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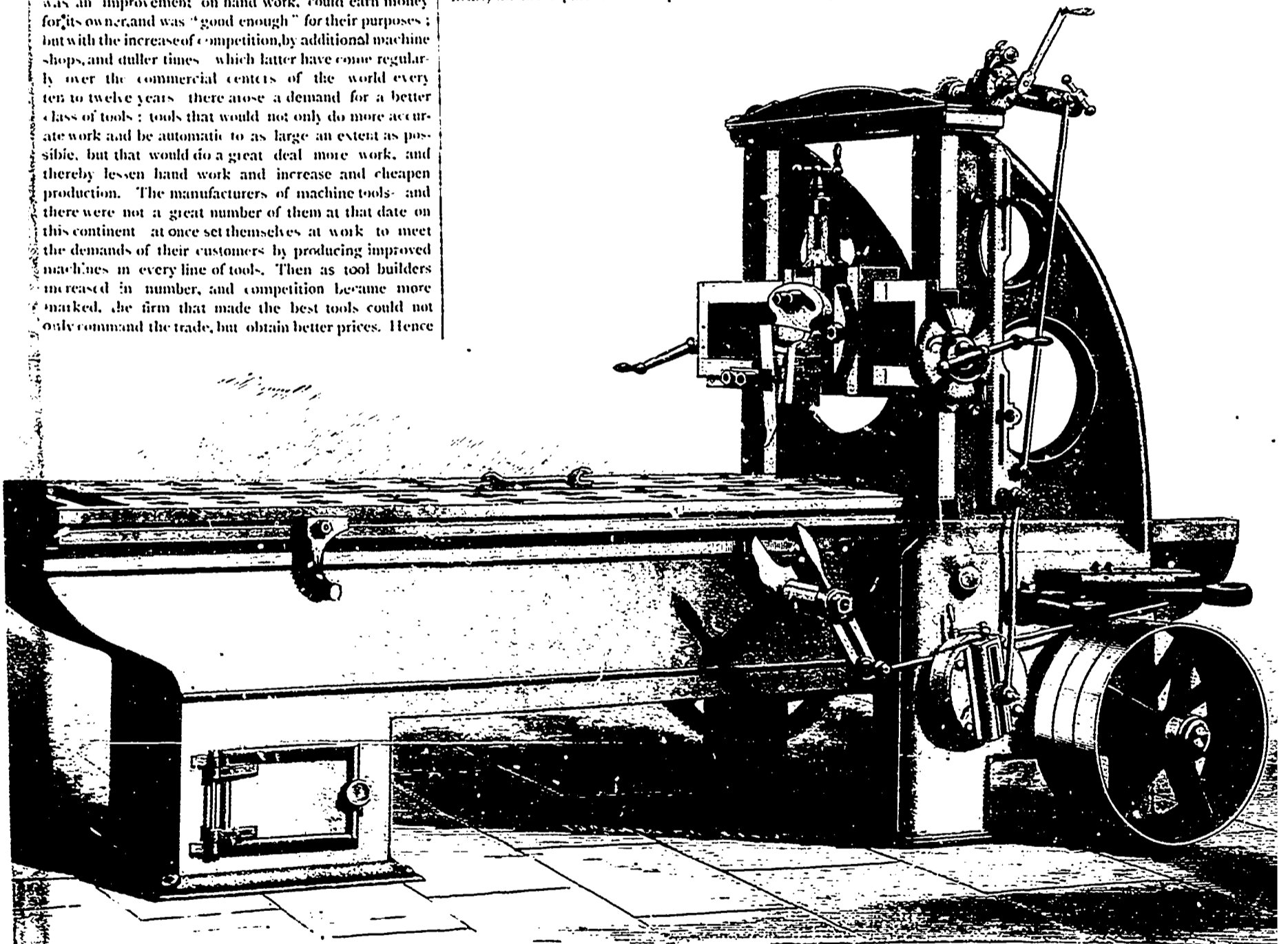
IRON PLANING MACHINE,

IN no branch of mechanical industry has more marked and radical alterations and improvements been introduced and developed to a high degree of perfection of late years, than in the manufacture of machine tools; and in no single machine, perhaps, has so important alterations been made as in the Iron Planer. Twenty-five years ago, when machine shops were few, and work plenty, and prices good, any iron surfacing machine that was an improvement on hand work, could earn money for its owner, and was "good enough" for their purposes; but with the increase of competition, by additional machine shops, and duller times which latter have come regularly over the commercial centers of the world every ten to twelve years, there arose a demand for a better class of tools: tools that would not only do more accurate work and be automatic to as large an extent as possible, but that would do a great deal more work, and thereby lessen hand work and increase and cheapen production. The manufacturers of machine tools, and there were not a great number of them at that date on this continent, at once set themselves at work to meet the demands of their customers by producing improved machines in every line of tools. Then as tool builders increased in number, and competition became more marked, the firm that made the best tools could not only command the trade, but obtain better prices. Hence

both necessity and competition have contributed to an almost continuous development and improvement, until to-day almost every important mechanical construction in machine tools has been brought to about as high a degree of perfection as skill and brains can bring it. In the earlier years of improvements in tools some important points were covered by patents, and this gave the owners a material advantage for quite a period of years over their competitors, but within the last few years nearly all these patents have lapsed, so that now nearly

all the important elements of machine construction are common property, and the man or firm that is clever enough to combine all the important improvements in any machine is certain to have a first-class one.

The London Machine Tool Co., several of whose improved machines have been illustrated in the DOMINION MECHANICAL AND MILLING NEWS, have been endeavoring to do this for the Canadian market, and we think have very fairly succeeded. The generous trade with which they have been favored during the past year,



IRON PLANING MACHINE.

would seem to indicate that Canadian Mechanics appreciate their tools and the efforts they have put forth to produce high-grade iron-working machinery. We illustrate herewith one of their Iron Planers. This machine combines within itself very fully all the late and important improvements in machines for planing iron. It is very strongly proportioned in all its parts, substantial and rigid, and strong up to the full measure of its capacity. All shafts and pinions are steel. The rack and all gears are machine cut. All feeds are automatic, with a large range of speed, and in addition to the automatic cross, down and angular feeds in the head, there is a universal feed over-head which feeds down the whole cross-head automatically. The machine is driven with two belts, and the shifting apparatus is so designed that the one belt is off the driving pulley before the other is on, thus

preventing the screeching noise occasioned by one belt pulling against the other, so common on old style planers, and the planer is so powerfully geared that a 2 inch belt will with ease enable an ordinary planer tool to take a cut in cast iron $\frac{1}{8} \times \frac{1}{8}$ at a cutting speed of 15 ft. per minute.

This description, with the illustration, and coupled with the fact that a 26 inch planer of this design weighs 2800 lbs., will be sufficient for any ordinary mechanic to judge of the merits of the tool.

We examined one of these machines for this description at the Soho Works, Toronto, and the proprietor, Mr. A. R. Williams, who, in connection with Mr. L. A. Morrison, the general agent of the Company, handles the entire production of the Company, will with pleasure explain the merits of these tools to visitors, whether they are intending purchasers or not.

THE AUTOMATIC EXTINCTION OF FIRES.

At a meeting of the Society of Arts, London, Captain Douglas Galton in the chair, Professor Silvanus P. Thompson read a paper on "Apparatus for the Automatic Extinction of Fires." In a single season, he said, England had to pay £2,000,000 as her fire bill, and she had paid it complacently year by year, with all unreckoned and incidental losses, and congratulated herself that the majority of the losses were covered by insurance, as if that made the slightest difference in the long run to the community at large, who practically had to pay for the loss. Out fire brigades were none the less efficient than of yore, our engines no less powerful nor prompt, our firemen no less heroic. The delay by a few minutes which elapsed before the fire brigade arrived was the critical moment, and was the fatal flaw in our system.

INFRINGEMENT OF TRADE MARK.

F WAS a manufacturer of yeast and he used a yellow label on which he printed his name, etc. S. put up his manufacture of yeast and also used a yellow label, but printed his own name, etc., not imitating the inscription of F. The former sued for an infringement on the ground alone of the use of the paper of the color used by him, and was defeated. In this case Fleischman vs. Starkey brought in the United States Circuit Court for the District of Rhode Island, Judge Colt, in the opinion said: "This case narrows itself down to the question whether a label of a single color is the lawful subject of a trade mark apart from any name, figure or device with which it may be connected, so that a person who adopts a similar color upon his label may be charged with an unlawful imitation. Color often serves as the groundwork of a trade mark, and it may be a very essential element in its composition. In determining the question of infringement it is often a very important incident. But the term 'mark' implies form rather than color, and it consists of some peculiar name, symbol, figure, letter or device whereby one manufacturer distinguishes his goods from like goods sold by other persons. The color of a label apart from a name or device can hardly be the subject matter of a trade mark. The effect would be that a single manufacturer might acquire the exclusive right to the use of labels of a certain paper or to the colored paper in which the goods might be wrapped. This might seriously interfere with trade and with legitimate competition. Whatever views may be taken by the French courts in the cases referred to by the learned counsel for complainants, we know of no American or English authority which goes to this extent. On the contrary, so far as the point has been touched upon in the adjudicated cases which have come to our notice, an opposite conclusion seems to have been reached."

CLEANING OUT WASTE PIPES.

The annoyance arising from the stoppage of waste pipes in country houses, although very great, says the *American Art. Sta.*, is but a small matter compared with the danger which may follow obstructed pipes. The "sewer gas," about which so much has been written and which is so justly dreaded, is not, as many suppose, the exclusive product of the sewer. Indeed, the foulest, most dangerous and deadly gases are not found in the sewers themselves, but in the unventilated waste pipes and those which are in process of being clogged by the foul matters passing through them. Any obstructions in the soil or waste pipes are therefore doubly dangerous, because it may produce an inflow of foul gas into the pipe, even though the entrance to the sewer itself has been entirely cut off.

The question is how to get rid of the accumulations in pipes partly stopped or already closed. Digging up and cleaning out is no costly remedy, often ineffectual by reason of careless workmen. The second is the plumber's force pump, which is usually only a temporary relief. In pipes leading from the house to the cesspool there is a constant accumulation of grease. This enters as a liquid and hardens as the water cools and is deposited on the bottom and sides of the pipes. As these accumulations increase, the water way is gradually contracted till the pipe is closed.

When the pipe is entirely stopped, or allows the water to flow away by drops only, proceed thus: Empty the pipe down to the trap or as far as practicable, by "mopping up" with a cloth. If water flows very slowly, begin when the pipe has emptied itself. Fill the pipe up with potash, crowding it in with a stick. Then pour hot water upon it in a small stream, stopping as soon as the pipe appears to be filled. As the potash dissolves and disappears, add more water. At night a little heap of potash may be placed over the hole, and water enough poured on so that a supply of strong lye will flow into the pipe during the night. Pipes that have been stopped for months may be cleaned out by this method, though it may call for three or four pounds of potash. The crudest kind, however, appears to act as well as the best. If the pipe is partially obstructed, a lump of crude potash should be placed where water will drip slowly upon it and so reach the pipe. It is also well to fill the upper part of the pipe with the potash as before and allow hot water to trickle upon it. Soda and potash are both used for the purpose of removing greasy obstructions, and the usual method of application is to form a strong lye and pour it into the pipe. It is better to put the potash into the pipe because the water which it contains instead of diluting, helps to form the lye. As water comes in contact with the potash it becomes hot, thus aiding in dissolving the grease. Potash, in combination with grease, forms a "soft" or liquid soap, which easily flows away while the soda makes a hard soap, which, if not dissolved in water, would in itself obstruct the pipe.

When a pipe is once fairly cleaned out, the potash should be removed from time to time, in order to dissolve the greasy deposits as they form, and carry them forward to the cesspool or sewer. The potash is very valuable for this purpose, because, in addition to its grease solving powers, it is exceedingly destructive to all animal and most vegetable matters. The most dangerous and deadly gases appear to come from urinals and wash basin pipes, these, in many cases, seem to be more foul than those from water closets. The decay of the soap and animal matter washed from the skin appear to be the sources of the gases. The potash will be effective in keeping these pipes clear and in this way may lessen the dangers.

PERCENTAGE.

The reckoning of percentages, like the minus sign in algebra, is a constant stumbling-block to the novice. Even experienced newspaper writers, remarks the *New York Journal of Commerce*, often become muddled when they attempt to speak of it. The ascending scale is easy enough: Five added to 20 is a gain of 25 per cent.; given any sum of figures, the doubling of it is an addition of 100 per cent. But the moment the change is a decreasing calculation, the inexperienced mathematician bemoans himself, and even the expert is apt to stumble and go astray. An advance from 20 to 25 is an increase of 25 per cent., but the reverse of this, that is a decline from 25 to 20 is a decrease of only 20 per cent. There are many persons, otherwise intelligent, who cannot see why the reduction of 100 to 50 is not a decrease of 100 per cent. if an advance from 50 to 100 is an increase of 100 per cent. The other day an article of merchandise which had been purchased at 10 cents a pound was resold at 30 cents a pound, a profit of 200 per cent.; whereupon a writer in chronicling the sale, said at the beginning of the recent depression several invoices of the same class of goods, which had cost over 30 cents per pound, had been finally sold at 10 cents per pound, a loss of over 200 per cent. Of course there cannot be a decrease or loss of more than 100 per cent.; because this wipes out the whole of the investment. An advance from 10 to 30 is a gain of 200 per cent.; a decline from 30 to 10 is a loss of only 66 2/3 per cent.

POWER REQUIRED IN FLOUR MILLS.

A correspondent writes to *Power*, an American scientific journal, as follows: "I have been running engines just seventeen years, and I find that there is much to learn yet. I have set up four boilers and five engines in my time. I think the more a man learns the more he finds to learn. At present I am running a 14 x 22 side slide valve Hadley engine, and my boiler is 52 x 24 five-flue. The engine runs eight sets of rolls, seven reels and other machinery, all run eleven hours per day, and making fifty barrels of flour. I burn 2,400 pounds of Ohio nut and slack coal in about eleven hours and forty minutes. Is that wasting coal or not?" To which *Power* replies: "The first two weeks a man runs an engine, he can generally give the boiler points. The next two weeks he begins to get one or two. After that he doesn't quite know it all. When he has been at it about ten years, he generally consults some one whenever anything new comes up. In about fifteen years he consults his neighbors about the regular run of affairs. You make fifty barrels of flour with 2,400 pounds of nut and slack coal; that is 48 pounds of coal per barrel, and is too much. You should make 50 barrels in twenty-four hours with 2,125 horse power. To do it in twelve hours you should have 44 to 50 horse power, and this should be got, with any decent kind of 50 horse power engine and with a respectable boiler, out of 1,800 pounds of coal. I should be very glad to guarantee to do it with 2,000 pounds. You ought to get along with thirty pounds of coal per barrel of flour if you run twenty-four hours. Rolls take less power than burrs, but there is generally enough extra finishing and cleaning machinery in a roller mill to keep the power per barrel of flour about the same with rolls as with either 'old process' or 'new process' stone milling."

THE CARRYING CAPACITY OF CARS.

Ten years ago, remarks an exchange, a standard car load on all first class railroads was 20,000 pounds, the weight of the car being 20,500 pounds. In 1881 the load on most roads had increased to only 22,000 pounds. The master car builders of the Pennsylvania road have now adopted cars to carry 60,000 pounds, while the weight of the cars will be very little increased. Instead of hauling more than one pound of car to one pound of freight nearly three pounds of freight can now be hauled for one pound of car. The substitution of steel for iron rails has made change possible. The condition of affairs makes it possible for the roads to carry freight at the low rates they receive and yet make a profit.

TESTS FOR DETERMINING THE FASTNESS OF COLORS.

In order to determine the fastness of colors with which fabrics have been dyed the following tests may be made:

REDS.—Boil a small strip of the tissue to be tested in soap-water and another strip in lime-water. The color should change very little. If, however, it in either case turns yellow or brown the color is not fast.

YELLOWS.—Boil strips of the tissue in water, in alcohol and in lime-water. If in the two last solutions the tissue takes a yellow color, and the liquid a reddish color, the dye is not fast.

BLUES.—Fast blue when boiled in alcohol should not affect the color of the bath, and the color itself should not change to red or reddish brown. When dipped in a warm solution of muriatic acid and water, or alcohol, and the bath takes a reddish color, the blue is not fast.

VIOLETS.—When violet colors boiled in a mixture of equal parts of water and alcohol give up their color or change to reddish brown, or brown when boiled in dilute muriatic acid, giving a reddish color to the bath, they cannot be considered fast. Of violet shades only madder violet and a combination of indigo and cochineal are fast.

GREENS.—When boiled in dilute alcohol, fast colors should not color the bath green, yellow or blue. In dilute muriatic acid the bath should not become either blue or red.

BROWNS.—Browns, when boiled in water, color the bath red, or, when left for a time in alcohol color the bath yellow, are not fast colors.

BLACKS.—If a dilute muriatic acid solution is colored red on dipping in it a strip of black tissue, the color of which changes to reddish brown or to brown, the color is not fast (logwood.) If the color of the tissue changes to blue, the black has a ground of indigo and its degree of fastness depends on the deepness of the indigo bottom shade. Black may be considered perfectly fast when being boiled with dilute muriatic acid, the liquid is colored yellow. To discover whether a black tissue has a bottom of indigo, boil a strip in a soda bath. If indigo is present, the tissue retains its black color or changes to blue or green, but if the black is a pure tannin black it will become brown.

HOLD ON TO YOUR TRADE PAPER.

How do you read a technical paper? By running down the column to see if there is something sensation[al] to "catch your eye," or that specially interests you? If you pursue this course you lose the money you paid for the paper. There is nothing in a well-conducted technical paper that is not of value. All may not be equally interested in certain topics or subjects, but there is something for all, and "information" is a very elastic word. It covers all things useful; and to keep up with the times, one should read a paper carefully. A properly edited technical paper is a handbook of the period and time in which we live. It sets forth current practice in certain branches of mechanics, or engineering, or other trades that support it, and it is the only vehicle for conveying technical knowledge in an easy, assimilable form. There are times in trade when there is next to nothing doing, and though the publishers scan the horizon and the immediate surroundings closely, little presents itself worthy of note. Then the paper is dull, and the publishers are as well aware of it as the readers are; but in the course of a year it must be either a poor paper, or a poor reader, that does not give or obtain the value of the subscription. Hold on to your trade paper if you would keep up with your trade.—*Mechanical Engineer.*

THE PRESERVATION OF ROPES.

The preservation of scaffold ropes is a matter of great importance when scaffolding remains erected for any considerable time, especially in localities where the atmosphere is destructive to the fiber. It has been suggested that in these cases the ropes should be dipped, when dry, into a bath containing 20 grammes of sulphate of copper per liter of water, and kept in soak in this solution for four days, afterward being dried. The ropes will thus have absorbed a certain quantity of sulphate of copper, which will preserve them from the attacks of animal parasites and from rot. The copper salt may be fixed in the fibre by a coating of tar or by soapy water. For tarring the rope it is best to pass it through a bath of boiled tar, hot, drawing it through a thimble to press back the excess of tar, and suspending it afterward on a staking to dry and harden. In the second method, the rope is soaked in a solution of 100 grammes of soap per liter of water. The copper soap thus formed in the fibre of the rope preserves it from rot even better than the tar, which acts mechanically to imprison the sulphate of copper, which is the real preservative. It is not stated whether the copper treatment is equally serviceable when dressed as with plain hemp ropes.

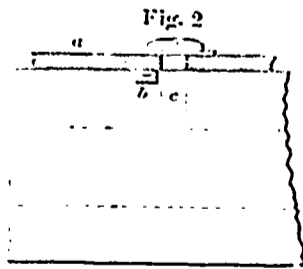
BEADING TOOLS CONSIDERED.

