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THE DOMINION MECHANICAL & MILLING NEWS

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[FOR THE MECHANICAL AND MILLING NEWS.]

HINTS ON PURCHASING MACHINERY.

BY "MACHINIST."

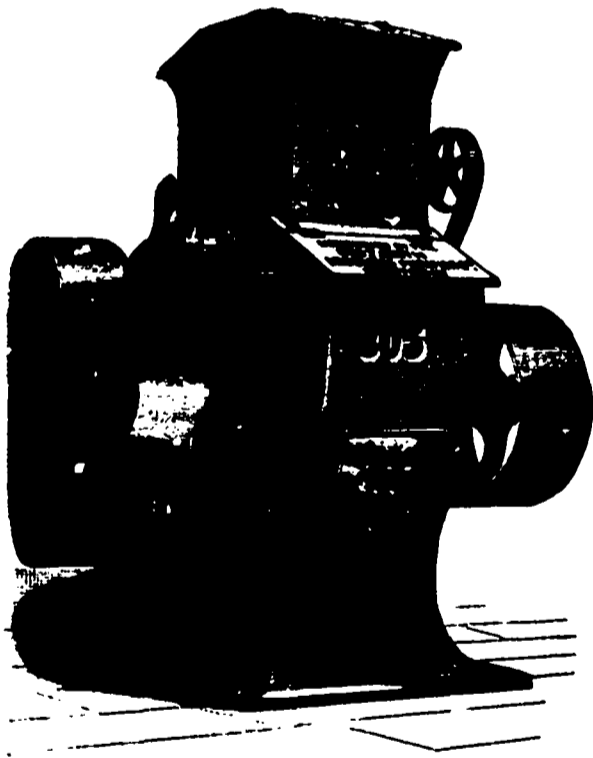
HOW often we see a person set out to accomplish a certain undertaking, and end up with something quite different from what they had at first in view. In the purchase of machinery, this is frequently the case. One man will say: "I am going to put in a new engine to drive my stave mill—present one is not large enough, or costs too much to keep in repairs." He determines in his mind to "look around" and "pick up" an old slide valve of larger size than present one, having heard of some dealer in such truck who sold his neighbour one "just as good as new," for his old one and two or three hundred dollars. Well, he does look around—goes to see one or two dealers, is offered a fair second-hand engine of the "Corliss" pattern, for, as the dealer assures him, about one half its cost, and, of course, the old engine thrown in. Well, he will let the dealer know in a few days; wants to see if he has room, &c., &c.; but, in reality, wants to get time to correspond with the maker or probably see him to ascertain what such an engine is worth new, and is surprised to find he can get a new engine of the very latest style for a few dollars more than the dealer asks. The result is, that after trying to beat the dealer down in his price and not succeeding to the extent he anticipates, he gets in a hurry, as the old one in his factory has probably failed in the meantime, and orders a brand new outfit from the manufacturer. Now, we do not say he has done an unwise thing by any means, but the chances are that he is no better off, and has spent more money than he would if he had adhered to his first intentions, as economy of fuel in his case was not an object, but simply power.

Or again, friend "Dusty," finding his stone mill with all his skill at stone dressing, fails to satisfy his customers. His neighbour, Mr Tape, having built a roller mill and hired a man to run it, now gets all "Dusty's" old customers. Well, "Dusty" made money once in the old mill, and some of it is out on mortgages on farms in the vicinity; so "Dusty" wakes up and determines that he will have one of the best "rolling" mills that wealth can buy. He writes to Slap, Bang & Co., Sweat & Bust, and in fact, all the people he knows of that ever built or are going to build mills of that kind. The result is, that he gets so bewildered by Puffer, of Slap, Bang & Co., and his percentages of middlings, low grade, high patent, &c., &c., to say nothing of Snorter, of Sweat & Bust, with his granulation and semolina, his patents, and royalties, that he don't know whether it is a mill or a washing machine he wants. After a while along comes Nipper, of Snap & Ketchum, sizes him up, takes him to one of his firm's mills, pays all expenses with may be a little liquid refreshment occasionally, and finally succeeds in getting "Dusty's" name to an order for about enough machinery to fit out a poor 25 barrel mill, and money enough to build a good 75 barrel mill, if properly laid out. In this case, the result is not as harmless as it was in "Stave Cutter's," for every day the wonderful mill runs, the pile of shorts—"too good too sell; too poor for flour"—increases, till "Dusty" finally awakens to the mournful fact that short system and short piles go hand in hand, and that instead of having one of the best "rolling" mills, he has only the nucleus around and upon which to patch roll after roll, and reel after reel. I need hardly add the moral: first decide what you will need, then go straight ahead, and rather trust to a first-class established firm of well known reputation in the line of goods you wish to purchase, than listen to the blandishments of those who are only interested in getting their commission on what goods they sell.

ANOTHER ATTACK UPON THE MILLSTONE.

THE accompanying illustration represents a new three roll for chopping corn, screenings and feed of all descriptions, which possesses so many advantages over the old millstone, that there is little doubt about the stone being retired from the field for chop purposes, as surely as it has already been for grinding wheat. Its enormous capacity, economy of power and space, and the simple drive, make it particularly desirable for new mills, and it is rapidly replacing the old chop stone in mills already completed.

It has a solid iron frame with perfect devices for adjusting and spreading the rolls, which are of best chilled iron of Ansonia manufacture. It can be driven from the roller line with a single open belt, and is furnished complete ready to put on driving belt. It requires very little attention, and can be run empty without injury. It makes two reductions, and will grind 75 bushels of screenings, or oats and peas, or barley, per hour, in an even granular manner, with less than one half the power required by the buhrs and no stopping to dress mill stones.



The mill is sold on 30 days trial if desired. For further particulars address The Geo. T. Smith Middlings Purifier Co., Stratford, Ont.

THE MOTIVE-POWER OF THE FUTURE.

IT is a recognized fact says *Power and Steam*, that the steam engine makes use of only a small fraction of the amount of fuel that is burned to run it. The nature of the machine is such that this fact is a necessary one. The fault does not lie in the workmanship, for the actual loss of power from imperfections in this respect is found (by the indicator) to be about twelve or fifteen per cent. The cause of the low efficiency lies too deep to be overcome by any mechanical device, and it has often been remarked that the motor of the future must work on an entirely different principle.

Mr. Edison has invented a motor which transforms heat into mechanical energy without the intervention of either boilers, pistons or cylinders, and he is very hopeful of improving it so that it may become of practical use. We have examined drawings of it, however, and have become skeptical. The motor is electrical in nature, and in order to make it run it is necessary to heat and cool a

piece of iron rapidly. We doubt if this can be satisfactorily done.

The hot air engine is very inviting, but men like Ericsson and Siemens, after years of thought, have not brought it into successful competition with steam, although they were well acquainted with the theory of its action, and were vastly better prepared to make experiments than the fathers of the steam engine were.

The windmill is too uncertain in its action to compete with steam, though the fact that it consumes nothing must become a very weighty consideration in its favor when our coal supply gives out.

The tide mill has never been very widely adopted, and hardly any one thinks of it seriously as a rival of steam; but it is nevertheless possible to construct one that can produce power enough to supply the entire United States. A reservoir forty miles square, at or near the head of the Bay of Fundy, where the tides are very great, would contain sufficient water to generate 700,000 horse-power for twelve hours; and this might be distributed electrically and sold in every state in the Union. When coal has become scarce the construction of such reservoirs may be attempted, so that the power and light and perhaps heat also, generated in Nova Scotia, may be sold all over the continent.

Power obtained in this way would not come from nothing. If a tide plant like that we have suggested is ever constructed, it will lengthen the time of day. It will slow down the earth's rotation just as certainly as a big gear wheel would, if placed on the earth's axis and made to drive machinery; though the defect would be so slight, owing to the immense size of the earth, that the increase in the length of day would not be measurable for thousands of years.

The gas engine has proved itself very convenient in many places, and oil and powder engines are also in use; but all of these use fuel, so that, equally with the steam engine, they fail to solve the great problem that must face the world sooner or later, when the coal is gone. The engine of the future must draw its energy from some of the forces of Nature, and it seems that it must be operated by winds, waves or tides, or by rivers, ocean currents or the direct rays of the sun.

THE United States Government might very profitably devote some of the attention it is bestowing upon the construction of modern war ships, to the improvement of its merchant fleet, upon which its trade with foreign countries so much depends. We, as Canadians, are much better off than our neighbors in this respect, as the following extract from the *Northwestern Miller* will show: "If the flour trade of China and Japan is to be controlled by American millers, there must be a reduction in rates and in transportation facilities across the Pacific ocean. According to a recent report of our consul to Japan, flour can be shipped from New York to Liverpool and thence via the Suez canal to Japanese ports at less cost in freights than from our Pacific ports direct to Japan. This is not as it should be, and if we had a government which was able to distinguish the difference between a ship and a washtub, we might have a mercantile navy which would do something for our merchants and manufacturers. The Canadian Pacific railway has already established a fine steamship line from its western terminus to China and Japan, and Manitoba millers are already in direct competition with those of Oregon and California for this trade. The matter is one which might very properly be taken up by the special committee appointed at the St. Louis convention to work on the Brazilian question." The American Government will require very prompt action indeed in order to prevent Manitoba millers from getting a firm grip on the Chinese flour market. As our contemporary says, our Northwest millers are now in direct communication with China and Japan, and this fact, together with the superiority of their flour, should place them in a position to develop a large and profitable trade, and hold their own against all comers.

Steam Department.

WATER TUBES vs. FIRE TUBES.

By GEO. C. ROSE

THE ordinary tubular boiler is of the fire tube class, so called because the fire or products of combustion pass through the tubes which are surrounded by the water to be heated.

When this arrangement is reversed, and the water is put inside the tube and the fire acts on the outside, the boiler belongs to the water tube class. It is a matter of dispute which of these kinds makes the best boiler.

Under certain circumstances, as to quality of water used, kind of fuel to be had, and pressure of steam to be carried, each is claimed to be better than the other. Change the fuel, or the water, or the pressure and quantity of steam required, and the boiler should be changed also, to get best results.

The ordinary horizontal tubular boiler needs but little description; it is well known. One of the most successful water tube boilers is the Babcock & Wilcox boiler.

It consists of a number of water tubes with a cylindrical shell above them, which is about half filled with water and forms a steam drum.

The water tubes are not level, but all slope the same way, the high end being to the front or above the furnace.

Suitable connection is made between the tubes and the shell above, and with a drum at the back end, so that circulation of the water may take place. If water tubes are placed level, there is danger of steam forming in the middle and by its expansive force driving the water out at both ends. With the tubes placed sloping, there is danger of steam forming in the low end and driving the water out at the high end. This caused the failure of many of the early forms of water tube boilers.

In the arrangement now adopted, there is good provision made both for the ascent of the steam and highly heated water, and for a return current to the drum connected at the low end of the tubes. In this way the water flows in at the low end as fast as it is forced out at the high end, and consequently the tubes are kept always full of water.

The boiler is similar in many respects to the Root boiler and several others. The furnace has brick sides, and the brick setting for the boiler is higher and more expensive than for an ordinary horizontal fire tube boiler.

The furnace and bridge walls and baffle plates are so arranged that the flame and products of combustion pass up across and between the tubes, and then down and in some cases up again before reaching the flue leading to the chimney. The heat is also allowed to play upon the under side of the upper shell. This arrangement of heating surface is very good, as the current of water inside the tubes moves in the opposite direction to the current of hot gases and flame on the outside.

There is a hand hole at each end of each tube so that facilities are provided for cleaning out.

The difficulties in the use of these boilers are chiefly caused by deposit forming in the inside of the tubes, and by soot, ashes, etc., gathering on the outside.

But the same amount of labour as has to be expended in cleaning an ordinary tubular boiler would keep one of this class in proper condition.

It is probably a more expensive boiler if first cost alone be taken into account; but the first cost of a boiler is a small item compared with a year's fuel; and the additional outlay of a few dollars per horse-power should not be allowed to outweigh increased safety and greater economy.

A water tube boiler with a cylindrical shell above and another below, has many advantages from a manufacturer's point of view. Being made up in sections, it can be conveniently altered as to size, by increasing or diminishing the number of tubes. It is also more easily handled and shipped, and the several parts can be kept in stock and put together to suit orders received.

Other advantages are that a high pressure can be safely carried, and that liability to injury from over heating is not so great as in the ordinary tubular boiler.

From these considerations it would appear, that where much steam is required, and that of a high pressure, the water tube boiler described is preferable to the ordinary horizontal tubular boiler.

Regularity in cleaning is of very great importance in point of economy, whichever kind of boiler be used. Some have claimed that the high velocity of the water passing constantly through the tubes in water tube boilers will keep them free from deposit. This may be true so far as some kinds of deposit are concerned, but it is not true in every case.

A certain large boiler of this kind required about five cords of wood per day. It was regularly cleaned and kept in good order. A change of engineers took place. The new man was one who believed that the water tubes were self cleansing and did not need scraping out. In a few months the consumption of fuel rose to over twelve cords per day. Another change of engineers took place, and the water tubes were found to be nearly full of hard scale.

WATER IN STEAM PIPES

WE who live in a country where heating houses by steam is so common are more or less familiar with the noise and disturbance caused when water in the pipes interferes with the natural flow of the steam.

In small pipes, or rather pipes of small diameter, there may be much noise without any great danger, but when the pipes are of large diameter and the steam of high pressure, there is very great danger.

At a mill near Bradford in England, on the 25th October last, water had been allowed to accumulate in a large steam pipe connected with the boilers, through a drain cock having become choked. When the engineer in charge opened the shut off valve, the water was driven forward by the steam with such violence as to blow off the upper part of the valve, and scald the engineer so severely that he died in a few hours.

Such cases are not uncommon, and the only sure preventive for them is either to have the pipes so arranged that water cannot by any possibility accumulate, or to have means to draw the water off before admitting the steam pressure.

In September last, while the S. S. Elbe was being tested, the copper steam pipe from the boiler to the engine burst and caused the death of ten men. The pipe was about 9 1/4 inches in diameter, and the steam pressure was 150 lbs. per square inch.

A very full investigation has been made, and a number of theories, some of them very fanciful, have been advanced to explain the cause of the rupture.

One suggested that it was due to water brought over from the boilers, and that as the velocity of the steam through the pipe was suddenly stopped and again started each time the engine valve closed and opened, the water became separated into different parts and were again thrown violently at each other, and thus ruptured the pipe.

The unfortunate pipe has been cut to pieces and the various parts thoroughly tested, and the conclusion reached by those most competent to judge is, that the copper sheet of which the pipe was made had been by some means overheated during the brazing of the joint, and thus seriously injured the tenacity and ductility of the metal. One peculiarity of this case is that the identical pipe which gave way under 150 lbs. steam, had been twice tested by hydrostatic pressure, once to 300 lbs., and again to 350 lbs. per square inch.

It is possible that it then sustained an injury which hastened, if not directly caused the accident.

Other parts of the same range of pipe were burst by hydrostatic pressure during the inquiry, and were ruptured at pressures varying from 600 lbs. to 1,140 lbs. per square inch.

One lesson which might be drawn from this serious accident is that too much reliance should not be placed in the strength of a pipe or boiler merely because it did not burst under a certain hydrostatic test.

The testing by water pressure is a useful and valuable method, but it should always be accompanied with a careful examination of the behaviour of the pipe or boiler while under the strain.

PUBLICATIONS.

The first number of a new English journal, *The Constructioners' Union*, published at 171 Queen Victoria Street, London, E. C., has been received. It presents a creditable appearance, and gives promise of filling in a useful manner the field it is designed to occupy.

Our contemporary, the *Canada Lumberman*, has donned a new dress, and now presents a very handsome appearance.

The first number of the *Canadian Grocer*, printed in this city, is to hand, and is creditable in every way to the publishers. Mr. J. B. McLean, formerly one of the commercial editors of the *Mail*, is the editor. The *Grocer* starts out with a good advertising patronage, and we hope and expect to see it succeed.

It is stated that for a number of years the weather has not been so favorable for shanty work. Already a great quantity of logs are piled up.



The average weight allowed in calculating the strength of bridges is 1000 pounds per man.

Blasting paper is an Austrian invention. It is merely a kind of blotting paper, coated with an explosive mixture, cut into strips, rolled into cartridge form, and fired like gunpowder.

Brass may be colored black by repeatedly coating the cleaned metal with a moderately warm solution of nitrate of copper. Heating over a charcoal fire follows. Finally, the tone is heightened by rubbing with olive oil.

Manganese in appreciable quantity has been found by M. E. J. Mammene in thirty-four samples of wine. Tests also revealed its presence in various cereals. As it can be detected also in nearly every description of rock, the above facts go to prove the wide diffusion of this metal throughout nature.

A blackish-brown bronzing can be applied to vases, figures, busts, etc., or cast iron zinc, by the application of a solution of sulphate of copper. If the projecting portions are then well rubbed with a woolen rag, they assume a coppery red brilliancy, which increases the resemblance to genuine bronze. A solution of verdigris in vinegar also produces an effective bronzing.

A steel color on brass is developed by using a boiling solution of arsenic chloride, while a careful application of a concentrated solution of sodium sulphite causes a blue coloration. Black being generally used for optical instruments, is obtained from a solution of platinum chloride, to which tin nitrate has been added. In Japan the brass is bronzed by using a boiling solution of copper sulphate, alum and verdigris.

ARTIFICIAL PUMICE STONE.—An artificial pumice stone is now prepared by moulding and baking a mixture of white sand, feldspar and fire clay. By varying the proportions and quality of the ingredients, any desired degree of fineness may be obtained. The product is thus adapted for use in all industries where natural pumice stone has been employed, and it has superseded the latter in parts of Germany and Austria.

Paper may be stuck on wood by means of the following solution: Gum arabic, half an ounce; powdered gum tragacanth, half an ounce; water, one and a half ounces; acetic acid, twenty drops. It will cause labels to adhere very firmly without staining them, unless the paper is of unusually bad quality. A clear solution of gum arabic applied once or twice is all the varnish required in finishing for most purposes.

STAINING WOOD TO IMITATE CEDAR.—German technical papers recommend the following mixture for the staining of wood in imitation of cedar: Two hundred parts of catechu, 100 parts of caustic potash, and 10,000 parts of water, all by weight. The longer the wood remains in this solution the better the stain penetrates its fibers, and thick veneers can in this way be stained right through the whole thickness, which permits a finishing without injury to the color.

BISMUTH BRONZE.—Mr. Webster, an English metallurgist, manufactures a bismuth bronze, which is said to resist atmospheric influences, by fusing 1 part of bismuth with 25 parts of nickel, 25 parts of copper, and 50 of antimony. The resulting alloy is hard, and is said to be suitable for reflectors for lamps, axle bearings, etc. Another bismuth bronze is produced by fusing 1 part of bismuth with 16 parts of tin, then fusing 6.4 parts of the alloy thus formed with 45 parts of copper, 22.5 of zinc, and 32.5 of nickel. This alloy is claimed to be well adapted for the manufacture of screw propellers, tubes, and materials exposed to the action of sea water. On account of its tenacity, it is recommended for telegraph wires; and on account of its sonorous quality, it is said to be useful for piano forte wires.

For detecting cotton seed oil in olive oil, the following method is recommended as decisive by Prof. Bechi, of Florence: The reagent employed is a one per cent. solution of nitrate of silver in absolute alcohol. He directs the following procedure: Place 5 cubic centimeters of the suspected oil in a glass flask, add to it 25 c. c. of absolute alcohol and 5 c. c. of the best solution of nitrate of silver of the above named strength. Heat the flask, and contents in a water bath (direct heat must be avoided) to 84° C. (=183° F.) If any cotton seed oil is present, the mixture will begin to darken, the most minute quantity producing a discoloration, the intensity of which will depend upon the quantity of cotton-seed oil present. The rationale of the process appears to depend on the fact that cotton-seed oil will reduce nitrate of silver, while olive oil will not. Rape-seed oil, which is also used as an adulterant of olive oil, will likewise cause the same reduction, but pure olive oil will not be discolored. It is probable that this test may prove useful in detecting the adulteration of other oils besides olive with cotton-seed oil.

PURIFICATION OF OIL DRIPPINGS.—Drop oil is collected in many mills and factories to be cleaned and used again. A little apparatus has been constructed for this purpose, which, it is reasonable to suppose, is patented. It may be described as follows: The apparatus is a box-like concern of several "stories," the interior either lined with or consisting entirely of lead. Above it has a shoulder like a funnel, into which is poured the oil to be cleaned. The purified oil passes off through an escape pipe in the bottom. The different shelves or stories are perforated and covered to a height of about 2 inches with raw, loose cotton, through which the oil must percolate. The cotton serves as a filter and retains all kinds of contaminations. After the oil has in this manner passed through the several shelves, it is nice and clean and drops into a vessel underneath. The dirty cotton is occasionally replaced by clean. It is necessary to add that the apparatus must stand in a warm place. The cleaning of the oil with chemicals is both a tedious and a doubtful process, because even after thorough washing it may still retain traces of acids, rendering it unfit for lubricating purposes.

