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THE DOMINION MECHANICAL & MILLING NEWS

Vol. X.—No. 1.

TORONTO, ONTARIO, JANUARY, 1888.

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ROLLER MILL FOR FEED GRINDING.

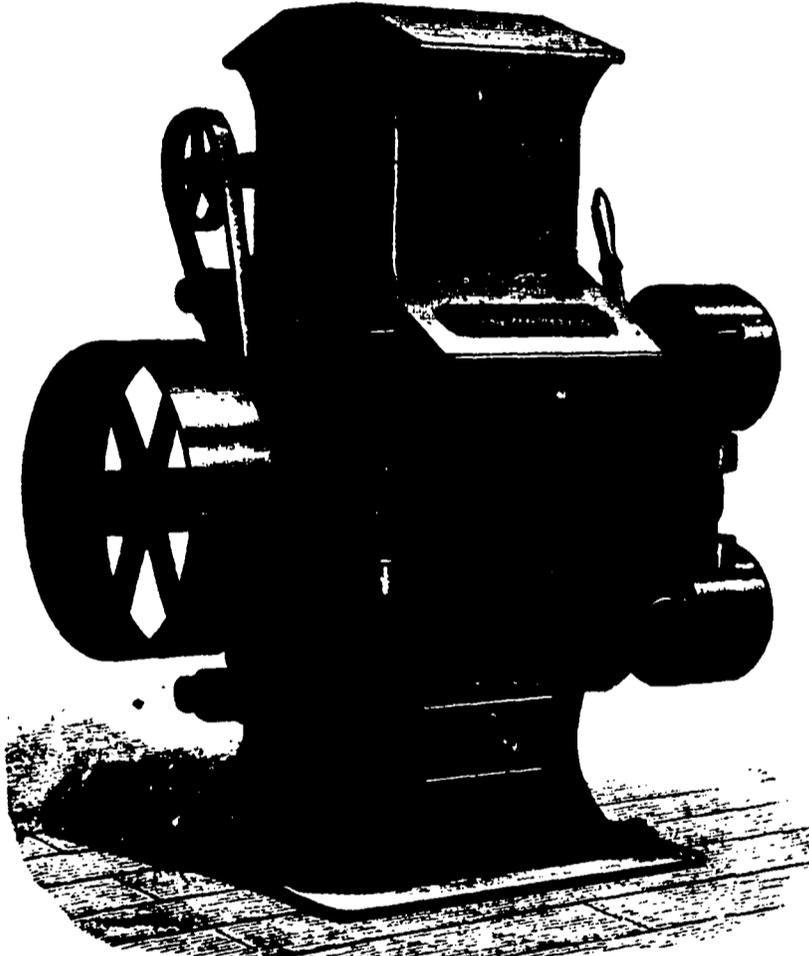
MESSRS. WM. & J. G. GREY, of this city, have recently constructed a new style of Roller Mill intended for use in the grinding of all kinds of coarse grain for provender, or even corn meal for table use. We present herewith a fine cut of the machine, and for the benefit of those interested, a short description of its construction and operation.

The machine is wholly enclosed and supported in a cast iron frame of neat and compact pattern, surmounted by the wooden hopper or feed-box, in which is arranged a feed roller and gate to control the flow of grain to the rollers, of which there are three. These rollers are of the hardest chilled steel, the one on which the driving pulley is placed being 14 inches in diameter. It is located between two of 6 inches diameter each. All these rolls run at the same speed, the difference of diameter of the rolls giving the requisite differential speed. The journals of the large or centre roll are firmly secured to the frame, and those of the smaller ones carried in arms shown on each side of the frame. These arms are adjustable and supplied with springs, which allow the rolls to separate in spreading, or in case of any hard substance passing between the rolls when at work. The lever at the right hand side of the hopper is for spreading the rolls.

This mill, in the opinion of the manufacturers, is destined to supplant the old buhr stone for the following reasons: it is complete when shipped from the shop; it has great capacity for the power required; will do three times the work with the same power used for the stone; requires very little attention; does away with stone dressing; requires no heavy framing to support it.

The machine can be driven from either a horizontal or upright shaft with a single belt, and is regarded as the cheapest and most complete machine for chopping known.

Further particulars may be had of the builders, Messrs. Wm. & J. G. Grey, 2 Church Street, Toronto.



ROLLER MILL FOR FEED GRINDING.

look into a similar furnace of the present day, he would be very much surprised to see a great mass of material that he fired out as worthless, now being made into cement, mineral wool, glassware, pottery, fire bricks, fertilizers etc., etc. So it is in all the important industries, and the manufacturer, whether large or small, who does not pay attention to the by-products in his business in the future, will come out second best in the race with his competitor who does.

In the production of light, the electric light has assumed such an important position within the last decade as to waken up the gas engineers to the necessity

use suitable appliances for producing a cheaper (or fuel) gas, not very well suited for illuminating purposes, but with all the necessary elements for producing heat. This branch of the gas business has been brought to such perfection within a few years that, in all the important centres, it now only requires a willingness on the part of the gas corporations to work for ordinary, instead of extraordinary, profits, and it can be speedily arranged that without any additional expense to the user, gas may be used for heating and power-producing purposes.

To show that this thing is entirely possible, and that the exorbitant greed of the gas companies alone is entirely responsible for the small amount of fuel-gas used at the present time. I need only mention that the town of Los Angeles, in California, is now being supplied with fuel-gas for fifty cents per thousand cubic feet. The coal used has to be brought from Pennsylvania, British Columbia, or far-away Australia, and yet the gas companies expect to pay respectable dividends.

PROCTOR.

GOOD ADVICE.

IN the copy of the constitution and by-laws of a mutual benefit association sent us by Bausch & Lomb Optical Co., of Rochester, N.Y., is a loose leaf not belonging to the copy referred to. From this leaf we learn that this firm has established a library consisting of books, newspapers, periodicals, etc., for the use of their employes. On this leaf are printed a few very simple rules to be observed by those making use of the library—rules in which any intention to hedge about the use of the library by annoying conditions is conspicuously absent. Then follows this advice, which is worthy of being given wide publicity. We think nothing better could be got into the same space:

‘Read something useful every day, if only for a few minutes.

Read not too fast, nor too much at a time.

Read attentively, thoughtfully; by inattention you waste your time and injure your memory.

Stop occasionally, after you have read a short time; see whether you remember the substance, the ideas, of what you have read—if not, or if you do not understand it properly, read it over again, think it over, and try to retain the most important part in your memory.

Have a note book at hand, and copy into it some of the choicest and most important passages or expressions you have read, with page and name of book selected from; or write down your thoughts about what you have read. Of papers you may cut out these parts if you have permission to do so.

Separate and arrange occasionally your notes and papers according to the subjects treated.

The company trusts that their employes will assist as much as they can in keeping the library in as good a condition as possible; that they will employ some of their leisure time in making use of the same, and by so doing secure to themselves hours of pleasure, as well as useful knowledge, valuable to them in daily life.”—*American Machinist.*

The next great invention prophesied by Mr. Edison is the turning of coal into motive power without the mediation of steam. Now about three-fourths of the energy in coal is wasted in getting at the other fourth. If the invention of producing electricity directly from coal succeeds, a steamer that now burns one hundred and fifty tons of coal a day will burn twenty-five tons instead.

“PROCTOR’S POINTS.”

THERE are a good many live issues, in connection with the production of light, heat and power agitating the minds of a very large number of the world’s leading thinkers at the present moment, and it might not be amiss for me in a few “Points” to discuss one or two of them. And I may remark in parenthesis, to begin with, that in all the discussions and mechanical appliances bearing on any subject which I shall venture to discourse upon, the utilization of all materials is one of the strong points—leading, practically, to the erasure of the word “waste” from the dictionary, in its relation to industrial products.

It is not so long ago since the manufacturers of gas, chemicals, iron, and, for that matter, of nearly all the important and prime necessities of this progressive age, paid but little attention, and in fact almost totally neglected, the utilization of the by-products in their business, and only the keen competition of these latter days has induced them to regard these as so many integral parts or branches of each enterprise. The old maxim: “Take care of the pennies, and the pounds will take care of themselves,” is having a fulfilment in the mechanical arts and appliances of this latter day that the strongest of its advocates never hoped for; and if one of the busy, careful iron smelters of 40 years ago could

of improving the quality of their gas as an illuminant, and of so perfecting the methods of production as to be able to compete with the incandescent form of electric lighting. The immense resources accumulated by the gas companies during the last twenty to fifty years, placed them in a position to do such experimenting as they desired without in the least encroaching on their capital, and as a result of this spirit of investigation, immense progress has been accomplished within the last few years, until now it is “which and t’other” between incandescent gas lighting and incandescent electric lighting, as to which is ahead. Electricity has a little advantage in brilliancy, while gas still keeps ahead in economy of cost. (I do not here refer to any of our Canadian gas, because, as a whole, our Canadian cities, in the matter of gas-light, are very little better off than they were ten years ago.)

A long article might be written, in each instance, on the different methods and constructions employed in the production of gas. It is not my intention to touch upon these. I only desire to call attention to this fact, that the near future has in it as much of promise for industrial production in the line of gas, as in that of any other factor entering so largely into general use in manufacturing. With the improved processes for manufacturing a better class of illuminating gas, there has come into

Steam Department.

BOILERS FOR STEAM HEATING.

By Geo. C. Romp.

A BOILER intended to be used for a steam heating apparatus, should be designed to hold a large proportion of water for the amount of heating surface, and the heating surface should be large in proportion to the grate surface—that is, these proportions should be larger than is usual in boilers intended to be used for steam engines.

The reason for this is, that in a heating boiler a slow fire may be used with great economy, and as the boiler will most likely be often left for a length of time without any attention being paid to the fire, there should be a sort of reservoir of heat stored up in the water.

It is also advantageous in such boilers to have a large quantity of brick-work about the furnace, which will absorb heat when the fire is strong and give it off when the fire is low, and thus tend to maintain a more uniform temperature in the boiler.

Cast iron sectional boilers are often used, but they are most frequently recommended on account of some other reasons than their real value as safe and economical boilers to use. They may be convenient to make, and easy to set up in position, and hence from a maker's point of view be good boilers; but the man who pays for the coals, and the woman who grumbles about the want of heat on a cold day, find by experience that there are other ways of determining whether or not a boiler is a good one. The use of a boiler in a steam heating apparatus is merely to absorb the heat produced in the furnace, and by so doing change water into steam, which is conveyed by pipes to the radiators, where it again gives off the heat while changing steam to water.

There are thus four elements in the complete apparatus, viz., the furnace, the boiler, the piping and the radiators. And there should be a complete cycle going on by means of these, which may be described thus: heat absorbed producing steam from water, and heat radiated producing water from steam. Defects or derangements in any one of these four, will affect the working of the whole, and sometimes it is very difficult to determine exactly where the difficulty really is. Hence frequently a boiler is blamed as being a bad heater, when the trouble really is in the furnace or chimney. In other cases, the fact that in a certain boiler steam can be very quickly got up, is held to be sure evidence that it will answer well for heating, while really the getting up steam quickly is merely evidence of the small quantity of water in the boiler.

In a certain large steam heating apparatus several upright tubular boilers were put in by the designer, who reckoned the amount of heating surface in the boilers by calculating the whole length of the tubes as available and useful for steam making. When the job was started, it was found that while the mains were hot, the radiators remained comparatively cool, and the building could not be heated. By adding more boilers the difficulty was removed, and the apparatus worked all right. The mistake of having the boiler too small is much more frequently made than that of having the boiler too large.

It is better to estimate the boiler by its capacity for evaporating water into steam, than by its heating surface; as no proper comparison can be made between a vertical tubular boiler with fire-box, and a horizontal tubular boiler with brick furnace, if the square feet of heating surface in each be the only dimension given. But if the number of pounds of water at a given temperature which each is capable of making into steam of a given pressure be stated, then a fair and useful comparison can be made, and more especially if the amount of fuel used be also known.

It is usual to state for comparison the number of pounds of water of 212° temperature evaporated into steam at the pressure of the atmosphere per pound of coal as the measure of the evaporative power of the boiler. Thirty pounds of water evaporated in an hour is called a horse power. The term applied to boilers is very confusing, as it is often supposed to have the same meaning as the "horse power" of an engine, whereas there is really no necessary connection between the two; except that it is supposed that an engine ought to do a horse power of work for each thirty pounds weight of steam which it gets from the boiler. Some engines will do a horse power of work with twenty pounds weight of steam, and others will need no less than sixty pounds.

The boiler that is most successful for heating a building, is the one that supplies all the heat needed in the coldest day and gives the least trouble at all times. It will be impossible to do this if the boiler requires a strong fire to be kept up in order to keep up its supply of steam.

Hence no matter what form or design of boiler be used, it will not give thorough satisfaction unless it be of sufficient size to keep up steam with a slow burning fire; and a slow burning fire is more efficient in a brick furnace than when the fuel is in contact with the iron of the boiler.

HOW TO PREVENT BOILER EXPLOSIONS.

A FRIEND has handed the MECHANICAL AND MILLING NEWS the following letter, written by an old engineer of long experience, Mr. Joseph Langdon, of Hamilton, Ont., to his son, who is in charge of a steam plant in Detroit. The letter contains so much valuable advice that we willingly give it publicity. It reads as follows:

"I see by a recent number of the *Stationary Engineer*, that the Detroit City Inspector says you can prevent boiler explosions by lifting the safety valve every morning. Now, that is misleading to a young engineer, and as I do not want you to trust to any such foolish plan, I will give you a better one. In the first place, you must keep your boilers clean; and to do this you must wash them out often—in many places once a month is sufficient. In preparing for this, work your fires down as low as possible; then work your steam down as low as possible; shut off all connections with other boilers, if you have any; clean out all the clinkers, ashes, and soot. Now let the boiler stand for a day and a night, so that it and the furnace walls will cool off gradually. Then fill with cold water up to the water line, and run it off again. Now take off your man-hole and mud-hole covers, and wash out thoroughly with the hose. Do this thoroughly and carefully, and you will have a clean boiler. The next thing to do is to examine your boiler carefully. Examine the bottom of the boiler to see that it is not bogging or bulging. Now try the bottom of the boiler with your hammer, tapping it lightly all over. If you hear a hollow or dead sound, that is lamination of the iron; or, in other words, the iron was not properly welded in its manufacture. The blistering of the sheets results from this. Next examine the seams and rivets—ascertain if they have been leaking, and have been caulked, look for marks of the caulking tool or the hammer. Where the iron has been bruised much in this way, the gases from the fuel take effect on it, and cause outside grooving. Look also for drift pin marks, which you will see by means of small cracks from the rivet to the edge of the sheet. Examine carefully the tube ends; see that they are even in length and that they have been properly expanded in their places. If you have a mud-hole back and front, examine very carefully all around each, and see that the action of the fire and water has not caused corrosion, thus reducing the thickness and strength of the heads. I will now call your attention to the method of examining the outside of a boiler. Look at your feed pipe, and if there is scale or sediment around it, clean it out properly. If you cannot do this, have a new one put in. Look carefully at your try-cock and water column pipes, especially those at or near the water line. Next try all your stays—see that there is the same tension on each. You can tell this by the sound they give out when tapped lightly. Examine the nuts or keys and bolts, for the next time you go in you may find some of them broken—nuts off, or keys out. This will prove the workmanship of construction, as it will show the stays were not each taking its share of the strain and of the expansion and contraction. Now examine the seams and rivet heads. Look for pitting or grooving, or, as it is sometimes called, channelling. The pitting will make the sheet look as though it was marked with small pox marks. This and the channelling is caused by the chemical properties in the water, which of course is worse in some localities than in others. The channelling usually occurs along the horizontal seams, and sometimes goes to the depth of $\frac{1}{8}$ of an inch. Examine your safety valve; see that it is clean and tight, and that it works free. Should you discover any defects in any parts of this boiler, report it at once, and insist on having it properly repaired. See that your water column and glass gauge are of the right height. Have glass so set that you will have one inch of water in the tubes when the water is just visible at the bottom of the glass. When you have got through with this inspection, make your man-hole and mud-hole joint, and fill up your boiler, and, if possible, when you have two boilers, use the spare water from your pump, as all that water goes through your heater. Now prepare your fuel, and if you do not want the boiler till the next day, do not fill it. When you look at your glass the next morning, you will see a bright mark where you left your water, but the careful engineer will find out by actual trial whether the water is really there or not. He may find that the water has gone out of his glass, and even out of the boiler, and yet he will say, "I know it was there, for I

saw it." Now you may think some enemy or mischievous person has let the water off, for you could see no other way it could get out. But if you look around you may find it has gone into the other boiler, owing to some of the fuel connections having been left open; or it may have leaked out your blow-off cock; or you may have forgotten to shut your steam cock, and the water siphoned out. Above all things be sure your water is at its proper level before you start your fire. Slip the weight on your safety valve close up to the valve, so that the valve will blow off long before your pressure is at the proper height—thus getting rid of the air in the boiler, for it will not do your engine any good. Set your ball in the proper place on the lever. Never put extra weights on it nor attempt to carry higher steam than your safety valve will respond to. I do not think pulling your safety valve open every morning, or every hour for that matter, will ever save a boiler explosion; it will only injure the seat of the valve and make you extra work. Keep your valve levers and pins clean, and see that the valve responds to the gauge pressure you have it loaded for, and you will succeed.

I think you will be able to infer from the foregoing remarks, what causes boiler explosions, and whether there is any difference between "engineers," and "smart alecks" who call themselves such. Engineers' associations are being formed all over the continent for the purpose of educating their members so that the right man will be in the right place; and as time passes the older engineers will accept better situations, and the younger ones take their places, without any loss or injury to the employer or his machinery. At present, unfortunately, vacancies caused by these changes are sometimes filled by the aforesaid "smart alecks." I will give you an idea how these "know alls" work. One of this class begins by not being able to work a pump and heater that has done service in this plant for some time, and by using his cheek with the employer, throws them out and gets an inspirator. Now he begins to crowd his fires, and soon down goes his furnace walls or front arch. He then finds he has not grate surface enough, so he puts it all out, and has it all bricked over again. Still he is not satisfied. The grates are warping and twisting out of shape, and he cannot get enough steam. Now a smoke-burner man appears, and between them they are going to fix things. They persuade the proprietor to put on a smoke burner, for which they take a $\frac{3}{4}$ inch pipe from the boiler, which results in 20% of the smoke being consumed, and in 30% more fuel being used.

Now the careful and intelligent engineer can prevent 10% of the smoke, and in doing so he will save fuel. I could follow this "smart aleck" until he goes aloft in a boiler explosion, but it is not necessary. You attend to all these matters I have written you about, follow my directions, and your boiler will not explode, your coal bills will not be too high, and you will be able to satisfy any reasonable employer."

THE NECESSITY OF A SYSTEM.

A LESSON to be learned from the costly experience of many millers in the transition to roller milling, is that there must be a definite system for every mill. If eight breaks are to be employed, then a complete system adapted to that number of breaks must be planned, and if but four or two breaks are to be employed, then a system complete in itself must be planned and adapted to such number of breaks. Many changes have been made that have proved unsatisfactory because they did not form a complete system. A plan to be correct must be based on an actual knowledge of what the products of the given number of breaks are to be, and the numbers and lengths of the cloths must be correctly given, for the required reductions. The product of four breaks varies from that of eight or any other number of breaks, and of course requires a different treatment. The time has come when all this should be known to a certainty, and no miller should add any number of rolls without knowing that he is to have all that is required to make his system complete, and to handle all products as they should be. It is the want of this knowledge that accounts for failures and unsatisfactory results. If we do not have the knowledge, we will save money by securing the services of those who do. There has been much experimenting by mill builders at the expense of mill owners, but there are reliable parties who can now plan and build a mill and guarantee results, but not without the complete line of machinery clearly set forth. Such is the surest way to get a satisfactory mill, if we are lacking in experience ourselves. It takes a certain amount of machinery and it costs a certain amount of money, and the expert who is constantly building mills can save us money and avoid mistakes, if he is what he ought to be, but there are some so-called experts who do not know all they claim to know.—*Millers' Review*

THE "COCHRANE" SYSTEM OF ROLLS.

The Business Mens' Association of Toledo made a proposition to purchase an interest in the American Patent of Mr. W. F. Cochrane for his system, and appointed a Committee to go to Peterboro' for the purpose of reporting on same. The following is the Report of the Committee so appointed :

REPORT OF THE COMMITTEE SENT FROM TOLEDO TO PETERBORO' TO INVESTIGATE THE MERITS OF THE COCHRANE MILLS.

TOLEDO, OHIO, November 5th, 1887.

To the Business Mens' Association of the City of Toledo.

GENTLEMEN,

In compliance with your appointment and instructions, the undersigned as a Committee appointed to investigate the recently invented grist mill of W. F. Cochrane, now in operation at Peterboro', Ontario, have to report :

That on the evening of the 4th November, the whole Committee, with the exception of Mr. Taylor, who sent in his place Mr. J. A. Stetzel, the experienced superintendent of Taylor's system of mills, started for Peterboro'. On the way, the Committee failed to make connection at Hamilton, Canada, with the train for Toronto, and were delayed at the former place about half a day. Mr. Cochrane, who was with us, immediately prepared to take the Committee to Dundas, a manufacturing Village five miles from Hamilton, the head-quarters for the Canada syndicate for the manufacture of his Mills. He took us through the extensive machine works of Bertram & Sons, who are using the great force of their works in manufacturing the machinery which is to be used in manufacturing the new Mills.

The machinery will be completed and the factory in working order inside of ninety days. In the factory of the Canada Company, which we found close by, we were shown the first mill produced by Mr. Cochrane under his patents. It is not connected with power, but in all its points is complete and kept there as proof of the claims of Mr. Cochrane to the discoveries and improvements involved in it. We found the greatest enthusiasm among the machine men of that industrious center in favor of both Mr. Cochrane and his invention.

The manufacturing establishment of the Canada Company occupies about four acres of ground, with excellent water power, and railroad facilities.

