

# The Geo. T. Smith Middlings Purifier Co.

TORONTO, April 27th, 1889.

THE GEO. T. SMITH PURIFIER CO., Stratford, Ont.

GENTLEMEN: Replying to yours of the 18th inst., I have always been pleased with the result of the changes you made in my mill at Lambton Mills, and which has now been running about six months. From the time you first turned wheat on the mill, the flour has been good and the finish close. The machinery, millwright work and material of all kinds are entirely satisfactory and our business relations agreeable. I was influenced by these facts to place my contract with you in preference to other mill furnishers from whom I had favorable offers for changing my Thorold mill to 300 bbls. capacity using your full centrifugal system, which I think superior to any other system which has come to my notice.

I have another mill built by E. P. Allis & Co., but prefer your system to theirs.

Yours truly,

W. P. HOWLAND.

THE WELAND MILLS.

Sir Wm. P. Howland, Proprietor.

THOROLD, ONT., Dec. 20, 1889.

S. S. HEYWOOD, Esq., Manager G. T. SMITH M. P. CO.,

Stratford, Ont.

DEAR SIR: Replying to your favor of the 7th inst., enquiring as to how we are pleased with our mill that you built for us this summer, I am happy to say we are very highly pleased with the mill throughout, and I believe we have the best mill in Canada to-day. I may say that until now I have been in favor of the long system, but our mill, which is on the short system, is such a complete success and so far exceeds our expectations in every way, that I am now perfectly satisfied that the short system is the true and proper system when properly put in.

You are already aware that we can with perfect ease turn out 400 barrels of flour every twenty-four hours. We can do this and not crowd a roll or machine in the mill, although your guarantee was for a 300 barrel mill only. For quality of flour and cleanliness of finish I have yet to see anything to equal us. The machinery is the best that can be made, the workmanship and general get up of the machinery cannot be excelled, and it runs and works to perfection. The whole plan of the mill is so simple and perfect that it is impossible to speak too highly of anything in connection with it from beginning to end. Wishing you success and prosperity, I am,

Respectfully yours,

R. B. ROUNTREE,

Manager Welland Mills.

ST. CATHARINES, July 23rd, 1889.

GEO. T. SMITH PURIFIER CO., Stratford, Ont.

DEAR SIR: Your esteemed favor of the 17th inst. came duly to hand requesting to know how we were pleased with the mill you built for us last winter. In reply would say that the mill has proved in every way a great success. Your contract with me was for a 300 barrel per day capacity. The mill will exceed this 300 bbls. per day at least. The workmanship is all done in a first-class manner, and the quality of the flour produced by it, in our opinion, is not excelled by any mill yet built. It has been running night and day for some time, and so far it has given us entire satisfaction.

Yours truly,

JAMES NORRIS.

NORVAL, ONT., 23rd July, 1889.

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

DEAR SIR: On the 23rd of November last I contracted with your agent for a four break full roller mill of 300 barrels capacity. Work was commenced on the first of February, 1889, and now I am happy to say that I have a mill that can make in 24 hours 400 barrels of as good flour as any in Canada, and this with a very low yield and clean offal. My mill is built so that one-half can be run alone, or fall wheat can be run on one half and spring wheat on the other.

For the nice arrangement of these two mills in one, much credit is due to your draughtsman. Of the millwright work I cannot speak too highly. Your foreman is a practical man, and does things right. In fact, every man on the job did his part with credit to himself and satisfaction to all concerned.

Your special machines, which comprise eleven belted double Roller Mills, six No. 3 Purifiers, twenty No. 0 Inter-Elevator Bolts, two No. 0 Centrifugals, Bran and Shorts Dusters, Packers, &c., are got up in good style. They run light, are stable and handsome. Nor does the work they do fall short of their outward appearance. Each handles its stock with ease, and separations are made which bring the best results at the finish. The belting you supplied is simply first-class, and reflects great credit on our Canadian manufacturers, as well as yourselves for using such stock.

I cannot close this letter without a word of recommendation for your agent, whose courtesy and business-like manner in dealing with the public should gain for you the patronage which you deserve.

Yours truly,

ROBERT NOBLE.

PEAREN BROS.' ROLLER FLOUR MILLS.

BRAMPTON, ONT., Dec. 21, 1889.

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

DEAR SIR: We take pleasure in informing you that the short system flour mill of 100 barrels capacity built by yourselves for us last season is very satisfactory. We did not ask for tenders from any other mill furnishers, believing at the time we placed contract, that you would build us a good and complete mill, and since we have been running it we have not regretted doing so. The Brown engine with cylinder 13 x 36 built by you at your works in Stratford is a fine piece of workmanship, and for economy in fuel and easy working we do not think it can be surpassed. In regard to the mill, the planning and arrangement of the machinery is excellent. The machinery and millwright work is first-class in every respect, and we feel satisfied that no expense was spared on your part to give us satisfaction.

Yours truly,

PEAREN BROS.

PRESTON & MCKAY, Merchant Millers,

BOISEVAIN, MAN., Dec. 13, 1889.

S. S. HEYWOOD, Esq., General Manager

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

DEAR SIR: As you will doubtless be interested in knowing how our mill is running, we write you to say that since starting everything has run like clock-work, and we have been running night and day. We are turning out work equal to anything manufactured in this country. Our flour is giving general satisfaction and we have been so busy since starting we have hardly been able to take care of all the work offered. All the machines are models of fine workmanship and smoothness of running, while the mill has been planned by your clever draughtsman to facilitate the operations of the miller and convenience of all concerned. So far as our experience goes we do not know of any one mill furnishing house in America that manufactures as fine and complete lines of mill machinery as you do, as you seem to have secured all the latest and best lines produced by any single house. Your milling expert deserves great credit for the results we are obtaining as regards quality of flour and yield. We shall take pleasure in showing any one our property here.

Yours very truly,

PRESTON & MCKAY.

## SECOND-HAND MACHINERY FOR SALE.

1 No. 2 Smutter, manufactured by W. & J. G. Greey, -	\$ 50	8 9x14 Porcelain Rolls (new), each -	30
1 No. 2 Smutter, manufactured by Howes & Babcock, -	70	2 Single 9x24 Roller Mills, Gear Drive, manufactured by John T. Noye Co., each -	110
1 Run Chop Stones, against sun, four feet six inches, -	60	1 Single 12x24 Roller Mill, Belt Drive, manufactured by Goldie & McCulloch, -	100
1 Run Chop Stones, with sun, four feet, -	50	1 Single 10x30 Roller Mill, Belt Drive, manufactured by The Consolidated Purifier Co., -	125
1 Four Break Machine, rolls 66 in. x 20 in., Goldie & McCulloch, -	300	1 Single 9x24 Roller Mill, Gear Drive, manufactured by The Consolidated Purifier Co., -	110
1 E. P. Allis & Co. Four Break Machine, -	400	3 Jones Stone Rolls for middlings, each -	40
7 Garden City Purifiers, each -	50	2 Jones Iron Rolls for Breaks, each -	30
6 Barter Purifiers, each -	100		
5 Single 9x30 Roller Mills, Gear Drive, manufactured by John T. Noye Co., each -	125		

We have for sale a full line of special machines of our own manufacture, which includes a full line of Upright and Horizontal Cleaning Machinery, and Upright and Horizontal Bran Dusters.

*We are Canadian Agents for the Knickerbocker Co., of Jackson, Mich., for the manufacture and sale of the Celebrated*

## Cyclone Dust Collector.

# THE GEO. T. SMITH MIDDINGS PURIFIER CO.

United States Shops: JACKSON, MICH.

STRATFORD, ONT.

# NOTICE TO MILLERS.

We take pleasure in informing the millers of Canada that we have succeeded in making arrangements to manufacture and sell the

## COCHRANE TRAIN OF ROLLS

FOR THE DOMINION OF CANADA.

*At a large outlay of money, we have fitted up our works with SPECIAL MACHINERY for manufacturing these rolls, and are now prepared to fill all orders with promptness and satisfaction.*

READ A FEW OF THE CLAIMS WE MAKE FOR THESE ROLLS:

**SAVING IN POWER OF 20 TO 33 PER CENT.**

**MORE EVENLY GRANULATED PRODUCT**

**HIGHER PERCENTAGE OF MIDLINGS**

**REQUIRES LESS ATTENTION**

**MORE DURABLE, CHEAPER AND BETTER IN EVERY WAY.**

*For proof that the Cochrane Rolls do all we claim for them, write any of the twelve Canadian millers who have already adopted them, and whose addresses will be furnished on application.*

If you wish **A NEW FLOUR MILL COMPLETE,**

If you wish **YOUR PRESENT MILL REMODELLED,**

If you wish **THE BEST ROLLS AND THE BEST MILL IN THE WORLD,**

Address,

*Write us for plans and estimates.*

# Hercules Manufacturing Co.

PETROLEA,

ONTARIO.

# ELECTRICAL MECHANICAL AND MILLING NEWS

Vol. XIII, No. V.

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**ELECTRICAL, Mechanical and Milling News,**  
PUBLISHED ON THE FIRST OF EACH MONTH BY  
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Office, 14 King Street West,  
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Advertising rates sent promptly on application. Orders for advertising should reach this office not later than the 25th day of the month immediately preceding our date of issue.  
Changes in advertisements will be made whenever desired, without cost to advertiser, but to insure proper compliance with the instructions of advertiser, requests for change should reach this office as early as the 15th day of the month.

**SUBSCRIPTIONS.**  
The ELECTRICAL, MECHANICAL AND MILLING NEWS will be mailed to subscribers in the Dominion, or the United States, post free, for \$1.00 per annum, 50 cents for six months. The price of subscription may be remitted in advance, in registered letter, or by postal order payable to C. H. Mortimer. Please do not send cheques on local banks unless 25 cents added for cost of discount. Money sent in unregistered letters must be at sender's risk. The sending of the paper may be considered as evidence that we received the money.  
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Subscribers may have the mailing address changed as often as desired. When entering change, always give the old as well as the new address. The Publisher should be notified of the failure of subscribers to receive papers promptly and regularly.

**EDITOR'S ANNOUNCEMENTS.**  
Correspondence is invited upon all topics pertinent to the electrical, mechanical and milling interests.

That at Ottawa an admirable sheathing paper is being manufactured from sawdust. Saw mill men will be glad to see the rise of many such factories, and the introduction of any other method of turning profit to account the 20 per cent. of waste which the sawdust pile at present represents.

In our last issue we pointed out the opening in Canada for a manufactory of carbons. We are pleased to learn that during the last month Chicago companies have completed arrangements for establishing such a factory at Peterborough. The new concern is expected to be in operation in February.

English exchanges give particulars of a strike of millers, the peculiarity of which in the United States is its spasmodic character, but which seems to be well sustained and gathering strength. It is thought that this may possibly compel some action to be taken at the forthcoming session of Parliament.

In our effort of our purpose to maintain for this paper a high standard of typographical excellence, the ELECTRICAL, MECHANICAL AND MILLING NEWS for the new year improved in appearance as the result of the use of an outfit of new type. We would be instrumental in helping our subscribers to the use of spectacles to the latest date possible.

The *Chicago Tribune* would make a hero of James G. Thompson, the telegraph operator who perished in the *Tribune* building at Minneapolis. It would serve no important purpose by remaining in the building beyond the time when he might have escaped, his conduct appears foolhardy rather than heroic, especially when it is known that a wife and children were dependent upon him for support.

THE death of Mr. Bull is announced at Minneapolis. We have been wondering whether this is the gentleman who had a hand in inducing Canadian millers to pay \$1.20 per bushel for wheat a year ago that they have since found out was worth considerably less than a dollar. If so, it may be some consolation to his friends to know that he is beyond the reach of the Canadian miller's wrath.

IN England and the United States there are a number of electrical institutes, associations and clubs, the existence of which has done not a little to stimulate electrical interests and inventions. The number of persons interested in the various applications of electricity throughout Canada, should now be sufficient to make the organization of a Canadian electrical society both possible and profitable. Who will be first to move for the accomplishment of this object?

THE electrical transmission of power is daily assuming more importance. The present outlook is one of great promise. The use of electric motors is to-day large and widespread. Motors can be found in all parts of Canada on both arc and incandescent circuits, doing various kinds of work, and not only is the quantity of power delivered on the increase, but the motors themselves are becoming larger and larger, until now a motor of 15 or 25 horse power, or even more, running from a central station, is no longer a matter for special comment.

MR. Geo. Robertson, late vice-president of the St. John Board of Trade, is addressing the Boards of Trade of the various cities throughout the upper provinces on the subject of increased trade with the West Indies. He states that Canadian cotton, flour and other products would find a market in the West Indies, while if Canadian millers would desire it, the West Indian Steamship Company would pass their representative for the first trip to and from the islands, and the same offer would hold good to the representative of any other important industry.

MR. Thos. A. Edison, the well-known electrical inventor, has been examining the Canadian iron, copper and phosphate mines, with a view to their development by his new electrical invention, which it is claimed will at a moderate cost extract these minerals and place them upon the market. Mr. Edison, in an interview, stated that his invention would extract 12 per cent. ore with profit, and that he had been surprised to find that mines of such richness as those in the vicinity of Madoc containing, as they do, at least 65 per cent. of mineral, had not been developed long ago.

AT no time during the past five years has there been a greater activity in the electric lighting field than prevails to-day, but the industry is still in the early stages of growth, as a department offering legitimate and lucrative employment for capital. What we mean is, that there is very little left of the early speculative fever, and that the erection of new plants and consolidation of old ones, occupies the energy of all the leaders in the business. There were periods when it looked as if the scrambling and gambling would utterly wreck the business, but it was pulled through depression and disaster by its own inherent vitality, and stands now one of the most inviting arenas for brains, labour and money to enter.

THE citizens of Toronto have reason to complain of the expensiveness and lack of efficiency of the telephone service of that city. The cost of a telephone

in Toronto, where one company controls the service, is \$50 per year. In Montreal, where the service is divided between two rival companies, the price is exactly half this amount. From this fact must be inferred that the profits of the Toronto company are abnormally large, and consequently that the citizens are paying about double the proper price. Added to this disadvantage is the fact that the service, as compared with that of Montreal, for instance, is most inefficient. In this connection, we are informed that a rival company will shortly enter the Toronto field. Its advent will assuredly be hailed with delight by the thousands of telephone users of the city.

A WELL-KNOWN farmer named J. K. Little, in a conversation with a reporter at London, Ont., is credited with having said: "I brought a load of wheat to the city this morning and sold it to Mr. Hunt. His tester made the weight 57 lbs. I took a sample to Mr. Plewes, who declared it 60 lb. wheat. I then went to Mr. Saunby, and his apparatus told 59 lbs. I make this statement on my own responsibility, and it just goes to show how much reliance can be placed on the grain-testers. Both Mr. Saunby and Mr. Hunt used the regulation Government tester." We would suggest that the officers of the Dominion Millers' Association should personally investigate these complaints of farmers regarding the unreliability of grain testers. The millers are as much interested as the farmers in knowing that every tester bearing the Government stamp has been correctly adjusted, and may be depended on to show a just record. The testers having undergone inspection at the hands of Government inspectors, should be reliable. If they are not reliable, the inspectors have not properly discharged their duty, and the Government should be made aware of the fact. If the machines are capable of making a wrong record, disadvantage is as liable to result to the miller who buys the wheat as to the farmer who sells it. Let a comparison be made between a sufficient number of these testers to prove their reliability or otherwise.

WE believe that we are correct in saying that not a single death has thus far occurred in Canada from contact with electrical currents. This fact speaks well for the character of the electrical work done on the streets of our towns and cities, and the care exercised by those in whose hands is the management of electric lighting. The interests of our electrical companies are closely connected with the maintenance of such a satisfactory record. It should be the object of all interested in the successful applications of electricity to insure in every way possible against the possibility of danger from its use. The superiority of electricity above any other illuminant is so great, that nothing can prevent it from ultimately coming into general use. This result might, however, be considerably retarded should the electrical companies neglect to throw every possible safeguard around its use. Much injury has in our opinion been done electrical interests in the United States by the attempts of some of the electrical journals to pool-pool the statements of those who complain of the dangers of the electric currents. It would be far more sensible on the part of these journals to frankly admit that high-tension electric wires are dangerous unless properly protected, and to suggest that the electric companies should set themselves to assist in devising methods for removing the existence of such danger. In Toronto recently a deputation of underwriters waited upon the Mayor to urge that legislation be obtained empowering the Council to compel the electric companies operating within the city to limit the voltage of currents passing through their wires, and the appointment of an inspector to see that the insulation of the

wires in the streets is in a proper condition to ensure public safety, and that all disused or "dead" telegraph, telephone and electric light wires are removed so that the operations of the firemen would not be hampered. No objection seems to have been raised to these requests by the managers of the electric light companies present. On the contrary, Mr. Wright, of the Toronto company, expressed his willingness to see an inspector appointed. This we regard as the proper attitude in the interests of all concerned.

**M**R. Ira Cornwall, Secretary of the Committee of Management of the recent Electrical Exhibition at St. John, N. B., was presented the other day with a handsome clock and bronzes, accompanied by an address expressing appreciation of the earnest efforts put forth by him for the success of the exhibition.

**T**HE Toronto *Empire* professes in its special anniversary number to give a review of the manufacturing and commercial interests of the Dominion, but we are surprised that not a word is said about the grain and flour interest. From this are we to understand that this interest is not of sufficient consequence to call for special mention in connection with other lines of industry, or is our contemporary afraid to depart from its past policy of silence regarding the condition of the great milling industry of this country, while posing as a champion of the National Policy and the doctrine of "Canada for the Canadians."

**I**T is not surprising to learn, says the London *Miller*, that the wheat growers of the Dominion have generally made the cause of the miller their own, since it must be remembered that every barrel of American flour that finds its way into Canada reduces the demand for home-grown wheat by four to five bushels. It is true that the farmer has a market beyond the Atlantic, but he complains that the great competition prevailing in European and especially in British markets, prevents his wheat from fetching a fair price. This may account for the comparative scarcity in this country of that desirable commodity, the hard wheat of the Canadian Northwest. It is quite possible that a rearrangement of the Dominion cereal tariff may cause it to become yet more infrequent. In time, no doubt, as the flow of emigration westwards increases the production of Manitoba's fields, there will arise a surplus of wheat, for which a market will have to be found in Europe. But that time may not be yet, and in the meantime the Dominion agriculturist will naturally devote his energies to selling his grain at a profit within his own country.