BY "HOMO."

IN our desire to excel in the quantity and quality of the wares we produce, and in our interchange of ideas with our fellow men who are interested in a kindred business, we are very apt to reach for something large and great and entirely ignore the small things, the knowledge and thorough practice of which are the very foundation of success. It is as fully appreciated in wood-working factories as anywhere else that one can furnish a plant of the best and most expensive kind, but if he neglects to pay close attention to the small details, his large and costly machinery is of no avail. How many operators have been bothered with lack of little accessories in the way of supplies, tools and other conveniences, and how many have been cursed with a goodly supply of poor worthless stuff that is an annoyance and a thing of misery forever! In this connection we may bring to mind the many kinds of beading tools that are and have been in use from time to time, and consider their qualities and objections. Those who have been interested in dressing lumber for any great length of time can remember when almost all beading was done on a separate head for the purpose, generally located near the delivering end of the machine. The board was fed through, surface on top, matched, and perhaps beaded on top and surfaced on the under side at the same time, or, if not undersurfaced it was beaded last. Does any one recollect that he could get good, nice beading and rely on having it run so all day? Not to any great extent. He would find that nice straight boards had good beads and *vice versa*. The reason is clear. They might be pressed straight under the pressure bars while being planed on top, and when under the beader head did not get exactly the same pressure, consequently when the pressure on the board was light the bead was sunk deep, and where the pressure was heavy the bead was scant. Another trouble was with boards having a crooked or bowing edge. If they had ever so little tendency to leave the guide the bead would run out. It was an utter impossibility to do nice work with a separate beading attachment from the fact that the principle was all wrong. To insure either first-class beading or rustic siding in connection with tonguing and grooving, it must be done with the top planer head at the time that the top surface is being dressed. The uniformity of depth is then assured, and it will always have the same relation to the surface. Another point in its favor is that it will be properly related to the edge for the very reason that it is acted on so closely to the matcher cutters that it cannot get away from the guide so easily. In fact, if it does, both head and tongue are left off, but this is a rare occurrence. These facts are so generally recognized that but few builders will consent to furnish an independent beader attachment, and if those who do would only go around the country and see them standing idle and the tools placed on the main head, they would quit furnishing superfluities. Naturally, some one asks, what is the best form of beading tool, and how can it be attached to the head in the best manner? As an answer, I illustrate a few of the many ways it is done in common practice.



Fig. 1
a Planer Knife
b Beader Tool.



Figures 1 and 2 represent the tool called a beading slip placed in the cutter head under the planing knife. It is a steel slip about $\frac{1}{8}$ of an inch wide and $\frac{1}{4}$ thick, with a semi-circular groove the whole length. It fits in a corresponding slot planed in the cutter head. The slot, being slightly shallower than the thickness of the beader, allows the planing knife to hold it down. This tool has objections; first, it calls for a blank of the same size to put in the slot when not in use to prevent the chips from driving in and springing up the planing knife; second, the chips drive through the little semi-circular groove of the knife itself and make trouble; third, you cannot tell where to have your planer head cut out for the tool and after you have found out, along comes some stuff which may be several different widths to be double beaded, and then where are you?

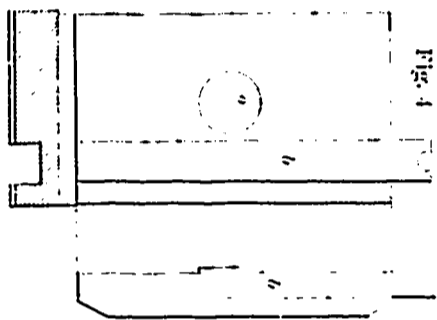
Figure 3 represents a very common form of beading tool that is readily placed on two sides of any head that

is slotted, leaving the other two sides for the surfacing knives. It is commonly made of steel, slotted, with a

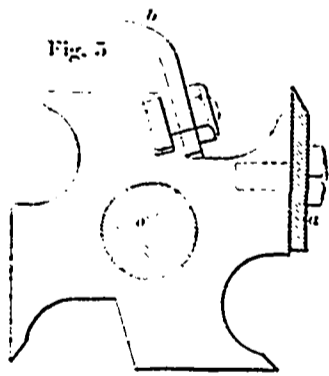


small semi-circle planed in the top, and beveled on its under side for the purpose of keeping it sharp with the least possible work, the same grinding bevel always insuring the same depth of groove. It is simple, easily taken care of, and can be placed on any part of the cutter head. The objection to this form is that when you pull the nut or bolt down on it for the final squeeze it turns, just a little bit perhaps, but enough to make you wish you had something better. You loosen up again, perhaps put sandpaper under it and grease the washer on top of it, then try it again; you start again, not to wrench it down but to swear through some knot hole where the angels can find no record against you; you finally get ashamed of yourself and drink some ice water and drown your feelings and, by exercising what little patience you possess, get the measly thing set right. If you don't want to be bothered with these negative blessings try beading tools like those shown in Fig. 4.

The cutter itself is the same as Fig. 1 fitted in a steel cap that has a tongue on its under side at right angles



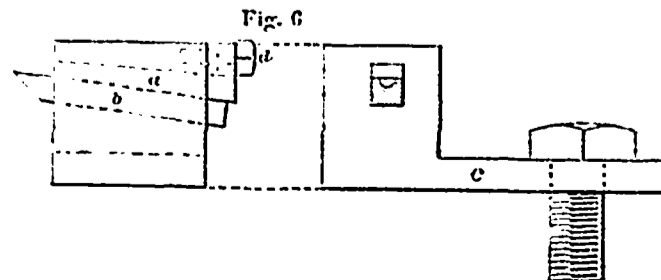
to the tool. This tongue need not be over 1-16 inch thick and just the width of the bolt slot in the cylinder. It is held down by a bolt and not in the ordinary manner; it cannot turn around or get away, and it holds the knife from driving back because the knife is slightly thicker than the cap and is consequently held by compression. It will stay put and can be moved so as to cut at any part of the board. The objection to this as well as Fig. 3 is that it necessitates the displacement of two of the surfacing knives while in operation. As a partial answer to this I would say that in these days of high speed it does not make so much difference as it would have made a few years ago, and the chances are that not more than two of your knives have been cutting anyway; besides it is not everyone that pretends to make beading or rustic siding as fast as plain flooring.



This form of beading tool is intended for use in connection with a four-wing cutter head, allowing the use of all four cutter knives at the same time. As will be seen, it is made the proper length and bent to cut the proper depth, fastened by two bolts, the heads of which

can be moved in the bolt slot in the throat of the cutter head. Care should be taken to make it thick enough to prevent vibration and give it the proper curve, so that as it wears it can be ground and set out to use as far as possible.

Fig. 6 is another form of cutter that can be used



when four knives are operated. It is fitted with a tongue on its under side to prevent slipping or turning

around and has a mortise for the cutter and a small taper key to hold the cutter firmly in place. The cutter can be made to cut more or less by loosening the taper key, setting the knife as you want it, and driving the key home, or it may be held by a set screw pressing against the side of the cutter. It will be noticed that all these cutters are beveled on their under side for the convenience of grinding and because they will produce better results. They are a few of the many kinds of cutters used for the purpose and seem to be in the most common use for their convenience, simplicity, and general adaptability.

THE ELECTRIC LIGHT IN AUSTRALIAN MILLS.

Messrs. Harrison & Co.'s mill, Port Adelaide, is the first in South Australia to be lit up at night by electricity. The machine is a dynamo, supplied by the Australian Light Power and Storage Company of Sydney, who have taken a contract for lighting the mill. The dynamo used is known as Class A2, Victoria Brush, and is capable of supplying a current for forty Swan lamps of an electromotor force of 55 volts. The current from the machine is conducted to the lamps in main cables of seven strands of No. 16 B. W. G. These wires are insulated with a composition so as to ensure thorough immunity from connection with anything likely to damage the cable or make an improper connection. The current is directed straight to the lamps from these main cables by minor leads of No. 18 B. W. G., insulated, and covered with fancy cotton so as to give a neater appearance. To each of these minor leads is attached a safety-fuse, which consists of a very fine wire of low fusing point and high conducting activity, so that on any danger arising in the wires from heating this fuse immediately melts, stopping all currents in the leads. Thus is avoided risk of fire. To these leads is also attached a switch, so that the lamps can be turned off or on at pleasure. At present there are twenty-five lamps actually in use in the mill, two of which are in the basement, four on the ground, four on the first, four on the second, and three on the top floors, two in the smutting and two in the engine-rooms, one in the boiler-shed, and three in the offices. The office lights are mounted on brackets with switches combined, fitted with opal shades. The machine is worked from a counter-shaft driven off the main shaft with belt gearing driven at a speed of 1,300 revolutions per minute. This class of machine is the latest improvement from home in incandescent dynamos. It is Morley's patent, belonging to the Anglo-American Brush Company, and made at their works, London. It is an improvement on the old class of dynamo, as it has compound setting, by means of which 99 per cent of lamps can be turned out without affecting the force of the light of the last one. The cost of working the machine will be purely nominal to Messrs. Harrison & Co., because the motive power, which is already supplied by the mill, is about the most expensive item usually. The renewal of lamps will be about once in five or six months. The machine is so simple that with a few instructions any one can attend it. Altogether it is so constructed that the electric light will prove 30 to 40 per cent cheaper than gas in the mill. In some of the Victorian mines the saving thereby has been as much as 50 per cent. Though this is the first mill lit by electricity in the colony, several have been lit in the other colonies. The most notable in New Zealand recently is reported to be a marked success. Mr. E. M. Grant, the Engineer for the Lighting Company, is also engaged in putting up an insulation at the Albion Mill, Gawler, which will be lit by electricity by about the middle of next week. The work at Messrs. Harrison & Co.'s mill has been rapidly executed, it having been commenced only on Monday. It was tried on Wednesday and Thursday nights, and on the first trial every light gave satisfaction. —Adelaide Observer.

SPEED OF DYNAMOS.

The schedule speed of all dynamos from sixteen to forty-five lamps 2000 candle power, is 850 revolutions per minute. Now I get very much better results in the matter of light, and as to flashing on the brushes, and as to hissing in the lamps, by adopting a speed of from 650 to 775, than by adopting the high rate prescribed in the printed schedule. I find better results by having the wall controllers so fastened that they did not tremble. I have had the most trouble with carbons. I make a most critical examination every day, keep a record of the carbons used and the success of each kind, and reach the conclusion that any good dynamo, with a fair even speed, will give a most even, brilliant light, if good carbons are used.—Pliny Norcross, in *Electrical Review*.

SKIDDING LOGS BY STEAM.

To a few, perhaps, of our readers, the statement that logs are now skidded by steam power instead of horse and ox power, may not be new, but it is believed will be new to a great majority. It seems to be a settled fact that logs can be, and are, handled successfully by this means, and by a comparatively simple and inexpensive apparatus. The following account of the apparatus and its operations, is taken from the columns of a Michigan journal.

The method and machinery consist essentially of a hoisting machine with drums operated by steam power, upon one of which is wound the skidding rope and around another of which passes an endless rope attached to a traveller, which moves upon a guy rope fixed to some point distant from the hoisting machine. The hoisting machine is not materially different from such machines used for other purposes. The motive power is furnished by a portable upright boiler.

The engine has two cylinders, which drive a shaft giving motion to the drums. The drums are loose on their shafts. The pinions driven by the main shaft have frictions on their inner faces which are moved by means of quick screws, engaged with the friction pinions, and cause drums to revolve. It will be seen that thus each drum can be put in motion, or left at rest, independently of the others. One drum is used for the leading line, another for the skidding line, and still another, which is called the receding drum, is used for hauling the velocipede to which the skidding is attached back into the timber. The patent office specifications call for a mast on the portable truck, to the top of which is attached the main guy rope, and also sheaves for directing the various hauling ropes, but in ordinary use in the woods, trees can be found to answer the purpose better.

An ordinary logging road or railroad is built into the timber or to the edge of swamps, and here a strong tree is chosen to which a 2 or 3 inch steel wire cable is attached. This is stretched about 20 to 40 feet from the ground, out over the land to be logged, for a distance of 500 to 600 feet, and fastened to another tree, both trees being well guyed to prevent them from breaking. Just at the side of the track is placed a small but powerful hoisting engine, provided with three drums and suitable clutches for operating them. On this wire tramway, as it really is, there is a two-wheeled velocipede, with an inch manilla rope attached, so that it may be drawn back and forth over the tight wire rope. The bottom of the velocipede is further provided with a sheave block, carrying a 1 1/2 inch manilla rope, one end of which is connected with a drum, the other being spliced into an ordinary pair of skidding tongs. This rope with the tongs is, by operating the receding drum, dragged into swamp or woods and fastened to the log to be taken out, the engine started, and the log hauled under the velocipede, one end of the log being suspended in the air, the other dragging, and in this way hauled over logs, brush stumps, etc., there being no roads cut for them, or swamping, as it is called, to the track, and there loaded on the cars. The velocipede is then run back for another log, which follows in the path of the other. The engine and boiler are both placed upon a little car or truck, that may be easily removed from the main track and run into any position that may be desired. Its construction may be varied to suit the taste or the necessities of the men who are to use it. The ropes are ordinary manilla, and the velocipede or trolleys and blocks are simple and of the ordinary type. It is only necessary to see this contrivance at work to be convinced of its great usefulness for the purpose for which it was invented. Logs are snaked out of mud holes, ravines and gulches, where no horse could ever be driven, raised into the air, run along through the woods at a good rate, and piled at the track or loaded on to the cars with a rapidity and ease that would surprise any man accustomed only to the former methods heretofore in use: for with ordinary working 30,000 feet have been taken from the woods where the trees were felled, and loaded on the cars in the space of two hours, on a trial, and this with the service of 13 men. So strong and serviceable is the whole mechanism that with a single line of 600 feet in length at least 30 acres may be cleared by running the hoisting rope out on each side and beyond its limits, and by changing the terminus of the tram cable; and when all the timber within its reach has been removed, the whole is taken down, packed on a car and set up in another locality. With a force of 16 men we skid 50,000 to 60,000 feet, and in one day over 70,000 feet has been skidded and loaded on cars.

The machine is the invention of Mr. Horace Butters, of the firm of Butters & Peters. There are at present four of them in operation, the firm of which the inventor is a member employing two.

The machines complete, with cables, ropes, velocipedes

and all other attachments, it is thought, will cost about \$4,000, about the price of six or eight span of horses, and when they have done their work for the season, they may be stored away at no expense for hay and oats to feed them, and by their use all necessity for making roads and swamping to get logs to the cars is obviated. One prominent lumberman when referred to for an opinion, remarked that there would doubtless be a few slight improvements, but any man who witnessed its workings could only assert that it was a grand success.

WHERE TORNADOES BEGIN.

The most remarkable and interesting feature of the development of tornadoes, is the fact that they nearly always form southeast of a moving center of low pressure, and their tracks, scattered here and there, conform closely to the progressive direction of the main storm. For example, on February 19, 1884, forty-four tornadoes occurred in Georgia, Alabama and South Carolina, but principally in Georgia and Alabama. This developed at a distance of from five hundred to two thousand miles from a storm center that moved across the northern part of the United States, beginning at the northern extremity of the Rocky Mountains in Montana, thence southeasterly through Dakota, Minnesota and Wisconsin to Northern Illinois and Indiana, northward through Michigan, across Lake Huron, and disappearing north of Quebec. This sudden, sharp turn of the storm center southward into Illinois and Indiana seems to have relation to the unprecedentedly large number of tornadoes that developed not far from the South Atlantic coast, extending inland as far as Southern Illinois and Indiana. This southward lunge of a mass of cold, moist air seems to have caused the abnormal conditions of temperature and dew point, and the high winds necessary to cause the most tremendous exhibition of destructive tornado power ever recorded by the Signal Service. This invariable location southeast of the storm center is one of the main peculiarities of tornado development upon which the predictions depend.

AUSTRALIAN TARIFFS.

A study of some facts and figures in connection with the tariffs of the various Australasian colonies is full of interest, remarks *Bradstreet's*. It shows in their true colors the actual position of the so-called protection and free trade colonies, and the relative advantages derived from each system. The figures are taken from an elaborate comparative statement of the customs duties for 1884 that has been prepared by the South Australian government. The first table gives the number of articles imported into each colony that are free or dutiable, thus:

Colony.	Dutiable.	Free.
Victoria.	687	522
New South Wales	180	1,025
Queensland	1,107	80
South Australia	657	570
Western Australia	1,175	21
Tasmania	919	229
New Zealand	820	401

From the above it will be seen that there is considerable similarity and dissimilarity. For instance, Victoria and South Australia approximate closely, as far as numbers are concerned, in their ideas of taxation. The other colonies, excepting New South Wales, which is prominent with its free list, are even more strongly protectionist than the recognized protectionist colony of Victoria. In all the colonies, except New South Wales, there are two recognized kinds of duty—specific duty and ad valorem duty. It is the latter that is abolished by New South Wales, and through which abolition she lays claim to the title of "the free trade colony." The rates vary from the specific without ad valorem of New South Wales to specific with ad valorem of from 5 to 25 per cent., the highest rates being charged in Victoria. The following table gives details of the duties:

Colony.	Rate of duty
Victoria	Specific, with 7 1/2 to 25 ad valorem.
New South Wales	Specific, without ad valorem.
Queensland	Specific, with 5 ad valorem.
South Australia	Specific, with 5 to 10 ad valorem.
Tasmania	Specific, with 10 to 12 1/2 ad valorem.
Western Australia	Specific, with 10 to 12 1/2 ad valorem.
New Zealand	Specific, with 15 ad valorem.

It appears that New South Wales objects to the ad valorem duty on the grounds that this system opens the way for fraudulent transactions through the falsification of invoices. Such being the case, the government of that colony cannot have a very high opinion of the honesty of its merchants. If the system works well in the other colonies then why not in New South Wales? The only possible inference to be drawn is that either the Sydney merchants are dishonest or that the various governments of the other colonies connive at and are blind to frauds practiced by their merchants. This is hardly likely or probable, so it would seem that the taint of the old penal Botany Bay settlement in New South Wales can, so far,

have scarcely been eradicated. The next table presented is exceedingly interesting as it shows the aggregate amount of duty collected in the different colonies in proportion to the value of the imports. Thus:

Colony.	Imports.	Duty collected.
Victoria	£19,201,633	£1,936,358
New South Wales	22,826,985	1,806,328
Queensland	6,381,976	914,372
South Australia	5,749,353	517,489
Tasmania	1,656,118	254,946
Western Australia	521,167	117,478
New Zealand	7,663,888	1,409,343

The above is a remarkable exhibit. It shows that the 180 dutiable articles of New South Wales without ad valorem contribute within £75,000 as much revenue as the 687 dutiable articles of Victoria. The taxation on these 180 articles must be exceedingly heavy and of a very protective nature, inasmuch as New South Wales admits free of duty almost 100 per cent. more articles of commerce than does Victoria. The principal consumptive commodities in which New South Wales exceeds her sister colony, in the way of duty, are spirits, wine, ale or beer, sugar, tea and coffee, candles, bacon and hams, jams, jellies, hops and malt. In most of these where the excess is shown the object is mainly to protect the industries that exist in New South Wales. On the so-called question of "protection" there is still considerable diversity of opinion in the colonies; much dissatisfaction is expressed, and the outcome of the revenue system, which is really the main feature that all are concerned in, will be a subject to be noted with considerable interest.

WATER IN BREAD.