The Committee then proceeded to Peterboro', and were escorted to the Mills of Meldrum, Davidson & Co., in which is placed the Cochrane Mills. The Committee found Mr. Meldrum an educated and practical miller, owning a large Mill, propelled by water power. Mr. Meldrum informed the Committee that two years ago they completed his Mill with a set of seven double William & J. G. Greey Roller Mills, averaging 9 x 24 inch rolls, the then latest and most approved Roller Mills in Canada. The average capacity of the Greey Mills was 110 bbls. of flour in twenty-four hours, using the full head of water. When they became acquainted with the Cochrane system, they consented under strong pressure and a bond of indemnity against loss, to allow the Greey Mills to be taken out and the Cochrane Mill to be put in. The Greey Mills your Committee found lying in the basement of these Mills, and now offered for sale at 50 per cent. of the cost price. We were by Mr. Meldrum and his associates then shown the Cochrane Mill. It consists of seven double sets of rolls, average 9 x 24 exact duplicates in size of the rolls they displaced.

The rolls are all contained in a single frame or girder, and driven by three* pulleys at the finishing end and one belt of six and three-quarter inches in width. Two shafts pass through the front (hollow) rolls from end to end, and the front rolls in turn by gears and clutches propel the inside rolls. This single belt drives the two pulleys, which drive the entire machine of twenty-eight rolls. The Mill was in operation, grinding Canadian fall wheat. The Mill has been in operation for four months stopping only on Sundays. But seventy per cent. of the water power required to operate the Greey Mills in making 110 bbls. of flour in twenty-four hours is now used with the Cochrane Mill, which now averages 150 bbls. of flour in twenty-four hours. Mr. Meldrum stated that the Mill had never been stopped a single moment from the time the water was first turned on, for any defect, weakness or faulty construction up to the time we visited it, save the time when improperly corrugated rolls were replaced by properly corrugated ones, the Birmingham foundry having given

*This is an error ; there are but two pulleys each of thirty inch, and an "Idler."

improper corrugation to the rolls first used. Mr. Meldrum also stated that since the Mill had been in operation from seventy-five to one hundred practical millers had visited and inspected the Mill, and every one had approved the system and expressed the opinion that it was bound to surpass all other Mills. Mr. Meldrum stated that the Mill was put in by a Canadian syndicate with the understanding that if it did not operate to his satisfaction, and do better than the Greey Mills, it was to be taken out, and he to receive damages for the delay at the rate of forty dollars (\$40) per day for time, in addition to all other damages. That the Mill had been to him a gratifying surprise, that he had now become the owner of it and could not be induced to replace it by any other Mill in existence; that he had no interest whatever in the Cochrane Mill patents or company, beyond this Mill, and the money he can make by its operation.

Your Committee found Mr. Meldrum not only to be a miller of great practical experience, but in the enjoyment of the full confidence of his fellow-citizens. Your Committee made careful examination of the Mill and its product, and we do not hesitate to say that in our judgment it is the Mill of the future.

It was stated that the Greey Mill cost Meldrum, Davidson & Co. \$3,200.00, and over \$1,600.00 for pulleys, belts and cost of erection, making an outlay of \$4,800.00 for the Greey Rolls in operation. Whereas, if the Cochrane Mill is sold at \$3,000.00, the total cost of Mill and erection will not, we think, exceed \$3,100.00. The Greey Rolls gave an output of 110 barrels in twenty-four hours, but the Cochrane Mills, costing \$1,700.00 less, will, according to Mr. Stetzel's test, produce 192 barrels in twenty-four hours.

Your Committee believe the report of Mr. Samuel R. Campbell, the expert employed by Mr. Fuller when he was investigating the accuracy of Mr. Cochrane's claims, read by Mr. Fuller before this Association, is correct. Mr. Campbell reported "that the whole power of the Flour Mill is about seventy horse power, of which the Greey Rolls required about thirty-five horse power." He goes on to say, "allowing the thirty-five horse power to the balance of the Mill, and ten horse power to the (Cochrane) Rolls, we have a total of forty-five horse power now necessary to drive the whole Mill, which is confirmed by the fact that the water-wheel gate requires to be open but one-half now, while the whole gate was required before the change."

From this it will be seen that in the driving of the **Cochrane Rolls there is required but ten horse power, while the old system requires thirty-five horse power.**

In addition to the foregoing, the Committee are satisfied that the Cochrane Mill produces from the same amount of grain, a much larger per cent. of middlings, and the quality of the flour by reason of the absence of belts, and the positive motion of the entire rolls is of a more even granular. In proof of this, Mr. Meldrum produced and showed to your Committee letters from his Glasgow flour merchants, showing that they were offering him for his flour nine pence per sack over the highest market quotation. The Committee are satisfied the Cochrane Mill can be operated with much less attention than any other known mill.

We approve Mr. Stetzel's special report, which speaks for itself.

Your Committee is of opinion that Mr. Cochrane is possessed of a valuable improvement in milling machinery, and that the citizens of Toledo should secure the same if possible.

We are satisfied that other strong combinations are being made at other points to secure the same, and unless promptly secured by Toledo the opportunity will be lost.

R. B. MITCHELL.
MILTON CHURCHILL.
F. N. QUALE.
SAM T. FISK.

N. B.—The three first named members of Committee are Millers, and the last named is Chairman of the Committee, appointed to investigate into the merits of this Patent. As a result of this investigation Mr. Melton Churchill, has ordered a train of the "Cochrane Mills" for a Mill he is now erecting at Toledo.

MR. STETZEL'S REPORT.

Mr. Sam T. Fisk.

TOLEDO, Nov. 4th, 1887.

DEAR SIR: As per request of the committee I remained over at Peterboro' to test the capacity of the Cochrane mill. I find it capable of turning out 192 barrels or more every 24 hours. You have my permission to give this wonderful invention the very strongest endorsement, and I will say that I consider Mr. Cochrane has fully carried out his statements to your association.

Am sorry could not remain in Toledo and attend your meeting Saturday night. Please say for me that I consider this a grand opportunity for Toledo to get a very important enterprise and one destined to be very profitable.

Yours, etc.,

J. A. STETZEL.



PUBLISHED MONTHLY,

BY
CHAS. H. MORTIMER,

Office, 31 King Street West,

TORONTO, - - ONTARIO.

ADVERTISEMENTS.

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

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

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

SUBSCRIPTIONS.

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

The price of subscription may be remitted by currency, in registered letter, or by postal order payable to C. H. Mortimer. 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.

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

Subscribers may have the mailing address changed as often as desirable. When ordering change, always give the old as well as the new address.

Failure upon the part of subscribers to receive their papers promptly and regularly should be notified at once to this office.

EDITOR'S ANNOUNCEMENTS.

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

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

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

To every reader the MECHANICAL AND MILLING NEWS extends the wish for a happy and prosperous new year.

MR. JOHN MARSHALL, Lillooet Mills, British Columbia, writes: "I like your paper. Every issue appears to be better. It is full of 'wrinkles.'"

If those of our readers who may want machinery or manufacturing appliances of any kind, and who don't know where to obtain it, will drop a line to this office, stating explicitly what they require, and enclosing stamp for reply, we shall take pleasure in trying to furnish them with the information.

The recent bank failures in Canada, with their resultant loss and inconvenience to depositors and the business community, together with the revelations of recklessness and wrong-doing in bank management, should lead to the issuing of all paper money by the Federal government. Such a course would tend to re-establish confidence in the commercial world, and prevent a period of dull times such as the events of the past few weeks are calculated to promote.

The millers of Canada will have to bestir themselves if they are not to be placed at a still greater disadvantage by the alteration or abolition of the regulation relating to grinding in bond. It is said that quite a number of members of Parliament, representatives of agricultural constituencies no doubt, and with a view to securing the good will of the farmers, are in favor of changing the law, and, perhaps unintentionally, yet none the less truly, making it still harder for the miller to make ends meet.

The London *Millers' Gazette* notes the progress which Australia is making as a wheat raising and flour producing country, and while not regarding with much favor the large importation of foreign flour into Great Britain, takes the patriotic ground that if Great Britain continues to import and use flour made in other

countries, she should give the preference to her own colonies. It therefore hopes to see a considerable quantity of American flour supplanted by the product of Australian mills. Canada also may be safely counted on to do something towards supplying the wants of the hungry Britishers.

We read that still another car coupler has been patented by an Ontario inventor. This makes something less than a million patent car couplers on the market at the present time, but we haven't as yet heard of the adoption of any one of them by a railway company. No doubt many of the inventions along this line are meritorious ones, and would, if applied, greatly lessen the danger to the lives of brakemen. From what we know of railway corporations, however, we are inclined to believe that until the strong arm of the law is used to compel them to adopt a coupler which can be worked with less danger than those now in use, the insignificant consideration of saving the lives of a few brakemen will never induce them to do so.

If statistics of fire losses are to be relied upon, there must be a great army of fire-bugs in the United States and Canada, or else a vast amount of negligence on the part of people on whom depends the safety of buildings. In November, we are told, the loss by fire in the United States and Canada, amounted to \$16,004,000, of which the flouring mills contributed in fires costing \$10,000 and over each, the sum of \$986,000. Canada contributed \$394,000 in fires costing \$10,000. These are startling figures, and suggest the idea that, as a people we seem to be striving to make money just for the fun of seeing it go up in smoke. If this be not the purpose of our money-getting, isn't it about time precautions were taken to prevent such wholesale and needless destruction of valuable property?

MANY enquiries have reached us of late from subscribers in different parts of the Dominion wanting machinery of one kind and another, but apparently not knowing where to find it. To show the nature of these enquiries, we publish the following received a few days ago from a subscriber in British Columbia: "Please find out for me the price of a pony-planer, new or second-hand, laid down at Ashcroft station, B. C. Would like to buy a turbine water wheel, say 24 or 26 inch, second-hand, and would like some shafting with it, say upright shaft, 12, 13 or 14 feet, line shaft about 7 feet, with a pair of flanges and spur-wheel on upright to drive the line shaft." Such enquiries as the above show very clearly the necessity for more liberal and judicious advertising by manufacturers and dealers in machinery and manufacturers' supplies. The fact that they come so frequently from readers of this journal should serve as a guide to manufacturers and dealers in selecting the best medium for this class of advertising.

A RUMOUR is abroad to the effect that the Dominion Government is considering the question of re-imposing postage charges on newspapers and periodicals mailed to subscribers from the office of publication. The reason given for this backward step is, that the country postmasters are paid according to the number of stamps they cancel, and they want stamps put upon the newspapers in order that they may draw larger salaries. The regulation providing for the free transmission of legitimate newspapers through the mails, has obtained for several years, not only in Canada but throughout the United States and Great Britain; and we are loth to believe that in order to add a few dollars to the yearly income of the postmasters throughout the country, the Government will impose on the publishers such a retrogressive measure. We have noticed that there is no lack of applicants for the position of postmaster whenever a vacancy occurs, and the fact that the office is regarded as so desirable, would seem to be sufficient reason for not increasing its desirability at the expense of another class of the community.

AN official of the Toronto Public Library expressed surprise to the MECHANICAL AND MILLING NEWS the other day, because so few mechanics availed themselves of the privileges for obtaining information afforded to them by that institution. He admitted that the early hour at which the reference library closes each evening did not allow mechanics much time for the study of technical works, which can only be used on the premises. When the suggestion was made that if the reference library were kept open until a late hour one or two evenings of each week, mechanics might make more liberal use of it, he replied that such an experiment had

been tried, but the limited attendance showed that it was not appreciated, and it was consequently abandoned. It is a matter for regret that mechanics as a class are not given to reading books and papers which are calculated to impart to them valuable instruction in the line of work which they have chosen to follow, and upon which they depend for a livelihood. There is a constant demand among employers of labour for men of more than ordinary information and skill to fill positions of responsibility, to which are attached good salaries. If mechanics would spend one quarter of the money in purchasing books and papers that they spend in liquor and tobacco, and would devote a few hours a week to reading them, there would be fewer places awaiting skilled workmen, and fewer unskilled workmen waiting for places that never turn up.

THE MECHANICAL AND MILLING NEWS is entirely in accord with many of the views expressed by Mr. Wm. Houston, librarian of the Ontario Legislature, on the subject of technical education, before the Labor Commission in this city recently. He enlarged on industrial competition all over the world, which was going to leave Canada commercially and financially behind in the race if she did not put herself in a proper condition to compete with the productions of other nations. Germany had to an enormous extent gone into the work of educating their operatives, France and England to a less extent, and America least of the four. Mr. Houston very truly pointed out that the system of public school instruction in Ontario did little towards inclining the young to industrial pursuits. Its tendency was rather in the direction of professionalism and commercial life, the ranks of which are far too much crowded already. The agricultural and industrial classes must ever form the bulk of our population, and the imparting of knowledge calculated to improve their condition should certainly form one of the leading features of public school instruction. The primary branches of industrial training should be taught in our public schools, to such pupils at least as are most likely to engage in industrial pursuits. A well equipped school of technology is also required to complete the work begun in the public school. We are glad to observe a growing interest in this subject, and trust that in the near future steps will be taken to put the industrial education idea into practice.

OUR Buffalo contemporary, the *Milling World*, desires to be classed among the unbelievers in the extraordinary productiveness of Canadian soil. It says: "According to the newspapers and agricultural and commercial journals of Canada, there was hardly a single wheat-grower in all Manitoba who did not raise 40 bushels of wheat to the acre. Many individuals are quoted as raising 50 and 60 bushels, and not a few reported 75 bushels of wheat to the acre. The average man may well be pardoned for confessing his utter inability to believe such reports. We do not say that the Manitoba farmers did not grow 75 or even 100 bushels of wheat to the acre. What we do say is merely that we do not believe they did grow any such amounts to the acre. New countries are given to exaggeration, and Manitoba is probably not an exception to the general rule. If such wheat yields are the usual thing in Manitoba, it is a pertinent question to ask why so many Manitoban wheat-growers have left Manitoba and moved to the United States, where, according to certain more or less veracious authorities, the wheat yield runs from zero up to 7 or 8 bushels to the acre. If the figures quoted for Manitoba are accurate, then cause is nowadays having a most unusual effect. A few removals of Minnesota and Dakota farmers to Manitoba would "sort of even up" things, and make the Manitoban figures read a little less unreasonable and suspicious." Without going into the question of how many Canadians go from Manitoba to Dakota, or, *vice versa*, how many Americans leave Dakota and settle in Manitoba, because there is probably no reliable data to guide us to a conclusion, we simply desire to point out (1) that no Canadian journal that we know of has said that "there was hardly a single wheat-grower in all Manitoba who did not raise 40 bushels of wheat to the acre;" and (2) that statistics compiled by the Manitoba Department of Agriculture show that on an average the Manitoba farmer *did* raise 28 bushels to the acre. These statistics have been going the rounds of the press for some time, and coming as they do from a reliable source, their accuracy has hitherto not been questioned. Until our contemporary gives some better evidence of their unreliability, they will continue to excite the astonishment and perhaps the envy of people in less highly favored countries.

THE great timber raft constructed at the Joggins, N. S., and successfully launched a few days ago, is since reported to have gone to pieces. This will probably put an end to any further efforts to carry out the scheme.

THE Hercules Manufacturing Co., of Petrolia, Ont., under date of Dec. 20th, 1887, write as follows: "Our success with the 'Hercules' is becoming a surprise even to ourselves, and we freely admit that no small share of our success is due to the fact that we advertise in the DOMINION MECHANICAL AND MILLING NEWS."

THE Steam Boiler Inspection and Insurance Company, of this city, have sent to this office a document which shows that the parody entitled "The Boiler that Jack Built," which appeared in the last number of the MECHANICAL AND MILLING NEWS, and was credited to *The Locomotive*, was originally written by Mr. W. J. Coleston, one of the Company's inspectors.

THAT timber is becoming scarce across the border is evidenced by the greatly increased prices realized for timber lands sold by the Ontario Crown Lands Department last month. Prices have advanced several hundred per cent. above the figures realized in former years. This fact should demonstrate the necessity for taking every possible precaution to conserve our forest wealth.

THE Government of Australia offers a reward of £25,000 for an invention that shall effectually, and without danger to other forms of animal life, rid the country of the rabid pest from which it has suffered so long. Here is a chance for impecunious inventors whose fortunes have been shattered on contrivances that the public didn't want, to retrieve wealth, name and fame, by supplying a real "long-felt want."

THE incorporation of a new company, composed partly of American and partly of Canadian capitalists, with a capital of two and a half million dollars, to operate mines in the Port Arthur district, is an encouraging incident to those who are interested in the development and prosperity of this country. In spite of the efforts that are being put forth in some quarters to belittle the country, its people and its future, Canada may yet be a great nation if her sons will but "learn to labor and to wait."

COMPLAINT is heard that the Winnipeg grain inspector has of late allowed his judgment to be influenced by the popular clamor in favor of a reduction of the standards, and has been passing as No. 1 wheat that should have graded No. 2. In frequent instances of late have the inspectors here declared grain coming from the Northwest to be one grade lower than the standard at which it was graded by the Winnipeg inspector, and in some cases it has been found to be two grades below the proper standard.

THE statement is published that a couple of well-known gentlemen are trying to obtain a lease of a tract of timber land, comprising no less than 26,000 acres, in British Columbia. In view of the rapid depletion of the United States pine forests, and the fact that the supplies of that country must in future be largely drawn from Canada, the wisdom of giving individuals control of such large areas is open to question. The wonderful advance which is taking place in the value of such lands was clearly shown at the Government sale in this city the other day. Seeing, therefore, that our timber lands are certain to double and treble in value within a few years, the Dominion and Provincial Governments should manage things so that the profits resulting from increased values shall go into the public exchequer instead of into the pockets of private individuals.

MILLERS will be interested in the contents of the supplement issued with this number of the MECHANICAL AND MILLING NEWS. Regarding the merits of the new Cochrane roller mill, it speaks for itself. We are informed that the new manufactory at Dundas, Ont., for the construction of these mills, is nearing completion. The special machinery for use in the manufacture of these machines and the chilled iron rolls, is now being delivered by the makers, Messrs. John Bertram & Sons, and the Company expect to begin operations about the first of February. Mr. E. J. Condon, who is said to be one of the most successful manufacturers of chilled iron rolls in the United States, has been engaged to superintend this department of the new works, his draughtsman and pattern maker having also been brought from the United States to assist him. The readers of this journal should be on the look out for the Company's announcement in our February number.

THE Commercial Unionists are not united in opinion, therefore their cause seems likely to share the fate of the house which is divided against itself. The *Canada Lumberman* finds fault with this journal for saying that if what the *Mail* says be true, viz., that Canadian lumbermen can have a good market (in the United States) for all the lumber they can cut, it would be interesting to know what use our lumbermen would have for Commercial Union. The *Lumberman* says Commercial Union would be a good thing because the duty on lumber imported into the United States comes out of the pockets of the Canadian lumbermen. We shall allow another Commercial Union journal of at least equal authority with the *Lumberman*, the *Toronto Globe*, to answer this argument. The *Globe* says: "Sound principles have made an immense advance when a President of the United States tells Congress that the price to consumers of imported articles is increased by precisely the amount paid as import duty on such articles." Here we have it on the authority of President Cleveland and the *Toronto Globe* that the American importer, and not the Canadian exporter, pays the duty on lumber sent from Canada into the United States. Again we ask, if these things be so, what use have our lumbermen for Commercial Union?

MESSRS. Inglis & Hunter send us the following as "copy" for a change of advertisement, but unfortunately it arrived too late to appear in their advertising space, therefore we give it insertion here:

To all Users of Dust Collectors:—You are hereby notified that on September 3, 1886, Letters Patent of the Dominion of Canada were issued to us for certain improvements in dust collectors, which said dust collectors have been manufactured by us in the United States for the past eighteen months under the name of the "Cyclone Dust Collector." We are informed that dust collectors have been and are being offered for sale which broadly infringe said patent. We caution all parties against purchasing or using said collectors which contain improvements patented to us unless manufactured by Messrs. Inglis & Hunter of Toronto, Ontario, who are exclusively licensed to manufacture said Cyclone Dust Collector in the Dominion of Canada, and hereby give notice that we shall take proper legal steps to enforce our right against all persons who infringe, whether manufacturers or users.

Respectfully, THE KNICKERBOCKER CO.

THE NEW GRAIN STANDARDS.

THE CHANGES STRONGLY CONDEMNED BY THE GRAIN AND FLOUR SECTIONS OF THE TORONTO BOARD OF TRADE.

The Government's Hasty Action will make Trouble for Millers and Grain Dealers.

A GREAT deal of excitement has prevailed among Ontario millers, grain and flour dealers, since the fact became public that the Government had lowered the standards for Manitoba wheat. At a meeting of the grain section of the Toronto Board of Trade held on the 28th. ult., to consider the matter, the opinion was unanimously expressed that the effect of the changes would be injurious to millers, and handlers of flour and grain. The action of the Government in springing these changes upon the business community without consulting the leading Boards of Trade or seeking the advice of the Board of Examiners, was the subject of severe criticism.

On motion of Mr. J. A. Chapman, seconded by Mr. J. Carruthers, of the grain section, the following resolution was adopted:

"That whereas an order-in-Council has been passed changing the grades of Manitoba wheat, which will disarrange and cause endless trouble in carrying out contracts already entered into for future delivery on the basis of present grades, as well as necessitating the withdrawal of all samples now in the hands of foreign buyers and the furnishing of new standards, thereby causing great delay and cessation of business operations; therefore be it resolved, that this board desires to express its strong feeling of disapprobation at the changing of grain standards by the Governor-in-Council without consulting the commercial interests of the country through their various channels; and would therefore move that the council of this Board of Trade take such action in the matter as they may deem best to obtain if possible the rescinding of the order-in-Council until such time as all interested are consulted and their views ascertained."

The following resolutions were also passed at a meeting of the Executive Committee of the flour section:

"That whereas an order-in-Council has been passed amending the standard of Manitoba wheat, and which is fraught with most pressing import to all millers and flour dealers, any change at this time, when the grades are fixed, approved and known, is undesirable and likely to obstruct business, and also involve in litigation all contracts of sale fixed and still to be executed."

"That this section deprecates the fact that any change in existing standards of grain is possible, not coming through the regular constituted Board of Grain Examiners, who should be, in our opinion, the only authority by which a change in the existing standard of grain is possible."

It was ordered that copies of all these resolutions should be forwarded to the Department of Inland Revenue at Ottawa.

Subsequently a meeting of the Council of the Board of Trade was held, which, after fully considering the whole matter, appointed a deputation consisting of Messrs. M. McLaughlin, R. J. Stark, James Carruthers, and G. A. Chapman, to proceed to Ottawa and interview the Minister of Inland Revenue with a view to having the obnoxious regulation rescinded or altered in such a way as to remove the difficulties which, if enforced in its present shape, it would entail on the business community.

