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DOMINION MECHANICAL & MILLING NEWS

VOL. X.—No. III.

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NEW UPRIGHT DRILLING MACHINE.

IMPROVEMENTS are continually being made in iron-working and wood-working machinery, and it often occurs that before wood cuts of new photographed improvements are finished and circulars gotten out, the contour and construction of the machines represented have, in the hands of the mechanical superintendent, been changed in many important particulars. A year ago the London Machine Tool Co. thought their upright drilling machines were about as perfect as any manufactured on the continent; but they are now changing the style of feed, and making some other important improvements in their construction. The cut shown herewith will give the reader a general idea of the new style of friction feed. By this construction the feed can be changed from a light to a heavy, to suit the work in hand, in a moment. All the other points of construction are according to the latest improvements in drilling machines. A. R. Williams, Soho Machine Works, Toronto, handles their production.

PRACTICAL MILLING.

IT has been the policy of "the country saw mill" owner to buy that which was cheap. We have reference more particularly to their first plant—their mill, engine and boiler. Let a man want to engage in the saw mill business, nine cases out of ten he counts the profits first, then the cost, and as he is "a little short," he tries to economize by buying his outfit second-hand. He starts out on the cheap plan, and scours the country for some mill that has passed through the fire, or whose owner has found it far more profitable to let it lay up than to attempt to run it.

He visits the city and looks through the second-hand machinery stores. He looks at one or two new mills, gets completely muddled, and disgusted, starts off home and buys "Jones' old mill." It has not been run for two or three years, but he can save one hundred or possibly two hundred dollars in this his first purchase. He is told that it is a little behind the times, but then it will do him.

Now all that is wanted is to secure an engineer and head sawyer who is in keeping with the mill, and we have a full-fledged mill to help him cry "hard times," and, although gradually, it will soon cause him to feel that saw milling is not what they crack it up to be.

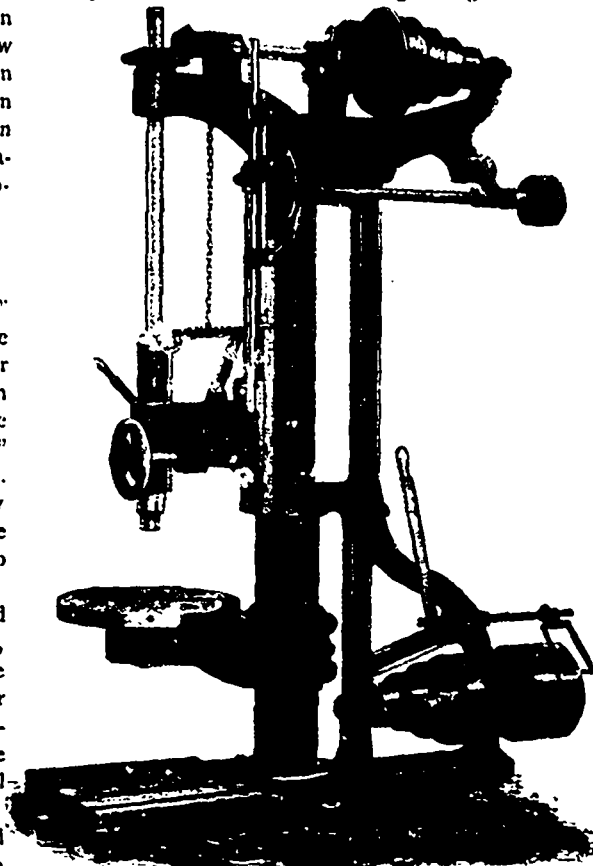
At last he finds an engineer who has done almost everything. He comes along, or, rather, "turns up," and wants a job. He has been used to large mills, big pay and his fireman, but has had a "streak of bad luck," and will take hold of this mill, put it in order and show what can be done. In not a few cases our engineer imparts "his bad luck," for he knows nothing of engineering, and but very little of firing. Our new proprietor is new at the wheel, and does not discover that his engineer is second-hand until reminded of it by repeated accidents and mishaps that suggest something wrong. A broken ring is looked upon as a necessity, hot wrists result from the mill laying up, steam escaping from nearly every joint of pipe, the piston rod, valve rod, and the several conditions soon suggest that something is not what it should be.

Strange as it may seem, hundreds of men start out thus, holding a penny so close to their eyes as to lose sight of a dollar within their reach. Poor tools make poor workmen, and a more fallacious policy was never pursued than economizing in the plant—getting something cheap, regardless of worth. The best is the cheapest, applying this both to tools, mill and labor.

The older mill men, even some who have been looked upon as "full-fledged," have erred to their sorrow, in moving too soon from a good site. They have cut out certain qualities of timber that they have depended upon largely for their run, and without fully investigating whether it would pay to cut other lumber, have hunted

up other sites and moved; and in not a few cases to their detriment. It has come under our observation of late, to note where several mills had moved back to their original sites, re-buying timber that they had passed over unnoticed at their first sitting, and, where the strange part comes in, paying for this second cutting a little more than they originally paid for the first, land and all. A little forethought could have saved them money, trouble, time, and expense of two moves.

It takes experience. The practical man studies not only the present but tries to anticipate his future wants. The practical miller counts nothing too good for him,



NEW UPRIGHT DRILLING MACHINE.

and looks upon the best as the cheapest. He wants good tools, good saws, good files, the best of lacing and belting, and good, steady, experienced men. He knows how to keep them, and they recognize in their employer a man who masters and understands his business. It's a satisfaction to them to work for such a man. It is rarely such a man fails; success is too near the surface.—Geo. Fisher in *Wood-Worker*.

PROCESS FOR PREPARING GRAIN, ETC., BY STEAM, FOR MILLING AND OTHER PURPOSES.

MR. Robert Wood, of Carlisle, England, has obtained a patent in that country (November 7, 1887), which he thus describes:—

It is a matter of common experience that quantities of native and imported barley, and other farinaceous seeds, becomes so desiccated and hardened as to have lost the quality technically described as mellowness; and cause greatly increased wear and tear to the machinery employed in grinding and milling the same; also necessitating a larger expenditure of motive power than would otherwise be required if said mellowness had not been lost.

The several objects attained by my process are the moistening, mellowing, and restoring those qualities which have been lost by desiccation, reducing the time occupied in milling, as well as the wear and tear of the milling machinery, causing a partial or complete germination or malting of, and improving the feeding quali-

ties of the grain, or other farinaceous matter, and increasing the yield, and improving the colour, and appearance of the meal.

I accomplish these results after cleaning from all foreign and extraneous matter by passing the grain through a hopper or vessel having an inclined bottom, over which the grain gravitates, and discharges itself through an adjustable mouth into a steamer in which the grain is agitated and submitted to the influence of steam. The steamer is operated in such a manner as to be continuous in its action, receiving the grain, agitating and exposing the surface of the same to the influence of steam, passing the grain on, and finally discharging it into a chamber, or vessel, or floor, in which the assimilating part of the process is carried on.

The assimilating chamber, or vessel, or floor, has an inclined hopper-bottom or flat-bottom as required, and is provided with necessary means for discharging its contents. Two or more of these chambers, or vessels, or floors, are ranged in a series, in such a manner that when one chamber is sufficiently full of steamed grain, the discharge from the steamer may be directed into another.

In these assimilating chambers, or floors, the steamed grain is allowed to remain when required for milling until the moisture and heat it has received in the process of steaming has permeated equally the interior and exterior parts of the grain, and the whole mass is assimilated in its condition or degree or state of moisture. These conditions being attained, the grain is discharged from the assimilating chamber, and when intended for reduction to meal may be led between rollers by which it is partially reduced. The grain can then be milled with much more rapidity than when treated in the ordinary way. Or it may be passed between rollers after leaving the winnower and before it enters the steamer.

When the grain is to be malted, it is conveyed from the steamer in its warm state to the assimilating and germinating chamber, and allowed to remain there, in about the same warm moist state, at a suitable temperature, till sufficiently germinated. By this means germination is accomplished in much less time than in the ordinary method of malting. From this chamber it is elevated and passed, and if necessary repassed, through a machine or machines which keep the grain in constant motion in warm air, during which the further development of the process of germination is arrested, and from which the barley, grain, or other farinaceous matter, is discharged in a dry and malted condition.

A MILLSTONE RECIPE.

THE following recipe, although a little out of date, may find some readers of *The Roller Mill* who are not yet quite won over to the cylinders. It is, as far as I know, original with the writer, though possibly others have also invented and used it:

Melt a suitable quantity of alum. At the same time place an equal weight of calcined plaster on the stove where it will get quite hot, in order to expel any moisture that may have gathered since its manufacture, and to assist the mass in retaining its head while being applied. When the alum is thoroughly melted, and hot, drop in as much of the plaster as will mix in with the liquid alum without making it thicker than hasty pudding. Then with a flat stick press the mixture while hot into the seams and pores of the burr. After this cement has cooled, take a sharp pick for a chisel, and shave down the projecting lumps to the regular level of the stone.

The above was tried by the writer, after using the various mixtures recommended by old millers in the trade journals, including what is widely advertised as millstone cement. I have found that it resists the wear of the grain and is but little affected by moisture.—"St. Cloud," in *Modern Miller*.

Northwest Letter.

THERE is nothing talked of here at the present time but the grain blockade. Every man you meet has some remarks to make regarding the situation, and generally winds up with the query, "When do you think there will be a change?" The matter is becoming monotonous, and further discussion of the question seems only to be dealing in words which have already been oft-repeated. Still the grain blockade is a most momentous matter to the West. Its influence has permeated every line of business. In a country so largely depending upon agriculture as Western Canada, the stoppage of grain shipping must of necessity prove as a break upon the wheels of commerce, and it has been felt here more or less keenly in every line of business. Some time ago the Winnipeg Board of Trade appointed a committee to investigate the situation. Complaints were pouring in from country towns all over the Province to the effect that trade was at a stand-still, owing to the inability of the C. P. R. to move out the grain. Country merchants reported to wholesalers that they could not meet their payments, as the elevators and warehouses were all blocked, and farmers could not market their grain, consequently they could not raise the money. Many went on to describe the situation of affairs, to the effect that at most of the stations, farmers had been obliged to pile their grain in bags outside, storage being full and no cars to take the grain away. These reports, together with the statements of grain dealers, to the effect that they were unable to obtain anything like the number of cars required, led to the appointment of the committee by the Board of Trade. This committee has obtained a great mass of evidence, directly from representative farmers, merchants, and grain dealers, which has enabled them to present a very full report as to the state of affairs and the loss to the Province from the blockade. The committee has reported to the effect that with one or two exceptions, the storage capacity all over the country is full up, and that cars are not supplied to relieve the jam to any extent, on an average not over one car in five wanted being supplied. Farmers who have come a long distance with grain, have piled it up in sacks outside, rather than haul it home again, at some points as much as 15,000 bushels being thus piled up. Farmers who have had grain outside in this way, after repeated trips to the railway points to sell it, have often at last been obliged to sell it at a very low price, as dealers would not pay a market value when there was no prospect of being able to ship out for perhaps many weeks. At some points buyers withdrew from the markets entirely, and at others, prices were very materially reduced, on account of the inability to ship out the grain. This state of things naturally checked deliveries, and compelled farmers to hold their grain, the result being a very serious injury to business all around. It is feared that this inability to market the grain in the winter season, will interfere to curtail the acreage sown next spring, as farmers (many of whom have no facilities for storing their grain) will be obliged to haul the grain to market in the spring, when they should be doing their seeding and other spring work. Grain dealers are suffering very severely, on account of being obliged to carry large stocks of grain, which they cannot move, and some threaten to withdraw from business here entirely unless there is a prospect of a change soon. They are unable to accept orders unless for very remote future delivery. Some shipments have been on the way between here and Ontario points for about two months, and yet no warehouse receipts are to hand. On this account drafts have to be renewed, and many orders are being cancelled. These include shipments of both grain and flour. The result of all this is a financial stringency which has not been equaled in the history of the country, and which exceeds in acuteness the closest times following the collapse of the "boom." Large quantities of flour are also locked up here for lack of cars, and altogether there probably never existed in any country such a complete blockade of railway traffic as this Province has suffered from for months past, for it must be borne in mind that the block has existed since the first rush of grain to market early last fall, though perhaps not felt so keenly as more recently. A wholesale dealer who has just arrived from Ontario, stated to your correspondent that some of the mills in that Province were obliged to close down for want of flour, whilst at the same time almost every siding between here and North Bay is full of loaded wheat cars, which the company has not the engines to move. Telegrams and letters from Ontario millers, to the effect that they would be obliged to close down, have also been received by grain dealers here. At the present time there ap-

pears to be little hope for early relief, and many believe that not until navigation opens on the lakes, will the railway be able to move the grain out fast enough to afford any great relief from the present stagnation.

There is another feature of the case which is somewhat alarming. This is, that an early spell of mild weather would cause an immense loss to the country. A soft spell of weather is liable to occur at any time now, and it would mean damage or destruction to the many thousands of bushels of wheat piled up in sacks at the railway stations all over the country. But besides this there is a great quantity of grain in the hands of farmers, not yet moved, which would be damaged or destroyed by soft weather. A great many of the farmers, in some districts not over one-fifth, have proper storage facilities for protecting their grain. The custom is to simply cover the grain with straw when threshed. When marketed in the winter it received no harm from this treatment, but as soon as soft weather sets in it is in great danger from moisture. As owing to the car shortage farmers have not been able to dispose of their grain, a great deal remains in this shape and liable to early destruction.

There has been a good deal of speculation as to the quantity of wheat from the crop of 1887 marketed to date, but it is difficult to arrive at accurate figures. Wheat going through all rail is inspected at Winnipeg, but a large percentage of lake shipments pass Winnipeg without inspection. The inspectors returns here therefore do not give a correct idea of the exports. Then the figures of wheat inspected at Port Arthur again include some grain that was previously inspected at Winnipeg. The only way to arrive at the correct figures would be to get the tonnage returns of the C.P.Ry., but these are inaccessible to the public. The following figures are therefore but an approximation:

	Bushels.
Inspected at Winnipeg to March 1st	2,700,000
" " Port Arthur to March 1st	3,500,000
Ground into flour	500,000
Total	6,700,000

What portion of the wheat inspected at Winnipeg has been re-inspected at Port Arthur, it is hard to determine. It is believed, however, that a very large portion has been so re-inspected. It would therefore be safe to reduce the amount inspected at Winnipeg by one half, or say to 1,200,000 bushels. This would leave a total of 5,500,000 bushels of wheat shipped out of the Province and ground into flour. This is believed to be a liberal estimate. The figures of inspection are estimated for the last few days. Of the wheat ground into flour, a large portion remains in the country owing to the car shortage, and as outside orders cannot be accepted for anything but very long dates ahead, some of the mills have closed down. The large Ogilvie mill in Winnipeg is among the number obliged to close, on account of the block in traffic. It is stated that flour shipped nearly two months ago, has not yet arrived at its destination in Eastern Canada. In many districts through the province, grain dealers say not over one half the wheat has yet been marketed.

I notice the Toronto grain dealers and millers have not taken kindly to the samples of Russian wheat submitted for their inspection. The Winnipeg Board of Grain Examiners have since examined a number of samples of Russian wheat, and their report agrees with that of the Toronto committee. The Ladoga variety they declare to be the best, though not nearly equal to Red Fyfe. The Kaubauka variety was said to be simply "goose" wheat, well known in Ontario, and the Saxona variety was declared to be an inferior soft spring wheat. These last two varieties have been sold here to quite an extent for seed, at fancy prices, and a good many have consequently been bitten. The wheat was sold as high as \$3 per bushel. The grain examiners have strongly recommended perseverance in growing only Red Fyfe wheat.

The Toronto *Mail* has been investigating the relative prices of wheat in northern Minnesota and Dakota, in comparison with prices in Manitoba, to the great disadvantage our Province. It is a fact, as the *Mail* represents, that prices to the south of the boundary have been from six to ten cents higher than in Manitoba. This has been known here for some time past. The only excuse that can be offered is that Manitoba is laboring under a temporary disadvantage, which it is hoped will be removed in a short time.

The difficulty with the customs continues. The department continues to refuse to sanction the shipment of wheat from Emerson via the Northern Pacific branch, which is completed to the boundary at that point, alleging as a reason that the wheat would be loaded in the cars in the United States. It has been pointed out that

a few years ago wheat was freely exported from Manitoba, loaded into cars in the United States, and shipped through to Ontario in bond. At that time it was shipped by the Red River and loaded into cars many miles from the boundary, whereas now the railway runs right to the boundary. Notwithstanding this fact, and also the grain blockade, the customs authorities refuse to recognize shipments via the Northern Pacific.

A large increase in the elevator capacity of the country will likely be made next season, arrangements having already been made for the erection of a number of elevators in the spring. There are some good openings for such investments in Manitoba at present, though some points are already well supplied with grain storage.

IMPROVEMENTS IN OATMEAL MILLING.

MR. J. P. HEPBURN, of Liverpool, has patented an improved apparatus for reducing oats or other grain into a fragmentary condition generally known as pin-head meal, by the action of knives or cutters.

The patentee says:—In carrying out my invention, I construct a grain chamber of cylindrical or other form which may be fixed in position by suitable framing, and closed on all sides. The upper end of this chamber is preferably removable and is provided with a feed spout or hopper through which the grain is fed; the lower end is perforated with a number of holes of sufficient size to admit easily the passage lengthwise of a kernel of oats or other grain to be cut. The holes may if desired be countersunk on the upper side so that the grain more readily enter the holes. In order that the grain when entering through the feed spout or hopper, may be spread equally over the bottom of the grain chamber, I provide if necessary a spreader provided with arms which is fixed to a spindle capable of being made to revolve. This spreader is fixed inside the grain chambers, and its arms are so placed that the grain is equally distributed over the whole of its lower or perforated surface. The spreader may have its bearings formed in the top of the grain chamber or in other suitable manner.

The underside of the lower end of the grain chamber is made with a true and smooth surface, and on its face are made to revolve a series of steel blades placed radially and fastened in a horizontal position, and at a little distance apart, to a central flange or boss. They are preferably made sufficiently long to pass under—during their rotation—all the perforations, and their ends may be secured if desired to an annular ring or frame. Under and partly covering the horizontal spaces between the blades I place gauge plates revolving with the blades and intended to arrest the grains as they emerge through the perforations in the grain chamber, until they are cut off by the blades. The fragments escape through a space between the knife edge of the blade, and the edge of its adjacent gauge plate. It will be obvious that as the plates are placed radially, the space between each of them will be considerably greater at their outer than at their inner ends, and therefore in order to increase the rapidity with which the grain is reduced, I may, if desired, provide additional blades which are secured to the annular ring before mentioned, or in other suitable manner, the gauge plates being of course shaped accordingly.

Between the blades and gauge plates, I may place if desired a series of arms or fan blades which are made of such a shape, that they assist in producing an air current through the perforations by which the grain passes to the knife blades. Further, these blades, if provided, may also be used to carry the reduced grain or pin-head meal to the discharge spout. The knife blades, gauge plates and fan blades are preferably made to revolve at a considerable speed on the same spindle or shaft, though other means may be adopted if desired. This shaft is placed in a vertical position, and may be conveniently provided with bearings in the main frame of the apparatus. It may be driven by a pulley fitted to it, or by other approved means. The spreader spindle may conveniently be driven by this shaft, but as I prefer that the spreader should revolve at a slower speed than the knife blades, I provide a counter shaft for reducing the speed. I do not however limit myself to the use of the countershaft, other means being equally suitable.

I arrange the framing of the apparatus, so that the grain chamber may be easily removed for cleaning, and the blades and gauge plates for sharpening or repair.

It is obvious that in place of using rotating blades, I may cause them to reciprocate and in this case, the grain chamber is preferably made square or rectangular.

Wm. Kennedy & Sons, Owen Sound, Ont., have just shipped two fine Leffel water wheels for Mr. Henry Green, Okhampton, England, at paying rates.

PROPER HUMAN DIET.

BY F. C. IRELAND.