[FOR THE MECHANICAL AND MILLING NEWS.]

REDUCTION OF MIDDINGS.

By L. MCKINNON, ALTON, ONT.

WHAT millers understand particularly in regard to the reduction of the product called middlings, is in many cases somewhat vague. Middlings is a term that denotes a certain product, which is the inside of a grain of wheat, or in other words the flour of the wheat in a certain stage of manufacture, and composed of the finest and purest of the bran's contents. To convert it into flour is a process of vast importance to the milling public. We find various systems placed before us for this purpose—some good, some indifferent, and others useless in the extreme. Take for instance a mill that makes five or six reductions on wheat, we find middlings of all imaginable shapes and sizes—some cut quite fine, some oblong, and some very coarse, as they flow from their respective scalpers, and as indicated by the duster and scalper.

To bring stock as described above to a proper and final termination in reduction, requires one of three systems, or the two combined, viz., the entire roll system, the entire buhr system, or a combination of both; that is, the buhr to perform the part for which it is best adapted, and the rolls to complete the operation, or vice versa, as the mode of procedure may dictate; and third, the buhr system complete.

To illustrate, a system that would, in the writer's opinion, accomplish the desired end of a final reduction, would consist of the following arrangement, beginning at the grading department:

As remarked already, the middlings are very irregular in size at this stage of the process. There are middlings at this point that are pure and fine, that will purify through a No. 7 cloth, others through No. 5, 3, 1, 00, 000, and another grade that even tails over the last number. To proceed with the purifying and reduction, we will take the No. 5 middlings, and omit the No. 7, on account of their fitness for the final reduction, excepting their purification, which is done by one repetition in purifying. After being graded and aspirated, the No. 5 middlings are reduced on smooth roll by one reduction, then dusted on a proper reel. The No. 3 middlings are given one reduction also, in connection with the No. 5. The No. 1, 00, 000, are run together through two reductions, and dusted and graded at each step; and all desirable middlings are sent to the bin for flouring, through their proper routes as designed.

Those reductions, purifications and separations, if properly done as laid down, the middlings will be in a fit condition for final reduction or flouring, as the impurities have been removed, at least so far as any methods of purification known at present. The gradual reducing of the middlings, so that the mesh of a No. 7, 6 and 5 cloth will admit them, will bring them into a practicable state for flouring, and where we will consider them ready for flouring rolls or other arrangement.

This diagram shows the reduction of the second middlings, a grade of material next in value to the first middlings, in consequence of their character being softer and more specky, but which, nevertheless, with judicious management, can be made into a flour that will in high grade milling pass off as 2nd patent. As shown by the cut, the product of No. 12 is a 2nd patent, and also the product of No. 14 on lower reel. The tail end of the top reel is clothed with No. 6, which produces tailings for tailings roll and No. 3 middlings.

This comprises the 1st and 2nd reduction on the 1st middlings stock, which produces 1st and 2nd patent, and the materials that are to be handled further on, and not illustrated or described at present.

A few remarks in regard to the handling of the arrangement may be of some service, particularly to millers of limited experience, and those just rising in the milling sphere. Experience has taught that attempt to crowd a roll is defeating any progress the operator may suppose he is making, inasmuch as a roll over fed will fail to act as a reduction medium; and if a roll is run with overdue pressure, it will fail also, as the excessive pressure presses the material into a state of fluffy and flat stock, which, if not disintegrated, cannot be subject to its succeeding separation. Therefore, to avoid any trouble in any of the departments of the gradual reduction mill, we must begin in the proper place and in the proper way. As this point is one out of a number of the starting places, the writer would recommend the reduction of the middlings to be done with as little pressure as is consistent with the successful running of the system. Of course, the differential has to be considered as a disintegrator, and can be used to advantage when properly adjusted.

There are many millers throughout the provinces who still adhere to the time-honoured millstone—who think there is still a place for it in the mill. There is no doubt as to its utility as a rapid reducing implement nor yet as to its impoverishing action on the flour thus made. For those who are favourable to the buhr for the reduction of middlings, the writer will give a scheme for its use. The following will show it.

granular texture, and at the same time a good colour. On the contrary, by the opposite method the flour will be deficient in colour, granulation and purity. Therefore to use the millstone to advantage, to make it an article of utility, requires judgment, skill and practice, judiciously applied. When these requirements are met the barbarous action of a rough or cracked face, etc., will be considerably lessened, and the buhr considered a tolerably efficient method for the purpose. Equality of face and furrow, according to the writer's experience, would be attained with one and a half inch face and furrow alternately, and a motion of from 1200 to 1400 feet of circumference per minute. For the dressing of its product two flouring reels are clothed with No. 12, 6 and 14, top and bottom respectively. The product of 12 and 14 is a patent flour, and product of No. 6 and tail of 14, is 2nd middlings, and tail of No. 6 is stock for the tailings roll.

The middlings produced by the first reduction are called 2nd middlings, and require a more tender treatment, in order that a flour of fair quality may be obtained. To accomplish this, smooth rolls are used, succeeded by two flouring reels, clothed with Nos. 12, 5 and 14. The product of Nos. 12 and 14 is patent flour, and that of No. 5 and the tail of No. 4, 3rd middlings, while the tail of No. 5 goes to tailings roll.

Another arrangement can be designed whereby the entire millstone system can be placed for the first two reductions. But in that case the perfection of the buhr must be observed, and the clothing of the reels. That is smooth surface reduction and bolting of the best, and so adjusted that the automatism of the process will be one continual and regular flow of the various material produced to and from the system. Where combination mills are running, and deficient in reduction rolls, this plan will make a marked improvement as the low grinding is dispensed with, being practical when only one reduction is made.

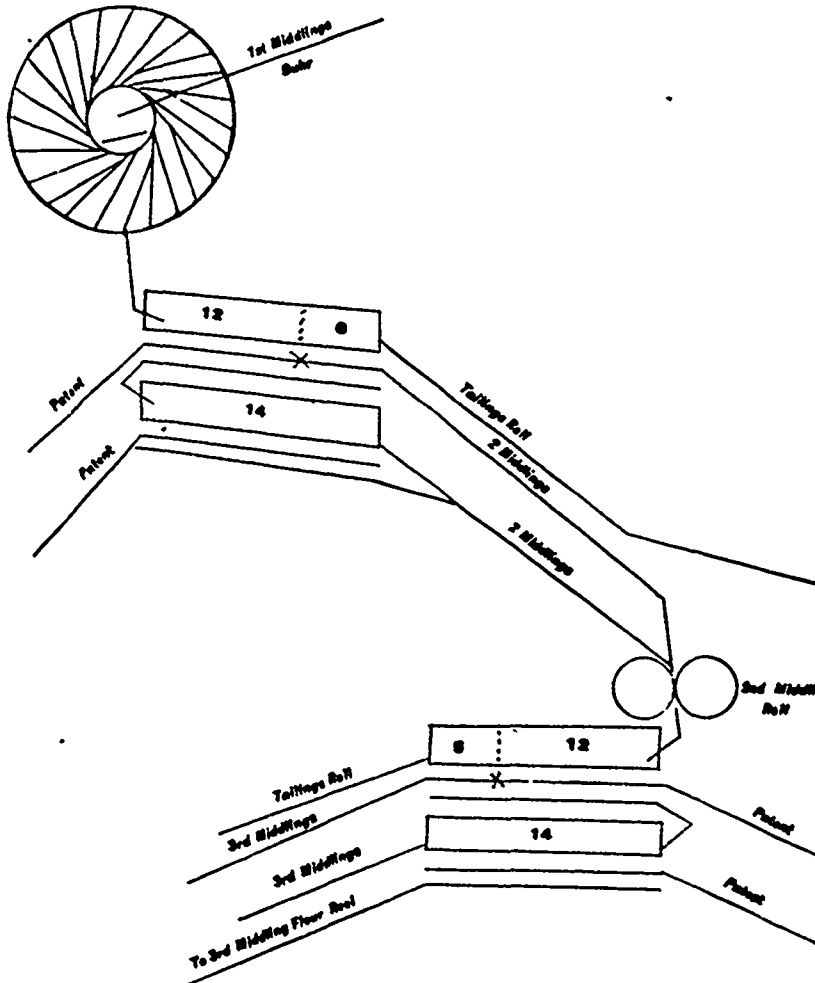
In the writer's opinion, this idea can be made to work quite successfully in some localities, that is, where roller mill competition is limited, and high standard milling not as yet in the field.

HOW IT IS DONE

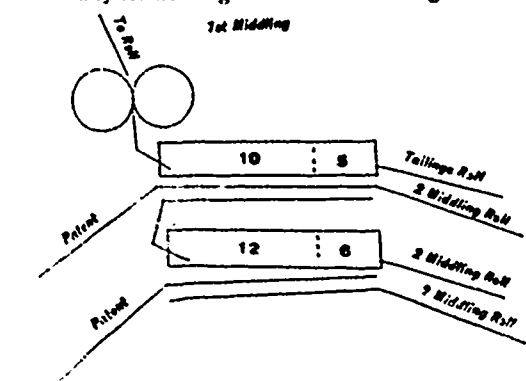
James Francis, in a recent communication to the Boston Manufacturers' Gazette, says: "I chanced to be in a wood shop not long since, and noticed in particular the frantic efforts made by a planer hand to force a 16-foot 2-inch plank through a pony planer which was designed for planing thin, light panels and cigar box stock. After one end of the plank had passed under the pressure bar, the workman (?) dropped the other end of the plank. The leverage was so great that the planer tipped up on one edge of the base, the front part leaving the floor nearly an inch. A deep cut in the plank told where the cutters were when the pressure bar and feed rolls were sprung upwards by dropping the plank. The feed belt had become so loose that the binder would not strain it sufficiently tight to prevent its slipping. The planer man did not think best to shut down and take out a piece of the feed belt; instead of that he turned the feed pulley with his hands, starting it every time it stopped, and slowly worrying

the plank through the machine. A big pile of shavings lay in front of the planer, and on this pile were half a dozen planks he had already planed. The farther ends of these planks were higher than the top of the planer. Instead of removing the planks, this man kept puzzling at the feed belt. The end of the plank glided up on the finished planks, thereby tipping up the planer again. In fact the planer came down with a jar, after the plank had got out enough to spring up the front feed roll's. That the planer was not broken by this usage was a good recommendation for its maker."

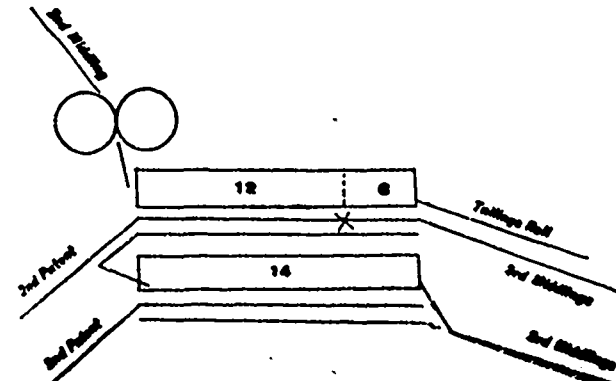
It is reported that one of the heaviest lumber operators on the upper St John River, N. B., is in serious trouble with the American customs' authorities for making alleged false entries at the customs' office, Fort Kent.



This diagram illustrates the most applicable system of using the stone in a gradual reduction mill, and if handled to good advantage, will be a reasonably good plan in combination with smooth rolls. But in its operation, the operative will require to handle it to a nicety, on account of its grinding tendency. The following suggestions will require particular attention, viz., the quality and texture; the fitting of the driving irons and mode of transmission; the balancing of the runner and leveling of bedstone; the smoothness of the face and furrow, which are slightly inclined from the eye; and lastly the reduction of the middlings. The latter need constant attention, as the quality of the flour thus made can be either improved or impaired. Running slowly, with the runner running high, the product will have a lively and



The above diagram illustrates the first reduction on rolls, and the dressing of their product, according to the latest ideas. The top reel has No. 10 for a flour cloth, and No. 5 for a tail sheet. Its products flow four directions—the flour to patent, tailings to tailings roll, No. 5 product to 2nd middlings roll, and cut-off to lower reel. The second reel is silked with 14 and 6, the 6 being the tail cloth, and 14 the flour cloth. The product of No. 14 is patent flour; the tail product of No. 6 is 2nd middlings stock, and its product, along with the cut-off, of No. 12 also.





A. Shepherd & Son, grist mill, Petrolia, have sold out. The village of Coldwater, Ont., wants a roller flour mill. Fire has destroyed Spence's flour mill at Dominion City, Man. Beaumont's mill dam is a fine new structure at Glen Williams. The J. F. Carter mill, Rathurst, N. B., has been burned down. Minnesota and Dakota have a total wheat crop of 80,000,000 bushels.

Mr. J. G. Beatty, miller, of Streetsville, Ont., has made an assignment.

Mr. Jermy's new mill at Minnedosa, Man., is about to begin operations.

It is expected that Rapid City, Man., will shortly possess an oatmeal mill.

Buffalo and New York are now providing an exit for wheat from the Northwest.

Fifty tons of Manitoba flour is being shipped for China from Vancouver, per steamer Parthia.

The Assiniboia roller flour mills are looked upon as a great boon by the farmers of that locality.

Mr. Cochoe, of Norwich, Ont., has purchased the grist mill at Rockton. It is now in active operation.

The milling firm of Koister, Craig & Co., at Virden, Man., has been changed to the Virden Milling Company.

The smoke-stack of the grist mill at Whiterose, Ont., was blown down and broken to pieces during a recent storm.

Mr. Jas. Goldie, of Guelph, recently received a carload of Manitoba wheat weighing 60 lbs to the bushel.

Mr. Joseph Davidson is said to be doing a good trade with the mill which he recently purchased at Wilkesport, Ont.

The new mill at Minnedosa, Man., is nearly finished. It will, when completed, be one of the best in the province.

The Montreal grain market is described as being "active," owing to the urgency of supplying cargoes to the last vessels.

Nine cents a bushel is the rate on grain from Port Arthur to Montreal, and points in Quebec and Ontario west of Montreal.

Messrs. Woods & Green have completed repairs to the old Lawrie flour mills at Port Dalhousie, and started them in operation.

Messrs. McCaul, McNicol, & Reilly's mill, Regina, N. W. T., has had large additions made to it, and is now in full swing.

Messrs. Shepherd & Sons have sold their flouring mill at Petrolia to Messrs. Bickell & May, of Essex Centre, who have taken charge.

Mr. S. V. Wilson's mill at Union, Ont., was burned last month. It was insured for \$5,000. The amount of loss has not been learned.

In the Northwest, wheat is coming in fast, and buyers are on the look out for No. 1 hard. Fifty cents is the highest price obtainable.

McBean Bros., of Winnipeg, have purchased the farmers' elevator at Manitou, Man., and have commenced to buy grain there.

An American mill furnishing company are erecting a new building, and are using blocks from discarded French buhrs as a foundation.

The Lynden, Ont., roller mills are again busily engaged. They were closed a short time recently for the purpose of putting in a new separator.

The flouring and saw mills of Mr. Thompson, at Bayfield, Ont., have been totally destroyed. The loss is heavy. They are not likely to be rebuilt.

Mr. N. Boswell, not being able to secure a sufficient quantity of the right kind of oats, has closed down his oatmeal mill at Wyoming, Ont.

A committee of citizens of Sebringville, Ont., has been appointed for the purpose of trying to secure for that place a roller process flouring mill.

A portion of the upper storey of the Keewatin flouring mill was taken down and rebuilt last month, having been found to be slightly out of plumb.

The lumber has been purchased in Winnipeg by Mr. A. Waddell for an elevator at Dominion City. The bonus has been raised and the necessary papers signed.

A western Ontario flour barrel manufacturer made 35,000 barrels for Messrs. Campbell, Stevens & Co. the Chatham millers, during the months of September and October.

Mr. Mitchell, of the Keewatin flour mill, is in the field as a buyer of Northwest grain, and some of the other buyers complain that the C. P. R. Company discriminates in his favor.

Mr. Alex. Waddell, has asked the municipality of Dominion City in the Northwest for the modest sum of \$500, as an inducement for him to build a 25,000 bushel elevator at that point.

An extensive addition will soon be made to the milling facilities of Galt. The machinery for a large roller flour mill of modern construction is about to be placed in the old Dumfries mill.

Natural gas has been discovered at Courtright, Ont., and preparations are under way for piping it to Mackenzie's mill, the proprietor of which hopes by using it to effect a saving in his fuel bill.

A Kingston despatch states that fifteen hundred tons of magnesian sandstone have been shipped from Portland by the Rideau canal to Vermont for the purpose, it is said, of being ground and used in adulterating flour. Soapstone is used for the same purpose, and an attempt will be made to use magnesian sandstone also. Some people are bound to make a profit on flour, no matter how low down the price goes.

John Harvey succeeds Harvey & McClure, millers, at Acton, Ont.

Mr. J. S. Barker, formerly of this city, has leased the Glenelg mills at Alveston, and intends running both a custom and merchant trade. The mill is equipped with the best roller plant.

Manitoba wheat will be shipped in bond in large quantities to England via the Northern Pacific railway and Duluth. Arrangements are being made at W. Segun for the reception of this grain.

Robson Bros., successors to Sir W. P. Howland in the milling business, at Waterdown, Ont., are reported to be doing a thriving business, though their expenses have been largely increased by the failure of the water power.

It is said there will be some trouble about a railway embankment on a new switch to the St. Thomas mills. The city granted the privilege to the company and now the people along the line have petitioned the city to do away with it.

Messrs. Knoll Bros., millers, of Port Colborne, Ont., owing to the discovery of natural gas in that quarter, and the success attained by other parties, intend to sink a well for the purpose of supplying their business with natural gas fuel.

In 1885 the imports of flour into Great Britain, amounted to 15,835,192 cwt. of wheat, including 12,008,913 cwt. from the United States and Canada; and in 1886 14,793,232 cwt. including 12,243,722 cwt. from the United States and Canada.

In the United States flour bags are a source of great expense. It is estimated that there are 50,000,000 barrels of flour consumed in that country in one year, and 12,000,000 people who buy it by the barrel, and there might be a saving effected to the extent of \$2,400,000 by purchasing the flour in sacks.

The Vancouver *Vice-Advertiser* says: The local dealers complain that it is difficult to obtain shipments of Manitoba flour, as all the mills in the Prairie Provinces are running night and day to fill orders for eastern points for shipment via Port Arthur and Lake Superior before the close of navigation.

Flour, says the *Millstone*, is a great absorbent of odors. In light of this fact it would seem that the use of crude petroleum for fuel in flour mills would not be a good thing, with the boiler room near the mill and opening into it. And it is a question whether oil, at a higher price than 45 cents a barrel, saves anything compared with slack coal. Millers who are using oil say it does not.

It is said that the Province of Ontario produces more wheat to the acre than New York, Pennsylvania, Ohio, Michigan, Indiana, Illinois, Missouri, California, or Kansas; it produces more oats than New York, Pennsylvania, Ohio, Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas or Nebraska, and it produces more barley than New York, Wisconsin, Minnesota, Iowa, Nebraska or California.

Peter Jepson, of Port Chester, N. Y., has received a patent on grain drying apparatus. The drier is described as consisting of a number of funnel shaped hoppers arranged in series one above the other, the hoppers having perforated linings and imperforate casings surrounding linings, hollow hot-air columns communicating with the casings by branch pipes, and a rotatable shaft having a series of perforated disks.

Another warning to millers may be found in the dust explosion which took place last month at Council Bluffs, Ia., in the Crystal mills. The flour hopper or wacker was being swept and cleaned, after which an ordinary lantern was introduced to find out whether the work was thorough, when an explosion took place, blowing out the side of the hopper towards the centre of the mill, wrecking the heavy brick walls from the roof to the floor of the third story, blowing off the roof of the cupola, and doing damage to the extent of \$1,000.

On Nov. 17th the steam flouring and grist mill of Mr. J. G. Turner, at Elmvale, Ont., was destroyed by fire. The building was a two story frame, on a stone foundation. It is supposed the fire was caused by soot in the sheet iron stack becoming ignited and heating the chimney to such an extent that it collapsed by its own weight, setting fire to the roof of the engine house. It being about midnight, nothing was saved except the boiler. Loss on stock and building, about \$4,000; insurance \$2,000; all in the British American Insurance Co.

The *Winnipeg Free Press* says Messrs. Thomas Marks & Co. are having built for the lake trade a steel spar decked screw steamship, 250 feet long by 40 feet beam and 23 feet moulded depth. She will carry, on 14 feet draught, 2,000 tons of cargo; on 16 feet, 2,500, and to have a speed, when so loaded, of 12 miles an hour. She is being built expressly for the grain trade, and will ply between Port Arthur, Duluth and Kingston. This will be the largest Canadian freight steamer on the lake. Messrs. Vapier, Shanks and Bell are building her.