**T**HE Committee recently sent from Toronto to visit the technical schools of the United States for the purpose of acquiring information which should prove valuable in the establishing of such schools in the City of Toronto, have presented their report. The Committee, from what they have observed of the methods of conducting such schools in the United States, are convinced that it would be unwise to vest the management in the Toronto Free Library Board, as has been proposed. The language of the report on this point is as follows: "We think that the Board of Management of these schools should be a distinct and separate body from the Free Library Board, and so constituted as to be a representative board of citizens, who from their education, tastes, or other special qualifications would be more likely to make the enterprise a success." Notwithstanding that fault has been found with the Committee for the above recommendation, we believe it to be a wise one. The Free Library Board has quite enough to occupy its attention in properly discharging the duties for which it was appointed. Technical schools, to be successful, should be directed by persons familiar with, and specially interested in, the branches of special knowledge proposed to be imparted. To place the management in the hands of any other class of men would in all probability result in the adoption of a blundering policy, and the exhaustion of the funds provided by the city without anything useful being accomplished.

**T**HE proper operation of electric lighting installation requires, as a rule, the maintenance of fixed conditions of some sort, whether of current or electromotive force, and incandescent lighting especially, demands the highest degree of permanence in the latter condition for economy of operation. For while a variation of only five per cent. in the strength of an arc light current would have scarcely any effect on the system, a similar variation on an incandescent circuit would, in one direction, result in considerable diminution in the brilliancy of the lamps; and in the other, would entail

their rapid destruction. Hence it becomes necessary to provide instruments which will show the conditions existent, so that any variation in the standard may be at once corrected. The instruments designed to insure fixed conditions of working are based upon two principles, and in nearly all cases both involve a variable factor. In the case of direct reading instruments, their operation, with few exceptions, depends upon the action of a force, which may be that of a magnet, spring, or solenoid influencing a core. Where the zero method of indication is employed, the constancy of a resistance, or of a standard cell is depended on for constancy of indication. Thus, while both methods involve uncertainties, the choice seems to rest with that method which will afford the readiest means of re-establishing the correct reading of an instrument in case of its becoming inaccurate. It is upon consideration of this point among others that prominent companies have adopted systems of indicating instruments which can be compared directly with a standard of resistance, the ohm, and a standard of electromotive force, such as the Latimer Clark cell. The zero method of indication has been objected to by some, on the score that it does not furnish at a glance the true value of the force measured, but this is met by the argument that in most cases some fixed condition is required to be maintained, and that an *indicator* as distinguished from a *measurer* is quite sufficient in the hands of the attendant. Another point urged by the adherents of the zero method is the fact, that a small variation from the fixed condition in the case of direct reading instruments causes only a small deflection of the pointer of the instrument, while on the other hand, a small variation with the zero method may be arranged to give a large deflection on a suitable galvanometer. The eye of the attendant is thus more easily attracted by a variation in the latter case. Both methods undoubtedly have their own peculiar merits, but the best results would seem to be obtainable where both are applied to the circuit, so that one may be an ever ready check on the other.

**T**HE threshold of a new year is the standpoint from which it is customary to review the past, and anticipate the future. It is yet too soon to learn exactly what amount of progress has been achieved by our manufacturers during the year 1889. The balancing of the books, which is now engaging attention, will we doubt not, show, that material advancement has been made during the year in the development of existing industries as well as in the establishing of new ones. The harvest, upon which the prosperity of the Dominion so much depends, was a disappointing one both in Ontario and the Northwest. The result is seen in the tightness of the money market and increased number of failures during the last three months. To Canadian millers the year has undoubtedly been anything but satisfactory. They have continued to fight for an existence in the face of the heavy disadvantages imposed by an anomalous tariff. Few, if any, we imagine, have reaped anything like a fair profit; many have lost money, while not a few have been forced to the wall. As yet the Government has turned a deaf ear to the demands for readjustment of the flour duties, but it is hoped that during the forthcoming session of Parliament, steps will be taken to place the millers on equal footing with other manufacturers under the National Policy. It is gratifying to notice the interest which has of late been shown in the question of the development of our iron mines and the establishing of blast furnaces for the manufacture of iron in Canada from native ore. Electricity seems destined to play an important part in the accomplishment of this object, the inventions of Mr. Edison having rendered possible the extraction of the ore at much less cost than heretofore. Speaking of electricity, we are reminded that the past year has witnessed remarkable growth on the part of this new and important industry. Several new companies have entered the Canadian field, and there are many more to follow. The applications of electricity are few indeed to what they will be a few years hence, when it will take front rank among the agencies working to promote the higher civilization and prosperity of this great country.

Of the new year we care to say little, for the reason that there is little to base our premises upon. In some quarters, we have heard the opinion expressed that the new year will be characterized by depression. This opinion seems to be based upon the experience of the past two or three months, during which the business situation has certainly not been satisfactory. However, as the making of "good times" or "bad times" rests to a considerable extent with the business community itself, we would suggest that it is the duty of every man in entering upon this new year, instead of crying "wolf,"

to determine that individually he will do his very best to inspire his fellows with confidence in the future greatness of their country, and a desire to do their full share in its development.

**T**HE milling situation, so far as the prospects of readjustment of the flour duties are concerned, appears to have improved very much during the last two or three weeks. The agitation for a readjustment of duties has been taken up with true western energy by the Winnipeg Grain Exchange and Board of Trade. The former has addressed circulars to every municipal council in the Northwest, asking that petitions be forwarded to the Government in favor of equalizing duties on flour and wheat. This circular says: "The Government positively refuses to reduce the import duty on wheat, and we are compelled as free traders and protectionists, to insist that the duty on flour should at least equal to that imposed on the raw material. The present absurd and illogical state of the tariff on wheat and flour is fast closing up Canadian mills. As the Manitoba farmer gets his best prices for wheat to grow in Canadian mills, it is directly to his interest to have as many of them in operation as possible." The circular intimates that it is the intention to send a deputation representing Northwest grain and flour interests to Ottawa on this subject.

What are the millers and farmers of Ontario doing in this matter? Not all we fear that they might do, we are sure they are fully alive to their own interests. While several of the Farmers' Institutes have been brought to see the advantage of supporting the millers in their demands for justice, others have shown themselves to be either remarkably obtuse, or willing to sacrifice personal interest rather than appear to support a trade policy which they have always been in opposition to. The resolution passed by the Winnipeg Board of Trade clearly shows that the question of free trade vs. protection, *per se*, is not involved in the present demand for an increase in the flour duties. Among those millers and farmers who are supporting this demand may be found Liberal Conservatives, Protectionists, Free Traders, and advocates of Reciprocity. The common ground upon which they stand is, that so long as the policy of protection to home industries shall be declared to be the trade policy of this country, protection should be accorded the various industries of the country in equal degree. The important industry of milling alone should not be left unprotected, and in no instance should raw material entering into the manufacture of an article be charged a higher duty than the manufactured article itself. Here is a platform upon which all may stand. So broad and logical are the premises laid down, that on the many occasions when it has been presented to the Government, there was absolutely no defence to be made against it. We trust that every effort will be made to show the farmers the identity of their interest with that of the millers in this agitation. The meeting of the Central Farmers' Institute to be held in Toronto in February should be taken advantage of by the millers to have this question thoroughly discussed, and a strong expression of opinion thereon obtained. We believe it would also tend to arouse enthusiasm and add strength to the movement if a general meeting of the Dominion Millers' Association were called at an early date for the final consideration of the subject before a deputation goes to Ottawa to present petitions to Parliament.

The sale of the mill property at Port Hope, Ont., lately owned by Peplow & McCabe, was put up at auction last week, but was withdrawn, a satisfactory bid not being made.

Messrs. Howson Bros., of Teeswater, Ont., whose mill was burned down recently, have been in Walkerton, looking at R. Clement's mill, with a view of buying or renting.

Mr. Wm. Philip, who has been employed at the Galt oatmeal mill for the past 15 years, has secured a position as head miller with the Ireland National Food Co., of Toronto.

At a mixed meeting of farmers and millers at London, Ont., Dec. 2, the differential duties on wheat and flour were discussed, the concurrent opinion being they were very unfair to the Canadian miller and against the interests of the Ontario farmer.

A despatch from Montreal says the Canada Pacific people at the harbor commissioners are discussing a scheme for constructing an inland basin with elevators and storehouses to cost \$5,000,000. The Canadian Pacific managers say that during the last year they were compelled to refuse 10,000 carloads of European freight to western states owing to lack of accommodation.

The western board of grain inspectors has forwarded samples of this year's standards to the Department of Inland Revenue at Ottawa. The plan adopted for the first time this year of having two inspectorate boards is said to have worked well. The grain this year is of a much better quality than last. Considerably more than half of the grain that has left Manitoba this fall has been No. 2 Manitoba hard and higher.



## THE MILLING SITUATION.

ELECTRICAL, MECHANICAL AND MILLING NEWS.

DEAR SIR, - the action of the Winnipeg Grain and Produce Exchange in issuing a circular to every municipal council in Manitoba asking them to petition the Dominion Government for the equalization of the wheat flour tariff, is not only a testimony to their energy and push, but a practical rebuke to the millers of Ontario in the somewhat dead-and-alive way in which they are doing their claims. When the Dominion Millers' Association met in Toronto and elected an executive committee, it seems to have thought that they had done their duty, and that their committee must be responsible for the success or failure of their case. In fact they found the writer forcibly of Micawber, who, having given his note for a debt, remarked, "Thank God! that debt is paid." There is not a doubt but the executive is making the most out of the material at hand, and such progress has been made, but there is also no doubt, that had all the members of the Association done a little, the result would have been much more satisfactory. During the last month, one of the most important questions to millers has been under discussion at the Council of Toronto Board of Trade, viz., the appointment of a Railway Commissioner. In view of the fact that the freight on a barrel of flour from Minneapolis to Toronto is 45 cents, and from Winnipeg, 92 cents, or, in other words, that the American miller saves the duty on his flour all but three cents by shipping his product to the Canadian market over a line bonused by Canadian money, it is about time something was done about it. But the arranging of rates to suit individuals, to the general hurt of the trade, has grown to be such an evil, that some means must be devised to abate it. Take the case in point: The shippers of wheat from a point on the northern branch of the G. T. R. had their rate raised from 10 to 12 cents per hundred, but an individual who stands in with the powers that be, has been getting his "cut" at the old rate.

The writer could multiply instances by the dozen, but for the present this one will do. Now, sir, I do not think that the milling fraternity of Canada are content to remain subjected to the caprices or the likes or dislikes of the freight agents of the railway companies, who have it in their power to bankrupt any shipper to whom they have taken a dislike. What they have been granting special rates on flour to the favored few during the past year, is an open secret. The majority of the millers are at the mercy of the railway, and dare not "kick," for they know the power that is vested in such men as Laris, of Toronto, to rate them off the earth; and they quickly submit to be bled slowly to death, rather than to die kicking.

The Board of Trade are, I understand, in favor of a railway commission or court, but are very, very slow in moving, because there is not wanting a powerful railway influence in the council, and their policy is to retard matters so that nothing can be done at Ottawa during the approaching session.

Should any member of the Dominion Millers' Association who is suffering from unjust discrimination, write to the Secretary or to the writer of this letter, no efforts will be spared to get the matter put right, and all communications will be considered confidential. It is reported that the Manitoba wheat is all in the hands of a "combine," and that they will put up the price—which will no doubt result in a much larger importation of American flour than has hitherto been brought in, and thus greatly increase the misery of the Ontario millers, while it will be very difficult to see how the members of the combine are going to benefit by it.

A noticeable feature of some of the farmers' meetings recently held was the adoption of resolutions condemning the present flour and wheat tariff, but recommending absolute free trade as a remedy. Now, sir, while I do not think this would be at all unacceptable to the millers in general, it certainly would not meet the wishes of the larger portion of the farming community; and they should be given to understand that it was in their interest, and not the millers, that an increase instead of a reduction was asked. Let us all remember that it is equalization or fair play that we want.

Mr. Robertson, the Vice-President of St. John Board of Trade, was in Toronto last week trying to get freights for the West Indies line, and he expressed himself as astonished at the condition of affairs in the milling trade. He stated that he felt sure that our case was not understood in the provinces. He also invited the writer to visit St. John, and offered an opportunity of explaining the case before his Board. As about one-third of the exported freights would be flour, and, as under existing conditions not one barrel can be profitably exported, he was very much disappointed. We may

therefore reasonably hope to hear some favorable reports from St. John in the near future.

Wishing you, sir, and your readers a more prosperous New Year, I am,

Yours truly,  
JOHN BROWN.

## ELECTRICAL SPARKS.

Judge Dwight has declared the electric execution law of New York state constitutional.

The Ball Electric Light Company has been duly authorized to place a plant in Kincaidme, Ont.

The capital stock of the Barrie Electric Light Company has been increased from \$20,000 to \$50,000.

Peterboro, Ont., will submit a by-law granting a bonus of \$6,000 for the establishing of an electric light carbon works.

As the result of contact with a live electric light wire, Mr. T. Brown of St. Mary's was rendered unconscious and had his head badly burned.

Harriston, Ont., has contracted with the Reliance Electric Light Company for the lighting of their town at the rate of 20 cents per light of 2000 candle power per night.

Mr. Charles A. Cooley, on retiring from the position of Superintendent of the Royal Electric Co., Montreal, was presented by his staff with a handsome clock and set of mantel ornaments.

The Vancouver Electric Railway and Light Company has been incorporated. The names of the incorporators are Geo. Turner, Henry E. McKee, R. P. Cooke, C. D. Rand and Thomas Dunn.

The shareholders of the Wind-or Hotel Company, Montreal, have authorized the issue of the remainder of the capital stock of the sum of \$50,000 for the purpose of furnishing electric lighting throughout the hotel.

The name of the Chandler Electric Company, Limited, has been changed to the "Halifax Illuminating and Motor Company, Limited." The capital is to be increased from \$100,000 to \$500,000, in 50,000 shares of \$10 each.

The maximum power generated by an electric motor is 75 h. p., but experiments indicate that 100 h. p. will be reached. The greatest candle power of arc light used in a lighthouse is 2,000,000 c. p., in a lighthouse at Housholm, Denmark.

The Royal Electric Light Company has, it is stated, nearly finished the excavation of a shaft 60 feet deep, and communicating with the St. Lawrence, from which it will in future obtain water for its boilers and thus escape paying water rates to the corporation.

Mr. J. C. Wilson, superintendent of construction for the Edison Electric Light Co., of Canada, is making extensive additions to the plant of the Calgary Electric Light Company, Winnipeg, increasing the equipment to a capacity equal to a 1000 of the new Edison lamp of 16 candle power.

We learn from the liquidator that the estate of the Hibbard Electric Manufacturing and Supply Co., of Montreal, has been sold to Mr. James Leggat, of that city, but the amount to be realized for creditors will be small, and owing to legal complications, the estate cannot be closed for some time.

The Hamilton Electric Light Company, with a capital of \$200,000, composed of W. E. Sanford, George Roach, Alexander McKay, M. P., R. M. Wanzer and R. E. Kennedy, have applied for incorporation. They propose to purchase the present electric light plant premises, franchise and contracts, and to supply electricity for light, heat and power in the City of Hamilton, and within a radius of ten miles thereof.

The Richmond, Que., Electric Company has decided that as the water power, five miles distant, has now been secured, they will purchase an electric light plant and have it installed without any further delay. The Royal Electric Company obtained the contract after a hard battle for the two plants, one for arc lights for streets and one alternating plant for house lighting. It is also intended to transmit power from the waterfall to Richmond.

A peculiar suit was recently entered in the magistrates' court on behalf of Mr. Joseph Thilkault, against the Edison Electric Light Company of Montreal. Plaintiff alleges that having entered Tardi's barber shop, in the Imperial building, he placed his coat and overcoat on a rack near which incandescent light wires were being fixed, and that both coats were burned and damaged by the electric current to the extent of \$20, which he now claims from the company.

It is reported from England that the plans and arrangements for the proposed cable from Canada to Ireland have been perfected and that the work will begin early next year. The main stretch will be only 1,900 miles in length, and various advantages are claimed for the northerly route chosen. It is said that Canadian business messages already number 800 a day. The *Electrical World* remarks that this is not an excessive quantity and the company is likely to need other sources of traffic and income.

Roughly estimating there are in the neighborhood of 40,000 incandescent lights in the industries of New England to-day, as furnished by two of the leading mill equipment companies of the United States. In Massachusetts there are over 100 manufacturing establishments equipped with electric plants. Most of these are on the incandescent system, the number of lights being about 20,000, in the manufacturing centres. Fall River has a number of its large cotton mills equipped, the aggregate light capacity ranging from 1,500 to 2,500.

A very useful electrical invention, tending to lessen the possibility of accidents in factories, is now being extensively adopted in Leeds, Eng. The breaking of a glass, which is adjusted against the wall of every room in the mill, will at once stop the engine, an electric connection being established between the room and the throttle valve of the engine, shutting off steam in an instant. By this means the engine was stopped at one of the mills recently in a few seconds, and a young girl who had got her clothes entangled in an upright shaft was released uninjured.

A very interesting paper was recently read before the South Stafford Institute of Iron and Steel Works Managers at Dudley, England, on "The Application of Electricity to Works and Mills." The reader stated that there was everything to recommend an electrical transmission plant. Waste heat from blast furnaces could be used miles away; steam boilers could be placed near the colliery to save hauling the coal; the power of a river or stream could be used and hundreds of horse-power conveyed along small copper wires, while the places could be lighted by electricity at a very low cost.

The Montreal South & Longueuil Company, are asking incorporation for the purpose of constructing and maintaining at Montreal South, systems of water-works, gas and electric lighting, tramways by steam, electricity and cable at the surface of the ground, or up in the air on trestle work, with power of crossing over the St. Lawrence river, at the place where it is not navigable, between Longueuil and St. Helena island, on an iron bridge, or masonry, resting on the bottom of said river. The capital of the company to be \$200,000.

India is not a country where one would expect to find a very ready appreciation of new ideas, but it seems that one or two recent improvements are about to have a trial there. It appears that electric train lighting is to be experimented with, and, as much of Indian travelling is done at night for the sake of coolness, it is evidently desirable to use incandescent lights. The use of electric motors on some of the Indian railways seems not to be far distant, and in such a climate as that of India these methods have special advantages and ought to be largely and successfully employed.