IMPROVED machinery, economy in production, an attractive article of merchandise, greater profits and such like subjects, absorb the attention of all interested persons, while the more important subject of a properly selected and properly prepared diet is almost entirely lost sight of in the hurry and bustle of competition. Scientific laws have been applied to the study and care of horses and cattle, and the intelligent farmer has learned just what food and management will best develop and preserve their strength, beauty and value. He has learned how to feed his land so that its productivity may be assured when the early and the later rain and sunshine are given by the hand of Providence, but how to feed himself and his children are subjects of little attention. They are expected to live, become perfectly developed, mentally and physically, without care or consideration. The food that is most palatable, most pleasing to the eye, as in Eden of old, has its votaries, without giving heed or taking pains to study nature's laws in regard to their health-producing properties. The cereal products of the earth, when put in a proper shape in regard to their chemical constituents, are the most healthful and inviting foods in the world; but due regard must be had for the nutritive wants of the human system. The very white bread, which is pleasing to the eye and palate, is not an article that supplies the wastes of the body as it should. Some of the very best experts in the medical profession testify to its deficiency. In fact many of them state without hesitancy that it is from twenty-five to forty per cent. deficient in nutriment. On the other hand, the craze for Graham flour has subsided in the great centers of scientific research in the chemical constituents of food; and a flour made of the whole kernel of wheat, except the outer bran, is pronounced by many of the very best authorities as the most perfect in nourishment that can be given to the human family for bread. In hygienic properties and nutritive value it produces the necessary bone, muscle, brain and nerve materials which supply the wastes of the body, and best regulate the action of the liver and kidneys, thus preventing the diseases of these organs and the stomach, which are now so common. Medicine will rarely cure these diseases, but a properly selected diet will. If a person in the ordinary occupations of life needs to build up his body and repair its wastes a pound of nutritious food, he eats along with it a pound of unnutritious food, the stomach and other digestive organs (which together form a channel averaging 25 feet in length), have got to handle, carry and expend force upon useless matter; and there is really a great actual waste of energy and strength. The manufacturer can understand this by overloading his elevators or machines with foul grain, while if the grain is properly cleaned and supplied in proper quantities, he will have no difficulty. So to eat just what the system needs is to save strength, to save expense, to save health and to save money. It has been proved by scores of experiments that the average man, under average circumstances, needs for his daily food something containing about 4 ounces of protien, 2 ounces of oil or fat, and 18 ounces of carboli-hydrates—and he does not want much, if any more, of either of the materials named. If he eats food that contains 4 ounces of protien, and 2 ounces of oil or fat, and 42 ounces of carboli-hydrates, he gets 24 ounces too much of the latter into his stomach, and need not wonder if the conveyors of his system get clogged and the whole machinery out of order. This costs money and produces disease, pain and sometimes a complete break-down and failure. The nerves may be the first to complain. They may groan out like an unlubricated pinion, and neuralgic pains give the warning with no uncertain sound. The teeth may cry out for more bone food to make them solid for the work they have to do. The head may ache because the stomach has been overworked to please the palate. In some way or other people who eat all kinds of food without regard to exercise, climate or other physiological information relating to the conditions of the human system, will find sooner or later some of the machinery in a deranged condition. Sour stomach, distress after eating, belching of wind, capricious appetite, fullness and detention of the stomach, feeling miserable, drowsy, languid and useless, are premonitions of a clog somewhere in the system. These may have been preceded by an inactive state of the liver, a torpid condition of the bowels, or some irregularity which has burdened the conveyors in consequence of the errors in habit—the habit of eating improper food. A proper combination of foods is necessary for the strength, warmth and health required according to climate, active or sedentary professions. There is no denying the fact that too much fat is

injurious. Too much meat is eaten; therefore the great "staff of life" is cereal food, and when this is properly prepared, it contains the most perfect elements for human food that can be furnished, always considering, however, that a sufficient supply of animal material be taken with it in our daily diet. The question, therefore, is in the preparation of this cereal food. The outer bran, which is shown by analysis to be a substance of straw and woody fibre, should not be eaten by a human being. On the other hand, the inner bran, which is rich in nitrogen and phosphates, should be retained in all the cereal food eaten. The very white bread, which is fashionable, must be sacrificed to the "golden brown" loaf, which can be made equally as palatable and far more nourishing. The porridge food, also, which is partly cooked in the process of manufacture, is a greater boon to the early breakfast table than most people give it credit for. The process of partly digesting these cereals, as at present, by some manufacturers, confers a benefit upon dyspeptics and persons of weak digestion that is hard to estimate the value of. Such foods assist in building up a strong muscular development, as well as brain and nervous vitality. This treatment of the cereal productions of the earth, in the light of all the scientific progress of the times, cannot help but be beneficial to the health and vigorous growth of the human body, if used in the earlier stages of life as well as throughout its entire existence. If this subject was more generally studied, there would soon be a revolution that would upset the dental profession, with its extensive manufacturing interests—the patent medicines would remain on the chemist's shelves and their factories close up; and even the medical schools would scarcely turn out their thousands of new medicos every year at the rate they do at present. Health, strength and longevity would be increased, vitality would abound, and the ability to labor with pleasurable success would, when all combined, shed a ray of sunshine around and along life's pathway that would be like paradise compared to the aches, pains and languid misery that are endured by thousands who now find life miserable, because of their ignorance and folly in regard to properly selected diet.

ANNUAL MEETING OF THE CANADIAN MANUFACTURERS' ASSOCIATION.

A LARGE number of gentlemen engaged in industrial enterprise throughout Canada attended the thirteenth annual meeting of the Canadian Manufacturers' Association in this city last month. The proceedings were of a most interesting character, embracing the annual reports of the various officers, and speeches by the retiring President, Mr. Thomas Cowan, of Galt, and his successor, Mr. W. H. Storey, of Acton. These reports and speeches all go to show that the manufacturing interests of the country are in a state of prosperity and satisfactory development—a condition due, in the opinion of the Association, to the present tariff.

The following officers were elected:—President, Mr. W. H. Storey, Acton; 1st Vice-President, Mr. Samuel May, Toronto; 2nd Vice-President, Mr. Bennett Rosamond, Almonte; Treasurer, Mr. George Booth, Toronto; General Secretary, Mr. Frederic Nicholls, Toronto. Representatives to Industrial Exhibition Association: Messrs. George Booth, R. W. Elliott, Daniel Lamb, Samuel May, Frederic Nicholls. Executive Committee: R. W. Elliott, Toronto; E. Gurney, Toronto; James Watson, Hamilton; Wm. Bell, Guelph; Jos. Simpson, Toronto; A. Warnock, Galt; W. Millichamp, Toronto; B. Rosamond, Almonte; Geo. Pattinson, Preston; Daniel Lamb, Toronto; Isaac Waterman, London; C. Shurley, Galt; John Taylor, Toronto; M. B. Perine, Doon; Thomas McDonald, Toronto; S. Greening, Hamilton; Geo. W. Sadler, Montreal; J. R. Barber, Georgetown; John Fensom, Toronto; Robert Mitchell, Montreal; H. N. Baird, Toronto; C. Raymond, Guelph; W. F. Cowan, Oshawa; J. S. Larke, Oshawa; H. Heintzman, Toronto; George Lang, Berlin; D. R. Wilkie, Toronto; P. Freyseng, Toronto; F. Crompton, Toronto; Carl Zeidler, Toronto; C. A. Birge, Hamilton; W. G. A. Hemming, Toronto; W. K. McNaught, Toronto; Chas. Boeckh, Toronto; T. D. Craig, M.P.P., Port Hope; Wm. Chaplin, St. Catharines; H. E. Clarke, M.P.P., Toronto; L. Cote, St. Hyacinthe; W. H. Cross, Barrie; E. J. Davis, King; James McKendry, Peterboro'; P. W. Ellis, Toronto.

The following resolutions were adopted:

"Resolved, That the Canadian Manufacturers' Association are entirely opposed to Commercial Union with the United States, and to any other political proposition that might imperil our existing relations with Great Britain or prejudice the political status of the Dominion or the welfare of Canadian manufacturing industries."

"Resolved, That the Committee on Industrial Arts be

instructed to offer as many as ten of the Association prize medals to successful competitors, the objects to be competed for to be chosen by said Committee."

"Whereas a certain bill now before the Legislative Assembly of Ontario entitled An Act respecting condition sales of chattels, has been brought under the notice of this Association; and whereas certain clauses in said bill are inimical to the interests of a very numerous class at present selling goods on the instalment plan—on which plan a large aggregate of business is transacted yearly; and whereas, the obligation to place in a conspicuous point the particulars of sale, the registration of such sales, and the keeping of a book by the vendor for the inspection of the public are objectionable features of said bill, be it therefore resolved that this Association regard it as against the best interests of the trading community for clauses two, three, and four, to become law."

A vote expressive of thanks and appreciation was tendered to the retiring President for the ability and courtesy manifested by him in the discharge of his official duties.

The Association made a new departure this year by winding up the proceedings with a banquet at the Rossin House, where a very pleasant social time was spent.

MANITOBA vs. DULUTH WHEAT IN THE BRITISH MARKET.

IN reply to an enquiry by the publisher of the *Nor-West Farmer* regarding the relative values of Manitoba and Duluth wheat in the British markets, Mr. D. Bannerman of Glasgow, Scotland, reports as follows: The No. 1 Dakota is of a quality never seen here, so far as I know. It seems quite like Manitoban, and differs much from what is known as No. 1 hard Duluth wheat in this market, and which comes or is supposed to come from Minnesota and Dakota.

First as to Manitoba wheats in this market. Last year everything went smoothly as to quality, for nearly all, though not quite, was straight No. 1 hard. On this year's crop all is uncertainty, owing to the variations in quality. Little or no straight No. 1 hard has come so far, or even No. 2 hard. Most of what has come, and there has been no great quantity at all, has been Northern, whether No. 2 or a mixture of No. 1 and No. 2 it is rather hard to guess. I send forthwith an average sample of what is being received.

Last year most of the wheat, not all, was sold on inspector's certificates; this year there is more disposition to sell by sample or by "fair average quality." Selling on certificate was highly satisfactory; selling otherwise is not likely to be so, but on the contrary, is sure to leave room for endless discussion and dispute. So long as there is an inspection in the Dominion, one knows the article one is handling, and in my opinion it would be wise that transactions should be based on inspection certificates alone. This will be the only safe course for parties on this side, and on yours alike.

Second, as to the relative difference. Of Manitoban wheats of this year's crop it is impossible to speak with certainty of actual experience for the reason just given.

Of course No. 1 is most valuable, and there is a difference of at least 6d. to 7d. a quarter between it and No. 1 Northern, by and by when trials have been made, probably increase from 9d. to 1s. I should fancy that No. 2 hard would be as valuable for our millers as No. 1 Northern, perhaps more so.

The relative value of Duluth and Manitoba wheat is with us quite an important question. Last year's No. 1 Duluth was better than this year's, and was sold generally 6d. a quarter under the price of No. 1 hard Manitoban. This year it is not yet certain what the difference may be. Eventually I think the preference will be in favor of No. 2 hard or No. 1 Northern Manitoban, as against the new No. 1 hard Duluth. However, of this I am not quite certain. Some millers don't like the Manitoban so well as the other, believing Manitoban to be less dry and not so strong.

Just as things look at present I expect to see Manitoban wheat take a prominent position in this market during the coming spring and summer.

If there is any further information I will gladly give it.

Advise your people, who look to this side for customers, to sell by grade rather than any other way. If the grade is too high that can be remedied; I believe some lowering of it has already taken place."

American shippers accuse the Dominion Government of discriminating against Oswego and other American ports, with the object of inducing the exportation of grain via the St. Lawrence River and Montreal. The American Government is asked to retaliate by refusing permission to Canadian vessels to navigate the St. Lawrence and St. Marie Canal unless they are willing to pay toll.



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 22nd 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.

SHIPPERs will be glad to learn that legislation will be sought from the Dominion Parliament this session to prevent unseaworthy vessels from engaging in the carrying trade next season. Such a measure is urgently needed.

PERSONS who require to use bags have their attention called to the advertisement in this issue of Messrs. C. W. Allen & Co., Toronto, manufacturers of the "Dandy" bag holder, a patent device for holding open the mouth of the bag while it is being filled.

THE subscription list of the MECHANICAL AND MILLING NEWS is growing at an increasingly rapid rate every month. The large number of new names added since the beginning of the present year is most encouraging to the publisher, and will prove an incentive to him to still further increase the interest and value of this journal.

"GOVERNMENTAL-monopolistic-political corporation" is a new name just coined for the Canadian Pacific Railway Company by the *Mining World* of Buffalo. It is hoped that our contemporary's inspiration is not derived from thinking upon the loss to American railways occasioned by the diversion of American trade through Canadian channels.

OATMEAL milling is much overdone in Canada, and it is announced that a number of the persons engaged in the business have decided to go out of it. If the present condition of the flour market continues, a number of flour mill operators will also find it necessary to abandon their calling for something which will offer better returns for money and labor invested.

THE attention of our readers is called to the advertisement of the Canada Jute Co., of Montreal, which appears for the first time in this number. This old-established company, finding their present facilities inadequate to the demands of their business, are about to move into new and commodious premises, built specially for their accommodation. In the April number of this

journal will appear an illustrated description of the Company's new quarters.

MR. GARSON'S Bill in the Local Legislature respecting the examination of engineers and inspection of steam boilers has been referred to a special committee to report upon the wisdom of its provisions. It does not seem probable that the Bill will pass the House this session. In moving the second reading of the Bill Mr. Garson stated that there were 6,000 boilers for stationary engines in the Province, and of this number the insurance companies reported 700 to be in an unsafe condition.

AMERICANS are noted for their inventive powers. In fact the patent office reports would seem to show that every fifth or sixth man in the country is an inventor. And yet, strangely enough, no man has attempted to establish his title to the one hundred thousand dollars offered as a prize by the business men of Buffalo to the person who shall present a method of successfully utilizing the water power of Niagara Falls for manufacturing purposes. If the inventive Yankee can't capture this prize, why doesn't some Canadian divert his attention from patent car couplers, etc., long enough to do so?

AMERICAN milling journals are in accord with the opinions lately expressed in these columns that the scheme advocated by the London *Miller* of forming British syndicates to purchase Manitoba wheat for grinding in English mills, would not prove successful. Such a scheme might afford British millers temporary relief from American competition, but it is only a question of a little time when the wheat of the Canadian Northwest will be ground in Canadian mills, situated in the wheat-growing regions, and exported as flour to Britain. Then the British miller's condition will be even more discouraging than at present.

IT is but a few months ago since Pennsylvania enjoyed a monopoly in natural gas, and manufacturers there were the envy of those in other parts of the world who had heavy coal bills to pay. Now the situation is greatly changed. Natural gas has been discovered in various parts of the United States and Canada, and bids fair to become an every day commodity. The people of Chicago are just now very much excited over the discovery of natural gas in the very heart of that city. We shall not be surprised to hear that some enterprising investigator has struck a never-failing supply of this modern steam producer and illuminator in some of the back yards of Toronto.

THE decision arrived at by the Fishery Commission appears to give satisfaction to some and dissatisfaction to others on both sides of the line. It does not appear to us that Canada has been compelled to sacrifice everything to her neighbors, as some newspapers affirm. It does seem clear, however, that we have had to give away some of the privileges which undoubtedly belonged to us. Further than this, there can no longer be any doubt that England thinks more of retaining the profitable carrying trade of the United States for her merchant marine than she does of securing for her dependencies their rights and privileges. The day is not far distant when Canada must decide what her future position shall be.

THE bill introduced into the Ontario Legislature by Mr. Balfour, which proposes to take away the right from municipalities to grant bonuses to manufacturers, comes a little late in the day. Had such a measure been passed a year ago, several Ontario towns would not now be mourning the results of efforts to purchase fictitious prosperity. So many municipalities have lately reaped the reward of their folly in this direction, that no Act of Parliament is now required to prevent the repetition of such mistakes in the future. A burned child dreads the fire. The bonus hunter is beginning to be appreciated at his true worth, the bonus craze will soon cease, and as we have already said, the assistance of the law-makers is scarcely needed to hasten its exit.

IT is gratifying to note that legislation is being sought with the object of curtailing the immense damage annually resulting from bush fires. The bill introduced by Mr. French, member for Leeds and Grenville, in the Local Legislature of this Province, provides for the appointment of fire guardians by the township councils, whose consent must be obtained by persons desiring to start bush fires, and whose fees must also be paid by such persons. The idea of committing the safety of forest and other property in a township into the hands of the township authorities appears to be a good one; and such a system as the one proposed would be more

likely to be effectively and economically administered than if the supervision of the whole province were undertaken by the provincial authorities.

A FEW figures will serve to show the value to Minneapolis flour shippers of the new C. P. R. route through Canada, and also the value of this carrying trade to the C. P. R. Company. Minneapolis last year turned out 6,375,250 barrels of flour, of which 2,522,030 barrels were exported. A very large proportion of the balance was shipped to Boston and the New England States. The distance from Minneapolis to Boston via Sault Ste. Marie is 1,400 miles; via Chicago and Albany, 1,559. The distance from Minneapolis to Liverpool via Montreal is 3,947 miles, and via New York 4,463 miles. If the United States authorities do not adopt the example set them by the Dominion Government, and refuse bonding privileges to shippers over the Canadian route, the Minneapolis people and those of the C. P. R. will have cause for congratulation in such a mutually profitable arrangement.

THE adverse judgment passed upon the value of the new Russian wheat grown in the Northwest last season, as compared with the hard Red Fyfe variety hitherto grown there, will doubtless receive the consideration its importance demands. Since the proposal was first made to substitute a new variety for Red Fyfe in the Northwest, the MECHANICAL AND MILLING NEWS has counselled caution in making the change. It is well that caution has been exercised and experiments made to determine the actual relative values of the two varieties of grain. The result of these experiments leaves no room to doubt the proper course for the farmers of the Northwest to pursue. A difference of 11 to 12 cents a bushel in favor of the hard wheat should be sufficient to decide that point. The farmers of the Northwest should now devote their attention to making the arrangements necessary for getting the seed into the ground at the earliest possible date in the spring, in order to avoid the danger from early frosts.

WE take pleasure in directing the attention of our readers to the third annual report and financial statement of the Millers' and Manufacturers' Insurance Co., which will be found on another page. The Company which has been in existence less than three years, practically demonstrates the efficacy of their plan of working by the results as therein shewn, for in addition to the low rate (averaging about 25 per cent. less than ordinary rates) they have again declared a bonus dividend of 10 per cent. to continuing policy holders, payable on renewal of their policies, and carried the sum of \$11,191.78 to reserve. The benefit accruing from the system of rigid inspection by this Company is shown in the fact that whereas, on the business for the past year of other companies whose statements have been published, the losses alone averaged over 64 per cent., both the expenses and losses of the Millers' and Manufacturers' combined is under 50 per cent. Manufacturers must feel that for a Company restricting its business to special hazards, the report of this Company is highly encouraging.

THE printed reports that have appeared almost daily for months past regarding the sufficiency or insufficiency of cars provided by the Canadian Pacific Railway for moving the grain crop of the Northwest, have been of such a contradictory character as to make it very difficult, if not impossible, for people in the east to form a conclusion concerning the facts of the case. It is to be hoped, therefore, that the offer of the Winnipeg Board of Trade to pay the expenses of a member of the Toronto Board of Trade who should be appointed to visit the Northwest and examine and report on the situation, will be accepted. If there is foundation for one half the complaints made by the people of Winnipeg and other Northwest towns, something should be done before another crop is harvested to afford the farmers of the Northwest the facilities necessary for getting their grain to market. If the Canadian Pacific Railway Company hope to enjoy a monopoly of the carrying trade of the Northwest, they must provide transportation facilities on a scale commensurate with the necessities of shippers. If they are not prepared to do this they should be compelled to divide the business with other companies.

VERY prompt and decided action has been taken by the heads of manufacturing establishments to prevent the passing by the Legislature of Mr. Nairn's Bill to compel the registration of Hire Receipts or Conditional Sales. Largely signed petitions against the Bill have been secured from all parts of the Province, and large and influential deputations representing the manufacturing and agricultural interests waited upon the

Government a few days ago urging that the Bill should be thrown out, on the ground that it is not needed, and its enforcement would result in serious expense and inconvenience to dealers and purchasers. It is estimated that the expense to persons engaged in buying and selling machinery on the instalment plan of complying with the requirements of such a law, would be from \$150,000 to \$200,000 a year. The number of sales made annually is about 200,000. On this number the registration fee of ten cents would amount to \$20,000, cost of affidavits, about \$100,000; postage and loss of time, say \$50,000, or a total approaching very closely the figures named. As no one has petitioned for such a measure as Mr. Nairn proposes, his Bill will probably not find a place on the statute books.

MILLERS' AND MANUFACTURERS' INSURANCE COMPANY.

THE annual meeting of the Millers' and Manufacturers' Insurance Company was held at the Company's office, 24 Church Street, on the 21st February. The President, Mr. James Goldie, occupied the chair. The Secretary, Douglas Sutton, acting as Secretary.

On motion of the President, seconded by the Vice-President, W. H. Howland, the annual report of the Directors and the financial statements were read and adopted as follows:

To the Members and Shareholders of the Millers' and Manufacturers' Insurance Company:-

GENTLEMEN,
Your Directors beg to submit the third General Statement of the business of the Company, comprising Revenue Account and Profit and Loss Account for the past year, and the Balance Sheet, showing Liabilities and Assets on 31st December, 1887:

The total number of Policies in force at the close of the year was 392, covering at risk, after deducting Re-insurance, the sum of \$1,131,371.

The Accounts before you demonstrate that the original expectations regarding this Company have been fully realized, showing as they do, that after placing at the credit of Re-insurance reserve, a sum equal to Fifty per cent. (50%) Government standard basis of the Cash income on existing risks, we felt justified in making a Bonus appropriation to continuing Members, equal to ten per cent. (10%) of the Cash premium income, payable on the renewal of each policy.

As evidence of the value of the system of inspection adopted by this Company, we think it only fair to draw your attention to the fact that on the business of the past year of the Companies whose statements have been published, the losses alone average over Sixty-four per cent. (64%), whereas both the Expenses and Losses combined of this Company amounts to less than Fifty per cent. (50%).