Translated from the Austro-Hungarian Ualler

A local police court in Wurtemberg, aiming at the prohibition of the sale of bread not perfectly baked and containing too much water, recently addressed the royal chamber of trade and commerce asking what methods should be employed to test the amount of water contained in bread, and the probable cost of employing those methods. The answer received from the authorities was published by Herr Alett in Wurtemberg, and we present it herewith to our readers. After stating that not even a quantitative analysis would decide the exact amount of water contained in bread, that the proportion might be obtained by drying out the bread, whereby the loss of weight would measure the water lost, and that, for a decision as to the goodness of the bread, the determination of the amount of water in the crumb when separated from the crust would be valuable, the following things were designated as necessary:

1. A scale capable of weighing 200 grams and of accurately weighing one-tenth of a gram. Such scales may be obtained of the gaugers.
2. A drying room or air-bath, 25 centimeters deep, built of copper, which may be obtained of mechanics for about 30 marks.
3. A thermometer which registers over 100 degrees Celsius, costing two and a half marks.
4. A gas lamp for heating the air-bath, costing with the necessary gas connections four marks, and an iron chimney costing 30 pennies. From these figures it appears that the entire necessary apparatus will cost about 37 marks.

The determination of the proportion of water is accomplished in this way: Out of the center of the loaf of bread a piece is cut in a vertical direction, and this is divided into equal parts. A fourth part of these, from which the crust has been separated and the crumb of which is weighed, is devoted to the water-test. The crumbs to be dried should weigh at least 50 grams, and it is better to take 100 grams. The weighed bits of bread are placed in the air-bath on a floor raised about five centimeters from the floor of the bath, with a paper underneath, and the thermometer is so suspended in the chamber that its bulb is suspended among the crumbs of bread. If the bulb of the thermometer were placed higher than the crumbs, the instrument would show a lower temperature than that surrounding the crumbs. Then the lamp is lighted and placed under the bath, and the flame is so regulated that the thermometer rises slowly and after a few hours registers only 100 degrees Celsius. A little practice will enable the investigator to so regulate the flame that the temperature shall remain between 100 and 110 degrees Celsius, in order to perfectly vaporize the water in the bread. When it appears that the water has been expelled, the bread should be taken from the box and weighed after cooling. Then it should be again placed in the box and subjected for a half hour to a temperature of 100 to 110 degrees, and this operation should be repeated so long as diminution of weight is perceptible. The loss of weight answers to the water contained in the bread and may be easily reckoned in per cent.

AN IMPORTANT PATENT SUIT DECIDED.

THE HANCOCK INSPIRATOR PATENT DECLARED NULL AND VOID IN CANADA.

AN advance copy of the proceedings (by the way, the very first one sent out), received shortly before closing our forms, enables us to communicate to our readers the decision rendered in a very important patent case. It is in the suit brought by Robert Mitchell, of Montreal, against the Hancock Inspirator Company, of the same city. The case of dispute was raised against the existence of Patent No. 7,011, granted on Jan. 24th, 1877, to J. T. Hancock, for the "Hancock Inspirator," now owned by the aforementioned company, for alleged forfeiture on the ground of non-compliance with Section 28 of "The Patent Act of 1872." This is the section, on several previous occasions quoted in these columns, ordaining that a patent shall be null and void at the end of two years, unless the patentee, &c., shall within that period have commenced the manufacture or construction of his invention in Canada, and shall, after such commencement, continuously carry it on, &c.; furthermore that a patent shall be void after the expiration of twelve months, if the patentee, &c., after that time imports, or causes to be imported into Canada, the invention for which the patent was granted.

The proceedings in the above suit took place before the Deputy of the Minister of Agriculture, Mr. J. C. Tache, and were concluded on Dec. 22nd last, and on January 22nd the Deputy Minister rendered his decision, from which we extract the following passages:

"In this case the question of importation is the only one which really appears to be involved. There is no proof that at any time the patentees have refused to sell or license their invention; far from it, they seem to have always been anxious that its manufacture should be carried on by somebody in Canada, under license or on payment of a fair royalty, at the same time that they have shown themselves determined to push the sale of their patented articles, even to the alternative of supplying the Canadian markets by importation. The injury to home labor, in this case, comes not under the head of *non-manufacture*, but under the title of *importation*, because to the extent that imported articles have been introduced in Canada, to that extent the manufacturing industry of the country has been deprived of the advantages intended to be secured by the 28th section."

"Patent No. 7,011 was granted on the 24th January, 1877; therefore, the year, during which the importation of the invention was allowed by law, expired with the 24th day of January, 1878. It is clearly proved that the importation did continue after the latter day, till about two years of the present contest. At times the importation consisted of the article brought in its complete state, in small numbers; at times it consisted of the articles introduced in parts, in some instances all the parts to be simply put up in Canada, in other instances of only some of the parts: the aggregate of such importations amounting, so far as the evidence goes, in number to many hundreds of the patented apparatus, in value to many thousands of dollars worth."

"It is argued that inasmuch as the patent covers an invention which consists of a new combination of old elements, the importation of the elements in their separate state is not the importation of the invention. This is opposed to the very nature of things, as admitted in all countries in matters of patents. A new combination of known elements is an invention to all intents and purposes, and as such is patentable, and confers to the person having devised such new combination the rights and privileges of an inventor, even if the novelty consisted in a trifling mechanical change, provided, in the latter case, some economical or other result is produced somewhat different from what was obtained before. The combination then is the invention, and, when patented, is the essence of the patent; it must be taken as a whole, not the elements as several things to be separately discussed, and the combination another thing, but the elements as combined, one thing, to stand with all the privileges conceded by law, and, reciprocally, with all the obligations imposed on all patentees. The *manufacture* of a combination is the producing of the elements as combined, in the sense applied to the word *manufacture*; the *importation* of the combination is the introduction of the elements as combined, to perform the functions described in the patent and in the manner described, totally irrespective of the existence of other combinations of the same elements, whether patented or not patented. Consequently, if Nicholson's ejector of 1806, now of the public domain, if Giffard's injector of 1858, also now public, if Hancock's apparatus of 1869 or of 1881, are imported, to be used as such, they do not affect patent No. 7,011; but if the elements made use of in these mechanisms are imported as constituents of the combination

secured by the said patent, and to be used as such, this importation is the importation of the patented article; because, in the same way that a new combination of known elements is entitled to the protection granted by a patent, in the same way it is subject to the conditions to which all patents are subjected."

"In the present case the importation of the invention itself lasted for several years of the existence of the patent, till a comparatively recent date, covered a large number of the patented articles and amounted in the aggregate to a large sum, many thousands of dollars. "It seems hard, says the counsel of Respondent, after the company trying so many years to introduce this invention into the country, that the patent should be set aside. It is, undoubtedly, very hard; if it were a matter of sympathy or of sentiment, in all probability the patentee would continue to enjoy the privileges to which inventors are so well entitled; but it is a matter of the fulfilment of obligations and administration of the law, in a case where no legitimate doubt can come to the rescue of the patent."

"Therefore, John Theobald Hancock's patent, No. 7,011, for an "Inspirator," has become null and void under provision of section 28 of the Patent Act of 1872."

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.

LEATHER BELTING.

MONTREAL, Jan. 25th, 1886.

Editor M. & M. News.

DEAR SIR,—With your permission we desire to correct a wrong impression which we fear may have fastened itself upon the minds of some who read the article headed "A Chat About Belting," in the January number of the MECHANICAL AND MILLING NEWS. The author of that article doubtless writes from an American standpoint when he warns the public against purchasing belting marked "Standard" in the belief that they are getting the best quality, and points out that there are grades of belting which are much superior to "Standard." All this is true from an American standpoint, as American belt manufacturers do make several grades of belting, and their best grade is not "Standard." It is not true, however, as applied to Canada. Our highest grade of belting, which is exclusively short-lap, is stamped "Standard," and for that reason we desire that the Canadian public should not become possessed with the idea that all belting marked "Standard" is inferior. Ours of that brand, as represented on page 18 of your paper, is of the highest grade.

Yours truly,

ROBIN & SADLER.

A MILLER'S OPINION.

MAPLE HILL, Ont., Jan. 18th, 1886.

Editor M. & M. News.

DEAR SIR,—Enclosed please find one dollar to pay for the MECHANICAL & MILLING NEWS. I find it very useful to millers. As a medium of information on all subjects of interest to millers I consider it fully equal to any of the milling papers of the United States. I think you should urge most persistently the claims of the millers, for a readjustment of the tariff as it relates to wheat and flour. Don't you think the present is a good time to bring pressure to bear upon the Government, when the people our eastern provinces seem inclined to kick over the traces? It is to the eastern provinces that the Americans are shipping so much flour, that ought to be supplied from Ontario. We have the wheat and the roller mills to do it, if not hindered by the tariff. Either the duty on flour should be increased to one dollar, or the duty on wheat should be removed. If the Government will not give us protection, let them at least put us on equal footing with the Yankees, and you will see what the millers of Ontario will do in getting our wheat from the west, at a low price, which would enable us to successfully compete with them. As editor of the paper which represents the millers of Canada I hope you will devote more of your valuable space to this important subject.

Yours truly,

R. B. CLEMENT.

WHEAT CLEANING.

Editor M. & M. News.

It was not to be expected that a paper on wheat cleaning would prove universally acceptable, and therefore a letter in your January number criticising some of "American's" statement seems to come as a matter of course.

Your correspondent has the courage of his convictions in maintaining that beater machines not only have been but are now and will hereafter be the leading machines.

Having projected himself into the future for forty or fifty years, your correspondent may have brought back other equally surprising news. Mill-machinery inventors would think it an invaluable faculty to see clearly to see clearly what is to be the favorite process and the favorite machine so far ahead.

Your correspondent if he could convince others that he is a seer might command his own price. Unfortunately for his reputation as a prophet, his first news item from the coming time will not predispose people to accept his forecasts in other lines.

By-and-bye perhaps your correspondent may find out the exact composition of the outer coating of the berry. He will live, and learn, we hope, and will also add to his stock of experience that there is a gentle means of scouring out smut without beating it. The *naïve* admission that if a smut ball "goes to the scouring cylinder, it then has to be broken, * * and in a great many cases it is nearly as hard to break as a kernel of wheat," is amusing, following the claim that beater machines can be constructed without breaking grain. If a great many smut balls are nearly as hard as kernels of wheat, what particularly nice mechanical adjustment that smutter must have, that will break the one and not the other.

On one point "American" can agree with your correspondent, and that is, that emery and stone scourer are lamentable failures, and should have no place among flour milling machinery.

AMERICAN.

MACHINERY ACCIDENTS.

Mechanical World: Several kinds of apparatus have been invented for putting on straps, by means of a long pole, without requiring ladders at all, and it is surprising they are not more generally adopted. Although accidents among machinery will never be prevented altogether, much may be done by employers of labor to minimise, as much as possible, the chances of accidents by taking precautions, such for instance, as having projecting wheels and straps fenced in and guarded, as well as to provide facilities, such as stretchers, by which injured persons may be promptly attended to. The introduction of ambulance lectures by professional medical men, by which workmen and others are taught how to act in cases of emergency, has already been the means of saving many lives and it is not too much to say that the foreman and leading workmen of all engineering establishments should be encouraged to attend such lectures free of cost to themselves, even, if necessary, in the time of their employers, as their services, should occasion arise, would be freely given, to the great advantage of the unfortunate sufferer. Even keeping a supply of lint, linen rag and sticking plaster upon the premises is not to be lightly prized, as many a poor fellow who has been struck by a hammer or cut by a flying chip of iron can testify, and such slight mishaps are common enough.



Mr. O. D. Cowan has purchased the carriage gear business at Gananoque, lately carried on by S. McCannion and R. Lowrie.

A considerable extension is being made to the gas works at Peterboro', the demand for gas having increased since the advent of the electric light.

Some charters of vessels for the lumber trade have been made for next season. Mr. Neelon, M.P.P., of St. Catharines, has contracted for some \$400,000 feet, and agreed to carry it at figures considerably below the rates of last year. There are enquiries for rates for deals from Marquette and other western points.

A Milwaukee despatch of Jan. 29th says—Advance sheets from the biennial millers' directory show a net decrease of 6,812 flouring mills in the United States and Canada as compared with 1884. The number of mills at present in operation is 18,257. The gross capacity shows a slight increase over 1884. Every state and territory shows a decrease in the number of mills except Dakota, Nevada and the district of Columbia. In Wisconsin there is a loss of 120 mills. The most marked loss is in Pennsylvania, Ohio, New York, Illinois, Missouri, Texas and Ontario.

On the afternoon of January 29th, the works of the Toronto Lead and Color Company, of which Mr. Sanderson Pearcey is the principal owner, were burnt, and the stock and machinery pretty well destroyed. The fire was caused by a large pot of mixture boiling over. There was \$20,000 worth of stock in the building, and about \$5,000 worth of machinery. The insurance on both amounts to \$8,000. The building, which is owned by the C. P. Railway, was damaged to the extent of \$500, and is insured. Mr. Aikenhead, the book-keeper of the establishment, had to jump out of a window to save his life, and was badly hurt. The foreman of the factory, David Brown, was badly burned about the face, and had trouble to escape from the burning building.

BUDAPEST'S ELEVATOR.

THE Budapest elevator, says *Die Muehle*, lies in the southern part of the city, on the east bank of the Danube. It lies parallel with the river, a narrow strip of land intervening between the two, on which is a railway track. In dimensions the elevator is 344 x 164 ft., 102 ft to cornice and 170 to top of monitor, from which a very fine view of Pest and Ofen can be obtained. The capacity of the structure is 1,200,000 bushels. A room for the bucket mechanism extends 16½ ft. below the street level. Four railroad tracks traverse the elevator lengthwise, so that loading and unloading can take place each from two tracks as well as from vessels. The five stories consist of the basement, containing the bucket mechanism, ground floor, devoted to transportation purposes, second floor, where weighing is conducted on Fairbank scales, storage room proper, with grain bins 49 ft. high, and the top or roof storey. There are ten legs, five on a side, which elevate the grain from the ground floor to the top of the building. On the river side are five legs for emptying ships. Horizontal transfer is done by belts. The 49 ft. grain bins are not of equal size, as is the case in America, but vary from 1,500 to 6,000 bus., because each owner has his grain stored separately and demands the same in delivery, instead of so many bushels of a certain grade, as in America, where the identity of the various parcels is not usually preserved. For this reason, the bins can be sealed. The stairs and elevator are in the four corners, the former being of stone and separated from the main room by fireproof doors. For fire purposes there is a steam pump 197 feet high. This is especially important, as the city water works have not enough pressure to throw a stream over the building. The buckets of beaten iron plate carry 15½ lbs. of grain each, and travel at the rate of 6½ to 8 ft. per second. The conveyors, which, on account of the general employment of belts, are used but little in Budapest except in old structures, revolve at about 30 per minute. The belts travel about 10 to 11 feet per minute and each carries 1466 bus. per hour. They are of rubber, 19½ inches wide, the hemp ones employed originally not proving satisfactory. Those now in use are according to the American plan. Motive power is furnished by two compound 200 h. p. engines. These are placed in the story above the ground floor. The cylinders are of 20 and 30 inches diameter. Steam is generated in the boiler house, 164 feet distant, and conducted by a pipe laid in a canal of masonry under the street level, to the engines, about 23 feet above the pavement. There are four Lancashire boilers, 6 x 26 ft. each, with over 1,000 square ft. of heating surface. This elevator was constructed on plans by Christian Ulrich. The ground on which it was built was very bad, and had to be greatly strengthened by piles and masonry.

CHEERFULNESS IN THE SHOP.

Cheerfulness is always an admirable trait, but is nowhere more appreciated than in a busy workshop, where many perplexities arise daily to vex the patience of the workman. A smiling face and a hopeful word act not infrequently like oil on troubled waters, bringing tranquility and peace. A growling, snappish workman is a discomfort to himself and all about him. He disturbs his own tranquility, and becomes more or less a nuisance to his fellow workmen. A grumbler feeding on his own discontent, and giving vent to ill-natured utterances, too often imparts his feelings to others, making trouble for every one connected with the business at hand. It is not the cheerful man who creates trouble in the shop. He is never at the head of socialistic movements, and, as a general rule, is reluctant to engage in strikes, or to favor any movement tending to a breach of good feeling between the hands of the establishment and the employers. A cheerful man cannot well be envious or jealous. He does not see in every movement of his employer an attempt to do him wrong. He does not feel that every man's hand is against him, and that to protect his rights he must organize an opposing and disturbing force. There is comfort in transacting business with a man who presents to you a smiling countenance, and meets you with a friendly grasp of the hand. One instinctively feels that it is safe to deal with such a man, and that confidence in him will not be misplaced. In times of trouble, when things go wrong, and help and confidence are needed, one turns to the cheerful, pleasant workman with a feeling of restful assurance that he will indeed be friendly when the strong arm of friendship was most needed. Such men have their value, not alone as estimated in the scale of wages paid, but as shown in the very strength of the tenure of their position, in the confidence which their employers bestow upon them, and in the general esteem of their fellow laborers.



Marshall's mill dam at Hampton, Ont., was washed away a couple of weeks ago.

Flour shipments from Duluth this season were 1,076,342 bbls., against 812,370 bbls. last year.

The elevators at Morris, Man., have been closed for some time because the town would not exempt them from taxation.

The firm of Lennon, Penney & Co., flour men, Quebec, have dissolved.

The pioneer milling firm of Edmondson, Messrs. Hardesty & Fraser, have dissolved partnership, the business being continued by Mr. R. D. Fraser.

A public meeting lately held at Neepawa, Man., to consider the question of building a roller flour mill and elevator, dispersed without having reached a conclusion.

Mr. A. Clegg, who has carried on a milling business in Peterborough for ten years past, has decided to retire and devote himself exclusively to his furniture business.

The forger has been working his game on the Geo. T. Smith Purifier Company, numerous false cheques on the firm having been circulated in Grand Rapids, Mich.

Cable dispatches announce that the wheat crop of 1885 in England was greater by 3,000,000 quarters, or about 24,000,000 bushels, than any of the published estimates.

Notices are now being sent out to farmers who have stored wheat in the Minneapolis and Manitoba elevators and have borrowed money thereon, that they not call and put up a margin or the wheat will have to be sold.

The first lake charter for the present year was made on the 4th of January, consisting of 42,000 bushels of corn for Kingston, Ont., to be shipped at the opening of navigation. The first lake charter of the season, therefore, is for the St. Lawrence route.

The farmers of the Hanlan district, near Portage la Prairie, are talking of building a flour mill on the co-operative plan. They allege that the local millers "take the grist and leave them the toll."

The Manitoba & Northwestern railroad is commencing work on five warehouses to be built along the same for the convenience of the farmers. Gladstone, Basswood, Newdale, Shoal Lake and Solsgrith are the points selected.

The tenth annual statement of the "Millers' National Insurance Company," of Chicago, shows assets amounting to \$1,000,027.53 and liabilities \$47,497.92, leaving the enormous surplus of 952,229.61 of assets over liabilities. The total losses of the Company during 1885 footed \$122,803.67, and the losses since organization, \$533,066.06.

The building known as Clegg's mill at Peterborough, Ont., has been enlarged to 40 x 80 feet, and raised a storey and a half higher. The old-fashioned mill stones and all appurtenances are being taken out, and when the building is ready for its reception a complete patent process will be put in. The mill, it is expected, will then have a capacity of turning out from one hundred and fifty to one hundred and seventy-five barrels of flour per day.

Austria-Hungary proposes to levy a tax on foreign wheat and flour equal to that now enforced in Germany. Evidently we shall soon have a tariff war on the continent. It is noticeable in this connection that in spite of a tax of 6¢ per qr. on imported wheat in France, prices remain ruinously low, and are actually some 2¢ per quarter below the comparative values of foreign wheat.—*Millers' Gazette*.