The Indianapolis, Ind., *Millstone*, writing in reference to small mills vs. large mills, says: Small mills usually have a local market. The demand is practically unvarying. The market of the large mill is the world. In the present condition of the general market there is no predicating the demand. The only thing which gives the larger mills an advantage over the mill with the local market is that the former can manufacture flour cheaper than the latter on account of having a more complete mill. If it were not for this the larger mills would be shut down a portion of the time.

The following summary of the principal cereal crops of Ontario for the current year has been issued by the Ontario Bureau of Industries. "The yield of fall wheat is 14,440,611 bushels, being 3,630,531 bushels less than last year, and 5,162,693 bushels less than the average of six years. The berry is small, but hard; and while some correspondents say it is below the standard weight, others claim that the hardness and soundness of the grain fully compensate for its lack of size. The average yield per acre is 16 bushels. Spring wheat may be set down as a general failure, for while a few good fields are reported, the common result is a small yield of inferior quality. The estimated yield is 5,633,117 bushels, against 9,518,553 last year and 9,713,879 for the average of six years.

F. W. Fowlds, of Hastings, Ont., has purchased a No. 1 centrifugal from Wm. & J. G. Greey, of Toronto.

The new roller mill built by E. P. Allis & Co., and which went into operation last month, has a capacity of 125 barrels per day. The plant consists of five double sets of rolls, 4 run of stones, 4 purifiers, 4 centrifugals, 1 six-reel scalper, 2 large bolting chests, 1 bran duster, 1 smutter, 1 separator, 1 wheat scourer, a 75-horse power condensing engine, manufactured by the Waterous Engine Co., Brantford, Ont. The engine and boiler rooms are fitted up with all the latest improvements in pumps, heaters, etc. The coal shed has a capacity of 50 tons. On the east side of the mill is a large warehouse, 28 by 40 feet, and elevator with a capacity of 10,000 bushels. The main building is 36 by 40 feet, and 4 stories in height.

The *Winnipeg Commercial* says: A close scrutiny of the advertisements of trade and other papers published in Canada shows that over fifty mills east of this province have for over a year been advertising their products as made from "pure," "choice," or "selected" Manitoba hard wheat. In fact it is now almost impossible throughout the east to sell a fine grade of flour without advertising it as made from the hard wheats of this province. The mystery is where these mills got all the hard wheat from. To keep them all running about two-thirds of their capacity, would require somewhere in the neighborhood of twenty millions of bushels. Even with our big crop this year we cannot supply that demand, but we expect to be able in a year or two. About four eastern milling firms have heretofore used about three-fourths of our export wheat, but that day is past, and others can now get a fair chance to give it a trial.

A few facts are given below in reference to the exportation of grain and flour from Montreal. It is interesting to note that the total exports of grain to Oct. 31 were 10,203,376 bus. against 12,595,739 bus. last year. The figures show a heavy shortage in corn and oats, and a large increase in wheat. The total exports to Europe of flour to date were 562,883 sacks, against 443,870 sacks in 1886, which indicates an important increase in our export flour trade. In 1887 the gain in the exports of wheat was 1,732,720 bus. over the same period last year. In 1887 of the wheat exported 2,530,493 bus. were for Liverpool, 1,663,961 bus. were for Glasgow, 1,415,319 bus. for London, 691,805 bus. for Bristol, 260,106 bus. for Antwerp, 33,431 bus. for Havre, 40,049 bus. for Leith, 116,201 bus. for Dublin, and 40,345 bus. for Aberdeen. In 1887 of the wheat exported 97,756 sacks were for Liverpool, 242,680 sacks for Glasgow 190,852 sacks for London, 17,163 sacks for Bristol, 4,882 sacks for Antwerp, 1,400 sacks for Newcastle, 2,150 sacks for Aberdeen, and 6,000 sacks for Dundee.

While the idea may be a chimerical one, says the *Northwestern Miller*, we cannot avoid expressing the wish that the selection of seed wheat, at least in America, should be regulated by law. If the government of Canada should compel the use of Scotch fife seed in Manitoba, the farmers and millers of that province would be greatly and permanently benefited. In the United States it would seem to be almost as feasible to regulate this matter of seed wheat as to regulate grades, inspection and storage, by law. It should be as much of a crime in the eyes of the law for a man to offer smutty wheat on the market as it is to offer a glandered horse for sale. It is a fact that there is a certain belt of country where in only soft and inferior varieties of spring wheat can be raised but some of these wheats are far superior to others, and so long as there is no law, written or unwritten, which prevents the use of the inferior varieties for seed, these varieties will be sown to an extent which will cause considerable as well as needless damage to the wheat growing and consuming interest. The same is true of winter wheat. The men who first bring up this matter in legislative halls will have the earnest support of millers and all reputable grain handlers, and should be backed by the honest farmers of the country.

Another writer has turned up to frighten the Yankees and Canucks with dire visions of ruinous competition in South America. This writer, distinctly sensational and alarmist, recently secured the publication, in a prominent monthly magazine devoted to chestnut literature and statistics, of an article designed to send a myriad myriads of azure chills up and down the Yankee and Canuck spinal columns. Plunging into a sea of figures and an ocean of imagination, he shows, to his own satisfaction at least, how the growth of grain and meat in South America and the increase in population in the Argentine Republic are going to bankrupt the United States, wipe out Canada and gorge all Europe with cheap grain and meat. The picture is old, very old. It is by the "old masters" of misrepresentation and commercial sensational fiction. It will not frighten the inhabitants of Canada or the United States. Wheat-growing and meat-growing will continue in these countries, notwithstanding the utmost possible and probable development of South America. The Argentine Republic is at present engaged principally in borrowing money and piling up a mountain of debt to be paid in the near future. That country is swiftly nearing a collapse that will set it back a good deal and postpone the destruction of the United States and Canada.—*Milling World*.

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.



PUBLISHED MONTHLY.

BY

CHAS. H. MORTIMER,

Office, 31 King Street West,

TORONTO, - - ONTARIO.

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

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

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

The price of subscription may be remitted by currency, in registered letter, or by postal order payable to C. H. Mortimer. Money sent in unregistered letters must be at sender's risk. The sending of the paper may be considered as evidence that we received the money.

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

Subscribers may have the mailing address changed as often as desirable. When ordering change, always give the old as well as the new address. Failure upon the part of subscribers to receive their papers promptly and regularly should be notified at once to this office.

EDITOR'S ANNOUNCEMENTS.

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

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

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

THE country literary societies are grappling with the Commercial Union question.

MR. JAMES JONES, the well known mill-furnisher of Thorold, Ont., has taken his son into partnership. The new firm will do business under the name and style of James Jones & Son. Their new advertisement, which appears in this paper, will prove interesting to millers.

AN inspector of the Ontario Government has been visiting the scenes of forest fires, and enquiring into the losses of residents in such districts. It is understood the Government propose to grant relief to persons who suffered heavy loss by reason of these fires.

THOSE Western Ontario millers who decided so hastily that Commercial Union would be a good thing for Canadian millers, have apparently found three months too short a time in which to formulate a good and satisfactory reason for their action and belief.

THE news that a large manufacturing company in Hamilton, Ont., will shortly adopt petroleum for fuel, leads us to point out, that while petroleum may prove to be cheaper than coal, it is also more dangerous, and much care should be exercised by those who have the handling of it.

AN American expert mechanic is at present making an examination of the pumping engines of the Toronto water works department, with a view of having them put in first-class condition. It is proposed to spend something like \$200,000 next year in increasing the pumping capacity, and placing the city beyond the possibility of a water famine by the breaking down of one or two of the pumping engines.

ALREADY forecasts are being made concerning the wheat crop of 1888. The dry season is said to have rendered the condition of the ground unfavorable for the growth of winter wheat, and a comparatively light crop is consequently expected. Crop prophets, like

weather prophets, however, are noted for getting "out" in their calculations. Let us hope that it may be so in the present instance.

SOME time ago our Northwest correspondent pointed out the disadvantages under which grain buyers in the Northwest were placed owing to the high standards for grain at Manitoba points compared with the standards at Duluth, in consequence of prices being regulated from Duluth. The matter has occasioned much dissatisfaction among Northwest buyers, who have appointed a delegation and arranged to interview Mr. Van Horne on his return from the Pacific coast, with a view to having the standards of wheat reduced to correspond with those in force at Duluth.

Judging from the tone of the industrial press, the profit-sharing experiment entered into by some manufacturers in the United States with their employees, has not resulted as satisfactorily as could be wished; but the hope is expressed that when the idea becomes better understood, it will succeed. Meanwhile the concerns which have adopted the system have received a vast amount of gratuitous advertising. We hope they are more deserving of it than a certain large dry goods concern in this city, which keeps its employees at the verge of starvation all the year, and then gets a free puff in the newspapers, and the reputation for generosity from an unsuspecting public, by distributing a thousand dollars or so among several hundred employees at New Years.

THE St. Catharines Journal performs a commendable service in drawing the attention of the authorities and the public to the practice of overloading freight-carrying vessels. Our contemporary says: "We have on more than one occasion heard masters boast of the heavy cargoes carried, and it is a well known fact that since the enlargement of the Welland canal many of the old vessels that formerly carried 18,000 to 20,000 bushels have been loaded from 32,000 to 35,000 bushels. Vessels thus loaded may float in smooth water; but the moment seas are shipped foundering follows. There being a loadline of perfect safety, it should be in sight at all times, just the same as the capacity of a freight car is marked, to be seen and known by all interested." Shippers would do well to look into this matter, with a view to securing the safety of their property.

THE effort to harness the mighty Niagara, and cause its immense water power to subserve the use of man, has been laughed at by many, but nevertheless we expect to see the undertaking accomplished. During the past month the Niagara Falls Hydraulic Power and Motor Co., has filed articles of incorporation with the Secretary of State of Illinois, its objects being to convert Niagara Falls into power to run dynamos for electric light and power for manufacturing purposes at a distance of 1,000 miles or more. The incorporators are M. Morgner, E. C. Phillips, and E. B. Morgner. The capital stock of the Company is placed at \$15,000,000, and its headquarters are to be in Chicago. The time seems to be approaching when manufacturers, instead of maintaining steam plants of their own, will be supplied with power by electricity from a central power station, perhaps many miles distant, and at much less expense than under present arrangements.

NEGOTIATIONS are said to be pending with the object of transferring control of the Northern and Northwestern railway system to the hands of the Grand Trunk managers. A few years ago the farmers and people in Ontario towns and cities, went deep down into their pockets and handed over vast sums of money to assist the projectors of the various local lines of railway to carry out their enterprises. In return for the large bonuses granted, the people were promised that the new roads would remain under independent management, and act as competitors to the trunk lines, thereby keeping down rates to a fair figure. Instead of this however, these local roads have one after another surrendered their independence, and placed themselves under control of either the Grand Trunk or Canadian Pacific railway authorities, who are thus enabled, to a very large extent, to fix rates at whatever figures they may choose. The Northern and Northwestern railway is about the last of the local roads to throw up its independence. Under present circumstances, Canadians may well feel grateful for the great natural and artificial water ways of which this country is the possessor. Our merchant fleet will always be a formidable competitor to the railways for the carrying trade of the country, and will prove a most effectual check to the avarice of greedy railway corporations.

A MILLER not a hundred miles from Hamilton, Ont., said to a representative of the MECHANICAL AND MILLING NEWS the other day that none of the milling journals devoted much attention to stone milling, and therefore, were no use to him as a miller operating a stone mill. He then proceeded to argue to his own satisfaction that stone-made flour was superior from a health-giving point of view, to that made by the new process. We have met both these statements before, and simply desire to say that so far as this journal is concerned we shall be pleased to make room for any correspondence or information on the subject of stone milling, or the relative merits of stone versus roller process flour as an article of diet. If our friends of the mill stone want to hear something on that subject, let them contribute some information from their own experience, and in return they will receive the ideas of others. There are, and always will be, a considerable number of stone mills throughout Canada, and we shall endeavor in future to publish articles from time to time bearing upon the handling of such mills. The subject of the relative merits of stone process versus roller process flour is one upon which we invite discussion.

THE farming community through their representatives in the Dominion Parliament, are said to be urging the Government to alter the regulation governing the importation of American wheat for grinding in bond. It is urged that the flour made from this wheat, instead of being exported as the customs regulation provides, be sold in Canada, in competition with flour made from Canadian wheat, and to the detriment of Canadian wheat producers. What foundation exists for this complaint, we are unable to say, but it does seem to us a trifle inconsistent on the part of the farmers to be crying out for protection against the comparatively small importations of American wheat under the present tariff, while at the same time joining hands with the Commercial Unionists to remove all protective barriers. If they cry out because of American competition, hampered as it is at present, how can they hope to face a competition ten times more formidable when the customs line shall have been swept away? The millers will oppose any alteration in the direction of placing them at a still further disadvantage. The tariff as it exists is certainly in favor of the farmer as against the miller, and the Government should be slow to make any changes which will tend to further cripple an industry which is already laboring under great disadvantages.

CANADIAN manufacturers will be interested in a new kind of fuel, which has just been introduced into the United States, and which is thus described by our Chicago contemporary the American Engineer: "A company has been incorporated in Hyde Park, near Chicago, known as the Hyde Park Light and Fuel Company. This company promises, by means of a new system, to supply gas for illuminating and heating purposes at 50 cents per thousand feet, and propose, if the consumption warrants it, to reduce the price to 35 cents per thousand feet. The new system to be used is called the Fahnehjelm system, named after its inventor, Otto B. Fahnehjelm, of Stockholm, Sweden, which distributes fuel gas and produces light by direct incandescence at the burner tip. This system has been in successful operation in Europe for several years, and was introduced into this country for the first time some three months ago at Bellevue, Ky. At that place, although the population is only 2,000, the price of gas is only 50 cents per thousand feet. The proposed plant at Hyde Park will be built under the Loomis patent. This produces 45,000 feet of gas from a ton of bituminous coal, the temperature of the gas being 300° higher than has ever been recorded by Rossetti with the Bunsen flame. The gas burns with a blue, non-luminous fire, has a complete combustion, and is perfectly clear. It is said to have qualities of a high order for fuel use and to be particularly fitted by the pure character of the fire for the production of light by incandescence. For this purpose an attachment, called the Fahnehjelm comb, is used. It is based on the intense temperature of the flame, which is 1700° centigrade. A frame moveable by means of a screw up and down the burner carries at its two extremities two iron wire standards which carry a curved back provided with two rows of long teeth or needles. The needles are composed of magnesia, which has been first baked at a high temperature, then ground, and then sintered, under high pressure with some agglutinating material. The flat flame of the gas passes up between the two rows of vertical needles, which thus receive its greatest heat and do not come in contact with its comparatively cool interior. They become immediately incandescent and beautifully luminous, and the gas flame becomes invisible.

SOME EXAMPLES OF CORROSION.

OUR illustrations this month show the serious results that may and frequently do follow when the water supply for boilers is contaminated by sewage, by the contents of privy vaults, and other impurities of a similar character, which may either be discharged directly into the source of supply, or may filter through the ground into it by reason of leakage through walls or pipes, resulting from accidental breaks or imperfect construction.

Fig. 1 shows, nearly full size, a portion of a plate cut from the bottom of a boiler about fourteen months after it was put in new. It was eaten entirely through in several places. The surface where the corrosion occurred was found very rough and uneven, the character being very difficult to show in a wood cut; the original photographs show it much better.

Fig. 2 shows the entire portion of the plate which it was found necessary to remove. The light colored portions show a scale formation, nowhere more than one-sixth of an inch thick, covering a portion of the plate, and the peculiarity of the corrosive action was that it occurred only beneath this scale; those portions of the shell which were clean being as sound as they were the day they were put in. Corrosion arising from causes similar to those in this case is very apt to occur in a similar manner, and is very difficult to detect under most circumstances.

In Fig. 3 is shown a portion of a patch which lasted just twelve months from the time it was put on. The action was exactly similar to that which occurred in the preceding case, although the localities of the two boilers were widely separated. The engraver has admirably shown the nature of the corroded surface in this cut. The patch was eaten quite through, the corrosion taking place only beneath the thin coating of hard scale, similar to that shown on the plate in Fig. 2.

This corrosive action seems to be caused by the presence of ammonia in some form, probably as sal-ammoniac, which if concentrated to any great degree, forms a very active agent in the destruction of the plates.

In one of the above-mentioned cases the damage was attributed by the owners to the use of a patented boiler compound, designed to remove scale and prevent its formation. We do not think the facts in the case justified this conclusion; still it is possible that if the compound used contained sal-ammoniac the damage might be caused by it, as the chloride contained in this substance would combine with the lime in the water, forming chloride of lime, while the ammonia would form with the other constituent of the scale, carbonate of ammonia, which would be very likely to attack the plates in the manner above described.—*The Locomotive.*

Mr. Hayne is receiving about 1,500 bushels of grain per day at Bridgen, Ont., is grinding 500 bushels per day, and has 10,000 bushels stored in his elevator

COMMON SENSE IN MILL BUILDING.

WE remember very distinctly, says *The Millstone*, the first new process mill that was built in this section. It was rather an elaborate establishment; contained 12 run of buhrs, 22 or 23 reels, five or six

such a mill to do as good work in all respects as the more elaborate mill which has just been built."

The junior partner was very much interested, and was favorable to the acceptance of the proposition. The senior said: "He has not made a proposition yet. His

statement is merely general. Let him reduce it to writing and state just what he will do, and if he can accomplish what he says he can, or anything which is approximately like it, why, we will accept and pay for a new mill."

So it was that he was asked to reduce his statement to writing. It came, but in a very modified form. It never came as it was given orally, and the proposition was never accepted. The same kind of a proposition has been accepted many times. Guarantees in all kinds of mills are made recklessly, and they are accepted recklessly. A mill is built which costs \$20,000. Some one comes along and says he will do as well for \$12,000. On general principles it is as poor business to accept a proposition of this kind as it is to make it. While it is true that a poor mill may be built for \$20,000, or any other given sum, it is to be remembered that on general principles the better mill can be built for the larger sum of money than for the smaller. While money does not make the mill, it has a great deal to do with it. A man who attempts to compete with one of Pillsbury's mills, for instance,

with another mill which cost from one-half to two-thirds as much, is reasonably certain to get left. In principle this is done in many instances. Nearly every miller is attempting to get as good, or better mill than his neighbor, and at the same time for less money. This is sheer

folly. It is strange that so many people will undertake it. It is a policy that has crippled a large number of mills throughout the country. It is one cause of the lack of system, the lack of unity in ideas, and of the general mixed condition in which we find ourselves in regard to

milling matters. There is only one principle as far as any may see in mill building at this time, and that seems to be first, last and all the time to get a cheap mill.

People invest money in mills to make money, that is if they invest it in a business way. Building an essentially cheap mill is not a good investment. To get money out of a mill one must make a good flour at a low cost. That is the broad principle. They do not do that by skinning the mill furnisher. They ineffectually skin themselves. The mill furnisher merely gives them their money's worth. There can be no doubt that a man can take the money which is ordinarily put into a 700-barrel mill and build a 300 or 350 barrel mill and make more money out of the latter than the

former. The question of money making in mill building is merely one of the difference in the relative cost and quality of the flour made. The mill which does better in this respect will make more money, other things being equal.



FIG. 1.



FIG. 2.