We feel that we cannot too forcibly impress on you the importance of having, together with your other appliances for extinguishing fires, a complete supply of Pails and Barrels of salted water (always full) distributed throughout each building. The Statistics furnished by the New York Fire Commissioners prove that out of every one hundred fires that have taken place in that city during the past six years Sixty-four have been extinguished in their incipient stages, with Pails of Water. In confirmation of this we may refer you to our own published experience of their value in the early stages of a fire. It is on the insistence of your having such appliances Combined with Care, Order and Cleanliness, that we can expect to maintain in the future, as we have in the past, such a substantial reduction in the cost of Insurance as 32½ cents on each dollar of premiums paid or an average of Forty-eight per cent. (48%).

The retiring Directors this year are, H. McCulloch, S. Neelon, J. L. Spink, W. H. Howland, who are eligible for re-election.

All of which is respectfully submitted.

JAMES GOLDIE, *President.*

HUGH SCOTT, *Managing Director.* DOUGLAS SUTTON, *Secretary.*

REVENUE ACCOUNT FOR YEAR ENDING DECEMBER 31ST, 1887.

<i>Dr.</i>	
To balance cash premium income, 1886.....	\$ 8,041 54
premium income, 1887.....	355,718 50
commission income, 1887.....	1,106 83
interest.....	946 38
	<hr/> \$57,771 71
<i>Cr.</i>	
By statutory assessment, printing, stationery and advertising.....	\$ 611 62
rent, postages, telegrams and auditors' fees.....	490 84

By salaries.....	1,759 94
" travelling expenses.....	1,379 26
" directors' fees.....	885 40
	<hr/> \$ 5,127 06
" re-insurance.....	4,779 11
" cancelled policies.....	1,109 80
	<hr/> 5,888 91
" claims paid.....	10,467 55
" balance carried to Profit and Loss Acct	44,309 73
	<hr/> \$65,812 25

PROFIT AND LOSS ACCOUNT TO DEC. 31ST, 1887.

<i>Dr.</i>	
To balance Revenue Account, 1887.....	\$44,309 73
	<hr/> \$44,309 73
<i>Cr.</i>	
By renewal bonus fund, 1888.....	\$ 2,855 58
" dividend to stockholders.....	1,225 00
" preliminary Expense Account, balance written off	1,000 00
" re-insurance reserve, being 50 per cent. of cash premiums of existing risks.....	11,191 78
" balance.....	28,037 37
	<hr/> \$44,308 73

BALANCE SHEET FOR YEAR ENDING DEC. 31ST, 1887.

<i>Dr.</i>	
To capital stock subscribed.....	\$125,000 00
" profit and loss balance, 1887.....	28,037 37
	<hr/> \$153,037 37
" re-insurance reserve.....	11,191 78
" renewal bonus fund.....	2,855 58
" dividend to stockholders.....	1,225 00
	<hr/> 15,272 36
" sundry creditors.....	3,911 33
	<hr/> \$172,221 06
<i>Cr.</i>	
By debenture Man. & N.W. Loan Co. \$	10,000 00
" 114 shares Consumers' Gas Co.....	9,600 00
" cash on deposit in banks.....	10,206 46
" cash in office.....	459 27
" sundry debtors.....	1,929 06
" office furniture.....	113 60
	<hr/> \$ 32,308 39
" undertakings in force Dec. 31st, 1887	27,162 67
" capital stock not called up.....	112,750 00
	<hr/> 139,912 67
	<hr/> \$172,221 06

The retiring Directors, Messrs. S. Neelon, Hugh McCulloch, J. L. Spink, W. H. Howland, were unanimously re-elected, after which the meeting adjourned.

At a subsequent meeting of the Board, Mr. James Goldie was re-elected President, and Mr. W. H. Howland, Vice-President, for the current year. The Board of Directors is now constituted as follows: James Goldie, Guelph, President; W. H. Howland, Toronto, Vice-President; H. N. Baird, Toronto; Wm. Bell, Guelph; Hugh McCulloch, Galt; S. Neelon, St. Catharines, Geo. Patinson, Preston; W. H. Storey, Acton; J. L. Spink, Toronto; Hugh Scott, Toronto; A. Watts, Brantford; W. Wilson, Toronto.

DON'T.

DON'T allow any oily waste or rags to be thrown on the floor, but only in a metal can with a cover, and have them taken out of the building every night; they are self-igniting. Don't allow saw dust to be used to catch oil-drippings from machines. Sand is safer. Don't allow matches to be kept loose or in paper boxes, but only in metal or earthen "safes." Those lighting only on boxes are safest. Don't allow smoking on your premises. Don't fail to have your fire-buckets filled, and test hose and fire apparatus from time to time. Don't fail to have all hoist-ways provided with good trap doors or hatches, and have these shut at night. Don't allow stoves or heaters on your premises which are not securely set on stone, cemented brick, or metal; and be sure that all wood-work near the stoves or pipes is covered with metal. Don't allow any loose-jointed gas-brackets on your premises which could be swung against wood-work; or any gas-bracket without wires, screens or globes, if hay, straw, light material or window curtains are near them. Don't allow electric lights or wires on your premises which are not properly protected. Don't allow any steam pipes to be in contact with wood or other inflammable material. Don't allow any kerosene oil lamps to be filled after dark. Filling lamps near a fire is dangerous. Don't forget to keep the lamps filled and wicks in good order. When the oil is low it generates gas which is liable to explode. Don't allow benzine, gasoline, naphtha, or other explosives in your place. If necessary to keep these in stock, let a separate building be provided for their storage. Don't allow ashes to be put in a wooden-box or barrel in your building. Always have an iron ashpan.



The Barnum Wire and Iron Works at Windsor has been incorporated with a capital of \$45,000.

A company has been formed at Hamilton to bore for natural gas near the Grand Trunk yards in that city.

Messrs. McKeough & Trotter's laundry and machine shops at Chatham, Ont., were destroyed by fire on the 15th of Feb. Loss about \$20,000.

A sample of Manganese ore has been discovered on a farm on the line of the New Brunswick Railway, and its value is being determined by chemical analysis.

An Ohio firm have lately visited St. Thomas, Ont., with a view to engaging in the manufacture of railway frogs there. The proposed new industry is expected to give employment to a large number of men.

The Erie and Huron Railway Co. expect to have their new machine shop at Chatham, Ont., finished in about a month's time. It is 150 x 30 feet, furnished with a 30 h. p. engine, and will contain lathes and other machinery for repairs of engines and general iron work.

The Massey Manufacturing Co., of this city, are making arrangements to establish malleable iron works here on an extensive scale. The Company has petitioned the City Council to grant the new enterprise exemption from taxation for ten years; but as yet the Council has not taken any action in the matter.

The capacity of the new pumping engines of the Hamilton Water Works Department is as follows: Duty per 100 lbs. of coal in foot pounds, 114,500,991; capacity during test, in imperial gallons, 4,118,587 per 24 hours; capacity at contract speed in imperial gallons, 3,895,600 per 24 hours; mean steam pressure during test, 112 lbs. per square inch.

The secretary of the old Joseph Hall Manufacturing Co., of Oshawa, Mr. Joseph Weir, has purchased all the patterns of the estate, and will shortly open a malleable iron shop in connection with his machine shop. Mr. Thomas Morrison, a former resident of the town, has returned and will commence the manufacture of boilers, iron fencing, etc., in the same building with Mr. Woon.

The first piece of belting made with wire has been manufactured at Beaver Fall, Pa., J. E. Emerson and Thomas Midgely, under patents taken out by the letter. It is said to be as pliable as leather, in fact more so, and will wrap around a 1 or 2-inch shaft without straining the wire. The link arrangement is similar to that of flat gold chains, and the sample shown has a tensile strength of five tons.

When a shaft is to be loaded down with pulleys and strung up in every direction with belting, quite a saving in power can be made by giving some attention to the number of bearings that can be brought into use. A light shaft, with bearings close together, will stand as much lateral displacing tendency as a heavy one with hangers few and far between. There is nothing lost by having a few extra bearings, as far as friction goes, if the foundation has got through with settling and the frame from warping out of line, but the percentage in power keeps up wonderfully with the size of the shaft when an addition in this respect is made.

The newly invented pipe of wood fibre for water, gas and electric wire conduits, says the *Proceedings*, is made under the enormous hydraulic pressure of the material, and, after the pipe is thus formed, it is thoroughly saturated with a liquid that makes it water and acid-proof and indestructible by natural causes, and then it is finally baked. Pipe of this character will stand a pressure of 125 to 175 pounds to the square inch, though it weighs but one-fifth as much as iron. Its tensile strength is enormous, and it will endure heat up to 400°. It is a non-conductor of heat, and protects its contents from freezing, unless at a very low temperature. The pipe is suitable for mills using water and dyes, and is said to insulate electric wires perfectly.

PERSONAL.

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

Mr. J. A. Stephenson will take charge of the Portage Milling Co's branch, shortly to open at Winnipeg.

Mr. Joseph W. Warder, formerly of London, Ont., has taken charge of Mr. Peter Shaw's roller mill at East Oro, Ont.

While working in his saw mill near Owell, Ont., a few days ago, Mr. Wilson McCreadie had one hand nearly severed by a circular saw.

An accident occurred last Thursday afternoon in Tilson's saw mill Tilsonburg, Ont., in which John Theid had the base of his skull fractured.

Geo. Zimmer, of Brussels Ont., who was badly injured the other day while working at Vanstone Bros. mill near Southampton is doing as well as could be expected.

Mr. John C. Lazier, manager of the Moim, Ont., flouring mills went to Southern California last month and will stay for two years for the purpose of recruiting his health.

A Society under the name of the Messrs. Wm. & J. G. Greeys' Employees' Mutual Sick Benefit Society, has been organized in connection with this firm. As the name implies the object of the Society is for the mutual benefit of its members in case of sickness. After existing for some months now it bids fair to fill the purpose for which it was started.

The *Evening Sentinel* of Birmingham, Conn., thus speaks of the newly appointed manager of the Cochrane Roller Mill Supply Co. of Dundas, Ont.: Edward Condon, for the past 23 years in the employ of the Birmingham iron foundry, will sever his connection with the concern Saturday next, and leave for Hamilton, Ontario, Canada, where he will assume a position as foreman in a foundry there. Mr. Condon is at present a member of the city government and his services on the board will be missed by his associates as he was looked upon as a conservative man on all subjects pertaining to the public welfare. He is also a member of the school committee of the sixth school district.

PIPE HANGERS.

TO the *Locomotive*, published by the Hartford Steam Boiler Insurance Company, we are indebted for the following valuable article on the above subject:

Steam pipes are often hung up in a most slipshod and inefficient manner. No proper allowance is made for the movement of the pipe by expansion, and as a consequence joints are strained and leak continually; flanges are broken off, and in many instances the hangers are pulled out and the whole or a portion of the line tumbles down bodily. The usual support for steam-pipes is shown in Fig. 1. It consists simply of a ring or loop which is slipped over the end of the pipe and supported by the gimlet-pointed hook screwed into the beam above, and which admits of no adjustment. With a pipe of any considerable length the ring assumes the position shown by dotted lines in Fig. 1, when steam is turned on. The pipe is raised, the covering is badly torn, unless, indeed, a section is left uncovered where the support comes, and severe strains are thrown on the joints. Few realize the severity of the strain set up in a long line of pipe by using a hanger of this kind. We have seen the extreme end of such a line lifted up clear off the hangers by the upward curvature thus produced so that the hangers along the middle of the line supported the entire weight of the pipe. In many cases the ring will be found lifted clear out of its supporting hook. Of course it is evident that when this is the case those hangers which do remain in place have to carry a greatly increased load, so that unless they are of excessive strength they are apt to give way. When one breaks the shock

Fig. 2 is a side view and Fig. 3 an end view of one of the cheapest and best forms of hanger where the motion of the pipe is not very great. Two clips are made of 3" x 1/2" flat iron bent around to fit the pipe, so that when

ported by the lag bolts which are screwed into the beam as shown. The pipe may be raised or lowered by simply turning the nuts on the bolts, and set at any desired height.

Fig. 4 and 5 show a hanger exactly similar in principle to the one just described, but available in a case where it would be necessary to carry a pipe as close as possible to the timbers. In this case the weight of pipe would be carried by the floor planks instead of the beams. With mill floors as constructed at the present time, this would form a good support, especially if it were placed close beside a beam. Two bolts are let through the floor, the heads being flush with its upper surface so as to offer no obstruction. The bolts should be a "driving fit" through the planking, and have their threads cut of such a length that a nut and washer may be screwed up to the under side of the plank. The pipe is suspended from these bolts by means of bar, roll, and clips exactly like those described in Figs. 2 and 3, and the same facility of adjustment in a vertical direction is obtained as in the first described case.

Figs. 6 and 7 show another form where the adjustment vertically may be obtained by "shimming" with the wedges shown at S, S, the remainder of the hanger being the same as those previously described. The objection to this form is, the floor would be apt to shrink and loosen the wedges, and so make frequent adjustment necessary. This form might be used in some places with satisfaction, where there would be little danger of the floors springing, but we would not advise it in preference to the first described ones.

Fig. 8 shows another form where no provision is made for adjustment vertically. When a line of pipe is run close to a wall so that there is no chance for the timbers or floor to settle appreciably, and so throw the pipe out

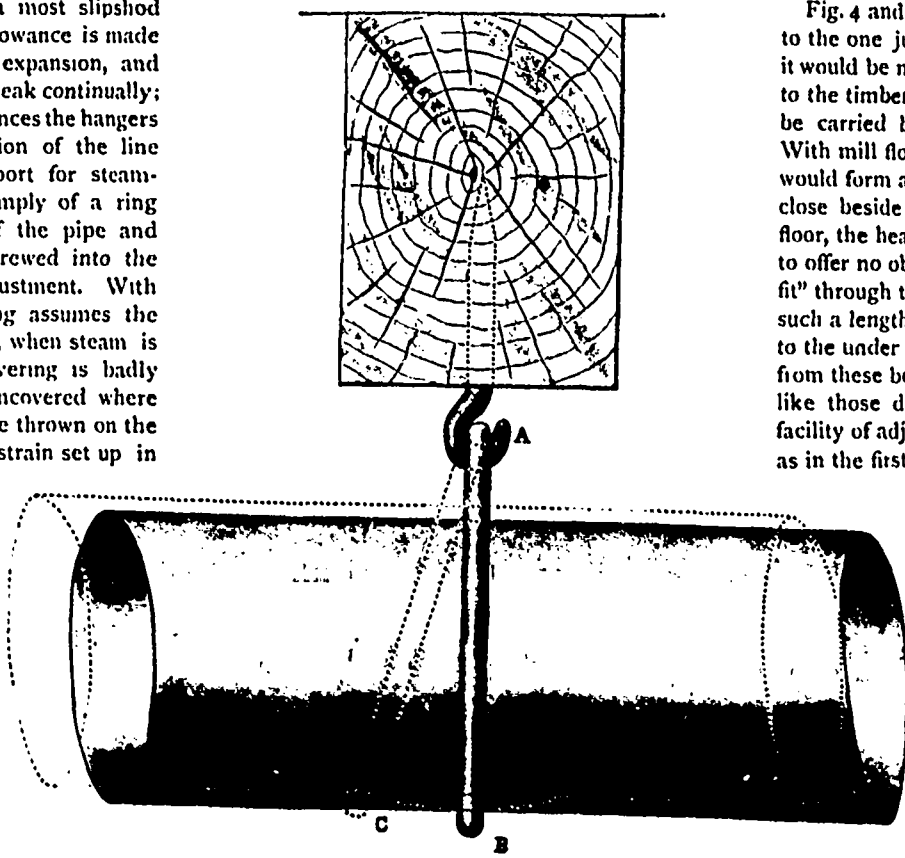


FIG. 1.

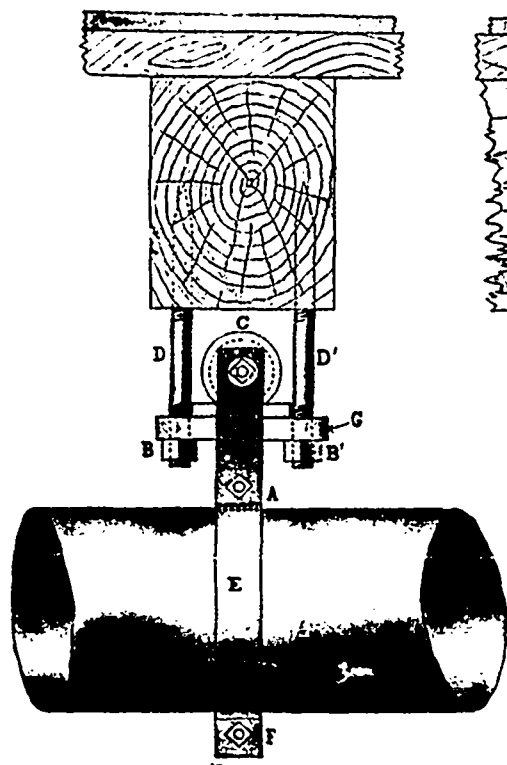


FIG. 2.

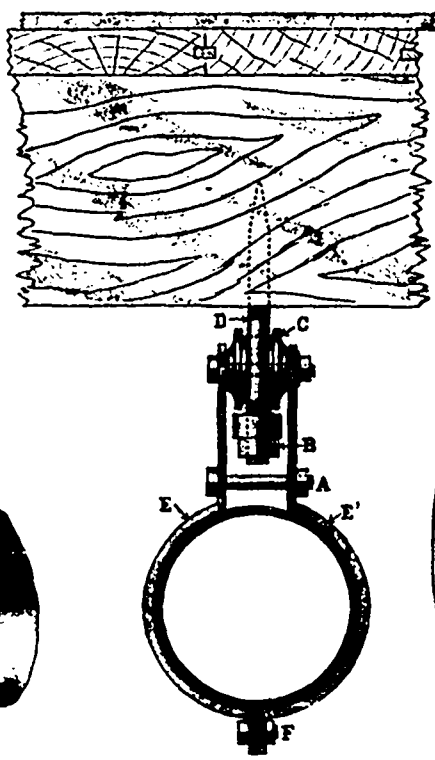


FIG. 3.

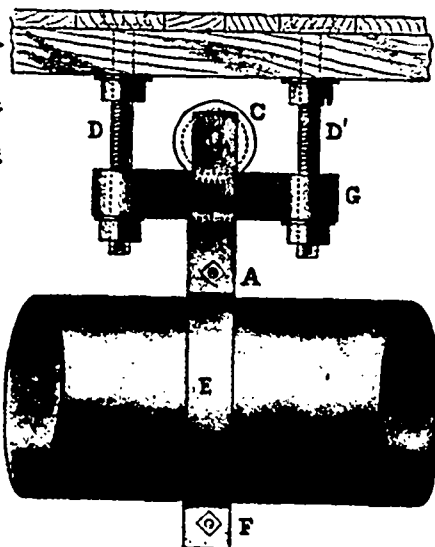


FIG. 4.

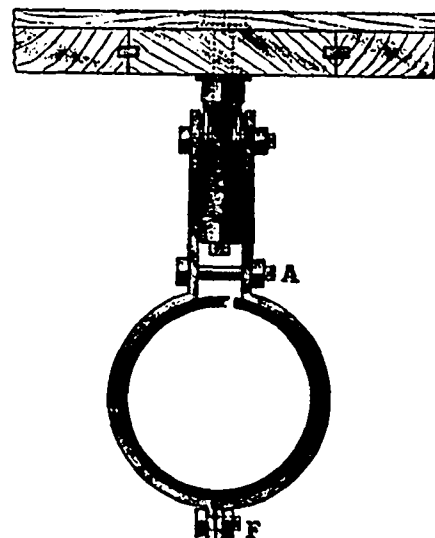


FIG. 5.

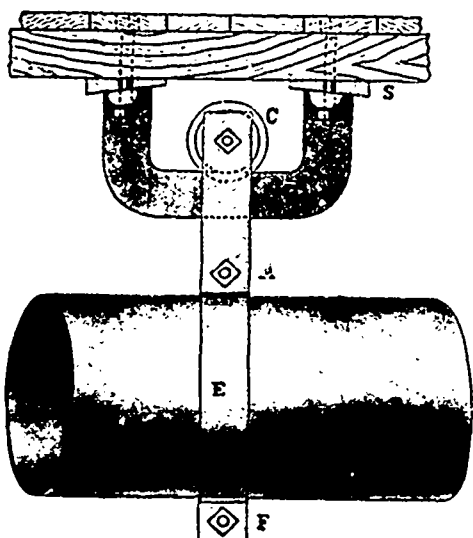


FIG. 6.

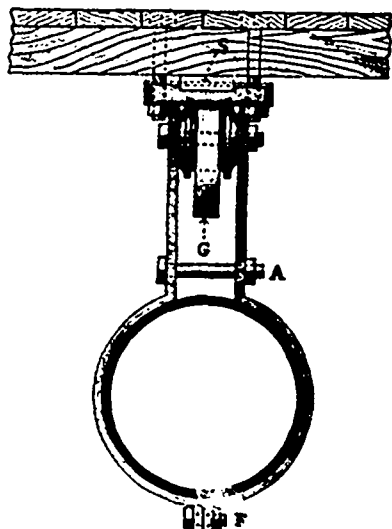


FIG. 7.