A prominent miller expressed the general feeling among flour manufacturers, when he said to a representative of the MECHANICAL AND MILLING NEWS:

"If you want the opinion of a miller, it's an outrage to upset business in this way right in the middle of the crop. Look at the effect upon millers who have made large purchases of Manitoba wheat for future delivery. To illustrate, my own firm bought some time ago 40,000 bushels of No. 1 Manitoba wheat. If this new regulation is enforced, the parties from whom we purchased will deliver to us grain graded as No. 1 hard under the new standard, but which, owing to the lowering of the standard, is worth 3 cents per bushel less than the wheat we would have received under the old standard. That simply means a loss to us of 3 cents a bushel on 40,000 bushels."

Leaving out of consideration for the present the advisability of lowering the standards for Manitoba wheat, there can be no two opinions regarding the injustice and lack of wisdom displayed in the Government's present action. The sudden declaration of changes affecting so widely and in so important a degree the business interests of the country, is without precedent. That the changes have been made without the opinion being asked of the persons interested in or likely to be affected by them, tends to increase the dissatisfaction. It has always been the custom for the Board of Examiners, the members of which are appointed by the Government, to meet once a year and fix the standards for grain and flour for the succeeding year. When this has been done, the grain trade go to a great deal of trouble and expense in sending these standards all over the world, and business for the ensuing year is done upon the basis of those standards. This procedure has been followed the present year. After the standards for the year have been fixed, however, and buyers and sellers of Manitoba wheat throughout the world are in the midst of heavy transactions based upon those standards, the government suddenly announces a change in the standards. The annoyance and loss which such unwise procedure will entail, can be readily understood. If the changes were deemed necessary, they should either have been made at the time of the annual meeting of the Board of Examiners early in the fall, or left until the meeting of 1888. It is said that a great deal of indignation prevails among members of the Board of Examiners because the Government did not seek the advice of that body before taking action; and it will be a matter of no surprise should some or all the members of that Board tender their resignations.

The Ontario flour and grain dealers, are recalling the fact that Mr. Van Horne, of the C. P. R., when at Winnipeg recently, promised to do all he could to have the standards reduced, and, as a singular coincidence, that immediately after he visited Ottawa, the changes were made.

A Winnipeg despatch received just before going to press says: "Several grain men in this city think that a meeting of the Dominion Grain Board will be called before the new standard comes into force. If so it is proposed to send a strong deputation from Manitoba to Toronto, as it is thought the Eastern grain men are averse to the desired change, and the greatest influence possible will be required to carry the point." Millers and others interested in this matter will await with interest the result of the interview between the Toronto deputation and the Minister of the Interior.

Inglis & Hunter have an order from R. S. Williams & Sons, Toronto, for Cyclone dust collector for shavings, for use in their piano factory.

Messrs. Wm. Kennedy & Sons, water wheel manufacturers, etc., of Owen Sound, Ont., have recently made quite a large number of Leffel water wheels, six of which went east, two going to McQuat & McRea, of Lachute, Que., and four to Robb & Sons, of Amherst, N. S. A considerable trade is also done by the same firm in propeller wheels, and they have furnished during the past season, something like thirty wheels to vessels plying in nearly all the waters from the St. Lawrence to Vancouver. These wheels varied from 22 feet in diameter and three tons weight, to 18 inches in diameter and 35 lbs. weight. Two 6 foot wheels were forwarded to Vancouver.

Northwest Letter.

THERE are two great questions agitating the wheat interests here at the present time, in fact people in every line of business here are deeply interested in anything affecting wheat, and therefore it may be said that these questions are agitating the whole community. For the time being they have almost exceeded in importance the railway and disallowance questions, and like the latter, they are of such a nature that they cannot be considered fully apart from each other. These two wheat questions are both of the greatest importance to millers, as well as to wheat growers, though in some respects the interests of the two sections may clash. These two great questions are: first, the grain standards, and second, the desirability of giving up the cultivation of Red Fyfe wheat in the Northwest.

In regard to the first question of the grain standards, it is practically the unanimous belief here that the standards are altogether too high. The fact of the matter is, the farmers and also the general public of the Northwest, have been misled on these wheat questions. At the time the wheat grades for Manitoba were first fixed, it was generally believed that our wheat so graded would command a price in proportion to its excellence. The Northwest was to be the great granary of the world for this wonderful hard Fyfe wheat, which it was then argued would be worth from 5 to 10 cents per bushel more than any other wheat. In order to make a name for Manitoba wheat and attain these great results, it was thought necessary that the grades should be put up very high. The result has been a sad disappointment. Manitoba grades of wheat, after several years in the world's markets, will not command any higher price than many greatly inferior grades, and our No. 1 hard has actually been obliged to take second place to the soft wheats of your own province. Manitoba No. 1 hard is quoted the same in British markets with Duluth No. 1 hard, though the former must be not less than 85 per cent. hard Fyfe, whilst the latter need only be "mostly" hard Fyfe. Furthermore, Manitoba No. 1 hard is now quoted at Montreal at the same price as the soft wheats of Ontario. It has therefore been abundantly demonstrated that our high grade hard wheat will at best only bring a price equal to Duluth hard of a much lower quality. But this is not all. It goes forth that Minnesota and Dakota produce a much larger percentage of hard wheat than Manitoba, and it is never taken into consideration that there is a great difference in the standards. At the Duluth standard, two-thirds to seven-eighths of the wheat of the Northwest, according to the district, would grade No. 1 hard. As it is, but one-third will reach No. 1 hard at the Canadian standard. The result is, that Manitoba loses three cents per bushel on nearly one half of her wheat crop.

The board of grain examiners of the Winnipeg Board of Trade have taken the matter into consideration, with the result that they have presented a report in favor of a reduction of the grades of Manitoba wheat. In accordance with the report, a memorial will be presented to the proper authorities. The grain examiners advise that the standard for No. 1 hard be reduced to 65 per cent. of Red Fyfe, instead of 85 as at present, and weighing 60 pounds to the bushel. No. 2 hard would be of the same percentage, but weighing 58 pounds to the bushel. Our grade, No. 1 Northern, is now the same as Duluth, or not less than 50 per cent. Red Fyfe. The examiners further advise that the grade, "Extra Manitoba Hard," which now calls for an absolutely pure Red Fyfe wheat, be reduced to the standard of the present No. 1 hard, namely, 85 per cent. Red Fyfe, weighing 62 pounds to the bushel. This report is evidently all right as far as it goes, but in the light of present experience it does not go far enough. The standard for Manitoba wheat would still be much higher than Duluth. If, as it has been clearly demonstrated, Manitoba grades will not bring a higher price than Duluth, why keep up the difference at all? It would only be to keep the Northwest at a disadvantage with Duluth, though in a less degree than at present. Manitoba wheat growers will still be the losers, to the extent of the difference between the Manitoba and Duluth standards.

But as matters are now going, the prospects are that there will be very little hard wheat to grade in the country in a very short time. Our grain raisers are saying: "If our hard wheat will only bring the same price at Montreal as the soft varieties of the Eastern provinces, why grow hard wheat at all?" This brings us to the consideration of the second great question: "The desirability of giving up growing Red Fyfe wheat." There are certain disadvantages in growing Red Fyfe

wheat, as compared with some other varieties, and it would certainly be unwise for our farmers to undergo these disadvantages unless there is some prospect of gain in another direction. So far there has been no encouragement to take any additional risks in order to grow Red Fyfe wheat. Whatever, therefore, may be the special value of this variety as a milling wheat, it is not likely that Manitoba farmers will continue to grow it unless they can command a higher price for the grain, in proportion to other wheats, than they yet have received. Already, it is understood, there is a considerable movement among the farmers to sow other varieties of wheat next spring. The great substitute for Red Fyfe so far considered is a variety, or I might say varieties (for there are several sorts mentioned), of Russian wheat. There certainly seems to be a great deal to say in favor of Russian wheat. A quantity of Russian wheat was distributed to parties throughout Manitoba and the territories last spring from the Ottawa Experimental Farm, and the results of the test have been most satisfactory. It has been pretty thoroughly demonstrated that this wheat will ripen from ten to fifteen days earlier than Red Fyfe. This is in itself a most important consideration, when it is known that owing to the danger from early frosts, a few days may be worth thousands to the country. The productiveness of the wheat has also been well established, and the tests have shown that it yields very heavily, being in no respect behind Red Fyfe. Some farmers assert that it has ripened with them fully three weeks earlier than Red Fyfe. As to the milling value of this new wheat, grain dealers who have examined it speak very highly of its appearance. Professor Saunders is very enthusiastic over this wheat, and declares his belief that it is nearly, if not quite equal, to Red Fyfe in value as a milling wheat. The berry is small, but quite hard. The question is whether one year's test of this wheat is sufficient to warrant its general adoption in preference to Red Fyfe. There are many who believe that though this Russian wheat will ripen much earlier the first year, that inside of four years, grown in succession in this climate, it will lose this favorable feature, and when acclimatized will be no earlier than other varieties. In one instance, however, where grown two years in succession, it ripened in the same number of days each year. As to the milling value of the variety, that will have to be decided by future tests. Still farmers would seem to be risking little by abandoning Red Fyfe, when they are unable to obtain any extra price for it over ordinary soft wheats.

The question asked here is: "Has Red Fyfe lost its high commercial value, or is Manitoba wheat under the influence of a bear clique? The latter cause is generally supposed as the real reason. We are reading every day in Eastern papers of the increasing demand for Manitoba flour in that direction. A Montreal paper lately stated that several Ontario millers were grinding Manitoba wheat exclusively, owing to the great call for Manitoba flour, yet in the same paper the quotations show our No. 1 hard actually quoted one cent lower at Montreal than the common spring and fall wheats of Ontario. This is certainly passing strange. This state of affairs has strengthened the desire for a competing line of railway to the south. It has been pointed out that with the proposed Southern railway, Manitoba wheat could be shipped to Duluth, where it would be graded according to the standards in use there, and a better price would be obtained than can now be secured at Montreal for our present very much higher grades.

There is another feature of this hard wheat question which deserves special attention—this is in regard to the flour trade of Manitoba. The milling industry here has been extending with greater rapidity than almost all other industries combined. Manitoba flour has gained a reputation at home both in the East and the far West, and is now being spoken of very highly in Britain. The abandonment of Red Fyfe wheat would certainly strike a great blow upon the milling interests, unless it can be shown that this Russian wheat, which is likely to come into use here, is equal in milling value to Red Fyfe. Those interested in milling will therefore watch the present movement with the keenest interest.

PERSONAL.

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

Miller Amos Hibbert has removed from Blair, Ont., to Salem, Ont.

Mr. Goodwin, miller at the Freetown, Ont., mills, again occupies his old position.

The proprietor of the Repton, Ont., grist mill, Mr. Coobos, now resides in the village.

Mr. S. J. Hogg of the firm of S. J. Hogg & Co., lumber dealers, Calgary, W. T., is dead.

Mr. John Payne, of Stratford, has been appointed buyer for the Ontario Oatmeal Millers' Association.

Mr. Wm. Gillesby, a well known and highly respected grain merchant, of Hamilton, Ont., died last month.

It is reported that the government will appoint Mr. Richard Pope Commissioner of Patents.

Mr. Samuel Rogers, of the Queen City Oil Works, Toronto, has just returned from a trip to the Northwest.

Mr. J. B. Miller, president of the Parry Sound Lumber Co., has made this city his headquarters for the winter.

Mr. J. K. Millard, agent for the Massey Mfg. Co., of Toronto, has been engaged by the same company for next season.

James McBride was caught in the belting of Marsh's saw mill, York township, a few days ago, and instantly killed.

Mr. Daniel Rats, late of Salem, Ont., has removed to Elmira, taking his family with him. He will be employed in the Elmira mills.

Mr. Ross, grain buyer for McBean Bros., at Boisévain, Man., had his hand caught in the cups, and badly lacerated in Patchell's elevator at that place.

At Chesterville, Ont., recently, Mr. Sam. Keys, an apprentice, had his arm nearly taken off through coming in contact with some machinery in Barrie's roller mill.

Mr. Archibald Campbell, the well-known Chatham miller, who was recently unseated in Kent county, has been renominated for the Commons by the Liberal party.

Mr. Jos. Windgarden, an employee of Manson Campbell, Chatham, Ont., has lost a finger and had another badly lacerated, through coming in contact with a circular saw.

Mr. C. Davidson, until recently employed as a machinist by Mr. W. W. Cowan, of Stratford, has gone on the road as travelling representative of Messrs. Cowan & Co., Galt.

According to the Brantford Courier, Mr. R. McNeil, an employee of the Waterous Engine Works Company, has been left a legacy by an uncle who died recently at London, Ont.

A prominent grain dealer and merchant of Bath, Ont., Mr. Thos. E. Howard, expired suddenly in the streets of that village a few days ago. Death was due to paralysis of the heart.

The London Free Press says Mr. John Campbell, miller, of St. Thomas, has assumed a debt of between \$300 and \$400 which has been hanging over the Disciples' Church of that city.

Miller Robert Tink, of Hastings, Ont., while keying a wheel to the water wheel shaft last month, caught a severe cold which developed into pleurisy. He is now nearly convalescent again.

Among the various bequests made by the late Mr. Dennis Moore, of Hamilton, Ont., was one of \$25,000 for the purpose of establishing a chair in the Faculty of Arts in connection with Victoria College.

The Toronto City Council have made a wise choice in appointing Mr. John Fensom, of this city, as one of the examiners to report on the qualifications of applicants for the position of Chief Engineer of the Water Works.

Messrs. Walter & Fred. Massey, of the Massey Mfg. Co., of this city, sailed on the 20th Nov. by the steamship Australia, for Auckland, New Zealand, on a business and pleasure trip round the world. The boat would, all being well, reach its destination about the 8th ult.

Mr. Thomas Stewart, who was once one of the leading business men of Galt, Ont., died recently at Port Elgin, Ont., where at the time of his death he had charge of a mill. He was, before business complications overcame him, proprietor of the Doon & Dumfries Mills, Galt.

The following are the names of the pupils who have received the silver medals awarded by the Canadian Manufacturers' Association to the successful competitors in the different Art Schools of Ontario, for artistic designs of various subjects:—Misses Mina Faircloth, of Toronto, and Narcissa Bulla, of Brockville, and Messrs. R. W. Crouch and M. C. Edey, both of Ottawa.

We regret to announce the death of Mr. John Lawrie, of St. Catharines, Ont. He was born in Scotland in 1820 and came to this country in 1837 at the age of 17. He had acquired a knowledge of the milling trade in Scotland, and soon after his arrival obtained a situation in a Brantford flour mill. He did not remain in Brantford long, however, but removed to Port Dalhousie, where, with his brother, Robert Lawrie, he erected the "Port Dalhousie Mills" in 1837. For a period of thirty years, from 1855 to 1885, he was prominently identified with the municipal affairs of the locality in which he resided. He was politically a Reformer, a member of the Presbyterian Church and also of the Masonic fraternity. He leaves a widow and two sons and two daughters.

Mr. A. M. Wickens, President of the Toronto Association of Stationary Engineers, has recently invented and patented an expanding spool for spooling web printing paper. Heretofore an iron spool has been shipped in the centre of each web of paper sent out from the mills, and the freight to and fro on these iron spools cost one of the daily newspapers in this city several hundred dollars a year. The new spool, which contracts and expands, is removed from the web of paper at the mill, and replaced by another in the newspaper office, thus saving the freight charges. The new spools are being manufactured in this city, and orders for them have been received from several Canadian paper concerns, and the largest paper manufactory in the United States.

TO GEO. T. SMITH.

A hundred thousand welcomes, Smith!
But weak are words to welcome with,
And feeble are they to reveal
A title of what for thee we feel.
But thou art not a stranger here—
No, nor in either hemisphere!
For through the earth thy name has spread
Farther than thou may'st ever tread.
In Europe's cities, old and quaint,
Where dwell and dwell the sage and saint,
Thy name is heard—thy worth is known,
Even as they are throughout thine own.
In that bright land of golden mines,
O'er which the Cross wore golden shies,
Thy works a foremost place have found
And are with honors rightly crowned.
By East and West and North and South.
Thy praises are in every mouth,—
And justly, for thy labors made
An art of that which was a trade!
I, see thou wert, and didst foresee
The coming of the things that be,
Whilst others slept—when night was wound
O'er millers' minds the wide world 'round,
A pilot true, who mad'st and manned
The barque that bore us safe to land—
And mark'st the course which all have steered
And all have praised because 'twas cleared.
Still dost thou guide, still dost thou toil—
Yet not alone for labor's spoil,
But that thou might'st perfect that art
To which thou'st pledged hand, head, and heart.

Maryborough, Ireland.

JAMES MURPHY.



Mr. Henry Powley's saw mill at Treacle, Ont., is in full swing.
Mr. John Zoeger's saw mill at Newton, Ont., will be running shortly.

Mr. Joel Stauffel, saw mill owner, Oil Springs, Ont., has assigned.

A new saw mill is being erected by Mr. Wm. Whalley at Mersea, Ont.

Johnson Bros.' planing mill, Essex Centre, Ont., was recently damaged by fire.

The estimated cut of lumber at the Chaudiere this season is 365,000,000 feet.

A lumber company has been formed at Lakeshore, Ont., with a capital of \$800,000.

A large brick planing factory is being erected on Northcote Avenue, in this city.

From Richibucto, N. B., was shipped during the season of 1887 12,988,000 feet of lumber.

Mr. Thomas Whaley, late of Milverton, Ont., is now lumbering on an extensive scale in Muskoka.

The celebrated Gilmour-Harris case is to come up for decision before the Privy Council next spring.

Mr. Neiberger has closed his mill at Dunlop, Ont., and transferred his employees to Sheppardton.

A saw and planing mill will be started in connection with Mr. James Harbank's grist mill at Hartley, Que.

Mr. Wm. Machan will stock his mill at Moncton, N. B., this winter as usual, so also will Mr. J. C. Wilson.

Daniel Hayes, lumber merchant, Toronto, has assigned with \$15,000 liabilities, and showing a surplus of \$5,000.

Fred. Richardson and Wm. Baird, of Trimble's Corners, Ont., have gone to northern Michigan to purchase a timber limit.

The village of St. Arns, near Lowville, Ont., will shortly be able to boast a sawmill. Mr. John Readhead is the builder.

The Hastings Saw Mill Company has been incorporated by W. C. Ward and others, of Victoria, B. C. The capital is \$150,000.

At the headwaters of the Kennebec this season, the cut of logs will be above an average, between 100,000,000 and 125,000,000.

Damage to the extent of \$16,000 has been caused by fire at Jones's factory and J. K. Booth's piling ground near Ottawa, Ont.

About 25,000 railway ties from the Rathbun mills, Campbellford, have been landed at Port Covington, Maine, and 45,000 more to follow.

Mr. Gildersleeve's saw mill which was the chief support of the village of Lake Opinicon, Ont., has shut down and will shortly be removed.

Mr. J. Lamoureux arrived at Edmonton recently from Battleford, accompanied by a party who will take out 4,000 logs this winter for his mill.

A raceway has been constructed at an outlay of \$5,000, from the Welland canal to the lumber mills of Messrs. Phelps Bros., Welland, Ont.

The new cedar mill at Deseronto, Ont., is expected to be started by the end of January. Millwrights are now busily engaged fixing the machinery.

The Jerseyville, Ont., planing mill, now belonging to Messrs. Weaver & Howell, has been overhauled and placed in thorough working order.

Messrs. Manhard & Co., lumber dealers, Brockville, Ont., will move their headquarters from Canada to the United States. The place fixed upon is Cape Vincent.

The Royal City planing mills company, of New Westminster, British Columbia, are shipping large quantities of lumber to the Northwest Territories and Manitoba.

Mr. David Wallace of Brantford, Ont., has built a saw mill on his farm, Talbot St., Scotland, Ont. He intends to do business extensively in this line during the winter.

Messrs. Christie Kerr & Co., intend to get out 12,000,000 feet of lumber this winter. They have sent herds of cattle to their camps at Oakley, Ont., for the purpose of feeding their men.

The Chatham Manufacturing Co., of Chatham, Ont., received the other day the largest stick of timber ever seen in that locality. It was of oak, 79 feet long and over 11 tons in weight.

A large quantity of square timber is being taken out of Belmont township, particularly along the North and Deer Rivers and the vicinity of Belmont Lake, by Mr. Thompson, of Peterborough.

The great Chatham pulp mill is now rapidly nearing completion. Considerable progress has recently been made, and the last brick of the chimney, which is 150 feet high, has been placed in position.

The total loss by fire in Canada and the United States during the month of October is estimated at \$9,769,825 to which the lumber and kindred interests contributed the large total of \$933,000.

It is estimated that the cut of white pine square timber in the Ottawa district this winter will reach one and one-half million feet; waney or board six hundred and fifty thousand, and square red pine half a million.

Messrs. Fraser & Co., Edmonton, Man. have sawed 350,000 feet of lumber this season and have about seventy five thousand feet of logs up the river at the present time. They will take out half a million feet this winter.

The failure is announced of Messrs. Joseph Kidd & Sons, of Dalden, Ont., who, in addition to other extensive business enterprises, operated lumber mills on the North Shore. The firm's liabilities are estimated at \$150,000.

Considerable progress has been made in the construction of the new mills of the Parry Sound Lumber Co., and the Midland and North Shore Lumber Co., and it is expected that both will commence operations early in the spring.

Additional activity among Canadian lumber mills will be the result of the decision arrived at by the Treasury authorities at Washington that dressed ship planking shall be admitted free under the tariff regulation for ship timber.

About 394,000,000 feet of lumber have been shipped from Ottawa since the opening of navigation. The United States received about 295,000,000 feet of this amount as sawn board lumber, and the greater part of the remainder went to England.

A correspondent writing from Sturgeon Falls, Ont., says that lumbermen in that quarter are wishing very earnestly to see an open winter. The water is very low and unless frequent thaws come to raise it, there will be a difficulty in getting out the drives.

The following is the tally of saw logs etc., put through the boom at Belleville, Ont., during the season of 1887:—Sawlogs, 253,257; Floats, 773; Cedar, 26,855; Posts, 27,941; Pies, 13,506; Jois, 6,040; Long Logs, 9,583; Timber, 81. Total number of pieces, 338,036.

