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THE DOMINION MECHANICAL & MILLING NEWS

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HOUSE AND RAILWAY CAR VENTILATION.

MR. Charles Cluthe, the well-known surgical machinist of Toronto, has just made an invention, which, although on quite another field, will undoubtedly prove itself none the less beneficial to the general public, than the number of other inventions previously introduced by that gentleman, more especially in the surgical line. The invention is a system for the rational and thorough ventilation of dwelling houses, and buildings generally, as well as railway cars, and has already been patented in the United States and Canada. For Great Britain and Ireland letters patent have been applied for and will be issued shortly. It is a well-known fact, that whilst our dwellings and buildings of the present day are fitted up with the latest appliances and conveniences looking to the comfort and well-being of their inmates, in point of proper and rational ventila-

tion, they are still sadly deficient, and if Mr. Cluthe's system, for which he claims that it is designed to bring about a lasting and permanent remedy for this long-felt defect, only fulfils a part of the expectations that the inventor bespeaks for it, the community at large will hail its advent with unfeigned pleasure, and its general introduction will without doubt be assured.

The general system for house ventilation may be seen at a glance, and may be easily understood by referring to Figure 1. It will be seen that there are two flues, one a smoke flue, and the other a ventilation flue, running off from the chimney breast up through the different stories of the house. These flues are united in the inlet of the pipe from the furnace in the cellar. For the purpose of opening or closing either of these flues for the transfer of heat, a valve is attached to this inlet. Openings proportioned to the size of the respective apartments connect each flat systematically with the suction flues, both at floor and ceiling, and these openings are covered with ventilation plates, no register being necessary. The branch pipes tapping each floor are proportionate to the size of the room, and increase in size until they reach the apparatus which constitutes the main and most important part of the invention, and has been styled by the inventor, from its shape, the "swan's neck," located in the centre of the chimney breast, between the two flues, as shown in Fig. 2. The "swan's neck"

consists of a chamber having two partitions extending across the full width of the chamber, but having openings

similar to the letter S), so that the air entering the ventilation plates must pass round the end of each to reach the discharge flue. By the peculiar construction of this chamber draught is entirely done away with, and this is one of the most prominent features claimed by the inventor for his system. The whole is so arranged that the heated air near the ceiling and the foul air near the floor, which contains so much carbon, must be drawn off, rendering the atmosphere of the room healthful and sweet, in the absence of all draught.

The working of the apparatus is altogether automatic, and is based on the principle of the thermometer. A metal shute running on six rollers at the top and bottom, is connected with the thermometric arrangement acted on by the atmosphere by a simple lever attachment, and thus nature herself thoroughly regulates the ventilation.

Figure 3 represents the chimney breast of a finished

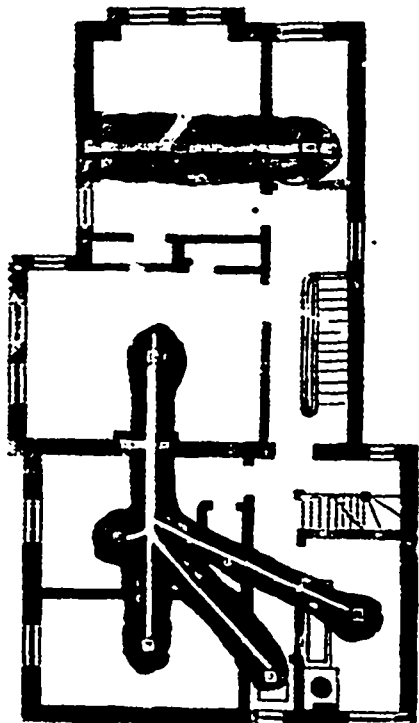


Fig. 4. Showing the system of tapping the various rooms.

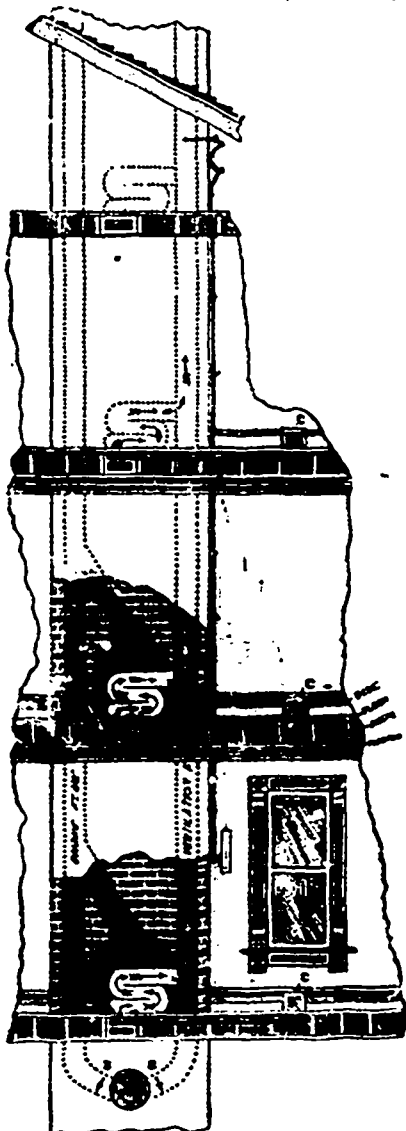


Fig. 1. Showing the system of house ventilation.



