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THE DOMINION MECHANICAL & MILLING NEWS

TORONTO, ONTARIO, JANUARY, 1887.

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FACTORY HEATING, VENTILATING, DRYING.

THE apparatus illustrated herewith contains special features which commend it to the consideration of all manufacturers. First, it is an exhaust fan which creates a vacuum at one side of the heater. The vacuum thus made is compensated by atmospheric pressure, forcing the air alike across the radiating surface in the heater, entering at open end as indicated by the arrows. The heater, as shown, is for "live steam" only, and can be used as 6 sections, 10 sections, or 16 sections, simply by opening or closing the valves in the supply pipes. The peculiar construction of the apparatus is such that the manufacturers claim one foot of steam pipe will do more work than 3 feet as ordinarily placed.

The pipes are all vertical, and are self-draining, consequently cannot freeze in extremes of winter weather. The pipes being encased in a jacket of sheet iron, makes them absolutely safe as a fire risk. As applied to heating or to drying rooms, no steam pipe whatever is used in the rooms. With the apparatus shown, a temperature of 220° Fahrenheit was secured. That the apparatus is a complete success is attested by many well-known firms in the United States. It is understood that an application is now being made to one of the largest churches in Chicago for heating and ventilating. The building referred to has had 7 large anthracite furnaces, but could not warm the rooms in 12 hours. It is claimed that with this apparatus it can be heated comfortably in less than one hour.

The heater is radically different in effectiveness, as it can be placed above or below or 100 feet distant, and heat rooms different in size and distance with like certainty.

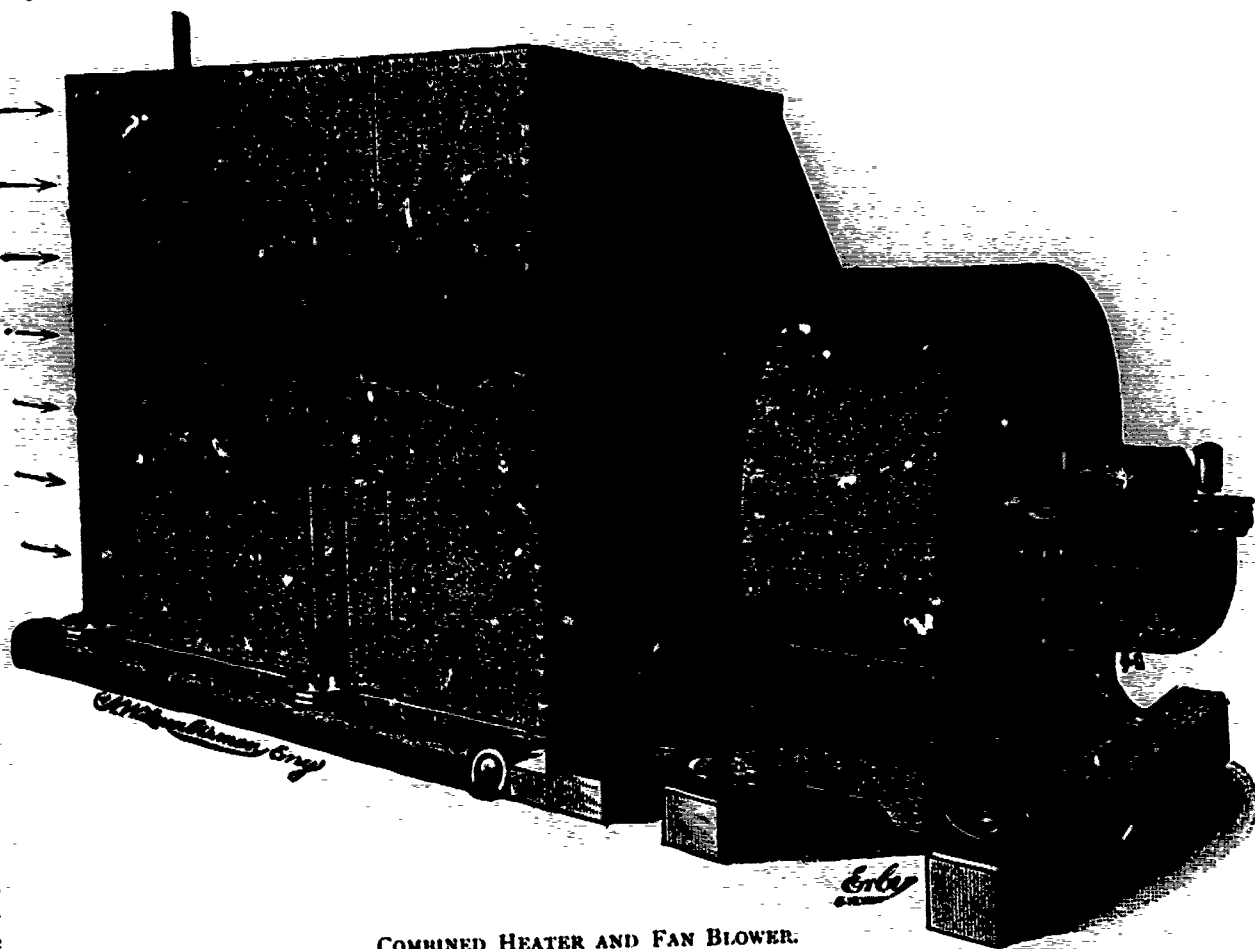
Mr. A. R. Williams, of Toronto, has made arrangements for the sale of these goods, and to him inquiries should be addressed.

GAS FUEL AND THE MANUFACTURES.

Manufacturers and scientists, says the *Iron Industry Gazette*, are devoting a good degree of attention to the question of gas-fuel. The discovery and utilization of "natural gas" have resulted in a practical revolutionizing of certain industries, and the probability that the supply of the natural gas is only limited has suggested the question whether, when the supply shall be exhausted, it will not be possible to convert solid fuel into a gaseous form and thus to continue to enjoy all the benefits now derived from the use of the natural gas-fuel. Solid fuel, as it is ordinarily consumed, is accompanied by a wastage of from 70 to 90 per cent., as estimated by Grouven, Rankin, Siemens, Galloway and others. On the other hand gas-fuel reduces the wastage to a minimum, and the great problem now is to provide for the transformation of the solid fuel into gas-fuel. The ordinary furnace is nothing more than a gas-

producer, crude, costly and wasteful, and the need of the manufacturing world to-day is a satisfactory system for the conversion of carbon into carbonic oxide and water into hydrogen and oxygen, to take the place of the rough and uncouth furnace. The appended table shows the advantages, in an economical point of view, to be derived in using fuel in the gaseous form:

	ONE LB. COAL. Crucible Furnace.	GAS FROM ONE LB. COAL. Crucible Furnace.
Per cent. of heat utilized	25	90
Per cent. of heat utilized	36	90
Per cent. of heat utilized	10	90
Available heat	455	7246
Available heat	4680	2246
Available heat	1300	2246



COMBINED HEATER AND FAN BLOWER.

American scientists are experimenting on this point, and in France, England and Germany the same important question is uppermost. The aim is to utilize products that are now wasted, to simplify complex processes and to decrease the cost of production in many important lines. In the report of the judges of the "Novelties Exhibition," held some time ago in the city of Philadelphia, on the subject of gaseous fuel, occurred this passage: "On the general question of the desirability of gaseous fuel, there can be but one opinion. It dispenses with the trouble and annoyance of hauling and carrying coal and with the removal of dirt and ashes; it is at all times under perfect control; when not wanted it can be instantly extinguished and can be instantly made to give its maximum effect, so that, other things being equal, gaseous fuel possesses incontestable advantages over solid fuel."

Professor T. S. C. Lowe, who in May, 1886, was awarded the "Grand Medal of Honor for his substantial improvements in the manufacture of water-gas as a fuel for domestic and industrial purposes," by the board of judges of the Franklin Institute, Philadelphia, demonstrates the economy of the transformation of coal into gas in his assertion that from 50,000 to 100,000 cubic feet of water-gas may be produced from one ton of coal. Taking the average at 80,000 cubic feet and making full allowance for plant, coal and labor, the cost of the gas

would be about nine cents per thousand feet. Professor Lowe says: "In large works and when large quantities of gas are being continuously supplied this product can be delivered through pipes to consumers as cheaply as a ton of coal can be delivered by horse and cart and put into the cellar. The advantages of the gas over the coal would enable the consumer to pay an average of forty cents per 1,000 cubic feet for the gas, which would then be as cheap as other fuels. At this price it would be equal to selling coal at \$32 per ton, and at thirty cents per 1,000, \$24 per ton; surely margin of profit enough to pay satisfactory dividends on all the investments necessary to supply any good sized town or city. One thousand cubic feet of gas per day to each ten inhabitants, for manufacturing, domestic heating, cooking and

lighting, is a low estimate; nevertheless, at this rate a city of 50,000 people would consume 5,000,000 cubic feet daily, which, at forty cents per 1,000, would be \$2,000 per day gross income, to produce which would require sixty-three tons of coal and the labor of about ten (10) men, besides book-keepers, collectors and officers, the expense of which is easily figured."

The process of generating "water-gas" may be briefly described. Any ordinary furnace is charged with fuel and by draft or blast forced to high temperature. A quantity of highly-heated carbonic acid, hydrogen and carbonic oxide is given off and discharged into a chamber or generator filled with a checker-work of fire-brick or other refractory material. The regenerator is heated to a high temperature by absorbing a part of the heat

and by the further consumption of the combustible gases. At a certain point the air-blast is cut off and the combustion of the fuel-chamber practically ceases. Then a jet of steam is turned into the regenerator and sometimes beyond it into the fuel-chamber. The steam passing in contact with the highly-heated material or through the incandescent fuel in the furnace to the regenerator, is decomposed into hydrogen and oxygen. The oxygen readily combines with the carbon and introduces into the elements a certain amount of carbon, effecting the actual result of the combined gas, which is composed of hydrogen and carbonic oxide, the two most effective heat-producing elements in nature excepting electricity. The addition of the carbon prevents the hydrogen and the oxygen, which are dissociated at 1,000° F. and upwards, from re-uniting chemically and becoming water as soon as the temperature of the gaseous product again fell below 1,000° F. This process gives about two equivalents of hydrogen and two of carbonic oxide. The energy required to produce the decomposition of the water is considerable and is a loss. As soon as the original energy is spent the furnace must be again fired by the draft or blast, until the incandescence of the fire and the stored heat of the refractory brick chamber are restored; then the process is repeated. By the perfection of devices and the introduction of additional furnaces in which fuel in a state of incandescence is maintained, the

process has been exhibiting increased economies and larger possibilities. In general, the following analysis, made by Dr. Gideon E. Moore, of New York, may be taken as a sample of a non-luminous water-gas—a gas that is efficient for heating, cooking and all industrial purposes:

Nitrogen	4.69	Carbonic oxide	30.80
Carbonic acid	3.47	Marsh gas	2.16
Oxygen	3.00	Hydrogen	5.88
Heavy hydrocarbons	0.00		
Total	100.00		

Another of the gas-fuels is "Producer-gas," dates back to 1846, and it began with the Siemens process. In generating this gas the aim is to preserve the combustible carbonic oxide and to restore the waste heat of the carbonic acid gas for utilization by means of regenerators. Late improvements include the introduction of the steam-blast for the addition of hydrogen to the product. The Siemens system was followed by the system of M. Ponsard, of Paris, which consists of the heating and expansion of the air so that when it comes in contact with the carbon of the fuel it will take up only one part of the oxygen, forming the carbonic oxide, instead of taking two parts of oxygen and forming the incombustible carbonic acid. The St. Gobian analysis of "Producer-gas" shows its contents to be substantially as follows:

Hydrogen	4 to 11 per cent.	Carbonic acid	6 to 7 per cent.
Carbonic oxide	15 to 19 "	Nitrogen	75 to 93 "

It is claimed in a recent report by the Board of Trade of Scranton, Pa., that anthracite coal has no equal as a gas-producing substance. That authority also asserts that the anthracite culm may be utilized in the production of gas-fuel and sets down the cost of producing 100,000 feet of gas at \$1.80, allowing 50 cents a ton for the culm, 30 cents a ton for the labor required to handle it, and \$1 per ton for the expense of the plant. According to this computation the 20,000,000 tons of available culm now above ground in the Lackawanna Valley region would produce 2,000,000,000 cubic feet of gas, while the total supply of natural gas around Pittsburgh is estimated at 1,981,000,000 cubic feet. From this it would appear that the exhaustion of the natural gas supply may well be considered an event of no great significance, because, even though the supply should give out in ten years, the ingenuity of man will have a substitute ready to take the place of the natural product without allowing the wheels of industry to pause a moment.

POINTS ON THE SLIDE VALVE.

A slide valve has no lap when the arch will just span the exhaust port and bridges, and the faces just equal the ports in width.

Lead is the amount of opening which a valve has when the engine is on the centre.

When a slide valve has neither lap nor lead the eccentric is set at an angle of 90° with the crank on the side toward which the engine is to run. Moving the eccentric forward makes the action of the valve earlier with reference to the crank in all its points.

Moving the eccentric backward makes the action of the valves later with reference to the crank in all its points.

When the blade of the valve exceeds the ports in width the amount which it projects over the edges of the port when in its central position is termed lap. The projection over the outside edge of the port, i. e., the edge at which the opening for admission takes place is called the outside or steam lap; the lap on the inside or arch side of the blade is called the inside or exhaust lap.

When outside lap is added the eccentric must be set enough further ahead of the crank to take the lap up, i. e., so that the valve may be all ready to open when the engine is upon the centre. Usually a little lead is also given in order that the steam may get in on time and the port be opening as the piston advances. The effect of steam lap is to close the valve earlier and allow the steam to expand. The effect of inside lap is to close the exhaust earlier and introduce compression. —*Boston Journal of Commerce.*

AN OVERTHROW BELT.

It may appear difficult to find a case in belting where the tight fold comes on the slack side of the belt, and it must be doubtful if any benefit could be derived from a driving force that is working against the speed of the shafting, but there are places where such seems to be the case. A belt thrown on over another when there is quite a difference in the shaft wheels will bring the slack side of one just the reverse of the other. The outer belt, in running over the smallest wheel, has a tendency to travel the fastest, taking up its own slack and bringing the tight side where the slack for the under belt is found. But this negative driving of the outside belt must be taken in connection with the increased drive with the

under belt, which has been made to cling to the shaft wheels with the binding force of both belts. A belt that cannot be made to drive without running so tight that there is nearly as much strain on the slack side as on the other, could well wear another of the same class on its outside for the benefit of the increased grip on the shaft wheels, although the inner driving stretch has all the load to carry.

NOMENCLATURE OF IRON AND STEEL.

Pig-iron is melted direct from the ore in the furnace, and contains 3 to 5 per cent. of carbon. When remelted it is called "cast-iron" or "metal."

Spiegel iron is precisely the same, but contains in addition from 5 to 15 per cent. of manganese.

Bar-iron, often called wrought-iron is pig-iron which has been smelted and deprived of nearly all its carbon, either in a puddling furnace or by the Wallon, Lancashire, or other analogous process; the spongy mass or ball of iron is usually hammered or rolled into a bar.

Puddled steel is precisely the same as "bar iron," except that the process of puddling is stopped when rather more than half of the carbon has been removed from the pig-iron. There is consequently no hard and fast lines between bar-iron and puddled steel, the one intergrading to the other by imperceptible degrees. Although there are an infinite number of intermediate stages between the softest bar-iron and the hardest puddled steel, and although it is impossible to state the exact percentage of carbon which marks the dividing line between the one and the other, it is usual to call all puddled bars which cannot be hardened in water, bar-iron, and all those which can, puddled steel. This dividing line falls somewhere near a mixture containing $\frac{1}{2}$ per cent. of carbon.

Blister steel is bar-iron which has been converted into steel in a converting furnace and varies in the amount of carbon which it contains from $\frac{1}{2}$ to $1\frac{1}{2}$ per cent.

Bar steel is blister steel which has been tilted or rolled down to the size required.

Cast steel is steel that has been melted in a "pot" and poured into a "mould" thus becoming an "ingot" which is afterward hammered or rolled to the size required. It may be of various "tempers," varying in percentage of carbon which they contain from three-quarters or less to one and a half or more.

THE TIME FOR STUDY.

Now is the season, says an exchange, the young mechanic should embrace to advance himself in the knowledge of his trade, whatever that may be. Autumn and winter are the seasons for study, and on no account should any young man who is learning any of the trades let the winter pass without improving his mind and gaining more knowledge concerning his trade than can usually be obtained in the workshop or on the building. It is the enterprising workman that first becomes foreman, then master builder. The young man who would rather loaf around the streets or "hang about" the corner store, seldom amounts to much. It is the studious, energetic fellow, in the building trades, as in every other occupation in life, that "gets the cake." A few hours each week spent in mastering the difficulties of a trade, is better than money invested, and is sure to bring in the very best of returns. Try it, young man. You will be none the worse for it, even if it is a failure.

SUPERHEATED STEAM.

A competent authority pronounces incorrect the current theory that superheating steam increases its pressure in pounds. It is asserted that if the steam is ordinarily dry, superheating to any temperature does not increase the temperature one ounce; in steam engines steam superheated slightly is economical, in that it maintains its normal temperature longer; that is, it does not condense so quickly, by reason of having a margin of heat above that due to its pressure, but highly superheated steam has disadvantages which are not counterbalanced. Again, it affects fibrous packings, decomposes lubricants, attacks working surfaces by drying them off so that they are apt to cut, and it has a special affinity for rusted surfaces, increasing and expediting the destruction of parts so affected most rapidly. From the instant that steam leaves the vessel in which it is generated, it commences to deteriorate in value by loss of heat: the farther it goes before reaching its work the more it loses. Superheated, it simply supports the vitality of steam and re-enforces it.

The Manitoba Board of Agriculture will send to Ottawa some of the Red Eye wheat and six rowed barley which earned off the Hudson's Bay Land Commissioner's prizes at the Provincial Exhibition. It will be planted on the central experimental farm, near Ottawa.

USEFUL INFORMATION

To remove grease from wall paper lay several folds of blotting paper on the spot and hold a hot iron near it until the grease is absorbed. Only a short time is required.

The curious observation that friction fails to produce heat in metals under the influence of magnets is now being discussed. Metals so exposed have been turned in a lathe quite cold.

JAPANESE GOLD SIZE.—Three quarts boiled oil, one pound litharge, one pound gum shellac, all boiled together till dissolved; take off the fire, and add one quart turpentine. Strain off into a bottle.

TO GRIND BRASS VALVES.—In grinding brass valves do not use emery. The dust from a grindstone is much better and cheaper. It will not become embedded in the metal and cut ridges as emery will.

TO PRESERVE WROUGHT IRON FROM RUST.—A cheap method of preserving wrought iron from rust, after milling, is to first dip the article in hot soda water to cleanse from oil, then in hot lime water, and dry.

Potato is used to clean steel pens and generally acts as a pen-wiper. It removes all ink crust and gives a peculiarly smooth flow to the ink. Pass new pens two or three times through a gas flame, and then the ink will flow freely.

For a green transparent varnish for metals grind a small quantity of finely powdered chromate of potash (it requires the most elaborate grinding), add a sufficient quantity of copal varnish thinned with turpentine. The tone may be altered by adding more or less of one or the right ingredient.

The economy of an engine should always be rated by the amount of steam, or water, which it consumes per horse power per hour. The amount of coal burned per horse power per hour involves the economy of the whole plant, and is not a measure of the performance of the engine taken independently.

TO PROTECT BRASSWORK.—Yellow brass may be made to keep its color without appearing varnished, by means of a thin varnish of white shellac or a coating of collodion. It will retain its color for a long time without a protective coating of any kind, if the finish is sufficiently fine. A light film of gold is the best possible coating for fine brass work.

A DRY FIRE EXTINGUISHER.—A cheap and reliable dry extinguisher is recommended from Germany. Thoroughly mix fifty-nine parts powdered saltpetre, thirty-six parts powdered sulphur, four parts powdered charcoal and one part brown-red oxide of iron. When dry put up in pasteboard boxes with a fuse extending five or six inches both in and out of the box.

Oak may be darkened by exposure to the fume of ammonia in a close box, but if the work is first oiled with linseed oil and wiped dry with a cotton or linen cloth, and then a solution of bichromate of potash (say half ounce of potash to one pint of water) be applied it will darken it, and not raise the grain, either of oak, mahogany and cherry. Care, however, must be taken that the work is not made too dark by too many applications of the solution.

POTATO MEERSCHAUM.—A new use has been discovered for potatoes. They can be converted into a substance resembling celluloid by peeling them and after soaking in water impregnating with eight parts of sulphuric acid, then drying and pressing between sheets of blotting paper. In France pipes are made of this substance scarcely distinguishable from meerschaum. By subjecting the mass to great pressure a substance can be made of it rivaling ivory in hardness.

PISTON VALVES FOR LOCOMOTIVES.—According to M. Ricour, piston valves in locomotives wear at the rate of one twenty-fifth inch for 125,000 miles, while with the slide valve the same extent of wear takes place with one-sixteenth of the mileage. The wear of the valve gear is reduced in the same proportion. The effect in the consumption of fuel is shown by the returns made at Saintes Station for the year 1882, where on all engines worked with slide valves the coal consumed per 1000 tons conveyed one mile was 226 pounds, against 234 pounds in the year 1884, when 30 out of the 40 locomotives had been fitted with cylindrical valves.

WOOD POWDER AS AN EXPLOSIVE.—Wood powder has recently been introduced as an explosive in the Belgian army in place of dynamite. The powder is obtained by treating ordinary sawdust with a mixture of nitric and sulphuric acids, which is afterward formed into cartridges by means of powerful presses. To protect these cartridges from moisture, they are afterward covered with paraffined paper. The instantaneous production of the gases arising upon explosion causes the air in contact with the face surface of the cartridge to act to some extent as a light trapping, and the power of the explosion is directed to the other face. In comparative experiments made with wood powder and dynamite, it was ascertained that, for equal weights, charges of the first substance were at least as powerful as those of the second, and the results were more regular.

PAPER PIANO CASES.—Accounts are given in the German technical journals of some interesting experiments which have been made with success in the employment of paper in piano construction. The case is made entirely of paper, as a substitute for wood, the material being so compressed as to be susceptible of the high polish which is required for such instruments. As described, the color is a creamy white; the tone is reported to be characterized by sweetness rather than loudness, the sound emitted, unlike the short broke note of the ordinary piano, being soft, full and slightly continuous, somewhat resembling that of the organ. This modification of tone, which must be considered an attractive feature, is attributed to the evenness of texture of the compressed paper.



THE MILLER.

BY HENRY NICH.

A grist on the hopper, the sun on the sill,
An' a heigho!
Lucky the lane that comes out at a mill,
An' a heigho!
Over his profit the honey bee hums,
Out of his blanket the butterfly comes,
An' a heigho! An' a heigh!
The doctor comes up on his mite of a mare,
An' a heigho!
We see this old world is all out of repair,
An' a heigho!
But we leave it alone in our neighborly chats,
And he mixes a mess for my beggarly rats,
An' a heigho! And a heigh!
The Squire o' late he rides double with care,
An' a heigho!
Two months at a manger have left his mow bare,
An' a heigho!
He never calls for the foot of my score,
'Till it runs from the rafter clean down to the floor,
An' a heigho! An' a heigh!
The Parson's the best o' the black-coated clan,
An' a heigho!
There is wheat he makes out in the branniest bran,
An' a heigho!
He never grudges a grain o' my toll,
He has an eye for a shoal or a foal,
An' a heigho! An' a heigh!
The sun's at the gable, come hurry, old wheel,
An' a heigho!
What say, my good widow, a coin in your meal?
An' a heigho!
'Twas in your corn may be, the Lord only knows,
He tempts the lamb, I forget how it goes,
An' a heigho! An' a heigh!
The greater the worry the lighter the gain,
An' a heigho!
The deeper the furrow the better the grain,
An' a heigho!
The thicker the stubble the fuller the bin,
The darker without the lighter within,
An' a heigho! An' a heigh!
There are haps in the air that a minute may bring,
An' a heigho!
For a cock is more sure of his head than a king,
An' a heigho!
So I sing out the days in my merry old mill,
A grist in the hopper, the sun at the sill,
An' a heigho! And a heigh!

Another large grist mill is talked of for Highgate, Ont.

Malone Bros. grain elevator at Alvinston, Ont., was burned recently.

Mr. F. Merner's mill at New Hamburg, Ont., is undergoing improvements.

Mr. John Dovey will, it is understood, rebuild his mill at Kinmount, Ont.

The Brechin, Ont., grist mill has been rented by Mr. Dutton, a practical miller.

The new roller mill at Westport, Ont., is expected to go into operation on the 18th inst.

A new Reynolds-Corliss engine is being put into the Manitoba Milling Co.'s mill at Carberry.

The spur line from the railway station to Moody & Son's grist mill at Ridgetown, Ont., is completed.

The new grist mill at Moosomin, N. W. T., is expected to be in operation about the 1st of February.

A joint stock company of farmers has been formed to convert the Cunningham, Ont., flour mill into a roller process mill.

The Enterprise, Ont., milling company are fitting up their water power mill to have it in readiness for the spring work.

Miller J. R. Hoover, of Pickering, Ont., is in financial difficulties, and is seeking to effect a compromise with his creditors.

The exports of wheat and flour from the United States and Canada from July 1 to Nov. 6, 1886, aggregated 68,000,000 bushels.

Bonused roller mills are now under construction at Moosomin, Wolesley, Stonewall, Balmoral and Shoal Lake, in the Northwest.

Following the example lately set by Toronto, the Montreal Corn Exchange Association has been amalgamated with the Board of Trade.

One grain buyer at Moosomin, N. W. T., has paid out about \$20,000 so far this season for wheat, most of which has graded No. 1 hard.

A side track has been put in on the Long Lake Railway so as to connect it with Messrs. McCaul, McNicol & Reilly's grist mill at Regina, N. W. T.

The ceasing of traffic on the canal has afforded a full supply of water to the grist mill at Kingston Mills, which has for some time been troubled by lack of power.

There were four bids for the damaged wheat in the burned elevators at Duluth. The highest was \$25,000 for that in elevator A and \$75,000 for that in elevator Q.

It is reported that the two westernmost roller mills in the Northwest will have to bring wheat from eastern parts of that country for grinding, owing to the drought in the west.

The profit on wheat raising in India is said to be but 4 1/2 cents per bushel, when the price is 38 shillings per quarter in the London market, and but 1 1/2 cents per bushel when the price drops to 1 shilling.

The village of Coldwater, Ont., wants a flouring mill, and a correspondent writes that he understands some parties have in contemplation the erection of a roller mill at an early day.

A dam has been thrown across the channel at Bobcaygeon, Ont., for the purpose of damming the water from the mill to allow the millwright a chance at its foundation, which is rather rotten and shaky.

Malone Bros.' grain warehouse at Chatham, Ont., containing about 3,000 bushels of peas, was totally destroyed by fire a fortnight ago. Loss, \$2,000; insured for \$1,200 in Huron and Mid-Deser.