The St. Louis *Globe-Democrat* of Jan. 19th says one of the biggest wheat deals ever attempted is now in progress in the Northwest. The scheme is being worked by Armour, Northwestern millers interested in railroads and elevators, and the grain banks. It is contemplated to put wheat down below 80 cents at Chicago, and to jump it from that figure for a profit of thirty to forty cents. Pork and provisions will be advanced, while wheat is being depressed.

The employees of Messrs. Campbell, Stevens & Co. of the Kent Mills, Chatham, Ont., presented Mr. H. N. Stevens and Mr. A. Campbell with a pair of easy chairs, ink stand and box of choice cigars as a Christmas box. The foreman of the mills, Mr. J. R. Walker, was also made the recipient of a box of choice cigars. Kindly worded addresses accompanied both presentations. The best of good feeling prevails among all who have a hand in running the Kent Mills.

What promises to be one of the biggest lawsuits in the history of Minneapolis has been begun. All the owners of flour mills on the west side of the river, representing twenty-five millions of capital, are plaintiffs against the city in a suit for a perpetual injunction against the building of a stone-arched bridge across the west channel of the Mississippi, from the city proper to Nicollet island. Bonds for this were authorized by the last legislature. The mill owners allege that by building the bridge the water power will be heavily damaged, with a possibility of ruining them.

The impression that a roller corn mill is much less complicated and requires much less machinery than a wheat mill is becoming generally understood. This impression is founded on fact. It is true that a better separation could be made by the millstone method of corn milling than by the same method on wheat. The reasons for this difference apply to the roller method. The corn is a hard, brittle grain on the inside, while the external covering is tough. The wheat is softer internally and quite brittle externally, which fact accounts for the difference in milling.—*Corn Miller*.

Later advices from Winnipeg state that there is no foundation for the statement published in New York, according to which the

Farmers' Union of Manitoba had resolved that, owing to the want of a market for damaged wheat, the farmers were unable to live. The Hon. John Norquay, premier of Manitoba, states that the Union did not pass any such resolution. Messrs. Ogilvie, the principal grain buyers and millers in Manitoba, declare that there is a brisk market with good prices for all wheat offered for sale, while the Canadian Pacific Railway authorities state that their utmost resources have been engaged in moving the crop, and that there is a very large increase in the acreage plowed for the next crop.

Uniformity in the weight of a sack of flour has long been desired. At least four different weights, leaving aside the variety of weights and measures by which flour is retailed, are in vogue in France; so that a committee was formed to consider the question. After some considerable discussion, lasting over several months, the following proposition is put forth as the result of their labor, which will be submitted to the Trade:—Market quotations of flour from 1st Sept., 1886, to be made on the basis of 100 kil (220.46 lb), and from the same date flour deliveries to be made in sacks of 100 kil net weight, allowing to millers a period of grace of five years, that is to say from 1st September, 1886, to 31st August, 1891, for the conversion of their sacks, during which period they would be free to deliver sacks of one metric quintal and a half net weight (150 kil).

Isn't it about time that the old laws regulating the affairs of grist millers and bakers were repealed. The necessity for them—which perhaps existed at some remote period, when such conveniences were few and the ignorant public was liable to be imposed upon by rascals—has long since ceased to exist. The baker and miller are subject to the closest competition, scales are found in every mill, shop and household and there is no opportunity for the public to be deceived in what it gets from them. Yet they are liable to prosecution for even the technical violation of an unjust law. For instance, J. D. Nasmith, a prominent citizen of Toronto and a well known baker, sends us a copy of a local paper where his name appears under the heading "Drunkards and Thieves," as having been fined five dollars for selling a loaf of bread unstamped. This is an absurdity, and such laws should be speedily repealed, for they accomplish no good end, and bring the law into ridicule.—*Northwestern Miller*.

A correspondent, writing from Manitoba to the *Farmer's Advocate*, London, Ont., paints a gloomy picture of the farming prospects in the northwest this year. He says: "The winter set in on us rather early this year, about the 4th of November, when the ploughs were brought to a standstill. This season it seems that the percentage of wheat damaged or spoiled by the frost is very large, some authorities placing it so high as nine tenths. The truth is that except in some few favored localities at the foot of Riding Mountain and around the Turtle Mountain district, and the stretch of country which the Pembina range of mountains protects, the whole wheat crop is to a greater or less extent damaged. There are farmers living on the western boundary of Manitoba who have had their wheat frozen for three consecutive years. One young farmer this year had fifty acres of wheat on new land that was not worth the cutting even for pig feed, and from what I can learn from those who travel more than I do, these are no exceptional cases. The average yield is about 18 bushels per acre, and the price at present paid in Southern Manitoba ranges from 35 to 65 cents per bushel for wheat, 30 cents for barley, 18 cents for oats.

The totals for 1885 show that Minneapolis is the most important primary wheat market in the United States. Chicago received from January 1, 1884, to January 1, 1885, a total of 20,000,000 bushels, while Minneapolis received 29,000,000 bushels. The shipments of flour for the year have been very large and altogether the year has not been a wholly disastrous one, although the decline in prices has been quite steady. In January, 1885, No. 1 hard wheat in Minneapolis was quoted at \$1.00 per bushel, and patent flour as high as \$6.50, while on the 16th of December, 1885, No. 1 wheat was quoted at 90 cents, and patent flour at \$5.00. This large reduction has forced the millers to cut corners very closely and to put the cost of milling down to the lowest notch. The output for the Minneapolis mills for 1885 was 5,579,081 barrels against 5,317,000 barrels for 1884, a gain of 162,081 barrels. The receipts and shipments for the year were as follows in comparison with the preceding year:

	RECEIPTS		SHIPMENTS	
	1883-84	1884-85	1883-84	1884-85
Wheat, bucs.	23,514,567	32,112,246	3,132,749	5,584,300
Flour, bbls.	116,684	23,378	4,814,424	5,298,941
Millstuffs, tons.	11,721	3,003	139,261	142,815

The milling capacity of Minneapolis is increasing. During 1885 there was one new mill built, and several of the existing ones were repaired and greatly enlarged, increasing the daily milling capacity by about 4,000 barrels. The total capacity of the mills of the city per day was 22,000 barrels in 1882, 26,610 in 1883, 29,495 in 1884, and 35,973 in 1885. During the year three new elevators and five annexes have been built, increasing the storage capacity of the city by 4,000,000 bushels. One of these elevators, called the "Union," contains 2,000,000 bushels, and is the largest elevator in the world. Minneapolis now has eleven distinct elevators, and during the year 1886 several new ones are to be erected, increasing the storage about 4,500,000. The total storage capacity of elevators, annexes and mills in the city is now 9,963,000 bushels, of which the mills store \$38,000 bushels and the elevators 9,125,000 bushels. The eleven cooperage establishments of the city employed 581 coopers and 232 other hands, and they turned out 2,738,400 barrels during the year. Besides these mighty flouring interests, Minneapolis has other large concerns. Her saw mills, for instance, turned out a product valued at \$5,000,000 for the year, and her miscellaneous manufactures footed up to \$30,000,000. It is evidently the intention of Minneapolis to maintain her leading position as a grain center, for her enterprising citizens are providing greater and greater grain storage capacity for the coming years, and certainly the figures justify the pride of the Minneapolitans in speaking of their wonderful city.

EDWARD P. ALLIS & CO.

30 Wellington Street East,

TORONTO.

If any miller doubts our assertions as made in the January number, read the following letters proving beyond doubt our ability to make mills successful from the start :

DUBLIN, 17th Dec. 1885.

Mess. Edward P. Allis & Co. Toronto.

DEAR SIRS,—It affords me very great pleasure to be able to state my Dublin flour mill, since adopting the roller system, is giving every satisfaction and manufacturing a beautiful grade and sample of flour, apparently highly appreciated by all who have used it. The working of the machinery is also very satisfactory, which indeed is due to the mastership and thorough knowledge of Mr. George Skene, your genial and obliging foreman, and upon whom it has reflected great credit.

Yours very truly,

JOSEPH KIDD.

LANARK, 21st Dec., 1885.

Messrs. E. P. Allis & Co., Toronto.

DEAR SIRS,—We are very much pleased to have it to say that we accept the fifty bbl. roller mill completed for us, without any hesitation.

Yours respectfully,

A. CALDWELL & SON.

[COPY.]

LANARK, 21st Dec., 1885.

A. Caldwell & Son, Lanark.

DEAR SIRS,—I have much pleasure in informing you that the flour I tested on the 19th inst., made by your new roller mill, has given me every satisfaction, both as to strength and color, and is the first flour made in the county of Lanark that I have had to satisfy me.

(Signed)

R. BARRIS,

Baker, Lanark, Ont.

MEAFORD, Ont., 1st January, 1886.

Edw. P. Allis & Co., Toronto.

GENTLEMEN,—We have pleasure in writing the acceptance of the mill built for us by you, and would say that she is fully up to the capacity agreed upon, and is making flour that beats anything in this section of country. You have our best wishes for your future success in the mill building business, and we will have pleasure in showing your future customers or parties contemplating building, what you have built for us.

Yours truly,

WM. COOK, Manager. THE PEOPLES' MILLING CO.
ROBT. KERR, Superint'g Director.

UDORA, Jan. 9, '86.

Messrs. E. P. Allis & Co., Toronto.

GENTLEMEN,—I am glad to be able to state that my mill, which you changed from a stone to a roller mill, and which started on the 1st inst., is just the mill I wanted. I wish to express my entire satisfaction with the manner in which you fulfilled the contract. I consider the four-break machine is just the thing for a 50 barrel mill, as it requires but little power and does its work perfectly. The mill exceeds my most sanguine expectations with regard to power, as it requires less power to do a great deal more work than it did with the stones.

Yours truly,

GEO. PEERS.

THE EVIDENCE IS INDISPUTABLE!

AND MORE IS COMING!

—== SEND :- FOR :- ESTIMATES. ==—



PUBLISHED MONTHLY.

A. J. WENBORNE.

Office, 31 King Street West,

TORONTO, - - ONTARIO.

ADVERTISEMENTS.

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

Changes in advertisements will be made whenever desired, without cost to the advertiser, but not more than one insertion in all the situations of the advertiser, requests for change should reach this office as early as the 25th day of the month.

Special rates for advertising in the Dominion are offered for one year, two years, three years, four years, five years, six years, seven years, eight years, nine years, ten years, and for life. The rates for one year are: 10 cents per line for the first year, 8 cents per line for the second year, 6 cents per line for the third year, 5 cents per line for the fourth year, 4 cents per line for the fifth year, 3 cents per line for the sixth year, 2 cents per line for the seventh year, 1 cent per line for the eighth year, 1 cent per line for the ninth year, and 1 cent per line for the tenth year.

SUBSCRIPTIONS.

The Dominion Mechanical and Milling News will be mailed to subscribers in the Dominion of the United States, post free, for \$5.00 per annum, in advance 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 A. J. Wenborne. Moneys 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 \$12.50 per annum.

Subscribers may have the mailing address changed as often as desirable. In case of 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.

The weight of the Iron Planer illustrated on our front page is 8,400 lbs., and not 2,800 lbs., as stated in the description.

A FURTHER proof for the immense profits of the Bell telephone monopoly may be found in the fact, that the Bell Co. furnished instruments to the New England Telephone Co. costing in the aggregate but \$38,000, from which the Bell Co. are at present drawing annually in rentals and commissions the nice little sum of \$180,000.

THE news of the failure of Canada's largest fishing firm Robin & Co. has caused quite an excitement throughout the country. This firm was rated at over five millions of dollars and was always believed to be almost above the possibility of failure. The firm has been in operation for over a century and owned fourteen establishments for fishing and the preparation of fish at the best places on the gulf. It did an immense business, sending its merchandise to all parts of the world in its own ships, of which it possessed quite a fleet. Its business amounted to about six millions of dollars annually. It is said that in consequence of this failure fully six hundred families of fishermen on the Gaspe and Bonaventure coast have been rendered destitute. It is to be hoped that the Government will immediately take measures to devise some means of relief for these unfortunate people, whose whole life has, to say the least, always been one of constant hardships.

STATISTICS taken from the U. S. Census reports and the reports of the treasury department show that whilst the population of that country has increased from seven million millions in the year 1840 to fifty-six millions in the year 1885, accordingly has more than trebled during that period, the consumption of whiskey has but risen from forty-three million gallons in 1840 to seventy million gallons in 1885. And it must here be borne in mind that in the last twenty-five years comparatively much larger quantities of spirits have been consumed for industrial purposes than ever before. Simultaneous with this decrease in the consumption of whiskey there has been a constant large increase in the consumption of wines, although the importation of foreign wines has since 1871 steadily become less. One of the lighter beverages, has greatly decreased the use of whiskey, the stronger. But...

lessened the use of strong drink. The manufacture of beer has increased from twenty-three million gallons in 1840 to five hundred and ninety-four million gallons in 1885, or in other words, during the year just closed more than twenty-five times as much beer was manufactured as forty-five years ago, whilst the number of gallons of whiskey manufactured, as compared with the year 1840, is yet far from having been doubled.

FIRE INSURANCE.

SINCE January 1st of the present year a new law is in force in the State of New Hampshire, which makes it obligatory for every fire insurance company to pay the whole of the sum insured, in case any building, on which such company has taken a risk, should be completely destroyed by fire; in case of only partial destruction, however the respective company is liable only for the amount of damage done. When this law was enacted by the state legislature during its last session, the different fire insurance companies doing business in the state made a big fuss over it and threatened to "boycot" the state altogether, or in other words to take no more risks on any buildings in New Hampshire whatsoever. Whether this has been done or not, we are not able to say, but this much we know, that the mere threat to do so, involves the open confession on the part of such companies that made it, that their business transactions are not strictly honest. For no company whose dealings are strictly honest, will under any circumstances insure a building for more than its actual value and therefore, in case the same is completely destroyed, it will not for one moment object to pay the full amount assured.

But for a dishonest company that has insured a building of the value of perhaps \$5,000, say for \$8,000, it certainly must not be a very agreeable matter to be under the legal obligation to pay the \$8,000, in case of total destruction of the same. To make the owner pay the premium computed on a value of \$8,000 is good enough, but to have to pay the full amount so assured if totally destroyed, is something that companies of this class do not appear to be able to realize.

In this whole controversy between the state of New Hampshire and the fire insurance companies the "cheek," the consummate coolness, with which these companies own up to their dishonest dealings, is perfectly amazing. For any and every fire insurance company knowingly commits a fraud, if it insures a building far above its actual value, with the intention to pay only so much as it was worth according to lowest calculation, in case of fire. In this case the company knowingly robs the owner of the building of the difference between the premium on the insured fictitious value and the actual value.

The new fire insurance law of New Hampshire is therefore a step in the right direction, but a good many more similar steps will have to be taken before our laws pertaining to fire insurance will be placed on a basis equitable alike for the insurer and the insured. For as fire insurance stands to-day, it affords us too much scope to a company that wants to be dishonest, to defraud honest people who have the misfortune to be burnt out, whilst, on the other hand, too much encouragement is given to the perpetration of the crime of arson by reason of fraudulent and fictitious values. There is one thing pretty certain. The number of fires that take place throughout the country during one year would undoubtedly be decreased by one quarter if there was a uniform law forbidding that no building can be insured for more than three-quarters of its actual value, and ordaining that in case of its complete destruction by fire, the owner has to make good at least one quarter of his loss himself.

"NEW INDUSTRIES."

A FEW WORDS TO PARTIES INTERESTED.

The publisher of this paper intends henceforth to introduce a new feature into its columns, for which he asks the hearty co-operation of the manufacturing and commercial communities at large, as well as of all interested generally. This new department has not hitherto been represented in any Canadian journal, either trade paper or of any other tendency, and we claim for it accordingly the initiative over all other publications throughout the Dominion. It is to publish, monthly, if this meets with the ready response which we may reasonably expect for it on the part of those interested, or from time to time, should these expectations not be realized in the measure at present anticipated, under the heading "New Industries," a classified and complete list of all new organizations, business corporations, mills, factories, machine shops, industrial works, gas works,

electric light plants, water works, public buildings, churches, hotels, stores, etc., etc., in contemplation or process of construction, or of improvements or changes contemplated by any miller or owner of any other kind of manufacturing or industrial establishment, throughout the country, or of any such establishment destroyed by fire or other causes. This list will be more especially designed for manufacturers and dealers generally whose products enter into the construction or operation of any of the above industries, thus making this paper a ready reference on the desk of almost every person who has anything to sell, and thereby greatly enhancing the value of the paper to him, in fact making it an almost indispensable requisite of his office table.

A miller of London, Guelph or some other town, by way of example, contemplates introducing a number of improvements into his mill, or remodelling it throughout, and a mill furnisher of Toronto, Stratford or any other place, reads a notice of this in the list contemplated, the latter will be afforded the opportunity to immediately address the miller that intends making these improvements or changes and enter into negotiations with him, with a view of securing the job. And this brief example holds good for all the other industries of the country. A contractor or brick manufacturer in any part of the country, to give another example, reads that a new public building, church, large store or hotel, is to be put up here or there, he will, in a like measure, by seeing such a notice published from a reliable source, be put in the way of immediately taking the necessary steps to, if possible, secure the contract or to sell his product.

But to be able to publish a reliable list of this kind, we must ask the hearty support and co-operation of all interested. It will be impossible for us to obtain the necessary information through our individual efforts alone, through the length and breadth of this vast country. We would therefore request the prospective secretaries of all new business organizations, manufacturing companies, &c., forming or in process of incorporation, to inform us of what is contemplated, giving the names of the incorporators, the capital stock, address, &c. A like request we would make to the proprietors of flouring mills, saw and planing mills, machine shops, foundries, factories generally, breweries, distilleries; to the projectors of new buildings, churches, hotels, water works, railroad extensions, &c. to send us all the necessary information, as brief as possible, concerning any intended improvements, new works or new buildings. All this will cost you will be the expense of a post card, on which you can put down, in as few words as possible, the main points concerning your intentions and the improvements or changes contemplated. All such information will then be classified by us, and published under the above-mentioned heading as a reliable showing of new business enterprises, improvements, &c., being put or to be put into operation in the various parts of the country. All such notices should, however, not reach this office later than the 25th of each month, to insure publication in our next succeeding issue.

We trust this new feature which we are endeavoring to introduce into the columns of this paper, will find the approbation of the business community of the country at large, and to enable us to inaugurate this department successfully, and carry it through according to our best intentions, we bespeak the cordial support and assistance of all interested, in the way above indicated.

THE PRINCIPLE OF LUBRICATION.

The correct principle of lubrication is to introduce a substance between the two wearing surfaces, that will prevent them from coming in immediate contact with each other; and the substance that will maintain this condition the longest, with the least quantity used, with out becoming thick and gummy, is the best lubricant of matter what it is composed of. Pure sperm oil probably contains the best lubricating properties of any other lubricant, as it is comparatively from gelatin, has little affinity for oxygen, and consequently will not oxidize but retains its fluidity still longer out; but the highest modern oil has superior for most uses.

PROCTOR'S POINTS.

.....

"There! that miserable belt is gone on that planing machine again; what will we do about it?" Thus spoke a shop foreman to the "boss" in the office of quite a large planing mill, in a town not a hundred miles from Toronto, the other day. "Oh, get another one; that makes three belts for that machine this year. What kind of a belt did you get last time?" "I got No. 1 at 20 per cent. discount." "Well, see here Jim, we can't afford to get such expensive belting if we are going to have to get so many belts as we have had to get lately; we must get 40 per cent off. Do the best you can, but mind and get a good discount." And so Jim went off to hunt for a discount, and he got one, and a home-made one at that. At least the belting was "home made" - "No. 1 Canadian," 40 per cent. off; and the belt was like the discount or, to be exactly accurate, the price list on this particular belting, subject to a "large reduction" at least the foreman found it so, for he had to stop four times within two days to shorten it. Now what do you think about it, reader? Was that economy or not?