Fig. 3. Showing finished apartment partly opened.

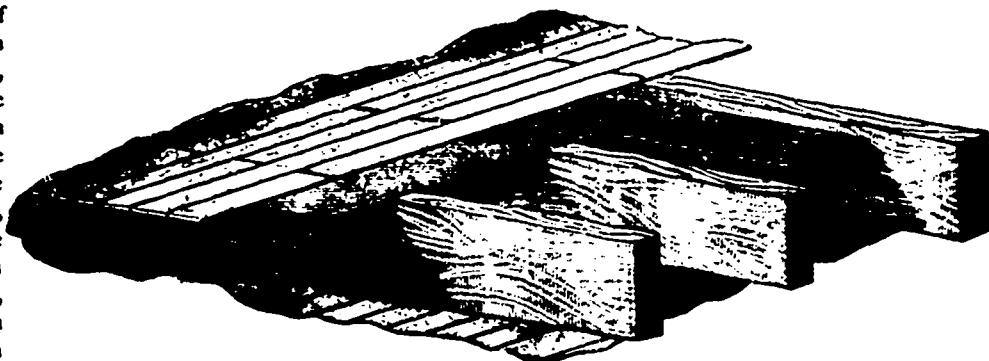


Fig. 5. Showing the laying of flue over joist.

at opposite ends of each (in short being formed very

apartment with the grate, which so far has been the only means to relieve our lungs from over-inhaling the descending poisonous air.

The inlet of a part or the whole of the heat from a furnace fire will in ordinary dwelling houses be sufficient to draw off all foul air, but in large buildings where often hundreds of people congregate, such as churches, schools, theatres, public halls, &c., and where the volume of foul air to be removed is therefore so much greater, it may be necessary to increase the draught from the flue by introducing a small pipe at the bottom of the flue with a burning gas jet, whereby a vacuum will be created from the inlet of the apartment to the main flue. The whole ventilation can be controlled from every flat in the house by means of a rod running the whole length of the flue up to the afore-mentioned shute. By having a thermometer outside the house, it can be so regulated as to adjust to a thermometer plate on the side next to the rod to the very degree marked by the thermometer outside; thus the ventilation is regulated wholly on Nature's simple, yet grand principle. The entire arrangement is so simple that even a child can work it.

All that appears necessary to say in reference to Figure 4 is that the size of the flues should be in proportion to the size of the apartment to be tapped, and great care should be exercised not to overcharge the capacity of the main flue, which would stop ventilation entirely.

The apparatus for the ventilation of railway cars is constructed on the same principle as the "swan's neck" ventilator for buildings. We extract from the specification of the patent the following, which will give an idea of the arrangement:

"It consists essentially of a hollow casing suspended from the ceiling of the car, and having a series of openings around its base leading into a chamber formed within the casing, and which chamber is furnished with the "swan's neck" arrangement, so that the air has to pass round the alternate ends of the two parallel partitions in order to reach the upper portion of the chamber, from which it escapes through a revolving ventilator placed on the roof of the car."

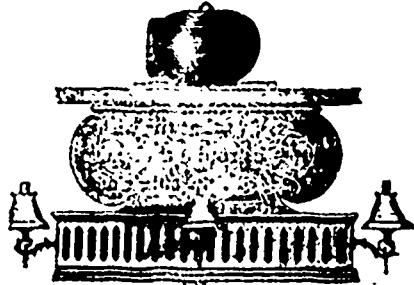


Fig. 6. Showing ventilator adjusted in the railway car.

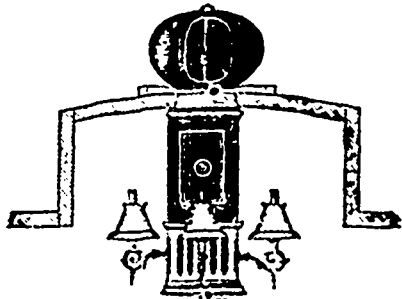


Fig. 7. Showing side view of ventilator.

The resistance of the air in a moving car furnished with this revolving dome, free to move like a vane, will always keep the opening for the exit of foul air on the lee side, and cause a suction by reason of the motion of the car. The ventilation is regulated from the inside of the car by simply moving a lever connecting with an attachment, which in its principle is quite similar to the one used in the house ventilation as described above.