The Birtle, Man., *Observer* says: Merchants complain that the business of the place suffers on account of the closing of the grist mill. Some effort should be made to keep mill stones running in such a center as Birtle.

Mr. R. E. Porrit has purchased the grist mill at Sunderland, Ont., from Mr. James Doble and has secured Mr. J. Somerville, of Uxbridge, for miller. Mr. Somerville is well and favorably known as a first-class miller.

Messrs. Taylor & Holmes have addressed a memorial to the Chatham town council setting forth that all milling property in the town is not taxed, and asking that all millers within the municipal pally be placed on the same footing.

The Assiniboine mills and elevator at Portage la Prairie, Man., had a narrow escape from being destroyed by fire by the falling of a chandelier in the office. Fortunately a couple of men were in at the time and extinguished the flames.

There is a scheme on foot in Minneapolis to consolidate all the mills under one management. All of the mills, it is said, have agreed to the plan except the Washburns. A committee has been appointed to decide upon the feasibility of the scheme. The new concern would have a capital of \$10,000,000.

The Listowel *Standard* says: The milling business which has been in rather a languishing state in this town for some time is about to enter upon a new era in its history. The firm of Hay Bros. have done credit to themselves and their enterprise, in the remodelling or rather making new the old Climie Mills.

The directors of the Chicago Board of Trade have taken a decided stand regarding trading in privileges. Hereafter trading in puts and calls will not be allowed in the Board of Trade building, and members engaging in such transactions will render themselves liable to suspension or expulsion under the rules.

THE MECHANICAL AND MILLING NEWS is informed that the milling business of Messrs. Campbell, Stevens & Co., Chatham, Ont., is increasing so rapidly that even with the new mill lately erected at St. Thomas, they find it impossible to keep up with their trade. For this reason, it is said, they contemplate erecting another mill shortly at some point east of Toronto, probably Port Colborne.

Mr. J. E. Seagram, of Waterloo, Ont., has made extensive improvements in his flouring mills during the past year, having changed the stone process to the full roller process. The mill has a capacity of from 200 to 225 barrels daily. The cost of these changes was in the neighborhood of \$12,000. The flour which Mr. Seagram manufactures has made for itself a reputation in the markets of the Maritime Provinces and Britain.

A by-law is to be submitted to the people of High Bluff, Man., to grant a bonus of \$6,000 to H. J. F. Rose for the erection of a roller flour mill of 75 barrels capacity to cost \$13,000. The by-law provides that the mill is to be kept in operation for gristing purposes for ten years, and a regular rate of exchange of 34 lbs. of straight grade flour shall be given to the bushel. No matter in whose hands the mill may be, these terms will have to be carried out, as security to the extent of \$4,000 will be given to the council to that effect.

Remember that stopping to tie a belt that might have been attended to while the mill was idle at little or no cost, may amount to criminality. A mill making ten barrels of flour per hour at a profit of fifty cents per barrel, employing an operative crew at an outlay of \$8 per hour, if stopped for an hour will knock \$7 out of your employer's pocket. It is the duty of the leading miller to look after all such points, and if he neglects them he does not fulfil his honest obligations. Careful attention to little things is a good recommendation for any miller, and the wise employer will appreciate it.—*Modern Miller.*

A Chicago dealer gives the following reasons why wheat is a good property: 1.—Because the stocks in the United Kingdom are 14,000,000 bushels less than one year ago. 2.—Because the official estimates place the shipments from Russia, from January 1 to August 1, this year, at 21,400,000 bushels, against 51,400,000 for the corresponding period last year. 3.—Because the shipments from Australia have decreased 8,000,000 bushels. 4.—Because there has been an increased demand in Europe and a decreased production. 5.—Because the exports from America for the first quarter have exceeded 52,000,000 bushels, and to date have been about 58,000,000 bushels.

German Mills, says the *Waterloo Chronicle*, is a flag station on the Galt branch of the G. T. R., three miles below Berlin. By going about a mile and a half west past the Waterloo township hall at Centreville, passing through a charming wooded avenue, you enter a section of undulating country, splendidly cultivated, with light soil and well equipped with rustic fences. On a sloping hillside directly in front are the extensive Champion Flouring Mills of Messrs. T. & A. B. Saider. The name of Saider in this county is synonymous with extensive and prosperous milling operations. The mill here was started by Elias Saider more than half a century since and has prospered and extended very satisfactorily all along. It has now eleven sets of rollers, and most approved milling apparatus, and a capacity of 125 barrels per day. For the most part it runs day and night steadily.

The following shows the months of the wheat harvest in the different wheat growing sections of the world: January—Australia, New Zealand, Chili and Argentine Republic; February and March—East India and Upper Egypt; April—Lower Egypt, Syria, Cyprus, Persia, Asia Minor, India, Mexico and Cuba; May—Algeria, Central Asia, China, Japan, Morocco, Texas and

Florida; June—Turkey, Greece, Italy, Spain, Portugal, south of France, California, Oregon, Louisiana, Mississippi, Alabama, Georgia, Carolina, Tennessee, Virginia, Kentucky, Kansas, Arkansas, Utah, Colorado and Missouri; July—Roumania, Bulgaria, Australia, Hungary, south of Russia, Germany, Switzerland, France, south of England, Nebraska, Minnesota, Wisconsin, Iowa, Illinois, Indiana, Michigan, Ohio, New York, New England and Upper Canada; August—Belgium, Holland, Great Britain; Denmark, Poland, Lower Canada, Columbus and Manitoba; September and October—Scotland, Sweden, Norway, and north of Russia; November—Peru and South Africa; December—Burmah.

Ten years ago the first shipment of wheat was made from this Province to the East by Messrs. Higgins & Young, and a copy of the invoice is as follows:

WINNIPEG, Man., Oct. 12, 1876.	
Messrs. Steel Bros.	
Bought of Higgins & Young, Winnipeg.	
10 412 sacks wheat	
51,842	
412	
5,143 lbs. = 857 1/2 bush.	
at 85c.....	\$72° 59
412 cotton sacks at 26c.	107 12
Total.....	\$835 71

This was the commencement of what is fast becoming one of the most colossal trades in the world.—*Winnipeg Sun.*

The people of Moosomin, N. W. T., seem to be proof against the wiles of the bonus-hunter, and to have well founded objection to put their hands in their pockets and bolster up concerns without being in possession of full details concerning them and those interested in them. Had some Ontario towns been as wise in their day and generation they would to-day find themselves in a more prosperous condition. We quote from the *Courier* to show how they do these things at Moosomin. "Mr. McHaney, a member of the legal profession, of Winnipeg, visited us on the 13th in connection with matters concerning the grist mill. He represented himself as the owner of the mill, having bought out the interest of Mr. Hughes, though what Mr. Hughes had to sell, is a mystery to most of us. The gentleman's mission here was to arrange for a bonus of \$1,500 from the town, \$500 of which must be paid as soon as the balance of the old machinery from Manitoba is shipped, and the balance on completion of the mill. A meeting of the committee and citizens was called at 1 p. m., and the matter laid before them. The people sat upon the scheme and the gentleman at once, if he had not sufficient money to build the mill, they did not want him. Pertinent questions were asked. Did he really own the mill? Was anything paid for? Was he going to pay the men who had worked thus far on it? Was he prepared to pay the merchants who had advanced material? Was it not a sham sale, etc.? The following resolution was passed unanimously. "That this meeting utterly refuses to have anything to do with the granting of a bonus in the present state of affairs."

The C. P. Ry. have on Lake Superior, says *The Emigrant*, the finest elevator in America, furnished with very modern means of rapid and proper handling of grain. It was built in 1884, taking its first grain in January, 1885, is 324 by 85 feet, and has a capacity of one and a quarter million bushels, and can handle 250 cars daily, working six gangs of six men each, the unloading time per car being about twenty minutes. The engine is beautiful in its quiet great strength of 400 nominal horse-power, 32-inch cylinder with 48-inch stroke, fly wheel 16 feet in diameter, condenser and pump and fire pumps are also in the engine room, itself as neat as a parlor, with flowers in every window. The Kamistiquia river water is very easy upon boilers, as it leaves no scale and leaves only a little sediment even if several weeks interval were allowed between cleanings. The elevator contains 305 bins, ten of them holding ten thousand bushels each, and six of the shipping bins hold 4,500 each, the balance 5,000 each, being 45 feet deep. There are nine intaking spouts and six loading legs with telescopic action, an invention of the manager, Mr. Sellers, with a capacity of 15,000 bushels an hour per each spout. Here are nine weighing scales of forty thousand pounds each and six "out" scales of 400 bushels each and four "separators" with a daily capacity each of 2,500 bushels, and 5,000 bushels if crowded. This railway company has another elevator of less capacity at Port Arthur, Ont., on the same lake, fitted in the same complete style.

There is one thing in the present position of the wheat and flour trade, says the *London Millers' Gazette*, which has become strikingly apparent, viz., that we are more dependent on America to supply us with wheat for our increased winter consumption than for some years past; therefore, the main question to be considered, with regard to the probable future movement of prices, is whether American holders will willingly and easily part with their stocks at present prices, or whether they will be able to demand higher prices for it. There seems only one answer to this question, and that is in favor of the latter part of the question. The trade, in fact, is just now studying how it will be able to obtain enough wheat for the next three or four months, and whence; when it has made up its mind that this will be a difficult matter, without entreaching upon stocks to a seriously large extent, prices will begin to move up. Under these circumstances it is not surprising that certain statisticians should have been busy calculating our probable supplies during these four winter months, during which the consumption is estimated to amount to 520,000 qrs per week. The outlook is that within the next four months our stocks in first hands will be reduced below 1,000,000 quarters, a state of things which has not happened since June, 1880; so that, allowing the greatest possible margin for error, the outlook is such that the most determined "bear" must acknowledge that at length the long-looked-for improvements in prices is at hand. Curiously enough two opposite factors are now at work: on the one hand we see in the U. S. the largest "visible supply" on record; and, on the other hand, the prospect is for stocks in this country being reduced to a lower point than for many years. It is, of course, to be expected that this huge pile of wheat in the U. S. will exercise a salutary effect on any premature or exaggerated advance, but it is not likely that it will be powerful enough to prevent it.

(FOR THE DOMINION MECHANICAL AND MILLING NEWS.)

HOW POWER IS LOST AND MAY BE SAVED.

By "DIAMOND."

THIS subject is one of vast importance to every manufacturer and machinist, for every one familiar with any quantity of machinery must be aware that there is a large amount of lost motion in the ordinary methods of transmitting power. By this is meant that the water wheel, or fly wheel of the engine, makes a great many revolutions whose power is lost before reaching its destination.

Newton's third law of motion was, that "To every action there is always an equal and contrary reaction; or, the mutual action of any two bodies are always equal and oppositely directed in the same straight line." The tension of a rope is the same throughout, and tends as much to pull back the horse as to pull forward the barge in tow. The tension of the drawing side of a belt is the same throughout, and tends as much to retard the speed of the engine as to accelerate the motion of the machinery. There is considerable difference in tension, however, between the tight and slack sides of a belt, and this difference is the amount of the frictional resistance to slipping at the surface of the pulley. Two unequal weights connected by a cord thrown over a beam may remain in equilibrium, whereas if we substitute a pulley for the beam one weight would rise and the other fall on account of the greatly reduced friction. It has been found by careful experiment in figuring from the source of power to the end of the shop, that about one half of of the motive power is lost in transmission. Hence we see that in estimating the power necessary to drive a piece of machinery at a given rate of speed an allowance must be made for a loss of power through friction of bearings and slipping belts. The latter alone consumes on an average about 33% and sometimes reaches as high as 80%. This, then, we think indicates an unnecessary and alarming waste of power, and the object of this short paper is to discover some of the causes of this waste, and apply a few simple remedies, and at the same time invite discussion on this interesting and important subject.

One body cannot move upon another without producing friction, but it should be the grand aim and study of every engineer to reduce this to a minimum. An unusual strain upon any part of the machinery frequently results in what is commonly called a "hot box," and this may generally be traced to one or more of the following causes, viz.: tight belts, imperfect bearings, inferior lubrication, unbalanced or bent shafting, or, as frequently occurs, the shafting is out of line.

Belts are often overstrained because they are too narrow to do the work required of them. S. E. Warren says, "It has been found from actual tests that about 76 square feet of belt per minute per horse power at a belt speed of 1800 square feet per minute is a fair average allowance of belting to power transmitted." Endless leather or rubber belts will bear a strain of 800 to 900 lbs. to square inch of cross section, but it would produce ruinous friction on the journals and prove disastrous to the belts themselves if used at anything near this tension. Where from any cause a wider belt cannot be used, the difficulty may be met by using a double instead of a single belt, or by increasing the diameter of the pulleys, for while, according to Warren, this would not increase the drawing power of the belt at the same belt speed, the larger pulleys necessitate a greater speed, the belt accommodates itself to the greater arc more readily, and heavier belt may be used. This enables the belt to do its work much more easily and satisfactorily, and adds to the life of the belt, thus more than offsetting the additional cost of the change. Probably a better way than either is to cover the face of the pulley with leather or other material that will give the belt a surer grip, or by replacing the iron pulley with a scientifically-made wooden one. It is well known that the friction adhesion of a belt to a pulley is much more over either of these surfaces than on iron. The theory generally held is that a smooth, polished iron pulley is the best for high speed, but in order to give the belt its required grip on such a surface it must be strained very tightly and that results in an increase of friction on journals. It has, however, been very clearly demonstrated that several other surfaces are much more satisfactory. But more of this anon.

Many belts are miserably laced. You find large holes punched in them, and these are filled with the lace lapped through and through them, forming projections on the surface of the belt that prevent it from fitting closely to the pulley. Others lace their belt, when a tightener is not used, by putting together the ends to be joined very much like a tailor does the parts of a coat, and then sewing them together with a thin lace. This may be all very well for the lace, but it is certain to leave a space across the belt that cannot touch the pul-

ley, especially if it be a heavy, stiff belt. Nor is the system of belt hooks free from objections. Unless carefully put in, they, too, will form projections that admit of air between the belts and pulleys, thus lessening their frictional adhesion, and being of a hard unyielding nature, they soon mar the smooth surface, making it rough and uneven. So far as I can learn, where an endless belt is not practicable or convenient, the most successful and least objectionable method is similar to the general plan of lacing a shoe, by bringing the lace between the belt ends every time after passing it through the hole. This forms a perfect hinge which readily adapts itself to any required position of the belt, without the usual cutting of laces, and presents a tolerably smooth surface to the pulley without leaving the air space across it.

Both leather and rubber have proved by years of satisfactory results that they may be safely used to transmit enormous power. The main driving belt in the New Jersey Zinc Works is made of leather, 48 in. wide, 4 ply, and 102 ft. long. A belt in the Locust Point Elevator, Md., is made of rubber, 60 in. wide, 8 ply, and 312 feet long. Both have been in constant use for a number of years. Cotton has also been used to a considerable extent for fast running machinery, but, whilst it is cheap and strong, it does not present a sufficiently smooth surface for fast running machinery, and is too easily affected by atmospheric changes. Rubber is especially adapted to damp places and out-door work, whilst leather is decidedly preferable for cross and shifting belts, because the shipping lever comes in contact with the edge, which is the weak part of a rubber belt. Manilla and hemp rope is now being extensively used, especially for main driving belts, and it has many arguments in its favor. It is light on the bearings, cheap, durable, effective, may be passed to any floor in the building irrespective of the others, and is used on wooden pulleys, which are 70% lighter than iron, thus relieving the bearings of a great load. For transmitting power long distances, such as from one building to another, or from a wheel at the water fall to a suitable mill site, wire rope stands unrivalled. Both hemp and wire ropes have been run over pulleys grooved in a V shape. This gives them a secure grip of the pulley, but if the angle of the groove is too sharp, the rope becomes wedged into it, and entails a loss of energy in releasing it again, and this is necessarily destructive to the rope. It has been found much better to make the sides of the grooves concaved, terminating at an angle of not less than 45°, and even rounded entirely, so that there is no lateral friction on the rope.

Robert H. Thurston, M. E., Professor of Mechanical Engineering at the Stevens Institute, says, "Every reduction of power by the introduction of an improved material or system of lubrication, effects a saving of fifty (\$50) dollars a year and upward," which amounts to simply this: it costs on the average not less than this amount to produce one horse power for a year.

Every 2000 lbs. pressure on bearings either of shafting or machinery requires a horse power to keep in motion. Many cry out about the supposed increase in cost of good babbitt, a good lubricant, self-oilers, heavy belting, and the application of leather or other substances to the face of the pulley for giving the belt a better and surer grip, but these are items of vital importance to the economical transmission of power. It has been demonstrated beyond a doubt that a belt will do its work easier and last much longer on a good wooden pulley than on iron, and it has been proved by actual experiment that a lagging of paper, leather or rubber on a wooden or iron pulley gives a better grip than either. Paper pulleys have been used to some extent, but their extra cost prevents their being generally adopted. However, the same results may be obtained from a solid paper rim that is made to fit the pulley exactly, and shrunk on. They soon pay their cost in the saving of fuel and wear and tear of belts, to say nothing of loss of time and spoiled material, or poorly-finished work.

The greater part of machinery in these days is run on babbitt or similar alloys, but due caution should be exercised in selecting the proper alloy for high-speed journals and heavy bearings. An additional outlay of a few cents here may save several dollars in time and repairs. If one grade of metal wears out in one month where another would wear for a year, it is quite evident that a good deal of power has been expended in friction, and time in making repairs. Many think that anything that looks like babbitt will do for bearings for line shafting, overlooking the item of friction, and the expense of dismounting and readjusting the shafting, which is probably much more than the additional cost of good material over cheap.

Considerable difference of opinion exists as to lubricants, but it is generally conceded that an automatic cup for feeding oil or grease saves a large percentage of the lubricator, and, according to tests made in England in

1871 by M. E. Cornut, the friction was 44% less than by hand oiling. The same authority claims a difference in friction of 15% to 20% in favor of mineral oils over vegetable. Graphite or plumbago has long been used in the powdered form to cool a hot bearing, and it is now being incorporated with the best oils to form a grease for use in automatic cups with great success. It has the effect of coating the journal and being very economical on oil.

In many factories and machine shops the arrangement of shafting and location of machines is not at all flattering to the skill of the millwright or engineer who designed the plans. The main line of shafting runs along one side of the room, and the machines being all on one side, the belts driving them must all pull in the same direction. This causes no little friction at the hangers and strain on the shaft, tending to bend or warp it. Certainly the proper place for such a shaft is overhead through the center of the width of the room, in order that the tension of the belts pulling in two opposite directions may balance the pressure on the shaft. In fastening pulleys to the shaft by keys or set screws, it is important to distribute them around the circumference of the shaft, for, if all put on one side, they would tend to unbalance it. Well-made wooden pulleys clamped to the shaft are much easier adjusted than iron, and, being lighter, they do not tend so much to throw it out of balance.

All journal bearings should be proportional to the speed and pressure resting on them, and the shafting itself as light as possible, consistent with necessary strength. But it is not the object of this article to lay down laws or formulas in these matters, rather to point out a few existing errors and ask for them the consideration they deserve. Many reliable works have been published on these subjects and are worthy of the careful study of all building or operating machinery. Undoubtedly Canada has the mechanical skill, and there is no reason why her mills and factories, with their natural facilities, should be behind those of any other country in point of convenience and economy.

TWO KINDS OF MECHANICS.

Mechanics out of work, says an exchange, are generally men who are not the best in their line. Mechanics who are steadily employed are generally the best in their line. The neat, quick, efficient, watchful and intelligent workman always has the strongest hold upon the proprietor or foreman, and when dull times necessitate a reduction of force, it is he who is retained. The slovenly, slow, inefficient and negligent workman is the one who always marches first when reduction in force is necessary, and it is he whom we hear most often prating in grog-shops about the oppression of capital and the tyranny of employers. While in the shop, his only aim was to put in his time and draw his salary. His employer's interest he never studied to serve. He made himself a mere drudge, and his employers were forced to treat him as a drudge. Between the good and the poor, the desirable and the undesirable, the careful and the negligent, the efficient and the inefficient mechanic there is a world of difference, and every mechanic owes it to himself to determine which class he shall join.

STRONG MINING COMPANY.

A letter was received in town to-day from Thos. A. Keefer, who is in Toronto on business connected with the recent amalgamation of the Huronian, Highland and Neebish gold mines, stating that the consent of all parties interested has been obtained to the organization in this country instead of England of the new company formed to operate these mines and that the new company, which takes the new name of "The Consolidated Huronian Gold Mining Company of Ontario" will have its head office in Port Arthur.

The capital stock of the new company is £360,000 sterling or \$1,300,000, with an additional working capital of £100,000 sterling, or \$500,000. The directors of the new company are Horace John Neville, George Augustus Thompson and Alexander McEwen, of London, Eng.; Andrew Ruthford Gray, of Edinburgh, Scotland; James McLarne, of Buckingham, Quebec; Thomas Alexander Keefer, of Port Arthur; and Nicol Kingsmill and Alexander John Cattanach, of Toronto, Ontario.

The formal notice for legal incorporation appears in this week's *Gazette*. When the charter is granted by the Government the company will begin its operation in earnest.—*Port Arthur Sentinel*.

The new pumping machinery for the Hamilton water works which is being manufactured by the Osborn-Kilby Co., of that city, will be completed in less than a month. One pump is already finished and the other well under way. Great interest is manifested in their success or failure, as they have been built entirely by Hamilton mechanics.

(FOR THE DOMINION MECHANICAL AND MILLING NEWS.)

"HOW POWER IS LOST AND MAY BE SAVED."

BY "NEMO."

EVERY discussion of so broad a subject as the one you have chosen for this month in your Prize Essay Department, introduces at least one quality in common with eternity, into the discussion, viz.—begin when you will there is a beginning back of that beginning.

In looking at, thinking about, or discussing this subject, one naturally locates oneself—in mind at least—in a mill or factory, amid the whirl of belts and the grind of machinery; but immediately there comes the conviction, that before the power which causes these results has reached the line shafting of the mill, a very great proportion of it may have been lost.

Steam power is so nearly the universal power that I may safely—for the purpose of this essay—discuss power from a steam stand-point, because all the elements of construction that contribute to the loss of power, after the line shafting is reached, are to be found alike in water-power and steam-power mills, and any remedy that may be applied to the one class, may with equal force be applied to the other.

Heat and water used in the proper relationship to each other are the physical agents in the production of steam power; therefore any construction, in the combined use of these elements or agents, that wastes either of them, (or any elements that unite to produce them) is a means whereby power is lost. Faulty boiler setting; too small combustion chambers; badly constructed grates; poor arrangement for ventilation; smoke stack too small or too short; draughts not in proper proportion to each other, or the conditions of the boiler setting; poor fuel, or fuel not adapted for the grates or the draughts; or, worst of all, a lazy, shiftless, thoughtless, careless fireman, who shovels in the coal or other fuel without any attention to the conditions upon which that fuel can be made to produce the very best results. Coal wasted means power lost. Scale on boiler means power lost. In short, anything and everything that hinders the very best results being obtained from the fuel used is a means whereby power is lost, and any and every construction in boiler-setting or engineering, (that has such an intelligent consideration of the conditions and situation of the setting, of the proportions of the boiler, of the quality of the fuel, of the source and quality of the water to be used, that will enable a careful engineer to obtain first-class results from the fuel used, is a means whereby power is saved.

I would like to go into some detail, along the line of boiler setting, if my time or your space would admit; but I see plainly that if I touch, even in a general way, on most of the important points that bear on this subject, I, no doubt, will quite fill up the word measure established for this essay.

Engine setting is the next point I touch upon. What a number of imperfectly erected engines there are in this country! Engines put up with poor foundations; out of line; out of square; out of level; with poorly balanced fly wheels; with poor lubricators and poorer cylinder oil; packed with cheap packing, and run by ignorant, or careless, or slovenly, or lazy engineers. No wonder that 20 to 50 per cent. of the power is practically lost in a large number of instances before the belt is reached that conveys it to the line shaft. Power may be saved in nine-tenths of the manufacturing establishments of this country by looking over the engine and boiler room, and correcting so far as possible the points I have referred to.

Line shafting is the next prolific factor in the loss of power that I desire to discuss. It is no uncommon thing in small shops to see half the power, or thereabouts, used up in running the line shaft. It is mistaken economy for any manufacturer to put up cheap (?) shafting.

The difference in cost between the best turned shafting and the cheaper classes of cold-rolled or hot-drawn classes is very little. Poor hangers, that cannot be adjusted to meet any variations in the standing conditions of the building, or, if good enough, not properly adjusted, is another factor whereby power is lost. Poorly balanced pulleys, which put and keep nearly all, the line shafts over Canada out of balance, is another source of loss of power. To save power, therefore, use only the best turned shafting; use shafting heavy enough for the purposes required; use adjustable hangers, and re-line and re-adjust occasionally; use wood split pulleys as far as possible, for all ordinary driving, as they are lighter than iron, cost less, can be put on or removed much more readily, and as a rule run in truer balance.

Beltting is the next productive agent in the loss of power. If the purchase of poor shafting is mistaken

economy, the putting on of poor belting is a much greater mistake, either from a financial or a power-bearing point of view. To save power, get only the very best belting and see that every belt is wide enough to do its work right and carry its load easily; then the belt can be run at an easy tension, thereby saving the belt, and preventing the friction necessarily caused in the bearing by a tight belt.

Machinery construction and setting is so broad a field, that for the purpose of this essay I will only touch upon a few of the more important general lines wherein power is lost, and in the correction of which power may be saved. I note first: in a very large number of machines, as constructed at present, for manufacturing purposes, the belts are too short and too narrow. This is the most radical defect in the machinery now in use, and one that I am pleased to see most of the machinery manufacturers are making an effort to rectify.

Another very important defect, and one whereby power is lost, is too light frames. The users of machinery are themselves very largely to blame on this point, as the general cry among them for years has not been better machinery, as a rule, but cheaper machinery, and many of the manufacturers have been pandering to this penny wise and pound foolish morbid desire of their customers, and making a cheaper class of short-belted, small-spindled, light-framed machines that do a certain amount of work fairly well, but are too light to continue to do good work and do it well, and that do not produce results in proportion to the power consumed, with heavier framed, heavy steel-spindled, long-belted machines. Short boxes, poor babbitt, and cheap machine oil, are each of them fruitful causes of the loss of power, and especially the latter. In machine-setting, as in engine-setting, poor foundations are a prolific source of loss of power.

Thus I might go on enumerating, and without going into detail any more than I have done, show how, in all manner of shops, by all manner of careless, unmechanical ways, power is lost; and at the same time show, in the correction of the evils touched upon, how power may be saved, but I leave a few things unsaid and lying around loose, for the other fellows who will no doubt desire to write on this subject, and for the critics, who will be happy to have a shot at something I didn't say.

(FOR THE DOMINION MECHANICAL AND MILLING NEWS.)