Something rather startling may be expected, if what we hear is true, in the development of dynamo building in the future says the London *Electrical Review*. One prominent dynamo maker at least is said to be pinning his faith to the type of dynamo with iron-wound armature, having no copper whatever in its coils, of the kind we have heard something about both from Paris and from Berlin. Expressions are not wanting from those who believe in the iron armature to indicate that they consider iron will beat copper out of the market in armatures as it has in telegraph wires, and that in a few years the copper-wound article will be as extinct as the dodo. Anyhow, if this is too much to expect, we may not be far out in mentioning that developments may be looked for.

It is announced that Messrs. William Van Slooten, civil engineer, of New York; E. H. Potter, capitalist, of New York; Wm. B. Turner, mechanical engineer, of Boston; Joseph Odilon Dupuis, merchant, of Montreal; and James Cochrane, of Montreal, will apply to the Legislature at its coming session, to incorporate a company in Montreal under the name of "The Montreal Underground Conduit Company," with the object of providing the necessary means to put underground telegraph, telephone and all other electric wires or cables, with exclusive power to construct, establish and maintain during forty years, subterranean conduits in the streets of the city of Montreal and other municipalities in the district, with the right to exact rent for the use of the said conduits. The capital is fixed at \$100,000.

While double track railroads make the duties for the train dispatcher comparatively light, the importance which the telegraph occupies in the operation of single track railways cannot be overlooked. In both cases, however, the interruption of telegraphic communication between the dispatcher's office and the intermediate station always means loss of time, and quite frequently, accidents. Again, the forgetfulness of operators in leaving their keys open when called away to other business, is a frequent cause of annoyance and trouble. A telegraph system by which a break in the circuit, whether at the key or on the line, still leaves the circuit in a condition to handle business is, therefore, most desirable, and we leave the matter in the hands of our thoughtful and ingenious telegraphers.

The induction coil is now employed in connection with many diversified applications, and the difficulties met with in its proper insulation are worthy of notice. A case has come to light in which a coil had been treated in the ordinary way with paraffine wax of low melting point. To increase the bulk of the coil it was cast in a mould with harder wax. Previously the coil had given very good results, but after the last treatment, it was difficult to obtain any spark from it at all. The experimenter was under the impression that the cooling and contraction of the wax in the interior of the coil, after the setting of the border exterior wax, must have left the mass of the wax in the coil full of fissures, which undoubtedly must have formed a number of minute vacuum, as no air could penetrate the already hard external coating. To test the accuracy of the hypothesis and possibly remedy the defect, the whole of the external coating of hard wax was removed, and the spark after this was as good as at first. As most paraffines and waxes of low melting points show this peculiarity, it is evident that their use requires care, and for apparatus in which the temperature is likely to rise much above that of the atmosphere they should not be used at all.

Messrs. Goldie & McCulloch, Galt, Ont., have received an order from the Dominion Government for a \$30,000 vault for the use of the Post office Department at Ottawa.

On condition that the proprietors of the London Machine Tool Works, London, Ont., remove their works to New Hamburg, and employ not less than forty men, the citizens of that town propose to grant them a bonus of \$25,000. The Company are to erect buildings to the value of \$10,000, and to pay the interest annually of the balance, and are to be exempt from taxation for any excess assessment over \$15,000. The offer has been declined.

The average amount of feed water required for a good economical engine is 30 pounds per indicated horse-power per hour; engines of high economy will use less than this amount, and those more wasteful will use more. A high piston speed, together with a high rotative speed, is very desirable, as great power may thus be obtained from moderate sized engines, and also the evil of internal condensation is corrected to a great extent, but these are somewhat limited by practical considerations.

## Our Western Letter.

THE absorbing question of interest here in the grain trade is the breadstuffs duties. For some time back Manitobans have been urged to take up and agitate this question, but there has been a marked feeling of hesitancy in taking hold of the matter. The reason is easily explained. Out here in the west we are practically all free traders. There are perhaps a few Government officials, or some who expect to occupy such a position in the future, who would put in a word in favor of the present protective policy. But outside of a few interested parties, it is not easy to find protectionists in the west. Here in Manitoba, and for that matter in all the country west of the great lakes, the people have always claimed that the protective policy is to the disadvantage of the country. It has been persistently claimed that through the operation of the tariff, the people of the west pay a much larger share of taxation than the people of the east. Imports are proportionately larger, and home production of miscellaneous commodities proportionately very much smaller in the west than in the east, consequently the protective policy bears especially heavily upon the west. While we are paying heavy duties on a great variety of imports, we have no home manufactures to speak of which can be protected. Manitobans, therefore, being free traders, it has been with considerable difficulty that an expression of opinion could be drawn forth upon the breadstuffs duties.

It was recognized that the existing duties on wheat and flour presented a very anomalous condition, the duty being higher on the raw material than upon the manufactured article. This was looked upon as an absurdity, so far as the principle of protection was concerned. It was further recognized that under certain conditions an increase in the duty upon flour would be beneficial to the wheat growers of Manitoba. On the other hand, it was urged that if Manitoba asked for an increase in the flour duty, we would be set down as having adopted the principle of protection, and that henceforth anything which might be urged against protection on account of the claim that the National Policy discriminates against the west, would lose its force. It was further believed by some that there was something of a political trick in asking Manitoba to agitate for increased flour duties, the reason given being that the Government could then say: "We have put a duty on flour at the request of and for the benefit of Manitoba, therefore Manitobans must accept the duty on commodities which they import." All these things together rendered western people very careful in their utterances on the breadstuffs duties.

However, after a good deal of quiet discussion on the side, during which considerable opposition to the movement was developed, the Winnipeg Board of Trade has taken up and pronounced upon the question. The result of the deliberations of the Board of Trade is, that a resolution has been forwarded to the Dominion Government, asking that the duty upon flour be equalized with that of wheat that is, that the duty on flour be advanced to a parity with wheat. This decision of the Board of Trade has met with a good deal of opposition among persons both in and out of the Board, for the reasons previously stated, that to some extent it has the appearance of a resolution in favor of protection. On the whole, however, the action of the Board may be said to express the opinion of the great majority of those persons here who have given the matter any consideration. In discussing the question, however, the Board guarded against expressing any opinion upon the principle of protection. The resolution passed by the Board is guarded on this point, and states that the action of the Board must not be taken as endorsing the general policy of protection.

The action of the Board, as the representative commercial body of Manitoba, seems perfectly rational and proper. It is a recognized fact that the National Policy is in force, and so long as it remains in force, Manitobans would be very foolish not to take any advantage from it which they can get. Only extremists would refuse to allow themselves to be benefitted by the National Policy, simply because they are opposed to protection on general principles. If an increase in the duty upon flour can be made of any benefit to Manitoba wheat growers, they are justified in asking for it, though believing in free trade on general principles. More than this, as the protective policy bears particularly heavy upon the western farmers, these farmers have a right to any benefits which they can derive from the protective policy, so long as this policy remains in force. Wheat is our principal product, and it has been shown pretty clearly that the keeping out of United States flour will benefit the Manitoba farmer. United States flour import-

ed into Canada is largely of such grades that it comes directly into competition with the Manitoba article, and thus displaces a certain amount of the product of Manitoba wheat in the home market. There is now quite an extensive milling business in Manitoba, grown up within the last few years, and it will be in the interest of the mills to have the home market secured to them. At present, where does the bulk of Manitoba's surplus wheat crop find a market? Is it exported? No! it is sold to the millers of Ontario. Prices to farmers here have frequently ruled too high for export, and it has been found more profitable to sell it to domestic millers. Now, if the Ontario mills are all closed up, owing to the importation of United States flour, it is evident that Manitoba farmers will have to look entirely to export markets to sell their wheat, and will have to take export prices. However, in a big crop year all over Canada, there would be such a quantity of surplus wheat that it is not likely the flour duties would be of very much advantage to Manitoba farmers. In a year like the present, however, it would certainly be a considerable advantage. If the large imports of United States flour recently made into Canada had been kept out, there would certainly be a sharper demand for Manitoba wheat.

The question of freight rates from Manitoba eastward has again come up for active discussion, induced by the consideration of the flour duties. Rates from Minneapolis to Toronto have been compared with rates from Winnipeg to Toronto and other eastern points. The rates from Minneapolis appear to be very greatly to the advantage of the flour manufacturers of that great milling centre, as compared with the rates from Manitoba. For instance, the straight rate from Minneapolis to Toronto, on flour, is 25 cents per 100 pounds, while the rate from Winnipeg to Toronto is 45 cents per 100 pounds. It is claimed that a transit rate from Minneapolis to Toronto can be obtained at about 20 cents per 100 pounds. This gives the Minnesota millers a great advantage over Manitoba millers, so far as rates are concerned, but the advantage is more apparent than real. For instance, the extra cost in freight rates from Manitoba is taken out of the price of wheat paid to farmers. If freight rates from Winnipeg were lowered, the price of wheat would advance in the same proportion, and while the farmers would gain thereby, the millers would be in the same position relatively as they now are. Thus, if the freight rates from Winnipeg and Minneapolis were the same, the value of wheat at the two points would be the same, whereas wheat is supposed to rule enough lower here to even up on the difference in the cost of freights. At the time of writing wheat is relatively higher in Manitoba than it is at Minneapolis, but this is an exceptional condition, due to local competition. At the time of writing, wheat is only about 8 cents per bushel lower here than in Minneapolis, while the difference in the freight rate is equal to about 12 cents per bushel. To be on a parity with Minneapolis, prices for wheat here should be 12 cents lower than at that place, but as prices here are only 8 cents lower, wheat is relatively worth four cents per bushel more here than at Minneapolis. Of course, a good deal of the wheat ground at Minneapolis comes from points a considerable distance north and west of that place, and is subject to the local freight rate. Thus wheat from points in northern Dakota will be subject to a freight rate before it reaches Minneapolis nearly equal to the rate from Manitoba to Port Arthur.

As just noted, wheat is bringing a pretty stiff price in Manitoba at the present time. The cause is owing to strong competition between local millers, and the competition is in turn due to the very light deliveries of wheat by farmers. For some weeks back very little wheat has been coming in, though the weather has been very favorable for marketing grain. Farmers' deliveries have gradually fallen off, and some millers, who are not supplied with their season's requirements for grinding, became alarmed lest they would not be able to secure the requisite amount of grain. They at once started buying actively, and in the competition that followed, prices have been advanced to above a parity with outside markets. The question with grain men now is: "What amount of wheat remains in farmers' hands?" The gradual falling off in deliveries to very small proportions, and the fact that the higher prices paid recently has not increased the movement, would seem to indicate that very little grain now remains to be marketed. Those best qualified to judge believe that the grain movement is practically over for this crop. What is still held will be marketed in little dribbles between now and next harvest, and will be so small as not to affect the situation. This abrupt termination of the wheat movement gives a strong feeling to Manitoba wheat. Stocks at Lake Superior ports are only about 300,000 bushels, and there is not much wheat remaining to go forward, as millers are

taking about all that is now being marketed, and are also buying what lots they can from quantities held in store here. Stocks at Lake Superior elevators are only about half what they were at the commencement of the present crop movement, so it will be seen that the grain has gone forward earlier than usual this year. The harvest being early this year allowed the grain to move forward sooner than usual, and the season of navigation has been also a long one.

There is great activity in the woods here this winter and prospects are good for a big log cut in the three principal lumber districts. On the Lake of the Woods about forty to fifty million feet of logs will be taken out, which, with the logs hung up from last winter, or held over at the mills for early spring sawing, will bring the available supply of logs up to about 60,000,000 feet for the next summer's cutting. On Lake Winnipeg between eight and ten million feet of logs will be taken out. In the Riding Mountain district there will also be a fair cut. The cut last winter in the last named district was mostly "hung up," owing to the dry season, but lumbermen will try it again. Immense quantities of ties are being taken out this winter, which looks well for prospects in railway construction next summer. The demand for men for getting out logs, ties, cordwood, etc. has been so great that considerable delay was experienced in securing the requisite number. The number of men in the woods is much larger than usual, and the demand has been in excess of the supply all the season. Up to the time of writing the weather has been very mild, but recent snows have made fair sleighing. There were light rains on the 16th, 17th and 18th of December.

### THE SPEED OF REELS.

THE speed of a centrifugal says a writer in the *United States Miller*, is often changed by increasing or diminishing the speed of the shaft carrying the beaters without altering the connection between the beater shaft and the reel, in order to retain the normal speed of the latter. The speed of a thirty-two-inch reel for instance is usually tabled at twenty-eight revolutions. Say we have a centrifugal of this diameter, the beaters in which are to revolve two hundred revolutions. If it is desired to speed the beaters to two hundred and fifty revolutions and the reel connection is left unchanged, it will cause the reel to revolve thirty-five revolutions. If the beaters are originally run two hundred and fifty and we desire to speed them down to two hundred, the revolutions of the reel would be reduced to about twenty-two. The speed of the reel should be kept at its normal speed, when changing speed of beaters. The speed of the centrifugal should be governed somewhat by the distance the beaters are from the cloth. It is evident that the nearer they are to the cloth, the slower they can be run, and no doubt produce the same results. The slower a centrifugal can be run the less power will be required to hold it to its work. The power required to drive a centrifugal as compared with the power to drive the ordinary round reel or flour-dresser has often been discussed. It would seem apparent however, that the centrifugal would require the more power, owing to the fact that in addition to the reel itself, which is usually speeded the same number of revolutions as the ordinary, we also have to transmit power to the beaters.

It would be an easy matter to give this a test by applying a belt to a centrifugal to drive the reel without giving motion to the beaters - the belt is to be no larger than is necessary to drive the reel without slipping. Then make the connection with beaters and put on a belt of sufficient width over the same pulleys (supposing the pulleys to be of sufficient face). In this case we have the reel transmitting power to the beaters, however the actual power consumed by the centrifugal remains about the same whether we have the connection made in this way or in the usual way. Would it not be reasonable to believe that the beaters running eight times faster than the reel would add considerable to the power consumed? Some will argue that the centrifugal requires less power owing to the fact that the material is more evenly distributed than in the ordinary round reel. But does it not require a considerable amount of power to exert the beaters to distribute the material? As for distributing the stock, the slow-revolving, inter-elevator reel or flour-dresser accomplishes the work, and there certainly is a saving of power compared with the power consumed by the ordinary hexagon reel or centrifugal. The centrifugal is at present used principally on low grade or soft stock. While it is no longer generally used on any other stock, it has proven to be a valuable machine, inasmuch as it has paved the way toward the round reel system.

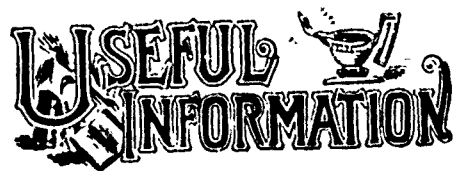
It is said that Point Edward, Ont., is to have the electric light

DYNAMOS VS. STEAM AND WATER POWER.

By Wm. B. Ferguson.

The improvement in the steam engine and in the utilization of steam power of late years, has been something marvellous. Every part and piece of the machinery, from the fire-box to the exhaust, has been improved and re-improved time and again. Engineers have been busy planning and designing new improvements, and the most skilled workmen are trying to excel in making the most perfect engine possible; and why should they not make it so in every department? The saving of every pound of fuel and utilization of every pound of steam is money saved; and money saved is money earned. But the expense of steam power in some mills and mills is a serious item. The item of fuel alone is enormous, some manufactories using from 150 to 3000 tons of coal per annum. It would be safe to say that fully 50,000 tons of coal are annually used in the city of Toronto to germinate steam power alone. This is an enormous expense, representing as it does about \$700,000 per annum. The water works alone use about 1,000 tons of coal, and this amount will be yearly increasing. Steam power will be a prime mover for a long time to come, and the more it can be improved the better, but there is one thing certain, which is, that there will have to be some other method of producing the lighter powers, and that power will have to be centralized. Power will be conducted from place to place in a manner similar to gas or electric light, and let out as so much per horse power. It is coming to that as fast as it can, as the expense of fuel for steam power, the danger of fire, the insurance, the expensive buildings, smoke stacks, engineers and firemen, etc., and a number of other expenses, are necessary adjuncts to the present use of steam power. Gas does not decrease the danger of fire, nor does it decrease the price of fuel very much. It would take an enormous amount of coal to manufacture gas sufficient for the required amount of power which would be used in cities. From present appearances, the most effective power will be electric power, generated in some central localities, conducted by some means much the same as electric light is now, and connected with dynamos at stations where power is wanted. It will greatly decrease the danger by fire, as dynamos properly placed in a small room can be properly secured so as not to be a cause of danger from fire or explosion. There are more than three times as many fatal accidents by steam than by electric power, and if electricity was properly understood and constructed, the proposition in its favor would be still greater. Steam power will be used in some places for a very long time to come, or until existing plants shall be worn out, and also in some mills and factories which manufacture a large quantity of refuse, which, unless used in producing power, would have to be got rid of in some other way. Such refuse is, however, a constant source of danger. With dynamos and some cheaper power than steam to operate them, we could have all that I have stated, and the time is not far distant when it will come to pass, and the sooner it comes the better. Some will be ready to say: "How are you going to get the means to germinate so much electric power so cheap?" I will tell you. Water power is the cheapest power we have—also the best and surest power. And here I must say, that if one-half the engineering skill had been spent on the improvement of the water wheel and on the privileges that has been spent on the steam engine and steam power, there would be a great many more water wheels in use than there are to-day. But the improvement of the water wheel is coming, when there will be more attention given to it than at present. There is more water power going to waste, unimproved, or not used at all, in Canada to-day, than there is in both the United States and water powers put together in use at the present time. It may be asked: "Why are there not more water powers in use? Why will people use steam power when water power is so much better and cheaper?" The answer is more than one reason for it. Often where a person wishes to locate his mill or factory, water power does not exist in the immediate vicinity. That is where the steam engine would come into use. The water power, if it should be miles from the mill or factory, could not be used where it exists, and also be made to operate something at a distance, and would be a source of revenue to the miller. Take Niagara alone. Enough power could be produced there with the aid of water wheels and dynamos to give both power and light to every city, village and hamlet within a radius of 100 miles—I am sanguine enough to believe that there are many to-day who will see it used in that way to great extent. There are numbers of other first-class water privileges throughout the country at present that go to waste which could be used in the same