Like in house ventilation, the methods hitherto employed to ventilate railway coaches, sleepers, &c., have been equally primitive and unsatisfactory. Even our "palaces on wheels," luxuriantly furnished and fitted up with every kind of comfort, are sadly lacking in that so very important element, fresh and pure air. If, therefore, Mr. Cluthe's invention sustains, what he claims for it, also in this regard, to remedy this evil which the travelling public has had to suffer for so long a time, he may rely on its being duly appreciated from wide and far, and that he will be assigned an honorable place among public benefactors generally.

A very elegantly gotten up apparatus for house ventilation, as well as a car ventilator, beautifully carved and finished in cherry, with four handsome lamps attached, have been shipped by the inventor to the Colonial and Indian Exhibition at London.

Mr. Cluthe will gladly give any further information concerning his system to anybody contemplating building a house on application and receipt of a rough sketch of the plan of the building to be erected. All the other appliances, with the exception of the "swan's neck," which he will furnish at a moderate price, can be made and adjusted by any building tradesman, thus reducing the total cost to a minimum.

A SODA MOTOR.

The New York *Star* has the following: "A new soda motor, which performs all the functions of an ordinary locomotive, is in operation on State street, Chicago. It does not require any fire, is noiseless, does not emit any offensive smells, has no exhaust stack or steam whistle to frighten horses, and makes full as good time as the old-fashioned steam dummy. It takes only thirteen minutes to charge it, and it will run continuously for six hours after it is loaded. The Boston and Albany Railroad Company is also building a forty-ton soda fountain to haul its trains through Boston; a similar machine is in successful use upon a road in England, and a company in Minneapolis is about to close a contract that will supply all its cars with two-horse-power soda fountains."

It is obvious that this soda motor is destined to become immensely popular. As yet we have not had an opportunity to compare its cost with that of the electric motor, the only other feasible substitute for the puffing, incinerating iron horse.

MILLING FLOUR & GRAIN

Wm. Stephen's grist mill at Bowmanville was burned on Mar. 21. George Patterson & Co., miller, Alviston, Ont., have sold out.

The *Manitowan* says it costs 40 cents a bushel in Manitoba to raise wheat or \$8 an acre, against \$12.54 cost per acre in England.

Moore & Son's mill at Oak Lake, Man., is rapidly nearing completion. No. 2 hard is selling at 82 cents there.

Midland offers to loan \$3,000 for ten years without interest to a man who will erect a roller mill there.

It is reported that the T. P. White mill at Whitevale, Ont., has been purchased by Taylor, Lount & Co., of that place.

Mr. Ezra Stiles has replaced the stones in his steam grist mill at Albert, N. B., with a set of new French burrs.

David L. McKenzie, a dealer in grain and provisions at Winnipeg, Man., has made an assignment. Liabilities estimated at over \$30,000.

Messrs. Hutchinson & Morrison, two energetic young men from Walsingham, Ont., have purchased the Tilsonburg Valley Mills from Mr. Piper.

Mr. H. W. Hill, of Woodstock, Ont., has lately been shipping large quantities of wheat to England from Woodstock, Stratford and other places.

A stock company, with a capital of \$15,000, has been formed in Wapella, Man., to build a mill. Over \$4,000 of the stock has been subscribed.

Messrs. J. Shinn & Sons have leased for a term of years their flouring mill at Nottawa, Ont. The lessees, Messrs. Hawke & Brackenridge, have had the mill thoroughly overhauled and fitted up with the most approved machinery.

Manitoba barley is beginning to attract attention, the soil and climate in many parts of the Northwest being peculiarly adapted to it. Malts made from it have been exhibited on the Toronto Exchange, and pronounced equal to the best Ontario product.

At Qu'Appelle, Assn., D. H. McMillan & Bros. entertained a large number of people at the Queen's hotel, the occasion being the opening of the Qu'Appelle roller mill, which was bonused by the municipality to the extent of \$10,000.

We learn that Mr. A. McFall's mill at Bolton, Ont., which has recently had a thorough overhauling at the hands of Mr. William Petch, of this city, is now in full operation, and is turning out a first-class article in flour. Its capacity is about 80 barrels per day.

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Little's flour mill at Teeswater, Ont., was burned to the ground at an early hour on March 19th, and nothing was saved. Incendiarism is suspected, as the tracks of a horse and cutter were traced from the mill through the village through the fresh snow fallen during the night.

The following is given as a safeguard against any smut that may be in seed grain: Dissolve 1 lb. of sulphate of copper or blue stone in boiling water, and dip your seed grain in the pickle the night before sowing. One pound of blue stone is sufficient for four bushels of wheat.

A fire occurred at Clement's grist mill, Maple Hill, three miles from Walkerton, Ont., on March 20th, caused by the upsetting of a lamp. It was fortunately put out, though not before damage was done to the amount of about a thousand or twelve hundred dollars. The property is insured in the Citizens' City of London and Western Companies.