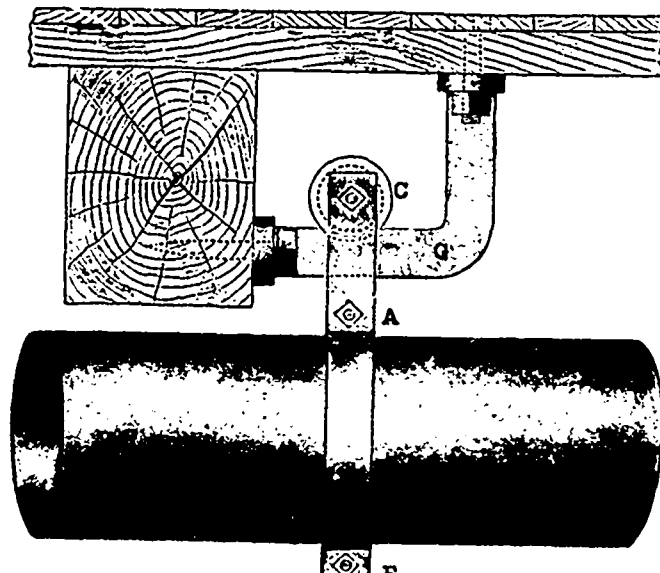


FIG. 8.

throws a severe strain on the next one and if that gives out the whole line of pipe is pretty sure to come down. Pipe of any size should always be supported by some sort of hanger that will admit of a parallel motion when the pipe expands. We illustrate various forms of hangers which we have found to answer admirably for supporting long lines of heavy steam-pipe.

the nuts on the bolts at A and F are screwed up the pipe is tightly gripped. The upper ends of the clips are not brought together but are left a few inches apart and long enough to enable the roll C to be placed between them as shown. The bolt passing through the clips and roll forms a bearing for the roll. This roll is grooved on its periphery, and runs on the bar G, which is sup-

of line, this form of hanger will answer every purpose if carefully put up in the first place.

Figs. 9 and 10 show a different form of clip from those previously described. This is simply a bar of round iron with threads cut on the ends and bent around to fit the pipe. The upper ends of this yoke pass through holes in the plate S and are provided with nuts which

enable adjustment to be made in a vertical direction. The plate S rests on two cast iron balls B B, which roll with scarcely any friction as the pipe expands.

Figs. 11 and 12 show a hanger made on a different principle. In this the pipe is supported on a concave roller which rolls with little friction on the plate P, which is adjustable vertically by means of the four set screws s s s s, the whole being carried by the casting A, which is bolted securely to the beam as shown.

Figs. 13 and 14 show a form similar to that last described, but modified so that it does not interfere with covering the entire length of the pipe. A cast-iron saddle, P, carries the pipe. This saddle rests on a cylindrical roller R which is carried on set screws in the same manner as that in Figs. 11 and 12.

In either of the two last-described hangers the vertical adjustment may be omitted if there is reason to believe that the beams or other means of support to which they are attached will never settle appreciably.

Figs. 15 and 16 show a form of hanger sometimes used and which answers its purpose very well if care is used in putting it up. Two lag screws S, S, are screwed into the timbers overhead.

Figs. 17 and 18 show a hanger which may be used with advantage on a short line of small pipe. The cast-iron hanger is bolted to the floor or any convenient support. It may be varied in its form to suit the requirements of different cases. It is concave on the upper side, and the nut on the rod is convex to fit it.

EXPERIENCE.

THE bulk of the knowledge in possession of the world to-day, says the *American Machinist*, is derived from the recorded experience of preceding generations. No man, however talented he may be, nor however wide his individual experience, can hope to possess as much practical knowledge of his business as he who, in addition to his own experience, adds the knowledge to be gained by the experience of his predecessors who have trod the same paths.

In no department of human knowledge does this truth hold good more than in the science of mechanics.

For hundreds of years men have been constructing machinery. Sometimes they have been entirely successful, and at other times have made absolute failures. From these failures, no less than from the successes, has been built up the science of mechanics or of machine design.

However wide the individual experience of any mechanic may be, it can by no possibility extend over more than a small fraction of the field covered by this recorded experience.

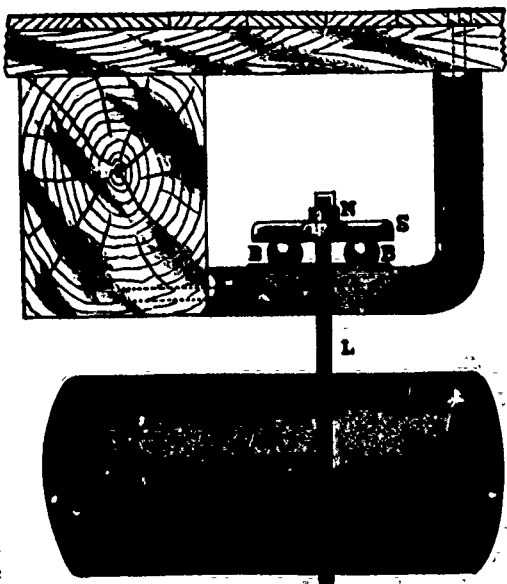


FIG. 9.

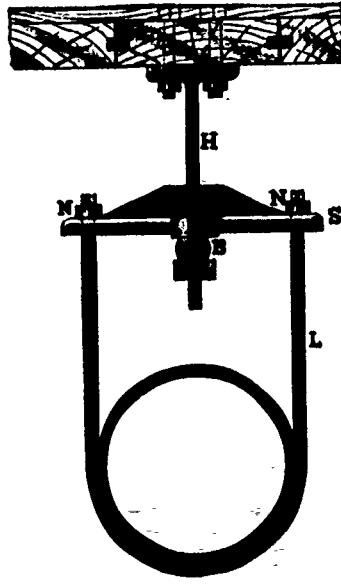


FIG. 10.

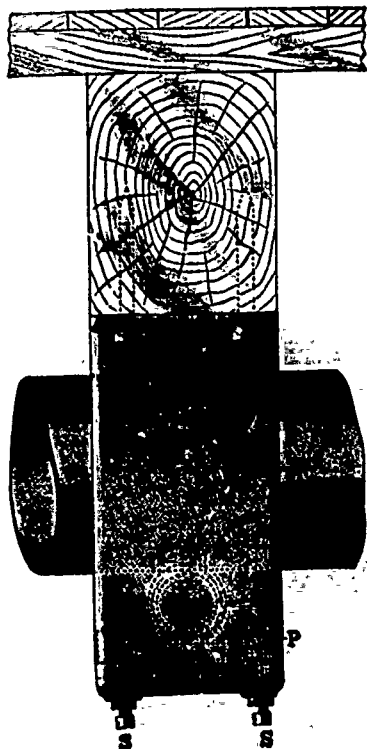


FIG. 11.

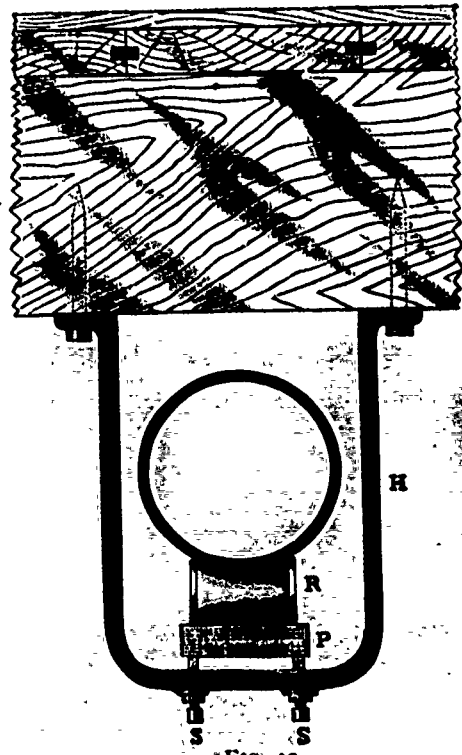


FIG. 12.

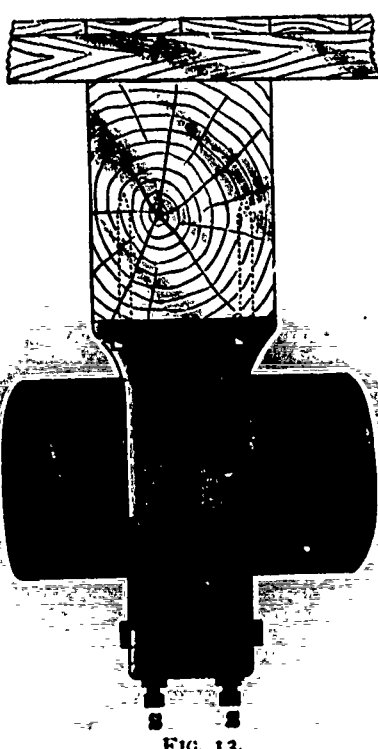


FIG. 13.

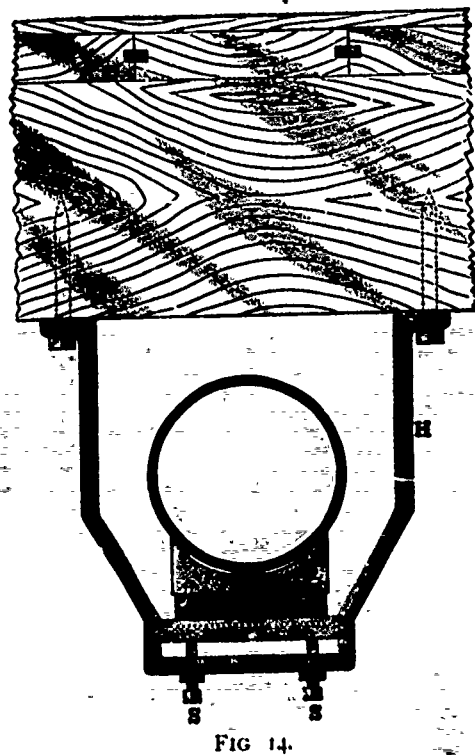


FIG. 14.

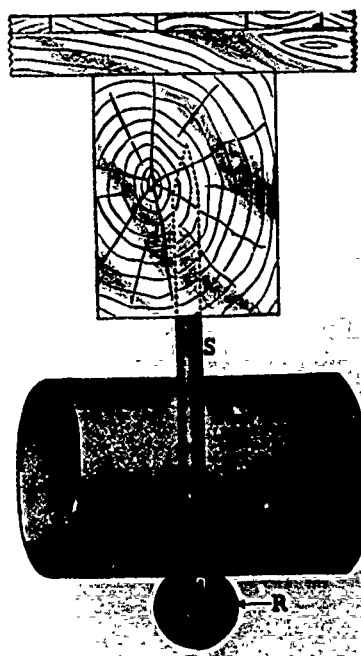


FIG. 15.

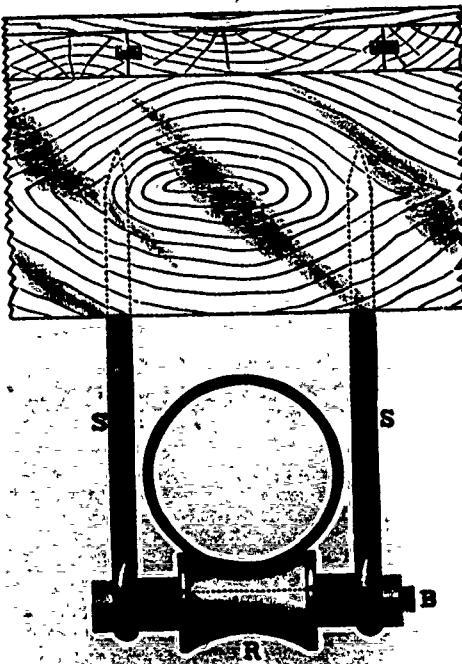


FIG. 16.

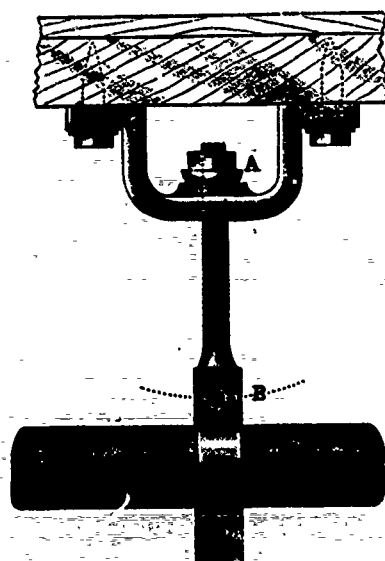


FIG. 1.

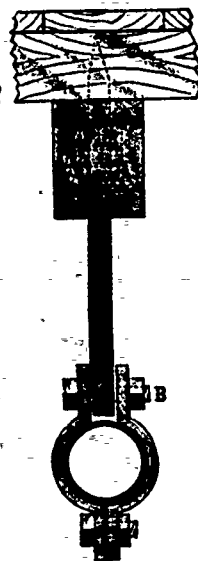


FIG. 2.

These screws are bent into the form of a hook at their lower ends, and an ordinary bolt passing through forms a bearing for the roller R, and carries the pipe as shown. A section of the pipe must be left uncovered where the bearing comes. This hanger is adjustable for height, but the minimum change which can be given it is equal to one-half the pitch of the thread on the lag screws. The adjustment is easily made by removing the bolt, B, and giving the screws half a turn or more as may be necessary, in either direction.

The clips around the pipe are of the same form as those described in Figs. 1 and 2, although but one bolt will be needed above the pipe. This passes through a hole in the end of the rod and the whole form a very neat adjustable hanger for short lengths of pipe. The longer the vertical rod can be made, the more easily will it work, and the longer the line of pipe it can be used on.

The Ogilvie Milling Co. is reported to have closed down its Winnipeg mill owing to lack of shipping facilities.

Personal experience is, of course, necessary for success in any mechanical pursuit, and he who is without it is at a great disadvantage; but, on the other hand he who knows nothing of the experience of others, necessarily knows comparatively little, and is also at a disadvantage. If, in addition to this, he despises the experience of others and boasts that his knowledge is the result of his own experience solely, he is in reality boasting of the narrowness of his own knowledge of his business, and makes himself ridiculous.

PROCTOR'S POINTS.

A CALL from an enterprising young mechanic of Highgate one of the thriving, busy little towns on the Canada Southern and a general conversation about mechanical matters, which finally merged into the discussion of the benefits which the young men of the place expected to derive from a Mechanics' Institute which they are forming, led my thoughts into the channel of mechanics' meetings, and gatherings, and Institutes, and I concluded to have a talk with the boys about them.

About a year and a half ago I endeavoured to impress upon the readers of the MECHANICAL AND MILLING NEWS the advantages that would arise from systematic organization of mechanics for the purposes of mutual improvement in technical, literary and general information. I have heard of some results along the line of my suggestions, and of some places that made a sort of effort to establish such associations. I am of the opinion, however, that these papers go into the offices of the various establishments that receive it, are looked over by the office staff and fired into a corner for future consideration, and that is the end of it. "Proctor's" suggestions, I suppose, are considered by the office staff of not much importance, and having reference to the workmen, and perhaps written by a workman, who—like some of the barnacles that hang on to the Knights of Labor—would like to make a "sit" for himself out of his maudlin sympathy for the workmen. But some of this same office staff would be earning less wages than they are now, and most of them don't earn a great deal and are not underpaid if it weren't for the workmen in the shop who produce the goods in the shop that makes the profit for the manufacturer, as well as a reputation for the production.

"Proctor" is not very high up, but he is not fishing for a situation. He has come all the way from the bottom, though, and he knows how much it would have helped him many a time if he had had an opportunity to discuss mechanical, technical, literary or commercial points with others who, like himself, were trying to earn a livelihood, and at the same time obtain a knowledge of practical matters higher up in these lines. He therefore asks the office-help who read this article, to show it to the foreman and discuss with him the advantage to be obtained from forming, in connection with the manufacturing concern in the city, town, village or community, such an association of workmen as shall be best suited to place and circumstances, and see if this truth can not be satisfactorily demonstrated to be correct, that everything that improves the knowledge and condition of the workman of any manufacturing establishment increases the magnitude and efficiency of the production of the establishment.

There never was a time in the history of the world, that competition was so keen in every commercial or manufacturing enterprise, as the present. Busy, earnest, tireless, plodding, thinking, brainy, willing workers are always in demand. It means systematic study and work for the one who would keep ahead; but it pays, in every way, to make an effort to be wiser than your fellows, and to know part of the unknown that is just in front of you. You will be amazed, my brother workmen, how much more deftly your fingers will be able to do the mechanical work you have to do if you are making a vigorous effort to improve your mind, increase your knowledge and master the difficulties that confront you. And then, when you have learned anything worth learning, try how you get along telling or teaching it to another. That is the true measure of knowledge.

I know of a few small towns and villages over this Province of Ontario where a nice, comfortable, centrally located room has been obtained, and with less than a dozen members to begin with, a Mechanics' Institute or Young Men's Literary Club has been formed, the nucleus of a library started, a number of good literary, mechanical and scientific papers subscribed for, and with such a pleasant, convenient place to spend an evening, it is very little wonder that many of these Associations now have from 25 to 50 members. Night classes for the study of subjects within reach of the members, or along the line of their more important needs, have been and are being carried on among the members. General meetings, for the discussion of some subject or the reading of an essay and an after discussion, have resulted in both pleasure and profit to the members. In the matter of good newspapers also they have found that by thus clubbing together in this way, where each practically takes a different paper, a large addition has been made to their literary income without increasing the outlay.

PROCTOR.



R. T. Hughson, flour mill, Blenheim, Ont., has sold out.

Mr. J. Hall's mill at Casarea, Ont., was burned a week or two ago.

The people of Kirkton Ont., are anxious to see the grist mill at that place rebuilt.

Neepawa, Man., hopes to secure the erection of a new roller mill in the spring.

Two new elevators will be built at Neepawa shortly by J. Law and the Ogilvie Co.

It will be some time before the mill at Yorkton, Assa., can be put in repair again.

The farmers of Chater, Man., are anxious that a grist mill should be built there.

James Mahaffy's new roller mill at Port Albert, Ont., is completed and in operation.

Manitoba flour is said to be displacing American strong brands in the Montreal market.

The people of Morden, Man., are trying to secure the erection of another grain elevator.

Mr. John Barclay, miller and grocer, Springfield, Ont., is reported to have assigned.

James Barclay, miller, O'Leary, Prince Edward Island, is succeeded by C. B. Champion.

The new elevator in connection with the Rapid City, Man., flour mill has just been completed.

Messrs. Downey & Johns, have purchased Mr. Malton's grain chopping mill at Lindsay, Ont.

The partnership existing between Elnes & Williams, millers, Zurich, Ont., has been dissolved.

Messrs. Alexander, Kelly & Co.'s flour mill at Brandon, Man., has a daily capacity of 150 barrels.

The boiler of the Minnedosa, Man., flour mill having been repaired, the mill is again in operation.

A new flour mill will be erected shortly at Brandon, Man., by the Brandon Milling and Elevator Co.

The Department of Indian Affairs has invited tenders for the supply of flour for the Indian Agencies.

Wealthy men of Norwood, Ont., talk of forming a joint stock company to build a first-class grist mill.

Strathclair, Man., will give a substantial bonus towards the establishment of a roller grist mill and elevator.

Leitch Bros. are asking tenders for the re-erection of their flour mill recently destroyed by fire at Oak Lake, Man.

The customs authorities have lately decided that the duty on wheat meal as wheat flour shall be 50 cents per barrel.

There is some talk of a grist mill being erected in Cannington, Ont., in place of the one that was burned down recently.

The Winnipeg Board of Trade has reported against the new Russian wheats as being greatly inferior to the Red 15c.

Mr. J. J. Johnson, with a gang of men, are at work on a new elevator for D. H. McMillan & Co. of Deloraine, Man.

The C. P. R. intend making extensive improvements in their docks, warehouses, elevator and storage capacity at Owen Sound.

Messrs. Alexander, Kelly & Co., of Brandon, Man., operate a flouring mill of 150 barrels capacity, and an oatmeal mill, capacity 100 sacks.

The town council are now engaged with a scheme having in view the making of Owen Sound harbour the very best on the upper lakes.

Messrs. Nansmith & Merillees, Blakeney, Ont., have recently made considerable additions to the building and plant of their oatmeal mill.

It is reported that McArthur Bros., of Lindsay, Ont., have purchased the old mill, and the stone grist mill and water power from the Smith Co.

If Mr. Steckle, of Plattsville, can compromise with his creditors at 20 cents on the dollar, he will sell his mill and devote his attention to brick manufacture.

It is said that Captain D. H. McMillan has received fine pecuniary inducements to remove his mills from Winnipeg. It is not known what course he will take.

During the recent fire at Chatham, Messrs. Campbell, Stevens & Co's flour mill and elevator had a narrow escape from destruction, having caught fire several times.