ON THE ROAD.

BY "RAMBLER."

People who are always sighing for the "good old days" gone by, should board the C. P. R., and "make the run" to Owen Sound, marking the difference between things as they are and as they were. The comparison is so strikingly favourable to the present state of things that they would be compelled to admit that in some directions at least, things have changed for the better. The old wheel-barrow road, called the "narrow gauge," on which the people between Owen Sound and Toronto spent so much money to little purpose, is a thing of the past. So are the snow blockades of from one to three weeks' duration, which were quite common occurrences in the "good old days" aforesaid. Passengers haven't time now to jump off and rob farmers' orchards and regain their seats while the engine struggles to drag the train up the steep grades and around long curves. Steel rails have replaced the iron ones. Narrow gauge has given way to "standard." The miniature engine, which no doubt "did the best it could," has stepped down and out in favor of one of larger dimensions and increased power. The little square boxes, which by courtesy were called "coaches," and which were incapable of seating more than a "baker's dozen," have been superseded by elegant and comfortable conveyances of modern construction. Those who delight in the "good old days" are welcome to them, but "Rambler" is decidedly of opinion that these days with which the new year is starting out are just a little ahead of any of their predecessors.

Nor are improvements confined to the railway. Towns and villages along the line also exhibit marked signs of progress, and the appearance of the country all along the route is in favorable contrast to that of five years ago. One of the brightest, busiest little towns on the line, or indeed within a radius of fifty miles, is Shelburne. It numbers among its manufacturing enterprises three planing factories, a large roller flouring mill, the property of Mr. J. S. Plewes, (a genial gentleman to whom the writer is indebted for many courtesies), and the "Dufferin Foundry," owned and operated by Messrs. Wilson Bros. This firm make specialties of threshing machines, horse powers, &c., and turn out castings up to a ton weight. They have in their employ one of the most skillful patternmakers in the Dominion, Mr. Geo.

McKinley, who is well known in Galt and elsewhere. Mr. McKinley learned the pattern-making business in Scotland, the birth-place of so many skillful mechanics. Messrs. Wilson Bros. are thinking of putting in a new engine of increased capacity at an early date.

The observant stranger, entering Owen Sound at night realizes at once that he has struck an enlightened community. Electric lights are as thick as fire-flies in June, the principal business streets being almost as bright as at noonday. Ten years ago this same town couldn't boast of half a dozen coal-oil street lamps, yet those were the "good old days." Owen Sound would be a bright town even if it didn't have the electric light, because its citizens, or the majority of them, are intelligent, enterprising people. Business in every line appeared to be prosperous, and when "Rambler" goes up again, as he hopes to do some of these days, he will devote some attention to the various industries represented there. He has only time here to say a word about a few of them. Mr. Wright, the well-known miller, seems to have got hold of the right man to run his flouring mill, in the person of Mr. Robt. Tinck, who, for thirteen years was connected with the Kent Mills at Chatham. Two years ago Messrs. Wm. & J. G. Greey of Toronto, remodeled this mill, and put enough machinery into it to turn out 100 barrels of flour per 24 hours. Until six months ago, however, when Mr. Tinck took charge, the mill never exceeded 60 barrels. With skillful handling it now turns out as much as 125 bbls., or more than double its former capacity. Mr. Joseph Case, formerly of Pinkham's Mills, Strathroy, is the second miller. The mill contains 10 pairs of rolls, 3 purifiers, 4 centrifugal reels, and all necessary bolting capacity. Two runs of stones are used for grinding middlings. Mr. Wright ships largely of the product of this mill to the Northwest during the season of navigation, and sends down to his store in Brockville a car load per week. His oatmeal mills, situated half a mile up the river, are in charge of Mr. Geo. K. Strachan, a native of the "land o' cakes," whose assistant is Mr. Louis Davey. Both are reading, intelligent mechanics, under whose care the mill is turning out a first-class product. The capacity of the mill is about 30 barrels per day. It contains machines for making both rolled and cut oatmeal, stones for shelling the oats and for grinding standard meal, a cleaning machine which frees the oats from all foreign matter, and a machine for grading the oats which have passed through the cutting machine. The oatmeal manufactured here is all disposed of in the local markets.

Almost in the center of the town are the Owen Sound flour, oatmeal and woolen mills, owned by Mrs. Wm. Harrison, and managed by her son. The mill, which is stone process, with a capacity of about 100 barrels, is in charge of Mr. G. S. Mitchell, who also hails from the "land of brown heath and shaggy wood." His assistant is Mr. John Harrison, also a son of the owner. It is in contemplation to put in the roller process in the course of a few months, when a merchant trade will be established. At present the trade of both mills as well as of the woolen factory is purely local.

COMPUTING SIZE AND SPEED OF PULLEYS.

Following are several valuable rules for computing the size and speed of pulleys as formulated by a practical machinist. Example 1. To find the size of driving pulley, multiply the diameter of the driven by the number of revolutions it should make and divide the product by the revolutions of the driver; the quotient will be the size of the driver. Example 2. Diameter and revolutions of driver being given, to find the diameter of the driven that shall make a given number of revolutions, multiply the diameter of the driver by the number of revolutions and divide the product by the number of revolutions of the driven; the quotient will be the size of the driven. Example 3. To find number of revolutions of the driven pulley, multiply the diameter of the driver by its number of revolutions and divide by the diameter of the driven. The quotient will be the number of revolutions of the driven. The following examples will assist in determining diameters and speeds of pulleys: A 30-inch pulley making 180 revolutions per minute drives a countershaft with a 12-inch pulley. What is the speed of the latter? Ans. $180 \times 30 \div 12 = 450$ revolutions per minute. A countershaft is to make 450 revolutions per minute, driven by a 30-inch pulley making 180 revolutions per minute. What will be the diameter of the countershaft pulley? Ans. $180 \times 30 \div 450 = 12$ inches. What will be the diameter of a pulley making 450 revolutions per minute, to drive a 12-inch pulley 180 revolutions per minute? Ans. $450 \times 12 \div 180 = 30$ inches. In calculating toothed gears, substitute the numbers of teeth for the diameters, as above.

CORN-MEAL MILLING.

MESSRS. Inglis & Hunter, of this city, who are the sole licensed manufacturers of the Case milling machinery in Canada, are not confining themselves to flour milling only, but are also giving attention to the fitting-up of corn-meal mills on the Case corn-meal system. As this system is not familiar to the Canadian public, a few of its most important features, with illustrations, are herewith presented :

In experimenting in the manufacture of corn by the roller process, it was discovered that almost the entire bran and germ may be eliminated by the first break. There is a peculiarity about the reduction of corn by rolls, differing materially from the wheat. In the grinding of wheat by gradual reduction, the bran clings to the glutinous part of the berry, and it becomes necessary to pass this bran through series of reductions, in order to eliminate the glutinous part from the bran. In roller corn-meal milling, however, it is entirely different, as the major part of the bran and germ may be removed by the first break, by simply using a suitable corrugation and breaking down pretty close on the first break. It is therefore very evident that if this bran and germ can be essentially removed by the first break, and the corn reduced to meal and grits, that it would be a wrong system of milling to carry this bran and germ through a series of reductions intermingled with the grits, for in so doing, the bran and germ become disintegrated and mixed with the meal, which produces a grade of meal not superior to that made upon the burrs, so far as color is concerned. To obviate this difficulty, the patentees of this system have constructed mills in which all the tailings from each break go directly to the tail of the mill, instead of passing through a series of reductions. In this manner all the germ and branny particles are kept separate from the grits, which enables the miller to make a very high grade of pearl meal at the head of the mill. If it is desired to make a close yield, these branny particles and germ which are sent to the tail of the mill, may be re-ground one or more times, and if so desired, thoroughly ground up into meal. The miller may then draw off, say 30 per cent. of meal made at the head of the mill, and mingle with this meal made at the tail of the mill, making a standard grade, about equal to that made on burr-stones, while the remaining meal made at the extreme head of the mill will be of a remarkably bright color, entirely free from bran and germ.

This principle of corn-meal milling is covered by two patents. The two patents represent two distinct systems. One is what is denominated the short system, which consists of only two breaks. On the first break the corn is reduced to ordinary fine grits, the bran is tailed off to feed, and the grits being purified are re-ground upon the opposite side of the roll, and separated upon a sieve upon which an air current is applied, so that the entire meal made is of a very high grade. This system of milling will make from forty to forty-five pounds of high grade meal to the bushel, and is especially adapted to the northern section of the country, where a close yield is not essential, or where the bran may be sold at a price-value, equal to or in advance of corn. But in the southern section of the country, where the difference between feed or bran, and that of meal is very great, and where the demand is not for a high grade of meal, it is preferable to use the long system, which consists in re-grinding this bran, and bolting it into meal. It has been found more profitable to millets, milling in the northern section of the country, to put in the short system, owing to the fact that the demand is for a high grade of meal, and the

further fact that the bran may be intermingled with oats—or other grains—and ground into feed, bringing a price in advance of corn, so that in all circumstances the miller would be making money. Every mill, however, should be arranged to make a high grade of meal if desired. This can only be done by tailing off all the bran and germ to the tail of the mill, grinding it separately, and afterward, if the miller desires, he may mingle the

Justice Wilson recently delivered judgment on the Bell Telephone application for an injunction restraining the Belleville Electric Company from stringing wires on its own poles so close to the telephone wires as to impede telephone communication by the humming of the electric light machinery. The injunction was granted with costs against the Electric Light Company, and Justice Wilson decided that the electric light wires must be strung at a distance from the telephone wires sufficient to ensure their freedom from disturbance.

whole together, and make one straight grade of meal.

Any further particulars regarding this system of corn-meal milling will be cheerfully supplied on application to Messrs. Inglis & Hunter, Toronto.

GENERAL NEWS ITEMS.

An Association of Canadian engineers is about to be formed with the object of advancing engineering science.

The MECHANICAL AND MILLING NEWS is pleased to learn that a class in mechanical drawing will shortly be organized at Ayr, Ont., by Mr. C. Sangster.

The Northumberland paper mill at Campbellford will be lighted by electric light, and power is offered by the company to illuminate the streets of the town.

The present cost of operating the railways of America by steam is \$500,000,000, but to transport the same tonnage, using men and horses, would cost \$11,306,500,000.

The Ariadne, a vessel belonging to the Port of Toronto, and loaded with 10,000 bushels of barley, went to pieces off Oswego, N. Y., on Lake Ontario. No insurance.

A Company is reported to have been formed at Montreal to furnish the city with natural gas, and a contract has been entered into with responsible parties to dig a well 2,000 feet deep.

An incandescent lamp which requires no vacuum in the globe is said to have been invented in Germany. The wire used is a mixture of conducting and non-conducting elements, the latter preventing the former from melting.

There was the other day, purchased by the Bank of British Columbia at New Westminster, a gold quartz nugget weighing 34 ounces. It was recently dug out of Granite Creek, and is valued at \$340, which allows 40 per cent. for quartz.

The Scientific American, published by Munn & Co., New York, presents weekly to its readers the best and most reliable record of various improvements in machinery, while the scientific progress of the country can in no way be gleaned so well as by the regular perusal of its pages.

The Architectural draughtsmen of Toronto have formed an Association for the mutual improvement of the members. The following officers were elected for the ensuing year:—Henry Steele, president; W. L. Symons, vice-president; Henry Simpson, sec.-treas.; A. F. Wickson and C. D. Lennox, members of committee of management.

FIG. I.

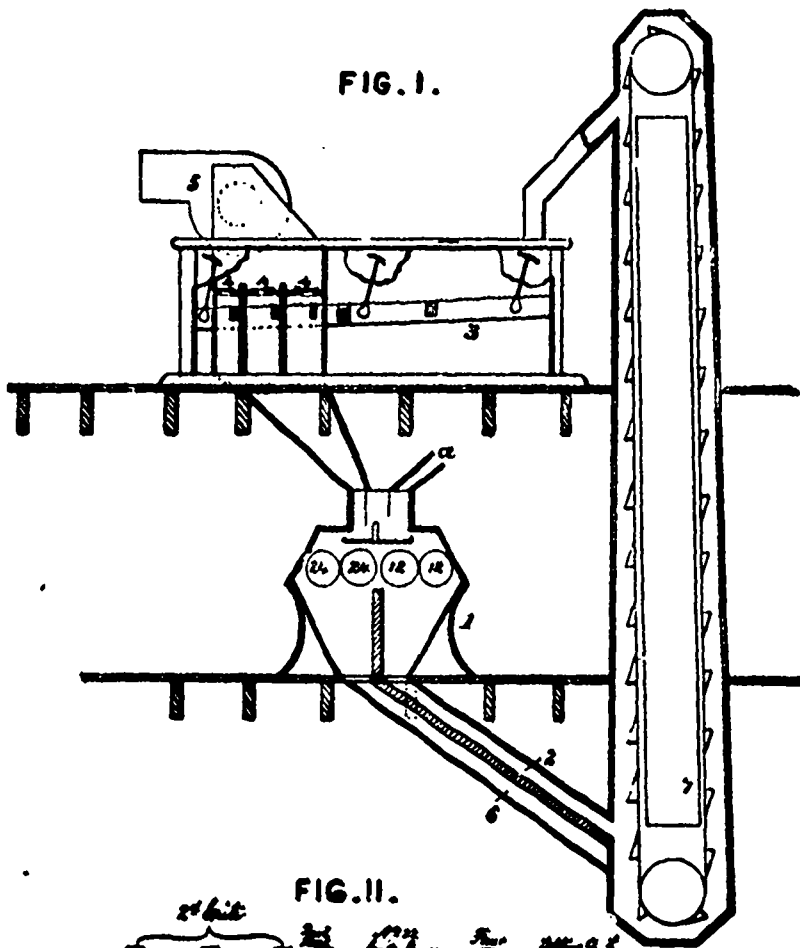
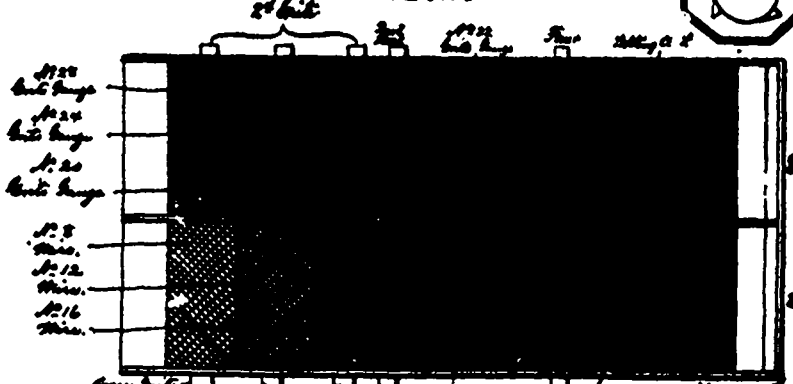
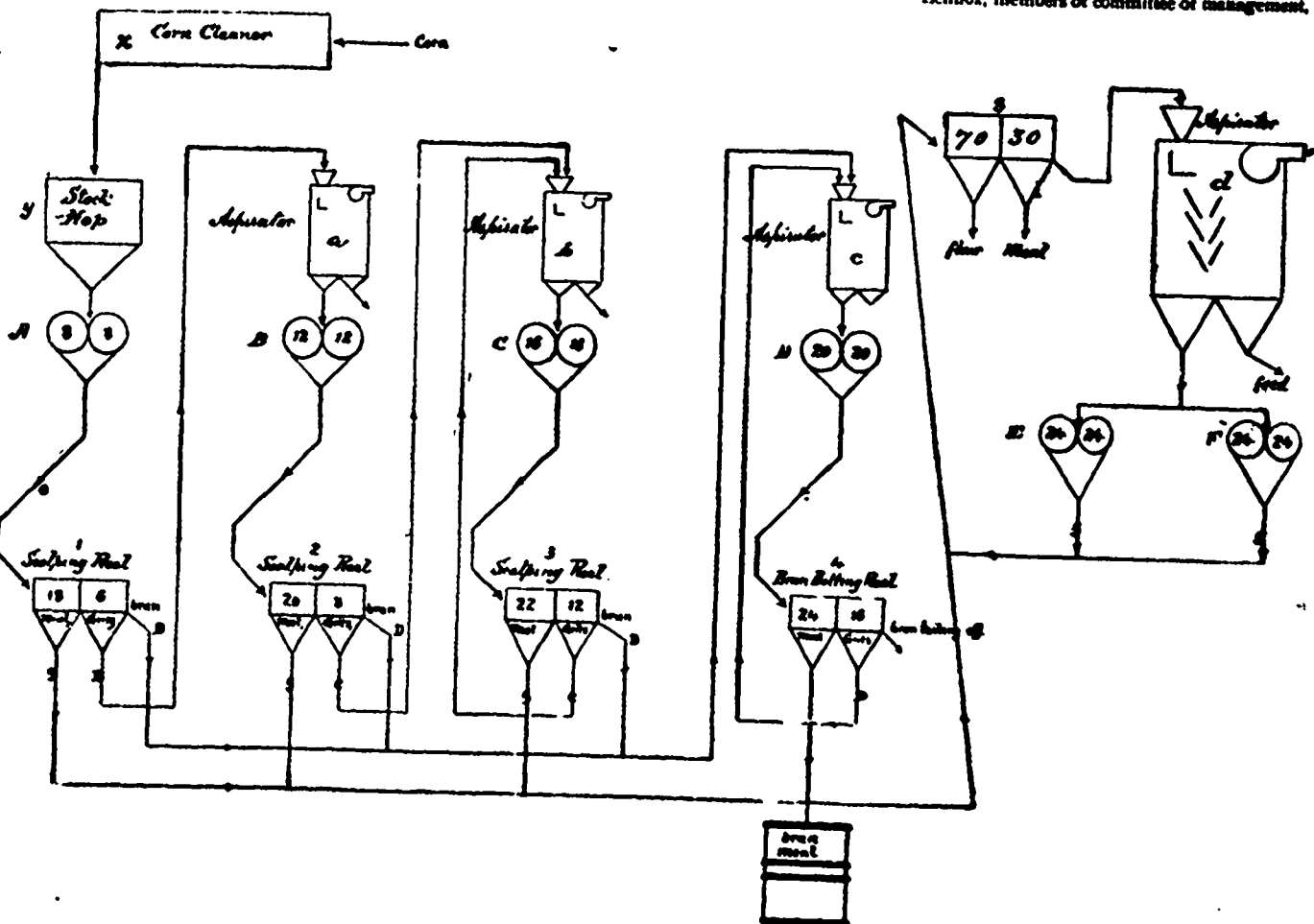


FIG. II.



THE CASE SHORT SYSTEM ROLLER CORN MEAL MILLING.



THE CASE LONG SYSTEM ROLLER CORN MEAL MILLING.

PROCTOR'S POINTS.

ANOTHER year has closed its records. "Proctor" is not going to moralize, except from a mechanical or financial standpoint. "Reviews" are useful, however, in mechanical and financial matters, as in philosophical and religious matters, and it is not a loss of time by any means, to look over the past and see if progress has been made along any line. The past is not always a "dead past" to us. The results springing from it are far-reaching in their effects, for good or ill, for gain or loss, as we take them, and as we use them. "Proctor" would like to indicate some lines of past experience along which some "Points" may be gathered up for future profit. Reader, if you heed them they may help you.

Master, what interest have you had in your men this year? How many times did you thank them for doing their work well, when they did it well? Did it never occur to you, that in the main it would pay you to do this? Don't you think that men are pleased to have their services appreciated? If you don't tell them when work is done right, as you think, how are they to know it? Have you looked upon men as so many machines, and on the basis that if you drove them a little faster you might make a little more money out of them? Have you discussed with your foreman as to the relative merit of the men in your employ, and shown your appreciation of the services of the best men by some advance, however trifling, in wages, or in such other way as prudence and the best interests of your business would justify? It pays to treat and pay men according to their merit, and if the masters over this country would do this, the standard of their workmen would very soon very materially advance in quality. Men are measured too much on a par.

Master, still another question, now that you are on the floor. What attention have you paid to the sanitary condition of your shops, or the providing of comfortable premises for your men to work in? Oh, the dirty, slovenly-kept unventilated machine-shops and planing-mills and grist-mills and factories that are over this country, and notoriously plentiful in this city of Toronto. Shops and factories seem to have been built, so far as the writer can see, over this country, without the matter of ventilation and cleanliness having been taken into consideration in any way whatever. Master, are you not under some obligation to the wives and children, the mothers and sisters, and society in general, as well as the interests of your own business, to provide for your work-people well-ventilated, well-lighted and comfortably-heated premises to work in? Look into the matter, and if your shops are not up to the mark, try what effect a dispensation of broom and whitewash and clean water will have. I fancy you will be so agreeably surprised that other changes in the same direction will be sure to follow. For instance, those steam-heating pipes under the benches, behind the debris and material, and sometimes covered up altogether, will be brought out of that and put over head, where they will heat your shop much better on about half the steam now used.

One more question, master, and you may sit down and let your men stand up. What have you done this year for the education of your men? "Proctor" asked this question of a master mechanic the other day, and his reply covered most of the ground covered by the masters, viz: "well, I've jawed 'em a good deal." It will pay every manufacturer to give considerable attention to the educating of his employees in the particular branch of industry in which he is engaged. If more attention were paid to the educating of the young mechanics, and beginners especially, the successful continuation of every line of industry would be more permanently secured. Every manufacturing concern that does this, has always at its command the material for its foremen and master-mechanics, among its employees. Master, it will pay you to make some provision for the education of your men. Try it.

Workman, how have you served your master this year? Eye-service? Time service? Was it for wages only? Did you try to do an honest, fair day's work, and earn your wages? Or have you been depending on the "Union" for work, and at a rate of wages that you were never worthy of? If the latter is true, it may carry you along in prosperous times, but depend upon it, you are kept on, not because your master can make any money out of you, but because, even if he don't make anything, he desires to complete his contracts on time; but these finished, if slack times touch him, you will be correct in anticipating that your "time's up." The experience of

"Proctor" is, that not over one mechanic in ten cares a button whether his work is paying his employer or not. This policy—or rather thriftlessness—on the part of the workman is the very thing that will not only keep him in poverty all his days, but will also keep him the dupe and cat's paw of every labor demagogue and professional agitator; men who would be earning a living in a legitimate way if it were not for the thriftlessness and ignorance of that class of workmen who have to depend on labor unions to get them employment and keep them there at wages far above their value. Good workmen need no "Union" to command first-class wages. Any man that gets first-class wages on any other basis than merit, is a ———. (Reader, fill the blank in, and that will be your opinion of him.)

On this point of workmen who are working for wages only, without any particular reference to the quality or amount of work turned out, a circumstance that took place in a Toronto shop during the Christmas week, and narrated to the writer by a friend, will serve to illustrate. Business called my friend into one of the large planing mills of the city, where he was somewhat surprised to find the proprietor, a man of about 70 years of age, at a bench, among his men, with his hat and coat and vest off, and his shirt-sleeves rolled up, driving a jack-plane as if his Christmas dinner depended on his exertion. When asked by his caller why it was necessary for an old man, and one who had a large force of men, and who was well off, to undress and go to work in this manner, he made prompt reply in vigorous language: "I promised a customer to have this job done to-night. Only one man can work at it, and although I have a large staff of men, I haven't one that could get it done before to-morrow night, and the only chance I had to fulfil my promise to my customer was to do the job myself. My men all work by the day." His men are good average workmen. I desire to emphasize the word *average*. It don't stand for as much as it ought to. It is a pretty low standard, considering the opportunities for excellence that exist nowadays. The old gentleman mentioned above drove a jack-plane many a day at 50 cents a day, in the old times, and he always did a good day's work, whether he got a good day's pay or not, and he always has had more work and business than he could get through with. Busy men who get through work quickly always get plenty of it. Only the fellows who take three days to do one day's work, but who are very anxious to have four day's pay for it, are ever short of work in this busy nineteenth century, or ever have (like Thompson's dog chasing his tail) a desperate struggle to make both ends meet. But "Proctor's" time is up, and making a polite bow to his friends, the readers of the DOMINION MECHANICAL AND MILLING NEWS, he only adds a New Year's greeting:

The years are for us what we make them,
They each have for us what we need,
And each will to us be a blessing,
If wisdom and duty we heed.
Let each then, with patient endeavor,
Think wisely, speak truly, do right,
And earth, by our presence, will ever
Be led into truth's clearer light.

PROCTOR.



Mr. Alex. Fier, Onemee, Ont., has purchased a set of 9x15 chilled rolls from the Messrs. Greey, of Toronto.
Messrs. Fish & Ireland, of Lachute, Que., are making extensive improvements. They are being supplied with machinery by Wm. & J. G. Greey, of Toronto, for making oatmeal.
Mr. D. W. Rose, of Simcoe, Ont., has ordered from Wm. & J. Greey, of Toronto, one double set of rolls for the improvement of his mill.
Mrs. A. Henderson, Huntingdon, Que., has contracted with the Geo. T. Smith Middlings Purifier Co. for a full line of machinery for a roller mill of 75 barrels capacity.
McKay & Freeborn, of Midland, have closed contract with the Geo. T. Smith Middlings Purifier Co. for the necessary machines to change their mill to the full roller process.
Messrs. Wm. & J. G. Greey, of Toronto, have booked another large order from their Australian agents for grain cleaning machinery, roller mills, &c.
Mr. Alex. Laidlaw, of Parkdale, in conjunction with Jos. Lehman, millwright, of Stouffville, Ont., has just completed plans for Mr. B. Reesor's proposed new mill at Newmarket, Ont. Work on the mill will now be pushed on as rapidly as possible.
Messrs. R. Fuggle & Co., of St. Thomas, Ont., are the first parties in Canada to adopt the "Case" patent roller corn meal system. They propose to make the finest grades of granulated corn meal, and will be the pioneers with it on our market, as none has hitherto been made on this side of the line. Messrs. Inglis & Hunter, the sole manufacturers for Canada, are putting in the rig for them and expect to have it in successful operation very shortly.

Messrs. Scott & Bell, Wingham, Ont., are shipping large quantities of furniture to the Northwest.

Messrs. Wm. Kennedy & Sons, Owen Sound, are putting two 66-inch water wheels, with a capacity of about 450 h. p. each, into Mr. W. A. Grier's new saw mill at Ottawa, Ont. The same firm are also supplying the heavy shafting, gearing, &c.

Messrs. Wm. & J. G. Greey have sold one of their largest size middlings purifiers to Whitlaw, Baird & Co., of Paris, Ont. This firm have been using Greey's velocity purifiers for the last three years.

Mr. B. F. Reesor, of Newmarket, Ont., is about changing his mill over to the full roller process, and with that end in view has purchased from Messrs. Inglis & Hunter ten pairs of rolls of the "Case" patent.

Messrs. W. B. Brown & Co., of Simcoe, Ont., have made a fair trial of their new mill, put in for them on the "Case" system by Messrs. Inglis & Hunter, and are well pleased with it. They write "The mill is going splendid and is in every respect a first-class mill, and we are more than pleased with her."