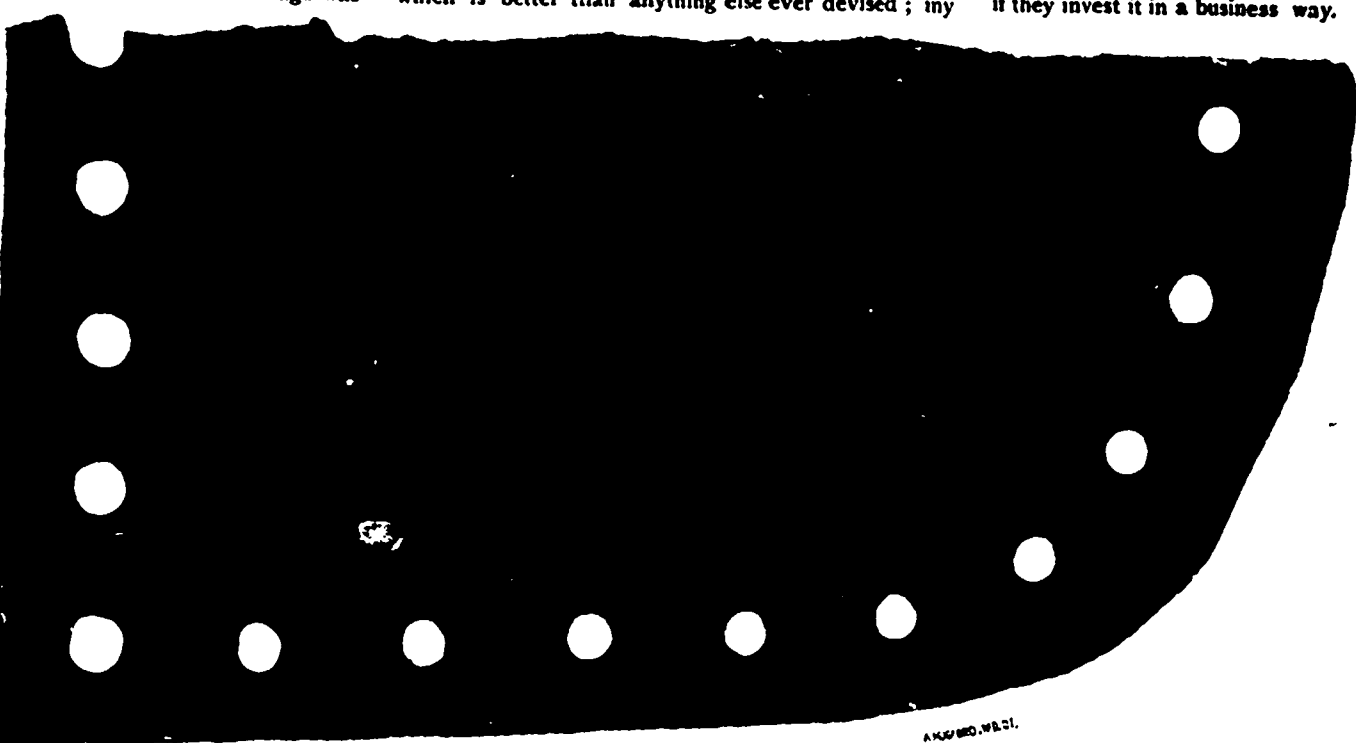


FIG. 3.

purifiers and two pairs of rolls. This mill had been started a few weeks when a mill builder went to the owner of another mill and said: "I will build you as good a mill as this more elaborate establishment for about one-fourth the money that one cost." He was

asked what machinery he would use, and said that the particular thing about his plan was not the amount of machinery, but its arrangement and his peculiar system. "I have," said he, "in the first place, a millstone dress which is better than anything else ever devised; my

bolting scheme is quite unique and altogether satisfactory; and then as to the purifiers, why, I will only use two or three, but then they are very large ones and of a peculiar type which will do as much work as any half dozen other machines. And," said he, "I will guarantee

Correspondents' Opinions.

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

MANUFACTURES AND COMMERCIAL UNION.

Editor *Mechanical and Milling News*:

FROM the time when the hammer of the redoubtable Tubal-Cain first rang out in chorus with those of the "artificers in brass and iron," and the rudely fashioned ploughshare of primeval man first turned the sod of the virgin earth, the world has been divided, to a large extent, into two great classes. While to one has been assigned the duty of promoting and gathering the increase of the field, to the other has been given the task of providing, not only the implements requisite for the proper equipment of the former, but also of supplying the necessary articles of use and comfort to the whole race. Mutually dependant upon each other, the progress or decline of the one has invariably involved a corresponding fluctuation in the case of the other. Working together hand in hand, their march through the centuries has been, in a large measure, the march and conquest of civilization.

It is a lamentable fact, however, that an attempt is being made in this country at the present time, to antagonize these two interests, and we find agriculture and manufactures marshalled against each other in hostile array. Under promises of pecuniary advantage and immunity from supposed evils, said to result from protected manufactures, the farmer is being induced to rally around the standard of Commercial Union. The promised advantages in the shape of "larger markets" and "increased prices" were dealt with fully in a former letter, and shown to be "broken cisterns that can hold no water." It is in regard to the imaginary evils said to be consequent on our present trade policy, and which Commercial Unionists state are a detriment to the progress of the community as a whole, and to the farmers in particular, that I wish to devote a few thoughts at this time.

The attacks made upon our manufacturing industries lose none of their bitterness though being mere repetitions of past onslaughts; nor does it become us any the less to examine and expose their weakness and puerility because they have been made apparent by former criticisms. The question having laid aside the ancient garb of "free trade" has donned the modern and fascinating apparel of "unrestricted reciprocity;" but I trust we shall still be able to recognize its true inwardness, notwithstanding the disguise. Amongst the foremost shibboleths of the new party, we find the cry that our manufactures are

"PROTECTED MONOPOLIES."

The farmer is told that he is being grievously taxed to support a system of extortion and monopoly that is crushing him to the earth; that leeches, in the shape of protected industries, are drawing his life blood and eating into his already too small profits. With such forebodings and importunities would these Jeremiahs induce the agriculturist to forsake the institutions of his country, and flee to Commercial Union as a sure remedy for all these grievances. Let us first assume, for the sake of argument, that the prices of our manufactures are slightly higher than those of the United States. That the difference can be but slight is apparent, when we consider that were they extortionate, the existing customs tariff would fail to deter American goods from entering and competing with ours. Even the fact that we are paying a slight advance for commodities would fail to prove Commercial Union a consummation to be earnestly desired, or that it would remove at all the possibility of extortionate prices. Neither does it follow by any means, that the cheapening of these articles would be an advantage to the country. There is a great deal of sound philosophy in that trite maxim of the renowned Edmund Burke: "Make things dear, in order that they may be cheap." It is an indisputable fact that *the more a country produces the richer it is*. The means, therefore, that will secure the greatest possible production will insure the most rapid development of its resources and wealth, and result in the greatest happiness to its inhabitants. Every article or substance that is manufactured from raw material, adds its quota to this increase of national wealth. Strange as it may at first appear, it is in consequence more profitable for us as a nation, to consume goods of our own manufacture at a moderately higher price, than to procure the same goods at a low price from a foreign power. An example will be necessary to give clearness to this point. Our farmer buys a wagon of Canadian make for \$80, which he might obtain, if there were no customs barriers, from

Buffalo laid down at \$75. It is quite obvious that, as an individual, he is a loser to the extent of \$5 on his transaction; but is this the end of the matter? By purchasing the Canadian article, he gives employment and encouragement to native industry and, as we shall see, makes a ready market for his own products that will more than repay the loss at first sustained. We will presume the manufacturer to have had a profit of \$25 on the wagon, the balance, \$55, being paid for material and wages. The whole amount of this purchase represents so much capital set in motion to reproduce itself. The manufacturer, after consuming a portion of his profit in his living, and thus contributing to the support of other trades, each of which realizes a profit, capitalizes the balance. The amount paid for the material affords subsistence for other industries, and employment for a further diversity of labour. That paid in wages—by far the largest portion of the cost of production—finds its way through the mechanics into the various channels of commerce, making a reliable market for other manufactures, and more especially for farm produce. In the spending of this small sum, it is at once observed that the farmer has called into existence a number of industries and a host of mechanics and labourers, from whom he is likely to reap more than ample return for the extra cost of his wagon. What would have been the result had he purchased the Buffalo wagon and saved \$5? All the money and consequent profit and advantage accruing would have passed into the hands of a foreign power and foreign labour, and, owing to the lack of employment and the want of funds on the part of the Canadian artisan, his purchasing power would have been decreased, and the market for the farmer diminished. As a result, he would have to look to the source whence he purchased his wagon to dispose of his produce. The fruitlessness of the hope to find this market on the other side of the line was fully shown in a former communication.

It appears, from the foregoing, that the truest prosperity of a country consists in the amplex of wages to the laborer. The laboring classes, constituting as they do its backbone and sinew, make the nation; being not only the source of its wealth, but the support of its institutions. When the farmer aims a blow in this direction, he is conniving at his own downfall, and will secure inevitable ruin and sure desolation.

But does protection induce monopoly and cause high prices? Not by any means. It is thought, on the contrary, that the opposite policy of unrestricted trade would tend more towards the accomplishment of this result. Large established manufactures enjoy the advantages of great experience, skill, and effective machinery; and from their very extensiveness, are liable to become centralizing powers, with sufficient strength to crush out irresistibly every attempt at competition. By thus crowding out every incipient industry the possibility, nay, the probability, is strongly in favor of their becoming worse than the "grinding monopolies" they were intended to supersede. We should have, as our share of Commercial Union, the oppression of oil rings, wheat rings, cattle rings, whiskey rings, and even "egg" rings, until our backs would bend beneath the relentlessness of the burdens as hopelessly as that of the Israelites during the Egyptian bondage.

The question as to our prices being higher than those on the other side of the line remains to be disputed. While undoubtedly their facilities for larger production are greater in many respects than ours, there are few if any lines in which we cannot meet them upon equal ground. Especially in regard to the manufacture of staples we possess every advantage in accessibility of material and cheapness of labor to enable us to not only compete with them successfully but to even undersell them. There is no time here for a comparison of prices but if it were necessary, figures could be produced to show, that the assertion that we are paying more for our commodities than they could be purchased for in the United States is absolutely groundless. The tendency, moreover, will be constantly towards a diminution of price, as the resources of the country develop and flourish, and greater facilities for production in the shape of larger manufacturing with improved machinery, reduce the cost. If it be true, then, that our industries are in a position to compete favorably with those of the adjoining nation, we are asked:

WHY IS PROTECTION NEEDED?

Why not throw down the customs wall and let our manufactures have the benefit of a "larger market," and our people the advantage of free competition. Competition, properly regulated, and of a fair character, is one of the most potent influences in the extending of commercial activity, and one of the mightiest promoters of human prosperity. When left unregulated, however,

it becomes a source of desolation and destruction. It has been already pointed out that the wage earning classes are the barometer upon which the progress or decay of national prosperity can be read, and that in the sufficiency of their wages, and the consequent extensiveness of their purchasing power, depends the stability of the home market. Besides being the largest producers, they are also the greatest consumers, and hence the necessity of the return for their toil being ample enough to insure a good living. The inevitable tendency in unlimited competition, to necessitate a reduction in the cost of production, results in the reduction of that item of expense most accessible as well as most easily compressible. Upon the workman, therefore, the efforts at minimizing cost fall, and his wages are ground down with increasing stringency. Besides, owing to the youthful character of many of our industries, in a fight for existence, numbers of them would succumb. With the loss of the entire labor of defunct manufactures, and the impoverishment of the remainder by the reduction in profits to employer and employee, an exodus would take place which would leave little but the memory of our present flourishing cities and thriving towns of Canada. Desolation and decay, like a deadly gangrene would eat their way into the vitals of the nation, until our condition would be similar to that of the West Indies a few years ago under the "cheapest market" regime, when it was said that a planter could scarcely find his dwelling amongst the thickness of the jungle.

To further complete the paralysis of our commerce, vast surplus and bankrupt stocks would find their way into our markets, and we would become once more the dumping ground of the over-production and refuse of the sixty millions of people to the south. We are not yet so poor that we can appreciate the crumbs that fall from the rich man's table. Reflection on this point ought to cause Canadians to hesitate ere they throw wide the sluice gates of unlimited competition to permit the slaughtering of their markets.

Another resort of Commercial Unionists, is the argument that

OUR MANUFACTURES ARE INFERIOR IN QUALITY.

It is surprising to what lengths free trade theorists and unlimited reciprocity advocates will go to endeavor to make a case. They are not only prepared to decry and belittle the financial standing and commercial status of the country, but will disparage the physical and mental capabilities of their countrymen, if it is necessary to the success of their schemes. It is to be hoped that the people of Canada will appreciate the estimate thus placed upon their intelligence. Why should we not be able to produce articles as good in almost every line of manufactures as those produced in the United States? Are not the raw materials as readily obtainable, and the capital, machinery and skilled labor, as available here as across the boundary? The fact is, we are producing every day goods of a quality and excellence of their numerous kinds, that will not only take their place side by side with any foreign product, but in some instances surpass them. Anyone who has visited our Industrial Exhibitions, or entered our factories, will have perceived the hollowness of this pretext raised in favor of Commercial Union. The immense exhibits that filled the spacious Canadian quarters of the recent Indian and Colonial Exhibition, and called forth the astonishment of the thousands who examined them from day to day, give the lie to this bare-faced and specious calumny upon our manufactures, that is being constantly reiterated by those whose lack of truthfulness is only exceeded by their want of patriotism. If the inferiority of Canadian manufactures evidenced as clearly the lack of brain power as some of the arguments in favor of Commercial Union bespeak for their authors, we might advise our artisans in all earnestness to take in a plentiful supply of "fish" ere the fisheries are handed over to the gluttony of our American cousins for depletion.

We are confronted frequently with the statement that the

HOME MARKET IS TOO SMALL

to warrant extensive manufactures or permit the rapid development of our natural resources. There is a semblance of reason in this argument which entitles it to better consideration than the one preceding it. A point too often forgotten in the comparison constantly made between this country and the United States, is the great disparity of their ages. In the brief twenty years of our national existence, during a large portion of which time our political and commercial affairs have been in that state of uncertainty incident to the amalgamation of diversified people, classes and interests, our progress, though gradual, has been none the less marked. It is quite out of reason, however, to expect that our population would increase as rapidly, or our commerce advance

as strikingly, as in the case of the United States, whose existence covers more than a century of time. Since the desire on the part of the people to have a distinctive national life, with national commerce and industries, found expression in the determination to levy a protective tariff against foreign competition, our advance has been more noted. We have no adequate means of arriving at a correct statement of the actual increase in population since the census of 1881, but it is safe to receive the assertions made by Commercial Unionists that a large increase has taken place in our manufactures, and therefore in the population to which they give employment. A proportionate increase has taken place, undoubtedly, in the agricultural classes, which to-day number two-thirds of the entire population. It would appear from this preponderance of the farming element, that our grounds for alarm as to the sufficiency of the market at present, are hardly warrantable, while the proportionate increase, and the certainty that immigration will increase to a large degree during the next few years, leads us to believe that the demand will keep pace with the supply. As a matter of fact, returns show that of the entire domestic production of Canada, the home market consumes about ninety per cent. Our facilities for receiving a foreign population until recently have been so limited, that much increase from this source was out of the question. Our trans-continental line has been completed only since 1885, and, unhappily, circumstances transpired almost immediately on its completion, to mar the growth and prevent the speedy settlement of the great territories through which this means of communication has been opened. The blindest can not fail to see that the populating of these immense tracts of fertile land is a thing as inevitable as the sunrise; and in far less time than it has taken to build up the American republic, a nation will here spring up that shall not only not require foreign help to develop her resources, but will assume the position of competitor for the commerce of the world with the surrounding nations. At present, however, we are neither over-producing, nor is there any probability of this immediately or in the near future. Our natural resources of lumber, phosphates, minerals and fish, as such, are bound to find their way wherever there is a demand for them, in spite of restrictions that may be placed upon their importation by foreign countries; and we are not quite so silly as to believe that the tax levied will detract from our profits thereon. Whatever may be the state of the home market, it is absolutely certain that to look for a larger market to the United States, is to depend upon the frailest reed that ever bent before a summer breeze.

The last object of the sneers and jibes of Commercial Unionists upon which I shall touch, is that of "HOT-HOUSE INDUSTRIES."

It is the case with the cultured as well as the ignorant, that often in taking up a hue and cry, they become so attached to pet phrases, that they lose cognizance of their true meaning. In the present instance, the effort to give the impression that we are forcing the growth of institutions that are neither natural nor congenial to the soil, finds vent in dubbing the industries brought into existence by a protective policy, as "hot house" plants. In the sense that the horticulturist affords to the tender shoot the protection necessary to give it an opportunity to get a start in life that will insure its endurance of the inclemencies of the climate, it has been our endeavour not to transplant to this country "rare exotics," but industries of a nature that will thrive and prosper. Thanks to this endeavour, we have already a large number of those "hot-house" plants, which would otherwise never have been known to Canada. The names of numbers of manufacturing institutions, having their head offices on the other side of the line, who have found it necessary and profitable to build branch establishments here, might be given. More than that, with few exceptions, these firms state that they are placing on the Canadian market the same goods as they supply to the Americans, at the same price in some instances, and at a reduced price in others. Will anti-restrictionists, dare tell us that these industries are "exotics" and detrimental to the country's welfare, when this amount of labour has been brought into the development of our national wealth? Surely the assurance of these philosophers must result from something more than great ignorance and unbounded confidence in the credulity of the brain-lacking "colonist." We are charitable enough to think that their bias, resulting from a life-long adherence to that phantom of the past, "free trade," leads them to imagine every object they look upon to be as green as the goggles through which they look.

To recapitulate, monopoly is rather to be feared as the result of unlimited competition than of protection; while the supply of first-class goods is a fact in our manufactures, prices are not enhanced under the present

policy: the home market is quite large enough for the present supply and gives promise of keeping pace with the increased production; and finally, the present tariff has not only been the means of stimulating existing industries, but has induced the sinking of foreign capital in additional Canadian manufactures, giving an increase in employment to labour within the country.

As it is towards the farmer that all expectations are turned on this occasion, I have endeavoured to show that he has nothing to gain in regard to the products of his own toil by Commercial Union; and that he will sustain a further irremediable loss should home manufactures decline and his home market be cut off. In a conflict between agriculture and manufactures, the end can only be defeat and destruction to both combatants.

It will be remembered that once, in the history of ancient Rome, when the opposing interests of Patricians and Plebeians resulted in the final secession of the latter to the Sacred Mount, amongst the delegates sent to reconcile the disaffected plebs, was the aged Menenius Agrippa, who related to them the celebrated fable of the "Belly and the Members." "Once upon a time," said he, "the Members refused to work any longer for the Belly, which led a lazy life and grew fat upon their toils. But, receiving no longer any nourishment from the Belly, they soon began to pine away, and found it was to the Belly they owed their life and strength."

It is to be earnestly hoped that the farmers of this country will see the point as readily as did the Plebeians, and turn from a conflict in which the victor must inevitably be the vanquished, the shout of victory be a nation's dirge, and the trophies and spoils of battle the deserted firesides of a desolate country.

CANADIAN.

THE VILLAGE OF HASTINGS, ONT.

Editor Mechanical and Milling News:

AS "Rambler" has not rambled this way, I will endeavor to give the many readers of the NEWS a description of the charming little village of Hastings and its industries.

The village is beautifully situated on the banks of the Trent River, 23 miles east of Peterboro' by the Midland railroad. It has a population of 1,000, and one of the finest water powers in Eastern Ontario, which I am sorry to say, however, is but half utilized. Yet there are to be found here some busy manufactories, notably the large saw and shingle mills of Wm. Foulds, which give employment to 13 men.

After being shown through the mill by the genial foreman, Mr. John Wilson, we visit the yard, where we see vast piles of lumber being lifted sky-ward, and a lot of busy hands loading it on cars ready for shipment to the east. Directly opposite is the sash and door factory of Doxsee Bros., which has a frontage of 34 x 40 feet, with a wing 24 x 30 feet, 2 stories high. Its motive power is transmitted from the saw mills by a $\frac{3}{4}$ inch wire cable 360 feet long.

Next we see the two large elevators of Henry Foulds, which present the busy appearance of a bee-hive. As we move on we come to the large woolen mills of Cummings Bros., but as time is short, do not call, but pass on to the well-known Trent Valley flour mills of Mr. F. W. Foulds, which are running night and day. These mills were lately fitted to the full roller system by the well-known mill builders, Wm. & J. G. Greey, who have every reason to be proud of its success, for it is as neat and clean a mill as any one would wish to see, and gives employment to 8 men.

Last, but not least, is the large tannery of Messrs. Welsh & Co., established in 1882, and employing 30 hands. It is fitted with the most improved machinery from the well known firm of Wm. H. Jaynes, manufacturers of carriers' tools and machinery. The output of the firm is 6,000 hides and 2,000 calf skins a year, using 600 cords of tan bark. They manufacture oil, pebble, glove, grain and split leather, which find a ready demand in the Montreal and Toronto markets. Much credit is due this firm for the enterprise and push they have shown in improving the east end of the village. A walk around the town reveals some really fine private residences and handsome business blocks, notably the large three story dry goods and grocery stores of J. Peters, and directly opposite the three story block of J. Tracey, the editor of the *Hastings Star*, a spicy little weekly.

Overlooking the village are three handsome churches, Catholic, Presbyterian and Methodist, and at the south east end the English church, which is now being ve-neered and assuming a very handsome appearance.

Having been shown much kindness by the good people of the village, I wish them continued prosperity, and am glad of this opportunity of drawing public attention to this thriving place.

Yours truly,

PILGRIM.



The Chatham Mfg. Co. is erecting a large dry kiln.

Mr. P. P. Cope has retired from the Norwood foundry.

Pictou people are endeavouring to establish a box factory in the town.

Messrs. Paxton, Tate & Co., mill machinery manufacturers, Port Per., Ont., have dissolved.

The Kingston Locomotive Works have an order for 14 locomotives for the Intercolonial railway.

The Cortland Carriage Works Company have selected a site for the Brantford branch of their factory.

Large iron smelting works and a locomotive factory are proposed to be established in St. John N. B.

A loss of \$11,000 has been incurred by the burning of a woolen mill at Pulmston. The property was only lightly insured.

Messrs. Inglis & Hunter, of this city, will make the boiler for the new boat of the Hamilton Steamboat Co. for the Toronto route.