way. Another reason why water power is not more generally used is, that it costs as much or more to put it in properly, even in the case of a good privilege, as it does to put in steam power. Manufacturers seldom consider the after cost of steam power, or they would not speak so lightly of water power. Another reason is that inexperienced persons think that because they have seen and helped to set a water wheel or two, they know all about them. No greater error could possibly be than this. What engineer would allow every "Tom, Dick and Harry" to rate and set up his steam engine? Why, he would not think of it for one moment on any consideration whatever. He would think more of his reputation than to allow such a thing. If the manufacturers of water wheels were to thus insist on none but thoroughly experienced persons rating and setting their wheels and water powers, they would give better satisfaction, and they would sell many more than they do at present. I am continually in receipt of letters asking for information in connection with water privileges or water wheels, and complaining that wheels do not give the proper amount of power for the amount of water used. They say "We measured our stream for amount of water; we levelled and got our head of water; we examined the manufacturers' tables and selected our wheel, set it according to directions given in the Book of Directions, and we find that it uses up all the water in our stream, and does not give anything like the amount of power as stated, so we set that manufacturer's wheel down as a first-class fraud." Now I find in nine cases out of ten the fault is that they rated their stream wrong at the start, and then all the rest of their calculations would be wrong. It is not every person who is capable of rating water power and setting water wheels. It certainly is reasonable that a person who has given water powers and water wheels a life-long study, should know more about them than one who only sets perhaps six or seven in a lifetime. A person may be a very good millwright, and yet not know very much about rating and setting a water wheel. It pays to get a practical, experienced hydraulic power engineer to rate the power, give a plan, set the water wheels, and see that everything in connection with the water power is carried out accordingly, for on the power depends almost entirely in every instance, the entire profits of the whole establishment, and every pound of power saved is money earned. Another error I find is that persons in rating their streams did not consider their rise and fall. They measured the stream when the water was high. The smaller streams have to depend on the rainfall to keep them supplied with water, therefore all streams should be measured in the very driest time of the year. Then there would not be any trouble on that point. For a company organized and properly equipped, the supplying of power by the method proposed would be a paying undertaking. They could give not only power but light also, and as the first cost is seven-eighths of the whole expense, the business would if rightly managed yield a profit of 30 per cent. In a future article I will figure it all out and show how it can be done. Enough power is used at the Toronto water works to do more than it does at present. If placed centrally, with dynamos at the pumping houses, 50 per cent. more water could be pumped than with the present system. I mean the power conducted from the engine house by a conductor to each pumping station. But cheaper still, and better too, would be to utilize some of the water power near by. There are water powers amounting to 3,000 h. p. on the Humber, not more than ten miles distant, which could be brought into use, but even if it was necessary to go three times that distance, it would pay to do so. Some may say water wheels are liable to get out of order. I will admit they are. Every piece of machinery that is made by man is liable to get out of order, but some much more than others. I know from experience that if water power water wheels are properly constructed and properly set, there is no better, no safer, and no cheaper power in the world. To give some idea of the expense of running a water wheel, 19 years ago last October I finished setting a 66 inch old James Leffel wheel, under a 17 ft. head of water, giving about 210 horse power, which has been running on an average 10 months every year since. And I have a certified statement that the wheel has only cost \$13.22. Now if you can find a steam engine 200 horse power which has run that length of time and cost no more, I would like to hear of it. In my next I will give particulars of the last and I think the best wheel I ever set, the water being carried 7 ft. up over a bed of rock higher than the lake, on the syphon principle, whereby over 100 h. p. was obtained. Mr. W. Thompson has sold his oatmeal mill at Scarforth to Mr. D. D. Wilson of that town.



A mixture of oil and graphite will prevent screws from becoming fixed by rust, facilitate tightening, and greatly reduce friction.

Recent foreign experiments at Witkowitz, Austria, show that a furnace run with water gas requires only 58 per cent. of the heat which is needed for a furnace fired in the usual way.

Liquid glue possessing great resisting power, and particularly recommended for wood and iron, is prepared, according to Hesz, as follows: Clear gelatine, 100 parts; cabinet-makers' glue, 100 parts; alcohol, 25 parts; alum, 2 parts; the whole mixed with 200 parts of 20 per cent. acetic acid and heated on a water-bath for 6 hours. An ordinary liquid glue, also well adapted for wood and iron, is made by boiling together for several hours 100 parts glue, 260 parts water and 15 parts of nitric acid.

Indented writing on iron has just been successfully done by John Farrer, an eastern iron foundryman, by the following process: The impression on the iron is made by writing backwards on thin paper, pinning the paper in a mould, and then pouring on the iron. The writing thus transferred to the plates, when the iron is cooled, is wonderfully clear and distinct, and is so deeply imprinted as to defy any attempt at erasure.

A bolting reel to be economical in every respect, says the St. Louis Miller, should run light and if possible run in the light. Every mill should let in all the daylight possible, so that it will pervade every nook and corner. The best insect preventive is light. A reel in a dark place is subjected to a much greater extent to the ravages of bugs than the reel in the light. And the cloth on a reel which is so located as to have plenty of daylight about it, can be more easily and accurately examined for holes, and the holes stopped with destruction to fewer meshes than that on a reel in the dark place; moreover, the cloth is not so much subjected to destruction of mesh holds by spilled grease and paste, etc.

A new feature in furnace building is to be introduced at the power house being erected at Alleghany City, by the Pleasant Valley Street Railway Company. The novelty consists of a smokeless furnace. It is a contrivance by which the fuel is automatically dumped into the furnaces, causing regular combustion, proper feed of air, and, it is claimed, an economy of twenty per cent. in fuel. Last of all, this very economy in the burning of the fuel makes the furnace practically smokeless. There will be six stokers placed in the new plant, and it is estimated that they will save the labor of four men. This is the first machine of its kind to be put into practical use in this section, although it has been introduced with great success in the west.

During litigation in a boiler explosion case in Toronto, Ont., recently, a number of experts were examined on "cold shortness" of iron. A broken rivet from the exploded boiler was shown in the court, and from the appearance of the fracture the experts said, under oath, that the iron in the rivet was "cold short." Mr. W. Raub, an eminent mechanical engineer, who was employed by the defence, stated before the court that no person could tell the quality of iron by the fracture unless he saw the fracture. Mr. Raub secured a bar of best brand of Lowmoor iron, took it to a blacksmith-shop, cut a nick about one-eighth of an inch thick all around it, tapped it gently with a small hammer for about an hour and then hit it hard with a sledge. It broke off "as short as a carrot." He then turned the other end over, after nicking it, and of course the fracture showed a beautiful fiber. The "short" end of the bar was first shown to the experts, who one and all said it was "cold short," but when the other end of the same bar was shown to them they were dumfounded. Mr. Raub, by his light tapping completely crystallized the one end of the bar and had left the other intact.

The uses to which wood pulp are now directed are innumerable and constantly increasing. Articles of utility and durability are manufactured in great variety from what is known as indurated fiber. The processes of manufacture, as described by an exchange, are interesting. Spruce wood is preferred, the stock being first ground so fine as to have its fibres thoroughly separated. When in this condition the material is placed in a large tank of running water and operated upon by a series of steel arms, which beat the whole until reduced to a homogeneous mass, which is then allowed to run into two large tanks below, where the mixture is kept well stirred by revolving arms. The pulp is forced by a rotary pump through a series of pipes to the moulding machines, from which the water can readily be drained, leaving the fiber behind. A hydraulic pressure of 25 tons is applied to the mould, and when the bulk of the water has been forced out the articles are taken from the mold and placed on a rack, and air-dried when the weather permits, or mildly heated in a dry room. The theory of the drying process is said to be to shrink the fiber upon itself, slowly at first and more rapidly afterward. From the dry room the articles go to two ovens, where they are subjected to heat of 120 degrees in one case and 180 in the other. After being worked at a turning lathe, sandpapering is the next process, finished off by the operation of a steam duster. Twenty-four hours of further drying follows, when the articles are dipped into a chemical preparation and undergo a heat in an oven of from 220 to 230 degrees. This treatment is followed by sandpapering to what is called a piano finish, holes for handles are drilled, and dusting is again resorted to. Dipped again in a chemical solution, the articles once more go into an oven 300 degrees. The goods are shoved into the oven on large racks and sent out by mechanical means. This process is gone through the third time, and when the handles are put on, if required, is finished. All handles have brass ears and brass hales. Notwithstanding the tedious and expensive processes of manufacture, indurated fiber ware sells at moderate prices.



## ELECTRICITY DIRECT FROM FUEL.

BY OSMAR DAHL

It is well known that the method of producing electricity by the steam engine and dynamo is very inefficient, in that only six to ten per cent. of the energy obtainable from the fuel is converted into electrical energy. Numerous other methods have been suggested. The following is a description of a new process for generating electricity direct from fuel by the aid of the gas battery.

A furnace, similar to those used in producing water gas, is charged with coke, coal or other suitable fuel. This is fired and brought to a certain temperature—more especially deemed here below, by the aid of an air blast. While the fuel is rising to the required temperature, "Siemens generator" or "producer" gas is generated and may be piped to a special holder for use as fuel gas or for other purposes. The supply of air is cut off and steam introduced to the incandescent fuel, when it has reached such a temperature that the admitted steam will be decomposed and a gaseous mixture of hydrogen and carbonic acid formed, the liberated oxygen having been combined with carbon to carbonic acid. This is attained at a temperature of about 500 degrees Centigrade with coke, and 350 degrees Centigrade with coal. To be able to guard against the temperature of the fuel becoming too high by which case part, or all of the carbonic acid first generated would be decomposed and carbonic oxide formed, a sample of the gas mixture from the furnace is made to pass through a solution of a chloride of mercuric acid, which absorbs the carbonic oxide, indicating its presence. Simultaneously with the admitting of the steam to the incandescent fuel, the outlet to the gas holder for the producer gas is closed, and the production in furnace, when the steam is decomposed, is led off through condensers, when all the steam that might have escaped undecomposed is condensed to water and the gases washed. The gas mixture next passes to the purifiers, containing chemicals—such as hydrate of lime, carbonate of sodium or potassium, or hydrate of barium, which absorbs the carbonic acid and allows the pure hydrogen to pass to a special gas holder provided for that purpose. When impurities are present in the gas mixture, they are caused to be absorbed by suitable substances before the gas mixture enters the purifier proper, thereby rendering it easy to re-oxidize the carbonic acid absorbing chemicals. After a short time the action of the steam upon the incandescent fuel in the furnace will have so lowered the temperature that the manufacture of gas cannot be successfully continued, and it becomes necessary to discontinue the current of steam and to re-oxidize the supply of air in order to repeat the process, alternately producing producer gas and hydrogen.

The hydrogen thus produced is conducted around one electrode of a gas battery, and oxygen or an equivalent gas or mixture of gases, such as the atmospheric air, or a liquid, is employed and conducted to the other electrode of said gas battery. By this process the hydrogen is oxidized to water and an electric current set up in the circuit electrically connecting the two electrodes outside the gas battery. In order to maintain a constant current with a constant resistance outside in the battery circuit, the depth and density of the electrolyte of water in the battery must be kept constant. The depth is kept constant by a float in one of two of the cells, or preferably in some vessel suitably communicating with the cell or cells by opening or closing for the undiluted water at proper times. The density is kept constant in a similar manner by a hydrometer, allowing access of air or undiluted water of higher density than that in the cells, when the density of the latter falls below a certain point. The undiluted water leaving the battery is distilled and used for that purpose.

From a ton of coke or coal are generated from two to 3000 cubic meters of hydrogen and as a cubic meter of hydrogen weighing 0.089 kilogram contains energy equivalent to 21 h. p. hours, a ton of fuel would in this way yield electricity equivalent to from 2,880 to 4,200 electrical h. p. hours, if there were no loss in the gas battery, but with a gas battery having an efficiency of 80 per cent. as has already been made, from 1,440 to 1,700 electrical h. p. hours are generated from a ton of fuel. The gas battery will, no doubt, be improved to an efficiency of 80 to 90 per cent., when by this process there would be realized from 2,300 to 4,500 electrical h. p. hours. The same amount of fuel, when used to raise steam for running a steam engine, and dynamo, will only generate from 500 to 800 electrical h. p. hours.

The process will, besides furnishing electric current, give some valuable by products, which to a large extent pay for the fuel and labour, and may even, under favorable conditions, pay a dividend on the capital invested.

The producer gas obtained during the period of blow-

ing up the fuel, may be sold as fuel gas, or enriched with naphtha or petroleum—sold as illuminating gas.

In the fuel there is always a small percentage of nitrogen present. This is converted into ammonia by the action of the steam upon the fuel and the ammonia salt is deposited in the condensers and recovered by removing the water from the condensers and distilling it with lime.

When carbonate of sodium or potassium is employed for absorbing the carbonic acid, the mono carbonate is changed into a bi carbonate by the absorbing of carbonic acid. It is transferred to a boiler and heated in steam, the bi carbonate may again be reduced to a mono carbonate and be re-used in the purifier. The carbonic acid driven off in the boiler is collected in a suitable receiver connected with the suction pipe of a compressing pump, and compressed into the liquid or solid state. The demand for this article for making aerated beverages is large and increasing.

It will thus be seen that by this process electricity can be generated cheaper than by any other method. *The Electrician*.

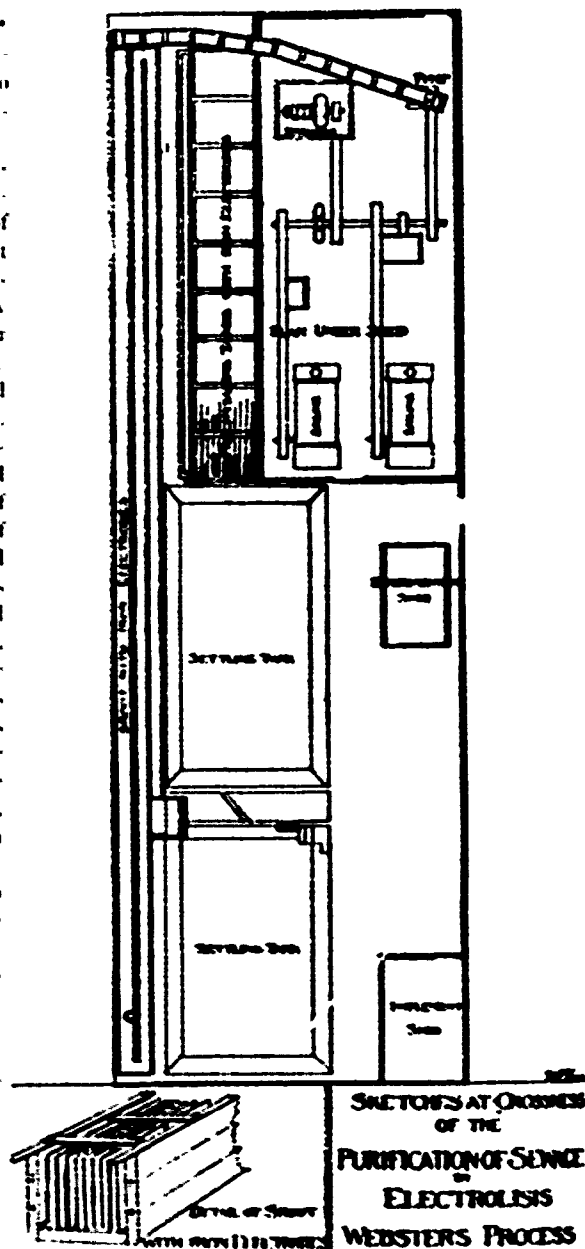
## DISPOSAL OF SEWAGE BY ELECTROLYSIS.

THE following is a description of the *modus operandi* adopted by Mr. W. Webster, F. C. S., who is engaged in extensive experiments at Crossness, England.

The dynamo in Edison-Hopkinson capable of developing an energy of 43 horse power. From the dynamo the leads run through resistance frames by means of which the amount of current can be regulated without varying the speed of the engine. These are then connected with the iron electrodes in both the precipitancy tanks and shoots. The precipitancy tanks are used for taking experimental measurements, so as to discover the best modes of arranging the electrodes here matter called plates made of cast iron run direct from blast furnaces. The shoot is fitted with wrought iron plates, more convenient for experimental work. They are thinner and weigh less than if made from cast iron. The shoot is of wood, but in any permanent work it would be built of concrete, bricks or iron. The bottom would be lined with asphalt, or other suitable material. The sewage is discharged into the shoot from the pump connected with the main sewer. The shoot is fitted with plates. In travelling along the shoot every particle of sewage comes in contact with the plates, and finally the whole is received in one or other of the setting tanks. The plates in this shoot are divided into twelve sections. All the plates in each section are connected in parallel, and the sections can be connected either in parallel or in series, as may be most convenient. I find it best to run them arranged in six sections in series, as owing to the low tension of the dynamo it is convenient to split them up into a greater number. The dynamo should be near the center of the shoot, and practice has proved that it must be so constructed that as many sets of plates as possible may be arranged in series, but the space at my command in these works does not admit of the most effective arrangement being adopted. My experiments proved that with 27 h. p. it is possible to treat 1,000,000 gallons of sewage in 24 hours. These figures relate to average London sewage. As to the cost of engine power, the newest type of engine suitable for driving dynamo may be taken to consume two pounds of coal per h. p. per hour. The experiments carried out with reference to the amount of iron consumed by this process tend to prove that the consumption in continuous working should not be more than two grams per gallon. Here, again, the cost depends entirely upon the position of the works, or, more properly speaking, the district in which the works are situated. The plates of pig iron are one inch thick, and if used in sufficient numbers, would last for many years when once fixed. For instance, I will take a town with a flow of 1,000,000 gallons of sewage per day corresponding to a population of 300,000 at 30 gallons per head. To treat this amount of sewage, the consumption of iron should not exceed 464 tons per annum. On calculating the amount of mechanical power required per head of the population, I find it represents eight horse power per 1,000. It will be seen that the above plant is practically in lieu of mixing tanks, machinery and chemicals employed in the chemical processes for the treatment of sewage. If such electrical plant is designed to meet the peculiar requirements in any particular district, it must, in my opinion, cost less and have a greater efficiency than any other process known, for not only does the electrical method precipitate the matters in suspension, but it also removes organic matter in solution and forms a precipitancy and disinfecting process in one operation. The cause of any successful precipitation of suspended matter in sewage is entirely due to the formation of flocculent particles by

means of chemical action. In the ordinary processes used this is obtained by the introduction of chemicals in a liquid form, and a large amount per gallon of sewage must be used to produce the necessary flocculency. Electrolysis with oxidized plates produces this effect with a consumption of material ranging from one grain per gallon, and the stronger the sewage the less the power required to produce the effect. The action that takes place manufactures the necessary precipitancy agent in the sewage, whereas precipitation with solutions of chemicals means a consumption of several grains per gallon of the sewage, if the action is intended to cause an adequate deposition of matter in suspension, and the resulting affluent requires further treatment with some oxidizing agent to remove the organic matter in solution. With my electrolytical process at the same time that the precipitation of the suspended matter is taking place, the organic matter in solution is being oxidized by means of free nascent chlorine and oxygen given off at the positive plate.