The Canadian flour trade has for some time past been completely demoralized, and but for the good prices for bran many mills would have been compelled to close down.

A despatch from the Northwest says circulars have been issued asking Manitoba farmers to hold their wheat until the Keewatin mill is completed, as they will then be able to get prices for it.

At a largely attended meeting of citizens of Strathclair, Man., it was resolved to petition the Council to submit a by-law to grant a bonus for the erection of a flour mill and elevator at that place.

Messrs. Campbell, Stevens & Co., of St. Thomas, Ont., are considering the matter of doubling the present capacity of their flour mill, making it 600 barrels per day, instead of 300, as at present.

The *Millers' Gazette*, of London, recently solicited the opinions of British millers regarding the average yield of flour from imported wheat. The replies received show the average yield to be 72½ per cent.

There is money in the elevator business, if it be true as stated that a Montreal elevator company has paid its stockholders a

dividend of 20 per cent. during the last two years, and an average dividend of 14 per cent. per annum for the last sixteen years, besides buying a new plant at a cost of about \$122,000, all on a capital of \$100,000.

Mr. H. N. Ruttan, City Engineer of Winnipeg, writing in the *Commercial*, estimates the present average cost of steam power in that city at 35 cents per horse power per day, and that water power to the extent of a minimum of 5,000 horse power can be obtained at a cost, the interest and sinking fund on which would not exceed 10 cents per horse power per day.

Northwestern Miller.—The foundation for the announcement from Winnipeg that since the opening of the Soo road the Canadian Pacific has been carrying wheat from Minneapolis to the seaboard for 27c. per 100 lbs., less than one half the price Manitobans have to pay, is the Soo tariff, which fixes the rate on wheat to New York at 32½c., via the Soo and Canadian Pacific; Boston and adjacent points, 37½c.; and Philadelphia, 30½c.

The Winnipeg Board of Trade has passed the following resolution: "That the refusal of the Canadian customs authorities to grant certificates to Manitoba grain shippers, who desire to load grain at the International boundary line, where it is placed in bond by the American customs, and securely locked in cars for transportation to Ontario, is a direct discrimination against shippers in this country, and that such refusal on the part of the Canadian customs is calculated to provoke retaliation on the part of the United States, in addition to injuring the interests of Manitoba grain shippers."

The amount of power required to drive a modern roller mill can best be determined by actual tests. We have heretofore published reports of several such tests, and add to the list one which was recently made at the Listman mill in La Crosse, Wis. The mill was run at a capacity of 850 barrels per twenty-four hours, and indicator cards taken at regular intervals showed an average of 340 horse-power, or four tenths of a horse-power per barrel of daily capacity. The cards were remarkably uniform, ranging between 336 and 344 horse-power. So far actual results show that the above ratio of power to daily capacity is a close average, and safe to base calculations upon when planning a new mill. —*Milling Engineer*.

Complaint is frequently made that the product of small mills is not so uniform as the product of large mills, even in cases where the same variety and grade of wheat are used. Close observation convinces me that this is wholly due to the miller, and is in no wise to be charged to the size of the mill. The explanation appears to be that in the large mills the care is more constant and all the operations, being in charge of different men, are more thoroughly watched at every step than in the small mill, where one man has to do all the work. The small mill man is a jack-of-all-trades in and about the mill. One minute he is attending to the fires and the next he is mending a broken belt or tinkering some dislocated piece or part of machinery, and as he does not stop all other machines while attending to one, it is sure to happen that one or more of those running without his supervision will have a frolic and get out of order. A weak spot in a bolting-cloth may develop into a hole and let through the desirable and undesirable in an unbroken stream together, to the great damage of the product. The feed may clog and make the rolls do bad work in smashing the grain, thus rendering future separation very doubtful and insuring a low quality in product. A thousand other things may happen in the every-day experience of the small miller that will not happen to the millers in larger mills, because the latter are not obliged to attend to twenty different things in twenty different parts of the mill at one and the same time. It is no disparagement of the small miller to say that he can not maintain the uniformity in quality of product that distinguishes the product of larger mills with men to manage each process with undivided attention, it is merely acknowledging the kind and degree of difficulties under which he is compelled to labor. —*Milling World*.

At a meeting of the Toronto Board of Trade called to consider the subject of the grain blockade in the Northwest, the following resolutions were adopted after a full discussion: This Board, at this juncture, is desirous of placing on record the fact that between Manitoba and the various provinces of the Dominion there are ties which, while being very close, ought under all circumstances to prove enduring. That whatever is found to be detrimental to the one cannot but of necessity prove hurtful to the other; that the removal of any difficulty which is oppressively felt by one is and must be a benefit to the whole, and that therefore each has in the prosperity of the whole a common interest. That in this connection it notes that while the enormous grain product of the North-West during the past year (variously estimated from ten to twelve millions of bushels) has demonstrated two things, viz.: the wonderful productiveness of the soil, and the advantages which the country offers as a field for immigration; it has also developed a feature quite phenomenal to the history of the country, viz.: that its very wealth has proved a source of serious embarrassment, that the products of the land have been vastly in excess of the appliances to bring them to market. For while it is claimed by the Canadian Pacific Railway Company that it has done everything that was in its power to do, by building additional engines, by leasing others as well as all the cars obtainable from the other companies, the fact remains that it has been unable to afford the full measure of relief so urgently required, so that large quantities of grain still remain piled upon the prairies (as this Board is informed) exposed to the action of the weather, as well as to the possibility of waste from animals. The question as to the best method of relief is one of great gravity, one in which the whole Dominion has a common interest, and this Board, without expressing any opinion upon the equities of the case, conceives it to be of the utmost importance that a remedy ample enough to meet the difficulty should be found with the least possible delay, conceived and carried out in a broad, generous and patriotic spirit. That this Board is of the opinion that free railway development is essential to the commercial success of the North-West, and to the prosperity of the Dominion as connected therewith, and will welcome any measure tending in that direction which may be consistent with the public faith.

AN ECONOMICAL METHOD OF HEATING AND VENTILATING.

THE following valuable paper on the above subject was recently read before the American Society of Mechanical Engineers, by Mr. Henry J. Snell, of Philadelphia.

Various methods have been devised and are in use for heating large rooms, manufactories and public buildings. Some of them take into consideration the ventilation of the buildings as well.

I will describe briefly a method I have had in use in my store at 135 North Third street, Philadelphia, Pa., for the past two winters, which has been very satisfactory. It has been very economical, and dependence could be placed upon its efficiency at all times, no matter what the condition of the weather might be.

A reference to the accompanying sketch will clearly give a correct understanding of the arrangement.

An exhaust fan driven direct by a small upright engine is connected with a "patent air-heater" placed in the basement at the front of the store by an 18-inch galvanized pipe.

An upright boiler in the basement furnishes steam to run the engine; the exhaust steam from the engine is delivered through the exhaust pipe into the base of the air-heater on one side, and the drip and condensed steam is conveyed away through a pipe at the other.

The exhaust steam of the engine furnishes all the heat usually used, but as a precaution, and for use early in the morning, in extremely cold weather, or for use in very moderate weather, in the middle of the day, when it is unnecessary to run the engine, a small live steam pipe is connected with the base of the heater. The fan runs at a very low speed, and is perfectly noiseless. In my case, no conducting pipes for the distribution of the air are necessary, and the variations of temperature in different parts of the store are not observable with the ordinary commercial thermometer. By examining the sketch, it will be seen the store itself becomes one large conducting tube—and the air is used over and over again, enough fresh air coming in through openings around the windows and through doors constantly being opened. An opening near the bottom of the wall surface of the back end is composed of glass; the rest of brick.

The building is five stories and basement, and I only occupy and heat the first and second stories and basement, but I think I could easily heat the whole with my apparatus at a very little increase of cost in fuel.

The engine that drives the fan is three inches in diameter, and has three inches stroke. The wheel in the fan is 36 inches diameter, and 13 1/2 inches wide at the outlet of wheel; the area of discharge of blower 1.76 square feet and the inlet is same size. The heater is about three feet wide, 6 feet 6 inches high and 20 feet deep, and filled with 588 feet of one-inch steam pipe. I am so well satisfied with the results I get from this apparatus that I have not made any close and accurate experiments of what I can do with it. I know from the cost of my fuel that the expense of heating all I occupy is about the same as I formerly paid when I only heated the offices which were partitioned from floor to ceiling and heated with open grate. I might return the condensed water from the heater to the boiler and make a greater saving. This is not done at present.

Possibly before the meeting of the society we may have some cold weather, requiring the use of the apparatus, and if this paper produces any discussion by the members some careful experiments upon its performance may be laid before them; but at present I can give only the results of one imperfect and incomplete observation made during December, when the outside temperature was 45°.

Temperature of the air on its return and just before entering the heater, 59°.

Temperature of air issuing from the blower after passing through the heater, 112°.

Average temperature of air in the room of main store, on first floor, 75°.

Pressure of steam in the boiler by gauge, 40 pounds.

* This floor I only heat occasionally, as it is used principally for the storage of machinery. When necessary to heat it, I open the damper shown directly over the blower, and sufficient heated air will be driven through the opening to heat it comfortably in a few minutes.

Steam Department.

CHIMNEY DRAUGHT.

BY GEO. C. KOHL.

THE fuels most commonly used in this country under steam boilers are wood and coal. The wood is used as fuel in a variety of conditions—as hard wood, slabs, cuttings, saw dust, shavings, etc.—and the kind of wood has some influence, and its condition as to dryness has a very great influence, on its value.

Green wood with the sap in it, has about 50 per cent. of its weight in the form of moisture. This not only diminishes the actual weight of the combustible portion of the fuel, but as it is introduced into the furnace, it passes therefrom in the shape of vapour, and consequently carries away with it a large portion of heat which otherwise would have gone into the boiler.

Wood dried, as dry as it can be made in the open air, contains about 25 per cent. of its weight in the form of water, and wood, equally dry is of same value as fuel, no matter what kind it be, if it be measured by weight. That is, one hundred pound weight of beech, is of same value as one hundred pounds of pine or of any other kind of wood if all are equally dry.

The quantity of air required for the proper combustion of wood is about six pounds weight per pound of wood; and at least as much more should be supplied, because the products of combustion should be diluted, and cause of the difficulty of distributing the air in the furnace and bringing it into chemical contact with the fuel in the state of combustion. Hence to burn wood, about 150 cubic feet of air at the average atmospheric temperature would be required for each pound; and in the chimney this would occupy about 300 cubic feet. In the case of wood burned as cordwood or cuttings, there is not much difficulty in getting the air to

posed and burns as a gas. This is a great gain, as in the ordinary method of burning sawdust under a boiler, the moisture in the fuel is simply evaporated and carries off heat, whereas in the other it is a producer of heat.

A chimney eighty feet high would produce a current flowing into the furnace at about 40 feet per second, and as at least 150 feet of air must enter the furnace for every pound of sawdust burned, the area of the chimney can be reckoned from these data. A more usual way, however, is to make the area of the chimney equal to the area of the tubes or flues of the boiler, or if there be a number of boilers, equal to from one-tenth to one-twentieth the areas of the united fire grates.

Enough has been said to show that the question as to what size of chimney should be used is not so easily determined. This, however, should be remembered, that too strong a draught can always be remedied by either closing the air admission or by shutting a damper between the furnace and the chimney; but if the draught be too weak, there is sure to be vexation and loss. Better have the chimney too high than too low, and too large in area than too small.

A certain firm in Britain using a large number of boilers had frequently been troubled with insufficient draught in some of their boilers. They rearranged the boilers, put them all into one house, and built a chimney that cost \$3,500. A couple of years' experience enabled them to say that the expensive chimney was one of the best investments the firm had ever made. This was strong testimony to the advantages of good draught, as the chimney was an extravagantly ornamental one; and one that would have given as good draught could have been built for one third of the money.

A fairly practical rule might be laid down, that good results may be relied upon if the chimney be at least 80 feet high, and equal in area to the area of all the tubes

in the boilers, or if coal be used, to one-tenth of the fire grate. If the chimney be connected with a number of boilers, better to increase the height, but there is very little advantage in making it more than 150 or 160 feet high. The famous chimney at St. Rollox, Glasgow, is 435 1/2 feet high above ground, and goes down 20 feet below. The foundation part under ground is 50 feet in diameter, and the chimney

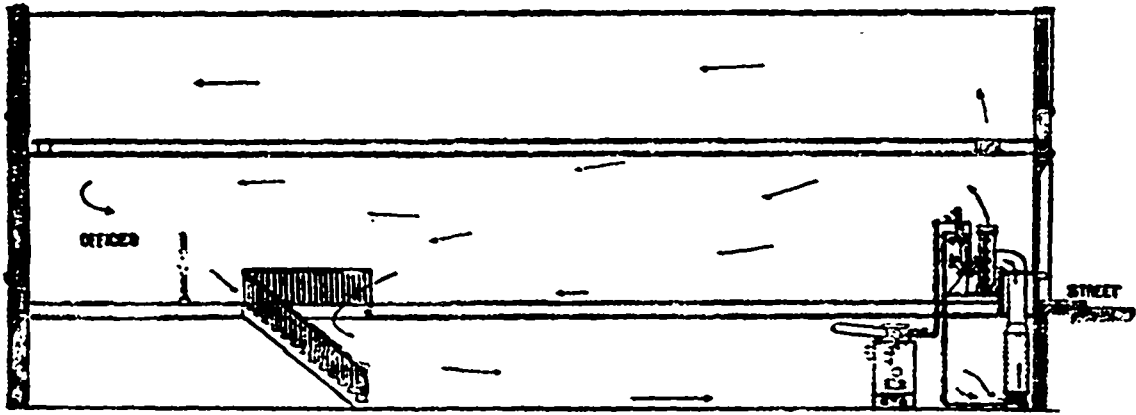
is 40 feet diameter at the ground and 13 1/2 feet at the top. This chimney and another one in Glasgow are the highest chimneys ever built, and are both used to carry away the fumes from chemical works.

New York Evening Sun: Two philosophers sat in a bridge car yesterday afternoon. Said one: "The waste of steam in a city like this is something inconceivable. If I had in dollars the earning power of all the steam that escapes and otherwise goes to waste in and around New York City every day I would soon be one of the richest men in the world. Why, from these car windows you can see hundreds of pipes through which steam is constantly escaping, to say nothing of the boilers on the rivers and bay. The total number of steam boilers in the city is nearly 7,000. The volume of one pound of steam is about twenty-six cubic feet. A cubic inch of water makes about a cubic foot of dry steam. Only a small fraction of the latent heat of steam can be made available in performing work. About seven-tenths of latent heat are lost through the existence of natural conditions over which man can probably never expect to gain control. Two-tenths are lost through imperfections of mechanism, and about one-tenth is all that can be utilized, even in the best engines. So, you see, the daily waste is greater than the actual daily consumption."

Neeppawa, Man., has excellent prospects as a grain market. Arrangements are being made for the erection of three elevators, and it is said to be almost certain that a roller flour mill will be built there next summer.

The Assinibois roller mills Moosomin, have been purchased by Mr. C. J. Smith. He has rented them to Leitch Bros. of Oak Lake, who intend putting them in first-class order and running them to their full capacity.

The citizens of Neeppawa, Man., will vote on March 10th on a by-law to exempt from taxation for five years an elevator of 50,000 bushels capacity; and on a by-law to exempt from taxation for fifteen years a roller mill of at least 100 barrels per day capacity.



AN ECONOMICAL METHOD OF HEATING AND VENTILATING.

NOT THE EQUAL OF RED FYFE WHEAT.

THE Toronto Board of Trade recently appointed a Committee, consisting of Messrs. M. McLaughlin, John Reed, Thomas Flynn, Joseph Harris, R. J. Stark, H. N. Baird, G. A. Chapman, W. Taylor, J. L. Spink, J. Carruthers, R. C. Steele, W. D. Matthews, jun. to examine and report on the value (compared with the hard Manitoba Red Fyfe wheat) of the samples of Russian wheat grown in the Northwest last summer and sent to the Secretary of the Board by Prof. Saunders of the Ottawa Experimental Farm. On a matter of so much importance, the Committee's report will be read with interest. It is as follows:

Your committee met in the afternoon of the 4th February, 1888, examined the samples and discussed the subject, which, in their opinion, is one of very great importance.

The conclusions at which they arrived are as follows:—

The most important test of commercial merit in a spring wheat sample is the percentage and quality of gluten it contains.

The examination made by the committee of sample 7 (the original importation) and of samples 3 and 4 (the samples grown at Plum Creek and Brandon Hills) shows that all three are very deficient in gluten or strength, being not superior to the present standard of No. 2 spring of Ontario growth.

No 2 spring is at present worth 80 cents per 60 lbs. here. No. 1 Manitoba hard, which contains 85 per cent. of Red Fyfe, is worth 90 cents. The answer to the inquiry as to how these wheats would compare in value with Red Fyfe would therefore be—pure Red Fyfe is worth 110 to 120 per bushel more than the samples 7, 3, 4.

The committee selected samples 3 and 4 for comparison for the reason that they were grown in the same section of Manitoba from which comes the bulk of the Red Fyfe, with which they are familiar.

Sample 8 (Kubauka) is the wheat grown to some extent in Ontario under the different names of Arnautka, rice or goose wheat. The demand for this wheat is limited, and when the quantity grown in Ontario was large, as compared with the quantity grown in Ontario now, the price was 20 cents to 28 cents below the price of No. 2 spring, say 35 cents below the price of No. 1 hard Manitoba. This wheat is also a later wheat to ripen than Fyfe wheat.

Sample 9 Saxona is a poor, thin sample, containing a small mixture of Kubauka or Arnautka. If free from this mixture it would inspect No. 3 spring, worth 77c., as against 90 cents for No. 1 hard.

The Ladoga would be a fair marketable wheat of the soft variety, and preferable to badly-frosted Red Fyfe.

If it is a fact that any section of the wheat-growing Northwest cannot be made to produce unfrosted Red Fyfe by proper farming, we would recommend that the Ladoga be tried in such localities, if by further experiments you fail to find a more glutinous wheat, possessing all the ripening quality of the Ladoga.

For the interests of the Northwest, however, it is to be hoped that every experiment will be exhausted in the direction of retaining pure Red Fyfe sowing before settling down to soft wheat of any variety.

An exceptionally bountiful crop of Red Fyfe and an exceptionally poor crop of winter wheat in the same year might result in the price of the latter approximating the price of the Fyfe, because the flours from the two varieties are not interchangeable for many purposes. But no surplus of Red Fyfe and scarcity of such wheats as samples submitted could bring the value of the latter to, or nearly to, the value of Red Fyfe. The Red Fyfe flours will answer in every case where flours from your samples will answer and with greater satisfaction and economy.

Instances are known to some members of the committee of No. 1 hard and No. 2 frosted being reaped side by side from the same field in Manitoba, the soil and the seed the same; the only difference being in the first case the ground was ploughed and harrowed in the fall, thereby admitting of a few days earlier seeding than in the second case, where the ploughing was done in the spring.

In view of the great importance of keeping up the growth of hard wheat important to all interests, but most important of all to the Northwest farmers—the committee repeat that in their opinion the greatest efforts should be made to extend its growth, and if other varieties than Red Fyfe must be used, such varieties as contain the largest percentage and best quality of gluten should be given preference.

For determining the percentage and quality of gluten the committee would recommend chemical analysis of

all samples proposed to be experimented with, this being the one reliable test for a small sample.

The samples last received are excellent in their plumpness and weight, but are quite as soft and deficient in strength as the former samples, and in value would bring about 2 cents per bushel more if offered for sale in quantity than the samples first received.

WOOD-WORKING CHIPS.

OPERATIVES in wood-working establishments are necessarily subjected to the unpleasant and unwholesome effects of dust, and in planing mills and similar establishments it seems to be impossible to escape this nuisance. Modern shops are supplied with machines for carrying away much of the dust and shavings made by wood-working machinery, but even in best-equipped shops the workers are obliged to inhale more dust than is wholesome. I have always noticed that planing mill, saw-mill and furniture factory operatives, and in fact all men who work in wood, have a peculiar appearance that is the result of inhaling wood dust. An observer would never mistake an old planing mill operator for a worker in a machine shop. Each bears in his face and general appearance the marks of his occupation.

In wood-working shops it is the men in smaller plants who suffer most from the baneful dust-nuisance. I have seen large and well-furnished planing mills in which there was very little dust flying, even when every machine was in full operation, while in a small shop I have seen one planer make the air solid and unbreathable with dust. Every occupation has its unpleasant features and this is the most unpleasant feature of wood-working.

Owners of expensive and delicate wood-working machinery too often waste by economy misapplied. Not long ago I visited an old friend who owns a large establishment. He was complaining about a new planer which he had lately put in. It would not do satisfactory work. It seemed to be balky. The superintendent pronounced it "no good," and it was left standing idle. At my request the machine was started and a specimen of the work was brought to me. Examination of the work and then of the machine enabled me to remove the cause of trouble in less than a half-hour! The machine was all right. It is one of the planers built by one of the best firms in the country, and the trouble was in the operators, not in the machine. The operators were not men of skill and tact, and every machine in the place showed the effects of their want of judgment. They were "cheap" men so far as the pay-roll was concerned, but they were very dear men when the owner made up his record of profit and loss and reputation at the end of the year.