The wastage about a mill amounts to a large item, and in itself would make quite a profit for a large mill if it could be prevented. It is claimed that the wastage of two of the Pillsbury mills at Minneapolis—the Anchor and A—is not less than \$60,000 annually, and Pillsbury & Co. have reduced the amount to what are considered minimum figures.

The F. Schumacher Milling Co. has been organized at Akron, O., with an authorized capital stock of \$2,000,000. Ferdinand Schumacher whose mills were burned subscribed \$200,000. The Akron Milling Co. subscribed \$370,000, and the balance is being taken in \$100 certificates. Very extensive mills will at once be built, it being the intention of making the company one of the greatest oatmeal and flour producers in the world, operating seven great mills.

One of the most important enterprises to be carried out in the building line the coming season will be the erection of a 1,500-hbl. mill at Montreal by the Ogilvie Milling Co. The recent visit to the city and tour of the east by Geo. Hastings, member of that firm, and P. M. Clark, head miller, was in connection with the project of the errand being to gather ideas which might be incorporated in the new mill. The mill is to be completed in time for the next crop and will make an important addition to the already existing works of Ogilvie & Co.—*Northwestern Miller*.

Secretary Hurstone of the Buffalo, N. Y., Merchants' Exchange, has compiled a report showing that the ten mills located at Buffalo, with a daily capacity of 3,850 barrels per day, made in 1885 752,262 barrels of flour. Eight mills at points tributary to Buffalo, marketing their flour there, with a daily capacity of 4,725 barrels turned out 640,500 barrels, making the gross output of the eighteen mills, whose total capacity is 8,575 barrels per day, figure up the handsome total of 1,392,762 barrels for 1885, or about 50,000 barrels more than one-half their accredited capacity for 313 working days.

As the success or failure of the wheat crop of India has now a direct bearing upon the wheat situation in this country, it will

interest handlers of Canadian grain to hear that the Indian Government has published a report, according to which the prospects of the coming wheat crop were very favorable, especially in the North-western Provinces. In the Punjab, the early cessation of the monsoon rains somewhat diminished the area under wheat, but the crops there and in the Central Provinces were in excellent condition, and the reports from the other provinces were also good. It is always difficult to understand the reports from so large and varied a territory as India. It may be safely assumed, however, according to the last accounts that the prospects are in the main for very good crops, but hardly so good as in the previous year, which was an exceptionally prolific one.

The visible supply of grain in the United States and Canada, and in transit by water, as compiled by the Secretary of the Chicago board of trade, was as follows on dates named:

	Mch. 13, '86.	Mch. 6, '86.	Mch. 14, '85.
Wheat, bus.	50,854,419	51,273,130	48,593,017
Corn, bus.	14,611,399	12,910,403	8,196,165
Oats, bus.	2,099,797	2,023,559	2,967,995
Rye, bus.	642,831	707,434	364,848
Barley, bus.	1,127,081	1,245,379	1,282,755

Totals 69,335,440 68,159,945 61,404,780
Decrease Wheat, 418,711 bus.; barley, 117,298 bus.; rye, 64,600 bus. Increase: Corn, 1,650,996 bus.; oats, 76,018 bus.

Mr. J. Meldrum, of Paris, Ont., is to be the new proprietor of Clegg's Mills at Peterborough. He is engaged at present in overseeing the alterations and improvements which are being made in the mills. A complimentary dinner was given in Mr. Meldrum's honor prior to his departure from Paris, at which many kind and eulogistic things were said of him, as a skilful mechanic, a man of high moral character and a good citizen. The best wishes for his future success were heard on all sides. As a fitting close to the proceedings, Mr. Henry Tatum came forward and read the following address—"We, the employees of the New Paris Mills, having a great respect for our esteemed foreman, Mr. Meldrum, and regretting his departure from us, feel it our duty to present you with this gold watch as a token of our esteem. Please accept this gift from your well-wishing friends." The address was signed on behalf of the employees by Messrs. John Wiles, Harry Tatum, Thomas Button, John P. Keaveny, Henry Metcalf and Wm. Patterson.

The Lake Carriers' Association held its annual meeting at Buffalo March 10. Important action was shown to have been taken in regard to the Canadian wrecking laws, uniform bills of lading, elevator charges, shipping to American ports in Canadian bottoms, and proposed legislation. A member referred to the Lizzie A. Law grain shortage case, and suggested that the association investigate excessive grain shortage cases. Capt. Percw spoke against elevator charges. The point at issue was that the elevators exacted more money from vessels for the work of shovelers than the elevators paid them. It was thought best to seek a restriction of rates by home agitation, and a motion was made to suspend all efforts to pass a bill at Albany. It was stated that the elevator people acknowledge the rates to be too high, and it is believed they will reduce them. Capt. Millen called attention to the fact that brokers were bearing freights greatly by taking large contracts and letting them to vessels at lower rates. It was agreed that this practice was increasing rapidly and should be resisted.