The accompanying sketch will assist to a better understanding of the appliances used in the operation of this system.



## FAKES AND FAKIRS.

THE country is full of advertising schemes, schemes only to get something for nothing; still long-headed business men, men who could not be duped in any other line of their legitimate business, are daily taken in by the snide advertising scheme, sometimes because it is cheap, and sometimes because the fob who manipulates it has a sick tongue. There are a thousand and one ways to bleed the manufacturer or business man who invests his money liberally in advertising for which he never gets a cent in return. A short time ago "a sleek young man" got up in this city a scheme in the way of a small book with transparent covers. The rate of advertising space on the inside of the book was nominal, though the space on the outside next the transparent cover was exorbitant. All good advertisers immediately recognized the advantage of getting their ads. on the outside. The consequence was that "the sleek young man" got an ad. for each of them for the same space. There were books enough printed with each advertiser's advertisement in its correct position to show the advertiser to make him believe the contract on the part of "the sleek young man" had been called out, and pay the exorbitant bill to have his name and business printed on the fly leaf of three or four books with transparent covers. Many men will pay \$10 for a card in a scheme of this kind who never patronize the trade paper which inconspicuously working to build up his branch of trade, and which in so doing benefits him, although indirectly.—*St. Louis Miller*.



**GUARANTEES.**

It has become customary in making contracts for the sale of almost everything, machinery included, to give some kind of a guarantee, says C. R. Tompkins in the *Woodworker*. Now this is all correct and business-like provided a reasonable guarantee is all that is required or given, but this practice, like many others, is liable to abuse from the fact that manufacturers' agents, in their anxiety to sell, are often led to give certain guarantees that they are not sure of being able to comply with and fulfill; in such cases they are often placed in a position where the advantage is entirely with the customer, and if he should be disposed to be tricky and take an unfair advantage, it often places the manufacturer in an embarrassing position.

One of the worst practices, though the most common, is to guarantee a machine "to give satisfaction," and also the privilege of returning it after a stated time, provided it does not "give satisfaction." Not that the purchaser should be expected or required to keep a machine and pay for it unless it has proved to be just what it was represented, and no manufacturer of any standing would knowingly send out a machine that would not fulfill his guarantee; if he should do so he would be legally and morally responsible to his customer for whatever damage he may sustain in consequence. Simply shipping a machine back to the manufacturer does not indemnify the purchaser for the freight, cartage and other incidents in putting up a machine and testing it and then taking it out again. It all requires time, and time to him is just so much money, therefore manufacturers or their agents should be careful what they guarantee and look to a certainty just what the machine will do, and to go beyond it. Then he can not only safely guarantee his machine to do a certain class of work, but he can also agree to indemnify the purchaser against all the damage he may sustain provided it proves otherwise. In such cases if the manufacturer furnishes a machine that comes up to his recommendation, and the purchaser is an honorable and reasonable man, the deal will in all cases be pleasant and satisfactory, but to unconditionally guarantee a machine "give satisfaction" is something that no manufacturer can do, nor should ever attempt to do, especially with the privilege of returning it at the end of 30 days or any other specified time.

I could cite any number of interesting controversies that have grown out of this kind of guarantee, especially where the machine was placed in possession of men who were only legally honest upon such conditions. One, however, will suffice at this time. The agent of a well-known eastern firm sold a machine to a firm in a western town, for a specified price. They were to have 30 days to try it, the same to be paid for at the expiration of that time provided "it gave satisfaction;" if not, they could return it. The machine, which was a first-class one, was put up and run for 30 days for all she was worth, and at the end of that time was taken out and shipped back, with a letter enclosing the shipping bill and informing them that the machine was not satisfactory. Of course the only thing for the manufacturers to do was to pay the freight, pocket the loss and clean the machine up and sell it again.

In the meantime another machine had arrived to take its place. I accidentally learned afterwards that the reason why the machine did not give satisfaction was that they were offered the present machine, which they considered would do their work just as well, for considerably less money than the first, and that explained the whole matter. The whole transaction was a rascally one from beginning to end, but those men were legally honest and the manufacturer had no business to make such a guarantee.

It is not, however, always the fault of the purchaser if machines are sent back. I could also cite many cases where the purchaser has been deceived by a class of light, cheap machines that were comparatively worthless, yet they were guaranteed to do everything that might be expected of a first-class machine. With such manufacturers I have but little sympathy, and it is more of a lack than good conduct that more of them are not sent back than there are. I once had some experience as a customer of that kind, which I will here relate to show that all men who send back this class of machine, are not so bad after all as they are represented. Some years ago, when there was not as many first-class planing machines in the market as at the present time, while travelling in the state of Michigan, I heard a party in an adjoining town who was an extensive planer dealer and in want of a first-class heavy commercial planer and matcher. I was also informed that if he was perfectly good he was a hard man to deal with, and that he had tried two or three different planers after using them a short time they had failed "to give satisfaction," and he had returned them, and that

probably if I dealt with him I would have to take the same chances. I called on him at his place of business and made known my errand. He looked over my circular and made numerous inquiries about the machine, as to its weight, price, capacity and quality of its work, all of which I answered apparently to his satisfaction. "Now," said he, "will you put up one of your machines of that size in my mill at the price named and warrant it to give satisfaction?" "No sir," I replied. "Well," said he, "if you have confidence in your machine that it will do what you represent it, and not like two or three other humbugs that I have tried and sent back after paying freight and cartage, you certainly, as your machine is so much higher priced than the others, ought to be willing to give some guarantee." "Ah," said I, "that is quite another question. You asked me to guarantee the machine to work to your satisfaction, and not knowing what it might take to satisfy you I could not consistently do it." "Well," said he, "I have already paid out over \$100 for experimenting on other machines, and I don't propose to pay out any more in that way; now if you want to sell me a machine, give me a proposition, stating price and just what you are willing to guarantee."

"My proposition," said I, "is very simple. First, I will ship my No. — machine, as described in this circular; price \$—, at Rochester, N. Y. I will pay all freight and cartage and deliver the machine in your mill. You will not be required to advance one dollar until the machine has fulfilled the guarantee which I propose to give you. All I ask is that you allow your foreman and such help as he may require to place it in position and get it started. I will be here to give the proper instructions. Then if the machine fulfils my guarantee you are to receive it and pay the price named, together with the freight and cartage; if not, then I will take it out at my own expense. Now my guarantee is that the machine shall be built of first-class materials and fitted up in a good, workmanlike manner. I will guarantee it to plane and match lineal feet per minute, and that the work shall be equal in quality to that of any machine in this town. If there is any question about the quality of the work, it shall be left to five disinterested carpenters or lumber dealers, you to choose two and I will choose two and they shall elect the fifth man, and whatever their decision may be shall be final as between you and me. Now if that is satisfactory to you I see no reason why we cannot trade." "Will you put that in writing?" said he. "Yes sir," I replied. "Well then go ahead."

An article of agreement was drawn up and signed by both parties, setting forth the foregoing conditions. When the machine arrived at its destination I was on hand to receive it and pay the freight. It was put up under my own direction and run two days on matching before anything was said. At the end of the second day Mr. — came into the mill and informed me that the machine had fulfilled my guarantee and that he was perfectly satisfied with both the quantity and quality of the work without any reference to anybody. He not only paid for the machine with freight and cartage added, but also figured in the bill my own expenses both ways. Now in this case the fault was not with the customer entirely. He wanted a good machine and was determined not to accept anything else, and if all manufacturers were particular and careful as to just what they guaranteed, and purchasers were all morally as well as legally honest, there would be no necessity for those iron-clad guarantees that are required by some purchasers.

D. Carson and J. W. Cochran, of the roller flour mill of Crystal City, Mo., have dissolved partnership. J. W. Cochran will continue the business.

F. and E. Pearson, who lately bought the Minnetonka, Minn., mill for a consideration of \$16,000, have removed to that place with their families.

A grain warehouse at Simcoe, Ont., owned by Alex. McCalland leased by Marshall & Son, grain buyers, was burned Nov. 27. Loss, \$3,200, insurance, \$2,000.

The Canada Pacific road has relinquished, at least for a time, the idea of closing its Emerson branch for the winter, much to the relief of grain men along the line.

Parliament will be asked to ratify the ordinance passed at the last session of the Legislative Assembly of the Northwest Territories entitled, "An ordinance to incorporate the Calgary Water Power Company, limited," and granting to the company; in addition to the powers granted by the ordinance, power to improve the Bow river at and above Calgary and its tributaries.

The circulation of water in boilers says the *Glasgow Engineer*, is attracting more attention from engineers, and the importance of it is being more generally recognized. The best circulation is, of course, found in the plain cylindrical boiler, where there is nothing to interfere, and decreases with the number of flues added. Other considerations must enter into the matter of the economical generation of steam, but the circulation should not be forgotten. In tubular boilers, the best practice places the tubes in vertical rows, leaving out what would be the centre row. The circulation is up the sides of the boiler and down the centre. Tubes placed zigzag in boilers never give good results.

**THE HEATING OF COPPER CONDUCTORS BY ELECTRIC CURRENT.**

FROM an abstract of a paper read by A. E. Kennelly before the Edison Convention at Niagara Falls, last August, we make the following selections:

From a number of experiments made at the laboratory of Mr. T. A. Edison in Orange, N. J., to determine the heating effect of the electric current on copper conductors when insulated and run in wooden mouldings, which is usually practised when wiring buildings already occupied, particular attention was given to diameter of wire, current strength and rise of temperature. With a bare wire of given size, if the resistance remained the same, the rise in temperature, would vary directly as the square of the current strength; but, as the resistance increases as the temperature rises and the wires being covered by an insulating covering and run in mouldings or panels the conditions become so numerous that the rule of square of the current equals the rise in temperature no longer holds good; for it is found that the radiating power of the insulation and also the panels, counteract, to some extent, the effect of the increasing resistance of the wire. With small wires, it was found that the rise in temperature took place more slowly than the square of the current, while with the larger sizes an opposite effect was noticed.

The result of numerous experiments showed that there was no simple law that would apply, and it was found necessary to determine a safe limit to the rise of temperature and make a rule that would apply and be correct enough for practical purposes. This was accomplished by making 150 Far. the limit, and so proportioning the wire that if double the amount of current proposed should be sent through it, the temperature would not rise above the limit. This was in accordance with the rule recommended by the Committee of the Institute of Electrical Engineers of London. Several formulæ were worked out, to apply to diameters of wire expressed in inches, mils, centimeters, and millimetres. For ordinary purposes the following formula is given as being convenient to remember, and agrees very closely with the results observed. When *d* represents the diameter of wire, expressed in inches, and *C* the current in amperes, then the formula  $d = 3\sqrt{C}$  gives the safe carrying capacity.

The following table, compiled from the data obtained gives the diameter of insulated copper wire for any specified current:

Amperes.	Minimum safe diameter of copper wire.		Circular mils per ampere.	Fall of potential in wire at full load.	
	Inches.	Cms.		Volts per foot.	Volts per metre.
1..	0.015	0.038	225	0.0503	0.165
5..	0.045	0.109	370	0.0305	0.100
10..	0.069	0.175	480	0.0237	0.0777
15..	0.090	0.229	540	0.0208	0.0681
20..	0.109	0.277	590	0.0189	0.0621
25..	0.126	0.320	640	0.0177	0.0581
30..	0.142	0.361	670	0.0167	0.0548
35..	0.158	0.401	710	0.0158	0.0518
40..	0.172	0.437	740	0.0152	0.0499
45..	0.186	0.472	770	0.0147	0.0481
50..	0.200	0.508	800	0.0141	0.0461
55..	0.213	0.541	825	0.0136	0.0447
60..	0.225	0.572	855	0.0133	0.0437
65..	0.238	0.605	870	0.0129	0.0423
70..	0.250	0.635	890	0.0126	0.0413
75..	0.262	0.665	915	0.0123	0.0403
80..	0.274	0.696	940	0.0120	0.0393
85..	0.285	0.724	960	0.0118	0.0386
90..	0.296	0.752	970	0.0116	0.0379
95..	0.307	0.780	990	0.0113	0.0372
100..	0.318	0.808	1010	0.0111	0.0365
110..	0.339	0.861	1040	0.0108	0.0353
120..	0.358	0.909	1070	0.0105	0.0346
130..	0.377	0.958	1090	0.0103	0.0337
140..	0.396	1.01	1120	0.0099	0.0327
150..	0.415	1.05	1150	0.00975	0.0320
175..	0.461	1.17	1210	0.00929	0.0305
200..	0.504	1.28	1270	0.00887	0.0291
225..	0.545	1.38	1320	0.00853	0.0280
250..	0.585	1.49	1370	0.00817	0.0268
275..	0.623	1.58	1410	0.00798	0.0262
300..	0.660	1.68	1450	0.00771	0.0253
325..	0.697	1.77	1490	0.00753	0.0247
350..	0.732	1.86	1530	0.00734	0.0241
375..	0.766	1.95	1570	0.00716	0.0235
400..	0.800	2.03	1600	0.00701	0.0231
425..	0.832	2.11	1630	0.00687	0.0227
450..	0.865	2.20	1660	0.00674	0.0221
475..	0.897	2.28	1690	0.00665	0.0218
500..	0.928	2.36	1720	0.00652	0.0214
550..	0.988	2.51	1775	0.00634	0.0208
600..	1.049	2.66	1840	0.00616	0.0202
700..	1.16	2.95	1920	0.00585	0.0192
800..	1.27	3.23	2020	0.00558	0.0183
900..	1.37	3.48	2080	0.00539	0.0177
1000..	1.47	3.73	2160	0.00521	0.0171

DATA: Insulated house wires carrying continuous currents, and coated in wooden punchings. Copper resistivity 1.690 microns at 0° C. = 1.876 microns at 31° C. assumed temperature of full load. Conductivity allowed 98 per cent.

## British Columbia Letter.

THE lumbering industry of British Columbia has long been an important one, but of late it has received a very great impetus, and promises soon to be mammoth in its proportions. This is the result of the increasing attention which the province commands among capitalists in all parts of Canada and the United States. The vanishing wealth of forests is causing lumbermen to look for new fields of operations, and the Pacific Coast is the last resort. Hence the great activity and speculation characteristic of west of the Rockies. At present timber limits are being sought out by representatives of syndicates and capitalists, and almost every issue of the *British Columbia Gazette* contains applications for large tracts of timber lands in all parts of the province, extending up as far as the Alaska boundary. As soon as these limits are surveyed and the Government price is paid, it is needless to say they become very valuable. This year has been one of activity in practical development. The McLaren Ross mill, the largest and finest mill in the province, has been erected on the Fraser river, Westminster, and is ready for logs. The Chemamus mills, on the Island, have been sold to a company, and have undergone extensive alterations and improvements. The Moodyville saw mill, on Burrard Inlet, with at present the largest output, has been extensively remodelled. The Hastings saw mills, with extensive limits, were sold some time ago to the Royal City Planing Mills Co., for a sum of about \$250,000. A Bill will be brought before the next session of the Local Legislature to consolidate the two extensive concerns, which united and under the successful management of Mr. John Hendry, will probably be the wealthiest in British Columbia. The McLaren Ross Co. have bought land on Burrard Inlet a few miles from Vancouver, and intend erecting another large mill with a capacity equal to their one on the Fraser. Capitalists from Illinois, Minnesota and other parts of the United States, have been in the province, and it is understood that extensive mills both on the Island and mainland are in contemplation, and of course, given plenty of capital and timber limits to draw from, the investment, with good management, is certain of satisfactory returns, as lumber is gold now-a-days.

Burrard Inlet, from the conditions that affect the lumber industry here, is bound to become the point upon which its energy and capital will concentrate. The chief market, the only export here, is to foreign countries, as freight rates eastward over the C. P. R. must necessarily be too high to make shipment profitable that way. Sea-going vessels are, therefore, the medium of export, and as Burrard Inlet is one mile long, three wide, very deep and perfectly unobscured and sheltered, no other harbor in British Columbia and few in the world can compare with it. The largest ship afloat can be accommodated at wharves anywhere on its shores, so that as a matter of course, its natural advantages must command the situation, not only in the lumber trade, but in the products of the fisheries, collieries and mines, and in general commerce.

The present season has not been a good one for export, owing to the fact that so many of the mills were closed down for repairs and extension, but up to the present time, the returns for the year being incomplete, forty sea-going vessels, barques, have loaded lumber at the Moodyville and Hastings mills for foreign ports, including those in South America, San Francisco, Yokohama, Shanghai, Melbourne and others. These have an average registered tonnage of about 1,000 tons, and their aggregate cargo will amount to 70,000 feet. About half a dozen large barques went up the Fraser to load lumber at the Royal City Planing Mills. Next season the export will probably be doubled. At present a large portion of the tonnage is done by American vessels, but it is hoped that the ship-building industry now beginning to grow into prominence, notwithstanding the great advantage which American vessels have over the Canadian on the waters of the latter, will soon remedy this. And here it may be permitted to state that if the Dominion Government were as stringent in its coasting laws as the United States is, the shipping of the British Columbia coast would not much longer remain in the hands of American navigation companies. The recent Order in Council was a spasmodic effort to do justice to our shipping interests, but pressure from Victoria resulted in its temporary suspension. Apart from the foreign trade, the extensive building improvements in all the four cities of British Columbia have kept the local trade in lumber and manufactured stuffs very active, a number of smaller mills being constantly employed in supplying the demand, and the larger mills finding a considerable market therein. A description of the

logging camps of British Columbia would be an interesting subject for an article, but is deferred for a future issue.