In the case referred to a change was made. A new superintendent was secured—a man who has tact skill and experience, and my friend informs me that already he sees the benefits of the change. All the machines now run well and satisfactorily. Stoppages are fewer. Repairs are less. Customers are better pleased with their work. The men are instructed how to get the best work out of every tool. The new manager receives twice the salary of the old one, but the owner says that, where every dollar paid to the old one seemed to be wasted, every dollar paid to the new one seems to be merely a good investment that brings immediate returns.

The moral is that good men are the best, the safest and the cheapest, even though their salaries are larger than those of inferior men. A good operator never furnishes machines for the second-hand market. He wears each one until there is no more paying wear in it. When he has "got through" with it, the planer is fit only for the scrap-pile.

Second-hand machinery has generally produced the "half-way" operator. He is the worker who can take care of a tool as long as the tool takes care of itself, and who fails when the tool through wear and tear needs skillful treatment. After the "first edge" is off, the second-hand man wants to throw it out, to sell it to some one else, to replace it with a new one. He is the expensive man for an owner to employ. Even if he gives his services, he is a dear employe. He can never be "cheap" because he can never be "good." Employers should remember that the man conscious of his skill and value, who demands the best pay, is generally the cheapest worker in the end, while the man conscious of his own failings, who will work for any salary, is generally the most expensive and least satisfactory.

Does your engineer force the fire in getting up steam? Does he use the heat starting with cold water that he uses in starting with hot water? If he do, put a flea in his ear. Slow fire is the best and safest.—"Job" in *Lumber World*.



A TIGHT JOINT.—An ether-tight joint can be made with a screw cap by just rubbing common bar soap in the thread. The ether will not penetrate through the soap.

TO TAKE PAINT SPOTS OFF OF WOOD.—To take spots of paint off wood, lay a thick coating of lime and soda mixed together over it, letting it stay twenty-four hours, then wash off with warm water, and the spot will have disappeared.

A HINT TO AMATEUR WOOD CARVERS.—In producing relief it is not necessary to cut away the ground of the wood to the depth of the design in relief, as a portion of the thickness necessary may be obtained by gluing on extra thicknesses of wood.

A series of experiments recently made by a French metallurgist are stated to have proved that steel loses weight by rust about twice as rapidly as cast iron when exposed to moist air. Acidulated water was found to dissolve cast iron much more rapidly than steel.

FLEXIBLE MUCILAGE.—To 20 parts of alcohol add one part of silicylic acid, 3 parts of soft soap, and 3 parts of glycerine. Shake well, and then add a mucilage made of 83 parts of gum arabic and 180 parts of water. This is said to keep well, and to be thoroughly elastic.

The cost of the oxygen is trifling, and it is evident from the results obtained in brazing that the consumption of gas would be considerably less than one-fourth that necessary with an air blast, irrespective of the fact that welding is possible with an oxygen-blast, whereas it is not possible if air is used.

One of the rules for spiral springs, when made of round steel, is to multiply the cube of the diameter of the steel wire in inches by the amount that it is to be deflected for each coil, and this product by 75,000, then divide by the diameter of the spring, measuring from the centre of the wire, and the quotient will be the force exerted in pounds.

TO REMOVE PARTICLES FROM THE EYE.—The following is recommended as an efficient means of removing particles from the eye: Make a loop by doubling a horse hair. Raise the lid of the eye in which is the foreign particle; slip the loop over it, and, placing the lid in contact with the eyeball, withdraw the loop, and the particle will be drawn out with it.

The surface of iron heated to welding heat by this means comes out singularly clean and free from scale; and a small bottle of compressed oxygen, with a blowpipe and a moderate gas supply, would make the repairs of machinery, boilers, brewing coppers and other unwieldy apparatus a very simple matter. The trouble and difficulty of making good boiler crowns, which so frequently "come down," would be very small indeed, when the workman has an unlimited source of heat at command, under perfect and instant control.

NEW METHOD OF BRAZING AND WELDING.—Mr. Thomas Fletcher writes as follows to the leading English mechanical journals:—The cheapening of oxygen by Hriin's process of manufacture has put into the hands of metal workers a new power. I have recently made a few experiments with the compressed oxygen and coal gas and found that with a half-inch gas supply a joint could be brazed in a 2-inch wrought-iron pipe in about one minute, the heat being very short, the redness not extending over one inch on each side of the joint.

A SOLVENT FOR RUST.—It is often very difficult and sometimes impossible to remove rust from articles made of iron. Those which are most thickly coated are most easily cleaned by being immersed in a solution, nearly saturated, of chloride of tin. The length of time they remain in this bath is determined by the thickness of the coating of rust. Generally twelve to twenty-four hours is long enough. The solution ought not to contain a great excess of acid if the iron itself be not attacked. On taking them from the bath the articles are rinsed first in water, then in ammonia and quickly dried. The iron when thus treated has the appearance of dull silver. A simple polishing gives it its normal appearance. We believe this process to be susceptible of numerous applications, and that it is destined to render great service in many industries.

The appearance of the surface after brazing led me to experiment further with welding, a process which is not possible with ordinary coal gas and air, owing to the formation of magnetic oxide on the surfaces. Contrary to my expectation a good weld was obtained on an iron wire one-eighth in diameter, with a very small blowpipe, having an air jet about 1-32 in diameter. This matter requires to be taken up and tried on a large scale for such work as welding boiler plates, which, it appears to me, can be done perfectly with far less trouble than would be required to braze an ordinary joint. The great advantage of this would be that the boilers would require no handling, but could be welded with an ordinary large blowpipe in position, and with about one-tenth the labor at present necessary.

The term incandescence, so much used at present, indicates a white heat, or the glowing whiteness of a body caused by intense heat. The little glass bulbs, remarks a writer on this subject, with their brilliant horse-shoe of glowing filament, attract so more attention than the flickering gas jet. But the facts about the gas jet are, unlike those of the electric lamp, easily and generally understood. Both produce light by incandescence, the molecules of gas being rendered incandescent by the heat generated by the combustion of other molecules. The blue portion of every gas flame is where combustion is taking place, and from there comes the heat which keeps the rest in a state of incandescence. With the electric lamp, it is the heat produced by the friction of an electric current compelled to go through a fine carbon filament which raises that filament to a condition of incandescence which produces light.

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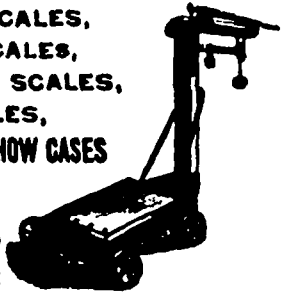
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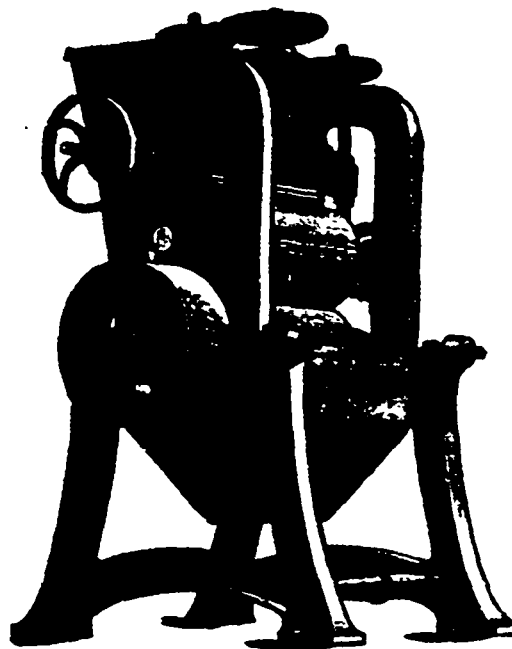
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CAPACITY—50 Barrels per Day from Fall Wheat.

TESTIMONIAL

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

ABINGDON, September 18th, 1887

JAMES JONES, ESQ., Thorold, Ont.

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

Yours truly,

R. A. SHEPHERD.

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



Apsley, Ont. lumbermen say this has been a fine season. Prospects are good for next season all over the Parry Sound district.

Mr. Wm. Asselstine, Roblin, Ont., is building a new shingle mill.

Mr. John Readhead is building a saw mill at St. Arns, near Lowville, Ont.

The mill's at Bobcaygeon will probably commence running about the 1st of April.

Mr. James Thompson is about to put in operation a new saw mill at Orkney, Ont.

Over 700 men have been employed in the mills north of Watton, Ont., this winter.

Mr. John Haley, of St. Mary's, is building a new saw mill on his premises near the Victoria mills.

The lumber mills recently burned at Milltown, N.B., will be rebuilt by Chas. F. Fodd & Son.

About fifteen mills have been built in the Province of New Brunswick during the present season.

Messrs. Kincard & McWilliams, planing mill operators, Peterboro', Ont., have dissolved partnership.

It is estimated that the use of the band saw in saw mills will effect a saving of 20 per cent in material.

Lumber operations are being carried on extensively by A. L. Wright and A. J. Babang, of Moncton, N.B.

The number of logs being brought to Peterboro' this winter is extra large, and the mills will be well supplied.

Mr. John T. Kerr, will have completed and in operation at an early day his new saw mill at Iona Station, Ont.

A large force of men are now operating in the spruce timber belt of the Riding Mountain, Northern Manitoba.

It is estimated that about four million feet of lumber will be cut at Salmon River, Queen's Co. N.Y., this season.

David Henderson, Tilbury Centre, Ont., is about to start a new saw mill on the 14th concession of Tilbury East.

Advices from Quebec timber merchants now in Europe report a fair number of contracts made for next summer's delivery.

W. H. Vesey & Son intend building a saw mill at the thoroughfare between North and Grand Lakes, N.B., in the spring.

A new saw mill will probably be erected where the Manitoba and Northwestern crosses Brit Tail creek, four miles from Battle.

C. F. White of Sussex, lumbering at Apple River, N.S., has 200 men and 70 horses in the woods. He expects to get out 9,000,000 feet.

Mr. F. Gallath, of Bethany, Ont., is about to build a saw mill there. The mill machinery is from the establishment of Leonard & Son, London, Ont.

Messrs. Lowring & Co. have already commenced operations in their shingle mill at Coldwater, Ont., and other mills are being prepared for an early start.

Mr. William Atue, of Milverton, Ont., has purchased the Passmore & Whaley mill on the 12th con. Elma, for \$500. Operations will begin about the 1st of March.

Mr. David Henderson, of Tilbury Centre, Ont., has recently erected a mill on the 14th concession of Mersea Township, and expects to get it in operation this winter.

It is said that Mr. Geo. Ateman, of Washago, has purchased the South Falls shingle and saw mills of Fred. Brasher, of Bracebridge, and will shortly commence operations.

Wallaceburg, Ont. lumbermen are very busy. The woods and roads were never in better condition for getting out the stock, and some of the mills have already enough for the season.

As an outcome of the agreement of the Lake of the Woods lumbermen to form an association, there is every probability of an advance of 52 per cent in the price of lumber in the Winnipeg markets.

The *Monetary Times* is correct in the opinion that Canada need be in no hurry to get rid of her timber. It will pay for keeping for a while, and those who refuse it now will have to pay the extra price in future.

The Georgian Bay Consolidated Lumber Co. will cut this winter about 50,000,000 feet, in addition to about 350,000,000 feet board pine. The probable cut in the five mills will be from 25,000,000 to 50,000,000 feet.

Henson, Weston & Co., Ottawa, have made a sale of five million feet of lumber to the Export Lumber Company, of Montreal, at about \$15 per thousand. The lumber is intended for shipment to South America.

The annual meeting of the Midland and North Shore Lumber Co. took place at Peterboro a few days since. There was a full attendance of directors, the reports were all of a satisfactory nature and all the old officers were re-elected.

Messrs. McLaren, Edwards & Co., late the Canada Lumber Co., have decided to establish their mill at Carleton Place. The establishment, when completed, will surpass anything of the kind in the Dominion, employing 400 men.

The *Tara Leader* says Hepworth downs any inland station in Ontario in its output of forest products. It is estimated that the output of lumber this year will total 7,000,000 feet to be supplemented by immense quantities of timber poles, ties and tanbark.

There was lately hauled into Ellison's mill, Port Stanley, four chestnut logs out of the same tree, three of them 10 feet long and the other 12 feet long, which, when sawed, made 4,000 feet of inch lumber. Head sawyer Kaseley says they were the largest chestnut logs ever sawn by him.

The Parry Sound Lumber Co., Parry Sound, Ont., are getting out about 9,000 feet to saw, which with 4,000 feet wintered over, will give them 13,000 feet to cut next summer. They are building a new shingle mill of about ten million capacity, which is expected to be ready in April.

By a system of dams Mr. Boyd will raise the level of the various creeks in the Township of Snowdon, Ont., and thereby effect a very large saving in expense in drawing logs. There are now about six hundred men employed in Boyd's shanties, and they will get out enough logs to cut nearly thirty million feet of lumber.

Messrs. Churchill & Sim, of 29 Clement's lane, London, E.C., in their monthly wood circular, dated February 6th, say: A parcel of 9,000 spruce deals, etc., represents the only arrival from Canada. More business has been going in the cheaper descriptions of pine deals, etc., at somewhat improved values, while the market has remained inactive for firsts and seconds, without any variation in the quotations. Spruce is very tight in stock and still very cheap in price, at the slight advance that has been required some moderate sales have been made, and the market may be considered as quite safe until the re-opening of the St. Lawrence. For timber there has been a better demand, coming chiefly from the country, and quotations are consequently higher and the stock reduced.

The Ontario Lumbermen's Association held its first annual meeting in this city on the 9th of Feb., and elected the following officers: President, A. H. Campbell, Toronto, Secretary Treasurer, J. B. Millar, Parry Sound, Executive Committee, M. M. Boyd, Bobcaygeon, J. M. Irwin, Peterboro', D. Gilmour, Trenton, A. H. Campbell, Toronto, James McLaren, Buckingham, John Waldie, Toronto, John Charlton, M.P., Lynedock, J. L. Burton, Barrie, E. H. Bronson, M.P.P., W. C. Colwell, Lanark, H. H. Cook, M.P., Toronto, M. Beament, Parrie. It was decided to increase the price of bill stuff at the mills on Georgian Bay to \$19 per thousand. The following resolution in favor of unrestricted reciprocity in trade with the United States was adopted: "That the Lumbermen's Association of Ontario appreciate the great importance to the lumbering interest as well as to the mining, fishing and other interests of the Dominion of obtaining free access to the great national market in the United States for the products of Canada, and that we cordially endorse and sustain the movement for obtaining free commercial intercourse between the United States and Canada by means of commercial union and unrestricted reciprocity to be secured by treaty arrangements that will duly guard and protect the interests of the great producing classes of this country."

THE CHARLOTTETOWN MILLING COMPANY'S NEW MILL.

A CORRESPONDENT sends the *MECHANICAL AND MILLING NEWS* a description of the new flour mill just completed at Charlottetown, P.E.I., for the Charlottetown Milling Co. The mill is built of wood, is four storeys in height, size 50x30 feet, with boiler and engine house attached, 46x26 feet. The necessary driving power is supplied by a 40 h.p. engine.

The basement contains the cleaning machinery, consisting of separator, cockle separator, and smutter; the second floor, twelve pairs of rolls, five on wheat, five on middlings, and two on germ, and also two flour packers; the third floor, two universal reels, an aspirator, four purifiers, middlings and bran dusters; the fourth floor, four universal flour dressers, five scalpors, bolter and dust collector and heads of thirty elevators.

The machinery for the mill was supplied by Messrs. Goldie & McCullough, of Galt, Ont., and was placed in position under the supervision of Mr. Edward Reace. The mill which has a capacity of 80 barrels a day, is said to be doing excellent work under the management of Mr. D. Plewes formerly with Messrs. Cahill & Co., of Mt. Forest, Ont.

TEMPERING STEEL WITH ELECTRICITY.

AT the shop of the Sadgwick Mainspring Co. can be seen a very interesting application of electricity to the arts. It consists of tempering watch springs, by means of the electric current. In one part of the room stands what is known to the trade as one-light dynamo. The conductors from the dynamo lead to another part of the room, to a bench on which stands an ordinary oil tempering bath. One of the conductors connects with a point within the oil bath, and the other to a point without. The piece of flat soft steel wire, that is to be tempered to the blue color, is fed under the contact point on the outside of the bath first and then under the one on the inside. When it reaches the latter the circuit is complete, and the wire immediately and uniformly becomes heated. No means have been taken to measure the current exactly for the purpose of doing the whole work mechanically. The variation in the percentage of carbon in different pieces of steel forbids the delicate process of tempering from becoming a purely mechanical piece of work. Therefore, with the electric current as with a fire the color of the steel determines the length of time that it shall be heated. Several advantages are claimed for this process of tempering. The chief one is that the steel does not have time to oxidize after it has been heated to the proper color before it is under cover of the oil and consequently that the steel wire is of the same thickness when it is tempered as it was before it

entered the process. The heating is uniform throughout the length of the spring and there is less liability of defective spots. The process is a rapid one, the springs being heated and passing into the bath at the rate of four inches a second. — *Western Electrician*.

AMONG THE MANUFACTURERS.

By RAMBLER.

I AM reminded by the editor of the *MECHANICAL AND MILLING NEWS* that for several months past I have neglected my duty to the readers of this Journal, so I hasten to apologize for my shortcomings, and promise to keep them posted in future regarding manufacturing matters in the various parts of the country over which I travel.

BRANTFORD.

While on a brief visit to Brantford the other day I was shown through the Waterous Company's large establishment by the courteous manager. Entering first the machine shop, I found it perfectly equipped with all machines necessary for the manufacture of every kind of saw-mill and wood-working machinery, stationary and portable engines, etc. Passing through another department devoted to the manufacture of wheels for portable engines, I found myself in the wood-working department, where a large quantity of mill machinery was in process of construction. Here, also, workmen were engaged on a new chop mill which the Company intend soon to place in the market. On visiting the moulding shop I was informed that it is the Company's intention to enlarge this department in the spring, as with their present facilities they are unable to turn out castings fast enough. Before leaving the works my attention was drawn to a shipment of goods destined for Australia, and to another to Peru. The Company have lately obtained the right for Canada to manufacture the Denning steam boiler for heating public and private buildings. They are also manufacturers of steam fire engines. In every department the Company appears to be doing a brisk trade, and they give employment to a large number of men.

GALT.

My next stopping place after leaving Brantford was Galt. I always enjoy a visit to the Canadian Manchester. There is an air of solidity about the place and the people that is certain to favorably impress an outsider. I found no talk of "hard times" here such as has greeted my ears so frequently in other towns of late. Everybody in Galt appeared to be busy, both manufacturers and mechanics, and in consequence everybody seemed contented.

The immense manufactory of Messrs. Goldie & McCulloch, had still further added to its immensity since I last saw it by the enlargement of the machine shops. A glance inside the works showed that even now there is no spare room, every foot of space being occupied by workmen, machinery and materials of manufacture. One's first thought on entering these mammoth workshops is—from whence come all the orders to keep so many hands and machines going. On putting this question to the proprietor he is told that the establishment draws its trade from every part of Canada, from Prince Edward's Island on the east to British Columbia on the West. Then one becomes impressed with the thought that this home market of ours is not so narrow or so limited as some people would have us believe.

My Scotch friend (everybody is Scotch in Galt) Parkins, the file maker, seems to be steadily increasing his trade, and on the occasion of my visit showed me an order he had just received for sixty-three dozen files for one firm.

The manufacturers of wood-working machinery, Messrs. Cowan & Co., Cant Bros. and MacGregor, Gourlay & Co., all reported plenty of orders on hand.

PRESTON.

An hour or two in Preston gave me an opportunity of walking through the extensive works of Clare Bros. This firm have a very complete and well-managed establishment for the manufacture of stoves and hot air furnaces, in both of which lines they have a large and profitable trade.

A description of Messrs. Stahlschmidt & Co.'s factory for the manufacture of office, school and lodge furniture, is not needed here, as I remember having seen one in your exhibition number last year. I found the establishment full of workmen and evidently prospering.

GUELPH.

Trade in the Royal City appears to be well-nigh at a stand-still. The contrast in this respect between Guelph and the other towns I had visited, was very marked. The only manufactory that seemed to display any amount of activity was that of Bell & Co., who are building an addition to their already large works for the manufacture of organs. More anon.

EFFECT OF FIRE AND WATER ON METAL MACHINERY.

THE question as above stated would hardly seem one upon which the thoughts of the engineer, tool maker or machinist could be turned with any really valuable results, says the *American Engineer*. But as with the average basis of economy in the engine, the operation of a factory, machine shop or steam plant, the points of advantage are of a quite minimum character; so it is with fire insurance. If the machines, etc., were constructed so that a minimum loss would be the result of a fire, (except where total destruction is concerned,) the cost of insurance would be materially decreased to the insured, and the salvage considerably increased to the companies. It is not in the power of the machine constructor to carefully watch the effects of fires, where in some cases a positive outline is clearly defined in a building, where the fires went and where it stopped, the actual reasons for which no one can with any accuracy define. As it is almost impossible to define the actual origin of a fire, so, too, it is impossible to account for the twists and turns taken by the heat and flames. A machine stands here close to that unfortunate necessity, the elevator, and is hardly injured, the paint hardly blistered; while twenty or thirty feet away, and apparently out of the direct line of the fire, everything is cracked, bent, twisted and generally destroyed. The nature, capacity and general doings of draughts and heat in a fire cannot be considered as subject to the control of anyone; they must be put out, killed and conquered.