E. B. Wilbur and others have about completed arrangements for the erection of a large storage and transfer elevator at Black Rock, Buffalo, N. Y. The location proposed is to admit receipts from all roads entering the west side of the city, and making delivery to all roads leading east, and to all switches on the east side of Buffalo. This elevator will enable the roads whose terminus is on the west side of the city to enter the field for Buffalo business which the heretofore limited elevator facilities have restricted. Barley dealers and shippers will be particularly benefited by this elevator. It will afford a more concentrated movement and systematic delivery of barley from Canada, and with good inspection and grading there make it a great market for that grain. The estimated requirements of Buffalo malsters is 4,000,000 bushels, of which more than one-half is Canada barley. Besides this a large portion of the enormous amount destined for other cities would, instead of lying on the tracks at Buffalo, go into store. In the matter of wheat from Michigan and corn from the southwest, the terminus of the roads being at Buffalo, this elevator would fill a long needed storage capacity, and would thus materially aid the Merchants' Exchange to accomplish the desired change in business methods.

At an early hour on the morning of the 6th of March the great oatmeal works of Ferdinand Schumacher, at Akron, Ohio, were destroyed by fire, together with other valuable property. The property destroyed consisted of two enormous mills, with a capacity of 1,400 barrels per day, one 13000-bushel grain elevator; two great engine houses, the above having a solid street frontage of 425 feet and being 90 feet deep, and, for the greater part, seven stories high, and the mills were equipped with the most approved and costly machinery. Then there was a \$50,000 dry house and elevator, Mr. Schumacher's \$70,000 banking house; three dwelling houses, the New York, Pennsylvania and Ohio freight house and telegraph office, valued at \$2,500; Weary & Kramer's architectural office, \$1,000. Mr. Schumacher's loss is fully \$1,000,000, with an insurance of only \$129,500. Besides the above insurance there is 45,500 held by Chicago agencies. There were 140,000 bushels of grain in the elevators, Mr. Schumacher having just received a large amount. Adjoining the property burned was Schumacher's Empire Mill, which was saved, and which is the mill from which have grown the great mills destroyed. Besides this property, Mr. Schumacher still has the Cascade Flour Mill, valued at \$125,000, a starch mill and much valuable real estate. He says he will not rebuild, as he does not want to borrow the money, which he would have to do. It is, however, quite probable that the mills will be rebuilt the coming summer, as a large number of capitalists met after the fire and appointed a committee to confer with Mr. Schumacher as to forming a company with \$1,000,000 capital, which plan Mr. Schumacher favors. The fire was caused by overheating the dry house. Five engines from Kent, Cleveland and Canton responded, but, coming late, were of little service.

MASTER A TRADE.

IN a series of "Letters to Young Men," Dr. J. M. Buckley touched upon a point which is of plain truth and of the most vital importance. He spoke as follows: "Benjamin Franklin told the truth when he said that the best knowledge a man could give to his son was the mastery of a good trade. Such a man is cosmopolitan. He can make himself useful anywhere, and he can live anywhere. If it should not be necessary always to work at his trade, he feels the ability within to support himself. * * * Between the average mechanic and the great manufacturer or merchant prince, great numbers can be found who began as mechanics, and who have taken positions by their mechanical skill fully equal to that of the average merchant and far superior to that of most clerks and professional men. * * *"

There is, as the German proverb says, "a golden bottom to handicraft."

Look at the clerk, the book-keeper, the general salesman. For one who has a fair position, there are hundreds ready to occupy the same, and fill it, perhaps, for a mere pittance. The qualifications necessary to the performance of their duties are not difficult to secure, and from this very fact not over remunerative.

The man who is master of his craft, has his capital safe and always at his command. In proportion to his skill the value of his stock in trade is rated. There is no danger that it will depreciate.

Hence the turning away from manual employment, the reluctance to take up good solid hand-work is foolish in the extreme.

In the mastery of a good trade there is the guarantee of earnings sufficient to subsistence and the prospect of a competency, while in the many of the other fields of labor uncertainty and scantiness of compensation are the rule.

MACHINES SURPASSING HAND WORK.

In one of the many stores in Fifth Avenue used for the sale of fine furniture to which the trade name of "artistic" is now applied, says a New York paper, two men were examining an elaborate cabinet, the other day. One of them was actively engaged in the wholesale furniture business, the other had retired from it some few years ago. "I want you to examine this," said the former, "and tell me if you think it is really what it claims to be—a piece of hand-made furniture." The other, after a sharp scrutiny, and examining closely various points, such as the carving, the interior finish of the little cupboards, the returns of the mouldings, and so forth, said: "Certainly this, with the exception maybe of some of the minor mouldings, must have been worked by hand, and finished altogether in that manner."