Messrs. Harris, Heenan & Co., dealers in leather belting, Montreal, have made an assignment. Their liabilities are estimated at \$18,000.

The "Usher" property alongside the Grand Trunk track at Brantford has been leased as the site upon which to establish the Courtland carriage works.

The Ontario Rolling Mills Company, of Hamilton, have concluded some very successful experiments with oil as fuel, and will probably discard coal in favor of the liquid.

Egleston's foundry at Ancaster, Ont., was destroyed by fire last month. The principal part of the machinery was sold, and removed a few weeks ago. The building was partially insured.

There is very little likelihood that Mr. McDonald of this city will remove his tin works to Oshawa, although the people of that neighbourhood were it is said, to offer him a bonus of \$10,000 to induce him to do so.

Three car loads of fanning mills have been forwarded by Mr. Manson Campbell, of Chatham, to Winnipeg during the last three weeks. During the season twenty-one hundred have been sold.

The prospect of the establishment of a saw and file manufactory at Peterborough, Ont., is taking definite shape. The citizens are asked to subscribe \$5,000 more stock before the company will begin operations.

The Reliance Gauge Co., Cleveland, U. S., makers of the celebrated Reliance safety water column, have sold the right to manufacture these protectors to the John Abell Engine and Machine Works, of this city.

There is a probability that a saw manufacturing establishment will shortly be located at Peterboro'. Citizens of that place are subscribing stock, and the town is ready to put up a building when the necessary capital is obtained.

A statement has been made, that the Dundas Ont., Screw Co., would transfer their business to Hamilton Ont., immediately. This is incorrect. The removal is not expected to take place until the beginning of next year.

Mr. T. R. Foster, proprietor of the Thornbury Ont., woolen mills, has just returned from the Northwest, where he thinks of establishing a woolen mill. Brandon has offered him exemption from taxes for ten years, and assistance towards the location of the mill.

At the Grand Trunk shops, in Hamilton, six fine locomotives are being constructed for fast passenger service. One of the engines just completed has six foot driving wheels, 19 x 14 cylinders, and a boiler with an outside diameter of 56 inches. The total weight of the machine is 93,000 lbs.

By the withdrawal of Mr. Thomas McDonald, who purposes engaging in other business, the firm of McDonald Kemp & Co., this city, has been dissolved. Mr. Thomas McDonald was the senior partner. Mr. W. A. Kemp, brother of the junior member of the firm, Mr. A. E. Kemp, has purchased an interest in the firm, and is now a partner. The name of the firm, McDonald Kemp & Co., will not at present be changed.

We predict that the time is not far distant when there will not be found a steam engine under ten horse-power in the manufacturing shops, within reach of the generating stations of the electric light companies. Electric motors will be the source of power, and the lighting companies cannot spend their spare energies to better purpose than encouraging the rental of motors to the utmost extent. Let any company calculate the receipts on investment if their full generating capacity can be utilized thus during the greater part of the 24 hours, and they will find enough incentive to push the matter vigorously.—*Electrical Review*.

The controlling interest in the Canadian Locomotive and Engine Works, at Kingston, Ont., has been purchased by two members of the firm of Messrs. Dulis & Co., locomotive builders, Glasgow, Scotland, and they will, on December 15th, take control of the Canadian works. The Glasgow gentlemen own \$150,000 in the capital stock of the company, which is \$200,000. At Messrs. Dulis' Glasgow works about 2,000 hands are engaged. A number of their skilled workmen will immediately be sent out to take charge of the Kingston works. In connection with the locomotive works the firm propose to engage on a large scale in the construction of iron vessels.

The Eureka mills, Wyoming, have been rented by Mr. James Garner, of Ingersoll.

Chopping will be done at the Greenwood Ont., saw mill in a short time. The oatmeal machinery will, however, stand for about a month.

FEED WATER PURIFIER.

THE accompanying illustrations represent an improved boiler water purifier which possesses several points of interest, among which the following may be mentioned: The purifier works without any filter, and the water is simply heated sufficiently to free it of scale before admitting it to the main body of water in the boiler. The pans of the purifier can be easily removed without emptying the boiler as they are placed above the water line.

The explanation is as follows: The purifier is placed in position by entering feed *A. A.* through shell back of man-hole and near enough to it so that it can be reached with the hand from there (see fig. 1). The stand (fig. 4) is placed on flues directly under it, and the lowest pan is placed on stand with the cut out towards the end of the same end as cut out, but on the opposite side, and so on alternately until the top pan is reached. Before putting that into its place guard *B* (fig. 3) is adjusted over feed *A.* and pushed up until it touches the shell, and it is then fastened there by pushing a "smo" wedge between the two pipes. The top pan is then put into its place, the wedge is removed, and the guard *B* drops with its feet on to the bottom of top pan as shown by the dotted line *C* (fig. 3).

When the purifier is in this position the water is turned on, and immediately flows into top pan, *C*, through *E E* (see fig. 3) until it rises to the line indicated in same figure (the feed entry is thus placed under water); and it then overflows into the next run, and so on to the end of the first pan, when it passes through an opening into the next below, and in this way through all the pans until the last is reached; and then after having been heated and cleaned, enters the main body of water at the water line of the boiler. The water should be fed slowly and as nearly as possible continuously while getting up steam, and it should be turned off when it rises higher than the bottom of the purifier.

The pans are taken out and cleaned by lifting up and fastening *B*. The top pan is then placed towards the man-hole, about 8 inches, the dipper entered, and the handle of the dipper passed over the pan until the latter is well into the dipper, then both are lifted together towards the man-hole, and, at the same time, turned gradually downward until the pan can be turned upright and lifted out with the dipper. The dipper is then emptied of whatever water and sediment it may contain, and the pans are taken out one by one until all are removed.

They are then cleaned and replaced. How often the pans should be cleaned depends entirely upon the amount and condition of the water used.

Further particulars concerning this invention can be obtained from Mr. J. W. Herman, agent for Canada, 114 1/2 King St. West, Toronto.

EDISON'S NEW PHONOGRAPH.

CONSIDERABLE attention is being attracted in the East to Edison's latest achievement with the phonograph. With the instrument which Mr. Edison produced ten years ago, and which he speaks of now as "my old toy," he produced all sorts of sounds, getting back from the phonograph something like the original sound, but, says Mr. Edison, to a *World* reporter "there were all sorts of objections in detail to my first instrument.

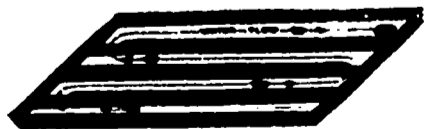


FIG. 2.

It weighed about 100 pounds; it cost a mint of money to make it; no one but an expert could get anything intelligent back from it; the record made by the little steel point upon the sheet of tin foil lasted only a few times after it had been put through the phonograph. My last instrument is a finished machine—simple, cheap, effective, not liable to get out of order, and it does everything that I ever hoped the perfected phonograph might do. My phonograph will occupy about as much space on the merchant's desk, or at the side of the desk, as a typewriter does. It will work automatically by a small electric motor, which runs at a perfectly regular rate of speed, is noiseless, and starts or stops at the touch of a spring. Suppose the merchant wishes to write a letter; he pulls the mouthpiece of the phonograph to him, starts the motor with a touch, and says what he has to say in

an ordinary tone of voice. When he is done he pulls out a little sheet and rolls it up for the mail. The recipient places this sheet in a similar phonograph, touches the motor spring, and the instrument will at once read out the letter in a tone more distinct, clearer, more characteristic of the voice of the writer, than any telephone ever heard.

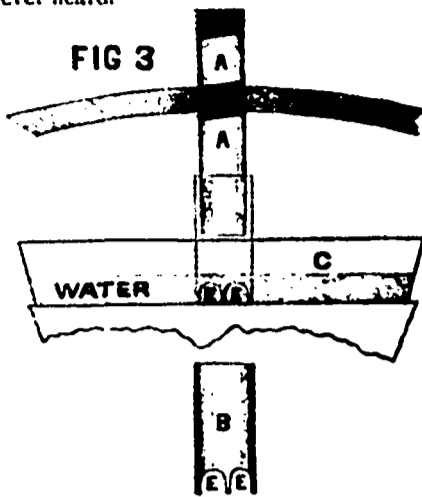


FIG 3

There seems to be no end to the things this little instrument will do; correctly giving back, when needed, every sound or combination of sounds that is given into it. Mr. Edison is confident it will be found in the office of every busy man, and says no editor or reporter of the future will think of losing time by writing with a pen or dictating to the stenographer when the printer can set type better from the dictation of the phonograph than he can from copy. The amount of talking which can be

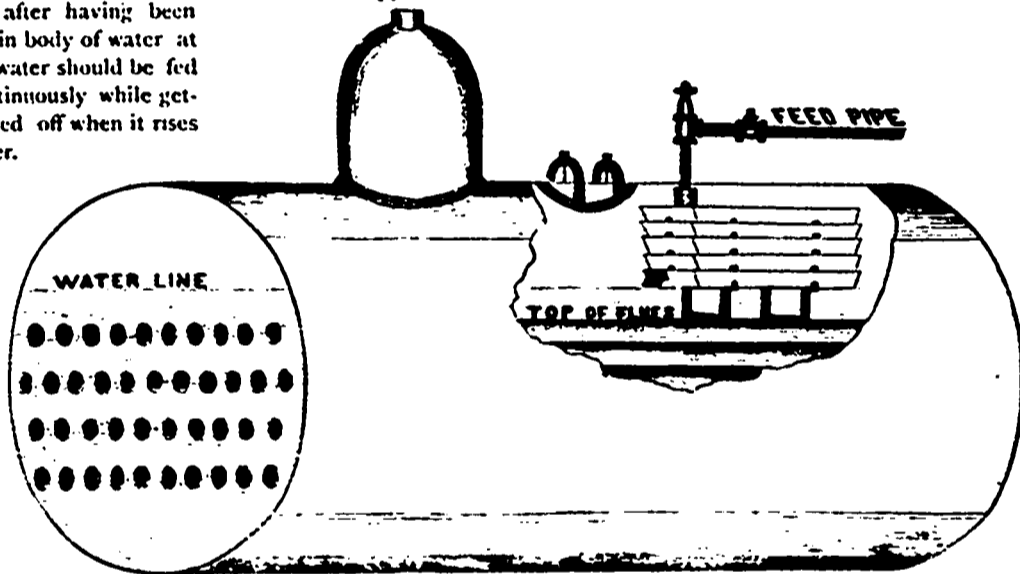


FIG. 1.

recorded upon the phonographic sheet is so much larger than which can be printed upon it that the phonographic book or newspaper of the future need not be half the present size. About the only thing that the perfected phonograph will not be able to do will be to give pictures. The cost of running the phonographs, according to Edison, will be no more than the cost of maintaining two cells which run the little electric motor—perhaps 50 cents a month. Three sizes are now being made—one size for the pocket, which will write 300 words on its sheet, another size for letters of 800 words, and a third size for 3,000 words." Mr. Edison now has forty workmen employed in making the tools for the manufacture of the first set of 500 phonographs. They will cost \$60 apiece.

AN UNOCCUPIED FIELD.

There would seem to be a first-class opening in Canada for the manufacture of lumber dry kilns equal to those manufactured in the United States. The MECHANICAL AND MILLING NEWS is in receipt of several

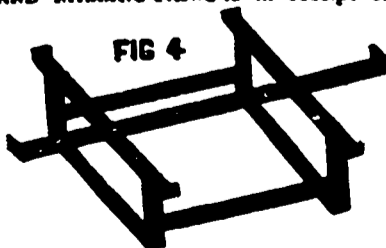


FIG 4

letters from manufacturers in different parts of the Dominion, asking whether such apparatus is manufactured in Canada. The gentleman who wrote us last on this subject stated that he would prefer to buy from a Canadian manufacturer if one could be found. This is the right sentiment and one which we would like to see displayed more frequently. So far as we can learn, there are no manufacturers of dry kilns in Canada, but we hope that before long, the inviting field for manufacturers in this line will be occupied.

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.

Miller Wm. J. Northgraves has removed from Ayton to Hespeler, Ont.

Mrs. Katz, of Gadshill, Ont., mother of Mr. Adam E. Katz, of the Tavistock Milling Co., died last month.

The MECHANICAL AND MILLING NEWS had a pleasant fraternal visit last month from Mr. Wm. Ireland, proprietor of the Parry Sound Star.

Mr. Archibald McDonald, late of the Bennett Furnishing Co., London, Ont., sailed for Scotland last month.

Mr. E. B. Walker, of the Drop Forging Works, Dundas, Ont., has just returned after a prolonged and profitable Canadian business tour.

Mr. Frier, has had two of his fingers badly damaged at Emerson's planing factory, Port Perry, Ont.

Mr. E. Kensing, for several years employed in Goldie & McCulloch's foundry as a finisher, leaves this week for Australia.

Mr. Tait, of the Hirtle, Man., mill, has removed his family from Winnipeg and taken up his permanent residence in Hirtle.

Mr. White, assistant commissioner of Crown lands for Ontario, has been visiting the Northwest.

Mr. H. W. Petrie, of Brantford, the well known machinery man, is suffering from a broken leg.

Mr. John Kercher has been appointed foreman in Mr. Livingstone's Saw mill, Stratford.

Mr. Dugald Dickey, of Heckman's saw mill at North Beaver Bank, Nova Scotia, died from the effects of falling on a revolving saw.

Mr. Frank Waterous, of the Waterous Engine Works Co., Brantford, Ont., and St. Paul, Minn., will shortly leave on another business trip to Australia.

The employees of the Smith Purifier Co., Stratford, Ont., are putting up a fire hall in the vicinity of the works, and intend getting uniforms for their fire company.

Mr. Meldrum, of the milling firm of Meldrum, Davidson & Co., Peterboro' Ont., is erecting a fine dwelling house. There seems to be money in the milling business, after all, if one only knows how to get it out.

The MECHANICAL AND MILLING NEWS extends congratulations to Mr. A. V. Tait, manager of Sutherland, Innes & Co.'s mill at Charing Cross, Ont., who was married a few days ago.

A young man named A. D. Fort, employed in the cedar mills at Deseronto, Ont., had his arm terribly lacerated by being drawn between the rollers while operating an edger.

Mr. Hugh McCulloch, of Galt, has returned from British Columbia, where he witnessed the starting of the large flour mill built by his firm for Pashall & Laws, at Enderby.

Miss Minnie Robertson Gilchrist, only daughter of Mr. Archibald Gilchrist, former y of the Stockwell mills, Galt, and now of Glasgow, was married at Seacombe, England, on the 7th October.

Charles Arlein, a boilermaker in the M. C. R. shops at St. Thomas, Ont., had his right eye ruined for life by a rivet flying from a plate when struck and striking him directly in the eye.

Mr. Chas. Mitchell, late manager of the St. Thomas International Grain and Stock Exchange, has received a well deserved promotion. He is now manager of the Toronto branch.

Mr. W. Baster, late of the Canada Jute Company, Montreal, has undertaken the management of the new bag works of Messrs. A. W. Morris & Bros. in that city.

Mr. Samuel Code, lately of Woodstock, has removed to Norwich, where he has charge of the new 175 barrel roller mill just finished by Wm. & J. G. Greer, of Toronto, for H. S. Moore.

Mr. Geo. Lockhart, brother of Mr. Wm. Lockhart, grain merchant, Newcastle, Ont., has died from injuries received by falling through an opening in their elevator at Pontypool.

A new roller plant, valued at \$15,000 is being put in McKeechie's flour mill, Durham. Additions are also being made to the premises in the shape of a new story. During these operations the actual machinery will continue running.

Mr. Pugh, of the Anthracite Coal Company, has been paying a visit to St. Paul to inspect the machinery ordered for the mines. He says the company will ship largely next season, and so cheer up to stop importation of American coal.

John Harte, former manager of the Harte-Smith Manufacturing Company, Belleville, Ont., has been arrested on a charge of embezzling between \$20,000 and \$30,000, the monies of the Company. He was admitted to bail.

Mr. C. E. Pachtham, for ten years head miller and manager in Messrs. Sils & Bros.' large mill at Myersburg, has removed to Belleville, where he has entered into partnership with his brother in the grocery, flour and feed business, under the firm name of Pachtham & Bros.

The Toronto Division of the Canadian Association of Stationary Engineers held their first annual supper at the Montreal House, in this city, on the evening of Friday, Nov 25th. The chair was occupied by the President, Mr. A. M. Wichow. There was a large attendance, and a very enjoyable evening was spent. The MECHANICAL AND MILLING NEWS returns thanks to the Association for an invitation to be present, and regrets very much that circumstances prevented a representative of this journal from enjoying the hospitality of the Association.

Another of Nature's true noblemen has gone, and Hamilton Ont., has lost one of its largest manufacturers and most worthy citizens in the death of Mr. Dennis Moore, of the firm of D. Moore & Co., which sad event took place at his residence in that city on the 21st inst. The deceased who removed from Grimsby to Hamilton in 1831, possessed great business tact and energy, and was prominently identified with many of the chief local business enterprises. He also rendered great assistance pecuniarily and otherwise, to various philanthropic and religious institutions. He leaves a large circle of friends among whom he was highly esteemed.

[FOR THE MECHANICAL AND MILLING NEWS.]

CARE AND MANAGEMENT OF BELTS.

BY E. H. HAWKINS

THE following interesting and practical paper on the above subject was lately read before the Toronto Association of Stationary Engineers, by the Secretary, Mr. Hawkins:

I beg to submit to you a short essay on belts, a subject that I am sure concerns us all as stationary engineers.

In opening let me say that belts should always be run grain or hair side to pulley. A belt made of thick, firm leather, cut from the back or centre of the hide, run grain side to the pulley, will draw 34 per cent. more than flesh side to pulley; 48 per cent. more than rubber; 121 per cent. more than gutta percha or canvas.

A pulley covered with leather, and belt grain side to pulley, will sustain 50 per cent. more resistance than without the pulley being so covered. The strain allowed for all widths of belting, single, light double, and heavy double, is in direct proportion to the thickness of the belt, the firmness of the leather being the same in all cases.

Experience has shown that on the first day a first-class belt will stretch about one per cent. This action decreases till about the third day, after which the belt works without much change. Belts will slip about three per cent. Pulleys should be slightly convex, about one twenty-fourth of the width face.

Belts should always be protected from dampness. Many engineers use resin to keep a belt from slipping. Now, this is about the worst thing that can be done. If a belt slips, the probabilities are that the pulley has become dirty or foul, and that the belt consequently does not adhere properly to the pulley. In such cases, clean all the dirt from the pulley and belt, and rub the pulley surface of the belt with warm tallow. If the belt then slips, you can be certain that you are overtaxing it, and you need a wider belt or larger pulley. Most belt stuffings are an injury rather than a preservation. Warm tallow is the best, and about the only thing, that will soften and at the same time preserve a belt, and it should only be used sparingly. Too much oil loosens the fibre and glued joints, and injures the belt.

Never try to put on a belt when it is in motion. Many a person has lost his life or limb by so doing. This advice may not be so important if you are carrying a heavy life insurance. Care should be taken that the ends of belts, if to be butted together, are cut perfectly square across, else a crook may be made in the band and the belt maker be blamed for it. The shafting of the pulleys to be connected should run parallel and the centres of pulleys on a line with each other, at right angles to the shafting, or the belts will not run well on the pulleys. If the belt is made endless by a lap joint, the edges of such joint should be on a right angle with each edge of the band.

To transmit motion to the machine without noise or loss of power, tanned leather belts of first quality are preferably used. They wear one and a half times as long as those of inferior quality, which, although their low price is an inducement to purchasers, are more expensive in the end by the stretching and deterioration they undergo.

To find the length of belts, measure with a tape line, when convenient. When not convenient, the following rule may be used: Add the diameters of the two pulleys together, divide the result by 2, and multiply by $3\frac{1}{4}$; add the product to twice the distance between the centre of shafts, and you have the length required.

The following may be regarded as an axiom. To use a belt of ample width and substance, for the work required, is to secure for it a long existence with satisfaction to the engineer and all concerned.

Under the same circumstance, and on the same machine, rubber belts will not last or wear one-fourth as long as leather. When once they begin to give out, it is next to impossible to repair them. Wide belts cannot be used for or cut up into narrow ones as leather can. Leather belts can be used over and over again, and when of no further value for belts, can be sold for other purposes. A rubber band costing hundreds of dollars may be spoiled in a few moments by the lacing giving out, or the belt running off the pulleys, or being caught in any manner so as to damage it; or by stopping of either the driving or driven pulley. A few moments of quick motion, or friction, will roll off the gum from the canvas in such quantities as to spoil the belt. Leather belts may be torn or damaged, yet easily repaired. Gum belts will not answer for any place liable to friction, as it will soon destroy them. A well made leather belt, if properly taken care of, will last ten, fifteen, or twenty years, providing width and pulley surface is in propor-

tion to the amount of work required, and yet be of value.