Since writing my former and introductory article, I observe that you have incorporated electricity in the scope of objects for which your journal is published. British Columbia is not behind the rest of the world in progress in electrical appliances. To begin with, at the C. P. R. head office, Vancouver, one of the finest distributing offices on the coast is to be found, its appointments being the latest and most improved. There are two quadruplex and several duplex instruments. Then Vancouver, Victoria, Westminster, and Nanaimo have each their own telephone systems. Vancouver so far has been lighted publicly and privately with the incandescent electric light, but lately has decided on the Thomson-Houston arc lights for street purposes. Her street railway, the rails of which have been laid for some time, is also to be operated by the same system by overhead wires. The electric light and street railway companies have amalgamated, and both the electric light and street railway will be operated from one building. Victoria has had the arc light in operation for some years, but is now constructing an electric tramway, also to be operated by the Thomson-Houston dynamos. Both Vancouver and Victoria are putting in the Gamewell electric fire alarm. A company at Westminster is applying for incorporation, to supply that city with electric light and street railway, so that the cities of British Columbia can in no sense be termed "moss-back," even if it has been customary to apply that phrase to many of its inhabitants who have been old-timers. A project has been considered for some time, and that is, for the utilization of Capilano creek, on the north side of Burrard Inlet, for the purpose of supplying electricity for Vancouver city. A notice of incorporation of a company with this view has already appeared in the *Gazette*.

This province is becoming daily an increasing market for eastern manufacturers of all kinds, and it seems to me that they should be more alive as a class to their interests here. Eventually, however, Vancouver is bound to become pre-eminently a manufacturing centre, as the conditions are similar to those in England, viz., plenty of timber, contiguity of iron and coal, shipping facilities, and direct communication with many markets.

### PREPARATION OF OATMEAL.

THE following abstract from a report by Mr. F. H. Underwood, United States Consul at Glasgow, upon the value, uses and preparation of oatmeal in Scotland, should prove instructive to Canadian oatmeal millers who have to compete in that market.

Every person of simple tastes, unspoiled by highly seasoned food, recognizes a flavor and a slight perfume in porridge skillfully made of the best oatmeal in Scotland, which is seldom met with in the United States. The flavor somewhat resembles that of freshly popped corn, so well known in the United States, and undoubtedly comes from the process of kiln-drying, hereafter to be mentioned.

At the mill oats are put in the kiln, which in the case used here for illustration is the upper floor of a chamber, about 18 feet square, having a floor of perforated iron plates. The heat comes from a furnace of anthracite or other smokeless coal, placed about 24 feet below the floor. The heat must be absolutely free from smoke, otherwise the grain will be discolored, and, what is worse, will have a repulsive taste. I could not get the degree of heat, as a thermometer is not used. The workmen simply drop a little water upon the floor, and when it "hizzes" in a certain way they know it is hot enough. The ventilation is by an opening in the roof, through which the steam escapes. Oats require a sharp and constantly sustained heat, care being taken to prevent their being burned by overheating. The miller observed that oats need a stronger heat than either wheat or Indian corn. Oats which have been properly cared for at the farm should not contain impurities to be cooked with them, and should be allowed to lie four hours in the kiln, during which time they must be carefully turned at least three times. A kiln 18 feet square will accommodate 90 imperial bushels of oats at a time. Short oats, i. e., oats with short grains, require less drying, but the long oats produce the sweetest meal.

After drying and a slight parching is thereby understood the grain is drawn off into a hopper, where it should lie for a day before being put in bags to be ready for the succeeding processes. Two days should elapse between the drying and the beginning of the milling, during which the grain cools slowly. If put into the mill before it is well cooled the meal will not be so sweet.

The oats pass from a hopper through a machine called a "dickie," containing two sieves, the first of which allows the oats to pass, but retains any foreign substances. The oats pass through the second sieve,

where again any dirt or remnant of weeds or stalk adhere to the sieve, and then the oats reach the shelling stones, by which the husks are separated from the grain. The shelling stones are 4 feet and 8 inches in diameter, and are made from gray stones procured principally from Yorkshire. The under or bed stone, which is stationary, has a surface bristling with points; the upper stone has its under surface of the same character, and moves with great velocity, raised about one-half inch above the bed. The velocity is so great that it is observed that the oats, in falling through the opening, are all perpendicular, as it were, suspended all endwise. The grain is made to pass twice through the shelling stones to insure thorough separation, after which it falls into another sieve, and then into fans, where the husks are blown out. The pure grain is then elevated to a hopper, to be passed through the grinding stones.

The object aimed at in grinding is to cut or break the grain into small particles, but not to crush it into flour, which is unpalatable. Unlike the particles of maize, oatmeal is digestible with a comparatively short cooking. The best stones are of French "buhr," having the surface well honey-combed. They are 4 feet 6 inches in diameter, and are laid in the same manner as shelling stones. The surface (of the points) must be kept sharp and well polished in order to make sure that the grain is well cut, for, if the points of the stone become blunt, the meal will be floury and of inferior quality. The meal passes from the stones into a box containing three sieves of graduated apertures, the upper No. 8, the middle No. 9, and the lower No. 10, of wire gauze. After passing through these three sieves (to remove any foreign substance still remaining) the meal is ready for consumption.

Oatmeal of a recent crop and freshly ground is the best. If not to be immediately used, it should be kept in hermetically sealed cans; otherwise, by absorbing moisture, it will lose its delicate flavor or become sour and moldy.

It is quite uncertain whether the rules observed in Scotland by farmers will be of much service in the United States, since the soil and climate are so different. But, as the crops here are considerably more than double those ordinarily gathered by our people, perhaps some useful hints may be given. Heavy soils produce the best oats for human food. The oatmeal of Midlothian vicinity of Edinburgh is much vaunted and liked, but its superiority over that of other good districts is a matter of opinion. If such superiority exists, it is owing to better modes of cultivation, and especially to atmospheric conditions, as there is far less rain there than on the west coast.

Whatever superiority is in the oatmeal of Midlothian, or elsewhere, comes mainly from the care and attention in treatment—drying, handling, cleaning with sieves and fans, and keeping of the millstones in perfect condition, as before explained.

As to species, any variety of long oats is preferable to any kind of short oats. After reaping, proper attention must be paid to keep the sheaves or stacks standing, so that the ear shall not lie upon or touch the damp ground; otherwise they will sprout, or at least become discolored, and thereby injure materially the quality of the meal.

### REASONS WHY STEAM PIPES SHOULD BE COVERED.

1. As much as from twenty to fifty per cent. of the effective steam is wasted in uncovered pipes, necessitating from twenty to fifty per cent. more steam plant.

2. Condensation, which takes place in an unprotected steam pipe leading to an engine, has two serious features about it. In the first place, the condensation carried into the cylinder is likely to cause an accident, or breakdown; and, in the second place, as only about one-tenth of the heat put into the steam is available for producing power, and it is only upon this one-tenth that radiation has any effect, every unit of heat lost by radiation from a steam pipe leading to an engine means ten times as much heat required from the coal pile and a corresponding wear on grate bars, boilers, etc.

3. An unprotected steam pipe in close proximity to wood is a great source of danger from fire.

4. Unprotected steam pipes carried into the mines to pumps, etc., cause rotting of timbers and disintegration of roof.

5. To convey steam any distance through unprotected pipes requires a much larger pipe to furnish the requisite power than when covered.

What is needed is dry steam at the point of utilization. To get this steam, pipes must be covered, and it is economy to cover them. It is economy because you can get more and better steam from fewer boilers. It is economy because you can use smaller and cheaper steam pipes.—*Colliery Engineer*.

**ESSENTIAL REQUISITES FOR THE MAKING OF GOOD FLOUR.**

BY R. JAMES ABERNETHY.

THE following remarks, contributed to the columns of the *Merchant, Miller and Manufacturer*, are applicable to owners of mills in Canada as in the United States:

Millers of these times must of necessity exercise caution and prudence in operating their mills in order to make the business a success.

That is true of all methods of milling; in fact of all kinds of legitimate business.

In view of that all important fact then, millers having mills not in condition to do the kind of work required by the trade of to-day, very properly hesitate and consider long and seriously the question of changing and adapting their mill to the requirements of the times.

I say that they do so properly, not because of the great controversy that has been going on for two or three years between the adherents of different methods of milling, because the consideration of that phase of the milling problem, aided by the developments that have been made in actual practice, have arrived at a point where no longer the slightest excuse is offered for even a doubt as to what method should be adopted, but rather because there is room for them in very many instances to question whether a change of any kind, or to any method, be it ever so simple, could be made profitable.

The one great stubborn and indisputable fact remains that the flour making facilities of this country are far in excess of any legitimate demands that will be made upon them for the present, or indeed, so far as can now be seen, for some time to come.

It is that appalling fact that causes men of business to hesitate and ponder long and well before making a decisive move in the direction of investing money in these milling plants by further improving them.

Mills cannot be built or remodeled without the expenditure of money—wind will not do it, or if done on wind, the uneven pressure brought to bear resolves it into a furious and destructive cyclone which sweeps from the face of the commercial world, the windy projector.

It takes cash or its equivalent to remodel a mill and make it go successfully. The absorbing question then is whether to spend or not to spend the cash on the mill for the reasons already given. Notwithstanding this state of affairs, the fact still remains that the whole issue is rapidly resolving itself into one of "the survival of the fittest."

Above all other things excellence will win, and about the only thing left to be done is for each to try to excel the other. There is nothing wrong about that. It is simply self preservation or nature's first law.

A quarter of a century or more ago, I really do not know how long, Geo. P. Plent commenced to make flour in the City of St. Louis on that plan. His ambition and business policy was to excel; he did excel, and up to the time of his death his business career was one unbroken line of successes. I have narrated the incident to show how one man with a worthy ambition to excel in the flour making business built upon an enduring foundation, and to show that in flour making as in every other phase of human life, character and calling, all ends in "the survival of the fittest."

While, as I have said, in view of the present very decidedly unhealthy state of affairs in the flour making world, it is no wonder that the many hesitate to improve when improvement is sadly needed, still, after all, when we come to look at it in the other light in which I have tried to present it, is it sound business policy to do so? We must all work to win, and can only win by the excellence of our work.

Millers who already own mills have necessarily large sums of money invested, and to let the business go entirely, or even partially by default, is to lose what they already have, while a judicious investment of more may save all. They may, of course, argue that it would be better to let what is in go than to risk any more in the business and take the chances of losing it all; that, however, is not a very sound position, because if all men in all kinds of business would view the situation in that way, and act accordingly, there would be no success in any direction, and humanity would gradually drift back to its primitive condition.

I think every mill owner should feel himself in a measure bound to try to succeed in business. Some must fail, but all should try not to. Some are dying every day, all must eventually die, but no man is warranted in ceasing work to-day for fear that he may die to-morrow. Just so it is with milling and all other business. We must continue to do our best to-day although we may fail to-morrow.

Although, as I claim, it is every man's duty engaged

in the milling business to try to improve his condition if it needs improving. In doing so, he must go at it with his eyes wide open and hew close to the line of common sense all the way through.

As I have many times endeavored to point out, it is simply useless for small mills, with old-time outfits of buhrs and such other inefficient machinery as is mostly found in such mills, to attempt to do a full and profitable business. The most they could possibly do would be to grind a grist now and then for some impecunious or antiquated citizen living on the faith of his ancestors, who lived so because they lacked the light and knowledge of the present generation, and knew not how else to live. But grinding a grist now and then, and doing a little corn meal business, will not even keep a very small mill alive very long, and hence of dire necessity they must make a change, must fix their mill to make flour that will suit the tastes of modern people, and meet the requirements of the trade of the present and not of the past.

Our old time millers may delude themselves into the belief that buhr-made flour is really the best and much healthier than roller made flour—may in fact indulge in any kind of fancies they please, but out of such a stock-in-trade they can make no money. If they desire to do a successful business and make money, they must cater to the wants of the people at large, and not to their own idle fancies.

It does not cost very much to change a small mill. There are many hundreds in existence depending on a purely local trade that reaches out but a few miles from them, that can fit up at a cost of \$1,500 or less, and make a flour that will be eagerly sought after by the custom which by right belongs to them. It will be in color and condition all they want, all they ask for, and hence, rather than buy flour made in some distant part of the country, they will only too gladly patronize the old home mill. That is straight human nature all the way through. Give them at home what they most desire and they will not go abroad to seek it.

Fifteen hundred dollars is not much money to put in a life-time business, and certainly the majority of them can do it.

This advice is intended only for those who now have such mills. I could not advise any man to build such a mill anywhere in the United States at the present time, unless it would be to utilize a small permanent water power in a thickly-settled community where wheat is grown in abundance and mills not too numerous. Nor could I advise the building of any large mills, because there are too many already. What I do advise is, that all now having mills, put them in a condition to make acceptable and marketable flour. In that way all can work together and suffer together if need be, and patiently await the time when the demand will have caught up to the facilities for making flour.

There are many mills, having machinery enough of all kinds, that are still unable to make such flour as they should, and in consequence, drop to the rear and do an unprofitable business. The reason for the drawback in such cases, is imperfect arrangement of the machinery, imperfections in the flour, or both together, with, perhaps, many other causes easily remedied. All so situated and perplexed should study the situation well, exercise caution and good sense while proceeding to rearrange, change the flow, and correct other minor defects that may be developed on careful investigation. All good millers should have sufficient knowledge of first principles to correct any important or unimportant evil that may exist in the machinery arrangement or flow of the mill. Those that have not should enter into a course of studies at once and qualify themselves for such undertakings.

**WHEAT AND FLOUR DUTIES.**

THE Farmers' Institute of East Huron last week voted down a resolution requesting the Dominion Government to place a duty of one dollar a barrel on flour until reciprocity in farm products with the United States is obtained, and adopted an amendment declaring the present tariff to be injurious to the farmer, and demanding its repeal. Some Liberal journals, we observe, have seized upon this proceeding as an evidence of the discontent of the agricultural community with the National Policy. It is rather an exhibition of the stupidity and partizan zeal of the East Huron Institute. Whether reciprocity in farm products would be to the advantage or otherwise of Canadian farmers may be a matter of fair discussion; and Liberals educated in the free trade principles once held by their party may naturally enough evince a desire to do away with protective duties on articles of consumption. But what in the name of reason has this to do with the inequality of the wheat and flour duties? There is nothing of inconsis-

ency in a free trader insisting that so long as protective duties are maintained they ought to be fairly apportioned, and made to serve their ostensible purpose, while the self-interest of the farmers of Canada clearly requires the preservation of the home market for wheat, by means of the exclusion of American flour. Without entering into the larger question whether under a system of free imports the Canadian farmer can successfully withstand the competition of his fellows in the United States, we maintain that every consideration of principle and regard for the interest of the wheat growers of the Dominion makes in favor of an increase in the duty on flour. A fall of 15 cents on wheat and 50 cents on flour is neither free trade nor protection. It is an anomaly, indefensible by any rule of reason, which in practical working discriminates heavily against the interest alike of millers and farmers. If the latter have no consideration for the millers, they ought at least to sufficiently comprehend their own interests to understand that every barrel of American flour brought into this country displaces five bushels of Canadian wheat in the home market. No; the East Huron Farmers' Institute has not manifested an appreciation of the beauties of free trade; it has merely exhibited the length of stupidity to which party excess will sometimes carry presumably intelligent men.

*Montreal Gazette.*

**THE RELATIVE COST OF WATER AND STEAM POWER.**

THE fact that the tendency in the field of textile manufacturing has been in a direction towards the preference of steam for water power, should not be permitted to create the impression that the water-wheel is on the decline. So largely do the differing conditions enter into the problem, that it requires but little investigation to show why steam is preferred in many cases. The location of a mill near a market, or transportation facilities, the requirement of steam for bleaching and dyeing purposes, and for heating purposes in winter, the unreliability of many water power plants during certain seasons, are all arguments in favor of the general use of steam. It appears to be the case, however, that water power has its advantages in the production of electricity, and in this case it is simply a question of continual supply. Furthermore it is being shown continually that the possibility of transmitting power by electricity a reasonable distance is leading to the utilization of water privileges which have long lain dormant because of the unfavorable location of the property. This is one of the opportunities which is open to the electric motor, and the manufacturers of water-wheels may be depended upon to point out the possibilities of combinations which will prove to be of the greatest importance to the industrial world. It is well to note also that there have been important improvements in water wheels, and that there are many points to be considered in connection with their installation which are frequently overlooked by those who are too closely wedded to the steam engine. Those who are called upon to decide upon the merits of these two systems of power production should not lose sight of the fact that the conversion of power into heat by electricity, is a problem that is already solved, and that the question of economy and utility is by no means to be considered as in the dim and distant future. The electric motor driven from a current produced by water power, is as near the fountain head of natural energy as is the steam engine, and it would seem therefore that the use of the dynamo in connection with the water wheel may be considered a suitable subject for the careful investigation of those who appreciate the industrial advantages of economical power.—*Electric Power.*

The *Winnipeg Sun* states that the Ogilvie Milling Co., have bought up all the wheat in the province with the exception of half a million bushels which the Keewatin Milling Co., has secured. Ogilvie's action is said to be due to an anticipation of an increase in the flour duties and to the fact that they want to keep all the wheat remaining in the province for their own milling purposes. A high price was paid for the wheat, and the dealers selling out have made a good margin. This deal has caused a rise in wheat throughout the province.

Mr. James Curtis, of Moscow Mills, Mo., who is an investigator, believes that M. Tourillon, the millstone champion of Paris, is correct in his assertion that "flour is completely altered by being passed between rolls; that the starch and gluten are both injured, and with such flour panification is difficult." In support of this assertion, Mr. Curtis sends the *Modern Miller* an 8-ounce vial filled with mucilage extracted by himself from four pounds of roller flour. The mucilage has about as good sticking and "smelling" qualities as the "Royal Crown," "Eclipse," or any other standard brand. Mr. Curtis holds that if the grinding of flour by smooth differential rolls generates sufficient heat to torify the starch and convert it to dextrine that will make eight ounces of bad smelling mucilage to every four pounds of flour, the smooth rolls should be discarded and a method of reduction substituted that will operate less violently upon and not change the natural properties of the flour. "Flour," he says, "should not be made hot till it reaches the oven."



## MODERN MILLING METHODS AND MACHINERY.\*

WITH the introduction and construction of roller mills in our land came the demand for men of genius, quick judgment and application in mechanics and milling out of whom should be developed competent milling engineers and experts. History shows us that great revolutions, whether political, moral or scientific, create or bring out great men who shall prove equal to the demand and the occasion. Our great revolution in milling drew out some good milling engineers and experts, and many excellent millwrights, many of the latter, however, have been spoiled in their aspirations to reach beyond their calibre. Of competent milling engineers in this country there are perhaps ten to fifteen and not more, and of thorough experts perhaps three times the number of engineers came quickly into prominence because of their quick application, long experience in milling and good judgment. But of so-called experts there sprang up everywhere many hundreds, who, with the presumption of high wisdom, could tell you all the secrets and intricacies of roller-milling methods, but many of whom could not spell the names of the days of the week correctly or solve a problem in simple interest. The humbuggery perpetrated and practiced by these latter follows upon the ever credulous mill-owner has been enormous and outrageous, and while putting mill men to no end of trouble in their business, has drawn heavily upon our bank accounts. I have known many of the so-called experts who could manifest great wisdom in diagramming a mill on paper, but who never served a day in their lives as practical millers, and who could not adjust, start and regulate a single roller machine to save themselves from perdition.