"Well, then," replied his companion, "I may tell you that this was worked by machinery from start to finish, and put together for thirty cents an hour." He remarked that during the last year or two an enterprising western firm had gone in for making furniture of the highest grade by machinery. The designs were prepared by the most skillful New York designers, and a design has yet to be prepared which the machine cannot turn out with nearly as fine a finish as can possibly be attained by hand-work. New machines are being constantly invented to do any peculiar work which has hitherto been thought only possible by hand. Fine mahogany fancy tables, carved parlor sets and cabinets are the principal lines of furniture now made in this fashion, and the work is as superior to common hand-work as the latter is to the cheap Chicago machine-made stuff which was once the only representative of machine work on the market. It appears that most of the dealers in the finer sort of furniture in this city are adding the new machine-made work to their stocks. The wood is carefully seasoned, and the joints are finer and closer than is usually the case with hand-work. The cost is of course much less."

REMOVING OIL, ETC., BY INFUSORIAL EARTH.

Scouring or removing oil from substances such as wool and wollen cloth, by means of infusorial earth, has been patented by Groth. The kind of earth is one that absorbs a great quantity of liquid, and is what is used to absorb nitroglycerine and make it into dynamite. The patentee states that it is this extraordinary power of taking up liquids which enables it to withdraw oil from textiles containing it. The process is to warm the textile with the infusorial earth in some apparatus where the temperature may exceed by ten or twenty degrees the melting point of the oil or grease. As soon as it is liquefied the infusorial earth takes it up from the textile. After this the materials are passed through warm water, which washes off the infusorial earth, leaving the fibre clean. If instead of infusorial earth we read fullers' earth, the principle of the process will be found very ancient.



It is said that the American firm of Pack, Woods & Co., own 600,000,000 feet of timber in Canada

The steam saw mill owned by Mr. O. Dufresne, near South Durham, Que., was lately destroyed by fire. Fully insured.

It is said that never before were there so many small operators at work in the lumber woods as this season.

The Muskoka *Herald* says that the cut of pine timber in that district this winter has been about 80,000,000 feet.

British Columbia has forwarded to the Colonial Exhibition in London an immense plank nine feet in width and twenty feet long.

Mr. C. Young's saw mill at Young's Point, Ont., has been fitted up with new saws and a cast iron track.

Last year's shipments of lumber are reported to have been fifty per cent. more than those of the two preceding years, and one hundred per cent. more than any previous year.

Advices from Arnprior, Ont., state that McLachlan Bros., lumber merchants, of that place, have sold their entire mill cut of next season for a figure in the vicinity of half a million dollars.

Mr. H. Lovering, a prominent lumberman of Coldwater, Ont., has been nominated to contest East Simcoe in the Conservative interest for a seat in the Dominion Parliament.

Mr. James Boyd, of Lethbridge, Ont., has returned from the lumber woods, having completed a contract of taking out 1,000,000 feet of saw logs in the township of Gibson for the Georgian Bay Lumber Company.

The mill lately built by Mr. Tait at Germania, Ont., is said to be one of the best and most conveniently constructed mills in that district. It is kept constantly running at present cutting shingles, but Mr. Tait will shortly commence the manufacture of lumber.

Mr. Wm. Thomson, President of the Longford Lumber Co., was in the coach which rolled down an embankment on the Northern Railway recently. He was fortunate enough to escape with a slight injury in the back.

Mr. James Kennedy, son of Mr. D. Kennedy, of Campbellford, Ont., is manager of the Brandon saw mills, which Mr. Christie, the present proprietor, lately purchased. It is the intention this season to cut one and a half million of lumber.

While engaged in surveying lumber at Malone for the Rathbun Company, Mr. Thomas Pidgen, of Deseronto, Ont., slipped off a lumber pile and fell against a log, sustaining very severe internal injuries.

The A. Manufacturing Co., of New Brunswick, are getting out large quantities of lumber of all kinds to be manufactured at their mill at Hillsboro. It is yarded at various points along the Albert Railway by which it will be taken to the mill.

Benj. Gammon, of Hopewell Hill, N. B., who is in the employ of the A. Mfg. Co. was struck on the head by part of a falling tree while working in the lumber woods the other day. At last accounts little hope was entertained of his recovery.

A syndicate of Quebec gentlemen, including J. E. Ross, E. Beaudet, H. J. Beemer, Andrews, O. Turgeon and others, are about to erect a large saw and shingle mill and furniture factory at River Pierre, on the line of Lake St. John railway, province of Quebec.

On March 11th Messrs. Steven Bros' sash and door factory at Chesley, Ont., with contents, was destroyed by fire. The loss is about \$7,000, insured for \$2,000. The fire was first discovered in the engine house, and had gained such a hold before it was discovered that nothing could be done to save the building.