Following is a good rule for lacing belts: With a triangle, cut the ends of the belt perfectly true; the grain side of the belt should run next to pulley. Punch the holes exactly opposite each other in the two ends. In punching a belt for lacing, it is desirable to use an oval punch, the longer diameter of the punch being parallel with the belt so as to cut off as little of the leather as possible. There should be, in each end of the belt, two rows of holes placed zig-zag. In a 3 inch belt, there should be 4 holes in each end, 2 in each row; in a 6 inch belt, 7 holes, 4 of them in the row nearest the end; in a 10 inch belt, 9 holes, in the same form. The edge of any hole should not come nearer to the side of the belt than $\frac{1}{4}$ in., and not nearer the end than $\frac{3}{8}$ of an inch; the second row should be at least $1\frac{1}{4}$ inches from the end. On wide belts these distances should be a little greater. Begin to lace in the center of the belt, and take much care in keeping the ends exactly in line, and to lace both sides with equal tightness. The lacing should not be creased on the sides of the belt that run next the pulley.

The belting for circular saws is, as a rule, too narrow, or on pulleys of too small diameter. To drive a saw well, and without injurious strain upon the bearings, belts should be $\frac{1}{3}$ in width the diameter of the saw, which is a very simple rule, and does not give any more than the needed driving force under fair conditions; one-fourth the diameter of the saw for the diameter of pulleys on cross-cutting spindles. Their faces can be $1\frac{1}{2}$ diameter in length. A 12 inch belt over a 4 foot pulley, at 30 feet per second, will transmit the power of a 6 inch cylinder engine, having 12 inch stroke, running 125 revolutions per minute, under 60 pounds of steam pressure.

A horse power is 33,000 pounds raised one foot per minute. A good leather belt one inch wide, having a velocity of 600 feet per minute, will transmit one horse power. The following directions for calculating the width of belts required for transmitting different numbers of horse power, will be found useful: Multiply 33,000 by the number of horse power to be transmitted; divide the amount by the number of feet the belt is to run per minute; divide the quotient by the number of feet, or parts of a foot, in length of belt contact with smaller drum or pulley; divide this last quotient by 6, and the result is the required width of a single tanned leather belt in inches.

The figures 33,000 represent the number of pounds a horse is reckoned to be able to raise one foot high in a minute. To obtain the number of feet a belt runs per minute, find the number of revolutions per minute of the driving shaft, and multiply by the circumference of the drum, which is always 3.1416 its diameter. The final division by 6 is because $\frac{1}{2}$ a pound raised 1 foot high per minute is allowed to each square inch of belting in contact with the pulley. A pound must be, therefore, allowed to two square inches, or six pounds to a strip one foot long and one inch broad. For example, required the width of a single belt, the velocity of which is to be 1,600 feet per minute, having to transmit 10 horse power, the diameter of smaller drum being 4 feet, with 5 feet of its circumference in contact with belt. 33,000 multiplied by 10 equals 330,000; divided by 1,600 equals 206; divided by 5 equals 41; divided by 6 equals 6.77 inches, the required width of belt.

For calculating the number of horse power which a belt will transmit, divide the number of square inches of belt in contact with the pulley by 2; multiply this quotient by the velocity of the belt in feet per minute; again divide the total by 33,000, and the quotient is the number of horse power.

The early division by 2 is to obtain the number of pounds raised one foot high per minute— $\frac{1}{2}$ a pound to each square inch of belting in contact with the pulley. For example, a 6 inch belt is being moved with a velocity of 1,200 feet per minute, with four feet of its length in contact with a three foot drum. Required, the horse power—6 multiplied by 48, equals 288; divided by 2, equals 144; multiplied by 1,200, equals 172,800; divided by 33,000, equals, say, $5\frac{1}{4}$ horse power.

In conclusion let me throw out the following hints to engineers:

1. Horizontally inclined belts, also long ones, give a much better effect than vertical, or short ones.
2. Short belts require to be tighter than long ones; a long belt working horizontally increases the grip by its own weight.
3. If there is too great a distance between the pulley, the weight of the belt will produce a heavy sag, drawing so hard on the shaft as to cause great friction on the bearings, while at the same time the belt will have an unsteady flapping motion, injurious to itself and the machinery.

4. Care should be taken to let belts run free and easy, so as to prevent the tearing out of lace holes, and also to prevent the rapid wear of the metal bearings.

5. In putting on a belt, be sure that the joints run with the pulleys, and not against them.

6. It is desirable to locate the shafting and machines so that belts shall run off from each other in opposite directions, as this arrangement will relieve the bearings from the friction that would result were the belts all pulling one way on the shaft.

7. If possible, the machines should be so placed that the direction of the belt motion shall be from the top of the driving to the top of the driven pulley.

8. Never overload a belt.

9. Lastly, a careful attendant will make a belt last many years, which, through neglect, would not last one.

[FOR THE MECHANICAL AND MILLING NEWS.]

THE PROTECTION OF EXPOSED MACHINERY.

BY "JACK SCREW."

IF there is any one thing above another that requires proper and careful attention in mills and factories, it is the construction of safe and complete guards about machinery, such as cranks, cog wheels, fast running belts and chains, shafts and couplings. When these points are attended to, the proprietor's liability for damages in case of accident from such sources, ceases. No amount of care in this way, however, will compensate for a lack of watchfulness and caution on the part of the operator whose employment necessitates attendance on running machinery. The writer, after an experience of over twenty-five years, the most of which time has been spent in mills and factories, and in all positions, from apprentice to superintendent, feels that no amount of familiarity will warrant the slightest chance or risk to life or limb. Just at the time it is least expected, and sometimes in the simplest manner, have serious accidents occurred. In all cases where a young apprentice is commencing to learn his trade, should it be the duty of both foreman and superintendent to instruct him as far as possible in the dangers that are sure to beset him. In fact, it would not be any more unreasonable for a concise set of rules respecting the care and attendance of machinery, to be put into his hands, and that he be thoroughly drilled therein, than that the same should be posted in every steamboat and railroad car. The dangers to be met are just as great in one case as in the other. A life can be lost as quickly by the fast running shaft as by the boiler explosion; a limb may be mangled as badly by an exposed gear as by a railroad collision. Applying the monkey wrench to the wrong side of a nut cost one miller his arm. Putting a belt onto a fast running pulley from the wrong side, cost a fine young millwright his life. These accidents could not have been any worse to the victims if caused by any of the many dangers which the public are supposed to be protected from by the printed rules and regulations which, if the law is obeyed, are to be found in trams and steamboats.

More especially should young employees be cautioned against trifling or sky-larking around moving machinery. The ordinary dangers are great enough, without wilfully increasing them. The old saying, "familiarity breeds contempt," is as true of machinery as it is in its personal application. Loose clothing, dangling belts or straps—even long hair and whiskers, have been known to be the cause of many serious mishaps. Some years ago a young Irish emigrant was set to work a vertical drill in a machine shop. In reaching over for a lamp or tool the set screw of the drill socket caught in the loop of a small woolen neck tie he was wearing, and would have choked him to death in a few seconds had not the quick eye of a fellow-workman, with an equally prompt hand and ready knife, severed the belt driving the machine.

Instances by the score could be cited, were time and space at command, to show the necessity for more thoroughness, caution and attention to the constant dangers which beset the average mechanic and operator. It may be the writer's privilege at some time in the near future to put into shape many of the most important points that an experience extending over a quarter of a century has fixed strongly on the memory, that by so doing he may at least lessen in some degree the dangers and difficulties of those who have the road yet to travel.

Mr. Wm. Greer's large planing mill, sash and door factory at Mount Forest, Ont., was discovered to be on fire about two o'clock on the morning of Nov. 24th., and was totally consumed together with a large quantity of lumber. Mr. Greer had only \$1,000 insurance on the property, and will consequently be a heavy loser.

Messrs. Brown & Weston have leased the small island in the Ottawa river opposite Blyth's Point, and will next spring construct extensive docks over the entire island which will be used in future as a lumber piling ground, for which purpose it is admirably adapted.

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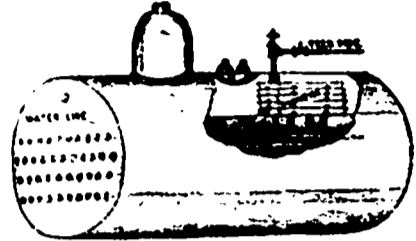
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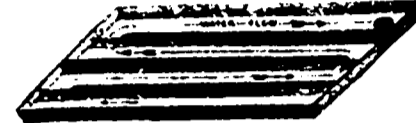
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Heat alone does it!

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

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



SHOWING POSITION OF PURIFIER IN BOILER.



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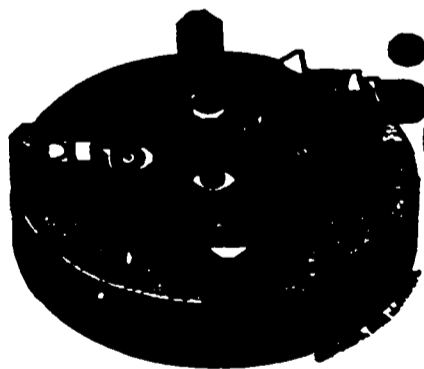
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LUMBERING

The saw mill at Wauhaushene has closed for the season.

On the Miramichi this year William Richards will lumber again. The great Chaudiere saw mills have suspended operations for 1887.

Jos. Charron, Jr., saw mill owner at St. Denis, Quebec, has assigned.

Mr. Young's saw mills at Young's Point, Ont., are undergoing improvements.

McElmon Bros., lumber dealers, Folly Lake, N. S., are reported to be in difficulties.

A new boiler is being placed in Mr. J. McDonnoughe's saw mill at Westover, Ont.

The exportations of lumber from British Columbia in 1886 were 75,000,000 feet.

Minnesota, Man., saw mills are reaping a profit from the sale of their sawdust.

The Georgian Bay Lumber Co., are putting in a new engine and other machinery.

Joseph Wheeler has erected his shingle mill in Freeton, Ont. It is now in full swing.

Nineteen million feet of lumber were exported from Ottawa to the United States last month.

Wilson Little and Alex. Morrison, of Donegal, Ont., will engage in lumbering at Warton, Ont.

Laurin & Capistrand, planing mill operators, Penetanguishene, Ont., have dissolved partnership.

Mr. H. C. Harrison, proprietor of the Norwood, Ont., saw mill, is fitting up a sash and door factory.

The Gilmour and Rathburn mills at Campbellford, have closed, the supply of logs being exhausted.

A former resident of Peterborough, Mr. Prehard is running the mill for Mr. Sils, at Meyersburg.

Mr. Cole's sawmill at Columbus, Ont., has been burned down. The building was insured for \$500.

Some of the launch ways of the big raft at Two Rivers, N. S., were carried away by recent storms.

Owing to the lowness of the water, considerable lumber has been hung up on the St. John River.

McLachlan Bros. have been compelled to close down their mill at Arnprior, owing to scarcity of water.

Messrs. Baker & Edmonson's mill at Uthoff, was burned down last month. The mill was insured for \$500.

From twelve to fifteen cars of lumber are being sent weekly from Selkirk to Winnipeg and other western parts.

A loss of \$8,000 has been incurred by the burning, at Trenton, Ont., of Messrs. Gilmour & Co.'s shingle mills.

Ottawa lumbermen are of opinion that less lumber has been cut in that locality this season than in former years.

The Strickland limits, north of Minden, Ont., have been purchased by the Christie Lumber Co., of Muskoka.

John F. Carter's saw mill at Bathurst, N. B., was recently destroyed by fire. Loss, \$5,000; insurance, \$2,000.

Mr. S. Cummer is building a new saw mill at Arranville, Ont., on the site of an old mill that stood for thirty years.

Jeffrey Bros., of Laggan, Man., are getting out 20,000 poles and some flat timber for the Galt Mining Company.

The schooner Corsaire, of the Parry Sound Lumber Co., has brought the boiler for the Company's new shingle mill.

Three million railway ties are to be furnished by Mr. F. E. Gould, of Cambridge and Colborne, to the Grand Trunk Railway.

The Canadian Lumber Cutting Machine Co., is to apply for an Act of Incorporation. The capital stock is placed at \$1,500,000.

Harrison's planing mill and sash factory at Owen Sound was destroyed by fire last month. Loss \$10,000; insurance, \$3,000.

The Dickson Company are building a dam twenty feet high and forty feet wide in a beaver marsh ten miles north of Minden, Ont.

The following Ottawa saw mills have closed for 1887: Messrs. Bronson & Weston, Perley & Pater, Grier & Co., and R. Hurdman & Co.

Lord & Hurdman's saw mills, Hull, Que., were entirely destroyed by fire on the 6th ult. Loss about \$75,000; insurance \$35,000.

At Point Wolfe, St. Johns, N. B., Bostwick's mill has closed down for the season, having cut about four and a half million feet of lumber.

An exodus of lumbermen has taken place from Fredericton for the Miramichi and Quebec lumber woods. Wages are \$18 to \$20 a month.

Morrison's shingle mill at Fredericton, N. B., will try the experiment of running all winter. The proprietor has also introduced the electric light.

Messrs. H. & J. D. Smith, of Stratford, Ont., intend erecting a saw mill at that place. It will be in full operation by the beginning of January.

The exports of lumber from Canada to the United States last month reached \$260,000. The total quantity of lumber shipped was nearly 10,000,000 feet.

Mr. Wm. Fowles, of Hastings, Ont., has purchased from the owners of the Harwood mills, which have shut down, sufficient logs to keep his mills going next season. He will therefore not engage in lumbering operations this winter.

The Midland and North Shore Lumber Co., of Parry Harbor, are adding to their plant a new 11 x 24 engine, shingle machine, cull boiler and drag saw.

Montreal has exported to date 25,870,330 feet of pine this season. This is 4,202,874 feet less than for the same period last year, and 5,005,183 feet less than in 1885.

A loss of \$800 has been incurred by the burning down of Alfred Jones's sash and planing mill, Rochesterville, Ottawa. The premises were only partially insured.

Logging operations are now commencing in the Keewatin Territory. The Rat Portage *News* reports that Cameron & Kennedy, of that place, have sent out three camps of men.

The Grangers on the Aroostook are reported to be holding large meetings and passing strong resolutions against Aroostook lumber being driven into New Brunswick, and manufactured there.

About a million feet of lumber has been washed ashore on Lake Huron, between Point Clark and Inverhuron, Ont., and it is reported that the farmers in that vicinity have been confiscating it.

From the Parry Sound *North Star* we learn that at S. and I. Armstrong's camp on Parry Island, two teams in thirty-five days drew from the stumps to the lake, 4,926 logs and 163 pieces of boom timber.

Messrs. R. W. Thistle & Co., of Ottawa, have purchased from Mr. J. R. Booth, the limit situated on the South Branch of the Indian river, the area of which is about 100 square miles. The price paid was \$25,000.

The boiler in Fred. Baechler's saw mill, Elma township, Ont., blew up, totally wrecking the engine and the roof of the building. Fortunately no lives were lost, as the men were all in the yard piling lumber. Loss about \$1,200.

The two mills of Mr. E. B. Eddy, one in Hull and the other on the south shore of the Ottawa river, have shut down for 1887. Over one thousand hands were engaged at these two mills. Mr. Eddy has sent gangs of men to the woods.

A number of prominent Ottawa lumbermen propose establishing a factory for the manufacture of paper pulp from the waste pine and spruce ends and boards. The project has met with success in the United States, the paper obtained being excellent.

A plan is being devised by the lumbermen of the Upper St. John to dam the river above the Grand Falls for the purpose of holding their lumber in spring, and to assist in driving in low water. There is some talk about the formation of a joint stock company.

The *Orillia Packet* says: Messrs. Heath, Tait & Turnbull have entered into a contract with Messrs. Thompson & Baker to take out of the woods and manufacture all the timber on their Sinclair limit, estimated at 25,000,000 feet. It will take about seven years to complete the contract.

Chatham Planet: Last Sunday, Robinson & Overton's saw mill was totally destroyed by fire, boiler excepted. It cost \$2,000, uninsured. Supposed cause, coal from tobacco pipe. Impossible for the men to do anything towards saving it, through lack of water. The owners are re-building.

The great Nova Scotian timber raft is nearly finished, and a further attempt to launch it will be made next spring. The raft is composed of 250,000 pieces of timber, and when completed, will be 550 feet long, 35 feet deep and 50 feet wide. It is held together by chains arranged in such a way that it is impossible for them to slip.

At Montreal, lumber is steady in price. The market is better than it has been, and there is little to grumble at, though expectations previously arrived at have not been realised. It is surmised that an advance in price will take place, owing to the fact that the contractors have purchased less than their requirements will necessitate.

The Fredericton, N. B., boom company this season rafted 100,000,000 feet of lumber. The total amount of lumber brought down the St. John river this season was 112,000,000. The prospects for this winter's cut are reported to be about the same as last winter. The lumber market is about the same as it was this time last year, and the contract prices, as a rule, are the same.

On the evening of Nov. 7th, fire broke out in Reynolds & Secord's saw mill at Reynoldsville, three miles south of St. Catharines. Owing to the inflammable nature of the building and the high wind prevailing at the time, the fire spread to the adjoining barrel heading factory and lumber piles, completely destroying them, together with H. F. Reynolds' stables. Loss, about \$15,000; insurance, \$5,000.

Here is a modicum of interesting news for Canadian saw mill owners and others. The Papineauville, Que., Council has stated that no tax shall be levied for fifteen years on any person or persons who erect saw mills or other manufactories in that locality. An Arnprior firm, Messrs. McLaughlin, and a Brashear firm, Messrs. Gillies Bros., it is rumoured, intend to take advantage of this promise.

An Ottawa despatch says: the effect of the heavy snowfall of last winter in curtailing the cut of logs is now being fully experienced in lumber circles. Prices have undergone a considerable advance during the summer in consequence of this and of the lowness of water in the Ottawa, which resulted in the "laying up" of thousands of logs and a reduced cut. The output of many of the mills is averaged to be from fifteen to forty per cent. less than last year's figures.

Letters patent under the great seal of the Province of Ontario have been issued incorporating the Lakefield Lumber and Manufacturing Company with a capital stock of \$300,000. The first directors are Messrs. Roland C. Strickland, Terry W. Strickland, C. J. Blomfield, W. H. Casement, and F. R. Harke, all of Lakefield. The objects of the company are to acquire the mills, limits and business of Messrs. R. & G. Strickland, to carry on the business heretofore carried on by them, and to more thoroughly develop the Lakefield water power. The chief place of business will be at Lakefield.

The export of Canadian lumber to the United Kingdom has greatly decreased during the present year. The English board of trade returns show the import of Canadian hewn timber for the first nine months of 1885, amounted to £830,602. The first nine months of this year shows a falling off of about 50 per cent., the value being only £428,627. Sawn, split and dressed woods have declined from £1,674,710 to £1,364,090.

Mr. Robert S. Wilson has been admitted as a partner into the lumber firm of McCraney & McCool of this city. Mr. Wilson will occupy the post of resident manager of a branch which the firm has recently opened at Ottawa. The firm has mills at Oakville, Burlington, Bronte and Huntsville, and makes a speciality of long bill stuff and dressing and the higher grades of pine. The firm is now trading under the name of McCraney, McCool & Wilson.

According to a statement issued by the Quebec Supervisor of Cullers, the following comparative quantities of timber, masts, bow-sprits, spars, staves, &c., had been measured and culled to the 16th inst. —

	1885.	1886.	1887.
Waney White Pine ..	2,876,753	3,077,331	2,056,004
White Pine	2,820,045	3,037,738	1,168,143
Red Pine	73,766	273,767	591,646
Oak	1,566,968	1,039,632	746,243
Elm	1,018,932	399,698	221,309
Ash	287,595	138,485	113,478
Kisswood	95	432	535
Butternut	3,205	192	1,079
Tamarac	3,622	6,864	5,507
Birch and Maple	381,085	227,183	116,694
Masts and Bowsprits ..	— pcs	104 pcs	— pcs
Spars	— pcs	— pcs	— pcs
Sid. Staves	144,2110	65,1228	44,7115
W. I. Staves	185,9325	128,7029	156,0055
Bal. Staves	209,2024	19,0316	15,4011

The *Ottawa Free Press* says: "Although the lumber mills in the city and its immediate vicinity are still at work, a walk about the Chaudiere and Rideau falls districts shows that there is not the activity of a usual season there, and enquiry shows that appearances do not belie the facts. Through the great portion of the season the production of lumber not only here, but all through the district of the Ottawa and its tributaries has been somewhat dragging, primarily owing to low water, and as a result of that scant supply of logs. This has not affected prices, however as in nearly all cases the millmen sold their season's cuts, in anticipation in the spring, so that the only disappointment is in the quantity of production, not in the rates obtained. In fact what few lots remained unsold have somewhat stiffened in price since it became evident that there would be a shortage in the cut." The shortage in output is placed by leading operators at about 100,000,000 feet, but it is not expected that this will affect prices to any extent in the American market.