Messrs. Wm. & J. G. Greey have received an order through their Winnipeg branch for an outfit of machinery for the Stonewall mill, consisting of 4 double stands of 6x15 rolls, 3 No. 3 Velocity middlings purifiers, 2 No. 2 centrifugal reels, No. 1 combined smut and brush machine, No. 1 separator and No. 6 cockle machine.

The Geo. T. Smith Middlings Purifier Co. write that they have been running their shops 12½ hours per day steadily since last July, and are compelled to decline orders for new work, except for long date shipment. They contemplate enlarging their shops in the spring to meet the increased demand.

Mr. B. F. Reesor, of Newmarket, Ont., has placed an order with Wm. & J. G. Greey, of Toronto, for one of their improved Velocity middlings purifiers, three centrifugal bolting reels, one No. 1 shorts duster and an aspirator; also machinery, bolting cloths, beating, &c.

The Citizens Milling Co., of Toronto, are remodelling their mill so as to be abreast of the times. They have adopted the "Case" system, and Messrs. Inglis & Hunter have put them in some "Case" rolls, have altered all their present rolls from gear to the "Case" belt drive, and have put the "Case" patent vibratory feed on all over the mill. They have made a most successful start up.

Messrs. Robin & Sadler, leather belting manufacturers of Montreal and Toronto, have just closed a contract with Messrs. A. W. Ogilvie & Co. for the entire outfit of belting required for their new mill, "The Royal," at Montreal. It will be the largest mill in Canada when completed. This makes the fifth mill Robin & Sadler have fitted up with belting for the Ogilvies in the last four years.

Mr. Alexander Laidlaw, of Parkdale, has had a staff of men at work for a couple of weeks past in Mr. John A. Breckenridge's mill at Nottawa, Ont., which he is remodelling to the roller system. The capacity of the mill will be 75 barrels. The mill is designed on an entirely new principle. It is expected to be completed and in operation by the 1st of March.

Messrs. Robert Muir & Co., Manitoba agents for Wm. & J. G. Greey, of Toronto, have secured the contract for the Balmoral mill. The plant of machinery is to consist of one No. 1 separator, one No. 1 combined smut and brush machine, one No. 6 cockle machine, eight sets of chilled iron rollers, four No. 2 improved velocity middlings purifiers, two No. 2 centrifugal bolting reels, all manufactured by Wm. & J. G. Greey.

Messrs. Freur Bros., of Acton, Ont., have just started up their new roller grist mill. It is situated 1½ miles from the village and upon the site of the old Folton mill built some years ago. The mill has a capacity of about 30 bbls., and is said to be capable of making high grade roller flour. The proprietors express themselves well pleased with the rollers and other machines supplied them by Wm. & J. G. Greey, of Toronto.

Mr. Fitzgerald, of Hamilton, has built a new 100 barrel roller mill on the site of the old stone mill destroyed by fire last summer. Last week the mill was completed and put in operation by the contractors, Messrs. Wm. & J. G. Greey, of Toronto. We understand that on the first test, the mill made flour at the rate of 115 barrels and of a quality equal to any roller flour coming into the city from outside mills. Messrs. Snider, Lake & Bailey have leased the mill for a term of years.

A representative of the MECHANICAL AND MILLING NEWS, while passing through Goderich the other day, devoted a few moments at his command to visiting the establishment of Messrs. Runciman Bros., who are the leading iron foundries and manufacturers of mill machinery in that town. A walk through their works revealed the fact that they are doing quite an extensive business. Their shops are fitted with appliances for the manufacture of agricultural implements as well as mill machinery. Since April last the firm has filled contracts for roller mills for the following parties: Messrs. A. Drake, of Byng Inlet; S. Manley, Smithville; Dunlop, Arkona, and McKillop & Son, Bismarck. They have a substantial building for the machine work besides the foundry and pattern and ware rooms.

CATARRH, CATARRHAL DEAFNESS, AND HAY FEVER.

(From Scientific American.)

Sufferers are not generally aware that these diseases are contagious, or that they are due to the presence of living parasites in the lining membrane of the nose and eustachian tubes. Microscopic research, however, has proved this to be a fact, and the result is that a simple remedy has been formulated whereby catarrh, catarrhal deafness, and hay fever are cured in from one to three simple applications made at home. A pamphlet explaining this new treatment is sent free on receipt of stamp, by A. H. Dixon & Son, 305 King Street West, Toronto, Canada.



The saw mill at Ompah, Ont. has lately changed hands.

Tett Bros. are rebuilding Salmon Lake dam which broke away last spring.

British Columbia cedar shingles are being shipped eastward to Puget Sound.

The township of Ryde, Muskoka district, boasts of six sawmills. Five of them are steam mills.

The mill-owners of Turtle Creek, N. B., commenced stream-driving and sawing since the recent rains.

The Enterprise, Ont., milling company is putting in a new water wheel. It intends to saw shingles and lumber.

The receipts of lumber at Chicago for the year 1886 shows a falling off of 65,000,000 as compared with 1885.

Messrs. A. W. Parkin & Son, of Lindsay, are at work getting timbers ready to rebuild their saw and shingle mill.

W. B. Phelps & Son of Phippsville, Ont. are putting up a shanty and getting ready to take out ties and shingle wood.

Crowe's saw mill, situated five miles from Truro, N. S., was destroyed by fire on the night of Dec. 10th. Loss heavy; no insurance.

Minneapolis saw mills are reported to have cut 51,000,000 feet less, lumber 27,000,000 less of shingles, and 26,000,000 less of lath this year than last.

The *Battleford Herald* says the Prince Brothers have removed their saw mill machinery to the banks of the Saskatchewan, to save the haulage of logs from their rafts.

Mr. H. R. Archer, of Newbury, Ont. is reported to have sold two hundred acres of timber lands, concession one, Mosa, to saw mill men of Chatham, for eight thousand dollars.

B. Caldwell & Sons saw mill at Wilbur Station, Ont. has been shut down for a few weeks, for the purpose of having some repairs made before starting the shingle mill for the winter.

Mr. Menno Bechtel's saw mill, planing mill, bolt heading and cheese factory at Wellesley, Ont., was recently moved from its original site to a new one near the edge of the mill dam.

There are 1,200 men in the Gilmour shanties. The big mill has shut down for the season. The men are taking up the dam to push forward the work of preparing it for running the new factory.

The Buffalo Lumbermen's Exchange which is composed of lumber dealers in Buffalo and vicinity, will hold weekly meetings throughout the winter, at the Merchants' Exchange committee rooms.

The West Indian birch is said to be the weakest and the nutmeg hickory of Arkansas the strongest wood. The lightest and most brittle is the blue wood of Texas, and the tamarack the most elastic.

Fire broke out in the Wm. Cane & Sons Mfg. Co.'s wood-working establishment at Newmarket, Ont., a fortnight ago, and resulted in a great deal of damage. The loss, however, is fortunately covered by insurance.

A Longford correspondent writes that Mr. A. McPherson's saw-mill has been shut down after a satisfactory season. The shingle mill will run all winter. Mr. McPherson will get out a large stock for the mill for next year. His shanties are in full operation.

The total shipments of lumber from the St. Lawrence to South America during the season just closed, were 29,682,204 feet, of which 21,584,100 went from Montreal, and 7,305,600 feet from other St. Lawrence ports, showing a decrease of 2,256,000 as compared with last year's shipments.

A correspondent writes from Fogler's Switch Ont. There is a good opening here for a steam saw mill it being close to the railway with a large section of country lying north and west of this place, full of pine and cedar, that could be hauled to the switch in the winter if there was a mill there to cut it.

The firms of Sewell & McVerney lumbermen, commenced operations on Nov. 1st on the Abegash river, says the *St. John Globe*, and have cut up to date about 1,000,000 ft. Mr. Sewell will take to the woods a number of men and teams. They expect to cut about 5,000,000 feet this season for Messrs. A. G. Young & Co.

In a discussion of the Port Arthur Board of Trade upon the best means of saving the pine timber burned over in forest fires this year, it was stated by a large lumber operator that one hundred million feet of pine had been so burned over and if not cut down the present winter, would be ruined by worms next summer.

The Export Lumber Company of Montreal and New York report the total shipments of lumber from the river St. Lawrence to the river Plate during the season of 1886 as 29,682,204 feet, of which 21,584,100 feet was pine and 7,305,600 feet spruce. The total shipment in 1885 was 31,344,543 feet, and in 1884, 29,038,548.

The *Winnipeg Free Press* says Messrs. Egan Bros., in addition to getting out 125,000 ties for the C. P. R. will take out 10,000 cords of wood. Mr. W. Skoad will take out 100,000 ties for the C. P. R.; Egan & Irvine 6,000 cords of wood, and Buchanan & Sullivan 5,000 cords of wood. The Messrs. Egan went to the woods on Saturday with 124 men.

Southern lumber resources continue to occupy the attention of lumbermen in the States and Canada. New lines of railroad in the south are running in all directions and bringing hitherto untouched forests within the reach of the markets, and along all these lines and wherever there is a hint of a line for the near future the prospectors and purchasers swarm. As our New Orleans correspondent clearly points out, the south offers many tempting inducements to northern capital and enterprise in her great forests of valuable wood which are yet to be had for a song.—*Lumber World*.

A veteran saw mill man remarks that the more work you can put on a small piece of wood the more money you make. The man who cuts and hauls logs by wagon to the mill hardly earns feed for himself and team. The man who saws the log into rough lumber barely makes wages for the hands. The men who work the lumber up into finished stuff can have a pretty good chance to make a profit.

Permits to take out ties and wood in Ontario along the C. P. R. have been granted by Crown timber agent Margach, of Port Arthur, to the following Winnipeg parties: Dennison Bros., whose permit covers the district from the Manitoba line east to Eagle River; Egan Bros., to cut 125,000 ties in the district extending from English River to Savanne. The H. B. Co. are also applying for a permit to take out a large number of ties.

A Calgary, N. W. T., dispatch says: The Eau Lumber Company have given a contract for a million feet of logs to be cut on their limits by the proprietors of the Kanaouaskis lime kilns. The company's saw mill at this point is nearing completion, but they will not likely begin sawing for the market till the spring comes in. Those who have visited the mill recently have been struck with the solid manner in which the structure is put up. The large engine room is of sandstone on a granite foundation, and is built to last no end of time. It gives accommodation for a large 120 horse power engine and three huge boilers. It is not improbable the company will keep as many as fifty hands about the mill when active operations begin.

Messrs. Duncan McArthur, W. R. Allan, F. A. Fairchild, R. D. Bathgate, Archibald Wright and C. W. Betts, all of Winnipeg, apply to the Governor-in-Council for letters patent incorporating them, a body corporate and politic under the corporate name of "The Rocky Mountain Mining and Lumber Company (Limited)," for the purpose of carrying on a mining and lumbering business within the Dominion of Canada, also for the purposes of the said company, to build, equip and operate tramways, sailing and steam vessels for the carriage of lumber, timber, minerals or mineral ores or any other production by said company; to purchase, build and erect stamp mills, saw and planing mills, or any one or more thereof. The head office of the company will be at Winnipeg.

Canadian lumbermen are turning the tables on the Americans, who for some years have been making fortunes out of Canadian timber lands. As stated in the *MECHANICAL AND MILLING NEWS* for November, a Canadian syndicate is said to have acquired the title to about 500,000,000 feet of pine in Northwestern Minnesota. It is also reported that negotiations are in progress by which the syndicate will probably secure the rest of the vast timber belt on the Northern slope, covering about half the area of the state. In retaliation for the 25 export duty placed by the Canadian Government on saw logs, American papers are urging their government to impose a similar duty on timber to prevent the syndicate referred to from bringing their Minnesota pine into Canada for manufacture.

The first shipment of lumber via the Canadian Pacific railway from New Westminster, B. C., arrived at Montreal on the 11th of Dec. It consisted of fifteen thousand feet of Douglas pine and cedar cut in thirty-foot lengths, and is the first instalment of 36,000 feet for a local contractor. The company expect to do a large freighting business in lumber, more especially where the long sill timber is required. The Douglas pine is not equalled in any other part of the world for size except in a very limited area in the State of California, a long distance from the coast. It is stated that the great lumber mills at Port Moody and Vancouver are preparing to put in new machinery to meet the demand that is almost certain to take place. Vast quantities of British Columbia wood have heretofore been shipped to Australia, South America and San Francisco.

A feature of the building trade is the extensive use that is made of veneers. The method of building up doors of strips of pine has tended directly to this result. The built up door made of strips of pine glued together, is stronger than any other kind at least of equal weight, and will not warp. But it necessitates the use of veneers of some kind. For heavy doors quarter-inch stuff is used and for the smaller doors in residences one-eighth inch is often considered thick enough. The kind of wood depends on the finish of the room. Mahogany, cherry, oak, and curly or birds-eye maple are perhaps the most common. This method of construction is particularly valuable where the opposite sides of doors have to be finished differently, to correspond with the rooms which they respectively face. This has often been done by making the door of two layers, generally of equal thickness, the unequal shrinking and swelling of which would twist the door and often tear it to pieces. The objection is raised against veneering that it is dishonest, and so not true art. That criticism should never be made in regard to such work as that mentioned. The built up door of pine, veneered with mahogany, costs about as much as one of solid mahogany, and is a better one.

A Point Wolf, N. B., correspondent of the *Albert Appeal Leaf* writes: Perhaps a few items in reference to the lumbering operations earned on here by C. M. Bostwick & Co., of St. John, would be acceptable. I would say that their mill commenced sawing May 15, and shut down Dec. 3. In that time 5,000,000 feet of deals and boards were sawn and 4,000,000 laths cut. The deals have all been shipped to St. John for re-shipment to Europe except 500,000 feet which are snugly piled in the lumber yard. The boards, scantling and lath were sold in Boston and New York. There are about 1,000,000 feet of old logs in the pond and streams, which would have been cut also if there had been good river driving in the early autumn. This mill, which is said to turn out as good lumber as any on the Bay shore, is driven during spring and autumn by water, and during the dry season by steam, having a 30-horse power engine for that purpose. The following are some of the efficient men employed. James Campbell, general manager; W. Ratsey, engineer; A. H. Nash, millwright; Nathan Cleveland, foreman, and William Hubbard, surveyor. The company has a large store here in connection with the business, over which W. M. Fowler has charge. Good wages are paid the millmen for which they can take goods out of the store or receive cash. Robert Connelly has the contract for putting all the logs into the stream and he intends getting out 5,000,000 this winter for next summer's sawing.



Orangeville woollen mills are illuminated with nine electric lights.

A carpet yarn factory is being started by a Guelph firm in Elora.

The Midland woollen mills have an order from Toronto for 3 tons of yarn.

Messrs. Bell & Phillips are fitting up a well-appointed machine shop in Selkirk, Man.

It is said that the Napanee & Tamworth railway company will build car shops at Napanee.

Mr. Simmons has his new planing mill at Newcastle most ready to be put in operation.

A cooper shop and heading factory is to be established by Mr. John Matthews at Kendall, Ont.

The Windsor cotton factory, Windsor, N. S., is working overtime until 9 o'clock at night, filling orders.

Mr. Kyle of Brockville, and J. E. Brown, of Delta, Ont., have started an iron pump factory at the latter place.

John Heard & Co., Amherstburg, want \$6,000 as a condition of removing their spoke and wheel works to St. Thomas.

The engine and boiler house of Woodward & Isbister, Petrolia, Ont., was totally destroyed by fire recently. Loss, \$1,000; partially insured.

H. McCrae & Son, foundrymen and machinists, Tilsonburg, Ont., have received a large order from the London Pottery Co. for machinery for the pottery the Company is erecting in London.

Messrs. John Bertram & Sons, Dundas, lately cast a bed-plate thirty-six feet long for a planing machine which is designed to take in work six feet square. Between eight and nine tons of iron were required for the casting.

The Canadian Pacific railway workshops in Montreal have turned out the first consolidation locomotive engine built in the Dominion. Four in all are to be built, each weighing 51½ tons, with a 19-inch cylinder and 22 inches stroke; diameter of driving-wheel, 51 inches.

Messrs. Wilson Bros., of the Vancouver Foundry, British Columbia, have shipped to Port Townsend, for transportation to China, on the bark *Southern Chief*, a pair of high pressure stern-wheel engines 90-horse power, and the necessary wrought iron work and connections. This machinery is to be put into a steamer, now building in China, to ply upon one of the large rivers of that empire.

Henry Crookes, of London, has invented a tell-tale paint for showing when a bearing is growing hot. At normal temperature it is a brilliant red, but as it is heated it grows darker until at 180° Fahr. it is quite brown. As it cools it regains its original color. If the bearings of an engine or machine be covered with paint the man in charge can tell at a glance if they are running cool, and if they become hot, he can watch from a distance the effect of the lubricant he applies.

A correspondent writing from Preston, Ont., gives the following illustration of the folly of the bonus system as applied to manufactures: Messrs. W. D. Hepburn & Co., are expected to move their boot and shoe factory to Ingersoll. The advisability of granting them a bonus of \$10,000 will be voted on in that town soon, the result of which will determine the action of Messrs. Hepburn & Co. They came to Preston under the influence of a bonus, and as said influence has only expired during the present year, their action is not being favorably received, nor is the bonus system gaining in popularity in the village.

A new steel steamer for the Niagara Navigation Company, the first ever totally constructed in Canada, will be erected at Deseronto in the shipyard of the Rathbun Company during the coming winter. This steamer, which will ply between Toronto and Niagara, will be of the following dimensions: 250 feet in length, 29 feet beam, 11 feet 6 inches hold, and is expected to run 18 miles an hour. The steel hull is being constructed by Mr. W. C. White, of the Vulcan Boiler Works, Montreal. The engines are being built in Scotland, but the boilers, six in number, will be built in Canada. Mr. White is also building a steel steamer for Captain Murphy, of Pembroke, and one for the Muskoka Navigation Company.

There is a class of work that a lathe man comes across once in a while, says the *Boston Journal of Commerce*, that might well be called arc turning, as the work cannot be made to revolve continually on its own centres but must swing back and forth while the turning tool is passing a protuberance that comes within reach of the tool post. Anything of this kind is never recommended, as it is considered impracticable in the first place and calls for too much hand work to make much of a success on an engine lathe, yet it can be done quite satisfactorily by taking a light cut with a round-nosed tool and driving the lathe with a slow speed for the sake of the feed motion. If the hub of a short arm connection is to be finished entirely it can easily be turned up to the arm on both sides as it revolves on the lathe centre, but to finish by the arm requires a specimen of arc turning where a large amount of hand power is used unless the work is to be taken to some other machine. If we file a large flat place for a tool to start in at the commencement of each cut, and a narrow groove chipped across where the cut is to stop, we shall have too large a sweep to manage by hand power; beside these there will be quite a large space taken up by the depth of the lathe tool to be finished by hand. It is better to commence in the centre of the sweep and work each way, taking a light chip with a round-nosed tool, using the power feed while the work is driven by a hand lever. This gives a short throw that is easily handled, and the work can be changed end off for every cut that is taken. The tool can be ground and set sufficiently high to cut itself clear so as not to drag in the return stroke, and with a fine feed a first-class job will be made at arc turning that will compare favorably with the best of lathe work except the unusual exercise that is required at long arm practice.

POWER AND ITS TRANSMISSION.

In order to save considerable time and trouble in searching for information with regard to the transmission of power, says the *Millers' Journal*, the following data have been collated from a mass of irrelevant matter. The reader will be able to find at a glance what he wants to know in order to be able to make accurate calculations.

BELTING.

Belting is daily coming more and more into use, and it is safe to say that at least 95 per cent. of the power is transmitted by it, while in Europe the greater part of the power is transmitted by cog-wheels.

THE POWER OF BELTS

is derived from the friction between the surface of the belt and the pulley, and is governed by the same laws as in friction between flat surfaces. The friction increases regularly with the pressure, and the more elastic the surface the greater the friction. The only fault to be found with the system of belting is that a portion of the revolutions of the motor are lost. The number of revolutions lost vary with the load as it changes. Ordinary belts will safely sustain a working tension of 45 pounds per inch in width.

WIDTH OF BELT, ETC.

The rule to determine the width of belt and size of pulley required to transmit a given horse-power is easily found. Since a horse-power is 33,000 pounds raised one foot high per minute, we must adjust the width and velocity of belts so as to effect the required result. Thus, if a belt runs with a velocity of 733 feet per minute, a belt five inches in width will transmit five horse-power, provided the effective tension is 45 pounds per inch. If the velocity be increased up to 1,466 feet per minute the same belt with the same tension will transmit ten horse-power, so that a 5-inch belt applied to a 5-foot pulley making 120 revolutions per minute would transmit ten horse-power when the effective tension is 225 pounds.

By taking the actual tension of the belt and multiplying it by the actual velocity, we get what may be called the indicated horse-power of the belt, which corresponds to the indicated horse power of the engine. By measuring the actual power transmitted, by a dynamometer, rules may be based upon the amount of belt surface in contact with the pulley.

For practical purposes, velocity and power to resist tension are the only available elements of calculation.

Actual tension, adhesion, friction, &c., can all be varied at will and form no certain dependence for calculation. It may, however, be adopted as a rule that the adhesion and capability of belts to transmit power is in the ratio of their relative lengths and breadths. A belt double the length or breadth of another under the same circumstances will transmit more than double the power, and for this reason it is desirable to use long belts. By doubling the velocity of the same belt its effective capability for transmitting power is also doubled.

Belts which run vertically should always be drawn tight, or the weight may prevent its adhering closely to the lower pulley, but in all other cases they should be moderately slack.

In order to obtain the greatest amount of power from belts the pulleys should be covered with leather, and more power can be obtained from the grain or hair side to the pulley than the flesh side, as the belt adheres more closely.

The most effectual remedy for preventing belts from running to one side of the pulley, would be to find out first if the face of the pulley is straight, if not to straighten it. In some cases the shafts may not be in line. The remedy in this case would be to slacken up the hanger bolts and drive the hangers out or in, as the case may be, until both ends of the shaft become parallel. This can be determined by getting the centres of the shafts at both ends by means of a long strip of board.

TIGHTENERS

should be placed as close to the large or driving pulley as circumstances will permit, as the loss of power in the use of a tightener is equal to that required to bend the belt and carry the tightening pulley; therefore, there is a greater loss of power by placing it near the small pulley, as the belt will be bent more than near the large one.

Belts always run to the highest side of the pulley, because of centrifugal force, and that part of the belt nearest to the highest part of the rounded pulley is more rapidly drawn, because the circumference of the pulley is greater at that point.

LENGTH OF BELTS.

The rule for finding the length of a belt desired is to add the diameter of the pulleys together, divide the sum by 2, and multiply the quotient by $3\frac{1}{2}$; add the product

to twice the distance between the centres of the shafts, and the sum will be the length required.

WIDTH OF BELTS.

The rule for finding the width of belt to transmit a given horse-power is to multiply 36,000 by the number of horse-power; multiply the speed of the belt in feet per minute by one-half the length in inches of belt in contact with smaller pulley; divide the first product by the second, the quotient will be the required width in inches.

HORSE-POWER OF A BELT.

Following is the rule for calculating the number of horse-power a belt will transmit, its velocity and number of inches in contact with the small pulley being given: Divide the number of square inches in contact with the pulley by 2, multiply this quotient by the velocity of the belt in feet per minute, divide this amount by 32,000 and the quotient will be the number of horse-power the belt will transmit.

To ascertain the horse-power which belts will transmit, multiply the width of the belt by the diameter of the pulley (in inches), by revolutions of the pulley (per minute), by the number in the following table corresponding to the pull the belt can exert per inch of width. Example: 10-inch single horizontal belt, 36-inch pulley, 200 revolutions, pull taken at 50 lbs.

$$10 \times 36 \times 200 \times .0004 = 28.8 \text{ horse-power.}$$

The pulls which belts 1 inch will transmit are as follows:

Single horizontal belts.....	50 lbs.
Double.....	100 "
Single vertical.....	40 "
Double.....	60 "
Quarter-twist single belts.....	25 "
" " double ".....	40 "

Pull exerted by belt 1 inch wide, in pounds.	Horse-power—Pulley 1 inch diameter, one revolution per minute, belt 1 inch wide.
10	.00008
15	.00012
20	.00016
25	.00020
30	.00024
35	.00028
40	.00032
45	.00036
50	.00040
55	.00044
60	.00048
65	.00052
70	.00056
75	.00060
80	.00064
85	.00068
90	.00072
95	.00076
100	.00080

HOW TO PUT ON A BELT.

Never try to put on a belt on the pulley in motion. Always place it first on the loose pulley, or the pulley at rest, and then run it on the pulley in motion.

ADHESION.

Adhesion of the belt with the pulley is found to exist most perfectly between surfaces that are coated with some semi-liquid. Castor oil has been found to have an excellent effect, and it is claimed that a belt three inches wide impregnated with it will transmit as much power as a 4-inch belt without it, and, besides this, rats will avoid castor oil, hence they will not touch a belt with it on.

Printers' ink has been recommended as a means of preventing belts from slipping. Neatsfoot oil, with a little resin, has been found very useful when a belt becomes hard and dry, but castor oil and glycerine are the best for this purpose.

The power required to bend the belt from a straight line and cause it to lap tightly around the pulley would not at first sight appear to be worth considering, but it will be found that where the belts are thick and rigid this item becomes an important one, and it becomes advisable to lessen it. The thicker the belt the more difficult it is to bend it. It is therefore more economical to use broad, thin belts than narrow, thick ones, as it has been found that the resistance of the belt to bending is inversely as the diameter of the pulley, large pulleys being more economical in this respect.

LACING A BELT.

There are many ways of making a lace joint or sewing a belt. The following has been recommended: Suppose the belt to be 8 inches wide, punch holes not larger than 3/16ths, beginning at 1/2 inch from the edge and 1/2 inch from the end, making the holes 1/2 of an inch apart from centre to centre. This will give eleven holes. Let the holes in either end of the belt be exactly opposite to each other. Now place the belt in position with a lace thong, not to exceed in width the diameter of the holes cut from a good thin side of lace leather. Begin at one edge to sew your belt exactly in the same manner as you would lace your shoes, drawing the ends well together at

each stitch. Having worked across the belt, secure the last edge with one end of the thong by sewing over and over, and repeat the operation to the place of beginning, securing the ends of your thong by inserting them in leading holes made by an awl.

POWER OF BELTS.

The smoother the surface of the belt and the pulley, the more friction is obtained. The following ingredients when mixed can be put on the inside of a belt, when the inside is put next to the pulley. They will be found to have a very good effect, as they will keep the surfaces cool, smooth and moist: 5 lbs. of common tallow, 1 lb. of yellow wax, 2 lbs. of common chalk, 1 lb. of black-lead and 1 lb. of resin. Dissolve together by gentle heat; put upon the belt when slightly warm. Keep well stirred while applying it; use a little at a time and frequently. It is better, however, to put the hair side next the pulley for power and grip, but the belt will not last so long.