Thos. Ebbage's pump factory and carpenter shop located in a large building known as the plow factory, at Acton, Ont., was totally destroyed by fire in the night of March 16th. Mr. Ebbage lost all his tools and some machinery lately put in. Insurance on building, \$1,200.

An exchange in presenting statistics of the Chicago lumber business, says: "There are over 250 houses and firms engaged in the lumber business in Chicago, of which 115 are dealers in pine, thirty hardwood, and the remainder commission dealers, scalpers and manufacturers, representing mills."

Messrs. J. & J. D. Howe, furniture manufacturers, of St. John, N. B., have prepared a very handsome wood trophy for the Colonial and Indian Exhibition. It is designed to exhibit all the various woods produced in that province in all forms which will interest practical wood-workers. It is represented as being very ornamental, and will no doubt attract a large amount of attention.

The Commissioner of Customs at Ottawa is credited with the assertion that the present export duty on logs is almost impossible of collection, and that it is practically useless. He, it is said, believes that an export duty on logs will never serve the purpose of protecting Canadian lumber mills, and that the only hope lies in a reciprocity in lumber between Canada and the United States.

The George T. Smith Co., of Jackson, Mich., use about 4,000,000 feet of whitewood lumber in the course of a year, or about 500 carloads. A short time ago they entered into negotiations with parties in the south for 3,000,000 feet of extra quality whitewood, but the purchase was not consummated because of prohibitive freight rates.

About five o'clock on the morning of the 18th of March a fire broke out in Round's sawmills at Welland, Ont., and in spite of the efforts of the Fire Department the building and its contents, consisting of machinery, stock, etc., were entirely destroyed. The building was occupied by O. H. Round & Sons who did a sawmill business, etc., and O. H. Round, a sash and door business. The total loss of the two firms is about eight thousand dollars, on which there is no insurance. A number of men are thrown out of employment by the fire besides having their tools destroyed.

Reports from Ottawa concerning the lumber trade are to the effect that at Chaudiere and Hull shipments are already going forward briskly. In a letter from E. B. Eddy, received recently from Europe, he says the indications point to a good demand from that quarter, and that lumber dealers in Canada need have no fear, but that their stocks of sawn lumber will meet with a ready sale and a good price.

While George Nix was putting a board through the matcher in Tillson's sash and door factory at Tilsonburg, Ont., the machine clogged and he got on the board to investigate. The board started unexpectedly, and before he could get off it one of his feet was drawn under the cylinder. He retained his presence of mind, however, and threw himself out far enough to reach the main belt, which he threw off and thus stopped the machine.

The largest stick of timber to be floated on the St. Croix river this year, says a St. John, N. B., paper, was cut on the banks of the Ox Brook Lake. This was a pine, and was cut in five logs, each 16 feet in length, the largest being 29 inches at survey end, and the smallest 17 inches. The whole scaled the enormous amount of 2,078 feet, making the largest stick that has been cut on the river for the past ten years.

A deputation consisting of Messrs. Burnham, M. P., Guillet, M. P., and Edwards of the Peterborough Anti-Sawdust Association recently waited on the Minister of Marine to represent to him that the throwing of sawdust in the river in the vicinity of Peterborough impeded navigation, killed the fish, and produced malarial fevers, and to ask him to prohibit this mode of disposing of mill refuse. The Minister promised to take the subject into consideration.

J. B. Wilson, of East Saginaw, Mich., dealer in pine lands, has been arrested there, charged with embezzlement of \$1,000. The complainant is William Merrill, of Norwich, Ont. Mr. Merrill held a mortgage on pine lands in the upper peninsula, owned by Bay City parties, and instructed Wilson to have the mortgage discounted and forward the amount, \$1,000, to him. The mortgage was discounted, but Mr. Merrill did not receive the money.

Mr. Murray's Bill for the better regulation of the driving of timber on lakes, rivers, and streams has been referred to a Special Committee. Deputations from the Ottawa, Georgian Bay, and Peterborough Districts have appeared before the Committee. While some of the members of the deputations strongly favored the Bill, the general desire was that further time should be allowed for consideration of its provisions, and that a conference of lumber merchants from all parts of the Province should be invited to declare judgment upon it. To this the Committee agreed. There appears to be a growing feeling that such legislation is necessary, and it is likely something will be done next session in this direction. The States of Maine and Michigan and the Provinces of New Brunswick and Nova Scotia have adopted Acts of a similar character.

The *Lumberman's Gazette* has the following:—"Canada pine will, before the close of this century, play a conspicuous part in the Northwestern output. The Canadian timber owners are over anxious that a treaty of reciprocity be consummated between the two countries. While they know that it would be desirable that their timber be manufactured under the flag of the Dominion, they are aware this cannot be and meet competition of American lumber at home. Great Britain offers them no inducements to export, and a strong probability is that their country will never be in a position to consume to give present owners any revenue. They seek the best opportunity to use the fruits of their accumulation in this life by favoring strongly a treaty between the two sister countries. We hope that the present year will crown their efforts in this direction."