The best and most successful mills that have been constructed, and containing the best systems of any in the country are those where some good common-sense practical miller of experience and judgment has acted in conjunction with the milling engineer during the construction, and has either given advice upon or supervised the diagramming of the mill. In my experience, which has been by no means limited, I have known but few mills where a milling engineer, who was not a practical miller, has governed and controlled all the details and methods of construction and system, that have proved a success from the start.

There are no set rules or methods that can be laid down and followed by millers in the arranging and diagramming of mills; there are no two mills having just the same line of mill faces and that are completed just alike, besides our American wheels vary greatly in different localities, and cereals like varieties require different treatment, so that a mill proving a success in one mill, may prove a failure, or nearly so, in another, where the conditions are not the same.

Every head miller, in order to employ the best methods for the mill he is operating or is to diagram, should know his line of machinery thoroughly, and be conversant with the capacity and capabilities of each machine. A good, practical, sensible, experienced miller, who reasons well from cause to effect, and studies all the details of the mill, is worth more to the owner than all the experts and expert theories you can put into a ten-acre field.

While we may seem to be somewhat severe upon these so-called experts, I am not disposed to exonerate mill-builders and mill-owners from all blame. I have known good, competent millers, who were experts indeed, meet with failures from their methods in their endeavor to diagram a mill out of a lot of worthless traps called machines. Of course the expert and his diagram received all the condemnation, when in fact the blame should rest entirely upon the mill-builder or mill-owner.

The best methods I can now recommend to a competent miller, and I would not recommend any method to incompetent ones, in arranging and systematizing his mill are those which have proven the best and most successful with him. I am presuming that every miller in charge of a modern roller mill is fully competent in these days to diagram and systematize his mill, and if he is not, he should top down and out at once, or take a subordinate position.

If your mill is working well and producing good results in all respects, let well enough alone. Don't keep changing for the sake of a change, without looking forward to better results. A change for the sake of a change may do in politics, but is an expensive and oftentimes a disastrous luxury in milling. If your mill is working well and producing good results with the long or medium system, my advice is stick to it; but on the other hand, if you have a short system mill which is not too short and it is serving you well, stay with it. I

have my own opinions, and well founded ones, in regard to the relative merits of the long, medium and short systems, still I am not an extremist. Nor am I so radical that I must seek to condemn my brother miller whose views may not accord with mine, even though we may differ widely in some particulars.

Very much can be said of the long system, especially when employed upon hard wheats, and of the medium system upon the wheat raised in Nebraska, Southern Dakota, and portions of Iowa, and the short system upon soft varieties, but time will not permit us now to enter into a discussion of them in detail.

I do not wish to be understood as opposing occasional and necessary changes in mills. On the contrary, I admire the progressive miller, and whenever a machine or method in his system has served its time, and he knows from his experience and good judgment something new is required to balance up the mill, my advice is put it in, and do it at once. Very much has been said and written about long and short systems, and it is generally considered as applying to the breaks, or reductions, of the wheat, but the facts are that the more breaks you make, the more extended system you require all through the mill. The reason is obvious, you make more sub-divisions, or grades, of stock, each demanding separate treatment to produce the best results. Whatever system we employ in making the breaks, there are many points demanding our consideration and care; the amount of roller surface required for a given capacity, the proper corrugations to be used, the speed of rolls best adapted for the work, and the differential speed between fast and slow rolls. These are all very important points in good milling, but I find many or all of them neglected or overlooked by millers generally. It is evident to every common-sense miller that you cannot break wheat against wheat and do first-class milling. How often do we see the break rolls in mills over-fed. There should be sufficient roller surface that every berry of the wheat comes in contact with the roller surface. Now the query arises, what is the proper amount of roller surface? My experience says not less than 24 inches for each break to every hundred barrels capacity of the mill per day. With a long system upon the breaks, however, a poor first or second break is not so disastrous as with a short system.

Now we come to the question of corrugations. Which shall they be, sharp or dull, or a medium between the two? Shall they be shallow or deep, coarse or fine? I will give you the result of my experience on these points, without undertaking to say that the experience of others who may differ from me may not have proven as good, or better, than my own. I contend that a sharp or saw-tooth corrugations is of no earthly use in roller milling. The reverse side of the sharp corrugation I have known to work well on some varieties of Western wheats. For our Indiana wheats the rounded corrugations with plenty of clearance, or open space, between each rounded part seems to be the best adapted, but the rolls should never be driven at less than 400 revolutions per minute for nine-inch rolls, and with smaller rolls run the periphery of fast roll same speed as the nine-inch roll. Sometimes a considerably higher rate of speed than we have named is beneficial.

The corrugation should not be too shallow nor too deep; just deep enough to make the beads full and bold. Differential of 2½ to 1, increasing with the breaks 3½ to 1, I think will give best results. The differential for smooth rolls should not be more than 2 to 1 on any stock, as the fast roll will heat too much, and thus heat the material passing between the rolls. But some one asks us right here for our opinion in regard to the number of corrugations per inch best for break rolls. We answer, first, if you must use the splitting process on first break, employ smooth rolls for that purpose, giving them a differential of 3½ or even 4 to 1. You will find this superior to any other device for splitting the berry at the seam or crease, making a cleaner break and causing less waste of good material. For the second break I would not use less than 16 corrugations; for the third, 18 corrugations; for the fourth, 20 to 22 corrugations, and for the bran rolls, 26 to 28 corrugations. The question now arises what rolls are the best, or rather roller machines.

There are many good roller machines in the market, but as I am talking to Indiana millers, I desire to say that you have no occasion to go outside of our own state to purchase as good roller machinery, and in fact other general mill machinery, as is made in the world. We have in Indiana three first-class mill machinery firms, two at the capital city and one at Richmond, either of these build good mills and furnish them with as good or better machinery than can be procured outside of the state.

I have found, in my experience as salesman for some

years, that prejudice and price has very much to do with most millers in the purchase of machinery, and they often go far out of their way to purchase a machine or machinery much inferior to that made near home. Investigate these things without prejudice and in nine out of ten cases you will find what I say is true. There are some special machines not made in our state, but everything in the general line can be found at the establishments I have named. I am not saying these things to advertise any establishment, but for the benefit of my brother millers of Indiana. But I find that I have omitted to discuss in regular order one branch of operative milling, that is of paramount importance, and that is wheat cleaning and wheat cleaning machinery. How grossly this branch is neglected by many millers in these days! I once heard a man say, (he was not a miller, although he had charge of a very good mill,) that it did not matter about our wheat being thoroughly scoured and polished, as his first break roll and first scalper would complete the wheat cleaning for him, and after looking through the mill and investigating the work being done, I wondered within myself how much, or rather how little he had cleaned his wheat. Great reliance has been placed by many millers upon the method of splitting the wheat for the purpose of cleaning the grain and removing seam impurities. There is no one point in our milling systems where a greater amount of humbuggery has been taught and practiced than at the first break, when it was being done for the purposes we have mentioned. Think for a moment of the method of splitting the wheat and exposing a portion of the flour in the berry, while the impurities were still mixed with the wheat, and then trying to separate these impurities from the grain without their adhering to the exposed flour parts. This never has been accomplished successfully, I care not what claims some may set up for having done wonderful things at this point in milling. Seam or crease dirt is a bugbear and a humbug. If we see to it that our wheat is thoroughly cleaned and polished before being sent to the rolls, all the seam impurities you can take from it by the splitting process you can put in a very small pipe and smoke it.

There are several good wheat cleaners in the market, and many very poor or ordinary ones, if a good miller will examine and test them for himself he will find no difficulty in selecting the best, but when selecting your cleaners, make no mistake in getting them of ample capacity for your work. You cannot crowd a cleaner beyond its capacity and clean your wheat well.

Having given our attention to wheat cleaners, breaks and rolls, we now come to the point of separations of stocks; these should be made clear cut and decisive at every point necessary in the system, and a mixture of stock or grades should be avoided at any and every point in your system. After separations have been made, treat each grade or kind of stock separately upon your rolls, and so far as possible in your bolting system.

We have now reached that important branch in modern milling, about which good millers have dreamed and pondered in their sleeping and wakeful hours, and over which they have struggled and toiled for years—the purifications of middlings—and still we are wont to hear good millers exclaim, "My middlings are not purified as they ought to be."

What a contradiction of ideas and methods exist among millers about purifiers and purification, some trying to purify the bran pile and others tackling the product from the flour spout, while another is sending enough stock to one small purifier to check a locomotive running at high speed, and the worst brain-cracked of all is one who will persist in sending the returns or cut-offs of a purifier back to itself in order to bury the whole concern if possible. If you would purify your middlings with air, put no more stock on each machine than will permit the air to pass through the stock freely the entire length of the machine, first dusting your middlings by the mildest action possible, grade them, and purify each grade by itself, watch the result of this method, and you will grow happy. We must affirm, however, that since the advent of roller milling here there has been less improvement and advancement in the methods and machinery used for the purification of middlings than there has been for the treatment of any other stock in the mill. In this important branch of the art of milling, we are very far behind the times, and I with many others, am anxiously looking and hoping that some practical inventive genius in this country may soon surprise us all with some new device for treating middlings that will send the expensive, cumbersome, most imperfect concern we now use to the scrap pile, never again to be called into use by any progressive American miller. "Tis a consummation most devoutly to be wished."

And now we approach the methods and devices

\*Abstract of address by Mr. E. M. Stevens, before the Indiana Millers' Association.

employed in our bolting systems as a tender-foot would approach a cowboy on the western plains-- the centrifugal systems. The multitude of round reels and flour dressers, with the systems advised by the makers of each, and not to be lightly passed by, is the old style hexagon flour reel that has aided in making many men rich. These all demand from us serious and thoughtful consideration and the exercise of profound judgment.

Centrifugals are useful machines in a mill, as a bran duster or wheat cleaner is useful and essential, but it will require far more highly colored and gaudy advertisements than we are wont to see in our milling journals to convince any rational miller that an entire centrifugal system is productive of first-class milling.

The slow motion reel that acts mildly upon the stock and has a reasonably good capacity is gaining favor among the better class of millers, but we have nothing yet in the line of bolting machines that is greatly preferable to the old style, or rather new process hexagon flour bolt, except that they occupy less room, and some of them require less power for driving. Whatever machines or methods we employ in our bolting systems it is essential that we may have ample capacity throughout the mill to do the work easily at every point; this will be found to simplify your system very materially, and save you much perplexity.

Because some maker of a special machine tells you of the gentle action, and the enormous capacity of his machine, do not swallow it all as naked truth. Mild action and large capacity are not harmonious terms to be applied to a flour bolt or any other machine we use in modern milling. A machine may possess one of these features, but if it does, you will look in vain for the other. The perfect bolting device like the perfect roller machine, purifier, grain cleaner and other special milling machines is not yet invented and perfected. We may look forward to still greater improvements in all the machines as well as the methods to be employed in the highest standard of milling.

We predict, however, that the advancement will not be as rapid as during the past eight or nine years, but far more substantial and permanent. Many of the cross-roads concerns with their cheap, inferior and imperfect machines, will drop out of the mill-furnishing and mill-building business, and the business will be conducted by reliable houses, fewer in number than now but of greater responsibility and knowledge. Millers will not pay their good money for worthless traps and then squander upon them much more than the original cost in futile experiments.

What a patient and long suffering people, indeed, have been the millers and mill-owners of America in these later years. They have borne the impositions heaped upon them with a fortitude truly commendable. But the day of deliverance is coming, mill men are nibbling some of the cunning of these special machine makers and venders, or, at least, are learning to sift the good grain from the chaff and cheat. There is one danger that still lurks among us--some will buy the cheapest offered, regardless of quality or adaptability. We should all remember that the best mill or mill machinery, while costing somewhat more when new, is by far the cheapest to us in the long run.

Many of you, no doubt, have learned this in the trying and expensive school of experience during the past few years. But, Mr. President and gentlemen of the convention, the passing moments admonish me that I am leaning too long on the sacred ground of your indulgence. I have discussed the topic assigned me very imperfectly and inadequately, but with an honest purpose and in the highest interests of the members of this

association, as I possess the light to discern those interests. I have not allowed my convictions or judgment to be biased or concealed for fear of bringing down upon me the acrimony of some, nor have I sought to gain encomiums from others. My aim and purpose has been while pursuing my theme to serve you as best I can in the field of discussion in the brief time afforded me, and if my feeble effort has set in motion one idle or dormant machine in the enginery of your thoughts that shall be productive of any good, however little, I shall be content.

PUBLICATIONS.

WE have been favored by the publishers of the Toronto Saturday Night, with a copy of their Christmas number. It is enclosed in beautifully lithographed covers, and embraces 38 pages of letter-press and illustrations, making one of the most artistic publications ever issued from the Canadian press. The number is essentially Canadian throughout, the literary work and illustrations being almost entirely the product of Canadian writers and artists. The contents are varied, interesting, and adapted to the festive Christmas season. Price, 30 cents. The Sheppard Publishing Co., Toronto.

The Youth's Companion Double Christmas Number is a charming souvenir. Its delicately colored cover encloses a wealth of stories and pictures that are intensely interesting to readers of all ages. Some of the features are, "Christmas in a Wagon," by J. L. Harbour, a story of pioneer life in the Rocky Mountains; "A Double Decker," by Mrs. Frank Lee, a story for the boys, and another for the girls, entitled "Beth's Memorial Stocking," by Mrs. H. G. Rowe; an interesting description, by Emory J. Haynes, of the famous "Minot's Ledge Light;" Arabella B. Buckley's "Sleep of Plants, and What it Means;" "Attacked by Cheyennes," by K. L. O. F. Wolcott, a story of wild western life; "A Christmas Night's Sensation," by Clinton B. Converse, and "Alice's Christmas," both fresh and appropriate to the season; highly beneficial editorials on "Thoroughness" and "Stanley's Return," with a beautiful page for the very young children, together with anecdotes and bits of fun, combine to make a complete treasury for the whole family.



The machine shops of the Nova Scotia Steel and Forge Company, New Glasgow, N. S., were damaged by fire on Dec. 3, to the extent of about \$1,000.

The building now being erected at Walkerville, Ont., for the new malleable iron works, are 400 feet long by 60 feet wide, with a wing 240 feet long.

Messrs. Crystal & Black of Goderich, have consented to remove to Seaforth and start boiler and engine works there, provided they receive sufficient encouragement from that town.

The town of Walkerville, Ont., is asked to grant a bonus of \$6,000 to assist Messrs. Austin, Busch, & Kline to establish a factory for the manufacture of wood-working machinery.

Application will be made to Parliament next session for an Act to incorporate a company to be called the Elbow River Water Power Company (limited) to operate in the vicinity of Calgary.

A machine for cutting up round or flat iron and steel, and much needed in mill work, has been invented, says the Rockville, Conn., Journal. It cuts round iron or steel from one-quarter to one-half inch, and flat up to quarter inch, as easy as one cuts a piece of

card with pocket sensors. There is an opening for each size of round while a drawing shear cuts the flat. There are several unique movements and points in connection with the machine which must be seen to be appreciated, especially the return of the blade after a cut has been made, and which is made without any springs to offer any resistance to the cutting motion. A great advantage and saving of time results from the finished manner in which the work is left after cutting.

In a paper on chimneys, read before the American Society of Mechanical Engineers by Horace B. Gale said: "Again from the same theory of draught is reduced a law, so called, which asserts that, no matter what the dimensions of the chimney and furnace, the maximum draught will be attained when the temperature of the chimney gases is such that their density is just one-half the density of the outside air. This would make the temperature of maximum draught in any chimney about 600 Fahrenheit. Experiments upon chimneys of ordinary proportions show, nevertheless, that the draught is stronger, and that more coal is burned per square foot of grate, when the temperature rises above 600."



The C. P. R. at Winnipeg, will give contracts for cutting about 1,000,000 ties this winter.

Only 89,007,657 feet of lumber were rafted at the Fredrieton, N. B., booms this year, as against over 132,000,000 last year.

Mr. Baptiste, a prominent lumberman of Three Rivers, Que., is going to the Pacific Coast with a view of starting a lumber mill there.

Ground has been broken at New Westminster, B. C., for the new sawmill which is to be erected by the Brunette Sawmill Company, and work will be pushed with vigor until the establishment is completed.

D. McPherson, whose mill at Comber, Ont., was burned down a few weeks ago, collected his insurance money, and is said to have left for the States. His liabilities are estimated at \$10,000, with no assets.

The Royal City Planing Mills Co., and the Hastings Sawmill Co., will seek incorporation at the coming session of the legislature, under the name of "The British Columbia Mills, Timber and Trading Co."

The Whaley Lumber Company, Limited, has been incorporated. The promoters are Thos. Whaley, Margaret Whaley, H. T. Whaley, Huntsville, W. J. Passmore, Jane Passmore, Clara Passmore, Milverton.

A lumberman who has explored the northern region of the North West, states the Government has lost three million dollars in timber dues alone since 1862 through fires set by Indians. He says one hundred million dollars would not cover the amount of timber destroyed by fire between Lake Dauphin and Lake Winnipeg.

A successful mill builder advises those who contemplate building saw mills to consider: What kind of logs do you have? What are you to cut principally? How much of the product will be bill stuff? How much will be loaded direct on cars? The location of the mill site? The location of the yard? Have the whole question settled: how to get logs in, how to get them through the mill, and how to discharge the product from the mill. Then have your mill plans made accordingly by some practical man, and when your mill is completed it is ready for business every day.

An Ottawa despatch says: After a delay of five years the lumbermen of the Chaudiere have paid up the arrears of hydraulic rents and the exchequer is enriched to the extent of \$64,744. The following amounts have been paid in by the parties named: Messrs. J. R. Booth, \$9,304; Perley & Pattee, \$17,200; T. McKay & Co., \$8,334; Mrs. Petrie, \$2,493; A. H. Baldwin, \$2,503; Bank of Montreal in trust, \$7,500; M. Merrill, \$2,500; Bronson & Weston's Lumber Co., \$14,760. Those amounts cover all rent due up to December 31st, inst. The dispute between the Inland Revenue department and the lumbermen having been satisfactorily adjusted, new leases have been granted.