As a comparison of results, a pair of examples may be cited: A line of shafting hangs to the overhead beams of a floor, second from the roof. The top floor is burned through half the depth of the building; the front portion of the roof has fallen in, and is well burned up. The beams forming the floor next the roof are also so badly burned that they will have to be renewed. The elevator runs through this portion of the floor beams, and as usual has been the means of spreading the fire. Two lines of shafting extend the whole length of the building, and the ends of both these lines extend some twenty feet into the space where the hottest portion of the fire was located—the front of the building; and yet with all this exposure the only apparent damage to the shafting is a coating of bright red rust. The shafting is not bent at any portion, the hangers are intact and the pulleys without a crack. At the end of some weeks after the fire, and not having been touched, (insurance not having been settled), a slight grip on a 20-inch pulley turns both complete lengths. The bright red rust on everything from hanger bolts down shows what has been going on; the paint, grease and dirt have all been burned completely off, and water and exposure have done the rest. Again, within fifteen feet of the elevator and about twenty feet of the rusty shafting, hang some light frames, some belting and some belt lacing, no portion of which have been damaged. In the second case a much less destructive fire, where the overhead beams and planking had not been burned through, the shafting was warped, the pulleys broken and the hangers loose from the beams. There is considerable difference between the two results, and that difference is really attributable to lack of judgment and care in the make-up and hanging of the shafting. In the first case the shafting was well supported in short lengths on its hangers; the hangers were carefully bolted to the timbers, the pulleys were of the best proportion to be exposed to heat and sudden chill. A loose pulley close to and exposed to the flames turned with the usual freedom, showing such a neat fit that the exposure had not rusted it fast. In the second case the carelessness was clearly apparent, accompanied by ignorance or false economy. The hangers were set far apart; they were poorly made, the shafting of small diameter, and the weight of pulleys was enough to sag the shafting cold, let alone bend it when hot.

Water damage in the case of average metal machinery is not so bad as with wooden machinery. Surface injury is the only effect with water or moisture alone. Where fire and water come in contact with the lighter metal attachments, damage is almost inevitable. They cannot stand the sudden effects of hasty expansion and contraction. As in the second case cited carelessness was the cause of considerable damage and loss, carelessness of another kind often saves considerable, especially when water damage rather than that of fire prevails. A settlement of grease and dust on tools or attachments not regularly used often stops damage by water, and renders the proof of the damage apparent.

The same may be said of large machinery also, and while such carelessness is hardly commendable in the ordinary operation of metal machinery, heavy damage by water has very often been stopped by it. A lesson,

however, should be taken from this, that where tools of any value are used, as for instance the dies, punches, gauges, etc., in the manufacture of metal wire, they should be well oiled or greased and stowed where fire and heat will reach them with the greatest difficulty. The oiling will save them from rust under ordinary atmospheric exposure, and will save them from water damage in case of a fire.

BIOGRAPHY OF THE LATE WM. GREY.

THE milling fraternity of Canada will learn with deep regret of the death of Mr. Wm. Grey, of the firm of Wm. & J. G. Grey, mill furnishers, Toronto, which took place in this city on Feb. 18th. Mr. Grey was born at Sandwich, England, April 10th, 1814. His parents afterwards moved to Dover, where he was brought up and learned his trade in one of the old-fashioned wind-mills on the downs near that place. He came to America in 1832, being then 18 years of age, and engaged in the milling business on the celebrated Genesee Falls at Rochester, N. Y., and afterwards at Black Rock, near Buffalo.

He came to Canada in 1842, and took charge of the Pine Grove mills, twenty miles north of Toronto, for the late John W. Gamble, where he remained over twenty years. While there, he married Mr. Gamble's eldest daughter, and as the fruits of this marriage, had four children—three daughters and one son. Two of the daughters have preceded him to the grave. The son, John G. Grey, daughter, Mrs. Hills, and his wife, still survive. In 1863 he took charge of the Humberford Mills for the late Henry John Boulton, and was with him at the time and assisted in the building of



the Dominion Mills on the corner of Bay and Esplanade Streets, Toronto. Leaving Mr. Boulton, he worked as journeyman miller for several years at different places—Kincardine, Amherstburg, London, Listowel, Hastings—and in 1874 was appointed Flour Inspector for Toronto, York and Peel, which office he held till 1876. At this time he started the mill furnishing and machinery business, and in 1877 was joined in it by his son. In 1856 he visited England and France, and was associated with many improvements in the milling business, and made the celebrated Pine Grove Mills, "Ne Plus Ultra" flour. His last active work was voluntarily going to England in 1884-5 and producing material evidence in the celebrated purifier case of Smith vs. Grey, which he had the satisfaction of seeing brought to a successful and honorable close. The last two years his health has been gradually failing, and a chill taken on Jan. 6th forced him to bed on Jan. 9th, from which he never arose. Gradually becoming weaker, he at last gently fell asleep Feb. 18, 1888, aged 74 years. His wide experience in the milling business assisted very materially in successfully building up the flourishing establishment in this city of which he was the founder.

CONCLUDED HE MUST HAVE IT.

IROQUOIS, Feb. 23rd, 1888.

Editor Mechanical and Milling News:

Enclosed please find one dollar for one year's subscription to your valuable Journal. I saw the February number and concluded I must have it. I am head miller for M. F. Beach. We are very busy, running the mills day and night steadily, turning out one hundred and fifty barrels per day. The machinery was furnished by Goldie & McCulloch, of Galt. We are making better flour and better clean up than a good many mills we hear so much blowing about. Wishing you every prosperity, I am yours truly,

ARCH. E. CAMERON,
Iroquois Roller Mills.

TAKING UP BELTS WITH A HAND SCREW.

THE place to have fun with the belt tightener says the *Boston Journal of Commerce* is down in the wheel room where the main belt has taken a notion to pile itself all up into a heap into one corner of the room and the governor is doing its best to keep the water wheel from running away with itself. A belt of this kind is examined every noon and evening and the lacing has the appearance of being none the worse from hard usage till just the moment it lets go and an hour's racket is on hand. Three hands, including the oiler, start for a rope to pull the belt on with, and before either one returns the super has got an old line around the wheel and is making fast to one end of the belt. What a time they have with all the ladders and step-ladders that are brought into use. The heavy cast iron rig adds music to the affair when it has to be held up by two men on tip toes as far as they can reach, and is no wonder that the eccentric cross-bars get in wrong end to. In lacing, where the time is precious and every moment is of extreme value, three men with a single lace at their fingers' end can get along about as a single man with three lacings. Each can jump for a separate lace hole left by the belt punch and arrive there at the same moment, but one or the other will be ready to draw his in first when the others have got to start over again. There is a belt awl to look out for, from some one who is running it wild from the opposite side of the belt while the loose ends of the lacings are being passed through for the final finish, as an awl of the belt-awl style takes hold wonderfully around the nails, and it is no wonder that the oiler has no thanks for any one and would much prefer to do the job himself. Away from the wheel house where all the moisture is found, a glue joint is the thing to use, if we don't forget to give split lap the right direction, and belt clamps should be used on every width of belting. There has been more time wasted in trying to get at the right length by guess-work and then being obliged to pull the lacing apart or to rip the cement joint open again, than would pay for two or three sets of belt tighteners. They can be rigged up very cheaply and the smallest of belts can be drawn just where it will seem right when laced and a cement joint made with a pot of the best glue, and no signs of nails or pegs brought into use. A belt tightener made out of a pair of hand screws gives all the room to work in we want. We like them for one thing; they can be opened by the crank motion that is familiar with every one interested in woodwork and allows the advantage of bringing on the final strain with the bottom screw, which has the most leverage. The jaws are of iron and are cast to set on the hand-screw with a joint bolt, and are made to operate in hand-screw style, bringing the bite on either edge or evenly across the belt.

HYDRAULIC FORGING PRESS.

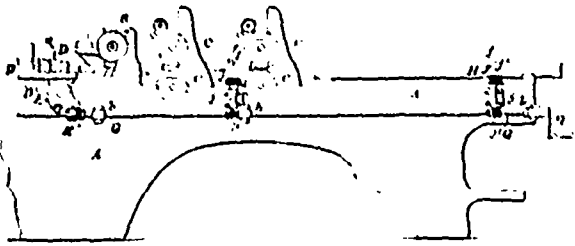
MR. F. A. Krupp, the head of the great works of Essen, recently visited the Atlas Steel and Iron Works, Sheffield, England. The special object of the visit, says the *Universal Engineer*, was to witness the action of the gigantic hydraulic forging press, lately added to the plant of the Atlas Works. This press, which is believed to be the most powerful and efficient forging-tool at present in existence, nominally exerts a total force of 4,000 tons, but its actual full power is considerably greater. Three large furnaces, each capable of heating an ingot of 100 tons, prepare the work for the massive machine, and two travelling cranes, each capable of lifting 150 tons with ease, convey the forgings from the furnace to the press, and manipulate them as required. One man who stands at the floor-level in a cage suspended from the crane and travelling with it, has under his hand four valves by which he lifts, lowers, advances, retires, moves sideways or revolves the forging on its own axis. A second man works the lever which governs the strokes of the pistons, and by observing an index in front of him, regulates with the utmost nicety the distance from the anvil at which the top tool is to cease its advance. A foremaster and several furnace-men are also required to superintend and to feed the apparatus, but its working is entirely under the control of the two men referred to. The press is manufactured by Tannett, Walker & Co., and will be put in the works at Essen by Mr. Krupp.

Wm. and J. G. Grey have secured the contract of changing over the stone mill of Mrs. Bonfield, of Eganville, Ont., to a full roller mill of a capacity of 60 bbls. per day. The plant will consist of a full line of wheat cleaners, rolls, scalpels, flour dressers, purifiers, dusters and packers. The work is to be proceeded with at once, and the Messrs. Grey are now busy getting out the plans and machinery and expect to start a gang of millwrights on the job at once.

Latest Canadian Patents.

Wood-Planting Machine.

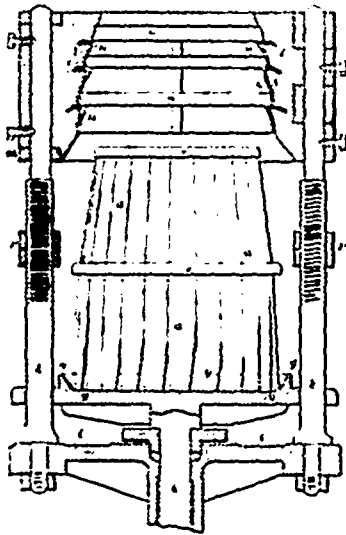
377,250. William H. Gray, Brooklyn, N.Y., assignor to the Glen Cove Machine Company (limited) same place. Filed May 23, 1887. Serial No. 230,077. Dated Jan. 31, 1888.



Claim. The combination, with the table and cross-bar H, slotted transversely of the machine, and the side guide, F, overlying the same, of the longitudinal side shaft, G, upright shafts J, connected by worm-gearing with said shaft G, and surmounted by chain-driving wheels J', the idler-wheels J at the opposite side of the machine, endless chains J, passing around said wheels in a horizontal plane and each having in its length a block, K, guided on the table or cross-bar, and bolts L connecting said blocks with the side guide through the slots in the table and cross-bar

Machine for Making Casks.

377,364. Charles Hewitt and William W. Hewitt, Swanscombe, county of Kent, England. Filed June 23 1886. Serial No. 205,600. Patented in England Jan 11 1886, No. 446, in France June 8, 1886, No. 176,630, in Belgium June 9, 1886, No. 73,418, in Germany June 16, 1886, No. 39,240, in Portugal July 9, 1886, No. 1,063, and in Spain Aug. 27, 1886, No. 9,247. Dated Jan. 31, 1888

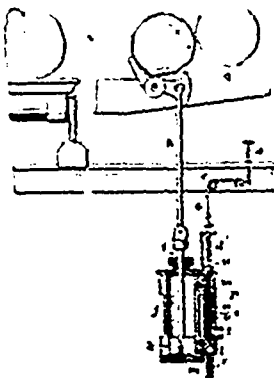


Claim 1. The method of trussing and applying permanent hoops to a cask, consisting in forcing the staves when suitably arranged and already grooved to receive the head, but not bent to final form into a bell or cone, with the hoops supported as described, and, as the staves are drawn together again by the bell or cone, inserting the head into its place, thereby simultaneously trussing and hooping.

2. The trussing cone or bell having grooves to receive the permanent hoops of the cask, and shoulders in the grooves which support the hoops on the upper side, and yielding supports beneath the grooves which sustain the hoops on the under side.

Log Rolling Device.

377,717. Lewis T. Kline, Bay City, Mich. Filed Aug. 27, 1886. Serial No. 211,668. Dated Feb. 7, 1888



Claim 1. The combination, in a device for rolling logs, of a log deck or skidway, a shaft journaled in the skid timbers and provided with curved arms rigidly secured thereto and a piston having a rod pivotally connected to one of the arms, with a steam cushioning cylinder enclosing the piston and provided with a valve and receiving and exhaust ports.

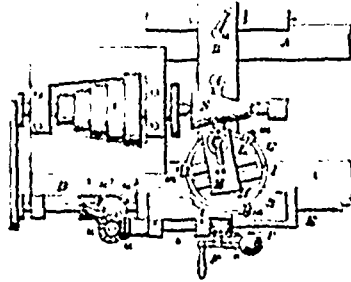
2. The combination, in a device for rolling logs, of a shaft journaled below the log receiving timbers and provided with extended arms, and a steam cylinder having a piston connected with the arms and provided with a valve and steam cushioning ports, with devices operating the valve, consisting, substantially, of a line, c', secured by one end to the valve stem and supported by one or more pulleys, c', and a standard, a', located near one of the pulleys c', and with its lower end secured to the opposite end of the line c'.

3. The combination in a device for rolling logs, of a shaft journaled below the log receiving timbers and provided with extended arms, a steam cylinder having a piston connected with

the arms and provided with a steam cushioning valve and ports, and a line, c', secured to the valve stem by one end and to a vertical standard, a', by the opposite end and supported by one or more pulleys, c', with a lever, f', pivotally secured at its lower end and having its upper end extending above the log receiving timbers, and provided with a pulley, h', on its central portion, and a line, i', secured by one end to the cord c' and passed over the pulley h', and a weight, j', secured to the opposite end of the line i'.

Taper Attachment for Lathes.

376,845. Edward A. Alpress, New Britain, Conn. Filed March 31, 1887. Serial No. 233,102. Dated Jan. 24, 1888.



Claim 1. The combination of the carriage and head of an engine lathe with the herein described taper attachment, consisting of the upper and lower beds concentrically mounted one upon the other, and adjustably secured to the lathe carriage, the driving shaft e, pinion g, double faced gear j, the feed screw I, having a pinion connected with said double faced gear, the supplementary tool carriage M and mechanism for driving the shaft e.

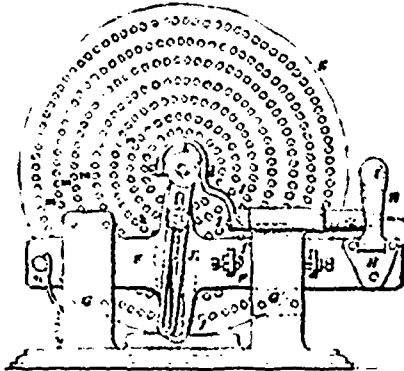
2. The combination of the lathe head C, carriage B, the upper and lower beds concentrically mounted one upon the other and adjustably secured upon the lathe carriage, the driving shaft e, pinion g, double faced gear j, feed screws I, having the pinion connected with said double faced gear, the supplementary tool carriage, the gear p, for driving the shaft e, the shafts s to D, with their connecting gearing and angle arms.

3. The combination of a lathe head and carriage with the supplementary tool carriage M, adjustably mounted upon the main carriage, and provided with a feed screw, driving shaft, and mechanism connecting said shaft and feed screw, the gear wheel p, secured to said driving shaft, the shaft s and its gears, mounted on the lathe carriage B, the feed shaft D of the lathe, and the swinging shaft z, with its connecting angle arms and gears.

4. The combination of a lathe head and carriage with the lower bed, G, adjustably secured to said lathe carriage, the driving shaft e, secured against longitudinal movement upon the lathe carriage, and provided with driving mechanism, the pinion g, secured on shaft e, so as to rotate therewith, the double faced gear j, the upper bed, H, concentrically mounted upon the bed G, and provided with mechanism for fastening it in any desired position thereon, the feed screw I, mounted within said upper bed and provided with driving pinion k and the supplemental carriage M, connected to said feed screw.

Dieing Mechanism for Gear Cutting Machinery.

379,833. Charles Spaulding, Malden, Mass. Filed May 2, 1887. Serial No. 230,874. Dated Jan. 24, 1884.



Claim 1. The combination of a rotary shaft adapted to hold a blank, an index wheel attached to said shaft and having concentric rows of holes, each row having a different number of holes from the others, while the holes in all the rows are at uniform distances apart, and operating slide which is adapted to be reciprocated across the face of the index wheel a distance equal to the distance from hole to hole in any row of holes in the index wheel, and provided with a slot extending radially of the index wheel, across all the rows of holes therein, and a latch or pin passing through said slot and adapted to be engaged with any hole in the index wheel coincident with the slot, said slide and pin operating conjointly to give the index wheel and the blank holding shaft step by step rotations the extent of which is governed by the distance of the pin or latch from the axis of the index wheel.

2. The combination of a rotary blank holding shaft, an index wheel attached thereto and having concentric rows of holes, all the holes being spaced alike, while each row has a different number of holes, an operating slide adapted to have a reciprocating motion which is limited, as described, across the face of the index wheel and provided with a slot extending across all the rows of holes in the index wheel, a latch or pin passing through said slot and adapted to be moved therefrom from one row of holes in the index wheel, to another, and devices whereby said pin may be alternately moved from and toward the index wheel to disengage it from and engage it with holes in said wheel.

3. The combination of the blank holding shaft, the index wheel thereon having the concentric rows of holes, the operating slide F, having a slot, f, an I provided with devices to limit its reciprocating movements, the latch or pin K, adapted to slide in said slot toward and from the index wheel and from row to row of holes therein, the slotted arm J, adapted both to oscillate and slide on a stud in line with the axial centre of the index wheel and engaged, as described, with the latch or pin K, and the rock shaft, I', having the arm I engaged with said arm J whereby said arm and

the latch or pin may be moved toward and from the index wheel.

4. The combination of the blank holding shaft, the index wheel thereon having the concentric rows of holes, the operating slide F, having the slot f and provided with devices to limit its reciprocating movements, the latch or pin K, adapted to move, as described, in said slot, the slotted arm J, adapted both to oscillate and slide on a stud in line with the axial centre of the index wheel, the spring j, whereby the arm J is normally pressed toward the index wheel to engage the pin K with a hole therein, and the rock shaft I', having the arm I engaged, as described, with the arm J, whereby the latter may be moved against the pressure of the spring j to remove the pin K from the index wheel.

5. The combination of the blank holding shaft, the index wheel having holes arranged as described, the latch or pin K, the operating slide F, having the slot f, receiving said pin, the stops f' 2 on said slide, and a fixed stop, as G', co-operating with said stops f' 2.

6. The combination of the blank holding shaft, the index wheels having holes arranged as described, the latch or pin K, the operating slide F, having the slot f, receiving said pin, the adjustable stops f' 2 on said slide, the spring n, arranged to move said slide in one direction, and a handle, H, whereby the slide may be moved in the opposite direction.

7. The combination of the blank holding shaft, the index wheel having holes, arranged as described, the latch or pin K, the operating slide F, having the slot f, receiving said pin and the handle H, the stops f' 2 on said slide, the fixed stop G', the slotted arm J, adapted both to oscillate and slide, the spring j, arranged to hold the arm J in its normal position, and the rock shaft I', having the arm I engaged with the arm J, and the handle I, arranged in close proximity to the handle H, whereby both handles may be grasped simultaneously.

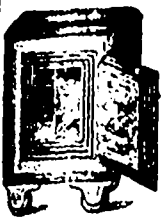
HOW TO CONCENTRATE THE POWER OF SMALL STREAMS.

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

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

The figures of this transmission are as follows:
Power to be transmitted 25 horse-power, distance 1,100 feet, velocity of rope 3,125, transmitting 25 horse-
 33000×25
power would show the tension to be $\frac{3125}{264} = 264 \times 60$
pounds (one half the tension weight), equals 324 pounds
total strain on rope, but there being two wraps, hence
 $\frac{324}{2}$
the strain will be divided by two, thus: $\frac{324}{2} = 162$ pounds,
which is about 5 per cent. of the breaking strain of a half-inch Firmus rope is about 25 per cent. greater than Manilla.—Power and Transmission.