Messrs. C. F. Todd & Son's lumber mill, on the upper dam, Milltown, Ont., was destroyed by fire on Dec. 1st. A large quantity of lumber, including five loaded cars, was consumed. The loss is estimated at from twelve to twenty thousand dollars partially covered by insurance.

Mr. H. F. McLaughlin, of Arnprior, Ont., has purchased a small limit on Papineau Bay, Que., for a considerable sum. He intends to erect a large saw mill there next summer. He is also carrying on negotiations with the Canadian Pacific Railway Co., in reference to shipping facilities, etc.

A new saw and grist mill is being built at the head of the Sault Rapids by Mr. W. H. Fotheringham. The proprietor has men in the woods, and expects to have about 600,000 feet of logs ready to commence work upon when the saw mill is finished. The site of the mill has been named Jubilee, and being located midway between Rainy Lake and the Lake of the Woods, is expected to be the headquarters for settlement on the river.

Messrs. A. H. Campbell, of Toronto, James McLaren, and John Charlton M. P., heading a deputation of lumbermen waited upon the Attorney-General and Minister of Crown Lands, and urged that the proposed increase of 25 cents per thousand feet Crown dues and \$1 per square mile ground rent, be not carried out. The deputation got but poor encouragement and it is believed that the government will put the proposed new regulation in force the present winter.

A loss of \$12,000 has been incurred through the destruction by fire of Messrs. H. F. Eaton & Sons' lumber mills, St. Stephen, N. B. They are known as the "Upper Mills," and are those about which there has recently been a disagreement as to which side of the river they were on. A short time ago United States custom officers took possession of some lumber made there, their contention being that it was from Canadian mills, and therefore liable to duty on going into the United States. The proprietors claimed that their mills were in Maine. The reconstruction of the mills is doubtful unless it is decided that they are situated on the Haring side of the boundary line.

The following is a summary of the declared exports of lumber from the port of Ottawa at the United States consulate, for the month of November:

Quantity.	Value.
Total of lumber, 13,654,771 feet	\$202,809
Laths, 8,761,100	11,681
Hemlock bark, 513 cords	2,541
Railway ties, 5,722 pieces	1,129
Shingles, 523 M	1,068
Telegraph poles, 110 pieces	71
	\$219,300
(Divided as follows)	
Lum. for U. S. consumption	10,466,653 ft. \$147,699
Lum. for re export (in bond)	3,188,088 ft. 55,110
	13,654,771 ft. \$202,809
Shipped by water	4,158,146 ft.
Shipped by rail	9,496,625 ft.
	13,654,771 ft.

A Washington despatch to the Toronto Mail says: "The Secretary of the Treasury recently received a letter requesting that persons engaged in the lumbering business in the Counties of St. Lawrence and Franklin, N. Y., may be permitted to import from Canada for temporary use, and without payment of duty, teams of animals and articles for use in the lumbering camps, which teams and articles are to be brought in by Canadians. The question was submitted to the collector of customs at Ogdensburg, in order to ascertain the necessity for such action, and that officer has reported that during the past year many horses suitable for use in lumbering have been imported from Canada. He also expressed the opinion that the bringing in of Canadians with their teams for the purpose indicated would be in contravention of the Contract Labour Act. He said further that there was no immediate necessity for granting the request, for the reason that animals needed in the lumbering business can be readily obtained in the United States. Assistant Secretary Maynard has therefore informed the persons interested that as there is no legal authority for granting the request the department declines to interfere in the matter."

The immense timber raft at the Joggins, N. S., of which mention has more than once been made in the MECHANICAL AND MILLING NEWS, has been successfully launched, but the enterprising projectors of the scheme have now to face another difficulty. By the request of the Boston Board of underwriters, the Heaver and Allan Line Steamship Company have called the attention of the Marine Department to the fact that in the event of the raft breaking, a contingency not unlikely to occur at this season of the year, the broken portions would be a floating menace to ocean steamers. The Boston underwriters absolutely refuse to insure the raft in its present shape. The Deputy Minister has written the Collector of

Customs at Amherst, asking him to acquaint the owners of the raft with the representations which have been made, and requesting him also to draw their attention to the provisions of the statute bearing on the navigation of rafts. Section 2 of chapter 79 of the Revised Statutes makes it compulsory on raft-owners to keep a bright fire burning on the structure all the time and to see that it is properly chained so that it will not break. Severe penalties may be inflicted for infraction of the law. The question, however, comes up, "Would this apply to any infraction done outside of the three-mile limit?"

The situation in the Northwest is thus described by the Winnipeg Free Press:—Following its usual custom, the Free Press has made inquiries among the lumber men as to the amount of the cut to be made and prospects as to prices. It is stated that the last season has been a very good one as regards quantities. Prices, however, have been low, principally because banks and others holding stocks of defunct companies have slaughtered them and thus kept rates down. However, these stocks are pretty nearly exhausted. A large inroad has also been made on the regular dealers' stocks of cut lumber. About this time last year there were about forty-two million feet of lumber in the country. Now the amount is estimated at twenty-six million feet. The normal aggregate stock is about thirty-six million feet. Under ordinary circumstances the result of this reduction of stocks would be an increased cut of logs; but lumbermen are still somewhat timorous owing to their losses in the last few years, and their present preparations only contemplate a cut about equal to that of last year, which was short. In the district about Lake Winnipeg, Itown & Rutherford will take out about 2,000,000 feet; Mather & Co. have a large number of logs which were cut last year, and which will now be taken out; Captain Robinson will take out 2,000,000 feet; Jonasson, Frederickson & Walkley, 2,000,000 feet; H. Crowe & Co. and the Selkirk Lumber Co. together, 3,000,000 feet; Mr. Mergan has bought about 3,000,000 feet of old logs belonging to the defunct Northwest Timber Company, which he will get out and saw; Woods & Co. have about 500,000 feet of logs at their mill on the Winnipeg river which they will saw, but they have not yet decided whether they will take out any more logs or not this year; D. E. Sprague & Co., have men out prospecting, and will not decide upon their operations till these return, which will be in about a week's time. In the Lake of the Woods district the cut of logs will be about as follows:—Rainy Lake Co., Rat Portage, 10,000,000 feet; Ontario Lumber Co., Norman, 8,000,000; Cameron & Kennedy, Norman, 8,000,000; Dick, Hanning & Co., Keewatin, 8,000,000; Keewatin Lumber Co., Keewatin, 10,000,000; total, 44,000,000 feet. The Ontario and Minnesota Co. get their entire cut from Minnesota; the Keewatin Lumber Co. get 8,000,000 feet in Minnesota, and the balance on their own lands on the Lake of the Woods; the other mills are supplied entirely in Canada.

On the 15th of December the Ontario Government buildings in this city were crowded with lumbermen from all parts of Canada and the United States, anxious to secure bargains at the Government sale of timber berths advertised to take place on that day. When the sale opened, with Mr. Peter Ryan wielding the auctioneer's hammer, bidding was exceedingly lively, and bargains were not so easy to obtain as some had hoped. The sale resulted in swelling the funds of the Provincial treasury to the extent of a million and a quarter dollars. Many choice berths were knocked down to American buyers. The names of the purchasers, location and extent of their purchases, and prices paid are as follows:—Township of Higger—Berth No. 1, 20 1/2 square miles, to Thos. & W. Murray at \$3,100 per mile; berth No. 2, 11 1/2 square miles, to T. H. Moffat at \$3,100 per mile. Township of Bishop—Berth No. 1, 13 1/2 square miles, to W. Cook at \$2,150 per mile. Township of Ballantyne—Berth No. 1, 22 1/2 square miles, to Albert Polk at \$5,500 per square mile; berth No. 2, 14 square miles, to Martin Brennan at \$2,350 per square mile; berth No. 3, 19 1/2 square miles, to Joseph Riopelle at \$2,600 per square mile; berth No. 4, 12 1/2 square miles, to Thos. McKay at \$850 per square mile. Township of Hutt—Berth No. 1, 15 1/2 square miles, to Alexander Fraser at \$900 per square mile. Township of Chisholm—Berth No. 1, 22 square miles, to Robert Thompson at \$3,000 per mile. Township of Canisbay—Berth No. 1, 2 1/2 square miles, to Alexander Harnett at \$500 per mile. Township of Devine—Berth No. 1, 17 square miles, to Alexander Fraser at \$4,300 per mile; berth No. 2, 13 1/2 square miles, to Alexander Fraser at \$2,100 per mile; berth No. 3, 11 square miles, to Alexander Fraser at \$4,200 per mile; berth No. 4, 11 1/2 square miles, to Alexander Fraser at \$3,000 per mile. Township of Hunter—Berth No. 1, 16 1/2 square miles, to Alexander Harnett, at \$3,500 per mile; berth No. 2, 12 1/2 square miles, to Alexander Fraser at \$4,600 per mile. Township of Livingstone—Berth No. 1, 8 square miles, to Calligan & Montrose at \$6,350 per square mile; berth No. 2, 13 1/2 square miles, to Albert Polk at \$4,200 per square mile; berth No. 3, 17 1/2 square miles, to P. H. Spohn at \$3,400 per mile; berth No. 4, 9 square miles, to N. Dymont at \$2,100 per mile. This was offered a second time, the Government bid being \$3,300; berth No. 5, 8 1/2 square miles, to W. J. Smith at \$800 per mile; berth No. 6, 9 square miles, to N. Dymont at \$800 per mile; berth No. 7, 7 1/2 square miles, to N. Dymont at \$1,350 per mile. Township of Lawrence—Berth No. 1, 15 square miles, to McArthur Bros. at \$3,300 per mile. Township of McLachlin—Berth No. 1, 17 1/2 square miles, to Alex. Harnett at \$3,400 per mile; berth No. 2, 12 1/2 square miles, to A. Harnett at \$4,400 per mile. Township of McClintock—Berth No. 1, 14 square miles, to J. Cockburn at \$2,500 per mile; berth No. 2, 12 square miles, to the Longford Lumber Co. at \$2,500 per mile; berth No. 3, 8 1/2 square miles, to the Longford Lumber Co. at \$2,300 per mile; berth 4, 10 1/2 square miles, to J. Cockburn at \$2,000 per mile; berth 5, 9 1/2 square miles, to J. Cockburn at \$1,600 per mile; berth No. 6, 11 square miles, to Longford Lumber Co. at \$1,005 per mile. Township of Penland—Berth No. 11, 1/2 mile to Wm. Mackay at \$400 for the lot. Township of Wilkes—Berth No. 1, 13 1/2 square miles, to W. McKay at \$900 per mile; berth 2, 15 1/2 square miles, to W. McKay at \$1,700 per mile; berth 3, 17 1/2 square miles, to T. H. Moffat at \$4,000 per mile. Township of Nightingale—Berth No. 1, 1 1/2 miles, to Thos. Murray at \$600 for the lot.



The roller mill at Bridgen, Ont., is running sixteen hours a day. Winnipeg has just come into the enjoyment of a produce exchange and call board.

Mr S Johnston's mill at Columbus, Ont., is now in operation, with Mr. A. Ellis in charge.

The new flouring mill at Minnedosa, in the Northwest, began operations on the 12th of December.

A roller flour mill of modern construction, capacity fifty barrels, will shortly be erected at Tara, Ont.,

The flour from the Virden roller mills, Virden, Man., is now being forwarded direct to Liverpool, England.

A roller mill, with a capacity of 100 barrels per diem, will be erected by Mr. J. J. Hamilton, of Nepawa, Man.

The totally destroyed the Rugby, Ont., flour mills. The only articles saved were the scales and a couple of bags.

Mr Thomas Goodman's mill at Columbus, Ont., is reported to be doing good work in the hands of miller Harry Burton.

A new elevator with a capacity of 25,000 bushels, is being erected by Messrs. Dougherty & Son at Leamington, Ont.

Mr T G. Mitchell, grain dealer, has decided to build an elevator with a capacity of 25,000 bushels at Watford, Ont.

Mr James Wells, late of the firm of Clemens & Wells, millers, has leased the Orangeville, Ont., mills, and commenced operations.

A large roller flour mill, recently finished, has just been started by Mr D. C. Horner at West Shefford, Que., near Cowansville.

Manitoba wheat in large quantities is being shipped by the Canada Atlantic Railway to New York by way of Rouse's Point.

Mr. T. G. Mitchell, grain dealer, Watford, Ont., will have an elevator erected on his premises with a capacity of 25,000 bushels.

The National Transportation Company launched at Kingston a few days ago, a new grain elevator, said to be the largest in Canada.

Sutherland's grain elevator at Owen Sound, Ont., was destroyed by fire last month. The loss amounts to \$15,000, with insurance of only \$3,000.

A six foot well is being put down by Mr. J. Misener at the Lynden, Ont., roller mills. The well is expected to reach a depth of fifty feet.

Captain Ellison, of Port Stanley, Ont., has had his mill and machinery overhauled and placed in thorough working order for his large winter trade.

The number of bushels of grain shipped from Belleville Ont., by water, during the season of 1887 was:—Barley, 134,390; Peas, 9,963. Total, 144,353.

The Dominion Parliament will, it is said, be asked to deal with the complaint that Manitoba grain standards are too high as compared with those at Duluth.

The construction of Mr. Jas. Mahaffy's roller mill at Port Albert, Ont., is progressing rapidly. The mill when finished will be one of the best in the district.

The Richardson, Ont., mills are now in the possession of Mr. Richard Keyworth who, if the right man does not come along to run them, will start them himself.

Mr. W. S. Morgan, the well-known Hamilton miller, after having inspected the working of the new Cochrane roller mill, is said to bear testimony to its superiority.

Mr. George Easterbrook, of Tweed, Ont., has built an engine house and intends to place within it a large engine for the purpose of running his elevator, grist and saw mills.

A consignment of 15,000 bushels of No. 1 Manitoba hard wheat of excellent quality was lately received by Messrs. Morgan Bros., the Hamilton millers. It weighed 63 lbs. to the bushel.

Between May the 6th and Nov. and nearly six million bushels of grain, in transit to Montreal from Chicago, Toledo, Duluth, and other American ports, was transhipped at Kingston.

The new C. P. R. route to Minneapolis via the Algoma Mills branch and the Sault is now complete, and will soon, it is expected, afford a considerable amount of traffic in flour and grain.

The machinery for the new 1,000 bbl. mill at Keewatin, Ont., is arriving fast and the roof is nearly completed. Hopes are entertained that the mill will be in active operation by the end of March.

Severe frost caused a break in the stone-work of the new engine house which is being erected adjoining the Brooklyn, Ont., flour mill. The damage has been repaired, and the new engine is now in operation.

Steps are being taken to erect a farmers' flouring mill at Brandon, Man. The mill is to have a capacity of 200 barrels a day, and to grind for the farmers at 15 cents a bushel, giving them 38 lbs to the bushel return.

Mr. John Love, of West Winchester, Ont., is putting into shape the building which he purchased from Messrs. Steele & Co., for a roller mill. He came to this city recently and invested in a 100 horse power engine and boiler.

Messrs. Robinson Bros. large roller mill at Watford, Ont., ceased operations for a short time recently during repairs to the furnace. Other improvements have also been carried out and the mill is now said to be quite a model.

Professor M. Brocchi has been deputed by the French Director of Agriculture, M. Tisserand, to make an exhaustive report concerning a new flour pest, known as *Ephasin Kuhnella*, the ravages of which are so serious as to cause much alarm.

The people of Deleoraine, in the Northwest, want some one to purchase the flour mill at that place and fit it up with roller process machinery. There is said to be abundant territory from which to secure custom; the nearest mill being at Plum Creek.

Debentures will shortly be issued by the Otman Council, Minnedosa, Man., for \$5,000, and Mr. James Jermyn will receive the proceeds as a bonus for the refitting of his mill. It is said that several capitalists will take these debentures at a premium.

Mr. Anthony Goettle offers to put roller machinery into his mill at Sebringville, Ont., if the people of the locality will give him a reasonable bonus. A considerable amount of money has already been subscribed, and there is little doubt that the enterprise will be carried out. Mr. Goettle is a native of Sebringville, and stands high in the estimation of the people.

A correspondent writes as follows to the *Milling World*: I saw an article in *The Milling World* lately about a mill narrowly escaping fire by the miller throwing down his coat with matches in its pocket. The matches set the coat on fire while the miller was up stairs. Now, if millers would use the Swedish safety matches, such a thing could never occur, as they can be lighted only on a paper prepared for the purpose. Millers ought to use them.

Is the Scotchman abandoning his "parrich?" It would seem so, or else he is getting the wherewithal to make it from some other quarter than Canada. The Montreal trade returns show that the shipments of oats during the past year declined from 2,000,000 bushels to 500,000 bushels. We are not told whether this large falling off in our export trade is due to increased demand for oats in Canada, or to the scarcely conceivable cause suggested at the commencement of this paragraph.

"Mysterious fires" in flouring mills are reported in increasing number since the advent of cold weather. Look to your heating apparatus. Allow no lights left burning during your absence from the mill. If kerosene lamps are used, never allow them to be turned down, and keep them full of oil. These lamps explode chiefly when the oil is nearly exhausted and the light is turned low. Keep matches in closed metal boxes away from the reach of mice. Look out for overheated stoves.—*Milling World*.

The Moose Mountain Trading Company's full roller flour mill, built by W. & J. G. Greey, of Toronto, and under the management of J. A. McIntyre, late of Tisonburg, Ont., is running day and night on custom work. The company have received several orders for flour which they have been unable to fill, owing to the demands of the farmers. There is urgent need for a large elevator on the company's premises, and we are pleased to see that they anticipate erecting one in the near future.

Tests are now being made with a view to deciding the commercial value of the variety of Russian wheat distributed last spring in Manitoba and the Northwest Territories under the instruction of the Minister of Agriculture. This grain, it will be remembered, matured some two or three weeks earlier than the Red Fife, and is valuable on that account, as by its use the danger from frosts is obviated. Professor Saunders, of the Experimental Farm, Ottawa, states that in his opinion the tests now being made will establish the fact that this newly introduced Russian wheat is in every respect nearly, if not quite, equal to Red Fife.

We understand says *The Miller* (London, Eng.) that Mr. Henry Simon, of Manchester, has patented and is now introducing to millers a novel and inexpensive application of the electric light in purifiers, so as to enable the work going on inside the purifier to be inspected with the greatest facility at any time. It is a simple arrangement which can be applied even in mills where the electric light is not in use for the remainder of the mill, and conduces to great improvement in the working of the purifiers, the most important machines in the mill, by enabling the attendant to watch their action and regulate them with the greatest facility and certainty.

Capitalists have come forward and a company has been formed in Prince Edward Island for the purpose of running a flour mill in Charlottetown on a more extensive plan than any hitherto adopted in that district. Machinery of a first class description has been purchased by the company in this city. The flour ground on the island heretofore has been of small value, not on account of the low grade of the wheat, but owing to the primitive construction of the mills causing the heating of the grain during the process of milling. A quantity of wheat of medium quality was forwarded to Toronto, milled here, and sent back, and the flour thus obtained was excellent.

The Vancouver *News* says: A noticeable feature in flour has been the receipt in this city of a car load from the Columbia Mills, Spallumcheen, B. C. This is the first to arrive in the city, and to those who think that this province has no agricultural lands it will be a surprise. The flour is described as being very good, and is especially adapted for pastry and fancy baking. It will no doubt, in time drive the Oregon and California flours out of the market for these purposes, just as the Manitoba hard wheat flour is driving them out for bakers' use. The demand for Manitoba flour still continues large, and dealers are at times considerably pushed to fill orders. Prices continue steady.

The C. P. R. authorities state that between five and six million bushels of grain have been shipped from the Northwest since harvest. The complaint that the carrying facilities are unequal to the demands of shippers, and that traffic blockades must result, are again being printed by Winnipeg papers. When questioned as to the foundation for these complaints, Vice-President Van Horne of the C. P. R., said:—"There is no truth in the statement that the company has not been able to move the grain crop up to the present time. There may possibly be a shortage of elevator capacity on Thursday before long, and undoubtedly the company will have to build more elevators there very soon; but at the very worst we shall be no worse off this winter than are the lines west of Chicago, following a good crop. We are at present moving a very large amount of export wheat over the Lake Superior section and have seven or eight trains of it coming east every day."

The Buffalo, N. Y., *Milling World*, says:—Short system advocates urge the necessity of cleaning the grain as nearly perfectly as possible before grinding. It seems to me that long system grinding necessitates just as perfect preliminary cleaning of the grain as does the short system. If cleaning means any thing, it means freeing the berry absolutely of all the fuzz, smut, rust and other dirt that may be on the outer surface of the covering. If any portion of this foreign matter be left on the covering, it must find its way into the flour, and it is just as much out of place and just as undesirable in long system as in short system flour. Our most successful and most scientific millers, operating any system, long or short, buhr or roller, agree that labor spent on the cleaning of the grain is really a gain, and the more nearly perfectly the cleaning is done, the greater will be the gain in flour. Our short system friends should not be allowed to claim a monopoly of grain cleaning.

The *North-western Miller* says:—We know what we are talking about when we say that the credit system has grown into considerable proportions and that millers in all sections are complaining of its evil effects. So long as there is no organization for correcting this abuse, there is but one course to pursue, and that is for each miller to decide to do business on the cash system, regardless of what others may do. It is impossible for men who give credit to stay in the field alongside of those who sell for cash only. C. A. Pillsbury says that it is impossible for northwestern millers to sell flour on credit. If this is true of these millers, it is equally true of all others. The men who adopt the cash policy at once, and adhere to it, are the men who will find a balance on the right side of the ledger when the books are closed. A little firmness and a little patience will work wonders in eradicating this evil. Middlemen have built it up, and now that the trade is growing more direct every day, it will be easy to kill what may grow into a monstrous evil. Adopt the motto: "No cash, no flour," and see if you are not better off a year from now.

Winnipeg *Sun*: Mr. Van Horne appears to have given the deputation, which waited upon him relative to the grain standards in this province, a favorable reception, and to have led the interviewers to expect the co-operation of the Canadian Pacific Railroad company. The interests of the company and of the province in this matter are apparently identical. The former may desire to see a "big name" given to Manitoba wheat, but that name is worth very little after No. 1 hard has been mixed with inferior grades of wheat by eastern millers, and the product of the combination placed upon the world's market. The idea of having a high standard was no doubt an excellent one in its conception; and could a No. 1 price be found for a No. 1 article would be quite satisfactory. But practical experience has shown that the idea cannot be, or at least has not been, successfully worked out in practice. The Duluth prices are in operation in Manitoba, but as they are based upon a system of grading considerably lower than that prevailing in Manitoba, it is not difficult to see that the Manitoba farmer is a sufferer thereby. Low prices paid to the farmer will scarcely help the railroad company. Let us have high standards for Manitoba wheat, if the price paid for it is in proportion; but if this cannot be done it is useless to establish grades any higher than the market demands.