We wish every reader of the ELECTRICAL, MECHANICAL AND MILLING News a Happy and Prosperous New Year.

LUMBER PRICES.

Table listing lumber prices for various types of wood, including pine, spruce, and fir, with prices per square foot and per cord.

Table listing machinery prices for items such as mill cull boards, shipping cull boards, hemlock canting, and cutting up planks.

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

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



It is said that some Montreal grain men are talking of erecting a grain elevator at Chatham, Ont.

W. W. Ogilvie of the Ogilvie Milling Company, is on a visit to the Northwest and British Columbia.

It is reported that a joint stock company to erect another grist and flouring mill will be formed at Alvinston, Ont.

G. M. Leshman has been appointed representative in British Columbia for the Ogilvie Milling Company, of Winnipeg.

It is reported that the Canadian Pacific will have an outlet at Portland, Me. A 700,000 bushel elevator will be built there.

Mr. Charles Peplow, of Port Hope, has accepted a position under his father in the Hillard Mills at Peterborough, Ont.

Walter A. Scott, for some time in charge of the Keewatin, Ont., mill has accepted a similar position in the new Imperial mill at Duluth.

The Emerson, N. W. T., grist mill is described as a veritable bonanza for farmer, and is being taxed to its utmost capacity day and night.

Mr. Wm. Sutton's mill at Simcoe, Ont., valued at \$10,000, was destroyed by fire on Nov. 28th. Grain and flour to the value of \$8,000 was also destroyed.

Geo. Cooke and Samuel Dredge were severely injured by the going way of a scaffold on which they were working in the erection of W. Sutton's new mill at Simcoe, Ont.

Over 3,000,000 bushels of grain passed through the C. P. R. elevators at Owen Sound during the past season. Of this, 1,500,000 was American grain and 2,000,000 from the Northwest.

Mr. Henry Hamlin, for the past eight years foreman at Richard Pincombe's mill, Strathroy, Ont., has left for Lambeth, to go into business for himself, having purchased the grist and saw mills there.

The report comes from Vancouver, that Mr. W. W. Ogilvie, president of the Ogilvie Milling Company, contemplates establishing a large mill in that city to make flour for the Pacific Coast trade.

The steel steamer Rosedale, downward bound Iden with 38,000 bushels of wheat from Fort William, Ont., ran aground recently on a rock shoal above Popsul Island, near Sault Ste. Marie, in Canadian water.

The engine house in connection with Messrs. Delahay Bros' elevator at Cobden, Ont., was burned to the ground a week or two ago. The boiler and engine were very fine ones. The loss will be about \$600, covered by insurance.

A register is kept at the Pillsbury A mill at Minneapolis in which the names of visitors are entered, and we learn that from January 1st, to 17th, last, 4,738 persons were registered as against 4,543 visitors for the same period of last year.

An advance of 2 cents per hundred in freights on flour and grain from Toronto and points west to the maritime provinces went into effect Dec. 16. The new rates make freight 35c per 100 lbs. flour and 17½c on grain from Toronto to Montreal.

On the recommendation of the Machinery Committee, the directors of the Highland and Agricultural Society of Scotland have resolved to offer prizes of £15 and £10 for the best grist mill to be exhibited at the Society's show to be held at Dundee next July.

The *Lastowal Inquirer* says that Hay Bros. have commenced to run their mills night and day on American wheat for export. The price of Canadian wheat is above an export basis, and they are running through a few cars of American wheat ground in bond, as an experiment.

The reports presented at the annual meeting of the Montreal Elevating Co. showed the quantity of grain elevated to be considerably over that of 1888. The old board of directors were re-elected. Messrs. Andrew Allan H. McLennan, A. T. Patterson, T. A. Crane and A. McDougall.

The new stone and roller process flour mill at St. Albert, Northern Alberta, belonging to Hutton & Maloney, is about completed. The machinery is all in except the boiler. The building is 28 x 40 feet and 34 feet high. There are two sets of four feet stones, and a double set of 9 x 18 inch rollers. The mill will be run by a 45 horse power engine, and will be able to turn out from 70 to 100 sacks of flour per day. It will be ready for work in a few days.

The *Toronto Mail* points out that there is a freight discrimination difficulty in the East as well as in the West. Flour is carried by the Canada Pacific railway from Galt or Guelph to St. John at fifty cents per barrel. If not carried so far but dropped off at Carleton it pays sixty cents. It cannot be said that in this case the longer haul makes the higher rate necessary, because the rate is really fixed by the rule of contrary. A long haul a short rate, and a short haul a long rate.

Negotiations are in progress for the removal of the St. Leon mills to Pilot Mound. The establishment consists of a stone mill, a bar and catme d mill. At a meeting at Pilot Mound to consider the matter, it was stated that the buildings and machinery would be removed to Pilot Mound if farmers would give assistance with their teams in the removal. A bonus of \$1,000 would also be required. The well and ground owned by the Pilot Mound Milling Company would be taken as part of the bonus.

The report comes from Keewatin that the Lake of the Woods mill is at work night and day. Its capacity is 1,500 to 1,600 bbls. Much of the flour is shipped to the maritime provinces, Montreal, Toronto and the Ottawa valley. The cooper shop is busy and turns out excellent barrels made from poplar, or white wood, which grows abundantly in the district. The wheat storage capa-

city at the mill is 50,000 bushels. Large quantities of wheat arrive daily from the west, and the elevators are being rapidly filled up.

Best indications in Canada point to a readjustment of duties on wheat grain and wheat flour imported in such a way that the Canadian miller will no longer be compelled to sustain American competition in flour at the present disadvantage. No fault can be found with such a readjustment on this side of the border. The trouble is that the readjustment has been delayed so long that enough American flour has gone into Canada to make the competition felt for months after the duties shall have been readjusted.

#### Milling World.

A Quebec despatch says: The flour market here has undergone considerable change since the close of navigation. There is more enquiry, and the market has a better tone. Manitoba wheat flours have advanced and are selling at 41c per barrel higher than the prices quoted before the close of navigation, while Ontario wheat flours, owing to the low figure at which American flours can be laid down, are selling from 15 to 20c. per barrel less all round. Strong bakers' is now quoted at \$4.04; patents, \$4.70 to \$4.85, straight roller, \$4.24 to \$4.30, extras, \$4 to \$4.10; superfine, bakers, \$1.50 to \$1.70.

The *Milling World* is of the opinion that the ideally perfect flouring-mill for small millers is yet to be perfected. There is a large field for the man or men who will apply invention and experience to the construction and equipment of the small mill, with the aim of enabling the small miller to produce flour equal in quality and cost of production to the flour of the larger mills. It is loosely claimed that this can never be done, but there is little doubt that during the past five years great advancement in this direction has been made, placing the smaller miller nearly on a level with the larger one. Five-years' more of experiment in this direction may bridge the present gap between the two classes of millers.

Importers of flour have discovered another little trick of those encouragers to the export flour trade the steamship lines to which they naturally object most vigorously says the *Northwestern Miller*. It appears that when flour which has been damaged by wet arrives on the other side, the steamship companies insist on emptying the flour, sieving it and after scraping the lumps off which adhere to the bag return the flour to it and sew it up. They then tender the package as in good condition. Importers, by this disgusting bit of petty trickery suffer a loss of flour, a damage to quality and a mixture of grades, and it is practised in Glasgow, Liverpool and Belfast with great success by the steamship companies, who are a law unto themselves and pay no attention whatever to the objections of the receiver.

The South Oxford Farmers' Institute, at its annual meeting adopted the following resolution: "That this Institute of the Farmers of South Oxford, having heard the explanations of the Dominion Millers Association's Secretary, David Plewes, on the evils of the different duties on wheat and flour, desire to express their conviction that the present duty of 50 cents only on flour, while there is a duty of 15 cents per bushel on wheat, is a great injustice to the milling industry of this Dominion in the present state of things, and very much against the agricultural interests of this province, and we therefore desire to petition the Government at Ottawa to remedy said evil by placing one dollar per barrel duty on all flour coming into this Dominion for consumption, and we desire our member, Sir Richard Cartwright, to convey to the Government the action of this Farmers' Institute and further the above desired remedy in the next session of Parliament."

*Vancouver World*—For some time back it has been known that efforts were being made to secure the erection in this city of a modern grist and flouring mill. To day we are in a position to state that the efforts are likely to be crowned with success. Before going over to Victoria a few days ago Mr. Redford a citizen of Montreal had a conversation with the Mayor on the subject. Mr. Redford returned from the capital, accompanied by T. B. Hill, resident director of the Mount Royal Milling Company of Montreal, and senior partner of the firm of Hall & Ross, proprietor of the Victoria Rice Mills. They were on their way to New Westminster in connection with the title of a site whereon to erect the proposed mill in this city, which they informed a *World* reporter would be a grist and rice mill combined, and that a considerable number of men would get employment in the new concern, the erection of which will be proceeded with at once.

Protective tariffs are all right, both in theory and practice, when properly administered, but when they are juggled and hoodwinked, as in Canada, for instance, in the case of the duties on wheat grain and wheat flour, so as to work a direct and positive injury to the Canadian millers, they are a costly farce and an intolerable fraud. The flour-makers of the Dominion are for the second consecutive season forced to handle poor wheat grown in Ontario, or dear wheat grown in Manitoba, while the inequitable grain and flour duties really constitute a premium on imported American flour. The result is disastrous to the important flouring interests of Canada. Every barrel of American flour sent into Canada means the intrusion of about five bushels of American wheat, pushing out the same quantity of Canadian wheat, and it is small wonder that the Canadian wheat growers and millers complain of the situation. Evidently politics in the Dominion are quite as ridiculous as the Canadians are forever asserting American politics to be. *Milling World*.

The Winnipeg *Free Press* states that special enquiries were made by the Winnipeg delegates to the meeting of Dominion flour examiners relative to the value for commercial purposes of flour inspection and it was ascertained that Montreal was the only place in Canada where flour inspection is carried on, and, strange to say, the demand for inspection comes almost entirely from the inhabitants of that province, who have been educated to buy flour in barrels bearing the government inspection mark. The inspection of flour at Montreal has dropped in a few years from 500,000 bbls. to 175,000, the great bulk of flour consumed in Canada or exported being bought and sold on the basis of the recognized brands made by reputable dealers. As the charge for inspection is about 2 cents per bbl., the trade in Montreal is practically taxed that amount per barrel on all transactions in inspected flour, and

it is claimed that but little good results from the inspection as mills depending on the reputation of special brands have to produce even quality flour in their own interests. In view of those facts the Manitoba delegates could see no cause for reporting in favor of the appointment of a flour inspector in Winnipeg.

At a recent meeting of the Winnipeg Board of Trade, the breadstuffs duties came up for discussion, resulting in the passing of the following preamble and resolution: "Whereas the customs duty on flour imported into Canada is 50 cents per barrel, and the duty on 4½ bushels of wheat, which, as per the government standard, is required to manufacture one barrel of flour, is 71½ cents, thus presenting the case of the raw material being taxed a greater amount than the manufactured article, the product of that raw material; and whereas, the policy of the Dominion Government is that of protection to home industries; and whereas, while as petitioners, we directly refrain from expressing an opinion as to the merits or demerits of the general protection now ruling, we strongly hold that the effects of that policy, so long as it be in force, should be harmonious and evenly distributed. Therefore, be it resolved, that this Board, in view of the anomaly presented, petition the Dominion Government to equalize the duty on flour with that on wheat imported into Canada, so that Canadian millers be not handicapped by the bonus now practically granted to foreign competitors."

There is not one miller in a hundred who does not recognize, nor cease to deplore, the faults that encompass the milling trade. But when it comes to concentrated efforts to cure the trouble, the hundred fall apart like a rope of sand, each of the breaking parts seeing, or seeming to see, some little thing that he might lose, or more likely seeing what he may not be able to gain. It is a narrow, clammy spirit, that would wall itself up in order to save a mite from being subtracted from his little territory, instead of a broader sentiment that might and could, if it were united, secure results ten-fold greater from without. Another class is represented by men who want the earth in its fullness, and would rather lose all of it rather than see a portion go to another miller. It is selfishness that is at the bottom of the apathy that reacts upon each member of the trade. The business is one that from its nature depends upon many conditions far beyond the control of the individual, and there is none that is subject to so many adverse influences that might be mitigated, or in which lie so many opportunities for advantage that might be reaped. But there is a narrow view of the field, or a narrow prejudice against a rival, and a petty jealousy lest some one may get a little more benefit than some one else, that together operates against an effort, even for improvement. And yet we know there is not one miller in a hundred who does not recognize the need of collective effort.—*Milling World*.

How to distinguish good oats from those that are not good is a valuable accomplishment of faculty and receives much consideration from Scotch farmers, grain merchants and meal millers. Here are a few "wrinkles" on the subject from a botanical writer in a scientific contemporary:—Good oats are clean, hard, dry, sweet, heavy, plump, full of flour, rather like shot, and have a clean and almost metallic lustre. Each oat in a well grown sample should be nearly all the same size, and there should be few small or imperfect grains. Then, again, the hard pressure on an oat should leave little or no mark, and the kernel, when pressed between the teeth, should show little or no impression. The skin should be thin, while it will be found that the size of the kernel will be less in proportion when the skin is thick. The colour of the oat grain is not very material, but white oats are generally thinner in the skin than the black sorts. Again, black oats will grow on inferior soils. Short, plump oats are preferable to large, long grains. In all bearded oats there is an excess of husk, but oats are not necessarily bad because they are thick-skinned and bearded. They must, however, contain a less amount of flour per bushel than thin-skinned oats without beards, and so are worth less money. It is a question of degree in value received, rather than of badness of quality.

An English syndicate is said to have written enquiring as to the Assiniboine water power scheme and will probably make an offer.

The Canadian Bridge and Iron Company has been incorporated at Montreal with a capital stock of \$75,000, for the construction of iron bridges, and the manufacture of iron work generally.

Wm. Murrell, C. E., of Port Arthur, is preparing plans for the dam which is to be built on the Winnipeg river near Rat Portage, to replace the one partly washed away some time ago.

In reply to a correspondent the *Locomotive* says: Caulking may be done either when the boiler is hot or when it is cold; but it should never be done while under pressure. When pressure is on, the entire boiler is in a state of strain, and nothing should be done to it that will increase the strain on any part. Distressful accidents have resulted from a neglect of this maxim.

Mr. S. May, of Toronto, will apply to Parliament next session for an Act to extend, or to authorize or enable the commissioner of patents to extend, the term of duration of certain letters patent of invention granted to Wallace H. Dodge and George Thibon, dated 12th July, 1883, for improvement on pulleys, being patent No. 17,243, of which Mr. May is the assignee, and to confirm such extension.

The *Steamship* says: "In marine boilers one of the most frequent, most annoying, and at the same time most expensive accidents (?) is the collapse of the furnaces. Those interested may possibly be pleased to learn that extensive experiments have recently been made by M. Hirsch on the causes which lead to the burning out of furnace plates, and as a result he confirms the fact, long known to experts, that under some conditions oil in the interior of the boiler is highly dangerous. The interior of a boiler to be examined was painted with oil before being filled with water, and firing in the usual way, and it was found that some oils so diminished the efficiency of contact between the water and the plates that in one case the furnace plates rose to a temperature exceeding 600°, or the melting point of zinc, when only evaporating 35 lbs. of water per square foot of grate surface.



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- 40 horse-power Horizontal Engine, Waterous Engine Co. build.
- 33 horse-power Horizontal Engine, Beck, of Baden, build.
- 33 horse-power Horizontal Engine, Northey make.
- 30 horse-power Rotary Engine, new.
- 30 horse-power Horizontal Engine, Northey & Co., builders.
- 25 horse-power Horizontal Engine, American make.
- 25 horse-power Horizontal Engine, Waterous Engine Co. build.
- 20 horse-power Pair of Twin Engines, Matreuil build.
- 20 horse-power Horizontal Engine, Corbett & Sons, builders.
- 20 horse-power Horizontal Engine, Goldie & McCulloch, builders.
- 20 horse-power Horizontal Engine, F. C. Beckett & Co., builders.
- 20 horse-power Rotary Steam Engine, Erie Iron Works Co. build.
- 20 horse-power New Horizontal Engines, two, Paterson build.
- 20 horse-power Horizontal Engine, Killey, builder.
- 18 horse-power Horizontal Engine, Geo. White, builder.
- 16 horse-power horizontal Engine, American make.
- 16 horse-power Horizontal Engine, Waterous Engine Co. build.
- 16 horse-power Horizontal Engine, Beckett make.
- 16 horse-power Horizontal Engine, Tift & Sons, builders.
- 15 horse-power Horizontal Engine, F. C. Beckett, builder.
- 14 horse-power Horizontal Engine, Goldie & McCulloch, builders.
- 12 horse-power Vertical Engine, Jones, builder.
- 12 horse-power Horizontal Engine, in good order.
- 12 horse-power Horizontal Engine American make.
- 12 horse-power Horizontal Engine, Peterson build, Serbia.

- 12 horse-power Horizontal Engine, Fisher & Sons' build.
- 10 horse-power Horizontal Engine, F. C. Beckett, build.
- 10 horse-power Vertical Engine, Swainson Machine Co.'s make.
- 8 horse-power Vertical Engine, good order.
- 6 horse-power New Champion Engine, Waterous make.
- 6 horse-power Oscillating Engine, Beckett build.
- 6 horse-power Horizontal Engine, Beckett build.
- 6 horse-power Horizontal Engine, Leonard & Sons' build.
- 5 horse-power Upright Engine, Clime make, Alliance, Ohio.
- 5 horse-power Three Cylinder Engine, Brotherhood & Hardingham, builders London, Eng.
- 5 horse-power Upright Engine Thos. Worswick make.
- 4 horse-power Horizontal Engine, refitted, good order.
- 3 horse-power Horizontal Boat Engine, Meakins make.
- 3 horse-power Vertical Yacht Engine, new.
- 3 horse-power Upright Engine, Doty & Sons, builders.
- 2 1/2 horse-power Rotary Engine, new.
- 2 horse-power Horizontal Engine, new.
- 1 1/2 horse-power Yacht Engine, Vertical, American build.
- 1 horse-power Horizontal Engines, three in stock.
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