About three-fourths of the users of belting in this country are after "discounts" when they want to buy belting, and no wonder they are always grumbling about the belting men selling poor stuff. That class of belting is not made or sold on account of the work it will do, but for the discount it can be sold at. There is no "economy" in buying it for the transmission of power, because, except under very favorable circumstances, it will not convey power as it ought to be conveyed - regularly, evenly and systematically. It will stretch in damp weather, and then is "too slack," and doesn't do its work. Shorten it up - and of course as much as possible so as not to have to do it too often - and then it is too tight, thereby causing both loss of power and speed by increase of friction in the bearings. But I think I hear some one say, "Belting ought always to be run tight." Indeed? When did you find that out? Can you show a proper condition of belting and pulleys where it is necessary to run belting tight?

"What is a proper condition of belting and pulleys, Mr. Proctor?" I think I hear some one say. Well, let me give you a few "points." 1. A good belt; the very best that can be got: pure English or American oak tan. Never mind the discount, get the belt right, and then buy as close as possible; and having the belt right it will always pull evenly. 2. A good width of belt considering the work to be done. One great source of trouble with belting is that nearly all the belts now-a-days are too narrow for their load. There is no use trying to have an ordinary donkey carry a camel load. The animal may be tough and strong, but that load will break him down sooner or later - most generally sooner. 3. As large pulleys as it is possible or convenient to have. The first two factors being right, this third one often upsets a whole calculation for the transmission of power, by one of the pulleys being too small. A pulley ought always to be over twice the width of face in diameter, very slightly crowning with the belt in its working position. 4. A good speed of belt. "Oh," says some lathe man, "I like a slow speed and heavy feed to turn out good work." Well, that's all right for a lathe spindle, but unless you have a good speed of belt travel from the line shaft to the counter shaft, you cannot get your power right. Figure it out and see for yourself. A good belt will last longer and do more work running from 2,500 to 3,500 feet per minute than at from 1,500 to 2,500 feet; and as for a poor belt, about the only chance to get any equivalent for the money invested in it, is to keep it moving lively.

"Why don't the English people put their belting on right side out, and run it with the grain or hair side to the pulley?" queried a Yankee enquirer in an American mechanical journal, not long since, as if it had never occurred to him that there were really two sides to that question, and that it might be at all possible for anything in American practice to be wrong or subject to improvement. The English belting manufacturers put the leather in their belting the same side out as it occupied in its original position on the animal, and that certainly is a very strong argument in favor of their position. Then as the greater portion of the wear of a belt is on the inside, they claim that as all the strong portions of the hide are near the surface of the skin, the belt lasts longer, and retains its strength longer, by being run "flesh side," towards the pulley. Isn't that logical, reader? If not, why not?

A FESTIVE GATHERING.

FOURTH ANNUAL BANQUET OF THE GEO. T. SMITH M. P. CO. TO ITS EMPLOYEES.

The fourth annual banquet given by the Geo. T. Smith Middlings Purifier Co. at the Hibbard House, Jackson, Mich., on the evening of New Year's day was a most enjoyable affair. The chair was occupied by Mr. Geo. T. Smith, with whom the idea of a "early entertainment of this kind originated. Among those present from out of the city were: Col. Rodney Mason, of Detroit, Messrs. Howland and Arnoldi, of Toronto, Ont., the lawyers who carried the Geo. T. Smith Canadian patent suit through the various Canadian courts and finally to the English privy council, where the suit was decided in their favor; John Webster, the George T. Smith representative in Toronto, Wade Wilson, eastern agent, John M. Roe, of St. Louis, southwestern agent, W. D. Gray, milling expert with E. P. Allis & Co., Milwaukee, Hon. J. G. Flanders, of Milwaukee, one of the attorneys of the Purifier company in the suit against the Milwaukee Dust Collector Company; Mr. Duncan, superintendent of the Purifier branch works at Stratford Ont.; Chas. I. Scott, agent in Maryland, Delaware and the Virginias; W. I. Keal, agent of the Michigan territory; H. J. Wright, of Rochester, N. Y., representative in New York.

Several excellent speeches were made in response to toasts. Our spare will only allow us to give a summary of two or three of the most important.

Mr. Howland, the Canadian attorney of the Purifier company, was called upon, and said that he was very happy to be able to meet the president of the company, its officers and employees under such pleasant circumstances. The company still has two patent contestants in Canada, one of which, he was happy to state, was vanquished but was very unwilling to acknowledge his defeat and the other he considered now in process of being beaten. The latter, he said, has not been wisely advised as to his position and has brought the question to trial. He has had the pleasure of meeting the important gentleman from whom a letter was read, Mr. Clark, and thinks that Mr. Clark feels restrained in so small a country as England and is happy that he has the continent to go to, when the smallness of England becomes too oppressive laughter. But while Mr. Clark is no doubt a great talker he is a valuable acquisition to the representative force of the Smith Purifier Co. He had frequently heard the machines mentioned in England: their superiority acknowledged and in their finish and workmanship they everywhere evoked admiration and wonder. He considered the patent laws a safe guard to industry as it allows the patentee to gain a perfection which would probably not be otherwise obtained. There will be an English and American exhibition in London next year, and he hoped that not only the purifier machines of the United States but those manufactured in Canada would be represented among the other industries of Canada. The Purifier Company is a good representation of the industry of the manufacturing interests of the United States and Canada, as the purifier machines of the same character and quality are protected by patents and manufactured in both countries.

John E. Winn, the gentleman in charge of the legal and advertising departments of the Company, said that there were some veterans present whose memory extended back to the time less than a dozen years ago - when the annual business of the Smith Purifier Company was less than \$75,000: the books of the Company to-day show that during the year just closed it has shipped from here nearly \$2,000,000 worth of machines, distributed to every section of the globe where wheat is milled. Its large Canadian business would swell this many hundreds of thousands more. Reliable statistics prove that over \$2 per cent. of all middlings purifiers in use in this country are the Geo. T. Smith machines. The Company is not content with the degree of acknowledged excellence already attained for its machines, but is constantly seeking to make further improvements. No machine ever effected a more complete revolution in a great industry than the middlings purifier. The purifier brought about the development of the spring wheat producing prairies of the great northwest, which for centuries had lain neglected by the world, known vaguely and to song as "the land of the Dakotas." Now visit the buy mills, the smiling farms, the happy homes in the "land of Laughing Waters" and be convinced that its later history could not be written with the name of Geo. T. Smith and his middlings purifier omitted. That machine was not only the direct cause of the settlement of the great "new northwest," but its invention marks an epoch in the history of milling. The world is familiar with the war its inventor fought to protect and defend his title and with his triumphant victories. But Smith was not content. He and his company saw the possibilities of

the centrifugal reel and have spared neither work nor expense until they have brought it to a degree of perfection never hoped for even by themselves. The results they have obtained from the centrifugal are producing almost as much commotion among the millers of the world to-day as those of the purifier did a dozen years ago. The Eldred mill demonstrated the success of their efforts with the centrifugal, and to-day there is a hasty scramble among the progressive millers of the country each to get the new system of bolting before his neighbor does. During the past year no less than twenty-six mills ranging in capacity from 100 to 500 barrels each per day have adopted the full centrifugal system of bolting, using the Geo. T. Smith machines. Plans are being made for many more. No machine was ever brought to a higher degree of perfection than this and yet, always "improvement" is the watchword and "Progression" is the measure of every man's success in the service of this company. The company appreciates the services and character of the gentlemen present and extends to them a royal welcome to the hospitalities of its home, wishing them life, health and abundant success as they enter upon the new year.

Mr. Arnoldi was called upon and said that his position with the purifier company was an *aide-de-camp* in the Canadian suits which his partner, Mr. Howland, had conducted. The Geo. T. Smith company has never gone into court without a good cause, and with so good a beginning, the result could not but be satisfactory. The Purifiers are introduced to Canada and are deservedly popular, and will stay there.

After several other gentlemen had spoken the company dispersed at a late hour, carrying with them pleasant recollections of the occasion.

ARCHITECTURAL TERRA-COTTA.

Broadly speaking, the term terra-cotta can be applied to all forms of baked clay, whether it be used for the manufacture of domestic utensils, such as jugs, crocks, etc., or for sewer pipes or other forms for which burned clay is utilized; drain tiles and pipes are, perhaps, as potent agents of civilization as the most beautiful productions of the potter's art; but the object of this article is to treat of the architectural employments of terra-cotta.

The use of this material for architectural purposes dates prior to the times to which our histories reach. In the mythical history of Greek art, we find that *Debatades*, *Rhæcus*, *Theodos* and others, are mentioned as masters in works of clay. Homer also refers to them, and if we accept the evidence of Dr. Schliemann, the terra-cotta ornaments found upon the hill of Hissarlik must have formed some part of the pottery collection of King Priam. The Assyrians used terra-cotta cylinders or tablets for all the purposes for which the Egyptians employed papyrus, and for which we now use paper, cards and books. These tablets are inscribed with the records of events: bulletins recording the King's victories and the annals of his reign were published on terra-cotta cylinders, having the appearance of a rolling-pin, and these were usually hollow, or hollow hexagonal prisms. The inscriptions were placed in different forms, those on the cylinders being engraved lengthwise, while in the prisms they are in compartments on each face. Both forms were made of a very fine material, sometimes unpolished or unglazed, and at other times covered with vitreous silicious glaze or white coating. Title-deeds, evidencing the sales of land, were inscribed on rectangular pieces of polished terra-cotta, slightly convex on each side, and as fraud was just as common in those days as now, a cylinder was run around the edges or across the deed, in order to prevent any enlargement of the document; this cylinder left its impression in relief; if names of witnesses were affixed, each one impressed his oval seal on the wet terra-cotta, which was then carefully baked in the kiln. Records of the sales of Phœnician slaves were also made upon these tablets, the name of the slave being inscribed in Phœnician on the edge. In the palace of Sennacherib at Kouyunjik, there were found collections of almanacs, deeds, histories and spelling-books. It is doubtful with what nation the molding of figures in clay originated; the Corinthians have been awarded precedence, although both the Greeks and Romans claim prior title to the invention; but as most of the figures have been destroyed by the barbaric races, their origin cannot be easily followed, and their history will probably long remain more or less hypothetical. The life-size terra-cotta figure of Mercury in the Museum of the Vatican and also some of the large terra-cotta statues in the Museum of Naples, are probably Grecian. The famous torso in the British Museum is also a fine specimen of early modeling in terra-cotta. The ancient statues with which the Roman temples were adorned, were made of terra-cotta but the general opinion is that many of them were purchased from the Greeks and Etruscans.

ONE OF THE BEST.

DESCRIPTION OF MR. TILSON'S NEW FLOURING MILL AT TILSONBURG, ONT.

A MAGNIFICENT new roller flouring mill has just been put in operation by Mr. E. D. Tilson of Tilsonburg, Ont., the cost of which is placed at \$30,000. Every improvement that time and experience suggested has been incorporated in the plant of this mill, and it stands complete a credit to the builders, Messrs. Goldie & McCulloch, of Galt, and its proprietor, who has invested so much money in it. The mill is thus described by the *Tilsonburg Observer*:-

"The main building is a substantial five storey building 35 x 70 resting on a massive foundation of masonry. Behind this is a custom grinding mill, about 25 x 70 and three stories high, in which are two run of stones. The eastern end of the main building contains the elevator, which runs from basement to roof, rests on a solid foundation of stone, is built of 2 x 7 inch planks, with the planks laid flatways on each other, and will hold 20,000 bushels of wheat. It contains four large bins of 5,000 bushels capacity each, and a bin over the smutter, capable of holding 700 bushels, in which to mix the wheat. By this arrangement of bins the different grades of wheat are kept separate until the manager wants to mix them, when they are run from any bin or all bins at once to the bin over the smutter by a series of elevators which he can control by a touch of his hand. He can, therefore, mix the grades to suit himself. At the bottom of the elevator is a conveyor—a sort of Archimedes' screw—by which the wheat, if it happen to beat, can be changed from one bin to another, and kept in motion in the elevator itself. The whole elevator, in fact, is most admirably designed and constructed, but that about it which most forcibly strikes the casual observer is its solidity, and, for so massive and utilitarian a structure, its architectural beauty. The remainder of the main building is occupied by the roller process machinery and the motive power, which is contained in the sub-basement and is itself deserving of considerable notice. We will begin with this sub-basement and, ascending to the top of the mill, notice what every floor contains; but, *en passant*, let us here remark, that the mill, from basement to roof, is packed with the best machinery that money could buy or that invention and accumulated experience enabled the contractors, Messrs. Goldie & McCulloch, of Galt, to supply; and that it has been so well placed, and so well fitted, that notwithstanding its ponderosity, and the great number of its parts, the inevitable concussion, or jar, is less than was felt in the old stone mill—is, in fact, surprisingly small. This, alone, is conclusive evidence of the care with which the mill and its contents have been constructed.

In the sub-basement we find the wheel pit, 25 x 35 feet, constructed of solid masonry walls, and with floors of masonry and cement, containing two powerful turbines—one a 33 inch and the other a 16 inch wheel—capable of exerting together 125 horse power. The larger wheel runs the roller mill machinery and the smaller the stone mill for custom grinding. Both wheels are of the very best patterns.

In the basement are the whole cleaning machines: the separator; grader and coke separator; smut machine; brush machine, and the necessary shafting for driving all. On the second floor we find the line shaft for driving all the rollers; the shoes of all elevators; three packers; two for barrels and one for hand; and the weighing and exclusive rooms. On the third floor are 13 sets of rollers for reducing the wheat, 4 for finishing the middlings, 1 for the low grade flour and 2 for handling the coarse material; four purifiers, for purifying the middlings and the business office, in which Mr. Geo. Tilson is supreme. Twenty-five stand of elevators, all in a row, and the packers run through this floor to the upper parts of the building. On the fourth floor we find scalpers; the stock hopper over the rolls; the bran duster; the shorts duster; 1 purifier; 3 centrifugal reels for handling the different grades of flour; one large dust collector, for receiving the dust from the smutters, and the tops of the packers and all stock hoppers. The elevators are run through this floor also. On the fifth floor are two scalpers; two chests of bolts; four reels, each for handling the different grades of flour and middlings; one centrifugal; another large dust collector, for receiving the dust from the purifiers; a large reel for separating the bran from the shorts; and the heads of all the elevators and all shafting for driving the same.

The barrel packers on the second floor, we might mention, are automatic—i.e. when the proper amount of flour is in the barrel, they throw themselves out of gear automatically, and no more flour descends, and the caretaker must remove the full barrel and put an empty one on the platform of the packer before the machine

will work again. There are men employed to attend to this and the stenciling of the barrels alone. An archway through the centre of the elevator enables the porters to take the barrels straight from the packers to the platform from which they are loaded on heavy drays and taken to any one of the three railway stations. And now, having gone as far as we can in a general survey of the mill, let us follow the process of manufacture, that is to say, let us follow the wheat, in its course of fifteen miles, we believe, from the weighing room to the barrel, where it finally appears as flour.

[Now follows a full description of the process of manufacture, which, in view of the fact that our milling friends are, or ought to be, by this time sufficiently conversant therewith, we may assume they will excuse us from reprinting.—Ed. D. M. & M. NEWS.]

The article then closes:—And now, in conclusion, the head miller, Mr. George Geddes, says that he never before saw so complete a mill; that is, in every particular. He pronounces it second to no mill in Canada. It made a better start than Mr. Geddes ever saw a new mill get. It started on Saturday, Oct. 10th, and flour was sold 3 hours after the water was turned on, and there has been no serious hitch since. This reflects great credit on Mr. Jas. Smith, of Goldie & McCulloch's works, in Galt; under whose superintendence all the millwright work was done.

The capacity of the mill is 175 barrels a day, or 54,775 barrels a year.

To accommodate the farming community, Mr. Tilson retains his stone mill, which is attached to the flouring mill, and which is ready to do business as of old. It is under the superintendence of Mr. John Lovell, who says he is prepared to grind flour with anyone.

There can be no question about the benefits this mill confers on Tilsonburg. They can be seen in the greatly increased liveliness on the market and in the enormous quantity of grain that is being weekly marketed here."

CURATIVE POWER OF WATER.

There is no remedy of such general application and none so easily obtainable as water, and yet nine persons in ten will pass it by in an emergency to seek for something of less efficacy. There are but few cases of illness where water should not occupy the highest place as a remedial agent.

A strip of flannel or a napkin folded lengthwise and run out of hot water and applied around the neck of a child that has the croup will usually bring relief in ten minutes. A towel folded several times and quickly run out of hot water and applied over the seat of pain in toothache or neuralgia will generally afford prompt relief. This treatment in colic works like magic.

We have known cases that have resisted treatment for hours yield to this in ten minutes. There is nothing that will so promptly cut short a congestion of the lungs, sore throat or rheumatism as hot water when applied promptly and thoroughly. Pieces of cotton batting dipped in hot water and kept applied to all sores and new cuts, bruises and sprains is the treatment now adopted in hospitals.

A sprained ankle has been cured in an hour by showering it with hot water poured from a height of three feet. Tepid water acts as promptly as an emetic, and hot water taken freely half an hour before bedtime is the best of cathartics in the case of constipation, while it has a most soothing effect on the stomach and bowels. This treatment continued for a few months, with proper attention to diet, will alleviate any case of dyspepsia.

A SOLAR CLOCK.

A prominent watchmaker in Rio Janeiro, has a solar clock fitted up in his establishment, which is not only ingenious but practically solves the problem of perpetual motion for those places where the sun shines perpetually. He has an electric bell apparatus in the upper storey, and the two wires from the battery are furnished, each with a thin flat horizontal piece of metal, separated by a distance of four to five millimeters from the other. Just above the flat pieces of metal a biconvex lens concentrates the rays of the sun upon them at a certain moment, noon for instance. The action of the sun's rays heats and bends the metal pieces so that they come in contact, thus closing the electric circuit, which rings the bell. This is not all that Mr. Magnin requires of the sun; he forces it to wind up the clock in his own room at the same time. The barrel arbor carries a click and ratchet, which is wound up by the hammer of the electric bell as it moves forward and backward, striking the hour. And even this is not all—this sun has to regulate the clock also. The cannon carries a washer with an indentation corresponding to a jointed lever, which is set in motion by the armature of a magnet, and at noon turns the cannon so as to bring the minute hand upon the figure twelve.



The E. B. Eddy Manufacturing Company, of Hull, P. Q., have made application to Parliament for a charter.

The Port Arthur Lumbering Company has been exempted from paying taxes for five years by a by-law of the municipality.

An addition of 40 feet is being built to Mr. Peter McLaren's circular saw mill at Carleton Place. The new building will contain machinery for manufacturing dressed lumber.

John McGregor, of Peterborough, employed by the Georgian Bay Lumber Company, was killed by a falling tree about four miles from Coldwater, Ont., a fortnight ago.

On December 25th, the bark Anabella, laden with lumber for Australia, went ashore on the rocks a few miles from Victoria, B. C. At last accounts it was thought a portion of the cargo might be saved.

The lumber manufacture of White Lake, Michigan, in 1885 was 74,576,000 shingles 73,595,000. On hand: lumber, 13,850,000; shingles, 3,700,000. The lumber cut was 4,000,000 feet less and of shingles 10,000,000 more.