HULL'S NEW ROLLER MILLS AT LAKEFIELD, ONT.

In the columns of the Peterborough *Examiner* we find the following particulars concerning Mr. John Hull's Lakefield mill, which has lately been remodelled:

Mr. John Hull, the well-known merchant and custom miller at Lakefield, has now the completest and compactest centrifugal roller mill in the Dominion of Canada. He has had the interior thoroughly overhauled and re-fitted with the best system of rollers and centrifugal reels which modern inventive science has supplied to the milling industry. About the 1st of August work was begun upon the remodelling of the mill, a contract having been made with the Geo. T. Smith Middlings Purifier Company, of Stratford, and last Thursday the contract was completed and the machinery started. From the very first moment the power was turned on, everything worked like a charm, not a change was required, and so pleased was Mr. Hull with the result that on Tuesday, after only a three-days' test, the mill was accepted by him. A brief description or enumeration of the new machinery may properly precede a description of the way it does its work.

In the basement is found all the driving machinery, the power being supplied by a seventy-two inch turbine water wheel of 150 horse-power. From this, power is communicated to the different machinery throughout the mill by a system of belting instead of the old style gearing, thus insuring more smooth and noiseless motion, greater steadiness of machinery, and less loss of power by friction. This floor also contains something that interests the insurance agents. It is a compact and powerful force pump for fire extinguishing purposes and to it is attached a sufficient length of hose. The pump used is one of those invented by Mr. Charles Dawson, of Peterborough. The basement also contains the feet of the 32 stands of elevators used in the mill. South of the main building, on the same level as the basement, is a store house with a capacity of 30,000 bushels.

The grinding floor contains fourteen pairs of Noiseless-Belt-Drive rolls, made by the Geo. T. Smith Company, Stratford, supplied with wheat by thirty-two stands of elevators. On this floor are also situated two power flour packers and three hand packers, two for farmers' feed and one for flour. The fittings of this floor are of oiled hard wood, and the scene presented with all the roller stands in motion, silently crushing the golden grain into the creamy flour, is a delight to a miller.

On the second floor is found one Eureka sifter and separating machine, two of the Geo. T. Smith centrifugal bolting machines, combining the new system of bolting which has superseded the long reels, four of Smith's middlings purifiers, and also four scalping reels.

The third floor contains one Smith brush machine, one separator for wheat, seven Smith centrifugal reels, six scalping reels, and two Smith bran-dusters. Also the packer-bones for the finished flour reach up through this floor. On the next floor, the attic, will be found only the heads of the thirty-two stands of elevators.

Mr. Wm. Black, an expert miller, who started the mill, asserts that it is the best centrifugal mill he has ever started in Canada. The system applied to Mr. Hull's mill is known as the full centrifugal system. The machinery certainly works like a charm, is beautifully finished, the wood casings being elegantly done in hardwood oiled. The machinery was put in under the superintendence of Mr. R. J. McAnlin, who performed the work in the most satisfactory manner. These mills have a capacity of 150 barrels of flour per day. Although a large merchant export trade is maintained with Montreal and the maritime provinces, Mr. Hull does a large custom trade on the exchange plan. He has also one stone running for chipping.

NEWS

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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.

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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.

Mill-owners and manufacturers requiring help, and millers and merchants in search of customers, may make their wants known through these columns, free of charge.

"THE same to you, and many of them."

It is gratifying to learn that there is no foundation for the recent report that Northwest grain had been "smoked" and consequently depreciated in value by prairie fires.

CANADIAN exhibitors at the recent Colonial Exhibition in London have been invited by Sir Charles Tupper, Executive Commissioner, to send their exhibits to the Jubilee International Exhibition to be held next year at Adelaide, Australia.

PARTIES wishing to get control of a valuable Canadian patent should note the advertisement of Messrs. J. B. Dutton & Co., Detroit, Mich., which appears in another column. They offer for sale the patent and patterns of the well-known automatic grain, flour and feed scale, a machine that is in use in some of the best mills in Canada.

It seems probable that within a few years a number of large flouring mills and other manufacturing concerns will be built at Niagara Falls, where manufacturers would get the benefit of enormous water power at small cost. Indeed, it is already reported that Mr. C. A. Pillsbury, of the celebrated Pillsbury mills, Minneapolis, has his eye on Niagara Falls as the site for another mill equal if not surpassing in size and capacity the one in Minneapolis.

MR. CHAS. STARK, a well known business man of this city, has lately commenced the publication of an eight-page weekly paper entitled *Forest and Farm*. Its title clearly indicates the field it is designed to cover, and seeing that it is edited by a practical sportsman and journalist, Mr. W. W. Fox, late of the *Mail* staff, it may be counted on to faithfully fill the bill. The subscription price is only \$1 per year.

THE mutual improvement societies organized in country towns and villages at this season, and whose deliberations are ridiculed by more pretentious city organizations, are nevertheless productive of much good. If young mechanics throughout the country would meet in the same way and discuss technical questions, the Dominion would in future years reap the benefit of a class of intelligent, skillful workmen.

ANY manufacturer who is looking for a ready fitted-up factory at a bargain should read the offer made by Mr. Chas. Cook, sr., of Kincardine, Ont., on page 23 of this paper.

MESSRS. Edwin L. Burdick and Chas. S. Parke have purchased Mr. A. B. Kellogg's interest in the *Keller Mill*, published at Buffalo, N. Y. The new managers are sending out a very neat and newsy paper.

READERS of the DOMINION MECHANICAL AND MILLING NEWS have their attention directed to the advertisement of the Kuhlman Automatic Scale, of which Messrs. Seaton & Sage, London, Ont., are the Canadian agents and manufacturers. Some of the most prominent millers in Canada bear testimony to the value of this machine.

MESSRS. NICHOLLS & HOWLAND are fitting up a large building on Front Street West, in this city, designed for the purposes of a permanent exhibition of manufactures. The object of the proprietors is to supply manufacturers with a branch establishment in the city where they may exhibit machinery in motion. We are pleased to learn from Mr. Nicholls that the project promises to be a success.

WE are pleased to note the formation of an association of stationary engineers in this city, the objects being social intercourse and improvement in the science of steam engineering. The association invites the co-operation of employer and employee for the furtherance of these objects. The association has set about its work in the proper manner, and will doubtless do much to improve the condition and prospects of its members. Employers should give their assistance and encouragement.

AS we are about to go to press we have received the holiday number of the *Northwestern Miller*, of Minneapolis, Minn. We have looked forward to its advent with pleasant anticipations, which have not been disappointed. This holiday number is a model of typographical excellence, contains one hundred pages of most interesting matter, elaborately illustrated, and is altogether highly creditable to the enterprising publisher, Mr. C. M. Palmer.

CANADA has much to expect from the development of her mineral deposits. It has lately been discovered that in the country shortly to be opened up by the construction of the Hudson's Bay Railway, there are unlimited quantities of iron ore. Samples have been tested, and the result has shown the ore to be well adapted to the manufacture of Bessemer steel. Thus there is a prospect that the steel rails required to build railways for opening up the vast regions of the Canadian Northwest will be manufactured in Canada from native material.

The MECHANICAL AND MILLING NEWS returns thanks to the Case Mfg. Co., Columbus, Ohio, for a large and beautifully designed calendar. Also a lithograph card of large size, bearing a monument to the memory of the late President Garfield, on which is inscribed "Garfield's Prayer" and a memorial poem in acrostic form. In the corners are two small pictures. One represents two broken columns on which are chiseled the names of Lincoln and Garfield. The columns are linked together by a chain stretching across the avenue leading to the White House at Washington, emblematic of two lives linked by one common destiny. The other is a view of Garfield's pleasant Mentor home. The whole design is excellent, and must be seen to be fully appreciated.

CANADIAN machinery manufacturers and dealers, who are all obliged to give more or less credit, have their ingenuity severely taxed in the attempt to construct agreements the wording of which will make them legally binding upon the customer. "We have been a long time in the business, and thought we had succeeded in framing a cast-iron agreement in which there was not a crack large enough for even the smallest and meanest customer to slip out," said a member of a well-known machinery firm to the MECHANICAL AND MILLING NEWS the other day; but, he added, "we find that we were mistaken, for those of our customers who are mean enough every now and then manage to find pretexts on which to repudiate the bargains they make with us." It is an old saying that there never was an Act of Parliament through which a coach-and-four might not be driven, and where the law-makers have failed how can ordinary mortals hope to succeed?

IT is an undeniable fact that a majority of the hundreds of millers throughout Canada who profess to be thoroughly posted on the details of roller milling, know but very little about the subject. To this fact may be attributed

the large number of millers constantly in want of situations. We visited a mill the other day where, within a period of eighteen months, seven head millers had been tried and found wanting. We could mention another mill where the changes have been even more frequent. The public taste has been educated up to the point where it is able to discriminate between different grades of flour, and millowners, if they desire to retain their trade, must see to it that the product of their mills is right up to the standard. Here is where so many so-called roller millers come to grief. Their work won't stand the test, and their employers are compelled to get rid of them. The moral of all this is, that the sooner the millers of Canada set to work to thoroughly master the science of roller milling, the better it will be for themselves.

THE attention of the Dominion Millers' Association is directed to the following extract from a circular issued by Messrs. L. A. Chipman & Co., Halifax, N. S.: "We have to complain that the Grand Trunk and Canada Pacific have advanced freights ten cents since the 1st of October, whilst no advance had taken place on American lines leading out of Boston, thus giving Boston fifteen cents advantage over Halifax and St. John, taking into account the rebate allowed, thus thwarting our chances of recovering the Canadian trade from Boston houses. The Millers' Association should use their influence with the railway chiefs in maritime trade interests. Trade fairly active. Prospects will be encouraging if railway freights on flour, fish and coal are kept at rates to ensure exchange traffic between East and West." Breadstuffs and provisions to the value of \$30,000,000 are annually shipped to the province of Nova Scotia from western Canada. In August last an understanding was reached with the Canadian Pacific and Grand Trunk by which the tariff per barrel to Halifax was fixed at 42c. compared with a tariff of 39c. via the Michigan Central and Boston. By this arrangement Nova Scotia merchants were able to transport their breadstuffs, etc., by Canadian lines as cheaply as they could via the Michigan Central and Boston lines. Recently, however, the tariff to Boston has been raised to 36c., while by Canadian lines it has been advanced to 63c. This, it is held, makes a discrimination of 18c. per barrel in favor of Boston, and tends to throw the entire trade of Nova Scotia into the hands of Boston merchants.

THE Toronto Board of Trade are seeking to induce the Industrial Exhibition Association to try the experiment of extending the period of the Exhibition this year from two weeks to three months, opening in July and closing in September. The Exhibition Association does not look with favor upon the proposition, believing that it would prove a failure financially and a serious injury to the continuance of the Industrial Exhibition as successfully conducted in the past. With this opinion the MECHANICAL AND MILLING NEWS is in complete accord. As President Withrow pointed out to the deputations from the Board of Trade, the experience of American cities has shown extended exhibitions to be no great successes financially. By extending the Exhibition, the Association would do away with one of the strongest incentives which people in the country have to visit the Industrial, namely, the desire to see a great crowd of people, among whom they expect to meet many of their personal friends, and mingle in the excitement consequent upon such immense gatherings. To many, a visit under such circumstances is a pleasant change from the quiet monotony of the scenes by which their everyday life is surrounded. Again, it is doubtful if the Association could make arrangements with the railways to grant reduced fares to visitors to the Exhibition for a period of three months. Thus another incentive to attend would be removed. The city could not be decorated and made to look attractive for three months as it can for a fortnight, which would likewise have a tendency to keep visitors at home. These, and many other reasons that might be urged, lead to the conclusion that the total attendance during three months would exceed but slightly, if at all, the records of past years, while the expense would be six-fold greater. An infinitely superior proposition to that of the Board of Trade is that briefly referred to by Mr. Withrow, President of the Exhibition Association, that we should have a Dominion Exhibition, with courts for the several provinces—fashioned after the recent successful Colonial Exhibition in London. Such an Exhibition, which might probably last three weeks or a month, would excite emulation among the various provinces, bring together business men from every part of the Dominion, thus promoting interprovincial trade, and give to the American Republic and Canadians themselves a clearer conception than they now have of the number and importance of the industries represented and fast developing in this Canada of ours.

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NORTHWEST LETTER.

In previous years wheat markets in Manitoba have not been influenced to any great extent by outside influences. Last season our provincial markets ruled higher proportionately than Chicago, Duluth or any other western markets. This, however, was owing to exceptional circumstances. The extent of the damage done by the early frosts in the fall of 1885 was not fully known, and our home millers being alarmed lest there should not be a sufficient supply of choice milling wheat, put up prices to a figure above an export basis. This had the effect of keeping the choice wheat at home for grinding purposes, whilst exportation was largely confined to damaged qualities. The high prices paid for last season's crop were therefore more apparent than real, for it will be readily surmised that quoted prices were only paid for sound wheat, whilst a large portion of that marketed was damaged stuff. Whilst sound hard wheat sold in Winnipeg for 80c. to 85c., frosted wheat was quoted at from 25c. to 30c. Eastern millers bought largely of this damaged wheat because it was cheap, whilst the sound wheat, which was selling higher at Winnipeg proportionately than it would bring in Toronto, remained at home for grinding. Of course a great deal of the wheat that was classed as frosted, was barely touched and very slightly damaged, yet it would not bring within 25c. to 30c. as much as wheat that was entirely free from frost marks. This year, however, all the wheat in the province has been of first-class quality. The general report from all over the province is to this effect. Scarcely anything but No. 1 hard and No. 1 northern has been marketed this season, and for all practical purposes these two grades would have answered all requirements for handling wheat this season; the former grade of course for Red Fyfe wheat, and the latter for soft or mixed varieties. All the wheat grown was of the best quality according to its kind; and but for the fact that quite a number of our farmers still grow soft varieties, the one grade of No. 1 hard would have been sufficient. By far the greater portion grown, however, is pure Red Fyfe wheat.

To go back to the point wished to be shown, however, namely, the course of the markets, millers were aware at the commencement of the present season that there would be no scarcity of choice wheat. All the wheat was choice and they would be able to obtain all they wished for without paying proportionately higher prices than ruled in outside markets. There was no object to keep any particular class or quality of wheat in the province, and consequently prices for all grades were started on an export basis. Our markets have therefore this year been subject to outside influences to a greater degree than ever before, as this is really the first year that there has been any considerable quantity of wheat of the regular grades for export. In former years such a thing as fluctuations in prices were of rare occurrence, and when changes did occur, there was never less than a 5c. advance or decline at a time. A fluctuation of a fraction of five cents was unknown. But this season, with prices ruling on an export basis, prices have changed more frequently in sympathy with outside wheat centres, and we have fluctuations of from 1/2 to 2c., changes not exceeding the latter figure at one step. Up to the close of navigation prices ruled on a basis of Duluth quotations, the grades at that price being about the same as for Manitoba wheat. The rule was to pay the same prices throughout the province as were current at Duluth, less the cost of freight from the point of shipment to Port Arthur. Thus No. 1 hard before the close of navigation sold at about 60c. at Winnipeg, the freight charges from there being 25c. per 100 pounds to Port Arthur, and 30c. or 100 pounds from Brandon. On the close of navigation prices dropped to 50c., and later to 57c., but the advance in Chicago again started values upward, and 7c. is now the ruling quotation. This seems a low price for the very best wheat which the world can produce, but under the present circumstances it is the very best which can be expected. If wheat ever gets back to its old standard of value (in regard to which many authorities take a very pessimistic view), say \$1 per bushel at Chicago, it would add 25c. to the value of wheat here. Then in the course of a few years we may expect freight charges to be considerably reduced, say 10c. per 100 pounds, or at least 5c. per bushel. Thus, in the event of wheat prices returning to a normal condition of values, and allowing for a very slight reduction in the present excessive freight charges, we would have wheat ruling at Winnipeg at about 90c. per bushel, and this without taking into account our Hudson's Bay route, to which I referred in my last letter. It is to this outlet that all Manitobans look to advance prices in

the future, and make wheat worth more at Winnipeg, taking into account the superior quality of our product, than at Chicago. But even without considering this route, the prospect is not at all unfavorable to profitable wheat growing in Manitoba, and even at the present time we are in a better position in regard to prices than many sections to the south of us in the United States, where, owing to railway and elevator monopolies, prices to the farmer are reduced to very low figures.

The wheat movement has been rather light for the past few weeks. Up to the time of writing we have not yet had sufficient snow for sleighing. Earlier in the season, while the wagoning was good, deliveries by farmers throughout the province were much larger than they have been for a few weeks back. We have had two or three light falls of snow, but not enough to make sleighing, though sufficient to render wheeling difficult, and this has retarded deliveries very greatly. All are wishing for more snow to improve the grain trade. It seems peculiar that railways to the south of us should be blocked with snow, whilst the ground is bare here, but such is the case. Weeks before we had any snow here at all, the railways between Minneapolis and Chicago were rendered impassable for days at a time with snow blockades, and more or less trouble has been experienced in rail-roading in Minnesota and Dakota ever since. Since the advance in prices at Chicago, shipments of grain from stocks in store have been moving more freely, and as far as can be judged from the number of cars inspected here to date, our exports will be considerably larger than last year, whilst the value of exports will be very much greater, owing to the improved quality of the grain. Those who took a pessimistic view of the situation, and who prophesied a falling off in exports of wheat, will consequently be disappointed. Early in the fall a good many were of the opinion that owing to the great drought of last summer, exports would not show up as large as for the crop of 1885. There is no doubt that the average yield per acre has been considerably less this year than last, taking the province as a whole. But last year there was a good deal of wheat which was used at home for food, whilst this year all is fit for milling, and this will help to make up for a shortage in the average yield. Then the larger acreage sown will further tend to bring up exports to a respectable amount, in comparison with last year's crop. A larger number of cars have been inspected here to date than last year, even with the movement commencing at a later date, owing to the fact that plowing was continued for a number of days later than last year. In regard to feeding the damaged wheat of last year, it is known that farmers wintered a large number of hogs to eat up the grain, rather than sell it at the very low prices. This season these hogs have nearly all been disposed of, which accounts for the large number of car loads of live hogs shipped to Toronto and Montreal from this province during last fall.

The evidence of an Ottawa commission man, who is agent for a Manitoba milling firm, before the railway commissioners, has created some interest in the matter here. The readers of the MECHANICAL AND MILLING NEWS will be familiar with the particulars of this case, in which the said agent charged before the railway commission that the C. P. Ry. Co. had favored the Ogilvie Milling Co. with lower rates of freight on their shipments from Winnipeg than had been given to other millers. The charges are known here to be unfounded, and nothing but the ordinary grinding-in-transit regulations have been allowed the Ogilvie company, which are open to all millers. The great bulk of the wheat ground in the three Winnipeg mills is brought in in car lots from outside provincial points. On this wheat the local freight rates are paid to Winnipeg, which of course are considerably higher proportionately than the through rates. When this wheat is shipped east in the form of flour, a rebate is allowed to cover the excess of charge in the local rate, so that the freight would amount to the same as if shipped direct from the point of purchase of the wheat to Toronto or Montreal, less a lay-over charge of one cent. This is an explanation of the bug-a-boo which has been troubling the Ottawa agent.

Manitoba millers have at last, after a brief struggle, captured the British Columbia markets. The British Columbians, isolated so long from the rest of Canada, have been wont to look upon anything "Canadian" with distrust. They talked about Canada as though it were a foreign country, and preferred to do their trading with the states of the Pacific coast. For some reason known best to themselves, they were especially prejudiced against Winnipeg, and to mention to them that a person was from this city, was sufficient cause for them to withhold their patronage. On account of this prejudice, our millers found it difficult to do any business with the British Columbians. One of the first travellers from Winnipeg who arrived at Victoria with samples of flour, met with

many discouragements of this nature in his canvass of the Victoria trade. One large dealer called upon was particularly gruff, and refused to allow the travelling man to open his samples, stating that "he did not want any stuff from Winnipeg." However, a few small orders were placed, and the superior quality of our flour has since done its work. As soon as the people tried the Manitoba product, they would have no other, and in order to protect their trade, dealers who at first refused to handle Manitoba flour, have since been obliged to obtain a supply. Thus the Victoria dealer who would have nothing to do with the "Winnipeg stuff," has since lately ordered a consignment of several car lots of flour from a Winnipeg firm of millers, and henceforth Manitoba flour will have full swing on the Pacific coast. The direct communication which now obtains with British Columbia, and the large inter-provincial trade springing up between that province and the rest of the Dominion, will be the means of eradicating this prejudice entertained by the British Columbians, and no doubt the people of that region will soon consider themselves an integral portion of Canada.

In my last letter I referred to the construction of a stone mill at Lac la Biche, north of Edmonton, which I said would be the northernmost flour mill on the continent. I have now to report the contemplated erection of a mill several hundred miles north of that settlement, in the far distant and much talked of Peace River country. The Church of England mission authorities at Dunvegan will establish a mill at that place in connection with their mission. Rev. Mr. Brick, of the mission, was in the city some time ago in connection with the project. He reports the country well adapted to wheat-growing, and had with him several samples of grain grown in the district. The almost illimitable extent of the wheat-growing area of the Northwest may be vaguely imagined when it is known that Dunvegan is well on to 2,000 miles north-west of Winnipeg. In this far-off region grain sowing is said to commence about the 20th of April, and Mr. Brick asserts that the country is free from frost during the growing season. When all this vast region from Winnipeg to the Rocky Mountains westward, and northward to the limits of the wheat-growing belt is peopled, the few million bushels of wheat now exported from the country will be as but a drop in the ocean in comparison with what will then be annually sent out of the Northwest.

During the past year or so there has been an epidemic in the granting of bonuses to establish roller mills. Almost every settlement of any size in the province has offered a bonus for such a purpose, and the evils of this system have now been made apparent in several instances. Your correspondent holds that the whole system of bonusing industries is wrong as a matter of principle, but will not enter upon an argument of the question here at the present writing. Irresponsible parties have seized upon these offers of bonuses as a chance for a little speculation, and as a consequence several badly-constructed and poorly equipped mills have been partially completed and abandoned, perhaps after passing through several hands. Mills deficient in modern machinery should not be established in this country, and can only do the trade of the whole province injury. As a general rule, an industry that cannot be established without the aid of a bonus had better be left alone.

ANTI-FRICTION PLUMBAGO METAL.

Public attention has lately been called to the Diamond Anti-friction Plumbago Metal. Although it has been used in the United States for more than eight years, it is comparatively new in Canada. Plumbago, one of the best lubricators known, is thoroughly incorporated with it, and it has successfully endured the tests. By order of the United States government, Mr. Edwin Fishian, Chief Engineer U. S. Navy, made an official test against brass with a system of weights and levers, and after several experiments declared it required only about one half the oil to lubricate it that the brass did and "the longer it ran the better its condition became. The last experiment made was to ascertain how great a pressure the anti-friction bearing will stand without heating or retarding. The pressure was taken off the brass bearing by putting in pieces between the brass. During the experiment of four hours the pressure is said to have been nearly double that which the brass bearing would stand without stopping the shaft, and yet there was no the slightest effect produced upon the speed of the shaft, and it was found to be in as perfect a condition as at the commencement. In testing it against some best American alloys it was found that after the other alloys had heated to such an extent as to be almost welded to the journal, the diamond metal was cool and smooth and plentifully lubricated. The sole agent for the metal in Canada is Mr. Theo. Ratcliffe, 233 Bay Street, Toronto.

BELTS: REINFORCED AND DOUBLE.

It is common among belt makers, says a writer in the *Milling Engineer*, to build up belts of great width, designed to transmit a large amount of power. These belts are made of two thicknesses of leather in rare instances of three thicknesses—secured by rivets. A writer in one of the technical papers recently gave the items of a somewhat singular experience with a double belt—one literally doubled, or coupled, one belt running on top of another. He required a very heavy belt to drive a gang of saws, and he utilized two six ply rubber belts twenty-two inches wide, riveting the two together, one on the other, with only enough rivets to keep them together. But they did not keep together. In less than one hour after starting, the rivets drew out, and it was found that the outer belt had crept on the under belt, having advanced twenty or thirty feet, but it still remained fairly on the lower belt. The belts were allowed to run so, and for fifty days (when the correspondent wrote) they had worked well together, their speed being about 2,600 feet per minute, the belts being horizontal. The correspondent suggests that perhaps two or more thin belts, to be used in this manner in place of one thick belt, would be advantageous, as the experiment shows that the outer ply of a thick belt has a tendency to get ahead of the inner ply.

Unless there was some peculiar unnoticed circumstance in this trial, it would seem to denote a great difference between the action of the composite rubber and canvas and the simple leather, for complaint is not made, by users, of double ply leather belt showing a tendency to separate. If, in this case, the true belt slipped, the outer, or reinforce belt, might creep from its own momentum, which must have been considerable from a speed of 2,600 feet per minute.

The experiment of running two belts, one superimposed on the other, is not new; at least, it has been tried as a makeshift. In starting a newsawing and planing establishment, the order for belts was misunderstood, and one of the belts was sent one inch narrower than directed, but more than double the desired length. Rather than wait for the ratification of the order, which would require two days, the narrow belt was used doubled—one length, or belt, on the other. The belts worked well, but the writer does not recall that there was any creeping or sliding of one on the other. These belts were of leather.

The practice of reinforcing belts by a narrow strip along each edge is probably a better one than that of doubling, or using two belts, or of building up a belt. The additional per cent. of driving power from the reinforced belt may not be exactly known, but it is very great, as can be indicated by a simple relation. On starting the engine in a new establishment, it was found that the fly-wheel face was too narrow the face would not take a belt sufficiently wide to transmit all the power of the engine, or all the power required. To put on an additional pulley would demand the extension, by coupling, of the engine crank shaft. The superintendent thought him of a narrow reinforce on each edge of the belt. It was a ten inch belt, and he put a strip of good belt leather one and a quarter inches wide on each edge, riveting them at intervals of about eight inches. That belt run for years, and never winked under all the load that was put upon the engine.

Every observer must have noticed that leather belts wear or strain more upon the edges than in the center. There is no support to the edge on one side, while the center and other portions of the belt are sustained on both sides. The edges ought to be made stronger and more resistant than the center. Belts so reinforced will not tend to wind or to stretch unevenly out of straight in running. The writer saw a reinforced belt that had run nearly eighteen years, which was as straight on its edges as the day it was first put on the pulleys. It is a rare plain belt of which such a statement can be made. For shipping belts—those which are to be shipped, or shifted, from fast to loose pulley and *vice versa* the reinforced belt is manifestly superior. The edges of such belts are subjected to great wear from abrasion against the pins, or guides, of the shippers, and the reinforce, coming flush to the edge, offers a double face to the shipping guides, thereby diminishing the wear.

SOMETHING ABOUT BEARING BOXES.

Every machine operative knows how to pour oil on to a journal or into the oil hole of a cap or cover, remarks the *Modern Miller*, but every one does not know how to fix bearing boxes so that the oil poured on will be utilized and keep them in such trim that utility of oil will constantly result. When a bearing becomes hot and the pouring on of oil is of no avail, it is proof positive that the lubricant is not utilized.