One of the largest and most costly mill fires that has ever taken place in Canada occurred in Winnipeg, last month, resulting in the total destruction of McMillan's large mill. The building was a wooden one, and offered no resistance to the flames. The fire seems to have started in the top of the mill, as the flames were first noticed leaping out of the ventilating shaft in the centre of the roof. Half an hour after the fire started, an explosion occurred which blew out one side of the mill and caused the tall chimney to fall with a crash on the engine house. By the help of the citizens the safe and office papers were got out of the building and removed to a place of safety. While the firemen were powerless to save the mill, they succeeded in preventing the fire from spreading to the adjoining grain warehouse, elevator and lumber yard. How the fire originated can only be surmised. It is supposed to have been caused by spontaneous combustion. The employees had only left the mill a few minutes, when the night watchman on the premises discovered the fire, and gave the alarm. The total loss is estimated at \$50,000. The insurance amounts to \$19,000; leaving a net loss of at least \$30,000. To this must be added the probable loss which must result from the stoppage of the business during a period of many months while the mill is re-building. McMillan Bros. have the sympathy of their fellow citizens and business acquaintances in their misfortune.

Our English contemporary, the *London Miller*, speaking of our Northwest millers' prospects for profitable trade in flour with the people of China and Japan says:—"One of the first effects of the completion of the Canadian Pacific Railway has evidently been to stimulate the millers of the Dominion to enterprise in the far east. Already we hear of cargoes of choice flour, milled from Manitoba hard Fife wheat, being forwarded to the seaboard and shipped to China and Japan, and larger consignments are spoken of as likely to follow. In this our Canadian fellow subjects are but following the example set by the millers of California, who have for some time turned their attention to the China and Japan trade. This trade, such as it is, is yet in its infancy, and it is possible that another few years may see a large development. It would, however, be well to build no hopes on the capacity for flour consumption of either the empire of China or of Japan. Oriental nations, though differentiated by many special characteristics, have this in common, a rooted disinclination to use any foreign products that cannot compete in price with their own commodities. Of no people is this more true than of the Chinese. The Chinaman will examine and admire foreign articles, but unless they are very cheap he will put them aside. Foreign flour may be very beautiful and white, but its price will effectually deprive it of his custom." As regards what our contemporary says about the high price of our flour proving a barrier to its introduction to Oriental markets, no such difficulty seems to have presented itself in connection with several shipments which have already been made to these markets by millers in our Canadian Northwest.

New machinery has lately been put into McLean's elevator, at Mantou, N. W. T.

A movement is on foot having for its object the starting of a flour mill at Macleod, Man.

A farmers' elevator at Morden, Man. is a project which will probably soon be carried out.

Mr. Louis Kribs has lately placed a new engine and boiler in his flouring mills at Hespeler, Ont.

Mr. Thomas Price purchased the Wingham mill property a few days ago for something over \$7,400.

Public meetings are being held at Macleod to consider the question of erecting a flour mill for the Alberta district.

It is said that the proprietor of the flouring mill at Courtright, Ont., saves about ten dollars a day by using natural gas as fuel.

Naptha was being pumped through the sewers in Rochester for use at the gas works. The vapor escaped into three large flouring mills, and an explosion followed, destroying the mills and causing a loss of four lives.

The proposal to erect a farmer's flour and grist mill at Brandon, Man., has met with approval. A board of directors have been appointed and the company will be styled "The Brandon Milling & Elevator Co." The capital stock is placed at \$50,000 in shares of \$25.00 each.

Orillia *Packet*: A young man engaged on the new roller mill at Elmvale last week, made a wager for the drinks that he could leap from the top of the mill to the elevator. He made the attempt, lighting flat on his stomach with his heels hanging over, escaping by that much of falling at least fifty feet. He has evidently more nerve than brain.

Mr. John Marshall, of Lillooet Mills, British Columbia, in a letter to the *MECHANICAL AND MILLING NEWS* states that some healthy gold ledges have been found about four miles from his mill, and free milling ore with gold visible to the naked eye on Cagoosh Creek. Mr. Marshall also states his intention of putting up a small stamp mill for crushing quartz.

The deputation from the Flour Millers' Association who waited on Mr. Earl, freight agent of the Grand Trunk, came away well satisfied with his answer. They demand a sweeping reduction of freight on Manitoba wheat from all functions on the Canadian Pacific railway. The reduction was so great that Mr. Earl did not see his way clear to grant it without consulting the authorities at Montreal, but he assured them that they would do all in their power to comply with the millers' request, which amounts to a reduction of one cent per bushel.

A despatch from Oak Lake, Man., dated Dec. 18, says: The Oak Lake mill was totally destroyed by fire at an early hour to-night. The fire is supposed to have originated from the engine room, and before anything could be done the building was wrapped in flames. Eight or ten thousand bushels of wheat and five hundred bags of flour were also burned and are said to be insured. The mill was worth \$18,000, and was owned by Messrs. Leitch Bros. Insurance on building, \$12,000. Oglives elevator and adjoining buildings were saved by the fire brigade after a hard fight.

The Minneapolis, Sault Ste. Marie & Atlantic Company has heavy backing among the flour manufacturers of Minneapolis. W. D. Washburn is its president. It has also financial support from the Canadian Pacific capitalists. President Washburn promises to have sleeping cars running next summer between Boston and Minneapolis, via Montreal, in twelve hours less time than by way of Chicago. The new line will inevitably cut into the growing travel between New England and the Northwest. There will also be advantages for a heavy movement of export trade from Minneapolis through Boston. There is a perfect understanding at the east end of the route between the Canadian Pacific and Boston & Maine companies, and the line all the way from the wheat fields of Dakota to the seaboard will begin operations in complete independence of the trunk-line combinations.—*Bradstreet's*.

The classification of grain is amended and modified by a recent order-in-council as follows:—Spring wheat, extra Manitoba hard wheat shall be sound and well cleaned, weighing not less than 52 pounds to the bushel, and shall be composed of not less than 85 per cent. of red Fyfe wheat grown in Manitoba or the Northwest territories. No. 1 Manitoba hard wheat shall be sound and well cleaned, weighing not less than 60 pounds to the bushel, and shall be composed of at least two thirds of red Fyfe wheat, grown in Manitoba or the Northwest territories. No. 2 Manitoba hard wheat shall be sound and reasonably clean, weighing not less than 38 pounds to the bushel, and shall be composed of at least two-thirds of red Fyfe wheat, grown in Manitoba or the Northwest territories of Canada. No. 1 hard Fyfe wheat shall be sound and well cleaned, weighing not less than 60 pounds to the bushel, and shall be composed of not less than three-fourths of hard Fyfe wheat, grown in Manitoba or the Northwest territories. The above will not apply to grain inspected prior to the above coming into force.

A recent issue of the *Stratford Beacon* contains the following interesting paragraph: The George T. Smith Mouldings Purifier Company have brought to light a curious relic of antiquity. We notice in a *Sherbrooke* paper that they have discovered that the only mill there, is one grinding wheat with one of the identical mills used by the children of Israel to grind their manna when in the wilderness. It consists of two stones, 2 feet in diameter, 6 inches thick; the lower one called the concave stone and the upper one fitted to it called the condemn stone, and turned from right to left by a bullock working a wooden handle. It is said, indeed, that the origin of these stones can be traced back to the time of Abraham, when they were used by that Patriarch and his wife Sarah when dwelling in the tents near Padanaram. The stones are well worn, but they seem to have suited the simple-minded, condemn miller, who, by the way, is said to be partly French Canadian and partly Highland Scotch. All this is to be changed, as the stones are to be replaced by rollers. The stones will be brought to Stratford, and be on exhibition at the Smith Company's shops as samples of a French Canadian miller's tools.

THE PATTERN SHOP.

THOUSANDS of dollars for the machine shop, but "nary a nickel" for the pattern shop.

After having visited a very large number of the most flourishing and wealthy firms of the country, the writer has arrived at the conclusion that this statement of the case is the almost universal policy.

The pattern shop is regarded as an unproductive necessity and as such, the settled determination seems to be, to do every possible thing to render it more of a burden and expense. "Can't afford any improvements here." "Have'n't any room." "Workmen don't want them."

No, he don't dare ask for a decent grindstone, even one which has been discarded in the machine shop. It would cost something for a frame. So he goes to the machine shop to grind with machinery which would disgrace the shops of the ancient Egyptians. The proprietors will tell you that their pattern shops are well supplied with machinery, and they do not need anything worse or better.

The typical pattern shop has a wooden frame saw bench, usually "home made," with the rudest appliances imaginable for cutting off and ripping gauges, and if any degree of accuracy is required in the work which it performs, these gauges must be squared, turned and adjusted, nearly every time the machine is used, and even then, standard angles attempted to be cut upon it, require six to eight times as long under the hand plane in fitting, as it takes to saw them, when they should be sawed so as to require no fitting.

This latter statement is a mammoth pill for the wooden saw-bench man to swallow, but the iron machine men are taking them daily. The wooden frame machine left the iron shop so long ago that a modern machinist never saw one, and the science of using such a machine in an iron shop would be numbered among the lost arts. This wooden saw bench costs forty dollars. The latest iron saw bench costs five times this sum; the first wastes the value of a man's labor in badly sawed lumber; the latter saves the lumber and one man's labor where three are working.

Which is the cheapest machine?

The typical pattern shop has a lathe, nearly always with a wooden sill, and generally so cheap, poor or antiquated, and out of balance, that it must be braced with wood, and weighted with iron or bolted to the floor, to keep it at home. Such a machine in an iron shop, even for drilling, would be regarded at least fifty years behind the age. But it is good enough for here, since it don't cost much, and it has great merit in its cheapness. Occasionally we see a fair jig or hand saw, the purchaser of which often takes a better, because nobody builds a poorer one, the wooden types of which, went out of existence with their first appearance though a few ancients have tried hard to resurrect them.

The typical pattern shop has a scanty supply of lumber, often unseasoned, the users of which cut it up regardless of cost, using an occasional fragment for a pattern, throwing the balance hither and yon, as if the proper use of lumber consisted in getting rid of it as quickly as possible; they rarely remember that the pieces cut off in the preparation of one pattern, will serve in another, thereby saving lumber and time in getting it out.

We would like to see a model pattern shop and if some body does not give a description of one we will try our hand at it.—*Power and Transmission*.

DECORATING GLASS.

WHAT is sand-blasting?" asked a *Chicago Herald* writer of a man whose life has been spent in decorating glass.

"The grinding or decorating of glass with sand—a secret process, the inside facts of which we cannot disclose," replied the expert. "Come up-stairs and see a sand-blast machine." The machine suggests a cider mill in shape, or a cheese press. The glass is laid on rubber belts at the side, and is then fed into the machine. As soon as it disappears from view some rubber flaps come down and prevent the pressure in the interior from escaping. This pressure is exerted by wind and sand—a 20-horse power engine being required to raise the "blow" which drives the sand to the glass. Looking through the window in the centre of the machine a "gun" is disclosed. It has a large mouth-shaped opening, at which it is loaded with 20-horse power ammunition of wind and sand. Before the ammunition is allowed to leave the gun, the aperture narrows to about one-sixth the width of the loading point. This condenses the sand so that when it leaves the gun it strikes the glass with such force as to eat into the surface. When the glass has been exposed it passes out of the machine

on rubber belts at the opposite side. This process is called grinding, and one machine will grind about 900 sq. ft. in a day.

Now for the decorative part. Suppose the sandblaster wishes to present on a square of glass a certain design. He simply covers the surface with beeswax and a certain mixture laid on over the glass in exact duplicate of the design required. The glass passes into the machine. The sand is fired from the gun, but this time it grinds only the exposed parts. The portion covered with beeswax and the secret mixture is not touched by the sand and when the plate emerges from the machine, and the wax, etc., are washed off, behold the design standing out in sharp contrast to the ground surface which the sand has scarified.

This is the A B C of sand-blasting. The process is susceptible of much elaboration, and one improvement, which was patented last year by a Chicago gentleman, is called the "amograph." The pictures are first drawn on the back of the glass by the artist with a color which will resist the action of the sand blast. It is then subjected to the stream of sand, which cuts the glass in all parts which are not covered more or less by the resistant. The resistant is then washed off clean, leaving the pictures cut into the glass. They are next silvered over, if desired, to give greater brilliancy. The effect is that of a multiplicity of colors, but no paint or coloring of any kind is used, the effect being obtained by the different shades of the glass itself.

SPONTANEOUS COMBUSTION UNDER CURIOUS CIRCUMSTANCES.

ONE of the most curious instances of spontaneous ignition on record is that recently reported to the *Iron Age* by a Chicago manufacturer of plane bits. For some time a sponge had been used for wetting an emery wheel in his shop, bringing water up out of the water box by capillary attraction and touching the wheel. It was kept against the wheel lightly by a spring. The wheel was used in grinding very hard steel plates, therefore the sponge constantly wiped particles of steel off the wheel during its revolutions, and it was used that way until these particles had filled up its cells to a very considerable degree, of course being wet all the time. It was then laid aside, the string being still attached to it, together with a little cotton cloth. In time it became entirely dry, lying on and against a couple of pieces of fine wood. After lying unobserved for a week or ten days, it was suddenly discovered one afternoon to be incandescent—in fact, a living coal—and to have set fire both to the board on which it rested and the one against which it leaned. It had burned a considerable portion of the stout twine and the cotton cloth attached to it. All were smouldering, and although flames had not burst forth they evidently would have done so in a short time, as the room contained a very pungent smell of burning wood. The boards were each burned to a depth of a quarter of an inch and to a width approximately three inches when the incipient conflagration was quenched. The appearance of the charred sponge was not much unlike that of a piece of roasted iron ore, which it differed from, however, very decidedly in weight, being quite light. When broken it exhibited the same characteristics throughout, showing that the fine particles of steel had been thoroughly distributed in its interior. This evident case of spontaneous ignition of an article which had not been saturated with grease or oil, but which consisted of a piece of ordinary sponge, filled with fine particles of steel while it was in a wet state, naturally caused much discussion, but a very plausible explanation of its mysterious behaviour has been made by the manufacturer himself, as follows:—The particles of steel which were wiped off the emery wheel by the sponge must necessarily have been exceedingly fine, as the steel was very hard. Lodging on the sponge in a wet condition and in constant contact with water, oxidation was active—or, in other words, the particles rusted very rapidly. The fine particles of steel presented an extremely great surface area for such action as compared with their bulk. Under ordinary circumstances oxidation does not develop sensible heat, but under the peculiar conditions here realized the usually harmless chemical phenomenon of rusting developed into an actual fire-creating agent and incandescence resulted. Here was an article which at first sight would seem to be as incapable of spontaneous combustion as an ordinary brick, but which proves to be entitled to rank with greasy rags and oily waste and other well-established fire-creating combinations. Had not this burning mass been discovered most auspiciously a serious conflagration would, in all probability, have ensued and its cause would have been "unknown."

Correspondents' Opinions.

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

HANDLING SWING AND CIRCULAR SAWS.

TRENT BRIDGE, Ont., Dec. 23rd, 1887.

Editor Mechanical and Milling News:

PERHAPS the following methods of doing certain kinds of works with swing and circular saws may prove interesting to your many readers:

The following is a description of a plan for sawing stone boat plank with a circular saw: The first thing is to square the log $14\frac{1}{2}$ x 12 inches; then take the square and measure off 14 inches from the end, and then measure $4\frac{1}{2}$ inches more on the top of the log to run the saw; then saw the log all up to the line, which will make four planks as shown in Fig. 1. Next take a rip-

Fig. 2

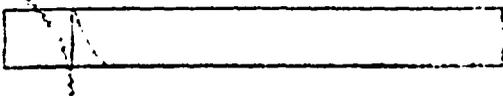
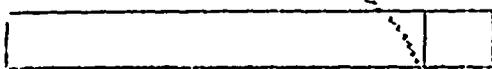
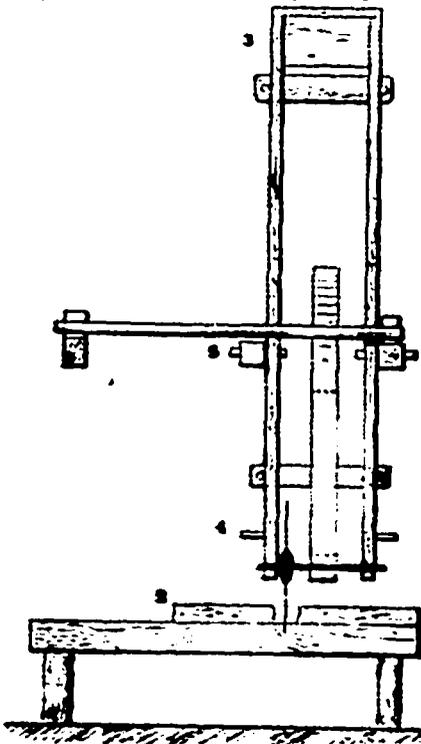


Fig. 1

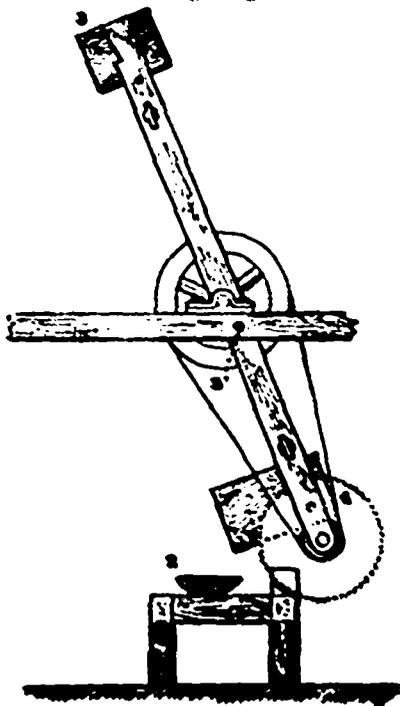


saw and saw the corners down to the line 14 inches from the end; turn the log end for end upside down, as in Fig. 2, mark off $4\frac{1}{2}$ inches from the line—that is 14 inches from the end—set the log at an angle on the headblock, with a block cut the right length to hold it



at the proper angle, run the saw in to the line, and then take the rip-saw and saw in to the line 14 inches from the end; split off the plank, clean it out with the adze, and you have a plank just as good as if it had been sawed with an old up and down saw.

Following is a description of a swing saw for sawing slabs or stove wood in long lengths, drawn to scale $\frac{1}{4}$



inch to the foot: Fig. 3 is a weight that will balance the saw any place you put it. Fig. 5 is an iron pin that goes through the bridge-tree and through the saw frame about six inches below the shaft, so that there is no weight on the shaft, and the difference in the circle is so little that it makes no difference to the belt. Fig. 2 is a table for wood and fig. 4 a handle to draw the saw out. There is a base to cover the saw that is bolted to the saw frame. If it is required to saw shingle blocks, put on a larger saw and lower the table.

Yours truly,

WALTER T. BOSWELL.

WOULDN'T BE WITHOUT IT.

CREEMORE, Nov. 30th, 1887.

Editor Mechanical and Milling News:

ENCLOSED you will find two dollars, and we want you to send us September and October numbers with this month's paper. Give us credit for one dollar on last year's account. We are sorry to lose one number of such a valuable paper, and will give you an item on our mill for your next month's paper.

We are, yours faithfully,

PLEWES & SPENCE.

70 King St. East,

TORONTO, Dec. 15th, 1887.

Editor Mechanical and Milling News:

IN your paper for this month we notice an article on "The Care and Management of Belts," read before the Toronto Association of Stationary Engineers by the Secretary, Mr. Hawkins. While commending the laudable anxiety of this gentleman to enlighten the members of the Association on the interesting subject of belting, we would at the same time beg to call attention to the fact that the information contained in the said article may be found, word for word, in a little pamphlet compiled and issued by us some years ago and which we have revised and enlarged from time to time. We enclose a copy and shall be happy to send one post free to any one who may require further information on the subject.

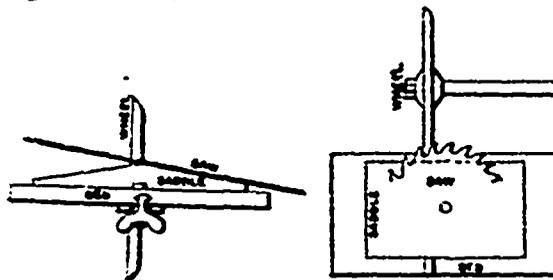
We remain, yours truly,

F. E. DIXON & Co.,

SAW GRINDING APPARATUS.

By "SWAGE."

IN the September number of *The Lumber World* I promised to give those interested my method of making an apparatus for grinding saws. My plan will require the printing of sketches more fully to demonstrate my meaning, which will appear further along. In starting out, one must procure a piece of well-seasoned hard wood about 12 inches wide, 14 inches long and 1 inch thick, planed up true, and fasten this on the bracket or rest-holder of the emery stand with counter-sunk bolt and wing-nut, directly opposite and a half inch from the edge and dividing the distance equally each side of the



wheel. Fasten on this bed or table transversely a strip of hard wood, one-fourth inch by three-eighths inch, directly in line with the center of the wheel. The wheel is to be 8 inches or 10 inches in diameter, a half inch thick, beveled off on one side about seven-eighths inch deep. Take a piece of board 10 or 12 inches square and $\frac{1}{4}$ inch thick and well seasoned. Plough a groove transversely through the bottom side of this to fit the strip on the bed or table, so as to fit squarely thereon and work easily to and from the wheel. Strike a line through the centre of the top side and bevel from the line to each end to a thickness of $\frac{1}{8}$ inch. This forms a saddle to hold the saw while grinding. Place this upon the bed and lay the same on one of the beveled sides, as shown in Fig. 1, pushing up against the wheel until getting the proper pitch and depth of tooth. Place in the saw eye, full diameter, a piece of new belting or round button of wood and fasten with a screw or otherwise. Put a stop on the bed to prevent the saddle from giving beyond certain limits and allowing the wheel to cut too deep. Go round your saw with every other tooth. When it will be necessary either to shift your leather centre or guide to the other side bevel of the saddle and turn over saw, or if centrally divided enough, it will only be necessary to turn the saddle end for end and turn over the saw. Of course the wheel must be changed or turned around on the mandrel. Fig.