TRADE NOTES

The Geo. T. Smith Co. are at present running part of their shops at Stratford night and day, with two gangs of men.

S. F. Johnston & Bro., of Columbus, have bought of Wm. & J. G. Greey, of Toronto, a No. 1 wheat brushing and polishing machine, and one of their new flour dressers.

Mr. Bradley, of the Flesherton mills, now changing to the roller system with Greey's machinery, has ordered two more of Greey's new flour dressers, as being superior to the old style hexagon reel which they displace.

Norton Bros., of Chicago, have entered into arrangements with W. H. Hanfield, Machinist and Die Maker, 80 Wellington Street West, Toronto, for the manufacture of their fruit can machinery for the Dominion of Canada.

We would call attention to the advertisement of C. Wilson & Son, Esplanade Street, Toronto, who make over 100 different style of scales for flour mills, and manufacturing purposes. They have just furnished Christie, Brown & Co. with an improved five ton automatic scale. The scale dispenses with the use of loose weights, and subtracts the weight of the wagon from the load, without the use of any figures. Any person desiring to purchase a scale of an improved pattern should write to this firm, stating capacity of scale wanted, when the lowest prices will be quoted by return of mail.

J. J. Minns, of Leamington, has purchased the Hylthwood mill from Isaac Willan, and intends converting it into a full roller system mill. Messrs. Wm. & J. G. Greey, of Toronto, secured the order for the outfit, and will put in a short system, using eight pairs of 9 x 12 and 14 inch rolls, improved flour dressers, and other machines of their manufacture, to make a complete mill. This will be the tenth roller mill built in the county of Essex by the Messrs. Greey.

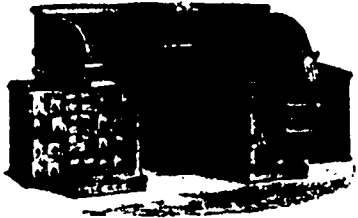
Messrs. Robin & Sadler, leather binding manufacturers of Montreal and Toronto, have received an order from the mill builders, E. P. Allis & Co., of Milwaukee, Wis., for the binding to be used in the recently erected flour mill at Keewatin. Canadian manufacturers now, and for some time back, have received such contracts, though some years ago orders of this description were almost exclusively secured by American makers. Home manufacturers are however, now able to compete successfully with foreign establishments.

The tests made at Peterborough on Mr. W. F. Cochrane's new roller process flour mill, were so satisfactory that an American Company has purchased, for the sum of \$200,000, the sole right of manufacturing it in the United States. The output of flour from it, as shown by the tests, is said to be double that obtained, at an equal expense, from any other roller process mill. A company has been formed in Dundas for the manufacture of the machinery. This will tend most materially to the industrial activity of that locality.

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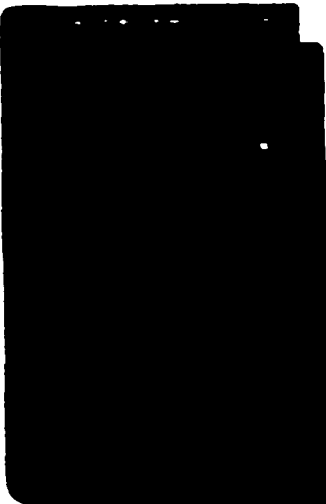
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OTHER PEOPLE'S OPINIONS.

BOLTING surface costs money; hence it is an object to economize in bolting surface as much as possible. There is perhaps no greater fault and consequent loss in many mills than an excess of necessary bolting surface. This is the result of wrong calculation, and sometimes of improper granulation. An even, correctly granulated product is more easily and satisfactorily bolted than an unevenly granulated product, and the first will take the least cloth. To get the numbers and length of cloth exactly adapted to the stock desired to be bolted is the question. Here is where many errors are made. The old hexagon is a great consumer of cloth. A certain number of reels are provided, and all must be clothed the whole length, whether one-fourth of the cloth is used or not. It does not pay to clothe a reel the whole length unless we are to need it, although a half clothed reel would be a sorry sight to many millers. Something is gained by the use of shorter reels, but the greatest advantage rests with the improved round reels in economy of cloth. One reason why they are satisfactory is that they are furnished as a separate machine, are designed and clothed for a specific work, and hence are clothed correctly for that work; so that, aside from their increased capacity, there is an economy of cloth. Again, they are more convenient for inspection, and thereby likely to be better regulated. It really appears as if by these improved reels the best results can be accomplished as to economy of cloth, etc.; but careful study, and attention to reductions, might lead to a greater economy of bolting surface in many mills.—*Millers' Review*.

R. James Abernathy: Crease dirt, so-called, is nothing more nor less than scourings mingled with the flour made by a first break wire scalper. The quantity of such so-called crease dirt will be always largely in proportion to the amount of cleaning and scouring the wheat has received before reaching the first-break machine. The better it has been cleaned the less there will be. Still it is not likely that wheat can be so perfectly cleaned, unless entirely hulled, but what some dirt in the way of fine bran scouring will be made by the action of the corrugated rolls and the wire scalpings. Nothing more strongly illustrates the evils in the practice of elongated milling than the foregoing facts.

There is as much difference in short system milling as there was ten years ago in millstone milling. With improper corrugations, a too slight differential, too little roll surface and too heavy feed, some short system millers make a slight proportion of middlings and a large proportion of soft break flour; while those who are right on the above requirements are making over fifty per cent. of nice middlings and a sharp break flour. The latter, of course, are the nearest to correct milling on the short system, and their work will overcome the prejudice of many millers.

If there is a point on which millers are apt to be a little lame just now, it is lack of acquaintance with roller machines and their mechanical principles. It is not likely that the best conditions for short system work have yet been ascertained, but the most successful short system millers, those who are making good middlings and short break flour, are using a differential of four to one, the roll running 400 to 500 revolutions per minute, the corrugations being round (never sharp except on bran cleaning), commencing twenty-two to the inch on first break, and length of roll surface being twelve inches for each barrel per hour capacity. This may seem long to some, but it pays. As to the number of breaks, there is a diversity of opinion, but it depends on the kind of millit. that you want to do, varying from one to four. A miller of much experience says one or two breaks for custom and three for merchant milling. I have seen good granular work done and clean bran made with one break on spring wheat, but winter wheat would require another break to clean the bran well. For myself, on winter wheat, milling for middlings, I would have four breaks, using the length of roll mentioned above.—*Modern Miller*.

Experience shows that the labor spent in washing the surfaces of buhrs before dressing is labor well applied. Water, brush and sponge will put the surface in proper condition for dressing. The best time to wash the buhrs is while they are yet warm from working. Just after stopping the deposit on the faces will be soft and easily removable, and the warmth still in the stone will hasten the drying of the stone and prevent the absorption of unnecessary moisture. Well-washed stones are more easily dressed than those whose surfaces are gummed over, and clean stones will turn out a better product than dirty ones. The water must not be ap-

plied so that the moisture does not soften the cement between the sections of the stone. Millers who have tried the plan recommend the application of hot water by a sponge to a portion of the stone at a time. The stiff wooden brush is next used, and the surface is then sponged dry. The work is easy, simple and quickly done, and it will repay the trouble over and over.—*Milling World*.

IMPROVEMENTS IN OATMEAL MILLING.

A CORRESPONDENT, over the initials "W. B.," writes as follows on the above subject to the *London Millers' Gazette*:

In the *Millers' Gazette* of Oct. 3 ordinary Scotch oatmeal is quoted at £10 to £11 per ton, the best Scotch Midlothian oatmeal £13 to £14 per ton, being a difference of £3 per ton.

Such a difference ought to have stimulated opposition in the milling of oats before now, but beyond one or two examples, notably Carr & Co., of Carlisle, and Cowan, of Montrose, the "land o' cakes" is comparatively lifeless in the matter.

Not so the milling interest of the Far West, as you will perceive from two papers which I clip from the columns of the *Montreal Weekly Witness* of Sept. 14, 1887, the one from a correspondent, "B," under the heading of "Oatmeal," and the other a leading article by the editor, under the attractive heading, "The Parritch." Both have apparently, in the opinion of the writer, the same object in view, viz., improvements in the manufacture of oatmeal for exportation to this country. It would appear that at present about 80,000 barrels are exported from Canada annually. The price realized I am not able to say with certainty, but it is probably £4 per ton less than the lowest Midlothian quoted above, i. e., £9 per ton.

If Canadian oatmeal millers can make oatmeal equal to the best Midlothian, which is £14 per ton—(and what is to prevent them?)—they will have reason to congratulate themselves on the supineness of the oatmeal millers of this country, more especially those of Scotland and Ireland, where oats are largely milled. In both the consumption of wheaten flour is largely on the increase, but much of this, it must be confessed, is due to the inferior quality of the oatmeal made. In this, however, there is a *per contra*.

It will be seen from the editorial article in the *Witness* that in the United States and Canada it is otherwise: "Oatmeal has become a regular morning dish at the tables of most people. In the United States porridge as regularly heads the breakfast bill of fare in the large hotels as soup the dinner programmes. Oatmeal has become almost a recognized necessity. In Canada, it is, we believe, almost universally used by all classes of all nationalities.

In England, as well as in Scotland and Ireland, the use of porridge, not only at breakfast, but also at supper, is on the increase, and were improved oatmeal made equal to Midlothian, the consumption would be greater. What prevents the use of oatmeal is the harsh and somewhat bitter taste of the common sorts, and the objectionable way porridge is made, especially in England, by steeping the meal over night in water for the breakfast porridge next morning. Add to this the fact that the meal is old and musty, having been kept in small paper parcels for months, if not years, in succession, and that much of the oatmeal sent to England is specially manufactured for dog kennels. But such a state of things is fast coming to an end, for people are becoming more intelligent as to the dietetic value of oatmeal, and the growing necessity there is for its improvement to suit the requirements of all classes, old as well as young. At one time paterfamilias, although he did not like porridge himself, strongly advocated its use for children. But the fact is old people and the middle aged enjoy their porridge with as much relish, if not greater, than when they were in their teens and childhood. True it is that when bones, nerve, and muscle are growing they use up the raw material of which they are made; but it is equally true that during middle life there is a greater wear and tear upon the system than in early life, and that during old age the natural decay of the body has its special demands upon the porridge, so that the old philosophy of paterfamilias must be left behind in the milling race.

What most concerns the oatmeal milling interests of this country is the marginal difference of £3 between the ordinary and best quality of oatmeal, and the support which it gives to establish an import trade. Once established, a foreign trade in oatmeal can be kept up although the price falls to the ordinary level, if not below it, as is experienced in the importation of foreign wheaten flour. The starting of a new trade is always attended with extra expense, and the importation of American and Cana-

dian oatmeal is not an exception to this rule. As "B," the correspondent of the *Montreal Weekly Witness* justly observes, when they began to export butter it was only fit for grease. The same was true of cheese, which could not be sold in England at any price. Dairy experts were sent to England to examine for themselves and now Canadian cheddar is as good, and even better, than the ordinary home-made, and very generally is preferred, because it is got for less money. This brings us to the all-important question, "Will it be otherwise with oatmeal? Can American oatmeal be imported at £11 per ton equal in quality to the best Midlothian now quoted at £14 per ton?"

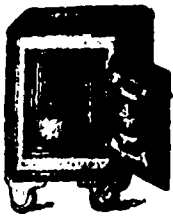
The question is a very plain one, and must be answered in the affirmative, unless a movement is made by our oatmeal millers to prevent the establishment of a foreign trade by bringing down the marginal difference of £3 per ton to the normal level of £11. It is a well authenticated fact that the quality of oatmeal very largely depends upon the quality of the oats, and that our best oats make better meal than the best American. This, however, is only present experience, for the farmers and millers of the United States and Canada will spare no expense in introducing and growing new varieties suitable for their climate and soil equal, if not superior, to our best grist, as they have done in wheaten flour milling.

It is not, therefore, one thing that has to be attended to, for we have to improve the quality of our oats, as well as the manufacture of oatmeal, before we can keep pace with the times. Our farmers must get into harness with the miller before we can expect a successful going team in competition with foreign rivalry.

THE LUCIGEN.

A VERY successful demonstration of its great lighting powers, says *Iron*, was recently given at the Crystal Palace. The method of producing this light consists in forming an intimate mixture of air and minutely divided oil particles, resulting, when ignited, in a continuous, steady flame of great brightness. The mechanism, which is very simple, is worked by a small supply of compressed air, and the flame is under perfect control by merely turning a tap. As the light is produced by the combustion of crude and waste oils, its cost is, by actual measurement by the official gas analyst for Glasgow, found to be from one-tenth to one-twelfth the cost of gas, and about one-twentieth that of electric light of the same actual candle power. It is stated that an area of half a square mile can be flooded with light equal to daylight at an expenditure of one shilling and three pence per hour. As shown at the Crystal Palace, the lucigen illustrated very perfectly the great volume of light it is capable of giving out. It was found that ordinary manuscript could be read at a distance of 150 paces from a jet which was stated to cost 3d per hour. The great value of this light lies in its diffusiveness, which adapts it so admirably for use on works or where any outdoor operations have to be carried on at night. The true principles of useful lighting, it would seem, are only now beginning to be understood. It has always been overlooked that the eye is the first factor in determining the success of illumination, as it is by the aid given to accurate sight that work is to be done. Now, the amount of light the eye will receive depends on the size of the pupil, and the latter depends on the intensity of the source of light, and not on the amount of light given out. Should the intensity be great, the pupil closes so as to protect the delicate retina from injury, and hence the eye receives little of the light reflected from surrounding articles, and the illumination appears very bad. Should the intensity be low, then the pupil does not close nearly so much and surrounding articles seem much better illuminated. Hence a naked arc lamp in a room is so blinding that work cannot be done; but when an opalescent globe is placed over it, so as to reduce the intensity, the eye sees details in the room much better, although the opalescent globe has cut off three-quarters of the light. Looked at in the light of these explanations, the effect of the lucigen may be imagined, as it is said to produce a flame of 3000 actual candle power, or equal to six large arc lamps, while its radiative surface is about 350 square inches, as against one square inch for the arc lamp. The result is that the lucigen gives a light of a quality highly effective for working purposes.

The lucigen marks the latest advance in the history of the production of light from carbonaceous substances, as not only does it raise the carbon particles to the most intense white heat, but the form of the flame is such as to retain them in that condition for the longest period. The lucigen has been adopted at a large number of works in this country, including those of the Forth Bridge, and it is also in use by the French government for military operations.



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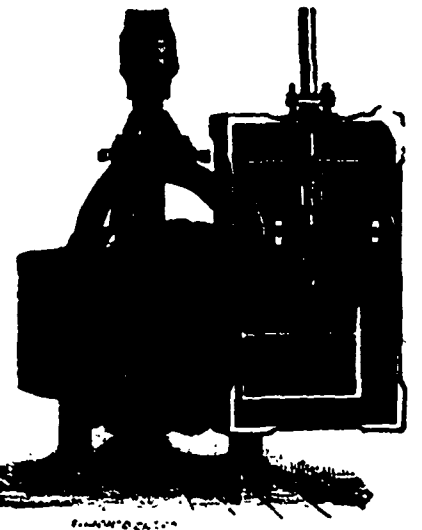
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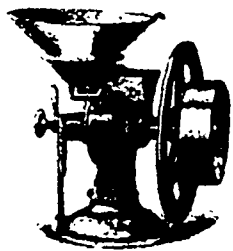
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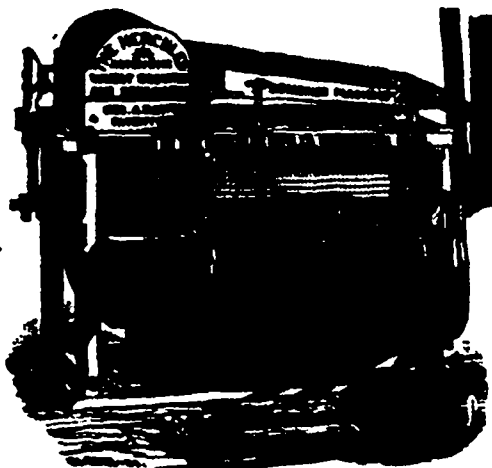
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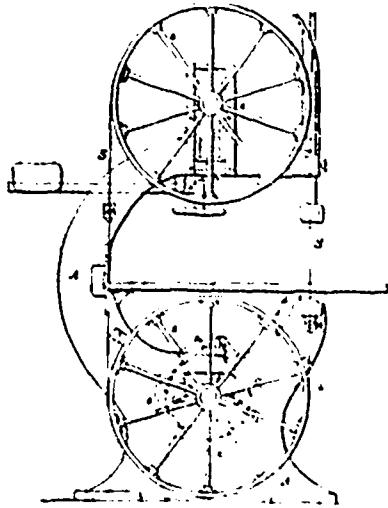
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Latest Canadian Patents.

Hand Raising Machine.

373,031. John R. Thomas, Boston, assignor to the S. A. Woods Machine Company, of Massachusetts. Filed August 11, 1886. Serial No. 210,602. Dated Nov. 8, 1887.



Claim 1. The combination of the tight pulley 13, the shaft 18, the belt-shipping lever 17, and the arm 14, attached to the shaft and carrying break shoe 15, bearing against the inner face of the pulley.

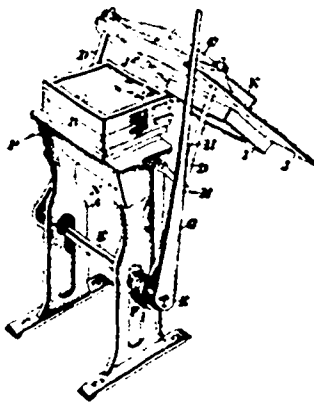
2. The combination of the tight pulley 13, the shaft 18, the belt-shipping lever 17, the arms 14 & 15, provided with set-screws 16 & 17, and the arms 13, located between the matter and carrying break-shoe 15, bearing against the pulley.

3. The combination of the hand-saw wheel shaft 12, the casting 11, carrying the shaft in its bearings and provided with the downwardly projecting arm 12, with the wedge 10, bearing against the side of arm 12, and its raising and lowering screw-shaft 17.

4. The combination of the upper hand-saw-wheel shaft 12, the casting 11, carrying the shaft in its bearings and pivoted upon the transverse pivot 11' and provided with the downwardly projecting arm 12, the wedge 10, moving vertically and bearing against the arm 12, and its raising and lowering screw-shaft 17, extending downward therefrom in a direction substantially vertical, and provided with the hand-wheel 18 at its lower end, whereby the latter is brought within the reach of the operator while standing in front of the saw-table.

Band-Molding Machine.

371,556. Charles Dawson, Peterborough, Ontario, Canada. Filed August 21, 1886. Serial No. 211,493. Patented in Canada Sept. 3, 1886, No. 24,857. Dated Oct. 18, 1887.



Claim 1. A cross-head, C, connected to the vertical rods D, the lower ends of which are journaled on the shaft E, in combination with the cranks F, fixed to the shaft E and pivoted to the bars G, which are pivoted on the frame A, and a handle, H, fixed to the shaft E.

2. The combination of a cross-head with a peening-frame connected to said cross-head and adapted to move up and down with the same.

3. The combination, with the cross-head, of a peening-frame I, connected to said cross-head and constructed to move from under the same.

4. A cross-head, C, having the arms J, in combination with the peening-frame I, carried on the arms J and operated by the rod K.

Ball-Turning Lathe.

372,460. Tronson Draper, Petrolia, Ontario, Canada. Filed April 19, 1887. Serial No. 235,337. Dated Nov. 1, 1887.

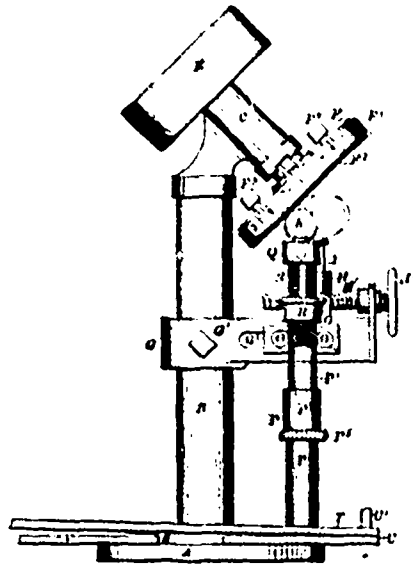
Claim 1. In a ball turning lathe, the combination, with a leather covered face-plate, of a stretcher for stretching the cover on the face-plate.

2. A face plate consisting of a disk adapted to be screwed to the lathe spindle, a leather covering secured to rim of said disk, a disk of rubber or other elastic material placed at the back of said leather cover, and a stretcher acting against the rear face of the rubber backing to force it against the leather.

3. The combination, with a metallic disk adapted to be screwed to the spindle of the lathe, of a leather cover secured to rim of said metallic disk, a disk of rubber or other elastic material used as a backing at the rear of said leather cover, a disk placed between the metallic disk and said elastic disk, and set screws screwing into the metallic disk against the disk placed between the metallic disk and elastic disk, so as to stretch or slacken the leather cover.