Every miller has experienced trouble with bearings in this respect, and more especially since the advent of roller mills, where a constant carrying in correct position and condition of the rolls by the bearings is of such great moment.

Temporary relief is sometimes effected by the use of lubricants that do not dissolve rapidly and run off, and while this may effect a relief, it is almost always only for a time affecting the present trouble, not righting the cause of disturbance. To illustrate: Observe the horizontal bearing box of a rolling mill, as illustrated in Fig. 1.

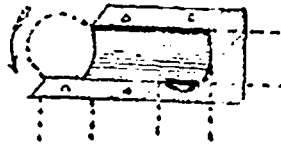


FIG. 1.

The bearing of gravity and, usually, belt pull is at and between dotted lines, A, a, while the spread bearing of the roll while grinding will be at and between dotted lines, B, b. From this continuous pressure the bearing from A to B will soon assume equivalence to a ground joint—resisting the entrance of oil to the bearing box proper, scraping it from the journal and running it off through the opening where the cap joins the box and dropping it from the boxing at points 1 and 2. Hence, oil poured along the journal, indicated by 4, would not be utilized properly in lubricating the journal where the bearing is greatest and where it is needed most. But, chamfer the inner edge of the lower face-plate and cut an oil channel in the metal, as represented in Fig. 2, and the oil will be conducted under the journal and be distributed along the central point of greatest bearing, holding it in reservoir.

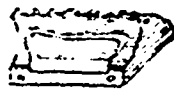


FIG. 2.

Boxes constructed in dividend halves are sometimes used in post hanging of horizontal shafts, as represented by Fig. 3.

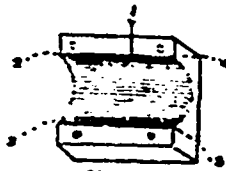


FIG. 3.

The oil hole is located at point 1, and passing through the block-locks to the journal, where the journal fits the box closely, or is borne heavily against it, the oil is scraped from the journal and passed out from the box between the faces, at points 2 and 3, and again at lower points 4 and 5, at oil channels left by improperly fitted shimming, as represented by Fig. 4.



FIG. 4.

As the plane of journal passes from one half of box to the other, the journal passing either way, one side, and that of greatest bearing, will be robbed of oil.

But chamfer the upper face-plates and cut oil channels in both blocks, as represented in Fig. 5, and the oil will



FIG. 5.

find safe conduct to the bearing points while shaft runs either way, and rapid shafts will be properly lubricated, at least when oiled when at rest, and while running by oil that will flow down the oil channel of box, not interrupted by the rapid shaft.

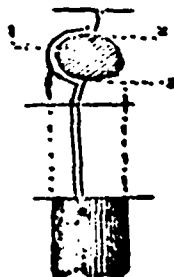


FIG. 6.

Upright shafting is held in position by two, three, four

or more bearing boxes. When with two, as represented by Fig. 6, and of solid boxes, as Fig. 7, it is plain to see how the oil is poured on at point 1, Fig. 6, may leave the journal and pass off down the channels left between the boxes especially scraped free from the bearing side when belt-pull or gearing pressure tends the shaft toward and

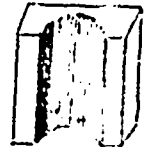


FIG. 7.

between dotted lines A, a; but chamfer the upper bearing edge of the boxing, as represented by Fig. 8, no matter how many boxes are used (for as the number of boxes are increased the number of places for oil escape are multiplied,) and the oil will supply the places of bearing needing it most and be held in the reservoir till worn out.

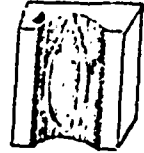


FIG. 8.

The shaft boxes, which are here as represented by Figs. 9 and 10, are greatly susceptible of wasting oil in the manner demonstrated in horizontal bearing boxes, Fig. 1, having double the number of off-lets for the oil, (observe points 1, 2, 3 and 4, Figs. 9 and 10,) two on



FIG. 9.

each side, instead of one. On boxing of this kind, facilities to waste of oil are sometimes increased by an attempt to give the oil supplied at the centre of cap a bet-



FIG. 10.

ter distribution along the upper part of journal by channeling the cap from the oil hole, as represented by Fig. 11, the oil channels conducting the oil to a nearer approach to escape over ends of boxes.



FIG. 11.

If the upper edges of quarter-boxes and bed-boxes were chamfered and channelled as represented by Figs. 12 and 13, the oil will be conducted to and held in reservoir at points of greatest bearing. In regard to putting boxes in this proper condition, there is much nonsensical talk indulged in by some millers, such as, "These grooves, or oil channels, cut away too much metal," or, "To do this with all the boxes that do not operate just right would take too much time and work," or, that "it should have been done by the maker of the machines or those who put up the shafting," etc. The miller who talks this way acts accordingly, simply refuses to take proper care of his machinery.

The facts are these: Journal bearings, many of them, are in this bad condition; the makers did not arrange them properly, or, if they did, the channels have disappeared. As to this work (properly done) "cutting away too much metal" we will say that boxes put in this condition will last double the length of time that they will when not so prepared, and may be kept much closer, without danger of heating, not allowing belt-tip or cross-friction of gear wheels, and not wasting oil, but utilizing it.



FIG. 12.

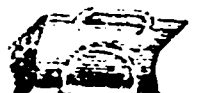


FIG. 13.

A new and promising industry has sprung up in Port Hope within the last few months in the shape of a leather lace factory, which already employs 25 hands and turns out 250 gross or 36,000 laces weekly. Messrs. Buckle & Sons, the proprietors, have had a practical training in the business in the large factories of England. This is the only factory of its kind in the Dominion.

JAS. JONES,

MANUFACTURER OF

CORRUGATED ROLLER MILLS,

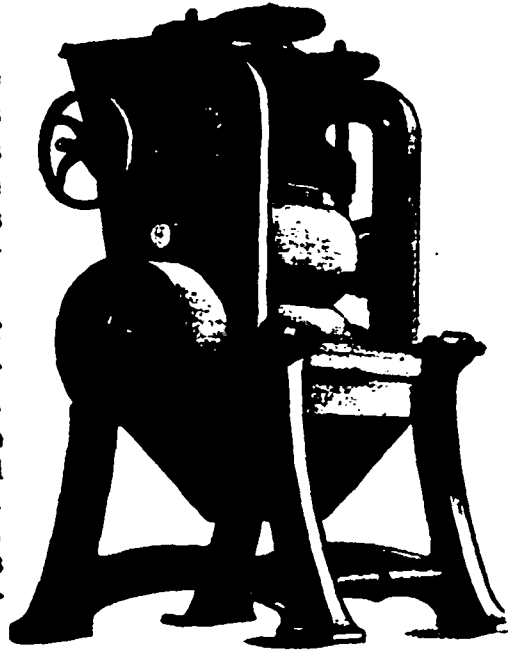
Smooth Rolls, Roller Disc Mills, and Stone Rolls for Middlings.

THOROLD, - - - ONT.

ESTIMATES GIVEN FOR BUILDING MILLS, OR RE-MODELING THEM TO THE ROLLER SYSTEM.

MY LATEST IMPROVED ROLLER MILL

Is the best Roll made in the Dominion. It is made in two parts: In the lower part of the frame is set the stationary roll, and in the upper part is the adjusting one. The top roll is kept true to the lower one by means of set screws at the four points at the end of the frame, thus making it an easy matter to keep the rolls true to their work. The adjustment for setting the roll to its grinding point is the threaded rod with hand wheel attached. This rod is attached to a slide bearing, which allows the adjustment of the roll to the grinding point. This roll commends itself to all practical millers as the best one in the market. Concerning my first and second break machine, there is nothing better in the market. It splits the wheat and prepares it properly for succeeding breaks.



MY STONE ROLL FOR PURIFIED MIDDINGS

Will produce better results than any iron roll can. It has more than double the capacity of iron rolls, and will produce a granular flour that cannot be equalled by any other process of grinding. This stone roll will also handle the fluffy material made in full roller mills, preparing it for bolting or purifying as no other machine can. Isaac Warcup, Esq., of Oakville, Ont., whose judgment and experience in milling is second to none, says of this Stone Roll that he likes it well, and that he can make a larger yield out of the material he is using it on than could possibly be made on any other roll, and the flour will be more granular. Nine of these stone rolls are used in the Welland Mills, Thorold, where it is said the best results in milling are obtained. BUCKWHEAT GRINDING.—Send for information about the new Buckwheat Grinder. It has great capacity and will grind damp buckwheat when a millstone will not, and the flour made will be superior to any other process. For further information, apply to

JAMES JONES, - - THOROLD, ONT.

GOLDIE AND McCULLOCH, GALT, - - - ONTARIO.

TO PARTIES WHO CONTEMPLATE

BUILDING OR RE-BUILDING FLOUR MILLS,

On the full or combined roller system, we are prepared to furnish estimates or specifications, using a full line of our machines—*NONE IMPORTED*—manufactured under Canadian Patents controlled by us.

OF ALL WHO INTEND TO MAKE CHANGES WILL DO WELL TO SEE US BEFORE DOING SO.

THE WHELOCK AUTOMATIC ENGINE,
WELL WORKING MACHINERY,
Shingle and Barrel Machinery,
WOOL MACHINERY.
Special Price Lists furnished on application.



FIRE AND BURGLAR PROOF
SALTERS
VAULT DOORS, & CO.
First Prize Awarded, Toronto, 1883, 1884.
CORRESPONDENCE SOLICITED AND ORDERS PROMPTLY ATTENDED TO.

CENTRIFUGAL FLOUR DRESSING MACHINE

Our Centrifugal, as shown above, contains important improvements covered by Canadian Patents which we control. Parties purchasing elsewhere, will do well to look out for infringements. All our machines are made under our own immediate supervision, of the best materials and workmanship. Satisfaction guaranteed.

GOLDIE & McCULLOCH.

Correspondents' Opinions.

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

THE ADVANTAGE OF KEEPING THE MILL CLEAN.

Editor Dominion Mechanical and Milling News.

In looking over your valuable paper, I have failed to find one word on the important subject of keeping the mill clean. Now, I hold that this question of cleanliness is one of the most important items in the success of any mill. It is a noticeable fact that most of our large mills place this as one of the leading items in their profits, while in nearly all small mills you will find little or no attention paid to the subject at all. In any mill of 100 to 150 barrels capacity, if care be taken to give it a test, it will be found that by keeping the mill clean, the sweepings alone can be made to pay a miller's wages, provided they are sifted and fed into the break reels from a feeder made for the purpose, and which can be made and placed in any mill at the small cost of three dollars. The first trial of this method will convince the most skeptical that it is the best outlay ever made in a mill. And, apart altogether from the saving, what looks better than a clean mill? In my next letter I will tell those wishing to know, how a mill can be kept clean at the small cost I have mentioned. Hoping that by drawing attention to this important subject I may elicit the opinions of others, I remain,

Yours very truly,

O. S.

BRITISH COLUMBIA.

INTERESTING LETTER RECEIVED BY A BRANTFORD FIRM.

The Waterous Company, of Brantford, have received the following interesting letter :-

ROSS SAW MILL, Duggan's Siding, B. C.

C. H. WATEROUS, JR., Waterous & Engine Works Co., Brantford.

DEAR SIR,-- As I have now finished here cutting with the mill, I thought that you would be pleased to know how it worked and what amount this mill is able to cut when run with proper care. As it is the first of this particular style of mill you have sent to the Rockies, and as I have kept an account of all expenses of running this mill and the amount it cut, I am able to give you a correct statement of what it cost to handle lumber in this part. Any of your customers may rely upon the truth of my statements. As you are aware, I left Brantford on the 26th May, the mill being shipped at the same time. I arrived at the Rockies on the 8th of June by way of the Canadian Pacific Railway. The mill arrived on the 12th and on the 21st we started to saw, and by the 8th of November we had cut 3,500,800 feet. The last month's cutting was the largest, amounting to \$17,000 feet. These are the figures of the measurer employed by the C. P. R., and are correct, making an average of 31.423 feet per day of not more than 13 running hours per day. This was all cut into inch boards and 3 and 4 inch planks, and all sizes to 8, 10, 12, and 14 wide. All the cutting and edging had to be done with the large saw as we had no edger. The timber was spruce, pine, fir, cedar, and hemlock. I see in some of your circulars that you give the amount of what has been cut per hour and per day, but I thought it would be more satisfactory to you and to your customers to know what such a mill could do in the season, and you may rely upon this statement as being absolutely correct during this time. The expenses for repairs only amounted to \$1.50, viz., for 1 bolt in friction lever, 1 bolt in saw lever, and repairs in timber gauge. This mill was never stopped one working hour during the whole season. The new dogs are a complete success, they are quick and sure to hold every time. I am satisfied that there need be no trouble or delay in running these mills if they are properly looked after. There was no extra chance to make this mill run any better than any other. The men were all picked up as they came along. The only man that had any experience in a mill was the sawyer. I filed the saws myself and kept all other things right. It might be interesting for you to know how much timber it takes to build one of these snow-slide sheds per mile. It takes over 6,461,800 ft. of timber and 62,080 bolts 3/8 in. long, and 200,000 spikes 1/2 in. long. I do not refer above to the ordinary snow sheds such as used on the Intercolonial Railway. These are used here also where snow is likely to drift in, but in speaking above I refer to what might more properly be called snow slides. They are built at a point where snow slides are apt to

occur always in the face of steep and high mountains. One side (the high side of shed) is built up into the side of the mountain and has a slant over the track something like a shed roof. They are wonderfully strong and you may be sure none too much so, as the accumulated snow of many years may start from the top of these lofty hills and come thundering down in masses 50 to 100 or 200 feet thick, with a force that nothing can resist unless it is the mountain on the other side of the valley from which the slide takes place. The snow in passing down slides over the top of the snow slide and passes on down into the valley and on up, may be several hundred feet up, the side of the mountain opposite. One can imagine what would be the result of such a slide striking a passing train. Certainly nothing but pieces of the smashed up wreck, that would be unrecognizable, would ever be found. Near where I am one of these slides happened. The snow came down the mountain in a body estimated to be 175 feet thick. It struck the track and carried it bodily down the mountain to the valley across the river that flowed through the valley, and up the opposite side to about the same height. It was where the railway track was found after the snow melted, and where it was struck. Some cars were wrecked at the same time, and were never found, probably the remains were carried down by the melting snow to the Columbia River, and then out to the Pacific ocean. The location here is a very beautiful one. A photographer who is out among the mountains taking views for the Canadian Pacific, came along one day and took a picture of the mill, and I send you one which will give you a fair idea of what the place looks like. The mountain that you see to the left is over 5,000 feet high from the railway track. The white spot between the higher and lower peak is snow and lies in that hollow place all the year round, and that snow is supposed to be 250 feet deep, and is a glacier, being full of numerous cracks. The men have dropped lines down some of these cracks for over 100 feet without reaching the bottom. The sharp high peak seen on the picture is rough and rugged and difficult to climb. There was a rain cloud floated up against this peak once and burst, letting out a flood of water that brought everything down the mountain with it. Enormous rocks and trees were apparently no obstruction whatever. The course of the water made a clear sweep, and its peak is easily seen yet. As it came down the rocks and trees that it bore up would sometimes lodge in narrow places on the sides of the mountain and be piled up 150 or 200 feet high, but the weight of water behind would soon be so great that the dam would give way, and down would come the water again, and rocks, trees, &c., and so it kept on until it reached the river, which was raised by this flood until the water stood 20 feet over the track. This cloud burst did a great deal towards preparing the mill site. Level places large enough to build 2 mill on are hard to get up here in the mountains. There are some very interesting things up here, and one need not get very lonesome if he has any taste for curious nature. A little way from the mill are soda springs and hot springs, so you can have both a plain soda and a hot bath, one or both, as you choose, and no thanks to any one. Soda plain, however. No liquor is allowed up here, which is a good thing, where so many and such different kinds of men are employed away from all law and order.

I have been up the Roumanian, Bulgarian, and Thuringian mountains, but the mountains here, I think, are much grander. It is not possible to picture them. However, as you have seen on the Andes and Alps, you can think back a few years to the time we were in Santiago, Chili, (I now see by the papers you are the Hon. Vice-Consul of that progressive republic) and used together take a walk to the top of Santa Lucia and look off to the snow-capped Andes, it will give you an idea of this place. Only I am here in the very midst of them; then we were at a distance. Should you or any of the Brantford people be taking a trip over the Canada Pacific to British Columbia, they can remember when passing through these sheds that Brantford saw mills with Brantford brains and muscle cut the six million or more feet of lumber that is required to build each mill. For this is not the only one of your mills here; there are a number of them, and I can tell you it does me good to know that no other mill, American or Canadian, (and there are a good many, especially of the former, scattered around the mountains), have done as much or as good work as our own mills. I naturally feel a pride in the old shop and what it does. I have been with you now some 30 years, and there are there still at work men who commenced before I did, and I want you to let them know what this mill has done up here, for I know they will be glad to hear from it, and that their work is a success. As I am writing, my mind turns back to a time when we were having one of our annual shop picnics

about the time the Canada Pacific was first being talked of. Mr. Robertson, of the Bank of British North America, was making a few remarks and spoke about the great railway, and said it was sure to be built, and would carry from ocean to ocean the Brantford saw-mills. We have seen that now all come to pass, and that his forecast of the future was correct. I have seen the Brantford saw-mills go ahead and cut the timber to build the railway bed, the stations and the fences, and now we have turned back and are cutting the timber and plank to cover the road where it is necessary to protect it from the snow. I have made this letter too long, but there is so much here to be seen and to write about that when you start to write you do not know when to stop. But I know you take an interest in such things as are to be seen here. And I would say come along and see for yourself, and I am sure you will be well satisfied and paid for your trip. With no more at present,

I am your old fellow-traveller,

JOHN LYLE.

Mr. Lyle also enclosed a letter to the Company from Messrs. McDermid & Ross, contractors for the mountain division of the C. P. R., in which they state: "We got good satisfaction from the little 25 horse power saw mill we got from you in the spring. She has cut 3,508,000 ft. in four months and fourteen days. We call this a little the best work we ever knew for the power."

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.

Jacob Raymer, miller, Stouffville, died on the 3rd of November last.

Geo. Burnett, while adjusting a planing machine with a wrench at Odessa, Ont., injured his hand severely.

William Lloyd, millwright, died at Chatham, Ont., on the 9th of Dec. last, aged 73 years.

Miller John T. Toms has removed from Waterford, Ont., to Glenshee, Ont.

Miller Chas. Shelby has removed from Sebringville, Ont., to-Hawkesville, Ont.

Miller W. D. Cook has removed from Indian Head to Wolseley, N. W. T.

Duncan McNaughton, a miller of Oakland, Ont., has removed to Scotland.

Mr. James Henry had his hand severely jammed in Watt's mill at Palmerston the other day.

Mr. West, the new manager of the knitting works at Wellesley, Ont., has arrived on the scene of his duties.

The MECHANICAL AND MILLING NEWS regrets to learn that head miller Lamb, of the Lorne Mills, Heidelberg, Ont., has been seriously ill.

Mr. Edward Pargetas narrowly escaped having two fingers amputated by a rip saw in Emerson Bros.' planing mill at Port Perry, recently.

Mr. Edmund Shore, at one time a Winnipeg lumber merchant, died at Qu'Appelle recently from the effects of a kick from a horse.

Mr. F. Vander Wee has gone to Fort Qu'Appelle to take his position as Government mechanical instructor to the Indians.

J. P. Thoraquist, of the Ogilvie mill, Winnipeg, Man., has become a member of the Minneapolis Operative Millers' Association.

Miller John Beckett, employed at Denne's mill, Newmarket, Ont., has removed his family from Belleville to that town, where he has decided to make his home.

Alex. McKean, aged 40 years, a Canadian and unmarried, was instantly killed in Buckley & Douglas's lumber camp in Crown, Manistee County, by a falling tree. His remains were brought to this city for interment.

It is said Messrs. T. & W. Murray, Pembroke, Ont., have refused \$26,000 for their interest in the Sudbury copper mines, which a few months ago cost them only \$300.

Messrs. Dobson, Porteous and Moore have been appointed a committee to look after the details in connection with the formation of a Board of Trade at Lindsay, Ont.

Mr. Robt. Dass, an old and esteemed resident of Owen Sound, Ont., who had recently been working at St. Clair, Michigan, was fatally injured by a stick of timber falling upon him.

Mr. E. Allan, employed at Goldie's mill, Guelph, Ont., had a narrow escape lately from being smothered by grain. He was working in a bin, full of grain, when the supports between it and an empty bin gave away. Mr. Allan was carried along with the falling mass and almost

lived alive. He managed, however, to escape from his perilous position.

Mr. Taylor and a young man named Coleman were seriously injured by falling twenty feet while at work on the extension to Messrs. Bertram & Son's works at Dundas. Five other workmen who fell at the same time escaped injury.

Mr. Thos. Cowan, of Galt, President of the Canadian Manufacturers' Association has mounted the political rostrum in support of the Dominion Government and protection to home industries. Mr. Cowan is a forcible speaker.

Julius Fisk, of Fenelon, Ont., was severely hurt the other day while working in Thos. Archer's lumber camp in the township of Longford. A rolling log struck him and knocked him down. It is feared he has sustained injury of the spine.

Archie Livingston, a young man employed in Lucan's saw mills, about five miles east of Petrolia, Ont., recently got his leg caught in the chain that draws the logs up to the saw in the mill, injuring it so badly that it was found necessary to amputate it below the knee.

A young man named John Brown, from Sombra, Ont., went to work in Fletcher, Pack & Co.'s lumber camp, Michigan, and after working a few hours was suddenly taken ill with pneumonia. He was taken to the hospital in Alpena where he died. His mother arrived a few hours too late to see her son alive.

Mr. E. Dickson, who was compelled, owing to ill-health, to resign his position as miller in the Assiniboine Mills at Portage la Prairie, Man., was presented on leaving for his old home in Owen Sound, with a fine gold pin and pencil, accompanied by an appreciative address, signed by his fellow employees in the mill.



A cash prize of \$20 is given every month for the best essay contributed to this Department on a subject selected by the editor. The essay selected as the best in each month will be published, and \$10 forwarded within ten days to the author. The conditions on which these prizes are offered are as follows:—1. Competitors must be paid-up subscribers to the Dominion Mechanical and Milling News. 2. All articles sent in to become the property of the publisher of this journal. 3. Articles must reach this office not later than the 20th day of the month next preceding the date of issue. 4. Every article must be accompanied by the bona fide name and address of the author, not, however, for publication unless desired. 5. Articles to be written on one side of the paper only, and not to exceed 750 words. The merits of all articles written for this Department will be decided by three thoroughly competent and impartial judges selected by the editor, and competitors may depend upon being fairly treated in all cases.

Subject for next competition: "Should Technical Instruction be made a part of our Public School Education or Course of Study?"

WHAT CONSTITUTES GOOD MANAGEMENT IN A MANUFACTURING ESTABLISHMENT?

BY "LONDRAK"

The exercise of that ability which results in the production of the most reliable goods at the smallest cost. Therein lies the full and complete answer to the problem propounded above. The subject does not embrace the locating or equipment of a manufacturing establishment, though both are of vital consequence to success. Given an establishment properly located and equipped, and not handicapped by insufficient capital, or inefficient management in the office, the highest measure of success is assured to the management which results in the achievements above stated. I do not say the production of the best goods on the market, though the higher the quality the better, other things being equal, but I emphasize the word *reliable*. An establishment may produce a very high class of goods—may even produce the highest in the land—and yet fall short of success; nay, further, the strain resulting from a struggle to reach too high, bears within it the element of weakness, the probability of irregularity in the product; and where irregularity is, there reliability cannot be. Let the reader whose line of life has brought him to observe the growth of any class of manufacturing establishments, analyze the success of those that have reached nearest the summit, and he will find there reliability of product and economy of cost.

What is this management made up of? What manner of man must he be who achieves it?—for any successful management, whether of a concern composed of different partners, or of a company of many, must be an individual thing, an illustration of the one man power in its inception. The commercial record of modern times reveals the names of hundreds of men, each of whom has been directly the parent of a great success in manufacturing, though not unfrequently a share of that success has been claimed by others. The Company which, in so short a time, built the great railway that all Canadi-

ans feel proud of—or ought to—as an honor to their country, began on this line by procuring the services of the man they deemed able to manage the most successfully. Their liberality in that connection was much talked of at the time. The success of their railway construction justified their faith in W. C. Van Horne, a giant among railwaymen. We have now got a manufacturing establishment located and equipped aright, with necessary capital, with a good live and accurate system of keeping accounts, and an understanding of modern methods of distributing the output, and an ideal manager. How does that manager proceed? Does he indicate to his men on what lines he wants work done, and leave them with the impression that shortcomings will be visited with penalties the most severe? Does he watch everything with the eye of a man intent on finding the wrongs more readily than the rights? Is he suspicious and prone to believe that if he were absent advantage would gladly be taken of the fact by his employees, to their own ease and the injury of the concern? For on such lines have myriads of manufacturing establishments lived—and died. The ideal manager will avoid all these, as the mariner avoids the reefs he well knows mean destruction, and will begin by taking into the internal working of his concern as many partners as there are names on his pay roll. He cultivates the interest of his assistants from the highest paid mechanic to the shipper who puts the label on the box or the brand on the barrel, knowing that even so small a thing as the putting on of that label squarely, or the brand hastily, cuts some figure in the great sum of success. He engages the hearts of his employees as well as their heads and hands, and finds equal logic in discharging the man he finds possessed of an incurably bad heart, as in parting with the man whose head or hands lack ability or deftness. He uses means not supposed by everyone to be within the pale of business. He is a friend as well as a director. He becomes an adviser in matters not connected with the daily toil, if so be that his associations possess him of knowledge not known to the employee. His interest in his men is not bounded by the walls of the factory, nor applicable to less than the entire family of every workman of his, so far as his time will permit. In short, he is their friend, and, possessing discernment, is soon surrounded by friends whose hearts enter readily into the objects his heart is engrossed in. That object is to put on the market the most reliable goods and at the lowest cost. That lowest cost he is wise enough as well as humane enough to believe unattainable through paring down the wages list to the lowest figures his employees will accept and continue in his service. A large manufacturer, some time ago, told the writer with pride in his eyes of how he had "economized" in manufacturing, how this year he was turning out so many more dozens per week than last year, and at so much less daily cost for wages, by making each girl do so much more, and work for so much less per diem. If it were allotted to me to select a text for some pulpit orator, that manufacturer's words would supply the requirement; or if choosing a subject for a practical lecture to a school of future manufacturers, I would seek no further for the theme. Neither morally nor financially will such inhumanity stand the test as good management, nor achieve permanent success.