The Ottawa Journal says: Up to this season most of the lumber firms have been using in their mills a piece of machinery known as a "hog," which is a sort of cone shaped iron basin studded with sharp knives. This is situated beneath the saws, and the edgings and waste fall from the saws into it and are chopped into sawdust by the knives, and fall through the small end of the cone into the river. By this system much lumber suitable for making lath and other small lumber is wasted. Messrs. J. R. Booth & Co. are doing away with this piece of machinery, and are constructing a large lath mill adjoining the saw mill, as well as blasting a roadway underneath the mill so that the waste lumber may be carted to the lath mill, and there manufactured into lath. The other firms who have also adopted this idea are Messrs. Perley & Pattee, Hurdman & Co., C. A. Grier, and Gilmour & Co.



CHAMPION FIRE & BURGLAR PROOF SAFES.

WARRANTED THE STRONGEST AND BEST.

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CHAMPION STUMP AND STONE EXTRACTOR.

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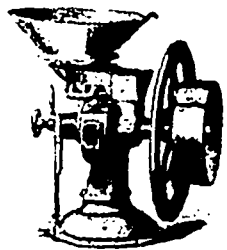
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GRINDS all kinds of Grain equal to any pair of French Burr Mill stones, or any Roller Mill for the reduction of wheat to flour, or for fine corn to table meal, or corn and cobs to feed meal. Send for par-



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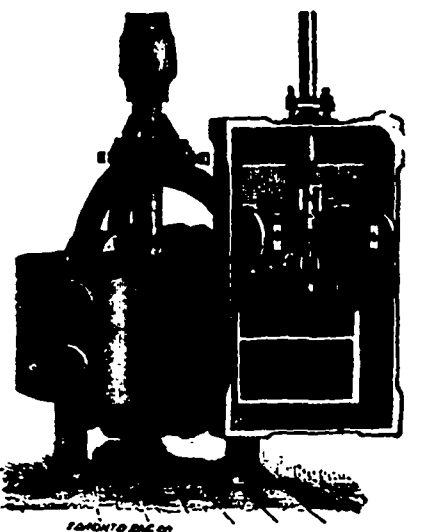
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UNEQUALED!

UNRIVALED!

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



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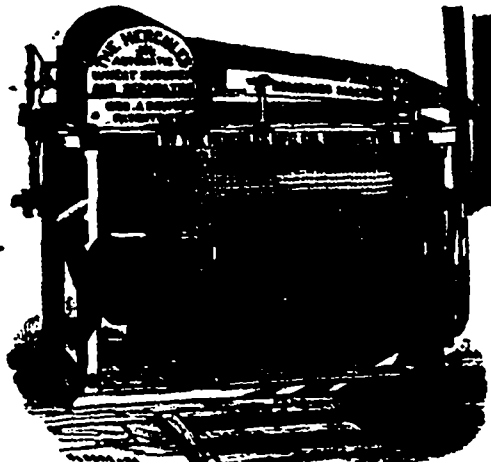
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To Improve the Color of the Flour in any Mill.

IT WILL REMOVE
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THAN
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WE ARE NOW READY, AFTER EXHAUSTIVE TESTS, TO PLACE UPON THE MARKET
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Write for Circulars, Prices and Guarantee on all the above machines. Address

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PETROLIA - ONTARIO.

**T
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Messrs. Goldie & McCulloch, of Galt, have just completed a new roller flour mill at Tottenham, Ont.

R. Muir & Co. have ordered a three-roll chopping mill from Wm. & J. G. Greey for the new roller mill of the Holland Milling Co., of Holland, Man.

John Moody & Son, of Ridgetown, have added a No. 1 Welch heater to their mill to improve the color of their flour, and purchased the same from Wm. & J. G. Greey.

The Cochrane R. M. S. Co., Dundas, Ont., have received a letter from the Cape of Good Hope, inquiring about their new milling machinery.

Messrs. Wm. & J. G. Greey have received an order from Geo. Davidson, of Fredericton, N. B., for one of their improved Eureka smutters.

Messrs. Goldie & McCulloch, of Galt, Ont., are placing a powerful steam engine and boiler in Scrimgeour's planing mill at Stratford, Ont.

F. C. Ireland & Son, of Toronto, are increasing the capacity of their natural food mills, and are putting in another pair of 5 ft. 4 in. shelling stones, shelling pan, and two dusting reels, and have placed their order for same with Wm. & J. G. Greey, Toronto.

R. Muir & Co., of Winnipeg, have ordered from Wm. & J. G. Greey one of their improved combined oatmeal and cockle separator for Klaus. Reimers mill in the Mennonite settlement, Man.

The Cochrane Roller Mill Supply Company write that they are pushing the erection of their new machinery in their works at Dundas as rapidly as possible, and will be able to turn out castings for their new mills and for general purposes about the middle of March, and will then be able to take contracts and estimate on all kinds of work in their line. The foundry and machine shop are very complete, and apart from the old machines in the shops, they are adding a bill of about \$17,000 of new machines. Messrs. John Bertram and others are building. Amongst them is a planer of 30 feet bed, and 22 feet table, with a capacity to take in six feet square under the tools. Its weight is in the neighborhood of from 20 to 30 tons and is recognized by all who have seen it to be the most thorough in construction and most perfect piece of mechanism of the kind ever turned out in the Dominion of Canada. The Cochrane Company do not intend to confine themselves to the mere building of trams of rolls, but state that they have brought on a staff from the United States, tried and experienced, by which they will be enabled to make all classes of chilled rolls for the manufacture of paper and rubber of all the varieties of manufacture into which it is made, also for rolling steel and iron into shafting or bar iron for all purposes for which it is commonly used; also rolls and housings for re-rolling and making cold rolled shafting, and they add that every dimension or capacity of rolls for either of these purposes, or for paper-making calendars, are within the scope of the machine shop. They can furnish rubber rolls as high as 20 tons each, which they claim is about the largest in size made in the world. The Company state that they have secured the remodelling of a large mill in Minneapolis, and have orders at their command for four other mills within a radius of twenty miles of Minneapolis besides a large number in Canada, and that millers are almost daily in Dundas seeking to make contracts with them men who apparently mean business. We have been requested by the Company to ask that millers await the time when they will be able to fill contracts—namely March 15th—before ad-

ressing further communications to them or visiting Dundas. The Company claim that they have in part of their machinery the capacity of a 200 barrel mill daily, and that when some further machinery is completed, they will have that capacity daily.

The manifest benefit of round scalpers in place of the old style hexagon has struck the Ogilvie Milling Co., of Montreal, and they are busy changing their scalping reels to round, and have ordered sufficient perforated zinc and steel to cover 20 reels from Wm. & J. G. Greey, of Toronto.

Mr. Hugh Mustard, of Wyoming, Ont., has been using during the past two weeks one of the Hercules wheat scouers purchased from the Hercules Manufacturing Co. of Petrolia, Ont., and by its use the quality of the flour is reported to have been greatly improved.

Messrs. Leitch Bros., of Oak Lake, Man., whose mill was destroyed by fire, have decided to rebuild the mill, increasing the capacity to 200 to 250 bbls. per day. Mr. A. Leitch was commissioned to come to Ontario and visit the best new mills erected here, and also the mill machinery manufacturers, and decide where to place the contract. After carefully examining a number of mills in different parts of Ontario he decided to recommend the firm of Wm. & J. G. Greey, who thereupon sent their Mr. W. S. B. Lawrie out to Manitoba to look over the ground and close the deal, which he did on Feb. 23rd. The plant will consist of 2 oat and meal separators; No. 3 cockle separator; No. 3 smutter; No. 3 brush; 20 pairs of 9x18, 9x24, and 9x20 rolls; 6 scalpers; 10 flour dressers; 4 centrifugals; 6 purifiers; 10 dust collectors; aspirators; pacters; bran and shorts dusters; one 3-roll chopping mill; Corliss engine, steel boiler, and everything required for a model mill of its kind. Messrs. Greey are getting the plans in hand, millwrights are to begin work in the mill on May 1st, and the work is to be finished and the mill started on August 1st next. This mill is designed to be one of the most complete in Manitoba.

— THIS SPACE —

BELONGS TO THE

Canada Jute Company,

MANUFACTURERS OF

JUTE AND COTTON BAGS,
MONTREAL.

WRITE FOR PRICES.

SEE ADVERTISEMENT IN APRIL NUMBER OF THIS PAPER.

TO USERS OF LEATHER BELTING

Some Pertinent Suggestions!

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

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

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

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

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

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Architects, Building Surveyors and Civil Engineers.

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

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AS the plans for the erection of the proposed Post Office at Prescott, Ont., are to be amended, intending tenderers are hereby notified that new tenders will be called for at a future date.

By order,
A. GOEIL,
Secretary

Department of Public Works,
Ottawa, 24th Feb., 1888.

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STENCILS
OF
EVERY DESCRIPTION

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GALT FILE WORKS
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Of every description, for
Planing,
Moulding,
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WHEN I WAS A BOY.**



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

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The Landed Enquiry Department of this Agency, the only institution of the kind known, is invaluable to Solicitors, Loan, Investment, and Insurance Companies, Estate Agents, and others, preventing fraudulent land transactions resulting from misrepresentations.

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Another important feature in connection with this Department is, that subscribers depositing accounts for collection will, if requested, be furnished with a Form of Script, on which will be entered the name of each debtor, the amount owing, and a full report of the prospects of collection, and providing that the receipts thereof be paid to bearer only, thus enabling subscribers to realize on their outstanding accounts.

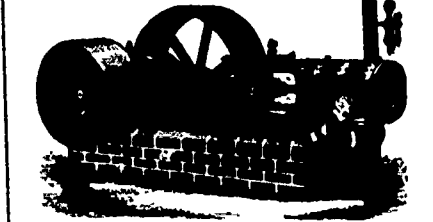
The Agency will forward at least once in three months, or oftener if desired, a report and statement of all accounts in hand.

NOTE.—The offices of the Agency are open to the Solicitors and subscribers for reference to our numerous maps, atlases, directories, and correspondence, and for the transaction of business with their clients and customers when in Toronto.

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1 1/2 and thicker clear picks, Am. ins.	\$34 00@35 00
1 1/2 and thicker, three uppers, Am. ins.	40 00
1 1/2 and thicker, pickings, Am. ins.	30 00
1 x 10 and 12 dressing and better	20 00 22 00
1 x 10 and 12 mill run	15 00 16 00
1 x 10 and 12 dressing	14 00 16 00
1 x 10 and 12 common	12 00 13 00
1 x 10 and 12 spruce culls	10 00 11 00
1 x 10 and 12 maple culls	9 00
1 inch clear and pick	24 00 26 00
1 inch dressing and better	18 00 20 00
1 inch siding, mill run	13 00 15 00
1 inch siding, common	12 00 13 00
1 inch siding, ship culls	10 00 11 00
1 inch siding, mill culls	8 00 9 00
Cull scantling	8 00 9 00
1 1/2 and thicker cutting up plank	22 00 25 00
1 inch strips, 4 in. to 8 in. mill run	14 00 15 00
1 inch strips, common	11 00 12 00
1 1/2 inch flooring	14 00
1 1/2 inch flooring	14 00 15 00
XXX shingles, sawn	\$2 40@2 50
XX shingles, sawn	1 30 1 50
Lath, sawn	1 50

YARD QUOTATIONS.

Mill cull boards and scantling	10 00
Shipping cull boards, promiscuous widths	10 00
Shipping cull boards, promiscuous widths, stocks	13 00
Scantling and joist, up to 16 ft.	13 00
" " " 18 ft.	14 00
" " " 20 ft.	15 00
" " " 22 ft.	16 00
" " " 24 ft.	17 00
" " " 26 ft.	18 00
" " " 28 ft.	19 00
" " " 30 ft.	20 00
" " " 32 ft.	21 00
" " " 34 ft.	22 50
" " " 36 ft.	24 00
" " " 38 ft.	27 00
" " " 40 to 44 ft.	30 00
Cutting up plank, 1 1/2 and thicker, dry board	25 00 26 00
" " " " " "	18 00 20 00
Dressing stocks	14 00 15 00
Picks, American inspection	30 00
Three uppers, American inspection	40 00
Cedar for block paving, per cord	5 00
Cedar for Kerbing, 1 x 14, per M	11 00

H. M.

1 1/2 inch flooring, dressed	25 09 30 00
1 1/2 " " rough	14 00 15 00
1 1/2 " " dressed	23 00 25 00
1 1/2 " " undressed	16 00 17 00
" " " dressed	16 00 17 00
" " " undressed	12 00 13 00
Beaded sheeting, dressed	18 00 20 00
Clapboarding, dressed	18 00 20 00
XXX sawn shingles, per M	2 75 2 90
Sawn lath	20 00 25 00
Red oak	25 00 30 00
White	18 00 20 00
Basswood, No. 1 and 2	50 00 60 00
Cherry, No. 1 and 2	25 00 30 00
White ash, No. 1 and 2	20 00 25 00
Black ash, No. 1 and 2	20 00 25 00



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AT GREATLY REDUCED PRICE.

All our Goods are manufactured by the "Simonds" process. Our Circular Saws are unequalled. We manufacture the Genuine HANLAN, LANCE TOOTH, DIAMOND, NEW IMPROVED CHAMPION, and all other kinds of cross-cut saws. Our Hand Saws are the best in the market, and as cheap as the cheapest.

THE LARGEST SAW WORKS IN THE DOMINION.

Beaudry's Upright Cushioned



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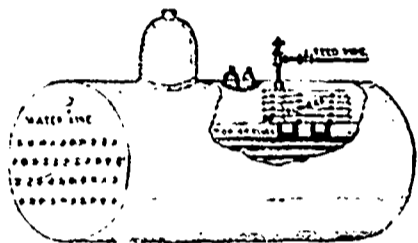
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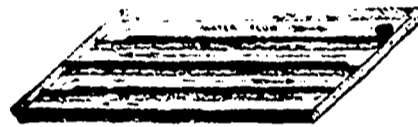
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PATENT BOILER WATER PURIFIER.



SHOWING POSITION OF PURIFIER IN BOILER.



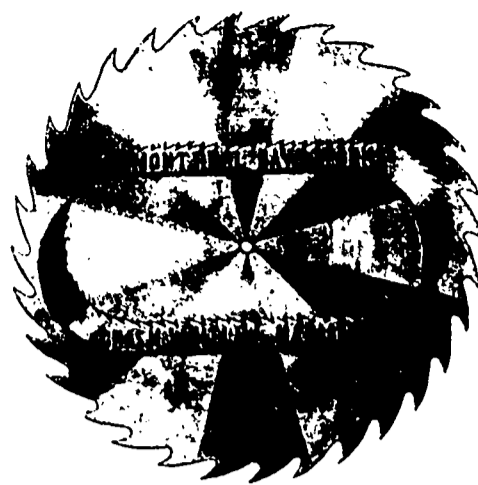
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FOR CIRCULARS WITH REFERENCES, PARTICULARS AND PRICES, ADDRESS

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No Purger Used!
Heat alone does it!

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

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



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WHEEL

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TAPER GROUND SHINGLE SAWS
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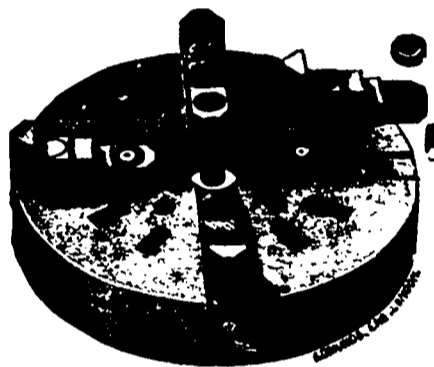
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Machinist--and--Brass--Finishers'--Tools.

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THE DOMINION CHUCK AND TOOL WORKS

— MANUFACTURE —

Combination, Universal and Independant

LATHE CHUCKS

— AND —

Wood Boring Machines

Of New and Improved Design.

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

J. F. WALMSLEY,

WOODSTOCK, - ONT.

✻ TO CANADIAN MILLERS ✻

IN RETURNING thanks to our numerous customers for their very liberal patronage in the past, we desire to say that our facilities for the manufacture of strictly first-class machinery cannot be surpassed, and we trust to merit a share of support from those requiring machinery of superior quality. Since we commenced the manufacture of the

CASE SYSTEM OF FLOUR MILL MACHINERY

we have met with the very best of success. We have changed a number of mills to the Long and Short Systems with gratifying results to our patrons, and would advise millers to thoroughly investigate the system. We have frequent enquiries about the Short System, and in reply to such would say that we can confidently recommend it, in fact it is the only method for small mills, as it requires a comparatively small amount of machinery for first-class results, and consequently effects a great saving in power and cost. We have mills using but three breaks, and they are highly satisfactory in every respect. This system is now being considered by some of our large millers, with a view to its adoption. In adopting the Short System, it is important to use none but the most reliable class of machinery. Knowing this, and being confident that there was a field for such a class of machines in the Dominion, we selected the most advanced and best machines made in the United States, for which we are the sole licensees for the Dominion, and are protected by broad patents. Millers are requested to respect the same, and look out for infringements. In introducing this class of machinery, we have not spared expense.

Our machines are finished in the highest style of workmanship, and we employ none but first class workmen. The following is a list of machines we manufacture under Royalties:

The Case Celebrated Roll, with Rotatory Feed,

Aug. Heine Silver Creek Flour Bolt,

Aug. Heine Silver Creek Centrifugal,

Aug. Heine Silver Creek Bran Duster,

Morse Cyclone Dust Collector.

For wheat cleaning, we use the best and latest American machinery.

We keep a general supply of Mill Furnishings on hand, such as Cotton and Leather Belting, Bolting Cloth of superior quality, Avery Steel Elevator Buckets, Avery Steel Elevator Bolts, Milling and Duster Wire, which we sell at a small advance on cost.

Correspondence Solicited.

INGLIS & HUNTER,

Strachan Avenue, TORONTO.

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 - -

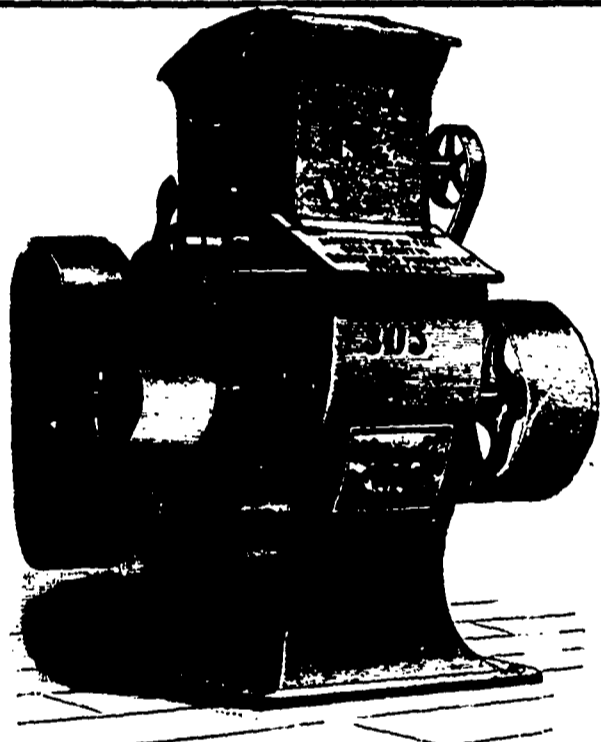
EDWARD P. ALLIS & CO'S Noiseless Belt Drive Roller Mills (

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

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

*****): Three Roll Chop Mills : (*****

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

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

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

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

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

Yours truly,

McINTYRE & McDONALD

Montreal, Feb. 18th, 1888

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

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

Yours truly,

A. W. OGILVIE & CO.,

Per P. M. Clark, Head Miller.

OXFORD MILLS, February 13th, 1888.

GEO. T. SMITH M. P. CO.

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

Yours, etc.,

R. D. GARDINER, Head Miller.

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

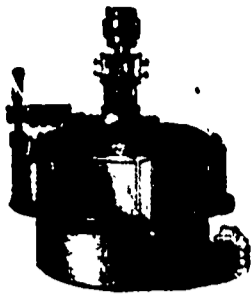
ALL ENQUIRIES WILL RECEIVE CAREFUL ATTENTION.

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

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

United States Shops, JACKSON, MICH.

STRATFORD, ONT.



"NEW AMERICAN" WATER WHEEL

Preferred by mill experts as the **VERY BEST.**
Was selected for driving the large Keewatin Mill.
Will grind with Rolls over 2 bbls. tabled H. P.

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

WM. KENNEDY & SONS, OWEN SOUND, ONT.
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Of every Description

FOR MILL USE.

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DUNDAS, ONT.

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To Mill Owners and Manufacturers.

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Phoenix :- Belt :- Oil,

THE ONLY PERFECT BELT DRESSING.

TO BE HAD ONLY OF

F. E. DIXON & CO,

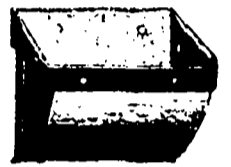
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