4. The combination, with a leather-covered face-plate, of a leather wheel held in contact with the said face plate and rotated by

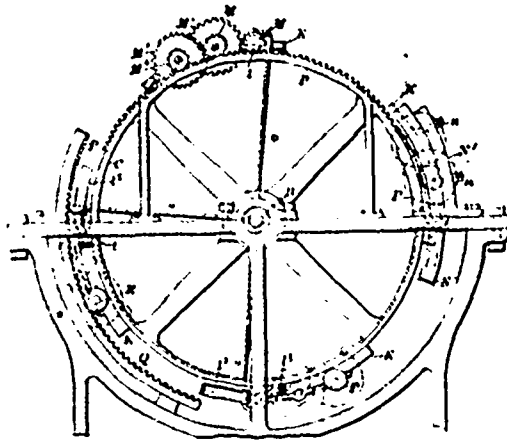
the latter, a second leather wheel having a concave rim and held on same spindle as said wheel, in contact with the face plate, a



cup holder, and a cup supported at the upper end of said cup holder and having a cutting edge.

Machine For Threading Bolts and Nuts.

372,541. Frank M. Kennedy, Youngstown, Ohio, assignor to Edwin Bell, Jr., same place and Henry J. Kennedy, Hadley, Pa. Filed April 26, 1887. Serial No. 236,229. Dated Nov. 1, 1887.



Claim 1. In a machine for screw-threading bolts, the combination, with the die-operating mechanism and dies, of the wheel D and the hook-holding devices thereon, consisting of the cam 13, the levers F, the sliding blocks 11', secured to said levers, and the stationary blocks 11.

2. The combination, in a machine for making bolts, of a revolving wheel or disk carrying bolt-holding devices, with a tool for finishing the head of the bolt, gearing for rotating said tool, and a stationary arc-shaped rack with which said gearing engages as the wheel revolves.

3. In a bolt or nut threading machine, the combination of two similar wheels or disks adapted to travel together, one of said wheels carrying devices for holding the article to be operated upon the other carrying operating tools and gearing for imparting motion to the same, with two stationary racks adapted to engage alternately with the gearing as the said wheels revolve, and thereby turn said gearing alternately in opposite directions.

4. In a bolt-threading machine, the combination of two wheels or disks mounted upon a common shaft and turning together, one of said wheels carrying threading devices and gearing for operating the same and the other carrying a device for finishing the heads of bolts, and gearing for rotating said device, with stationary racks adapted to engage with said gearing, and thereby rotate said threading and finishing tools.

5. In a machine for cutting threads, the combination, with the thread-cutting tool, of devices, substantially as described, for causing said tools to turn alternately in opposite directions, and comprising, essentially, a shaft upon which said tool is mounted, a cog-wheel on said shaft, other cog-wheels gearing therewith, and two racks adapted to alternately engage with the same cog-wheel in the train.

6. In a machine for cutting threads on bolts, the combination, with a wheel carrying a cutting tool mounted upon a sliding shaft, gearing for rotating said tool, and a pivoted lever at one end of said sliding shaft, of a stationary cam plate adapted to operate said lever, and thereby force said tool forward, and stationary racks adapted to mesh with the gearing, and thereby turn the tool as the tool revolves.

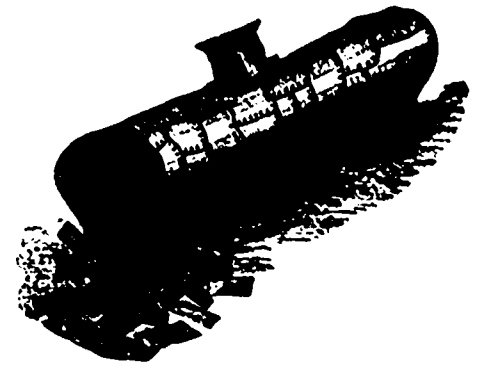
7. In a thread cutting machine, the combination, with the wheel C, the sliding shaft I, the tool 11, mounted thereon, cog wheel M M', and rack P, of the pivoted lever 12 and the cam plate N, adjustable towards and from said rack.

8. In an organized bolt-threading machine, constructed substantially as described, the combination, with the bolt holder and the threading tool, of the forked rod 14 and spring F.

Our enterprising contemporary, the Winnipeg *Sm* issued a large and handsome special number on thanksgiving day, the get up of which is a credit to the publishers, and the city of Winnipeg, the business interests of which are represented by numerous pages of attractive advertisements.

THE BOILER THAT JACK BUILT.

This is the boiler that Jack built,
These are the plates marked B for best
That for use in tanks may stand the test;
But don't use them in boilers, is our request,
If you don't want a boiler like Jack built.



This is the way the plates were bent,
Making fractured holes and serious dents,
And time and labor foolishly spent,
In making the boiler that Jack built.



These are the drift pins tapered so fine,
Driven into blind holes to force them in line,
And driven hard in with murderous clip,
Starting cracks from the holes, causing deadly seam rip,
In the plates of the boiler that Jack built.



This is the chisel so easy to prove,
That is foremost in starting the treacherous groove,
By scoring the plates with its corners so keen,
And gouging it deep along the whole seam,
That little strength's left is easily seen,
In the plates of the boiler that Jack built.



This is the boiler looking so slick,
For both inside and out the paint laid on thick,
And all ready to test for the owner to see,
And as the pump starts, so the boiler leaks free,
Owner is dodging the streams squitting around,
Gauge kicking hard to pass fifty pounds,
Pumping is stopped as crack goes a seam,
Owner's told 50 cold's good for hundred in steam,
And that all new work leaks some, but that little sup,
Why when steam is on will all take up, and soon will be as tight
as a cup,
So off goes the boiler that Jack built.



This is the take-up, sure enough,
Of boilers built of doubtful stuff,
And fractured plates and drifted holes,
And sledge blows used in place of rolls,
And deadly grooves with chisels keen.



The result of such is often seen,
That in such a take-up means a general wake-up,
And the homes of many break up, as their loved ones lives were
gave up,
In the bursting of the boiler that Jack built.

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Notice to Contractors.
SAULT SAINTE MARIE CANAL.

CONTRACTORS intending to tender for works of construction of the canal proposed to be formed on the Canadian side of the Saint Mary's River, are hereby informed that tenders will be received about JANUARY next, and that the most favorable time to examine the locality will be between the present time and the early part of November next.

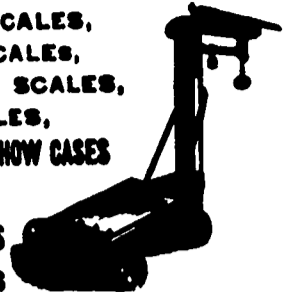
When plans, specifications and other documents are prepared, due notice will be given. Contractors will then have an opportunity of examining them and be furnished with blank forms of tender, etc.

By order,
A. P. BRADLEY,
Secretary.

Department of Railways and Canals,
Ottawa, 24th August, 1887.

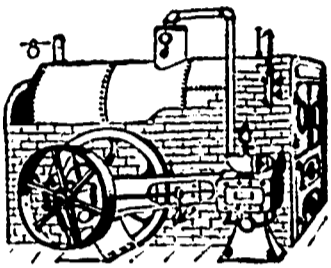
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Screw Conveyor. Apply to F. ROY, General Agent,
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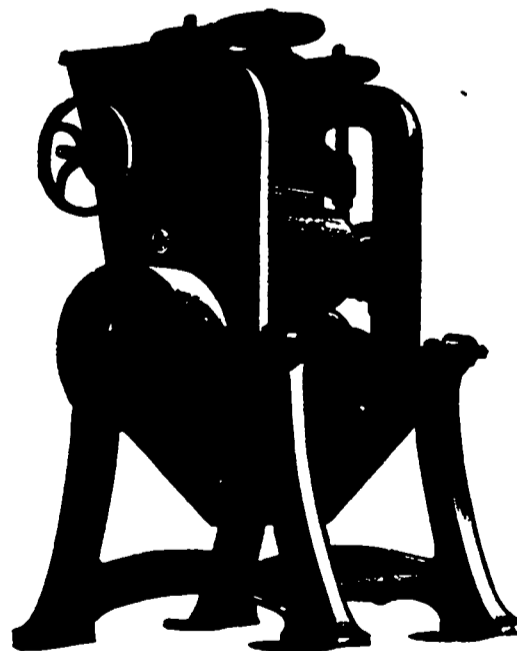
JONES' -- SHORT -- SYSTEM

THE LATEST AND BEST

**FOR MERCHANT AND CUSTOM
MILLS COMBINED.**

This system has been demonstrated to be superior to any long system now operated. The machine used in the reduction of wheat and middlings is a Two-Roller Disc machine, one set of corrugated rolls for bran, one set of smooth rolls for germ, and one stone roll for purified middlings. This combination with proper bolting and cleaning machinery, will produce better results than if more machinery were used. The difference will be in the color of the flour.

CAPACITY—75 Barrels per Day from Fall Wheat.



**JONES' SHORT SYSTEM FOR
CUSTOM MILLS.**

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

CAPACITY—50 Barrels per Day from Fall Wheat.

TESTIMONIAL

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

ABINGDON, September 18th, 1887

JAMES JONES, ESQ., Thorold, Ont.

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

Yours truly,

R. A. SHEPHERD.

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

GODERICH FOUNDRY AND MACHINE WORKS.

RUNCIMAN BROS. - PROPRIETORS.



WE ARE MANUFACTURING AND SELLING ALL KINDS OF MACHINERY FOR

GRADUAL REDUCTION ROLLER MILLS

— WILL FURNISH PLANS AND SPECIFICATIONS FOR —

FLOUR MILLS, SAW MILLS, STEAM ENGINES AND BOILERS

We make valuations of all kinds of Machinery when required ; we also take contracts to furnish Gradual Reduction Roller Mills with all the Latest Improved Machinery, and hand them over in complete working order, guaranteeing good results. MESSRS. R. and JAMES S. RUNCIMAN will look after the mill work, and give their personal attention to all contracts, and from their long experience in mill work, parties trusting them with contracts may depend on having the work well done. We have a very complete stock of Patterns for mill work and other things, and parties in want of Castings can be supplied here by sending in their orders.

We are making Roller Frames and Cabinets for small or large Mills, using the Genuine American Ansonia Chilled Rollers, Corrugated and Smooth, as follows : 6x12, 7x14, 9x14, 9x18 and 9x24, neatly fitted up and belted at both ends. They run perfectly noiseless.

Centrifugal Reels for Bolting Flour, Bolting Reels with Double Conveyors, Scraping Reels, Purifiers to Clean Middlings, Flour Packers, Oat and Cattle Separators, Smelters, Brush Machines, Dust Catchers, Bolting and Wire Cloth, and all kinds of Mill Furnishings.

MILL AND OTHER REPAIRS ATTENDED TO ON SHORT NOTICE.

Steam Engines and Boilers made, and set up to order. Some second hand Engines and Boilers for sale. SEND FOR PRICES.

To Mill Owners and Manufacturers.

— USE —

Phoenix :- Belt :- Oil,

THE ONLY PERFECT BELT DRESSING.

TO BE HAD ONLY OF

F. E. DIXON & CO,

— MANUFACTURERS OF —

PAT. LAP-JOINT LEATHER BELTING STAR RIVET

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

70 King St. E., Toronto.

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 Mill Machinery and Furnishings.

R. WHITELAW,

Oxford Foundry - Woodstock, Ont.

GOLDIE AND McCULLOCH, GALT, - - - - - ONTARIO

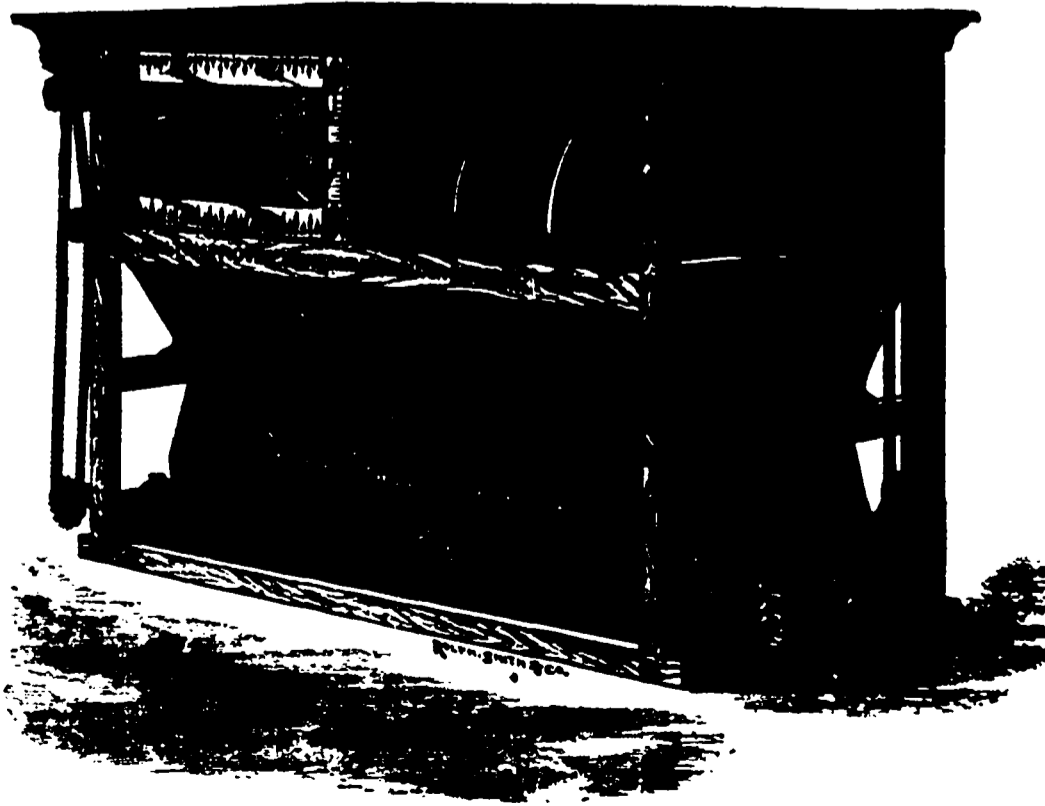
TO PARTIES WHO CONTEMPLATE

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.

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

**THE WHELOCK AUTOMATIC ENGINE,
WOOD WORKING MACHINERY,
SHINGLE AND BARREL MACHINERY.
WOOL MACHINERY.**
Special Price Lists furnished: application.



FIRE -:- AND -:- BURGLAR -:- PROOF.
SALTERS
V. A. DILLI -:- DOORS, -:- & CO.
First Prizes Awarded, Toronto, 1888, 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.

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

STRATFORD, - - ONTARIO

MANUFACTURERS OF THE

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

INCLUDING THE

GENUINE BROWN ENGINE

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

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

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

Three Roll Chop Mills :

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

Waterford, Oct. 10th, 1887.

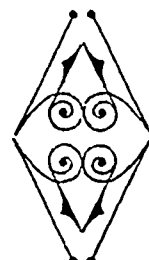
S. S. Heywood, Gen'l Manager.

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

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

Yours truly,

A. C. DUNCOMBE



Canton, 16th Nov., 1887

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

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

Truly yours,

W. H. KINSMAN.

Arthur, Oct. 28th, 1887

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

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

Yours truly,

COLEMAN & WIEGAND

Office of Ehnes & Williams,

Zurich, Sept. 14th, 1887

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

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

Yours respectfully,

EHNES & WILLIAMS.

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

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

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

Yours truly,

JOHN S. McKAY,
(Millwright in Charge)

It will pay you to visit some of our full CENTRIFUGAL MILLS and compare results with mills built upon other systems.
ALL ENQUIRIES WILL RECEIVE CAREFUL ATTENTION

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

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

United States Shops, JACKSON, MICH.

STRATFORD, ONT.

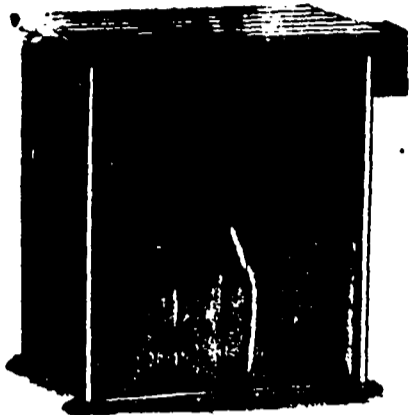


ST. CATHARINES SAW WORKS.
R. H. SMITH & CO.
 ST. CATHARINES, ONT.,
 Sole Manufacturers in Canada of
THE "SIMONDS" SAWS
 AT GREATLY REDUCED PRICE.
 All our Goods are manufactured by the "Simonds" process.
 Our Circular Saws are unequalled. We manufacture the
 Genuine HANLAN, LANCE TOOTH, DIAMOND, NEW
 IMPROVED CHAMPION, and all other kinds of cross-
 cut saws. Our Hand Saws are the best in the market, and
 as cheap as the cheapest.
THE LARGEST SAW WORKS IN THE DOMINION.



Montreal Saw Works
 CHAS. M. WHITLAW, Manager,
 COMPLETE STOCK UP
 Leather Belting, Lace Lathing,
 Gunners, Cutters, Saw Sets,
 Rubber Belting, Emery
 Wheels, Swages and Files,
 General Mill Supplies,
 ALWAYS ON HAND.
 MANUFACTURERS OF CIRCULAR, GANG
 PIT, ICE, CROSS-CUT, ONE-MAN,
 CROSS-CUT AND HILLET
 WEBB
SAWS
 TAPER GROUND SHINGLE SAWS
 A SPECIALTY.
 No. 452 St. Paul St. - Montreal

\$35 JUBILEE DUST COLLECTOR \$35



ECONOMISE!

*THIS machine is far ahead of any other
 of its kind in Canada, and is the only
 one built on the correct vacuum drop prin-
 ciple.*

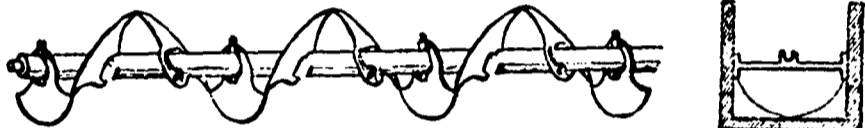
*Considering the dullness of trade among
 millers and the demand for cheaper
 machinery, we are now putting on the
 market this new machine, the low price
 of which places it within reach of all, and
 will recommend itself wherever used.*

CONVEYORS

REVERSIBLE STRONG CHEAP

*This Conveyor is all iron; the shaft is lap-welded pipe. This is the strongest and
 only reversible Conveyor manufactured. The flights are secured to the shaft
 without the drilling of holes, thereby leaving it in its entire strength.*

SEND FOR PARTICULARS AND PRICES.



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Established 1849. Incorporated 1884

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**CIRCULAR, GANG, MULAR,
 DRAG AND CROSS-CUT SAWS,**
 Moulding and Planing Knives, French Band Saws, Emery
 Wheels and General Mill Supplies.

We guarantee to make a better Saw for the same
 or less money than any Saw manufacturer in the country.
 It will pay you to send for our catalogue and prices.
 66, 68, 70 & 72 Fort St. East, DETROIT, MICH.

FAVORITE

MILL BUCKETS

Manufacturer and Dealer,

JOHN RADIGAN,

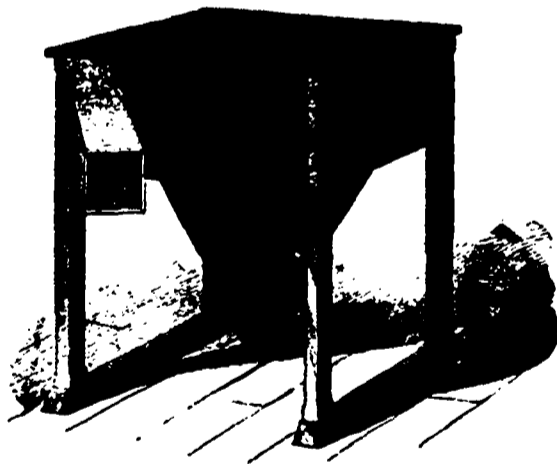
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HAMILTON ONT.

SEND FOR PRICES.

CASE SYSTEM GRADUAL REDUCTION MILLING.

INGLIS & HUNTER



No. 6 Strachan Avenue, TORONTO.

SOLE LICENSED MANUFACTURERS FOR CANADA OF

**The Cyclone Dust Collector,
 CASE'S CELEBRATED ROLLS AND MILL MACHINERY
 -AND-
 Silver Creek Flour Bolts and Centrifugals.**

-SPECIALTIES-

*Corliss 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. Special attention to the Short or Reform System of Milling.
 ROLLS RE-GROUND AND RE-CORRUGATED ON SHORT NOTICE.
 All Descriptions of Gearing, Shafting and Pulleys, Brass and Iron Castings.
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