1 gives the front view, while Fig. 2 gives the top view. By working the saw up to the wheel and following these directions one will be surprised at the uniformity of the teeth, the quickness of the work, the saving of files and labor, and the slick, clean cut of the saw.—*Lumber World*.

BUHR MILLS.

BUHR mills still exist in large numbers all over the country, says the *Millstone*, and in many cases there is still the old belief that the best flour is made by buhrs. We hear stories of this in various forms. There are those who say that their wives and children do not like the roller flour; that it dries out too readily and does many other uncomfortable things. There are a great many buhr mills that exist for other purposes than those stated. If every man had his own way in the milling business, he would probably have the most complete roller mill attainable. But he does not have his own way. He may not have the capital to make the change, or there may be other reasons why he does not make it. There are occasions when a miller would not be appreciably benefited by changing from one system of milling to another. One changes his milling system for the sake of whatever benefit there may be in it. If there is no benefit there is no reason for making the change. There would be no benefit where competition did not demand the highest grade of milling work, and if we were in the milling business in a locality of this kind we would not spend a dollar that the trade conditions did not demand. There is no information at hand which would lead to benefit in this direction. If there were, we would not pretend to monopolize it. If there were methods of buhr milling which would compete with roller milling there would be no roller milling. There is a method which will allow one to in a measure restrain the competition of roller mills but not positively meet it. One can make a grade of flour which is satisfactory in the market in which it is made and because of the price prevent roller flour from being shipped into that market from the outside, providing the point of shipment is far enough removed from that market. To do even this, however, the flour must be of good quality as buhr mill flour and the best methods must be used in making it.

NYE AND NATURAL GAS.

BILL NYE telegraphed from Pittsburgh to the *New York World* the following characteristic letter: "I came here last evening to compete, under the auspices of the Pittsburgh Press Club and Marquis of Queensbury rules, in a kind of natural gas tournament. I do not brag nor boast, but it strikes me I held my own for sixty minutes.

"Gas here springs spontaneously from the bosom of earth, and immediately proceeds to take charge of the heating, lighting and manufacturing business. It is clean, smells better than the places where the streets have been torn up on Fifth Avenue this summer, and burns readily when properly encouraged.

"Pittsburgh is a busy place. It is located at the point where the Alleghany and Monongahela Rivers fork. Nature has done much for Pittsburgh. She placed her in one of the busiest places in America and then gave her natural gas. This gas can be conducted into a room by means of pipes, and, by an automatic arrangement recently perfected, will, at any hour designated on an alarm clock, enter your room, scratch a match on its trousers and light your fire, so that you need not get up till the room is warm.

"It cooks evenly, and, assisted by an intelligence office, will do almost anything but vote. I like natural gas. Artificial or assumed gas does not please me; but the gas that bubbles out of the bosom of the earth and just simply asks where it can get a job is what we have been looking for.

"Artificial gas is superficial. It likes to look well in company and seem brilliant and attractive in society, but it is false at heart. It likes to seem refined and gentlemanly and polished and sincere, but rise and assert yourself and blow it out and see how quick it will take your life. Look the other way ten minutes and see how soon it will slip down into your cellar and toy with your meter.

But natural gas comes out of the ground, spits on its hands and asks where there is anything to do. It then proceeds to do it. The young men of America will do well to emulate the natural and untutored gas of Pittsburgh. Do not seek to shine too much by night or attract attention by organizing a gas leak by day. Give less attention to the matter of adequate service and you will do well. Give your best endeavors to the promotion of your employer's interests, no matter what your salary may be, breathe through your nose, look up and press onward.

USEFUL INFORMATION

Throw flour or a woolen rug over a fire caused by a broken kerosene lamp. Never use water.

TO BLACKEN ZINC.—"Bluestone" dissolved in water will blacken the surface of sheet zinc so that it will not rub off. Wetting the surface of the zinc and rubbing the bluestone over it will have the same effect.

TO MAKE CAST BRASS HARD AND DUCTILE. It is said that 2 per cent by weight of finely pounded bottle glass placed at the bottom of the crucible in which red brass is being melted for castings gives great hardness and at the same time ductility to the metal. Porous castings are said to be almost an impossibility when this is done, and the product is likely to be of great service in parts of machinery subject to strain. An addition of 1 per cent of oxide of manganese facilitates working in the lathe and elsewhere where great hardness might be an objection.

MAKING BARBIT METAL.—Take eight pounds of block tin, two pounds of antimony, and one pound of copper—a larger or smaller quantity can be used, taking care, however, to use the same proportions of each as here given—those to be melted and mixed together over a hot fire. If the metal be too hard it may be softened by adding some lead. There is no doubt that this metal can be bought for less than it can be made, but it is seldom that it can be had except of an inferior quality. In fact it cannot be recommended. If made according to the receipt given above, we can recommend it as one of the best alloys that can be used for fast-running machinery, the friction being less than with any other alloy or metal. Journals will run on it at a speed of two thousand revolutions per minute without heating. When making it, it is better to make a quantity that will last some time, and as it is wanted it can be melted over again.

GIVING STEEL A LUSTRELESS POLISH.—A finely polished, lustreless surface on tempered steel can be procured by either of the following operations. After the steel article has been tempered it should be rubbed on a smooth iron surface with some pulverized oil-stone until it is perfectly smooth and even, then laid upon a sheet of white paper and rubbed back and forth until it acquires a fine, dead polish. Any screw holes or depressions in the steel must be cleaned and polished beforehand with a piece of wood and oil-stone. This delicate, lustreless surface is quite sensitive and should be rinsed with pure soft water only. A more durable polish is obtained by first smoothing the steel surface with an iron polisher and some powdered oil-stone, carefully washing and rinsing. Then mix in a small vessel some fresh oil and powdered oil-stone, dip into this mixture the end of a piece of elder pith, and polish the steel surface with a gentle pressure, cutting off the end of the pith as it commences to become soiled. In conclusion it should be thoroughly cleansed in soft water, when the article will be found to have a fine, lustreless polish.

HOW TO MAKE LIGHTNING RODS EFFECTIVE.—Prof. Tyndall, in a letter on lightning conductors, points out that the abolition of resistance is absolutely necessary in connecting a lightning conductor with the earth, and this is done by closely embedding in the earth a plate of good conducting material and of large area. The largeness of area makes atonement for the imperfect conductivity of earth. The plate, in fact, constitutes a wide door through which the electricity passes freely into the earth, its disrupting and damaging effects being thereby avoided. A common way of dealing with lightning conductors, adopted by ignorant practitioners is, Dr. Tyndall remarks, to carry the wire rope which forms part of the conductor down the wall and into the earth below, without any terminal plate. Such a "protection" is a mockery, a delusion, and a snare. Some years ago, a rock light-house on the Irish coast was struck by lightning, when it was found by the engineer's report that the lightning conductor had been carried down the light-house tower, its lower extremity being carefully embedded in a stone perforated to receive it. If the object had been to invite the lightning to strike the tower, a better arrangement could hardly, he believes, have been adopted. He vetoed the proposal to employ a chain as a prolongation of the conductor, as the contact of link with link is never perfect.

AN IRON CEMENT.—Usually, certain proportions of pulverized sal-ammoniac in crystals, sulphur, iron filings or drillings, and urine or water has been deemed as quick and adhesive a cement for two iron surfaces as any that could be made. But this mixture sets slowly and requires days or weeks—to get in its perfect work. The object of this cement is to oxidize the surfaces of the iron so that close contact will unite the rust, and thus hold the two surfaces as one. Natural specimens of oxidizing of iron as cement are not uncommon. Almost all specimens of bog iron ore show aggregations of iron by rust, sometimes quite large masses being held in one firm embrace by this means; in Nova Scotia lumps of bog iron ore have been seen aggregated by rust so that there was a conglomerate globe of separate globes of at least 30 inches diameter. In fact the "rusting" of joint is an old trick with mechanics. But in the place of sal-ammoniac let the jointer use chloride of lime, one of the common disinfectants, and the fixity of the joint will surprise him. Two joints of 3-inch cast iron rope, with flanges sufficiently wide to take in 1/2-inch bits, were secured with a mixture (in the usual proportions) of cast iron filings, water, and chloride of lime. The actual proportions were: fine filings, 10 parts; chloride of lime, 3 parts; water, enough to mix to a paste. These joints were bolted together after the mixture was placed between them, and after being left one night, when broken apart the cement sealed off a portion of the solid iron of one of the flanges. This cement has stood the action of 60 pounds of steam in a pipe connection to a steam boiler where rubber glands and canvas and white lead failed.

HOW MIRRORS ARE MADE.

ONE of the factories in Chicago employs 150 men and boys, and its spacious four floors present an interesting series of sights to visitors whose nerves are steel and tympani proof against splitting. On the first floor he will see huge stacks and piles of glass in assorted sizes ranging from sixteen feet by seven feet square down to the smallest ovals for mirrors. These are all polished, some being run over by huge felt-covered wheels kept powdered with rouge, and the larger sheets scrubbed by sweating toilers with hand blocks covered with felt like the printer's proof planer in rouge. After the glass is thoroughly polished it is taken up to the next floor, where it is laid on tables and cut into the sizes ordered. It then passes into the hands of the bevellers, who, with sand and water and large grindstones, artistically finish the edges of the glass. It takes a trip upward again, to another floor, and is once more put through a polishing process, to remove any scratches or blemishes that may be on the glass. After every spot or scratch, no matter how minute, has been removed, careful hands convey the now beautiful and sparkling glass to the room where it goes through the final process, the silvering. Huge tables of cast iron or stone made like billiard tables, with raised edges, are used in the silvering room. These tables are of great strength and solidity, and all round the edge is a drain, for the superfluous mercury is poured over the tables in quantities sufficient to float the glass, which, after being tinfoiled, is gently and carefully pushed across the table containing the mercury. Great care must be used to prevent blemishes, the least speck of dust being ruinous to the mirror. Mercury, like molten lead, is always covered with a dirty-looking scum which cannot be removed by skimming. The least bit of this scum would spoil the mirror, so the difficulty is obviated by shoving the scum along the edge of the glass. After successfully floating the glass on the mercury, a woolen cloth is spread over the whole surface and square iron weights are applied until the whole presents a compact mass of iron, two or three pounds to the square inch. After this pressure has been confined ten or twelve hours the weights are removed and the glass placed upon another table with slightly inclined top. The inclination is gradually increased until the unamalgamated quicksilver is drained away and only the perfectly amalgamated remains, coating the glass and perfectly adherent. This ends the process, and the erstwhile rough piece of glass emerges from the silvering room a gorgeous mirror.

WHAT CONSTITUTES JUDICIOUS ADVERTISING?

AS to the advantages of judicious advertising, most business men are agreed; but judging from the vast amount of money wasted annually by advertisers, the methods of judicious advertising are but very imperfectly understood. The following extract from an article in the *Toronto Saturday Night*, on "Advertising as a fine Art," is in accord with common sense, as well as the experience of successful advertisers. Our contemporary says:

"Promiscuous advertising is most injudicious. A man who wants to express goods to a certain town will not ship them over half-a-dozen roundabout roads. He will send them by the most direct route, get them to his patrons quicker and save himself annoyance and expense. It is practically the same in advertising, although the oily-tongued advertising agents who flood the country and earn a precarious living by assurance and gab, would endeavor to convince the advertiser that all roads lead to Rome. It is a mistake to suppose that advertising in a paper with a large circulation is necessarily judicious advertising. No greater error could be made. I spoke a while back of the wholesale grocer and his advertisement in the widely-circulated daily as compared with the same advertisement in a trade paper. The same illustration answers here. The trade paper may not have the circulation of the daily, but IT GETS TO THE PEOPLE THE ADVERTISER WANTS TO REACH, which is all he wants, while he saves the percentage of money he would have to spend to put his advertisement before those readers of the daily not affected by it, and who are consequently of no use to him. If he desires to reach a thousand people in a certain walk in life, it is cheaper for him to utilize the columns of a paper that goes to those thousand people and no others, than it is to pay five or six times more for the use of a paper which only reaches about half the people he is anxious to appeal to, although its outside circulation may amount to forty thousand."

HOW SOME INVENTORS HAVE FARED.

W. M. GED, the inventor of stereotyping, was an Edinburg goldsmith. In 1825, he devised a process of casting whole pages of type, but the compositors thought they saw an enemy to their interests in the new idea, and they bitterly opposed it. Ged worked out his idea in secret and in 1739 he printed a book from stereotype plates. Unable to secure capital to develop his invention, Ged died in extreme poverty.

Henry Cort, of Gosport, invented the puddling furnace, and spent \$100,000 in bringing his process into use. An unprincipled partner caused his ruin, and Cort died in want of the necessaries of life.

Wm. Lee, of Nottingham, invented the stockingloom, in 1589. Queen Elizabeth refused to grant him a patent, because she had "too much love for my poor people who obtain their bread by the employment of knitting, to give my money to forward an invention that will deprive them of employment." Lee died of despair and disappointment.

John Kay, the inventor of the fly-shuttle, the little appliance that doubled the capacity of the cloth loom, engendered the hostility of the work people, and could not succeed in any undertaking. Driven from one place to another by the working people, he finally died in great poverty, without having profited in the least from his valuable invention.

James Hargreaves, inventor of the spinning jenny, in 1767, was hardly less fortunate than Kay. The spinners made war on this inventor, riots occurred whenever attempts were made to introduce the invention. Finally the Strutts took the machine off his hands, and made an enormous fortune out of it, leaving Hargreaves to die in poverty and distress. A similar fate met Crompton, the originator of the mule, an improvement in the spinning machine.

Palissy, who discovered the art of enamelling, had a troubled time for years, realizing little or nothing from his discovery, and finally, political and religious ideas brought him to the Bastille, where, after four years confinement, death released him.

This list could be continued indefinitely, but the foregoing will be sufficient to show how quick the human being is to either discredit an inventor, or, after his inventions have succeeded, refuse to grant the discoverer a fair equivalent for his invention.

LIGHT AND HEAT.

ONE of the most prosperous and at the same time absorbing branches of industrial endeavor, says the *Chicago Journal of Commerce*, is the subject of lighting and heating. There is a scramble between the electric light and gas men for the ascendancy, and two reasons serve to keep them nearly parallel and equal in the race. While electricity is an improvement upon gas for lighting, gas is increasing in interest rapidly as a fuel, and in fact we have seen gas engines employed to run dynamos.

Gas as a fuel and electricity as a means of lighting, but gas as a source of power and electricity as power and for smelting are associate ideas tending to evenly balance these two great principles of light, heat and power, while the rapid progress making in adapting them to man's use give them an importance at this time second to none of the many gigantic industrial interests now employing the attention of great inventive minds.

The world is marching with gigantic strides, but in no direction more surely than in the improvement, development and adaptability of gas and electricity to the service of man.

A statement that Chicago can be lighted by electricity fifty per cent. cheaper than by gas, is a stunning blow for one combatant, but a statement that heat and power can be furnished fifty per cent. cheaper by gas than by coal is again a consideration of equal importance.

While electricity is preparing to run machinery as well as operate the smelting furnace where gas is inadequate, and furnish a light with which it cannot compete, gas is preparing to take in crude petroleum and steam in a production at one-half the cost of the present gas-making, and to gain from coal the loss it sustains from electricity.

Every indication points to a still further material cheapening of gas for heating if not for illuminating, while the Bunsen burner in its modifications is materially reducing cost of illuminating gas for heating, as the new burners are changing heating gas into illuminating.

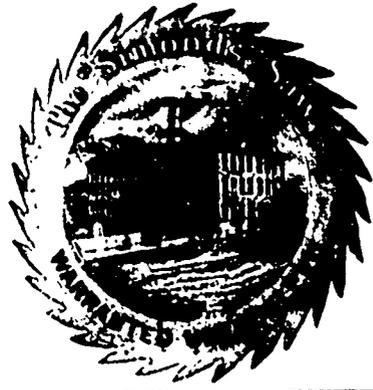
The general public will do well to keep their eyes and ears open ready for the new discoveries and denying nothing, be able the quicker to take advantage of the new processes.

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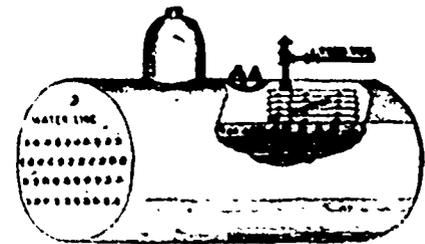


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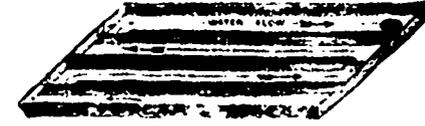


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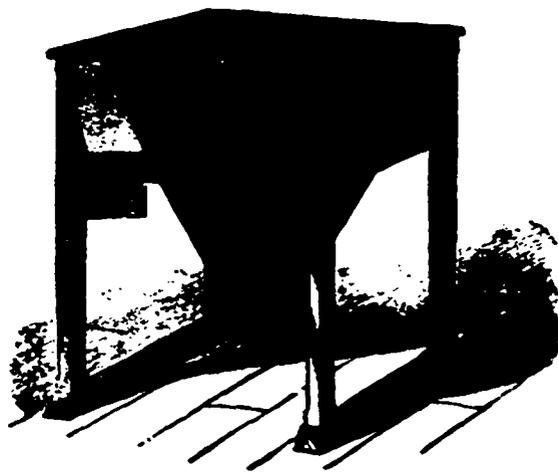
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A NEW FLOUR PEST.

CANADIAN millers and flour handlers will be interested in the following description of a new flour pest which has made its appearance in England, and may possibly find its way to this country. Mr. Sydney T. Klein, F.L.S., F.R.A.S., F.E.S., in a paper read before the Middlesex Natural History and Science Society, and published in the *London Miller*, refers to the pest as follows:—

In May last I discovered a colony of this scourge of Mediterranean ports, in some large warehouses situated in the east end of London. Over 1,000 tons of flour were stored in near proximity and, under my direction, great efforts were made to prevent the spreading of this pest. Fumigating with sulphur, and the hot liming of floors, ceilings and walls, were practised continually for many weeks, but although great numbers of the imagoes were thus killed the insects spread with great rapidity, until one entire warehouse was literally smothered, thousands of the larvæ on every sack and many hundreds of pounds worth of damage done—in fact the flour was so interwoven with larvæ threads that it was rendered unfit even for pig or cattle food.

The ova which were deposited by the imagoes, generally upon the top of the sacks, seemed to hatch out very soon after being laid, and the larvæ at once burrowing through the sacking, commenced spinning long galleries in the flour, seldom, however, going more than three inches from the exterior. I have brought a large quantity of this network, which very much resembles wool.

The larvæ, which were full fed in about four weeks, then made their way to the surface of the sacks, and could be seen in myriads crawling along the floor and up the walls of the warehouse till they reached the angle where the roof meets the walls; there they spun compact silken cocoons in which they turned to the pupa state. Their migratory habits when full fed were very extraordinary; nothing seemed to keep them within bounds. I had a colony of some thousands at home for the purpose of experimenting how to exterminate them, but found that my breeding cages with the finest meshed wire were useless to restrain them. I then placed them under large glass shades on a polished wooden surface with no perceptible opening; but it was no use, the corners and ceiling of my room were within a week studded with their cocoons, and every day specimens of the larvæ were discovered in different parts of the house, from top to bottom—in fact they increased and wandered to such an alarming extent that I had to give up keeping them; the colony was therefore delivered over to the tender mercies of about 50 game and Plymouth rock hens which are kept on my premises. The evident appreciation with which these plump larvæ were greeted at once suggested a remedy for exterminating those in the warehouse. A great number of hens was therefore requisitioned from the neighborhood in the east end, and it was encouraging to see the enormous quantities consumed; the hens, however, began to flag after ten minutes of gorging, and although they were kept in the warehouse for several weeks, the insects still continued to increase and spread to other granaries. The case was referred to many able etomologists and specialists, but no effective remedy was forthcoming, and it seemed as though many thousands of pounds worth of goods would be spoiled. Science having failed to find a remedy it remained for Nature to step in with those wonderful antidotes which she always has in store for counteracting any over-production of the fauna or flora under her charge. The sudden way in which the remedy was applied was most remarkable. I had held inspection each month through the summer, trying remedy after remedy without any success in abating the steady march of this army of larvæ. In July I actually had the flour of a whole warehouse put through fine sieves and the larvæ and their refuse burnt or thrown into the river, but within a few weeks this flour was again swarming with the grubs. At my next inspection in August, however, I brought away several of the full-fed larvæ for microscopical examination, as I noted some irregular brown and cream colored markings on the backs of these flesh-colored larvæ which had not been noticed before. These larvæ seemed to pupate quite regularly, and I did not suspect the state of the case till I visited the warehouses again in September. No sooner had I entered, however, than I noticed a most extraordinary change in the appearance of the large piles of flour, the tops of the sacks were perfectly black, as though covered with soot. On near examination I found that appearance was caused by enormous numbers of a small black fly, the ovipositor of the female of which clearly showed that it belonged to that wonderful family of flies called *Ichneumonidae*, whose young live in the bodies of lepidopterous larvæ; by examining the many larvæ of *Ephestia*

Kuhnella which were crawling up the walls, the majority were found to possess the strange markings indicative of the attack of the ichneumon, and the startling fact was thus made clear that Nature had come to the rescue and provided a remedy for herself.

As some of those present may not have studied the life history of an ichneumon it may not be out of place if I say a few words on the subject.