Example is better than precept, a fact as applicable to managing a manufacturing establishment as managing a family. Cast iron rules should be dealt in sparingly and cautiously. The fewer such the better. It is not in human nature to observe a superabundance of "employees must," or "employees must not," and if the habit of disregarding them gains a foothold, the disregard will extend to written or unwritten rules that are necessary. The writer has seen a formidable array of rules numbering over twenty, printed and pasted at various places throughout a manufacturing establishment. That was in the year 1881. In the year 1883 that establishment went into bankruptcy. In justice to the rules I must add that they were not quoted as the cause of the failure, nor even as one of the causes, but a collateral fact is that the rules did not save it. The evils of this plan are intensified where the manager is addicted to revising and adding to his employees' ten or twenty commandments. Certain rules and their observance are necessary, depending generally on the nature of the manufactory. The wise manager will never forget that they are much more efficacious if laid before friendly workmen, than if sought to be hammered into discontented or over-ruled ones.

The manager I am describing, if he is the purchaser for the manufactory, will resist all temptation to buy raw material unfit to produce the standard of goods he has established. If the purchasing is done by some one else connected with the concern, who perhaps is so constituted as to yield to a bargain, and load up with material

of a doubtful character, that someone will have their eyes opened by the manager to the old fact that "a silk purse cannot be made of a sow's ear," and that, too, without waiting for letters from customers waiting to know the reason for the last lot not being up to standard, and claiming a rebate, or containing an order for their removal. On this point he will admit of no parleying. Down goes his foot on the first attempt to utilize material unfit for the purpose for which it is intended, and having planted it, there it stays. If it were possible to enumerate the manufacturing establishments that, having reached a good distance on the road to success, and who then knocked their trade and their prospects on the head and went to an early grave by lowering or varying the standard of raw material, the list would be simply appalling. The pressure of competition, especially of competitors who are in a greater or less degree going it blind as to what their goods actually cost them, makes it sometimes hard to resist falling into this error. It seems an easy way out, but it is so only in seeming.

The same reasoning I have applied to the purchase of raw material applies in a still greater degree to the purchase of tools and machines used in the factory, and needs no repetition to establish its importance.

The good manager will have a thorough appreciation of the value of the highest and broadest technical knowledge, not only individually, but in his workmen. He will be liberal in subscribing to trade journals, not alone to the one he deems best of its class, but to many. My experience is that any copy of any trade paper issued, is worth the cost of a year's subscription to a concern in the interest of whose trade it is published, if read carefully and observantly. If the manager's duties permit of nothing further than a few minutes spent in turning over the pages, reading the titles of the articles, and enough of the matter to see the line of reasoning, he will find something to mark and hand to some one under him, who is immediately engaged in the duties of which that article specially treats, and who will find therein an opportunity of broadening his ideas and avoiding errors by studying another's experience. Visiting other establishments, especially those which have earned a reputation for good products, is another means conducive to improved methods. Liberal expenditure for travelling in this direction is usually well invested money.

All the constituents of good management would make a lengthy list. Those I have mentioned are the ones which in my experience are the most important. If any reader complain that others equally important have been left untouched, I answer him with an adaptation of the homely words of Abraham Lincoln, "Observe these, and if they don't make you a successful manager, they will give you a good life."

THE St. Paul Chamber of Commerce lately addressed a circular to the principal Boards of Trade throughout the Dominion, asking their co-operation towards securing a renewal of reciprocal trade relations between Canada and the United States. Canada does not feel her need of such a measure so much as she once did, and would only enter into the arrangement on a basis that would guarantee to her a full share of the advantages which might result therefrom.

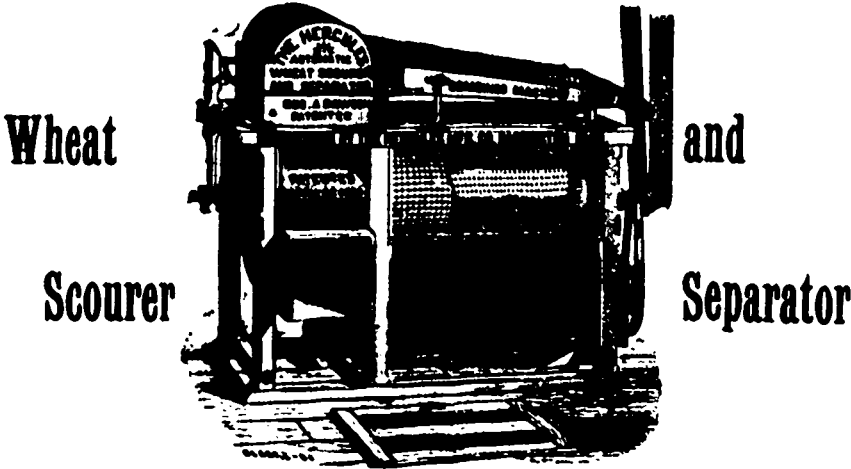
THE *Uxbridge Guardian* is kind enough to say of us: "The MECHANICAL AND MILLING NEWS is now published by Mr. Charles H. Mortimer, that gentleman having purchased it, and he is remarkably well qualified to conduct such a paper. There is no wonder the paper is making such rapid strides, as under his skilful management it is quickly gaining the top rung of the ladder. It is a credit to the province, and we have no doubt it will receive a most liberal support from all parties interested."

Mr. M. D. Campbell writes the DOMINION MECHANICAL AND MILLING NEWS from the "Glenora" roller mills, Picton, as follows: "Enclosed please find \$1.00 for your valuable paper, which I think has greatly improved. Will you send my paper, formerly addressed to Deseronto, to this place, as I intend remaining here, having bought out the "Glen House," a great summer resort, situated on the Bay of Quinte, a beautiful spot, known as "Glenora," or "The Lake on the Mountain." I have charge of one of the best roller mills in this country, which is run by water brought through pipes from the lake on the mountain, using a 9-inch "Little Giant" water wheel. The mill is running on the Jones system, and I believe he has the best rolls for reducing wheat. I find I can make more middlings than with any other roll I have ever met with yet. When this mill was first started it did not give satisfaction, and when I came they were running about one day in the week, but we now have more orders than we can fill. I will gladly send samples to any one wishing to see what the Jones rolls can do.

PLATED STEEL BOLTING CLOTH For Roller Mills,

TIMOTHY GREENING & SONS, DUNDAS, ONT.

THE HERCULES



Wheat

and

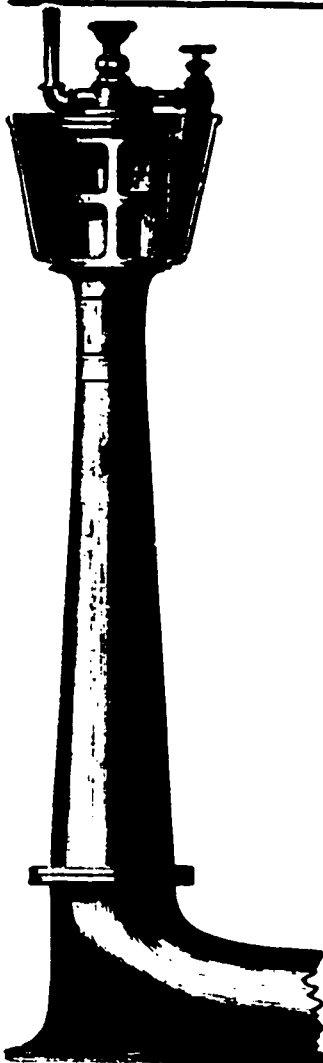
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Separator

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In use in Canada, United States and other foreign countries.

The only Automatic Wheat Scourer ever invented.
Requires no attention but oiling, and collects its own dust. Of very light draught.
Warranted to improve the color and value of flour in any mill. Sent on trial.
Circulars, Testimonials and Samples of Work sent on application.

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BY THE USE OF OUR

PATENT IMPROVED
FURNACE BLOWERS,

Any kind of inferior fuel can be
used, such as tan bark, saw dust,
hard coal screenings, etc.

- No Machinery required;
- Easily placed in;
- Do not burn the grate bars;
- Use very little steam;
- Make no sparks;
- Save their cost in a few days.

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BARTON ST.,
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TWO 17 INCH WATER WHEELS,
FOUR 20 " " "
TWO 23 " " "
TWO 26 " " "
TWO 30 " " "
TWO 35 " " "
TWO 44 " " "
TWO 52 " " "

All with improved Tight Gates of superior workmanship
and guaranteed the best in every respect.

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THOS. DEAN,

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always with the comforts of the travelling
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at single fare between all stations on its
line, Dec. 25th, 1886, good to return till
Dec. 27th, 1886, and on Jan. 1st, 1887, good
to return till Jan. 3rd, 1887, and at fare
and one third, Dec. 23rd, 24th, 25th, and
30th and 31st, and Jan. 1st, 1887, good to
return till Jan. 4th, 1887.

MILLERS

—AND—
MANUFACTURERS'
INSURANCE COMPANY.

STOCK AND MUTUAL
OBJECTS.

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

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

To reduce the cost of the insurance to the low-
est point consistent with the safe conduct of the
business.

METHODS.

All risks will be inspected by a competent offi-
cer of the company, who will make such sugges-
tions as to improvements required for safety
against fire as may be for the mutual interests of
all concerned.

Much dependence will be placed upon the obli-
gation of members to keep up such a system of
discipline, order, and cleanliness in the premises
insured as will conduce to safety.

As no agents are employed and the company
deals only with the principals of the establishments
insured by it, conditions and exceptions which are
so apt to mislead the insured and promote contro-
versy and litigation in the settlement of losses will
thus be avoided.

The most perfect method of insurance must, in
the nature of things, be one in which the self-
interest of the insured and the underwriters are
identical, and this has been the object aimed at by
the organizers of the company.

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

HUGH SCOTT, Managing Director.

Applicants for insurance and other information
desired, please address MILLERS AND MANU-
FACTURERS' INSURANCE COMPANY, No.
24 Church Street, Toronto.

McKEE & MARWICK,

Engine Builders

—AND—
STEAM
PUMPS,

Petrolia, Ont.

BOLTING CLOTHS



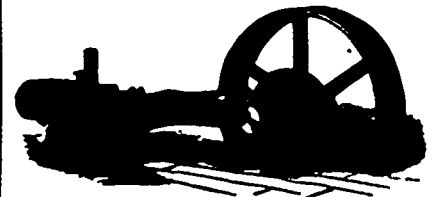
IMPORTANT TO MILLERS.—Agent for the Do-
minion for the Celebrated 'Madame Mot' Anchor
Bolting Cloths, furnished by the yard, or made up to
order. Full stock of all sizes on hand.
R. WHITELAW, Woodstock, Ont.

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Wire Manufacturers

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Metal Perforators,

VICTORIA WIRE MILLS,
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BUCKEYE AUTOMATIC ENGINE.



The Simplest, Most Durable and
Most Saving in Fuel of all the
Automatic Engines Made.

HAS NO SUPERIOR AND FEW EQUALS

—ALSO ALL SIZES OF—
Boilers and Every Description of
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Oxford Foundry - Woodstock, Ont.

STAR ENGRAVING CO.

Send for figures for engrav-
ing cuts of Buildings,
Machinery, etc.

17 ADELAIDE EAST. TORONTO.

MACHINE KNIVES
Of every description,
for
*Planing,
Moulding,
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SEND FOR PRICE LIST



**HUXTABLE'S
Purifier Attachments**

By making dead spaces in the cloth, and thereby reducing the capacity of the machine, makes it possible to do BETTER WORK than can be done by any other means.

The price is very low, and satisfaction guaranteed.

ADDRESS
JAMES HUXTABLE,
Horning's Mills, Ont

W. J. JORDAN
ALL BRANCHES OF
ENGRAVING

FIRST-CLASS MECHANICAL WORK.
17. KINGS ST. W. JORDAN
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DIAMOND

DIAMOND ANTI-FRICTION METAL
Being the only metal successfully containing

PLUMBAGO
It will run smoother and cooler than any other, requiring 50 per cent. less oil than brass to lubricate it.

PLUMBAGOINE,
A Superior Grease for Axles and Heavy Bearings.

FRICTION PULLEYS,
GRAPHER AND MORE DURABLE THAN MILL-BOARD.
Trial Orders Solicited.

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LONDON MACHINE TOOL CO.,

LONDON, - ONTARIO,
MANUFACTURERS OF

Machinist--and--Brass--Finishers'--Tools.

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**FREED'S
BOILER CLEANING COMPOUND**

WILL REMOVE SCALE FROM BOILERS WITHOUT INJURY TO THE IRON.

It effects a Great Saving of Fuel, and will not foam.

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J. L. JONES
WOOD
ENGRAVER
TORONTO



ROBIN & SABLER

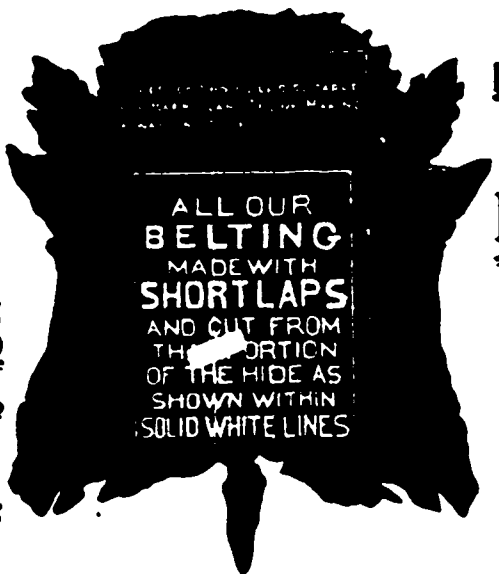
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Leather

Belting

2518, 2620 and 2622
Notre Dame St.

MONTREAL.



ALL OUR
BELTING
MADE WITH
SHORT LAPS
AND CUT FROM
THE PORTION
OF THE HIDE AS
SHOWN WITHIN
SOLID WHITE LINES

ROBIN & SABLER

Manufacturers of

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

DEALERS IN

COTTON AND RUBBER BELTING,

LACE LEATHER, BELT HOOKS AND MILL SUPPLIES.

DICK, RIDOUT & CO.,
- MANUFACTURERS OF -

**JUTE AND LINEN BAGS,
FACTORY COTTON BAGS,**

In all sizes. Samples sent on application.

TORONTO BAG WORKS

FACTORY---Esplanade Street.

Office and Warehouse: 11 to 13 FRONT ST. E., TORONTO.

AUTOMATIC GRAIN, FLOUR AND FEED SCALE.

ACCURATE, DURABLE,

AND MOST SIMPLE SCALE ON THE MARKET.

We are Sole Manufacturers of the

ONLY AUTOMATIC FLOUR AND FEED SCALE

in the United States and Canada.

We send Scales on 30 days trial, and guarantee them to weigh absolutely correct and work entirely satisfactory.

J. B. DUTTON & Co., Detroit, Mich.
ATTN: Ont., May 15, 1886.
GENTLEMEN:—Enclosed find certified cheque in payment for Automatic Scale. We are not in want of any more Automatic Scales at present, but when we want any we will give your preference. We consider it strictly reliable, as we test it every week; and what we particularly admire is its simplicity, so little to wear and get out of order.
Yours truly,
N. WENGER & BROS.

Messrs. J. B. Dutton & Co., Detroit.
Wolverto, Ont., March 5, 1886.
GENTLEMEN:—The Automatic Scale we bought of you is a GRAND SUCCESS. We have tested it many times, and in every case found it correct. We made one special test of 5,000 bushels to our entire satisfaction. It is so simple in construction that it cannot get out of order, and requires no attention. We can now take our yields daily and know exactly what we are doing; besides we can always sell just what wheat we have on hand. We consider it indispensable.
Yours truly,
A. WOLVERTON & CO.

Write for Circulars and Best Discounts.

J. B. DUTTON & CO.,
52 Woodward Ave.,

DETROIT, MICH.

THE FENSOM ELEVATOR WORKS,

34 36 AND 38 DUKE STREET,

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FOR BANKS, WAREHOUSES, PRISONS, VAULTS AND DWELLINGS.

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Notice to Contractors.

SEALED TENDERS, addressed to the undersigned and endorsed "Tender for Midland Harbor Works," will be RECEIVED until Tuesday, the 25th day of January, 1887, inclusive, for the Construction of Works at Midland, Simcoe county, Ontario.

Persons desirous of tendering are requested to make personal enquiry relative to the work to be done, and to examine the locality themselves, and are notified that tenders will not be considered unless made on the printed forms supplied, the blanks properly filled in and signed with their actual signatures.

Each tender must be accompanied by an accepted bank cheque made payable to the Honourable the Minister of Public Works, for the sum of one thousand dollars (\$1,000), which will be forfeited if the party decline to enter into a contract when called upon to do so, or if he fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order, A. GOBELL, Secretary. Department of Public Works, Ottawa, 24th December, 1886.



A New Series on the

SCIENCE OF ACCOUNTS

PRICE, \$1.00.

CONNOR O'DEA, TORONTO, ONT.

FOR SALE,

-VALUABLE-

CANADIAN PATENT

on an Improved Automatic

GRAIN, FLOUR AND FEED SCALE.

Not wishing to extend our manufacturing business into Canada, we have concluded to dispose of our CANADIAN PATENT on above invention. We have our Scales in operation in some of the best mills in Canada.

A full set of Patterns will be included in sale of Patent. Address

J. B. DUTTON & CO., 42 Woodward Ave.,

DETROIT, - MICHIGAN.

GRAND TRUNK RAILWAY.

Trains Leave Toronto as Under:

[STANDARD TIME]

MAIN LINE EAST.

7:15 a.m.—Local for points East to Montreal. 8:55 a.m.—Fast express for Kingston, Ottawa, Montreal, Quebec, Portland, Boston, etc. 1 p.m.—Mixed for Belleville and intermediate stations. 5:30 p.m.—Local for Cobourg and intermediate stations. 8:00 p.m.—Express for main points—Ottawa, Montreal etc., runs daily.

MAIN LINE WEST.

7:55 a.m.—Local for all points west to Detroit. 7 p.m.—Express for Port Huron, Detroit, Chicago, and all Western points. 4:00 p.m.—For Goderich, Stratford and London. 6:25 p.m.—Mixed for Guelph and intermediate stations. Express for Samia and western points.

ARRIVE FROM THE EAST. 10:10 a.m.—Local from Cobourg. 9:00 a.m.—Express from Montreal, Ottawa, and main local points. 11:00 a.m.—Fast Express from Montreal, etc. 6:40 p.m.—Mixed from Belleville and intermediate stations. 10:40 p.m.—Express from Boston, Quebec, Portland, Montreal, Ottawa, etc.

GREAT WESTERN DIVISION.

LEAVE TORONTO. 7:10 a.m.—For Niagara Falls, Buffalo, Detroit, Chicago and St. Louis. 9:15 a.m.—Local between Toronto and Hamilton. 12:20 p.m.—For Detroit, Chicago, Buffalo, New York, and all points East and West; runs daily. 3:55 p.m.—For Niagara Falls, Buffalo, New York, Boston, and local towns bet. Hamilton and London, and Brantford, St. Thomas, etc. 5:55 p.m.—Local between Toronto, Hamilton and St. Catharines. 11 p.m.—For Niagara Falls, Buffalo, New York, Boston, and all points East and West of Hamilton.

ARRIVE AT TORONTO. 8:35 a.m.—Express from Chicago, Detroit, Hamilton, etc. 10:15 a.m.—Express from London, St. Catharines, Hamilton, etc. 1:55 p.m.—Express from Hamilton, London, Detroit, and points west. 4:30 p.m.—Express from New York, Boston, Chicago, Detroit, London, etc., runs daily. 7:05 p.m.—Mail from Buffalo, Detroit, London, Hamilton, and intermediate stations. 7:45 p.m.—Express from Detroit, St. Louis, etc. 11:10 p.m.—Local between Toronto and Hamilton.

CANADIAN PACIFIC RY. ONTARIO DIV.

DEPARTURES.—Going West.—Detroit Express at 8:10 a. m.; Chicago Express, 10:5 p. m.; Express, 4:15 p. m.

Going East.—Mixed (for Peterboro', Carlton Place, and intermediate points), 5 p. m.; Montreal and Quebec Express, 8:10 p. m.

ARRIVALS.—From the East.—Montreal and Quebec Express—8:27 a. m.; 9:50 p. m. Mixed (from Peterboro', Carlton Place, and intermediate stations), 11:50 a. m.

From the West.—Detroit and Michigan Express, 9:10 a. m.; Express from St. Thomas—8:30 p. m. Chicago Express 5:20 p. m.

ORANGEVILLE AND ELORA BRANCH.

Depart—Mail, 7:45 a. m. Express 4:50 p. m. Arrive—Mail at 10:55 a. m.; Express at 9:10 p. m. Steamboat Express over the Credit Valley to Streetsville Junction, Wednesdays and Saturdays only, 10:45 a. m.

ORANGEVILLE AND ELORA BRANCHES.

Depart—Orangeville and Elora Mixed, 8:10 a. m.; 4:15 p. m. Arrive—Orangeville and Elora Mixed, 9:05 a. m.

TEESWATER BRANCH.

Depart—Teeswater Mixed, 7:45 a. m.; 4:50 p. m. Arrive—Teeswater Mixed, 10:55 a. m. 8:10 p. m.

NORTHERN & N. W. RAILWAY.

Trains Leave City Hall as under

7:55 a. m.—Mail for Gravenhurst, Orillia, Meaford, Penetang, and intermediate stations. 11:45 a. m.—Accom. Gravenhurst, Collingwood, and Meaford. 5:15 p. m.—Express for Collingwood, Penetang, Orillia, and Harrie. Trains are due to arrive at 10:5 a. m., 2:00 p. m., and 7:45 p. m.

CHRISTIE, KERR & CO.

LUMBER DEALERS.

OFFICE: No. 9 VICTORIA ST., TORONTO, ONT.

LUMBER FREIGHTS AND PRICES.

(Canadian Quotations furnished by above firm.)

Jan. 1st, 1887. The following are the present railroad freights From N. & N. W. R. Stations—Collingwood,

Gravenhurst, Penetang, Orillia, Severn, Phelps and Wyevale, to St. Thomas Suspension Bridge St. Catharines Paris Woodstock Ingersoll Brantford Goderich Buffalo Detroit Toronto 15c. per 100 lbs.

From U. T. R. Stations—Midland, Waubesa, Victoria Harbor, Sturgeon Bay and Fesserton to

Suspension Bridge St. Catharines London Goderich Tonawanda St. Thomas Buffalo, 11c. per 100 lbs. Paris Woodstock Ingersoll Brantford 15c. per 100 lbs.

From U. T. R. Stations—Midland Waubesa, Victoria Harbor, Sturgeon Bay and Fesserton to Toronto and Hamilton. 8 1/2 c. per 100 lbs.

From C. P. R. Stations—Owen Sound and Teeswater to Toronto. 9c. " " From Ottawa to Toronto and Hamilton. 10c. " "

From N. & N. W. R. Stations—Gravenhurst, Severn, Phelps and Wyevale to Toronto and Hamilton. 9c. per 100 lbs. " Collingwood, Penetang, Orillia and Harrie to Toronto and Hamilton. 8 1/2 c. " " " New Lowell, Angus, Barrie, Lisle and Tilga to Toronto and Hamilton 8c. " "

PRICES OF LUMBER.

Table with columns for lumber types (Pine, Fir, etc.), dimensions, and prices per 1000 ft.

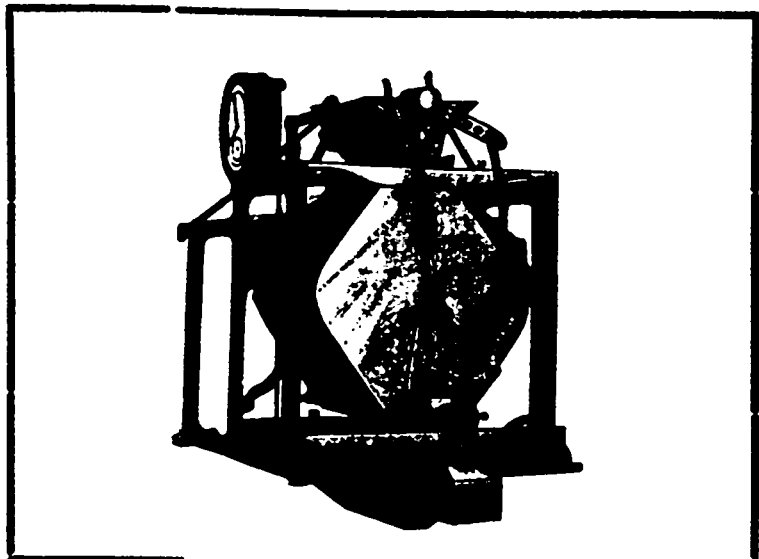
BUFFALO. Jan. 1st, 1887.

Table listing lumber prices for Buffalo, including 'We quote cargo lots' and 'Assorted lumber in car lots or best loads'.

Table listing wholesale prices of hardwood lumber delivered on cars or boat, including Walnut, White Oak, etc.

Kuhlman Automatic Scale.

SEATON & SAGE, MANUFACTURERS, LONDON, ONT.



It is the only Scale introduced that has come to stay.

WE TAKE PLEASURE IN REFERRING YOU TO THE FOLLOWING PROMINENT MILLERS OF ONTARIO:

- SEATON & LEA, Atchison, Kansas. LONDON, Ont., Canada, July 20, 1886. We, the undersigned millers in the City of London, Canada, certify that we have been using the Kuhlman Automatic Scales in our mill, and find them a great convenience in testing our yields and also a means of testing the amount ground each day. After careful tests we find them accurate and reliable. HUNT BROS. SEATON & LEA, Atchison, Kansas. PARK, Ont., Sept. 13, 1886. Gentlemen: The Kuhlman Automatic Scale you furnished our mill works satisfactorily, and from all tests we have made we are confirmed in the belief of its being absolutely correct. Yours truly, WHITLAW, BAIRD & CO. SEATON & LEA, Atchison, Kansas. INgersoll, Ont., Sept. 11, 1886. Gent's: The Kuhlman Scale placed in our mill by your agent, gives perfect satisfaction. I tried it against four pair of scales in my mill and find it absolutely correct, and I cheerfully recommend them to the milling fraternity. Respectfully yours, WM. BARTLO. KUHLMAN AUTOMATIC SCALE CO., Lincoln, Nebraska. LONDON, Ont., Sept. 13, 1886. Gent's: The two Automatic Scales placed in my mill by your representative, are giving entire satisfaction. Yours truly, J. D. SAUNBY.

SEATON & SAGE are General Agents and Manufacturers of the Kuhlman Scale.

LONDON, CANADA.

THE GEO. T. SMITH CENTRIFUGAL MILLS



LAKEFIELD, Ont., Nov. 16th, 1886.

S. S. Heywood, Manager,
Geo. T. Smith Middlings Purifier Co., Stratford, Ont.

Dear Sir: I commenced grinding wheat in my mill Thursday, Nov. 11, and with my acceptance of it, I take pleasure in testifying to the entirely satisfactory manner in which you executed your contract with me. The machinery was shipped promptly as agreed, and the diagram, plans and millwright work were in every detail everything that I could wish, and your Mr. McAulan, who had charge of the work, is a thoroughly competent man for the position, and gave me a mill that I am proud of.