The amount of lumber cut at Ludington, Mich., during 1885 was 85,632,000 feet, of which 8,635,000 were reported as on hand at the close of the season. The number of shingles cut was 55,567,000, of which only 910,000 were reported on hand. The gain in the cut as compared with 1884 shows 10,000,000 feet of lumber and 25,000,000 shingles.

J. A. J. H. English, lumber dealer and contractor, Stratford, have again assigned in trust. They failed in 1884, with liabilities amounting to about \$100,000, most of which was owing to the Federal Bank. That institution agreed to accept \$50,000 in full of their account, but the firm has not been able to meet the notes to the bank as they matured, hence their assignment.

The sad intelligence reached us from Newmarket on Jan. 14th, that Mr. Frank Lundy, foreman in Cane & Co.'s mill and tub manufacturing establishment, while reaching under the saw, was caught by the mangle and had his head completely severed from his body. He was a son of Mr. D. A. Lundy, and was held in high esteem by all who knew him.

On the morning of January 24th the large furniture factory and plant mill, owned by James Bennett, of Brussels, Ont., was discovered on fire. The buildings being frame and full of goods of a combustible nature it did not take long to consume the large building with a large stock of furniture. The loss is estimated at \$12,000, with an insurance of \$2,000.

A despatch from Marquette says that the details of the largest transfer of standing pine ever made in the upper peninsula of Michigan have been made public. T. H. McGraw & Co., of Bay City and New York have purchased of H. C. Thurber of Marquette, 36,000 acres of pine land upon the Dead River, for \$360,000. The despatch says the land is estimated to have 200,000,000 feet of standing pine upon it, and was sold at that low price because at present it is inaccessible. Between \$200,000 and \$300,000 will be required to put the river in shape for running logs, and in that will be included the construction of a railway either five or eight miles long. Included in the transfer are all the water privileges, the power being estimated at 1,300 horse. It is said the work on the necessary improvements will be commenced next season, and that Marquette will be selected as the site of the new mill, which will be the largest on the peninsula.

H. R. Robertson, of St. John, N. B., has invented a new description of raft, differing from any at present in use. In shape it resembles a cigar, being round and brought out to a point at both ends. He has got out patents for it in Canada, the United States and in several countries across the Atlantic. Several New York lumber dealers, confident that the raft will be a success, have made arrangements with Mr. Robertson to slip their logs by this means and Mr. Robertson, with that end in view, has contracted with Mr. R. B. Barnhill to have the raft constructed at Two Rivers, N. S. It will be ready for launching in May next. The raft will contain about four million feet of lumber, composed of pine, piece sticks, spars and poles, about 800,000 feet of hardwood suitable for what logs. Everything that enters into the construction of the raft can find a ready market in New York, and so no danger is anticipated in towing. Mr. Robertson expects to make a big thing out of it.

A New Brunswick paper publishes a statement of the lumber shipments from the Miramichi to Europe. The deals, ends, scantling and boards went to the following countries:—

Great Britain	47,739,692
Ireland	24,984,563
France	10,223,213
Australia	1,531,672
Africa	2,262,168
Italy	1,005,715

Total 87,250,006

The shipments for this season verify the predictions of last year and show a decided falling off. The shipments for the five years before averaged 131,400,000 s. f. per year. They are as follows:—

1880	155,000,000
1881	126,000,000
1882	117,200,000
1883	149,000,000
1884	87,000,000

The timber shipments of this season have been rather larger than those of last year, the total number of tons being:

1884	3,874
1885	4,944

Belongs to the number of 3,207,444; one brown hundred, 720 shovel shafts and 22 hundred of shingles were shipped.

A. R. WILLIAMS, Soho Machine Works,

TORONTO,

SUPPLIES FULL OUTFITS IN
IRON TOOLS,

Brass Working Machinery,

Wood Working Machinery,

Saw & Shingle Mill Machinery.

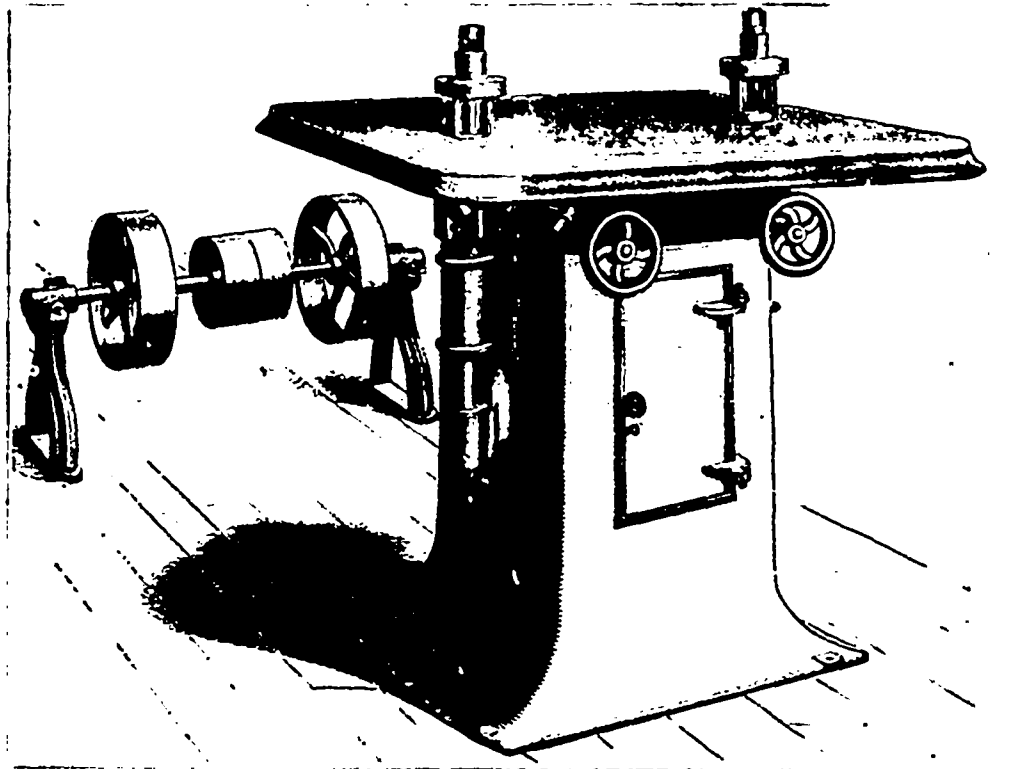
PORTABLE ENGINES AND THRESHERS,

Pumping Machinery.

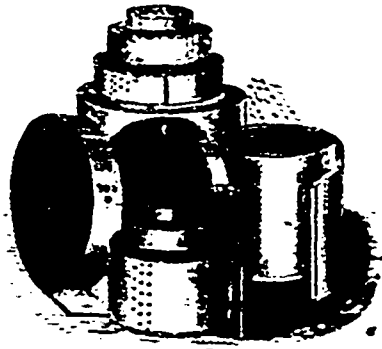
Gas, Steam, & Water Engines,

[SEND FOR CATALOGUE.]

27 Market Street, Toronto.



PEDESTAL SHAPER PRICE \$140.

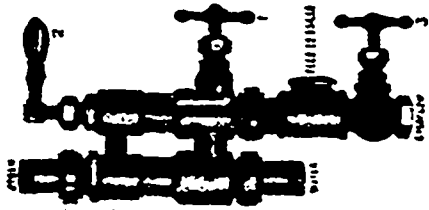


ENGLISH OAK TAN BELTING

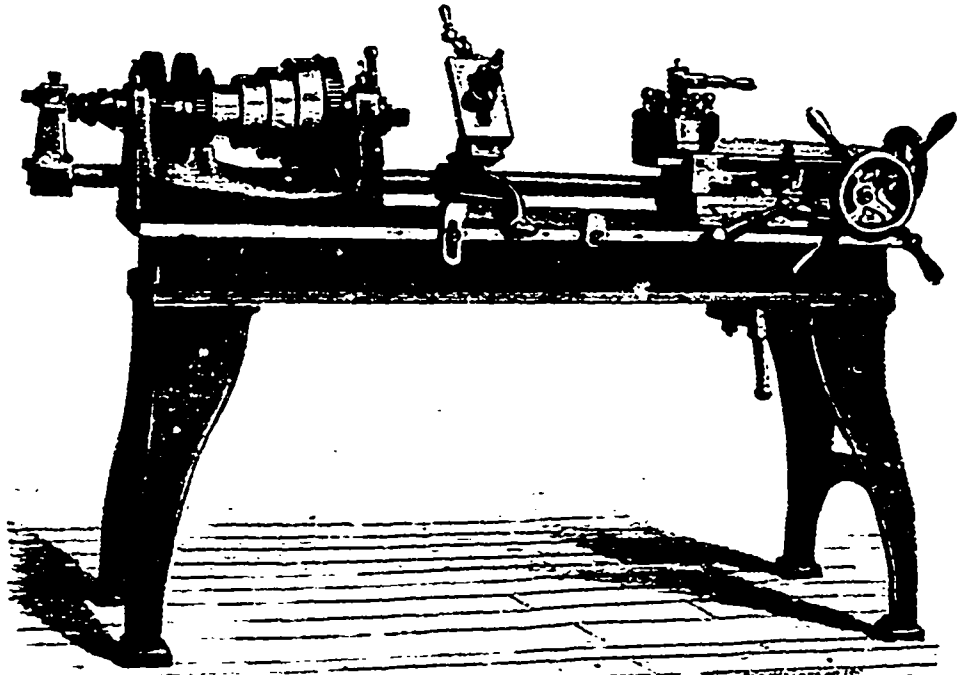
Smooth and riveted joints, weighing 18 to 24 ozs. to the square foot.

Guaranteed the Best in Canada.

SEND FOR SAMPLE BELTS.



WESTERN ENGINE BOILER FEEDER.



FOX MONITOR LATHE PRICE \$550.

BRASS-GOODS, Iron and Malleable Fittings,

BELTING AND LACE LEATHER.

Chucks,

Planer Knives,

Anvils,

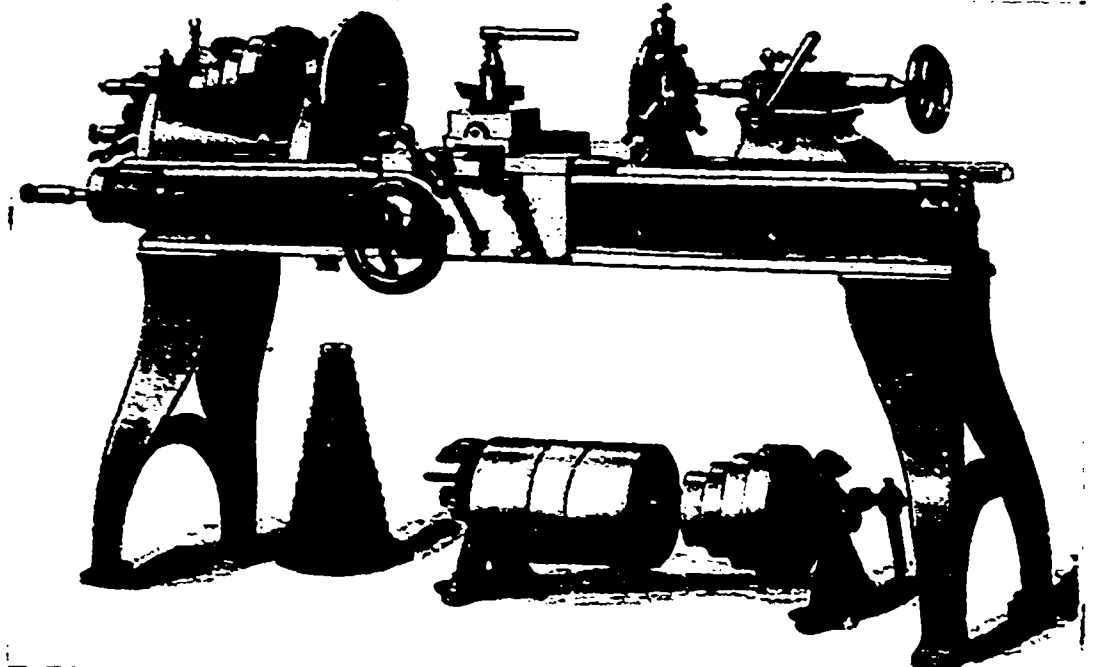
Moulding Knives,

Vises,

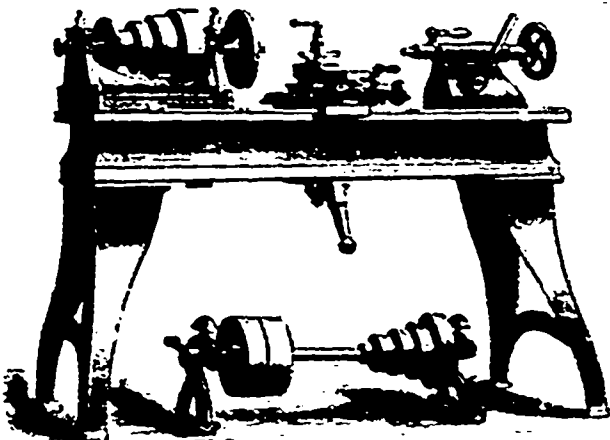
Circular Saws,

Tongs,

French Band Saws.



14 INCH ENGINE LATHE.



12 INCH SPEED LATHE.

NEW BRITISH WHEAT AND RICE COUNTIES.

SINCE the late Liberal or Gladstone government in England has been superseded by the Salisbury cabinet, a more vigorous and determined policy in the dealings with foreign nations has been adopted which betokens itself in many ways and directions.

There are, in the first place, the fortifications now being erected on a vast and formidable scale at Port Hamilton, Corea, opposite the coast of China, purchased by England in May last. As far back as forty years ago Sir Edward Pellew, surveyor of the admiralty, made soundings in the harbor which has since become a regular port of refuge and victualling for the British North Pacific squadron. In 1870 Russia began to make its Siberian port of Vladivostok, the Sebastopol of the East, and she can now sweep the Pacific with her men-of-war from that formidable naval stronghold. In May she sent two men-of-war to Port Hamilton in order to get a foothold first and then treat with the Coreans and pay for the acquisition, but they arrived a couple of hours too late, England was there, hoisted her flag and acquired the valuable spot. Now Vladivostok is checked, Port Hamilton, one of the deepest and widest ports in the Pacific, is British, five of the largest steel-clads are in port and eight gunboats besides, and some 6,000 Korean workmen are employed in helping to fortify the place bound to become the Hong Kong of Corea, an Eastern nation ambitious of imitating Japan and ready to trade with all the world. Here, then England will be possessor of an Asiatic Gibraltar strong enough to defend her vast trade with China and come to the assistance of Vancouver Islands and British Columbia, should her Asiatic rival, Russia, ever attempt to threaten these.

But a commercially much more important acquisition is the one obtained in less than a month in Indo-China, checking all the French may eventually obtain by the Tonquin campaign left them. Through the easy conquest of Upper Burma, England now obtains undisputed sway of the entire rice-producing regions of the Irrawaddy and highlands behind it, the bulk of which rice country, British Burma, she has, it is true, held for thirty-five years past, but this latest acquisition completes the Colony, and opens through it an important thoroughfare.

The prize wrested from the sanguinary tyrant, Thebaw, the King of Upper Burma, is a magnificent one indeed. It is, perhaps, the one kingdom in Indo-China seriously worth having. It is more than two-thirds the size of France, is accessible by splendid rivers, of which one, the Irrawaddy, is the most convenient water highway in Asia, and is splendidly fertile almost throughout. The forests are full of teak, the mountains overflow with minerals, and the plains under the rudest culture produce everything cultivated in the tropics. The reservoirs of earth-oil rival those of Pennsylvania or Batum, and there are large fields of coal ready for the working. Gold is believed to exist in large quantities, and Burma is the native land of the ruby, the sapphire, and the emerald, which have been exported for generations with little effect on the supply. The country commands the only easy routes into Western China, and it is not only probable, but certain, that under British rule Bhamo would become the greatest inland emporium in Asia, rivaling Bombay itself as a receiving warehouse for the trade of the two great peoples. Moreover, much of the land is vacant. Whatever the ancient population may have been, it has died away even more completely than that of Assam, until it is now believed that the Burmans, with their tributary Shan tribes, now number barely three millions and a half, not only "capable of civilization," but willing to be civilized, or, as regards two-thirds of their number, civilized already.

There is, indeed, room for thirty millions of agriculturists, and with a single line of railway Burma could be utilized to relieve that terrible multiplication of peasantry in Bengal which has arisen there and sometimes reduces the most philanthropic officials to despair or to a harsh belief that the "natural remedy," an occasional outbreak of famine, cannot be prevented.

While the month of November thus completed the possession of the greatest rice-producing country under British sway in Asia, the last spike was driven on the Canadian Pacific Railway at Eagle Pass, B. C., on Nov. 7th, thus completing the fourth transcontinental railway line, and throwing open to immigration eastward and westward another great wheat-producing country. Freight has been got through since from Port Moody, on the Pacific, to London, England, in between 14 and 15 days, and fast trains will next year reduce the distance between the Pacific and Atlantic so much that London will be reached from Port Moody in from ten to twelve days. As Port Moody is situated so much more toward the north than the termini of American transcontinental

railroads, there is going to be a gain of 200 miles between Northern Asia and Europe, so that northernmost travel will eventually give the Canadian Pacific the preference and steamship lines will ply between Port Moody, China, Japan, and Port Hamilton, Corea. The distance between Port Moody and Montreal is 2,895 miles.

Port Moody is destined to become a formidable rival to Tacoma, Washington Territory, Portland, Oregon, San Francisco and San Diego, California, and both Canadians and Americans have for some months past been engaged in buying up real estate at and around Port Moody as fast as they can.

Port Moody is the finest port on the Pacific coast of America, it is perfectly landlocked, and never so rough that it cannot be crossed by the shallowest of canoes. The "Great Eastern" could enter the harbor with ease. Off the shore there is Vancouver Island, with the capital of British Columbia, Victoria, a pleasantly situated city of about 15,000 inhabitants. Vancouver Island contains the British Columbian coal mines, whose output ranks in the San Francisco market as the best on the Pacific coast. The lumber business will also be one of the future sources of the province's wealth. The trees furnishing this almost inexhaustible supply of cedar, spruce, and soft pine, attain, some of them, an immense size, and the forests are very dense. There are a great many large and small sawmills in operation, their principal markets being Australia, China, South America, and the Hawaiian Islands. The rainy season, or winter, sets in about Nov. 1st, lasting until about March 1st.

British Columbia, with a wild climate, boasts besides that its scenery is not behind any on the continent. Towering snow-capped mountain domes are seen in all directions, rock-girted rivers and bays abound, and the admirer of everything in the way of a rugged, grand and magnificent scenery has there a paradise. Tourists and pleasure seekers will be flocking in next year by the thousand, the completion of the Canadian Pacific opening up one of the most interesting and least-known regions of this continent.

That the splendid wheat country lying on the track of this important line will attract a goodly portion of the settlement out of the impouring immigration, whether direct from Europe or other portions of the Northern Continent, there is every probability. The Canadian government is financially so much tied up with this railroad and the future greatness of the Dominion so dependent on it that nothing will be neglected to induce and facilitate settlement on the wheat lands.

Next to our own country and its development, England and her colonies are certainly that portion of the world that concerns and interests us most, not only because they are Anglo-Saxons and we all speak a common language, but because their prosperity always benefits us in one shape or another. Any new region rescued from barbarism and solitude by the vigor of England, is a new field for ourselves almost as much as to her, and the great conquests of civilization we have alluded to above are so much common gain to which mankind at large has every reason to rejoice.—C. Kirchhoff in *The Millstone*.

HOW TO ADVERTISE.