At the end of a paper read before the Society last session, entitled "Thirty-six hours' hunting among the Lepidoptera and Hymenoptera of "Middlesex," I gave descriptions of the hives of *Osmia rufa*, the mason bee, and *Megachile centuncularis*, the leaf cutter bee, together with their natural enemies, *Chrysis ignita* and *Tripoylon fulvus*. You will remember that these small flies, by means of long ovipositors, laid their eggs in the cells of the bees, so that, when these eggs hatched, the young larvæ devoured the honey and pollen provided for the young of the bee, the result being that the larvæ of the bee died of starvation and the parasite flies made their appearance instead. Now the proceedings of the *Ichneumonidae*, are very similar, the only difference being that an ichneumon lays her eggs in the bodies of live caterpillars instead of in the cells of bees. A very amusing but natural mistake respecting these little insects came under my notice quite lately. A gentleman wrote stating that he had discovered a veritable case of parthenogenesis, and that he had several witnesses to prove it. In one of his excursions, having come across a small colony of larvæ which were unknown to him, he duly pill-boxed them and brought them home. On opening the box he was astonished to find that two of these larvæ had actually laid about a dozen eggs each, and what was still more curious, the result presumably of their terrible efforts to upset the natural order of things, there was nothing left of the caterpillars but their empty skins. It was of course unnecessary to see the specimens to solve the mystery, the supposed eggs were nothing more than the cocoons of *Ichneumonidae* the grubs of which, having eaten up the inside of the larvæ, pierced its skin, came forth, and spun their small yellow cocoons round the remains of their victims. I have brought you several of these supposed eggs, and the small *Ichneumonidae* which came out of them. These are the yellow microgaster cocoons which are so common on palings; you will generally find them in small clumps of about twelve, and each of these clusters marks the place where the same sad tragedy has been enacted as the one described above.

Now with regard to the origin of the *Ephestia Kuhnella* I found that the larvæ originated in some meal shipped from Fiume in the Adriatic over two years ago; as, however, the moths did not appear till this year, the present visitation and extraordinary ravages may be attributed to the hot and dry season of 1887. The ichneumon has been referred to several specialists, but so far its name has not been determined, and it may probably prove to be a species quite new to science. On this account, and as it is very rarely that such an interesting example of Nature's wonderful counterbalancing power is displayed, it is with great pleasure that I am enabled to give the first notice of it to a meeting of the Middlesex Natural History Society.

N. B.—Specimens of imagoes, pupæ, and larvæ of *Ephestia Kuhnella*, together with the *Ichneumonidae*, are now being prepared at South Kensington, and will be on view at the British Museum Natural History Department in a few days.

EMERY WHEELS.

AT the meeting of the Polytechnic Section of the American Institute, held Dec. 8th, L. Duvinage said that the increased quantity and quality of work that goes out of the modern machine shop was due to the skillful use of solid emery wheels. He said that a grain of sand from the common grindstone magnified, looks like a cobble stone, a fracture of which shows an obtuse angle, whereas a grain of corundum or emery always breaks with a square or concave fracture. Therefore the grindstone rubs or grinds and heats the work brought in contact with it while the corundum or emery wheel with its sharp angular grit cuts like a file or circular saw.

There are two general classes of emery wheels in the market, one class must run at a high speed to burn out the cementing material by friction, and thus reveal new cutting angles. These are non-porous wheels and truing up must be done with a diamond tool.

The other class unlike the former has sharp grains of emery added together among matter, which, in some cases, is as hard and sharp as the emery itself. Such wheels cut very greedily, and do not need to be run at any particular speed. The dresser is made of hardened steel picks.



Ellis & Keighley, Toronto, have ordered from Inglis & Hunter a 48 inch boiler.

Isaac Warcup, of Oakville, Ont., has ordered from Inglis & Hunter two dust collectors.

Bennett & Wright, Toronto, have placed their order with Inglis & Hunter for a 48 inch boiler.

C. McDonald, of Collingwood, Ont., has purchased from Inglis & Hunter a 62 inch steel boiler.

W. J. Burroughes, Toronto, has placed his order with Inglis & Hunter for a 36 inch steel boiler.

Inglis & Hunter have an order from R. Muir & Co., Winnipeg, for four Cyclone dust collectors.

Mr. Jas. Stark, Paisley, Ont., has invested in one of the Hercules Manufacturing Co's No. 2 scourers.

S. Oland & Sons, Halifax, N. S., have ordered from Inglis & Hunter one two-roller mill with Case feed.

Inglis & Hunter have furnished Cane & Sons, Newmarket, Ont., with a Cyclone dust collector for shavings.

B. Hoover, Markham, Ont., has placed his order with Inglis & Hunter for Silver Creek centrifugal and bran duster.

Messrs. Thomas Matthews & Son Kingslake, Ont., have purchased a combined Hercules grain scourer.

Inglis & Hunter are furnishing John Gross & Sons, Welland, with a Corliss engine and boiler for their pump factory.

Mr. Covie, Attwood, Ont., is remodeling his mill, and with other machinery is placing in it a Hercules wheat scourer.

Inglis & Hunter have an order from the corporation of Newmarket for Worthington double pumps and 54 inch steel boiler.

Inglis & Hunter have an order from the Niagara Navigation Co. for the breeching for the six marine boilers for the steamer Cibola.

Mr. Colin Nigle, of Amherstburg, Ont., has improved his grain cleaning department by adding to it a No. 3 Hercules scourer.

Messrs. Coleman & Wigand Arthur, Ont., have purchased from the Hercules Manufacturing Co., one of their No. 1 wheat scourers.

The Hercules Manufacturing Co., Petrolia, Ont., have supplied Messrs. McDonald & Co., Halifax, with one of their No. 2 combined corn scourers.

Messrs. Olmstead & Clark, Walter's Falls, to further increase the capacity of their roller mill, are replacing their Leffel wheel by a 22 inch New American from Wm. Kennedy & Sons, of Owen Sound.

Mr. Frederick Brent, of Opanagon Mission, B. C., is adding to his mill a "Hercules" wheat scourer, smut machine, elevators, shafting, etc., furnished by the Hercules Manufacturing Co., Petrolia, Ont.

A splendid artistically completed revolving desk of black walnut wood with the metal portions of it thickly plated with gold, has been forwarded to the Pope of Rome by Wm. Stahlschmidt & Co., furniture makers, Preston, Ont.

John Tove, West Winchester, Ont., has placed his order with Inglis & Hunter for a full roller mill, including rolls, purifiers, Silver Creek flour bolts, centrifugals, wheat cleaning machinery, and iron work for a first-class short system mill.

The Blind River Lumber Co. intend making improvements in their mills at Blind River, and just before close of navigation, purchased from Wm. Kennedy & Sons, of Owen Sound, a 42 inch New American water wheel, and the necessary heavy gearing &c., for the changes.

Mr. John Harrison, of Owen Sound, has completed a fine large two story brick building and separate brick storeroom for his new planing mill and sash and door factory to replace the one burnt in the beginning of November. Mr. Harrison has lost no time, spared no pains or expense to have the best factory of its kind in North Western Ontario. Wm. Kennedy & Sons, of Owen Sound, are furnishing the main shafting, pulleys and hangers.

At the recent meeting of the Oarneal Millers' Association, held at the Walker House, in this City, an investigation was made into the alleged price cutting in Toronto. It was found, however, that prices had been well kept up. The price list of Sept. 5, remodelled on Oct. 30, but not revised was found to be too low for oatmeal, oats having risen from 3 to 4 cents per bushel in this province and Montreal, an increase of 35 cents per barrel on all grades and quantities was made.

Mr. S. S. Kimball, of Montreal, whose name has become familiar to our readers through his advertisements in this journal, has recently invented, and will shortly place upon the market, a combination door lock. While the chances against the house-breaker opening a door with this lock attached, are as 1500 to 1, a child knowing the combination can easily open the door. Mr. Kimball's invention is much needed, and will doubtless find ready sale, particularly as the cost of these locks will not exceed that of the ordinary pattern.

Since last heard from, the firm of Wm. Kennedy & Sons, of Owen Sound, have furnished plans and supervised recent improvements in the water power of the Peuman Manufacturing Co.'s No. 2 mill at Paris, furnishing therefor a 42 inch New American water wheel and main gearing and shafting, &c. The changes entailed a heavy expenditure on the part of the company, but anything short of the most efficient arrangement, first class machinery, and thorough workmanship will not satisfy Mr. Peuman, the able manager of the company that bears his name. He is a firm believer in the economy of water power when properly handled.

FUEL WATER GAS.

INTERESTING DESCRIPTION OF THE METHOD OF ITS MANUFACTURE.

IN the present day the use of steam as a motive power is so general that manufacturers are naturally very much interested in the result of experiments which are being made with a view to effecting a saving in the cost of fuel. For this reason, it affords us pleasure to reproduce from the columns of the *Los Angeles, Cal., Times* the following description of the Lowe process of manufacturing fuel gas from water:

Accepting the invitation of L. E. Mosher, Secretary and Treasurer of the Consumers Gas Light, Heat and Power Company, a reporter of the *Times* yesterday visited the works of the company, on the corner of Seventh and Alameda streets, and devoted some time to studying the new process of gas manufacture. It proved a mighty interesting subject—this conversion of water into a combustible gas.

The generating house, which stands well back in the company's six-acre lot, is built of brick, in a most substantial fashion. It is 40 x 80 feet in ground dimensions, two stories high, and has large open windows on all sides.

Inside the building there is an array of formidable boiler-iron cylinders resembling overgrown steam boilers standing on end, and which extend from the ground floor up through the second story, and some of them stop just short of the roof, or are topped off with smoke stacks extending through it. There are twelve of these cylinders altogether, varying in diameter from three to seven feet, and in height from five to twenty-five feet. The machinery proper consists of a large upright boiler for steam purposes, which operates a ten horse power upright engine of unique design, and this, in turn, works a No. 7 Sturtevant pressure blower that spins around at the rate of 2,000 revolutions a minute. The use of this blower becomes manifest when the process is investigated further. In an adjoining room, entirely separated by a brick wall, and which is reached only by an outside door, are the two purifiers—large flat tanks of riveted boiler iron, through which all of the gas is forced for purification. No lights are allowed in this apartment as there might be an occasional escape of gas while changing the purifiers, and an unprotected spark might lead to an explosion.

There are two distinct processes involved in the manufacture of gas by this method—first, the heating; second, the generation.

The largest of the upright cylinders, known as the generator, contains a thick lining of fire-brick. The interior space is filled with burning coal to a depth of eleven or twelve feet. The fan which is whirring industriously in another part of the building, forces a column of air through pipes and serves as a blower for this glowing furnace. In order to get everything into a working condition this column of air passes through a heated chamber called a hot blast stove, and is introduced into the generator hot in order to quickly bring the coal to a state of incandescence. The blast is divided so that a part enters beneath the bed of coals, and a part bears directly upon the surface, the latter furnishing air for a perfect combustion of all the gases arising from the glowing bed of coals while bituminous coal is being converted into coke.

The doubly-heated blast passes from the generator through a pipe of ample girth into another upright iron cylinder alongside called a super-heater.

This second cylinder is lined with fire-brick "criss-crossed" to allow free circulation of heated air between them. The blast passes through these bricks, bringing them to a white heat, which reaches very near 5,000°, and when the bricks are sufficiently heated, the firing-up process is stopped. After traversing the superheater the blast passes through another capacious pipe to still another heating cylinder, brick-lined, and filled with triangular pieces of iron. There are, in fact, two of these final heaters, which are used alternately for convenience of operating. From each of these last heaters a smoke stack leads through the roof and allows the escape of what is left to discharge. As may be surmised, there is not much smoke after the blast has passed over all these burning surfaces. The combustion is, in fact, perfect and one who looks at the smoke stack while the blast is in operation will see only a light curling vapor escaping from the orifice. Everything combustible, in fact almost everything visible, has been burned up.

In the regular course of manufacture this heating process lasts about fifteen minutes. The engineer looks through a little plate-glass peep-hole into the super-heater, and when he sees it glowing with a white heat he knows it is hot enough. Then he and his assistant proceed to pull down two or three levers, and the blast stops. The engine is checked up and the spinning blower

finds itself temporarily out of use. Here commences the second process.

In one of the last of the heating cylinders as the previous process was followed, there is introduced a water pipe, capped with a little revolving button sprinkler similar to those used on lawns about town. Water is turned on at a pressure of eighty or ninety pounds, and enters the heater in a whirling spray. This spray is at once converted into steam, and by the force of the expansion, it drives onward through a pipe into the superheater before described.

Here it encounters the white-hot mass of fire brick, and becomes what is known as superheated steam. As an illustration, it might be stated that if a little jet of this steam were allowed to escape, it would burn a plank like the flame of a blow pipe. Think of steam so hot that it would make a blaze!

But it is not hot enough yet, and it charges on through the next connecting pipe into a generator, filled with livid coals. Passing down through this nine or ten feet of glowing fire, and being subject to the additional high temperature of the coal, it then disintegrates, the oxygen and hydrogen, which form its constituent parts, separating. The oxygen immediately forms a combination with the carbon set free in the fire, and the resultant gases are carbon-monoxide and hydrogen; in other words, Lowe Fuel Water Gas.

But it is very hot gas just now, and is passed through boilers which are furnishing the hot water, which is continually being drawn off for making the gas and feeding the water boiler which runs the engine. Thus the economies are considered all through the process. The water which performs its office of cooling gas is itself made hot, so that it may be used to generate steam, thus requiring less heat for this purpose than when using cold water.

From the boiler and heater the gas passes to another cylinder, called the washer and scrubber. This is filled with cobble stones, and from the top falls a constant spray of cool water. This tempers the gas and cleanses it of its grossest impurities.

From the washer and scrubber the clean gas rushes through a pipe passing through the partition wall into the purifiers in the adjoining room at the rate of 2,000 feet a minute; thence back into two other purifying cylinders standing in one corner of the generating room.

In the purifying room are four large, riveted iron tanks or vats. Three are kept in constant use during manufacture, and the fourth is laid off for cleaning. The purifiers are water sealed; that is to say, they are great iron covers set opening down into receivers or vats partially filled with water. The gas rises under the covers, but cannot escape downward through the water. The interior space is filled with what is known as iron sponge. It performs the concluding touch of purification for the gas, so that it shall be utterly free from contaminating particles. When a charge of iron sponge becomes foul it is taken out and exposed to the air for revivification, and is soon ready for service again.

After the column of gas passes through all of the purifiers it is despatched by pipe line to the large holder, 100 yards distant from the generating house.

The holder is an immense affair and deserves especial description. It is an iron tank, circular in form, 60 feet 6 inches in diameter and 40 feet high. It is what is known as a telescopic holder, the upper and lower portions shutting together like sections of a telescope. As the gas enters from below the inner section begins to rise, and when it is up its full height it catches the outer section, and then both rise together. The full capacity of the holder is 105,000 cubic feet. It is capable, however, of passing along 500,000 to 900,000 feet of gas a day, as it discharges from one side while receiving in the other. The tank rises between strong iron pillars, which keep it constantly at a perpendicular, while allowing full play up and down. It is like a Brobdignagian tub turned upside down. It rises and falls in a vast cistern twenty-two feet deep, whose sides and bottom are staunch and tight with brick and concrete. The brick and concrete tank is filled with water, which perfectly seals the bottom edges of the tank, allowing no escape of gas beneath; in other words, the holder is water-sealed. When the holder is full of gas the displacement of water inside is six inches. In other words, the water rises six inches higher on the outside of the tank than it does in the inside. This serves to designate the amount of pressure on the gas; it is said to be held under six-inch pressure. The holder in question, including the tank, cost the company the snug sum of \$21,000.

From the condition of a spray of water introduced into a hot cylinder, then a volume of superheated steam, then disintegrated and carbon-charged gases, the process has been followed through its several stages until

the perfect fuel gas is safely lodged in the immense holder.

This process does not go on indefinitely, however. After about twenty minutes of generating it is found that the generators, superheaters, etc., are cooled somewhat and no longer in condition to make gas. Then the process is stopped. The three or four levers are reversed, a few shovelful of coal are loaded into the big furnace or generator, the blower is set in operation again, and the heating operation is repeated.

The two processes—fifteen minutes for heating and fifteen minutes for generating—may follow each other indefinitely, day and night. With each fifteen minutes' run from 10,000 to 20,000 feet of gas is manufactured, according to the heats in the apparatus. The consumption of fuel is comparatively light, a ton of Wallsend (Australian) coal being sufficient to make 60,000 cubic feet of gas. The combustion being so perfect, the coal in the generator is reduced to an ash. In this system there is no coke, tar or clinkers to dispose of which is equivalent to saying that there is no waste of raw material.

Long runs are the most economical, since the apparatus becomes more thoroughly heated the longer it is used, and the less time is lost in reheating.

The new gas will be sold to consumers for \$1 per 1,000 cubic feet, which is one-third the price now being paid for the gas in this city. The capacity of the works at present is 500,000 feet per day, and additions can be made to bring the output up to 2,000,000 feet per day, as consumption increases.

These are the largest works yet constructed for the Lowe Fuel Gas process, and they are probably the most complete fuel gas works to be found in the world to-day, embodying, as they do, all of the latest improvements known to gas-making science.

In these works, soft coal is used exclusively for the first time in manufacturing water gas, all previous works having been run with hard (anthracite) coal. There are over 300 works using the Lowe illuminating gas in the United States and Canadas.

Readers should understand that illuminating water gas and fuel water gas are two distinct processes. The former, although much cheaper than coal gas, is still far more expensive than fuel gas, which has never been successfully made except by the Lowe process, and for which the famous Franklin Institute of Pennsylvania awarded Prof. Lowe a special grand medal of honor in 1886.

TESTING VARIETIES OF WHEAT.

THE MECHANICAL AND MILLING NEWS has received from the Department of Agriculture, Bulletin No. 2, showing the results of experiments recently made with different varieties of wheat, at the Experimental Farm at Ottawa. As compared with the grain of Ontario and the Eastern Provinces, Manitoba and Northwest wheat shows an average excess of vitality, amounting to 4 per cent. In thirty-seven tests, the highest proportion of vitality shown was 99; the lowest, 36, and the average, 88. Regarding the results of the experiments made with samples of Russian wheat sent out last spring to the farmers in the Northwest, Prof. Saunders, in the Bulletin referred to, says: "Only part of the returns have as yet been received, but as far as they have come in, they show a most gratifying success, establishing the fact that this wheat will ripen in Manitoba and the Northwest from ten to fifteen days earlier than Red Fife, a gain which past experience would lead us to believe would be sufficient to secure this most important crop from all danger of frost. The shipment from Russia was not received until the seeding season in the Northwest was nearly over, hence the wheat could not be sown early enough to give it a favourable chance; on this account it will require the experience of another year to establish with accuracy its period of ripening. This subject is of such vast importance to the future of the country that no pains will be spared in the endeavor to ascertain the true bearing of all the facts. Samples of this wheat as grown in the several Provinces are being submitted to eminent experts for their opinion as to its quality, it is also undergoing careful chemical analysis with other wheats for comparison, and if practicable a portion will be ground into flour and its value in bread making tested; a special bulletin on the subject will be issued as soon as all the desired information is available.

In the meantime the interest awakened in the subject in the Northwest is very great, and so large a number of applications have been sent in for samples for spring planting, that a second consignment has been ordered from Riga, which supplemented by what has been grown here will, it is hoped, be sufficient to introduce this wheat into almost every locality and prepare the way for its general cultivation within two or three years."

WIRE-ROPE TRANSMISSION.

AN interesting example of the utility of the wire rope for the economic transmission of power from the place of generation to a point 1,000 feet distant, is afforded by the experiment of M. Garland, of Bay City, Mich. This gentleman has furnished power to a flouring mill at Hudson, Mich., by an ingenious application of this simple and effective method, transmitting by means of a wire rope, carried over a 6 foot sprocket wheel, 52 horse power from a water wheel, located 1,000 feet distant from the point where the power was required. There are many situations where the plan adopted by Mr. Garland might be profitably adopted.

DRIVING A PLUG FROM THE INSIDE.

ANOTHER wood-worker, says the *Boston Journal of Commerce*, has been bothered for a moment on handling steam where an exhaust pipe was to be tampered with. There was too much moisture finding its way up the chimney, or for reasons best known to the engineer, a plug was turned from a piece of good seasoned hardwood with the grain running lengthwise, and driven a taper to fit the nozzle when driven from the inside. It was a question among the wood-turners how the one with the plug was going to manage with his wrong-end-to contrivance until it was noticed that the plug was being cut into four equal parts lengthwise through the center by first splitting it into halves, then into quarters. Each quarter was handled with a wire driven into the small end, with which the plug could be inserted one piece at a time, and then all brought into their proper place within the pipe. The wires are then twisted into a small chain attached to a bar with which the plug is drawn into place, where it will have the advantage of having the pressure behind it.

A DEAD BLACK PAINT.

PROBABLY many of our readers, especially those who are the possessors of optical instruments, have, at some time or other, been in need of a "dead black" paint or varnish for brass work, such as tubes diaphragms, etc. We have often been in the same boat, and all the formulae and recipes given in the books were unsatisfactory because of their vagueness. The following can be relied upon to give a first-rate dead black, and it is easily made: Take two grains of lamp-black, put it into any smooth, shallow dish, such as a saucer or small butter plate, add a little gold size, and thoroughly mix the two together. Just enough gold size should be used to hold the lampblack together—about three drops of such size as may be had by dipping the point of a lead pencil about half an inch into the gold size will be found right for the above quantity of lampblack; it should be added a drop at a time, however. After the lampblack and size are thoroughly mixed and worked, add 24 drops of turpentine, and again mix and work.

WARPING OF WOOD.

IT is said that the wood on the north side of a tree will not warp as much as that from the south side, and that if trees are sawn in planes that run east and west, as the trees stood, it will warp less than if cut in the opposite direction. However this may be, it is certain that the tendency to warp when sawed into boards is much greater in green than in dry wood, and that the convex side of the curve is always toward the heart. This warping, due to unequal shrinkage, and to the more open texture of the external portion of the tree, is not found to occur in the middle plank or board of the log, excepting as it may in slight degree reduce the breadth. This quality of not warping, which is in many cases absolutely indispensable for certain uses, as, for example, in the sounding boards of pianos, is secured in the case of spruce timber by first quartering the logs, and then sawing them with the angle downward. It is then sawed into boards very nearly at right angles with the line of annual growth, and a small triangular strip must be taken off to make the board square edged, but qualities of stability and strength are secured that could not otherwise be had.

ERASTUS WIMAN AND HIS CYCLONE.

MR. ERASTUS WIMAN recently said to a New York reporter concerning his "cyclone pulveriser," "The old-fashioned Chilian mill—fancy a mill invented hundreds of years ago in Chili—is still the only thing that can be used to crush quartz in New England for paint and porcelain. The old buhr stone, one grinding crudely on another, is still the main reliance for two-thirds of the pulverizing processes so essential to human sustentation. Yet two young men

in Wisconsin will make a great fortune—and I hope to help them to do it by harnessing the cyclone, confining it in a narrow iron chamber not bigger than a hall stove and making it do work such as giants could not do with trip hammers run by all the powers of Niagara. In all the wide range of human achievements there are few things which promise a greater change in existing modes than the simple generation of air in imitation of a cyclone and its application to the manifold processes of reduction to powder, from the soft and pulpy rice hulls, through all the useful articles of commerce, down to the hardest substances encountered in mining in the bowels of the earth."