As regards capacity, I find that the mill will run to 150 bbls. easily and make a perfect finish. 125 bbls. was all that you contracted to give me. I am very thankful that I adopted the full Centrifugal system instead of the old style of long reels, and although the mill has been running but four days, I am already convinced of its superiority, and I have never seen any bolting device that could equal your Centrifugal in quality and quantity of work done.

The quality of my flour, the yield and finish, I have never seen surpassed. Should you desire to do so, I shall take pleasure in showing any parties you may send here what a CENTRIFUGAL mill can do.

Yours truly,
JOHN HULL.
LAKEFIELD, Dec. 7th, 1886.

S. S. Heywood, Manager,
Geo. T. Smith M. P. Co., Stratford, Ont.

Dear Sir: Mr. John Hull's mill, Lakefield, which you furnished with your complete Centrifugal system, has given entire satisfaction since the first day it started. I have seen a number of systems which I thought were good, but I must say this complete Centrifugal system excels them all both as to quantity and quality of work done, and it is the nicest running mill I have ever handled, and any one wishing to see a complete mill, I would heartily recommend this one to their notice. I am sure that they would go away well pleased with the mill. Your millwright deserves praise for constructing the mill to give so little trouble to us. Have not had a choke up since it started.

Yours truly,
JOS. L. SMITH,
Head Miller for John Hull.

RIDGETOWN, Nov. 25th, 1886.

The Geo. T. Smith M. P. Co., Stratford, Ont.

Gentlemen: I have my mill running after being changed over to your short system of milling, and I am well pleased with the work done by the mill. The flour is good and the offal is well cleaned. I like your Centrifugal reel and cleaning machines. The separator is doing good work and is admired by everybody that sees it. Your millwright did me a first-class job. I cannot find a fault with it. I think your short system cannot be beat.

Yours truly,
JOS. SMITH,
Proprietor of the Star Mills.

BOWMANVILLE, Oct. 18th, 1886.

S. S. Heywood, General Manager,
Geo. T. Smith M. P. Co., Stratford, Ont.

Dear Sir: In accepting my mill from you, I take pleasure in saying that the contract entered into with your Company last July has been carried out on your part to my entire satisfaction. The mill, as diagrammed by your Mr. Everett, started up without a spout or cloth being changed, and the machines located by your draughtsman, Mr. Olsen, were placed to the best possible advantage, and the millwright work, which was put in by your Mr. McKay, was done in so thorough and workmanlike a manner, that the mill is absolutely dustless, and not a choke-up since it started. You have given me the finest line of special machinery I have ever seen in a mill, and the quality of their work is as fine as their appearance. I do not think the quality of the flour could be improved, but my customers say the offal will have to be made richer or I will not be able to sell it.

Yours respectfully,
C. VANSTONE.
KINGSTON, Nov. 16th, 1886.

Geo. T. Smith M. P. Co., Stratford, Ont.

Gentlemen: Our mill has now been running 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 as far as capacity is concerned, instead of making 75 barrels as the contract called for, we run from 100 to 125, and clean up in good shape when doing it. The Centrifugals, on which nearly all the separations are made, do more work with less attention than any other machines in the mill, and do it well, too. We consider ourselves indebted to your Mr. Everett for supplying such an excellent flow sheet, to Mr. Black, your miller, for his send-off, and also to your firm for the prompt manner in which you carried out your contract. All our business with you has been very satisfactory.

Yours truly,
J. G. CAMPBELL & SON.
LONDON, Ontario, September 25th, 1886.

The Geo. T. Smith M. P. Co., Stratford, Ont.

Gentlemen: We have our mill which you built for us in operation on the full roller and Centrifugal system, and we are very much pleased with the working of the same. The separations are good and the flour very nice, and the offal well cleaned. Our trade is picking up, our flour is giving good satisfaction, and my prospects for a good business are good. I believe that I have a mill that will do 10 or 15 bbls. more than it was rated by you.

Oct. 17th, 1886.

We are getting along nicely. All going well. On the whole I am better pleased every day so far.

Nov. 11th, 1886.

We have sold one car load of flour at a fair working profit and have an order for three cars more. So much for a start.

Yours truly,
E. HUBER.

We are giving special attention to mills on the Geo. T. Smith Centrifugal System. The best mills in the United States are abandoning their long reels and putting in Centrifugals instead.

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

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

United States Shops, JACKSON, MICH.

STRATFORD, ONT.

MACHINERY FOR SALE.

SAW MILL MACHINERY for sale by H. W. PETRIE, Brantford.

SAW MILL. Waterous make, direct action, complete with power, good saw, all ready for use.

SAW RIG. 35 feet carriage, new saw frame, mandril and saw.

SAW MILL, Reid & Barr's make, 30 feet carriage, modern rig.

LOG AND LUMBER CARS, several in stock, prices low.

ONE DRAG SAW, with log car, &c., price low.

ONE WATEROUS ADJUSTABLE BOLTER AND PICKET MACHINE.

ONE SINGLE EDGING TABLE, complete in good shape, very cheap.

LATH MACHINE, one Waterous self-feeder, good as new.

LATH MACHINE, in good order, price \$30.00.

TWO STAVE CUTTERS, complete with Pitman rod and counter shaft.

TWO DOUGHERTY SHINGLE MACHINES, in good order, price very low.

UPRIGHT SWING SHINGLE MACHINE, Law's patent, Galt make, iron frame.

SHINGLE MACHINE, Smallwood patent, Waterous make, with jointer and drag saw.

WATEROUS SELF-ACTING SHINGLE machine and edger, new saw.

GOLDIE & McCULLOCH SHINGLE MACHINE, latest make, a fine mill.

WHEEL JOINTERS, 4, by different makers, and very cheap.

HEADING MACHINERY, one heading planer, saw, turner, and jointer at a bargain.

LARGE STOCK OF Engines, Boilers, Iron and Wood Working Machinery, Water Wheels, Grist Mill Machinery, &c. Send for catalogue.

FULL DETAILS of any of the above machinery forwarded on application. Address H. W. PETRIE, BRANTFORD, ONT.

MECHANICS WANTED.

No charge for advertisements under this heading. Persons replying to advertisements will please mention this paper.

MILLER WANTED—FIRST-CLASS—FOR STONE custom mill; single man preferred. Box 80, Mount Brydes, Ont.

PATTERN-MAKER WANTED—YOUNG MAN—good—who would not object going to St. Paul, if required. Address Drawer 130, Brantford.

SITUATIONS WANTED.

No charge for announcements under this heading. Persons replying to advertisements will please mention this paper.

AS MILLER IN STONE MILL. FIRST-CLASS stone dresser, good references. Apply J. M. Miller, Box 60, Merriton P. O., Ont.

AS MILLER—FIRST-CLASS—TO TAKE CHARGE of stone mill, or second in a good roller mill; can give best of references; 23 years' experience; total abstainer; state wages. Address A. ELLIS, Vroomanton, Ont.

AS MILLER—COMPETENT TO TAKE CHARGE of any stone or combination mill; extra good stone man; 22 years' experience; active and obliging; married man and wants steady position. State wages and full particulars to Wm. JAMES, Box 207, Newmarket, Ont.

AS MILLER—YOUNG MAN TO TAKE CHARGE of roller mill; 8 years' experience; strictly temperate; state wages and kind of mill. Address MILLER, Box 249, Galt, Ont.

STANDARD CHOPPING MILLS

Now furnished with Shaking Screen over hopper to take out nails, stones, &c.

Using Best Burrstones.	Capacity
12 in. all iron cases.	6 to 40 bus. pr. hour
20 in. iron cases.	2 to 20 horse power
30 in. wood frames.	Send for new Circular.
36 in. wood frames.	
42 in. wood frames.	



Waterous Engine Works Co., Brantford and St. Paul, Minn., U.S.



CAPE BRETON RAILWAY—SECTION, GRAND Narrows to Sydney.

Tender for the works of construction. Sealed Tenders, addressed to the undersigned and endorsed "Tenders for Cape Breton Railway," will be received at this office up to noon on Wednesday, the 12th day of January, 1887, for certain works of construction. Plans and profiles will be open for inspection at the office of the Chief Engineer and General Manager of Government Railways at Ottawa, and also at the office of the Cape Breton Railway at Port Hawkesbury, C. B., on and after the 27th day of December, 1886, when the general specifications and form of tender may be obtained upon application.

No tender will be entertained unless on one of the printed forms and all the conditions are complied with.

By order,
A. P. BRADLEY,
Secretary.
Department of Railways and Canals,
Ottawa, 15th December, 1886.

COX & CO., STOCK BROKERS.

Members Toronto Stock Exchange

Have the only Independent Direct Wire giving continuous New York Stock Quotations and which are received QUICKER THAN BY ANY OTHER LINE.

Buy and sell on commission for cash or on margin. All securities dealt in on the Toronto, Montreal, and New York Stock Exchanges. Also execute orders on the CHICAGO BOARD OF TRADE in Grain and Provisions. Daily Cable Quotations of Hudson Bay and other Stocks.

26 TORONTO ST. TORONTO.

TO MILLERS.

THE GALT EDGE TOOL AND CARRIAGE SPRING WORKS have on hand a number of

GRINDSTONE BUTTS

of a superior grit, for grinding MILL PICKS, AXES, &c. Diameter, 24 in. to 26 in.; thickness, 7 in. to 10 in. Price, \$1 each, F. O. B.

WARNOCK & CO.
Galt, 9th Nov., 1886.

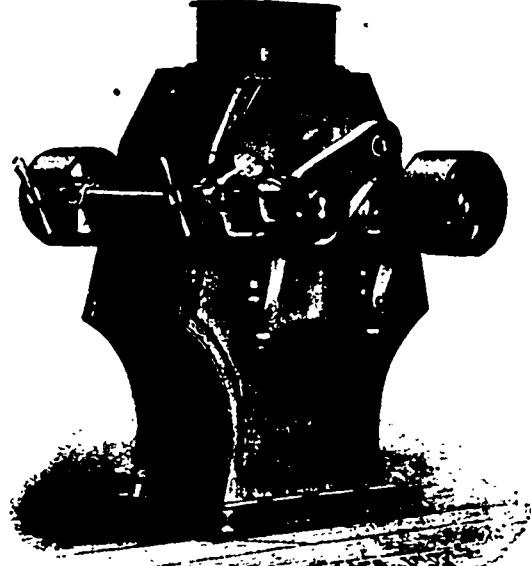
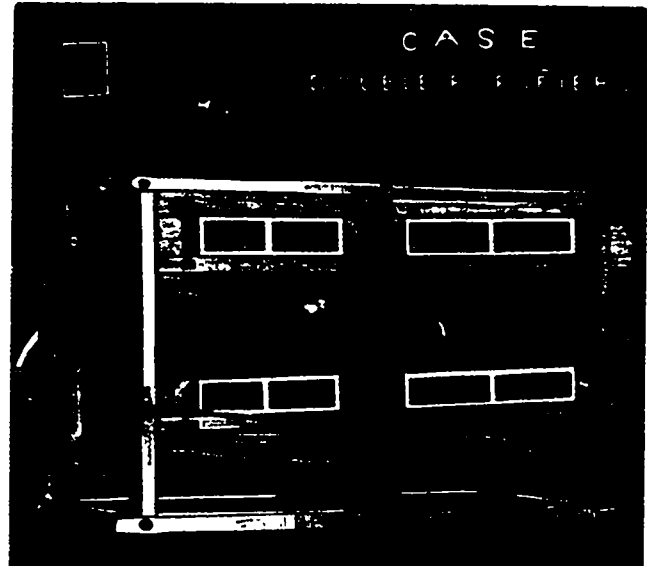
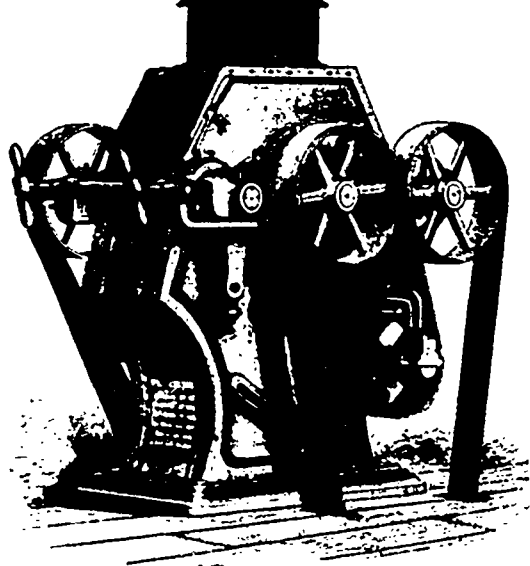
SHAVINGS AND SAWDUST

BOOK FOR PRACTICAL MEN BY A PRACTICAL MAN. Treats of the care, operation, designing and construction of wood-working machines. Substantially bound in cloth; 150 pages; illustrated. Price, \$1.50 by mail, postpaid. Address, C. H. MORTIMER, 31 King St. West, Toronto, Ont.



This old gentleman has been doing some advertising in the Dominion Mechanical and Milling News, and the result seems to surprise him. Every manufacturer who desires a similar experience may have it by placing his New Year advertising with the same free medium. Manufacturers wanting help, and mechanics desiring situations, are invited to use these columns, without charge.

CASE SYSTEM GRADUAL REDUCTION MILLING.



INGLIS & HUNTER,

No. 6 Strachan Avenue.

TORONTO.

SOLE LICENSED MANUFACTURERS FOR CANADA OF

CASE'S CELEBRATED ROLLS AND MILL MACHINERY.

—SPECIALTIES—

Corliss, Westinghouse and Marine Engines, Stationary and Marine Boilers, Wheat Cleaning and Flour Dressing Machines for Flour and Grist Mills.

Plans and Specifications for fitting up new and changing over old Flour Mills on the Most ADVANCED SYSTEM, furnished at reasonable cost.

All Descriptions of Gearing, Shafting and Pulleys, Brass and Iron Castings. Write for Prices and Catalogues. Correspondence solicited. Prompt attention to orders.

BARTER MANUFACTURING COMP'Y

TORONTO, ONTARIO.

MANUFACTURERS OF

Flour Mill, Elevator and Warehouse Machinery.

Mitchell Roller Mills, Aug. 10th, 1886.

BARTER MANUFACTURING CO., Toronto.
 GENTLEMEN: In reference to your enquiry about the Dust Collector
 which I have been using for nearly a year, I would say: The power used
 is noticed on the mill and cannot be much for the reason that when
 the machine was started it was driven with a new 4" belt which has never
 been tightened since, and for cleanliness there is not an accumulation of
 25 lbs. of dust from it in a week's run. Am perfectly satisfied with the
 working of the machine. These are the facts. If you can use them to your
 advantage you are at liberty to do so.
 Yours very truly,
 S. R. STUART.

Kirkton, Ont., Aug. 27th, 1886.

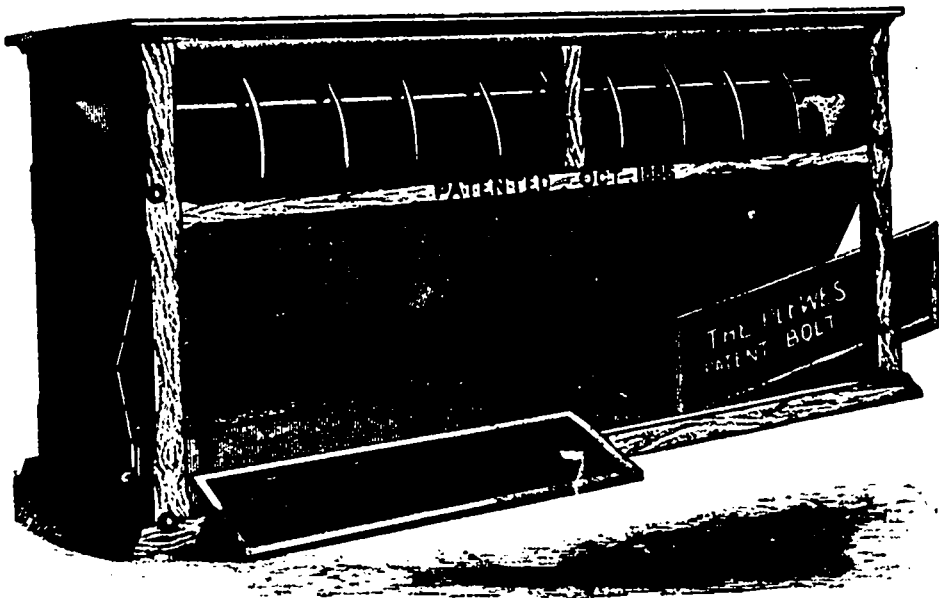
BARTER MANUFACTURING CO., Toronto.
 GENTLEMEN: As to how I like the mill you built or me would say I
 think it can not be beat for making first-class flour. As to the machinery
 I like it very much indeed. The purifiers work first-class; can't be beat,
 no matter where they are made. Would say all these separate machines work
 well, and I say this after running the mill one year.
 Yours truly,
 I. B. SPARLING.

Lucan, August 11th, 1886.

BARTER MANUFACTURING CO., Toronto.
 GENTLEMEN: The Purifier we got from you works well, the suction
 from the fan being on the tail end of the purifier, where the heaviest
 middlings are, it does not take the good middlings into the blast. We
 also like the CLOTH CLEANER you use. They keep the cloth clean. We
 have no trouble with it, and can recommend it to any miller wanting a
 purifier, as we believe they cannot do better in this or any other country
 Yours, etc.,
 BREWER & CO.

THE above are sample letters received from some of our customers, of which a host are in our possession, referring in similar terms to
 our various Milling Machines. All parties intending to build, refit, or buy special milling or cleaning machines, are invited to corres-
 pond with us before purchasing elsewhere.

BARTER MANUFACTURING CO., TORONTO, ONT.



THE PLEWES PATENT BOLT

Millers desirous of improving their entire bolting system, should enquire
 into the merits of this Bolt. It is

Simple in Construction,
 Easy Running,
 Occupies but Little Space,
 DOES ITS WORK IN THE MOST PERFECT MANNER,
 HAS IMMENSE CAPACITY,
 And is sold for less money in proportion to the quality of the work it performs, than
 any other Bolt in the market.
 Reels built to replace Centrifugals and Hexagon Reels; small cost—for which I invite correspond-
 ence. Send for descriptive circular to
ISAAC W. W. PLEWES
 ESPLANADE (Between Bay and Lorne streets) TORONTO, ONT.

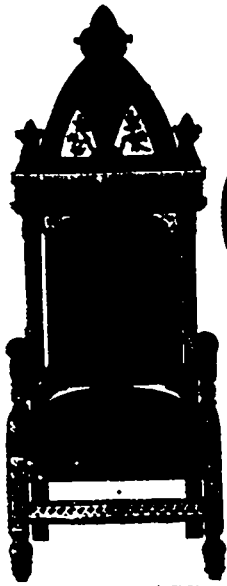
W. STAHLSCHEMIDT & CO.

PRESTON, ONTARIO,

MANUFACTURERS OF

Office, School, Church and Lodge Furniture.

SEND FOR CATALOGUES. SEE ACCOUNTS OF OUR EXHIBIT AT TORONTO EXHIBITION.



No. 1.-CHAIR.



No. 51 ROTARY OFFICE DESK.



No. 50 ROTARY OFFICE DESK

To Mill Owners and Manufacturers.

PHENIX BELT OIL,

THE ONLY PERFECT BELT DRESSING.

TO BE HAD ONLY OF

F. E. DIXON & CO.,

— MANUFACTURERS OF —

PAT. LAP-JOINT LEATHER BELTING STAR RIVET

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

70 King St. E., Toronto.

A RARE CHANCE

FOR THE RIGHT MAN OR MEN. TO SELL
 OR LEASE,

A SOLID BRICK FACTORY,

60x46, 2 stories, DOUBLE FLOORS, boiler and engine
 house in rear, with drying room, shafting and building
 complete. The building was erected for a cabinet fac-
 tory, but is suitable for a dozen other kinds of business.
 The following machinery in the building will be sold
 with or without the building, viz:

15 horse-power Engine and Boiler, Swing,
 Rip, Jig, and Cross-cut Saws, Pony
 Planer and turning lathe,
 in good order, and
 Belting.

The building itself cost, a few years ago, \$5,500, and
 not a crack in it to-day. It is situated on the main busi-
 ness street. The cost of engine, boiler and machinery
 was \$1,300, and will be sold cheap.

POSSESSION GIVEN AT ONCE.

Address, CHARLES COOK, Sr.,
 Box 145, Kincardine.

AN EXTRAORDINARY OFFER TO AGENTS.

We want Live, Energetic and Capable Agents in every County in the United States and Canada, to sell a patented article of great merit, *on the merits*. An article having a large sale, paying over 100 per cent. profit, having no competition, and on which the agent is protected in the exclusive sale by a deed given for each and every County he may secure from us. With all these advantages to our agents, and the fact that it is an article that can be sold to every house-owner, it might not be necessary to make an "Extraordinary Offer" to secure good agents at once, but we have concluded to make it to show, not only our confidence in the merits of our invention, but its salability by any agent that will handle it with energy. Our agents to whom we are making this offer, *above all expenses*, can return all goods unsold to us, and we will refund the money paid for them. Any agent or General Agent who would like ten or more circulars, and work them through all agents for 30 days, and fail to clear at least \$50, *above all expenses*, can return all goods unsold and get their money back. No other employer of agents ever dared to make such offers, nor would we if we did not know that we have agents now making more than double the amounts we guaranteed, and that but two sales a day would give a profit of over \$125 a month, and that one of our agents took 22 orders in one day. Our large descriptive circulars explain our offer fully, and these we wish to send to every one out of employment who will send us a one cent stamp for postage. Send at once and secure the agency in time for the season, and go to work on the terms named in our extraordinary offer. We would like to have the address of all the agents, sewing machine wrights and carpenters in the country, and a any reader of this paper to send us at once the name and address of all such they know. Address at once

RENNER MANUFACTURING CO., 216 Smithfield St., Pittsburgh, Pa.

TO THE MILLERS OF CANADA.

AS AGENT FOR THE

3-High Monitor Roller Mill,

— I NEG TO SAY THAT I HAVE —

IN OPERATION

Here one of the above machines, size 6x18, for chopping. It will run on custom work, so that if any of our milling friends should wish a close inspection of the machine and its work, they will be able to do so any day they may call.

NOTHING LIKE SEEING AND TESTING A MACHINE IN OPERATION BEFORE YOU BUY.

The Rolls especially are fully guaranteed to be of the best possible make. A fair trial and no favor is all I ask. Your closest inspection invited. It has

LARGE CAPACITY. ONE-HALF POWER OF MILLSTONE. AND WHOLE MACHINE IS CONTROLLED BY ONE HAND LEVER. PUT ON ENEMLESS AND RUNS UNTIL WORN OUT.

THE MILLERS' FRIEND,

W. B. BRAGG, - - BOX 103, ROCKWOOD, ONT.



CANADA PATENTS
Passed Sept. 4, 1905.
Renewed July 16, 1905.



TONGUE HEAD

The SHIMER MATCHING HEADS

Have been awarded

A World-Wide Reputation

By actual Every Day Work in Almost every Planing Mill.
UPWARD OF 11 000 NOW IN USE.

The Cheapest. The Strongest. The Most Durable.

— AND KEY TOOL —

LIGHTEST AND EASIEST RUNNING

Matching Heads in the World.

TEV FINISH HARD

Cross-Grained & Knotty Lumber

Neatly showing Clean Edges, and often

Save their Cost in One Day's Run.

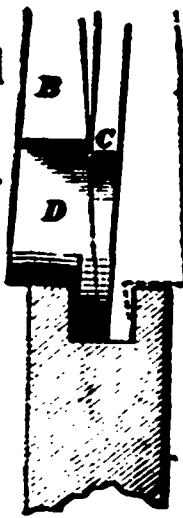
SAMUEL J. SHIMER,

(Successor to SHIMER & CO.)

MILTON, PA., U.S.



FIG. 1—A Non-Cutter.



THIS diagram represents a Bit (D) in the position it occupies when making a cut the Bit (C) which follows to complete the work is given in outline. This explains the division of cut and the free and easy working of the Tool. The Bits are arranged in upper and lower series, and secured to a Head having seats alternately inclined for the purpose of giving the side clearance to their cutting points. This

explains why these Bits hold their shape and turn

out standard work until used up; the entire circle of Bit being Top cutting edge—see Figs. 1 and 2. The Head carries its weight low down and in line of cut, and runs like a Top.

SELLING AGENT,

FIELD-CUTTER NAGLEY USED BY A. R. Williams, - - - Toronto

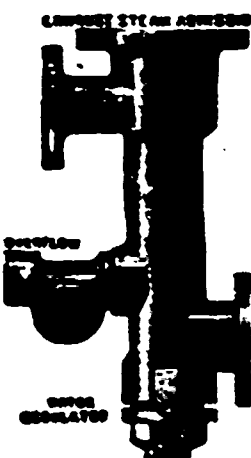


GROOVE HEAD.

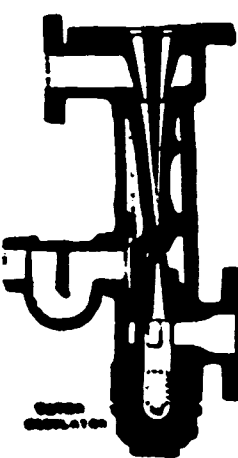
U.S. PATENTS
Passed Jan. 19, 1905.
Renewed Oct. 17, 1905.
Renewed July 16, 1905.

The PATENT EXHAUST STEAM INJECTOR,

WORKED BY EXHAUST STEAM ONLY.



The most economical boiler feeder in existence and at the same time the simplest and most durable. Replaces both pumps and feed-water heaters, and by condensing the exhaust steam, recovers the heat pressure, and consequently increases the power of the engine; utilizes a power heretofore thrown away; cracks automatically at a steam pressure of less than half a pound. The exhaust steam, in passing through the Injector, heats the feed-water to a temperature of 150 degrees, F., thus effecting a saving over any other Injector of from 15 to 25 per cent. in fuel.



FOR FURTHER PARTICULARS, APPLY TO

WILLSON & GATES,

HAMILTON, ONT.,

Sole Licensees for the Dominion of Canada.

THE DETROIT SAW WORKS

— MANUFACTURERS OF —



CIRCULAR, GANG, HULAY, DRAG AND CROSS-CUT SAWS, Milling and Planing Knives, Beach Road Saws, Sundry Wheels and General Mill Supplies.

We guarantee to make a better Saw for the same price than any Saw manufacturer in the country. It will pay you to send for our catalogue and prices. 68, 69, 70 & 72 Fort St. East, DETROIT, MICH

FAVORITE MILL BUCKETS



Manufacturer and Dealer

JOHN RADIGAN,

68 Mary Street,

HAMILTON, ONT.

SEND FOR PRICES.