A contemporary, in some "hints on advertising," says: "Another thing which publishers have to contend with is that the results of advertising are not always visible to patrons, many of whom cannot understand why custom cannot be directly traced to the source where they expended their money to obtain it. Business is like a river with many tributaries, and in which it is impossible to trace every individual drop of water to the spring from whence it came. But if a journal is selected for advertising purposes that reaches time and again the persons most likely to be interested in the solicitation, that paper is certainly a sure fountain-head of profitable trade in the stream of patronage far below. Temporary advertisements in a small way will not produce an immediate or permanent increase of business any more than a light shower will affect the depth of water in a well, but by persistency in the use of printer's ink in the right direction the results sought will be gained in the end with interest."

THE SUNNY SOUTH.

In 1880 the valuation of personal property in Florida was \$30,938,309. In 1885 it amounts to \$60,598,619. The increase comes from the encouragement given to northern capital. There are other States in the south which might learn a valuable lesson from Florida. Over 30,000 northern people have made investments in that state during the last five years, and many thousands of them have taken up a permanent residence.

If you want to buy or sell, this is the place to say so.



A solution composed of alum two pounds, water sixty pounds, blue vitrol two pounds, gelatine one pound, acetate of lead one-half pound thoroughly mixed, will prevent mildew from affecting any wood, clothing, fabrics, etc.

A small shaft is more elastic than a large one, and therefore is relatively less liable to fracture from torsional strain; the moral of which is, use as small shafting as practicable. It does not cost so much, takes less power to run, and is better in every other way.

A shaft two inches in diameter will safely transmit 20 horse-power making 100 revolutions per minute. A shaft four inches in diameter, making the same number of turns per minute, will transmit 100 horse-power, or eight times as much power as the two-inch shaft, provided it was equally as elastic.

RESTING OF IRON.—Experiments made by Dr. Calvert, in England, show that moisture and oxygen are not the sole conditions of oxidation, but that carbonic acid must be associated with these in order to produce any marked effect. In dry oxygen, iron does not rust at all; in moist oxygen very slowly; but in a mixture of moist carbonic acid and oxygen, the rusting is very rapid.

BRONZE PAINT FOR IRON.—Ivory black, one ounce; chromo yellow, one ounce; chromo green two pounds; mix with raw linseed oil, adding a little japan to dry it, and you have a very nice bronze green. If desired gold bronze may be put on the prominent parts, as on the tips or edges of an iron railing where the paint is not quite dry, using a piece of velvet or plush to rub on the bronze.

SOAP TO CLEANSE SILK.—Heat 300 grammes of coconut oil to 35 deg. C., and then add 250 grammes of caustic soda. Heat 250 grammes of white Venice turpentine and add to it the soap; mix well. Cover and leave standing for four hours; then heat anew, add 500 grammes of ox gall and stir well. Break small some perfectly white tallow soap, and add to the mixture sufficient to make it solid. When cold, cut in pieces.

SOLDERING FLUIDS.—Some of the soldering fluids used are injurious to tools and also to parts that have been laid on the bench where such fluids have been used. The following recipe will do the work as well, and will not rust and tarnish any more than water would. Take two ounces alcohol and put into a bottle, and add about a teaspoonful of chloride of zinc and shake until dissolved. Use it in the same manner as the muriate of zinc, or muriatic acid zinc. It has no bad smell.

ANTI-CORROSION PAINT.—Take equal parts, by weight, of whiting and whitelead, with half the quantity of fine sand, gravel, road-dust, and a sufficient quantity of coloring matter. This mixture is made in water, and can be used as a water color; but it is more durable to dry it in cakes or powder, after mixing, and then use it as an oil-paint by grinding it again in linseed oil. The preparation of oil recommended for the purpose is, 15 parts by weight of linseed oil, and 3 sulphate lime, well mixed. One gallon of this prepared oil is used to 7 pounds of the powder.

Wood worms can be destroyed in books and woodwork by benzene. Books are locked up in a cupboard with a saucer of benzene. The insects as well as their larvae and eggs soon die off. Furniture and castings are similarly placed in a room with a dish of benzene, and kept closed up for several weeks, the time required for the complete destruction of the insects varying according to the thickness of the wood. New woodwork can be protected against their entry by a coating of glue, or living on vegetable substances, they do not touch animal products.

WIRES SOLDER.—Take a carpenter's grooving plane that cuts about three-sixteenths of an inch wide, and run a groove in the edge of an inch board three-sixteenths of an inch deep and 3/16 inches long. Fasten three or four of the boards together and set them level on the bench. Then, with a bar of solder and a hot copper, fill the moulds full. The ends, of course, must be clamped with plugs of wood. The grooves may be filled from a ladle if that method is preferred. If the wires are too heavy, put them in the grooves of the stove-pipe rolls and squeeze them to any desired size.

A TEST FOR GOLD AND SILVER.—For testing gold, make a liquid consisting of nitric acid one ounce, water two drachms and muriatic acid one half scruple. Mix the ingredients well and keep the solution in a bottle with a glass stopper. With a glass rod which has been dipped in the mixture touch the metal and watch the action. If no effect is produced on the metal, it is either gold or gold plated. If the gold is very low, or less than karat, the acid will boil green, and base metal is at once detected by its mark left by the acid. To test silver, apply a drop of a solution of nitric acid three ounces, water one ounce, and bichromate of potash one-half ounce, and wipe off the drop immediately with a sponge and water. If a blood-red mark results, the metal is silver or the article silver-plated.

HOW TO CUT GLASS BY HEAT.—Berzelius' carbon, a species of pencil, by means of which glass may be cut by passing its incandescence point over the surface, may be replaced with advantage by a small flame of gas, in the following manner: Fit the point of an ordinary blow-pipe in a metallic tube so as to form a recumbent blow-pipe; put on the mouth piece a rubber tube, connecting it with a gas burner, and reduce the flame to 1 or 1 1/2 centimeters in length. Pass this flame over the glass, and it will cut it with great neatness. This action is due to concentrated focus of heat more intense than an incandescence point of Berzelius' carbon. To begin the cut, it is necessary to make a scratch with a file, and the blow-pipe must be inclined sufficiently to make the flame luminous at the base, and blue in contact with the glass, and to stretch along the glass. The glass blow-pipe may be employed to slit chimneys to their entire length, and thus prevent breakage when lighting.

ONTARIO MANUFACTURERS.

THE eleventh annual meeting of the Ontario manufacturers' Association was held at their offices in this city on January 27th, 85 members, representing nearly every branch of manufacturing industry, being present. The following officers were elected for the current year:

President—Thomas Cowan, Galt.
1st Vice-Pres.—Jas. Goldie, Guelph.
2nd Vice-Pres.—Samuel May, Toronto.
Treasurer—John Cosgrave, Toronto.
Hon. Secretary—A. W. Wright, Toronto.
Gen. Secretary—Fred. Nicholls, Toronto.

Among the resolutions passed were the following: "That the necessary steps be taken to secure letters patent as 'The Canadian Manufacturers' Association'"; "That for the purpose of encouraging the study of art and design as applied to manufacture, this Association shall offer for competition to the art schools of this Province, or other amateurs who may wish to compete, three silver medals to be severally awarded for the best designs in three subjects to be decided by the executive committee"; "That this Association direct the attention of the Government to the necessity of our manufacturers and exporters generally being afforded facilities more nearly approaching those enjoyed by their competitors in neutral markets, and this Association is of the opinion that this end can best be obtained by the appointment of 'Commercial Agents' resident at foreign ports, with duties similar to those performed by the commercial agents of the United States"; "That in the event of negotiations taking place between the Governments of the United States and Canada with reference to a reciprocity treaty, this Association would strongly impress upon our own Government the necessity of guarding the manufacturing and industrial interests of Canada."

During the evening session a number of interesting papers were read by Messrs. R. W. Elliott (the retiring President), D. C. Ridout, Thos. Cowan, (the new President), Fred. Nicholl, A. W. Wright, J. E. Klotz, John McLean, John Livingstone and Wm. Lukes. The last named gentleman's topic was "The Milling Industry." He gave the following reasons for the present depression:

1. Sudden and extensive fluctuations in the value of raw material.
2. The importation of foreign flour on a limited home market.
3. Discriminating rates and preferential shipments by the common carriers of the country, in favor of the foreign manufacturers.
4. The Dominion millers have serious difficulties in the way of access to outside markets.
5. The English market may be said to be free from duties on imports of flour, but there are many other obstructions forcibly confronting the Dominion millers for that market, which actually commence at his door on account of a preference by rail and ocean transportation companies for grain as freight rather than flour.

BAND SAWS—JIG SAWS—SHAVINGS VAULTS.

The band saw mill has not yet been brought to perfection, and probably will not get there for years to come. If it were perfect we should have no further use for the jig saw, and the jig saw is generally a rattling, jumping nuisance. The saw is always getting out of square; the crank shaft is out of balance and jumps around about as it has a mind to, while if the saw is a gate saw the gate gets loose and rickety, the sawer gets demoralized and your jig-sawed work falls into disrepute in the market.

The band saw is not a perfect tool, because we cannot do inside work with it. No practical method has yet been found for joining a saw so that it may be connected and disconnected at will, to enable it to be used for inside work. There is a device whereby a band saw can be unhooked and hooked together again, but it is not of much value. It breaks easily and often, and it costs considerable to repair it. Good jig saws are very scarce. They are not found in every shop, and even every other shop does not have a first-class jig saw.

A saw which has the over-head portion bolted to the floor-joint above, independent of the table—that saw is a tool that you want to sell before you are a day older. Perhaps the maker of that saw came to your shop and set it up himself. It did work nice, there was no mistake about that. It cut square, fast and smooth, and what more could a saw do? The next morning Bob nailed up four inches thick of gingerbread work and began to saw it. The narrow parts of the scrolls were about 1/2 inch wide. The saw cut quick and smooth and Bob soon got around the piece. While he was sawing Tom loaded a truck and took it upstairs on the elevator. When Bob got the pieces sawed he naturally turned

them over and looked at them. The narrow part of the scroll was cut completely off. That 2,000 pounds of stock on the truck had sprung the floor enough to throw Bob's jig saw 1-16 inch out of line. As long as that saw stayed in the shop you could always count on its being ready for "inland work," and it never could be depended on to cut two bevels alike.

The best jig saw we have yet seen is in the shop of Mr. Jas. W. Cooper, 17th street and Washington Avenue, Philadelphia. He has eight or ten of these saws. They were built expressly for his own use, and the designs were also his own. They are built on a frame similar to that of some band saws.

The frame was shaped like the letter C. The crank shaft was in the lower part of the back of the frame, and actuated a double segment rocker arm, which gave motion to two straps, one of which went to the upper end of the saw, the other to the lower end. The direction of the straps was changed to perpendicular by two light pulleys, the lower one fixed and the upper pulley hung in a frame. This frame rested upon a wedge. To take out the saw the wedge was withdrawn. To strain the saw the upper pulley and its carriage were raised with one hand, while with the other the wedge was pushed into position. These saws worked well. They did not shake enough to displace a 5-cent piece when set on edge upon the saw table while the saw was cutting two inches of black walnut.

"How is your shavings vault rigged?" we asked Mr. Cooper after we had inspected his jig saws. "Well, I'll show you," said he. "There it is, you will see that it is simply a big brick wall. There is nothing about its construction that can be burned. The walls are brick. It is 25 feet up to the iron roof, and if the shavings get on fire the whole thing acts like a big fireplace. The shavings burn up and that's all there is about it." "Ever had a fire there?" "Oh yes. The shavings will get on fire once in a while, but it never cost the insurance folks anything yet."

Why is this not a good idea?—Cabinetmaker.

THE MICROSCOPE IN THE WORKSHOP.

Professor Rodgers, in his paper read before the American Society of Mechanical Engineers, speaks of the serviceableness of the microscope in the workshop. In ordinary operations, he says: "The lathe and planer are the primary tools, while the caliper with the graduated scale is the secondary tool. Let us take the most simple case. It is required to turn down a piece of metal to a given diameter. In order to make the assumed case as simple as possible, we will assume the required diameter to be an even inch. The caliper is set for this unit of length, either from a graduated scale or, more accurately, from an end measure inch with parallel faces. The setting in the latter case is done by the sense of feeling. We thus introduce an additional element of complexity, since sight is at once the primary sense and the ultimate test of a given limit of extension upon which the workman must rely. When the market is supplied with graduated scales from which any required length may be taken by the sense of feeling, it will be in order to defend the practice of relying upon this sense as a final test in measurements of extension. As a differential test, it is both useful and accurate. As an absolute test, it had better be abandoned. It is a makeshift at best.

Assuming that the caliper has been set to an exact inch, the workman turns the piece of metal to the required size by a series of approximations, with the ever-present risk of going beyond the required limit. During the final part of the operation he stops the lathe to test the diameter with his caliper. He then takes another chip, stops, tries, starts, stops, tries, until the subtle and ever varying sense of feeling satisfies him. At he has obtained the correct diameter. But, after all, the uncertainty in the setting of the caliper remains, and this uncertainty is generally greater than that which would be found to exist in the comparative trials of the diameter. If, now, we increase the required unit, and especially if fractional increments are added, the problem of transferring a required length from a scale to a caliper becomes a most serious one.

Only one other objection remains to be overcome. It is the common impression that the delicate adjustments of the microscope which are continually demanded—especially the adjustment for focus—can only be made by the most delicate and sensitive means. No impression could more erroneous. Give me a small lead hammer and I will set the top of my comparator to a given line in half of the time and with greater precision than it can be set by means of a screw movement. Give me a vertical movement by means of an eccentric disk and a long lever arm, and I will bring the surface of a plate weighing 100 pounds into the focus of the objective quite as quickly and quite as accurately.



It is reported that Lieut. Howard, the Gatling gun man, will put in operation a new cartridge factory, at Brownsburgh, Que., in May next.

Mr. E. B. Cave, of Thistledown, Ont., is engaged in remodeling Messrs. Plewes & Spence's flour mill at Creemore, Ont., introducing the roller system.

Aspinall & Rothwell, iron furniture manufacturers, of Galt, Ont., called a meeting of their creditors, which took place at Galt on January 26th.

A saw mill belonging to George McGregor, township of Cranabe, was burned down on the 12th of January; loss, \$2,000. No insurance. The impression is that the building was fired by an incendiary.

All the iron mines in the Kingston district will shortly be operated to their fullest capacity, an American company having been formed to work them. A large number of men will be employed. This is due to the improvement in the iron trade.

The Windsor Foundry Company, of Windsor, Nova Scotia, have made arrangements with the American Ship Winless Co., of Providence, Rhode Island, to manufacture their windlasses and capstans for the Dominion of Canada.

Messrs. Rolin & Suttler, leather belting manufacturers, Toronto and Montreal, are shipping their celebrated "Standard" belting for Hoeld & Cullen's new 500 barrel mill at Stratford. The drive belt is a heavy double leather, 24 inches wide.

The well-known firm of Cant, Laidlaw & Co., manufacturers of wood working machinery, of Galt, Ont., has been dissolved, and is succeeded by the firm of Cant Brothers & Co. The gentlemen composing the new firm are Messrs. J. Cant, H. Cant, A. Cant, R. Maurer and H. A. Cant.

The Joseph Hall Machine Works, of Oshawa, Ont., have once more been forced to succumb to the pressure of dull times, and have suspended. Mr. Peter Ryan, of Toronto, who, since the works were started up again after their previous suspension, owned the controlling interest, says the suspension is solely due to lack of funds; the manager, Mr. F. W. Glen, not having been in a position to obtain sufficient funds to carry on the works during Mr. Ryan's temporary absence in England. The direct liabilities of the concern amount, according to Mr. Ryan, to between \$20,000 and \$30,000. The assets are estimated at \$25,000. The difficulty with the Oshawa works has also involved the Toronto firm of John Ryan & Co. to the extent of about \$35,000. A meeting of creditors will be held at an early date.



Mr. G. Haines has been enlarging and adding machinery to his planing factory at Bowmanville.

The Henderson Lumber Mills in Montreal were recently destroyed by fire. The loss was about \$30,000.

The East Toronto Lumber and Manufacturing Company, (Ltd.) Ald. E. A. Macdonald, President, E. B. Wade, Secretary, is about to commence operations.

The work of erecting new buildings to accommodate Patterson Bros. large manufacturing business, will shortly be commenced at Woodstock, Ont.

A boy named John Morgan, employed in Jas. Hay & Co.'s furniture factory at Woodstock, Ont., had his leg mutilated by a circular saw, a couple of weeks ago.

It is reported that the McClary Manufacturing Company, of London, have decided to locate their business in Windsor if the town will give them a bonus.

Mr. Robert Weddell, of the Trenton Machine and Engine Works, has been unable to come to terms with Messrs. Cameron & Molyerley, of Collingwood, for the purchase of their foundry.

The Lake Megantic, Que., Council offer to give a bonus of \$5,000 and exemption of taxes for twenty-five years to any parties who will start a new industry there with a capital of \$100,000.

Inglis' woolen mill, situated about three miles from Owen Sound, and operated by Benner & Sons, was totally destroyed by fire on the morning of the 25th of January. The machinery was insured for \$1,000 and the buildings for \$500.

The motive power at the Central Bridge Works, Peterborough, has been improved by the addition of a 30 horse power multitubular boiler, built by the William Hamilton Manufacturing Company, and an Improved Wheelock Corliss engine, from the establishment of Messrs. Goldie & McCulloch, Galt. The new motive power drives about three hundred feet of shafting.

Mr. Henry Schooley recently met with a very severe accident at Haggert Bros. Manufacturing Works, Brantford. He was getting out some work with the steam saw and the board he was sawing had a hard knot or twist in it. When the saw came to that part it bounded and threw his hand against the saw, almost severing two of his fingers.

We submit the following question, asked by a correspondent, to our mechanical readers for an answer, and will publish the answers received in our March number:—How many horse power will an 8 inch belt convey from a line shaft with 30 inch pulley and making 265 revolutions per minute, to a counter shaft having a 20 inch pulley; and how much to a countershaft having a 20 inch pulley? Why the difference, if any?

MACHINERY FOR SALE.

250 H. P. Twin Coupled Engines, with condenser complete as last used. Send for particulars. H. W. PETER, Brantford, Ont.
275 H. P. Upright Engine, cylinder 10 1/2 x 18 in. stroke, a very substantial engine. Get particulars. H. W. PETER, Brantford.
275 H. P. Coupled Engine, complete, with piston as last used driving flour mill. H. W. PETER, Brantford.
40 H. P. Waterous Horizontal Engine, with cut-off valve; can be seen running. Full particulars on application. H. W. PETER, Brantford.
35 H. P. Engine, by Haggart; a splendid rig for a saw mill, and this engine is in fine order. H. W. PETER, Brantford.
25 H. P. Horizontal Engine, Jas. Martin & Sons makers, Toronto; been thoroughly overhauled, in top condition. H. W. PETER, Brantford.
A 10 x 12 Horizontal Engine, in good order and complete; only taken out to make room for larger. H. W. PETER, Brantford.
12 H. P. Champion Waterous Engine, 120 in. stroke, guaranteed in first class order; one complete threshing outfit. H. W. PETER, Brantford.
A Swing Shingle Machine, (Law's system) 42 in. saw, steel labour, jointer has 4 knives, both all iron and steel, cheap for cash. H. W. PETER, Brantford, Ont.
BLOWERS and PANS: One No. 6 shuttle and steel pressure fan, one No. 3 do., monogram pattern, with full counter; one No. 1 pressure blower, with countershaft, and one No. 00; also all Murray's make; one blower (Guldie & McCulloch make); get particulars of size needed. H. W. PETER, Brantford.
WHEELS: 32 One 12 in. Turbine, by Barber & Harris; one 21 in., by Cole; and one 3 in. An. Hemedan, by Guldie & McCulloch, Gal. Send for full particulars of above wheels. H. W. PETER, Brantford.
MISCELLANEOUS MACHINERY: two pipe vices, one hydraulic ram; 3 letter presses, ten rock screws (two), two portable forges; one card cutter; one tobacco cutter; one straw cutter, for power; one photographic blower; two printing outfits, one small horse power, one large platform scale; one water meter (New York make); one Barnes No. 7 scroll saw; one scroll and circular saw combined; one velocipede foot power shaper; one stover wind-mill 12 ft., in good order; one pump mill; one roller mill and press, two iron safe (both have combination locks); one lathe for plate machine, one set drawing instruments, one set Brown & Sharp gauges, 1/2 in. to 1 1/2 in.; one lathe second hand emery wheels. Full particulars of any of above articles on application. H. W. PETER, Brantford.
CHOPPING MILLS: One 18 in. double geared; two 1 in. standard Waterous mills; two grain crushers and two feed mills, all power mills in good shape. H. W. PETER, Brantford.
TWO Stone Cutters, by different makers, complete with countershaft, pitman rod, &c. H. W. PETER, Brantford.
H. P. Engine, (new) a model of beauty, complete, with Pickering governor; price less than half build. H. W. PETER, Brantford.