A CHEAP JACK SCREW.

ONE way to get rid of key wedging and wedging so much with keys, when there is to be any blocking up done around a machine, or a heavy casting leveled on a planer, is to hunt up a few bolt nuts and set screws and rig up a number of jack screws on a small scale. A set screw will set down into a bolt nut far enough to get into a very narrow space if the screw is a short one, and there is just room enough to turn it up with a wrench, the oval head bringing all the strain near the center where the screw can turn easily. For blocking, a few waste pieces of steam pipe come in handy. The workman takes the height with the scale, and cuts off a piece of pipe the right length by making an allowance for the thickness of the nut and head of the screw. A long set screw is used for this purpose, as it will enter the pipe and hold the nut in place. A screw and nut at both ends of a piece of pipe makes a convenient arrangement for reaching from one joint to another where a crowding force is required and the pinch-bar of little use.—*Boston Journal of Commerce*.

MACHINERY AND ITS POSSIBILITIES.

THOSE who entertain the opinion that the possibilities of labor-saving machinery are nearly exhausted, and that the whole field of art industry in which it may be advantageously employed has been already covered by inventive genius, are greatly mistaken. That the achievements of human ingenuity have been wonderful, goes without saying, and there are reasons to believe that future triumphs in this direction will be even greater and more fruitful. We are forced to this conclusion by reason and analogy. Who would have believed, only a few years ago, that the difficult and complicated processes which are now every day being wrought out by machinery in various branches of manufacture would have been possible? Thus it is that the problems unsolved by one generation become accomplished facts of another. Who shall say that what now seems impossible and improbable may not be successfully attained by those who will come after us? In the hands of the modern scientific inventor matter becomes almost miraculously endowed with life and intelligence, and with great accuracy performs those functions which the most skilled manual labor executes but slowly and imperfectly.

AN IMPORTANT INVENTION IN FUEL.

OUR English exchanges comment upon two very remarkable inventions in the field of fuel economy. The first is that of J. Hargreaves, of Widnes, who claims that he can obtain a power of over 30 horses by a combustion of two gallons of coal tar per hour. Still more may be obtained, he says, but owing to the engine with which he has carried on experiments, extending over five years, having been so frequently altered and reconstructed, some of the parts are too weak to be safely trusted with the extra strain needed to give effect to the full development of the power which is actually possible by the use of his system. Other kinds of liquid fuel are stated to be just as applicable as coal tar, but at the present cost of the latter, 20 horse power can be obtained at the cost of two cents per hour. The result is said to be obtained by the use of very high temperatures within the working cylinder, while by other arrangements the working surfaces are kept at a lower temperature than in the steam engine. All the heat developed by the combustion of the fuel is intercepted and made to do work, instead of being allowed to escape up the chimney.

The second, equally startling, is reported anonymously from Durham, and proposes to affect a great improvement in the heating of steam boilers; a few hints only being thrown out as to the nature of the results attainable. The cubic bulk of fuel that will henceforth be required for marine steam engines, it is asserted, will be reduced by 70 per cent, giving a gain to the extent indicated by that proportion to the stowage space for cargo in ocean going steamships. The time for raising

steam will be diminished in all steam boilers, stationary or marine, by at least two-thirds. The cost of fuel consumption will be reduced by more than one-half; and the production of smoke will be absolutely annihilated. The process is stated to have been made the subject of actual experimental demonstration, and every test has been applied. It ought to be added that the new process is said to be applicable to existing steam boilers, and that the working out of that process will very greatly reduce the present wear and tear of boilers, fire-bars and implements.—*Engineering and Mining Journal*.

THE MANUFACTURE OF MEDICATED FOODS.

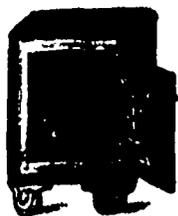
A REPRESENTATIVE of the MECHANICAL AND MILLING NEWS recently paid a visit to the new manufactory of Messrs. F. C. Ireland & Son, Church St., Toronto, successors to Messrs. Fish & Ireland, the well-known manufacturers of "Our National Foods." On entering the premises the busy hum and incessant whirr of machinery was his first greeting. A cordial welcome was also extended by the proprietor, and an invitation to make a tour of the establishment, which was done under his direction. In the course of the conversation which ensued, the following information concerning the business of this firm was elicited:—The firm carried on operations down at Lachute, Que., for a number of years; and although they had never employed a "commercial," they recently found it impossible to supply the demand for their foods with the facilities in existence at that place. They therefore removed to Toronto, where they obtained their present premises, and invested in an entirely new and costly outfit of machinery. That in use at Lachute, will also be shortly removed to Toronto. The manner of preparing the products of this establishment will doubtless prove interesting. The cereals as they come from the farmer are first of all subjected to a slow heating process, which is continued until the starch contained in them is converted into dextrine. This initial process is said to perform the first act of digestion, similar to that produced by the saliva of the mouth and the heat of the stomach, on ordinary cereal foods. The grain is then decorticated, or stripped of its outer hull, and by that time is perfectly clean, leaving nothing whatever but the most easily digestible and nutritious elements in its composition, such as gluten, phosphates, nitrogen, etc., necessary to supply the waste of tissue continually going on in the human system.

The premises are commodious and well ventilated. The basement contains all the shafting, pulleys, and gearing, for working the whole apparatus. On the front portion of the first flat are the offices, and to the rear of these are two pairs of French buhrs, one of which is used for the purpose of chopping oats and the offal that is caused during the manufacture of the finished cereals. Close at hand are two large decorticators for removing the outer bran from the grain. The materials necessary for the placing in position of another set of French buhrs to be used in the first stage of making whole wheat flour, are also on this flat. Situated at the rear of the first flat are the engine and boiler, both of modern and serviceable construction.

Ascending to the second story attention was drawn to a new combined grain separator, purchased from W. & J. G. Greey, used for cleaning and sizing the different kinds of grain. There are also on the same floor, various other machines employed during the manufacture of the foods, and also at the further end the drying apparatus, which is of very peculiar construction, and different from anything of the kind in existence in this country.

Ascending still higher, the third and last flat was reached. Arranged on this floor are two centrifugal reels, fans, aspirators, three sets of rollers, feeder and mixer, all driven by shafting, which is kept in steady, regular, and constant motion, by means of a new endless rope drive extending from the basement below to the topmost flat above. This drive is also one of Wm. & J. G. Greey's patents. In fact the whole of the machinery has been supplied and all millwright work done by that firm, who placed as superintendent over the work, Mr. Charles McEwen, a young man of considerable ability, and thoroughly conversant with the intricacies of complicated machinery.

The grain as it is taken into the premises on the first flat is conveyed by elevators to the top of the building, and then spouted into the drying apparatus; and having been dried, is again spouted to the various machines used in its manufacture. In this way a considerable saving of manual labour is effected. Such, in brief, is a description of the latest and most efficient method of preparing medicated foods, which appear to be both beneficial to the health of the community, and profitable to the inventor.



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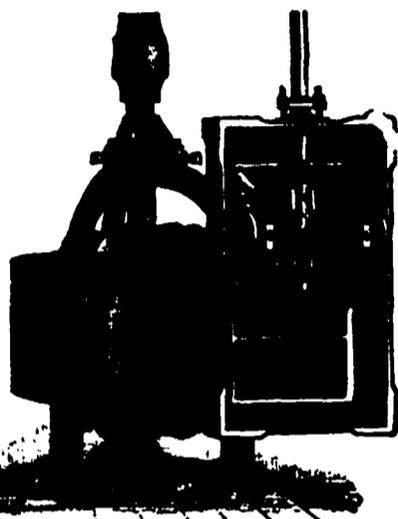
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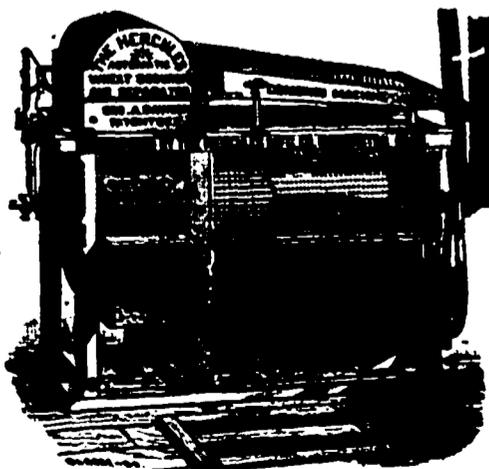
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The Chatham Mfg. Co. are putting in a new dry-kiln.

The firm of Royal & Percy, file manufacturers, Galt, Ont., has dissolved.

A machine shop is being built at Morden, Man., by Messrs. Schneider Bros.

Some products of the Norwich, Ont., foundry are finding a market in New South Wales.

The Minister of Customs has decided that belt dressing prepared shall be subject to a duty of 25 per cent.

The machinery is being got into place in the new Hamilton Screw Works, and operations will shortly be commenced.

The Kingston Car Works have contracts to the value of \$300,000 on hand, the largest orders being from the Canadian Pacific railway.

On December 21, the foundry of H. R. Ives & Co., at Longueuil, one of Montreal's suburbs, was damaged by fire to the extent of \$15,000.

The Calgary, N. W. T., town council has adopted a report advising that Cushing's planing mill be exempted from taxation for the current year.

It is estimated that the friction of ordinary pistons and plungers, is about one tenth of the amount of the effective pressure exerted by the fluid on the piston.

On the 2nd inst., Tilsonburg people will vote on a by-law to grant the Messrs. Weston the sum of \$5,000 to assist them to start a new stove foundry.

Mr. Thomas McDonald has purchased from the Joseph Hall Estate, Oshawa, a lot of valuable machinery for his new manufactory on Sherbourne street, in this city.

A file manufacturing firm at present located in Montreal, have written to Mayor Stevenson of Peterborough, asking if a suitable site for a factory could be found in that town.

An effort is being made to induce Messrs. Maxwell & Sons, agricultural implement manufacturers, at Paris, Ont., to remove their business to Stratford. The firm employ 150 hands.

What is described as being a simple and neat device for running grain crushers, straw cutters, etc., has been invented by Mr. James Mark, of Brookside, Ont. A patent has been applied for.

The town of Ingersoll, which has gone heavily into the bousing of manufactures lately, seems to be tiring of its late policy. A by-law to grant \$4,000 for the re-opening of the old Russell foundry was defeated the other day.

The manufacturing strength of Vancouver, B.C., will shortly be increased, as Messrs. Cook & McKelvie will erect a foundry and machine shop there. They will be freed from the local taxes for a number of years by the authorities.

Mr. W. C. R. Allan has bought Messrs. Allan's foundry, Carleton, N. B., including all the book debts and plant. Mr. W. H. Allen is manager and the firm will now trade under the name and style of "The Allan Iron Foundry and Machine Works."

Careful attention should always be given to governors to insure their proper action. If they are allowed to run dry or become gummed by accumulations of dirt and grease they will lose all sensitiveness of action and not properly control the speed of the engine.

Messrs. J. Whyte & Co., foundrymen, Peterborough, have entered a suit against the Grand Trunk Railway to recover \$10,000 damages for their foundry on McDonnell street having been destroyed by fire, caused they say, from sparks from a passing locomotive.

Messrs. Docking Bros., Waterdown, Ont., recently made their first casting in the new foundry which they have erected at that place. Curious villagers assembled to watch the proceedings which were quite a novelty to them, no casting having been done in the locality for thirty years.

The Mayor and Waterworks Committee of Hamilton, after an inspection of the new pumping engines recently constructed for the city by the Osborne-Killey Company, expressed themselves as highly pleased with the machinery and confident that it will perform the work it was designed to do.

On the morning of Dec. 15, the large foundry of Messrs. W. S. Symonds & Co., at Dartmouth, N. S., took fire and was entirely consumed, with the entire contents. The loss is estimated at between \$50,000 and \$60,000. Unfortunately there was only \$6,000 insurance on the property, and the company it is said will not re-build.

The Toronto Mail says The village of Beeton proposed to lend a local manufacturer \$4,000, without interest, to enable him to brickcase and enlarge his factory, and Stratford has under consideration a proposal to bonus a Paris manufacturer to remove to Stratford. The municipalities should go into manufacturing enterprises out and out.

Most mechanics who for the first time visit a shop where large circular saws are made are much interested in the process known as "blocking" saws. This is the process by which they are straightened and the proper tension imparted to them, and is an operation requiring the exercise of exceptional skill and judgment as well as a great deal of experience.

Mr. A. G. Lawson, Edison Electric Light Co., has informed the authorities of Sherbrooke, Que., during the progress of communications between them, that he should expect to be paid a bonus of \$10,000 cash, and be freed from local taxes for ten years, should the company decide to locate workshops there for the purpose of making engines, dynamos, etc.

The American capitalists who lately purchased the right to manufacture the Cochrane roller mill in the United States, paid a visit the other day to the new works of the Cochrane Roller Mill Supply Co., at Dundas, Ont. It is probable that the machinery for the American Company's Toledo works, for manufacturing the new rollers, will be purchased in Dundas.

The Canadian Lumber Cutting Machine Company have located in Bellefleur, Ont., and the machinery is now being sent from this city to be placed in position. An application to secure exemption from taxation for a number of years was made and granted. It is expected that the firm will employ at least one hundred hands. The company will manufacture staves, box shooks, veneers, etc., for which there is a demand in Great Britain and the United States. The capital is \$350,000. The names of the provisional directors are as follows:—Hon. J. Beverly Robinson, Robt. Hay, J. W. Langmuir, John J. Davidson, J. W. Hughes, R. N. Gooch, J. Kerr, Q.C., S. S. Mattson and S. N. Robinson.

It has been pointed out that the reduction in the cost of fuel in the manufactories of Pittsburgh, since the advent of natural gas, has placed successful competition by Chicago manufacturers in certain lines of business entirely out of the question. It is necessary, in order to restore the former trade equilibrium, that gas shall go back on Pittsburgh, or Chicago shall find and provide natural gas, or its substitute in fuel gas. This substitute can be made so as to sell for fifty cents per 1,000 feet. At that cost the equivalent to a ton of coal will cost but \$2.40, and the cost of manufacturing many articles in Chicago could be greatly reduced. Some serious attention will have to be given to the matter of fuel gas soon, even if it is for no other purpose than to break up the ring of robber coal barons.—Sanitary News.

Writing in reference to sharp angles the Journal of Progress says: It is within the recollection probably of many mechanics when workmen in boiler shops prided themselves upon superior skill in producing sharp and well defined bends and angles in flanges. The plates of boilers with such modes of flanging have no greater merit than they are more difficult to make than curves. Such angles strain the metal needlessly and are made in disregard of the properties of the material. A further objection to sharp angles in flanging consists in the fact that, in making them, the part of the metal on the inside of the bend undergoes such compression that the fibres are folded back upon themselves, and form a crease or crack not always visible to the eye, but none the less weakening to the metal. Such defects are called galls, and the ability to make sharp angles without such defects has often been considered evidence of superior skill.

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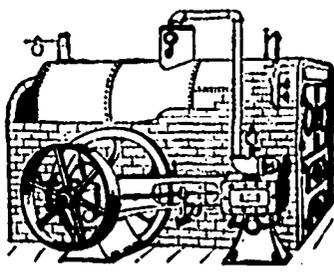
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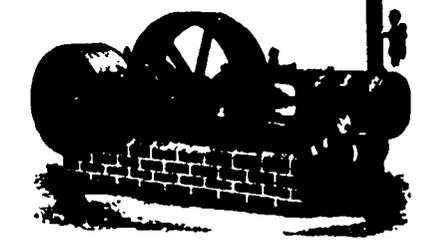
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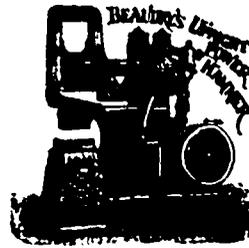
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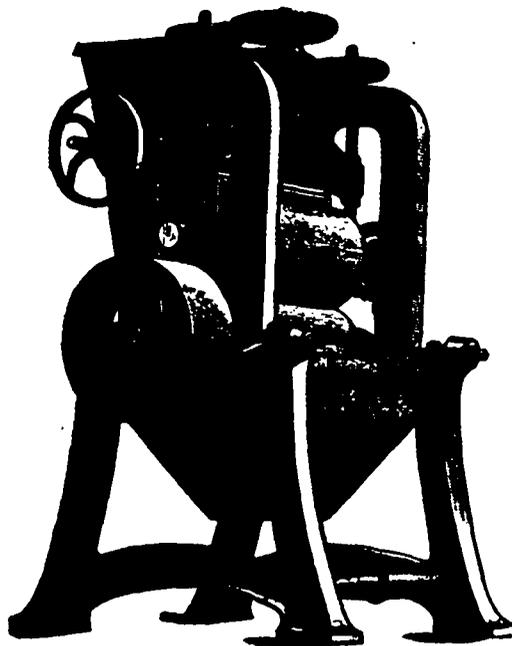
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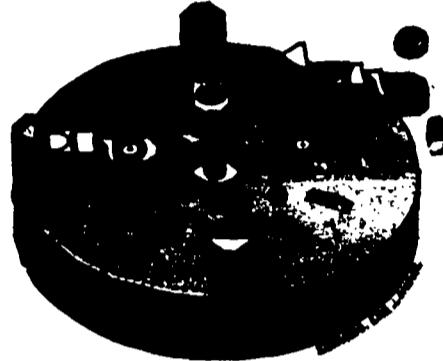
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CAP SCREWS: ::::::::::: PLAIN BOLTS: ::::::::::: PLAIN SCREWS

Cutting and Stamping to order for the trade.

Railway, Hotel Checks and Dog Tags.

SPECIAL ATTENTION PAID TO REPAIRING FACTORY MACHINERY
80 Wellington Street West.

|| All Sizes Kept in Stock, and Orders Filled Promptly. ||

DEALERS IN

COTTON AND RUBBER BELTING.

LACE LEATHER, BELT HOOKS AND MILL SUPPLIES.

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

— STRATFORD, - - ONTARIO —

MANUFACTURERS OF THE

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

INCLUDING THE

✦ **GENUINE BROWN ENGINE** ✦

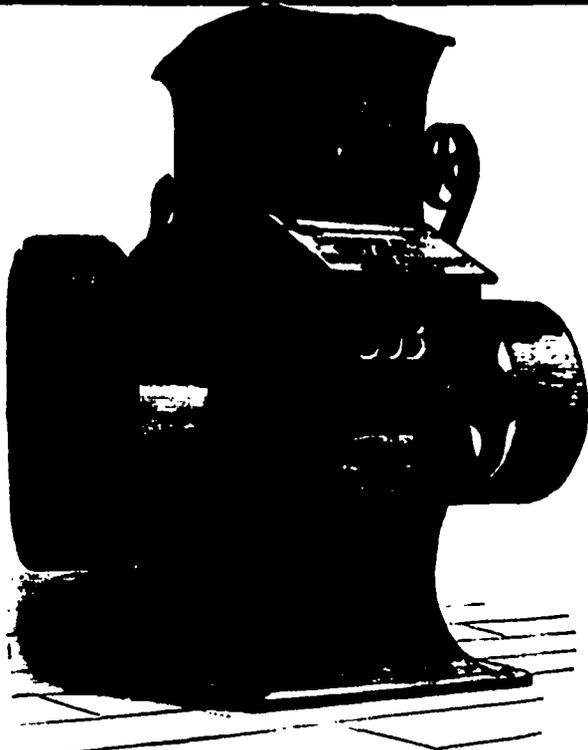
EDWARD P. ALLIS & CO'S Noiseless Belt Drive Roller Mills (

) The GEO. T. SMITH Middlings Purifier Centrifugal Reel and Inter-Elev:

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

✦ **Three Roll Chop Mills** ✦

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



Waterford, Oct. 10th, 1887.

S. S. Heywood, Gen'l Manager.

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

Dear Sir:—With my acceptance of the Three Break Short System mill you built for me with the full Geo. T. Smith Centrifugal diagram of separations, I am pleased to say that you have executed your contract to my entire satisfaction. I watched the mill carefully for four days after the wheat was turned on. You did not change a cloth or spout, and the flour and finish from the first were superior to anything I have ever seen in a long system mill of same capacity. In place of a 75 barrel mill which you contracted to give me, I find that I can make from 90 to 100 barrels, and still make a perfect finish. All your special machines seem perfect in material and workmanship, and I am particularly pleased with the THREE ROLL CHOP MILL you put in. It will do more and better work than three run of stones; takes comparatively little power and attention.

Yours truly,

A. C. DUNCOMBE

Canton, 16th Nov., 1887

S. S. Heywood, Esq., Gen'l Manager,
The GEO. T. SMITH M. P. CO.

Dear Sir:—Yours of the 14th received. As I told you before, I am more than thankful that I gave you my contract. I have had a good many grists from Millbrook lately. My mill continues to give the very best satisfaction, in fact I don't think there is a mill in Canada that can do better work.

Truly yours,

W. H. KINSMAN.

Arthur, Oct. 28th, 1887

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

Dear Sirs,—We are highly pleased with the THREE ROLL CHOP MILL that we got from you. Having tried it on all kinds of grain, we are entirely satisfied to keep it. Will remit the amount due in a few days.

Yours truly,

COLEMAN & WIEGAND

Office of Ehnes & Williams,

Zurich, Sept. 14th, 1887

S. S. Heywood, Esq., Manager,
Stratford, Ont.

Dear Sir,—The Three Roll Chop Mill is satisfactory. Draw on us at sight.

Yours respectfully,

EHNES & WILLIAMS.

West Shefford, P.Q., Nov. 15th, 1887

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

Gentlemen:—We have had the Wheat Cleaning Machinery and CHOP ROLL running now for a week, and all goes first-class. Mr. Horner is well pleased with Chop Roll and the work it does. Can chop as fine as anybody wants it.

Yours truly,

JOHN S. McKAY,

(McKewright in Charge)

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

ALL ENQUIRIES WILL RECEIVE CAREFUL ATTENTION

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

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

United States Shops, JACKSON, NICH.

STRATFORD, ONT.