HALF H. P. Engine, all brass and highly polished, in good running order; price, only \$12. H. W. PETER, Brantford.
Stationary Millers to back in, two 4 ft. 8 in. diam. x 14 ft. long, 64 x 3 in. tubes, one to ft. x 50 in. with 105 2 in. tubes; one 11 ft. x 3 ft diam. 51 3 in. tubes; one 7 ft. 9 in. x 33 in. diam. 19 3 in. tubes; one 7 ft. x 24 in. x 28 2 1/2 in. tubes, above all tested by cold water pressure. H. W. PETER, Brantford.
STEAM PUMPS, No. 3 Engine, 7 in. steam and 4 in. water cylinder; one Gordon & Maxwell upright, 4 in. steam and 2 in. water cylinder; two Toront pumps by the Miller Co., suitable for boilers of 20 h. p.; above pumps all tested with steam. Send for full particulars. H. W. PETER, Brantford.
A Pony Saw Mill, 16 ft. carriage, 2 head blocks, V track, 34 in. solid saw, complete with feed works, and only \$125. H. W. PETER, Brantford.
24 in. Planer and Mather, with Shiner E. brass heads, full countershaft, pulleys, &c. H. W. PETER, Brantford.
24 in. Surface Planer, Rogers' make, 4 rolls, double beveled, full countershaft, at half the original cost. H. W. PETER, Brantford.

MILL SUPPLIES

Best English Mill Picks, made and tempered in England, 40c. net cash per lb.
Gandy Belting, best main driver and cheapest.
Solid Cotton Elevator Belting at special low prices.
Elevator Buckets, Salem and Seamless Steel, very low. Also Malleable Iron Buckets, Elevator Bolts, Washers.
Ewart Link Belting, Cheapest and best elevator and conveyor. A positive driver, all sizes wheels.
Iron Elevator Boots.
Elevator Work a Specialty.
Waterous E. W. Co. BRANTFORD AND WINNIPEG.
MILL FOR SALE.
THE Town of Walkerton having passed a by-law granting me a bonus of \$2,300 to remove my roller mill to that place next summer, I hereby offer for sale the mill which I occupy at present, situated near Hart-over station. It is a large frame mill, nearly new, with good water power, on the Sangouin River. The building is capable of being altered for various other manufacturing purposes if required. Possession can be had as soon as I have taken my machinery out of the building.
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WELLAND CANAL. Notice to Contractors. SEALED TENDERS, addressed to the undersigned and endorsed "Tender for Lock Gate Timber," will be received at this office until the arrival of the Eastern and Western Mails, on Tuesday the 9th day of February next, for the furnishing and delivering, on or before the 22nd day of June next, 1886, of Oak and Pine Timber, sawn to the dimensions required for increasing the height of the Lock Gates on the Welland Canal.

SEALED TENDERS, addressed to the undersigned and endorsed "Tender for Lock Gate Timber," will be received at this office until the arrival of the Eastern and Western Mails, on Tuesday the 9th day of February next, for the furnishing and delivering, on or before the 22nd day of June next, 1886, of Oak and Pine Timber, sawn to the dimensions required for increasing the height of the Lock Gates on the Welland Canal. The timber must be of the quality described and of the dimensions stated in a printed bill which will be supplied on application, personally or by letter, at this office, where forms of tender can also be obtained. No payment will be made on the timber until it has been delivered at the place required on the Canal, nor until it has been examined and approved by an officer detailed to that service. Contractors are requested to bear in mind that an accepted bank cheque for the sum of \$5000 must accompany each tender, which shall be forfeited if the party tendering declines to enter into a contract for supplying the timber at the rates and on the terms stated in the offer submitted. The cheque thus sent in will be returned to the respective parties whose tenders are not accepted. This Department does not, however, bind itself to accept the lowest or any tender. By order, A. P. BRADLEY, Secretary, Department of Railways and Canal, Ottawa, 22nd January, 1886.

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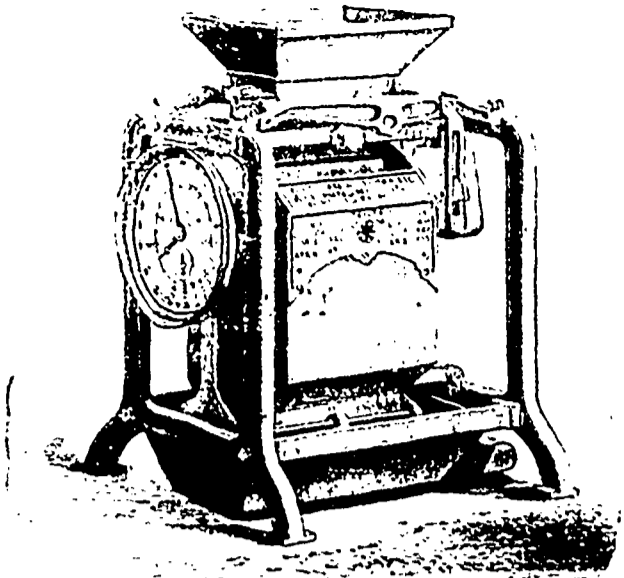
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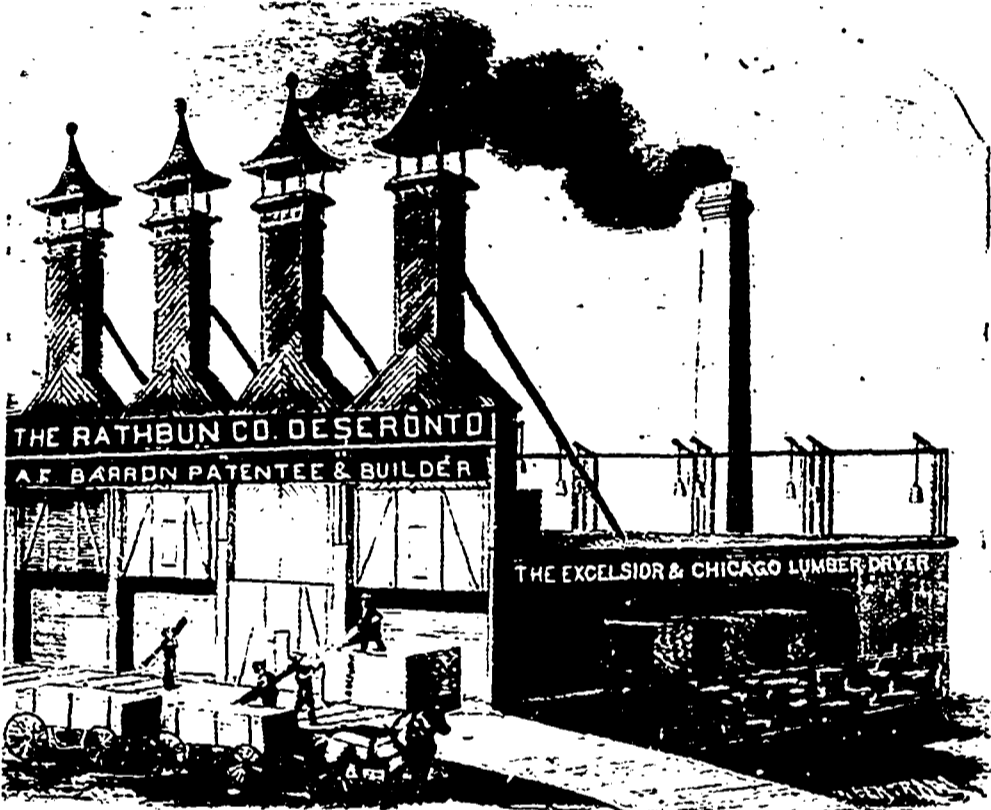
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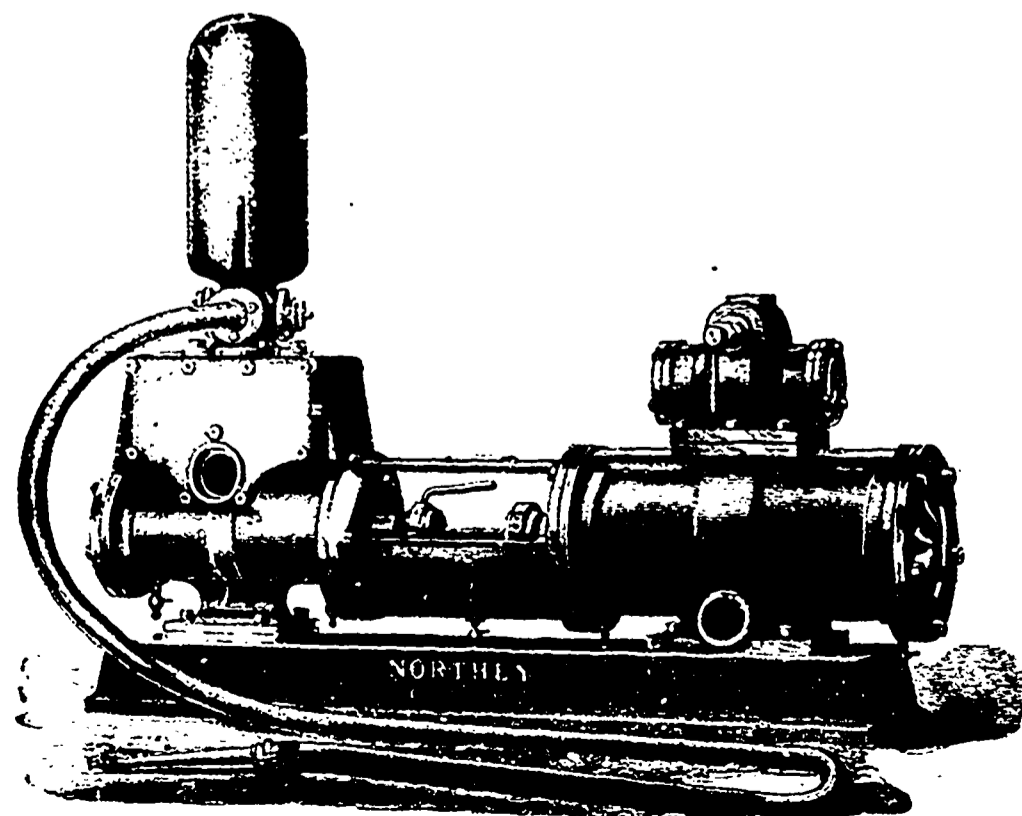
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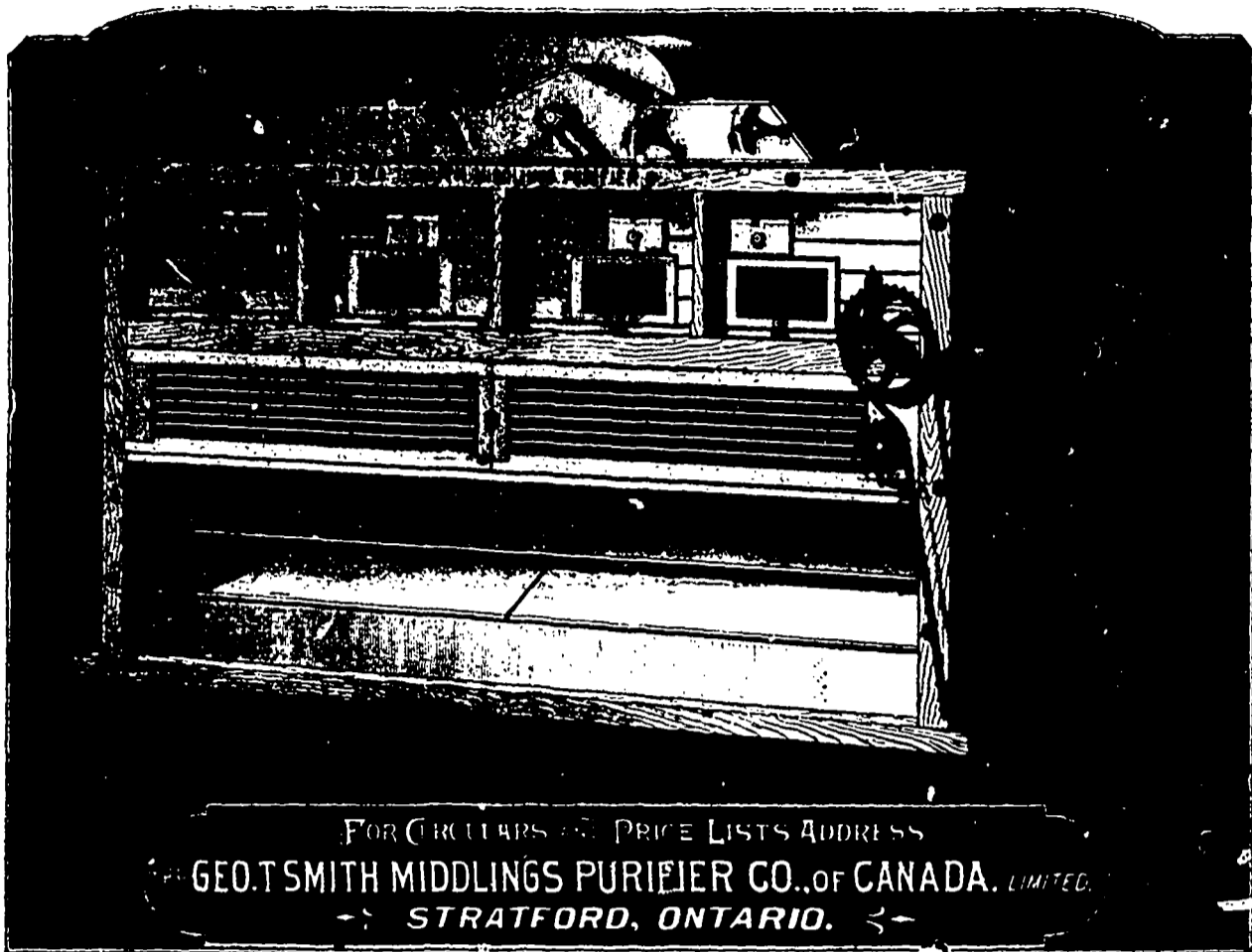
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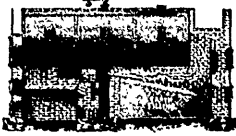
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Toronto, Ont., July 27th 1886.

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Per J. F. Hellmuth, Vice-Pres.

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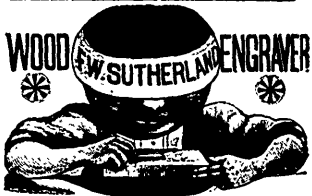
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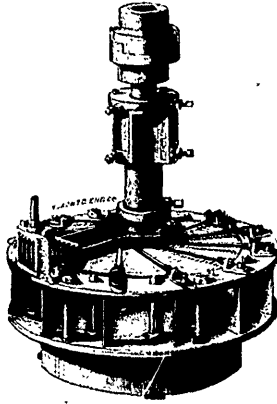


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It never hurts, holds every Hernia
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It has been put on upwards of thirty boilers where the other
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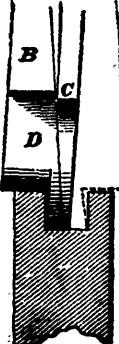
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Cross-Grained & Knotty Lumber
Neatly, showing Clean Edges, and often

Save their Cost in One Day's Run.
SAMUEL J. SHIMER,

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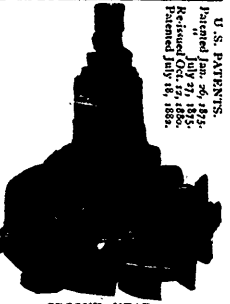
FIG. 1—A NEW CUTTER.



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



FIG. 2—CUTTER NEARLY USED UP. **A. R. Williams, - - - Toronto.**



GROOVE HEAD.

explains why these Bits
hold their shape and turn

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

SELLING AGENT,

Patented Sept. 4, 1885.
July 16, 1885.

U. S. PATENTS:
Patented Jan. 26, 1885.
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The Acknowledged Leading Canadian Instruments.

The only Canadian Company receiving an International Medal and Diploma of honor at the Centennial Exhibition, and this too when there were about 40 of the leading manufacturers of the world competing and contesting. This award to the "Dominion" was made by one of the most competent juries ever assembled, an honor unprecedented.

It is also gratifying to know, that the Piano and Organ purchased by the Government and Land and Lumber Agents in every part of the Dominion.

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1885

International Diploma of Honor,

(The highest award given) at the

ANTWERP INTERNATIONAL EXHIBITION.

Extracts from the address of Sir Charles Tupper, High Commissioner to England at the London Fair Sept. 18, 1885.

"I cannot mention all the (Canadian) exhibits at the Antwerp International Exhibition (Belgium) but I was surprised to learn that the Dominion Piano and Organ Co had obtained the very highest position, and that the best and ablest judges of music had declared that for tone, the instruments sent from Canada surpassed those from either Belgium or France.

ORGANS

Their Success is Unequalled by any other Company on the Continent of America.

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International Medal and Diploma at Centennial, Philadelphia, 1876.

International Medal and Diploma at Sydney, Australia, 1877.

International Medal and Diploma at Paris, France, 1878

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On PIANOS Over 60 First Prizes were awarded the "Dominion" in the last three years.

On ORGANS- Over 70 First Prizes were awarded the "Dominion" in the last three years.

Gold and Silver Medals at Toronto, 1878, 1879, 1880, 1881.

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—MANUFACTURE EVERY DESCRIPTION OF—

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Mineral Wool.

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OF
ROLLER
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I HAVE recently completed, and am now manufacturing, a *New Roll for Bran Middlings and Wheat*, which is an improvement on all rolls built by other parties. After several years careful examination of the different rolls in the market, I discovered some faults with them all, which rendered them in the strictest sense an imperfect machine for the purpose for which they were built; these imperfections are overcome in the new roll. I am now prepared to furnish the best rolls for the purpose of reducing wheat into flour. I make no exception to any roll in this or any other country, and am prepared to prove by *practical demonstration* all I claim. It is the only roll offered that takes the feed in proper shape to the point of contact; the adjustments and feed arrangements are perfect. It can be changed into cutting or non-cutting roll in five minutes. It has a Reversible Hopper. It is the only roll in the market that can be stopped or started without touching the hand wheels or feeding arrangement. They will last longer than any other roll because they never come in contact with each other. *The title to the patent is perfect.* It can be sold as cheap as any roll in the market. Any miller needing rolls will do well to investigate the merits of this roll before purchasing.

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