The Hon. H. G. Joly, of Quebec, has this to say concerning free trade in lumber between Canada and the United States:—"The Dominion would be much more benefited by the imposition by our own Parliament of a heavy duty on the export of logs to the United States, than by the abolition of the import duty on our own lumber into the States. A heavy export duty on logs would prevent the cutting down of our forests by the American lumbermen, and it would secure work for our people and keep them here. It appears little short of madness, when we have got the raw material here and thousands of willing men to work it, that we should send away to our neighbors both the raw material and the men who can work it here. It is a suicidal policy, and it would be difficult to find a parallel for it in any other country. The fact is that our timber trade does not rest on a sound basis. If we would arrive at a correct balance of that trade for the last 25 years, it would be sad to find out how little we have received for the value of our timber above our expenditure in manufacturing it. In more than one case I fear that we have actually paid the purchasers on the other side to accept our timber from us. The responsibilities of this state of things must rest, above all, with our Provincial Governments. They are the administrators of our timber lands. Instead of treasuring them and opening them only gradually to the lumbermen, as the legitimate requirements of the timber trade demand, they force them, wholesale, on the market and actually compel an extravagant production, which can only have one result: glutting the market and ruining the lumberman. How many men are there not among us who understand absolutely nothing of the lumber trade, who had never given even one thought to it, and who, at a moment's notice have been actually manufactured into lumbermen by the action of provincial government. I stated that our timber trade did not rest on a sound basis; let me quote no less authority than John Stewart Mill on the subject. In his first volume on the Principles of Political Economy, chap. 15, 'of profits,' he says:—"The timber trade of Canada is one example of an employment of capital, partaking so much of the nature of a lottery as to make it an accredited opinion that, taking the adventures in the aggregate, there is more money lost by the trade than gained by it; in other words, that the average rate of profit is less than nothing." This was written long ago, but it applies now, more than ever, to our timber trade. It is not often that Governments can interfere beneficially with trade; but they can in the present case, and it is full time that they should do so."

LOOSE PULLEYS AND THEIR SUBSTITUTES.

BY "HOMO."

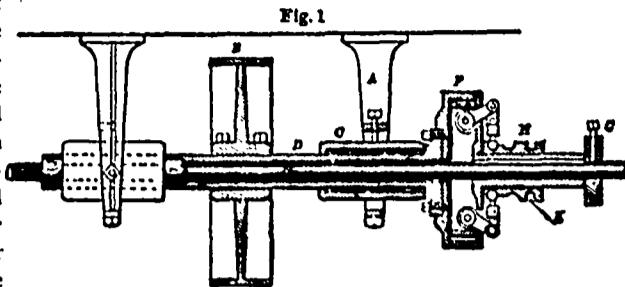
IT seems to me that if there is any one man who should have an Egyptian obelisk or other suitable monument set up to his memory, it is he who invented the loose pulley. It should be large and conspicuous; it should be formed of Oriental mud and American hemlock and the mud put on afterwards instead of paraffine; it should be located where those who use loose pulleys could pass by on the other side and swear. Perhaps, on second thought, it would be better to put the monument on wheels, like the car juggernaut, and wheel it through the country, so that those who have been troubled and worried by the fruits of the inventor's discovery could allow themselves to be rolled under it and thereby escape future misery. It might be drawn by those who would do any kind of light, easy work rather than bear the woe and cares of attending to a loose pulley. Instead of a steam calliope, it should have music furnished by a number of loose pulleys run at high rates of speed driven from the car wheels. There would be no trouble in getting a sufficient number to do this business, for each and every loose pulley gives forth a different sound, each tone being more and more noisy and hideous than the other. One might be a low rumbling bass, another a rattling baritone, the next a screeching tenor and another a terrible treble, with the usual number of accompaniments.

To make the thing complete the wheels could be old worn out shafts, so that it would dance easily and be more harmonious, as it were. It might be a plain dull color, not too flashy, for those interested in such things could and would probably paint it red at its first appearance on any road. Whoever would get up this monumental car would get wealthy. There are millions in it for him because there are thousands and thousands who would give twenty-five or fifty cents, or even their old boots, to know who the inventor was. History doesn't tell. It must be because old history has too much respect for herself and lets the great discoverer rest in peace. Statistics or records fail to disclose to us how old said inventor was when he last squeaked, but reasoning from a full knowledge of after events I am satisfied that he died young. I deduce this theory from the fact that he never finished his invention. He left it in a chaotic state and it still remains so, even more so, for every one who has improved or added to the loose pulley took good care not to eliminate any of the original faults, and with a perseverance worthy of a better cause has only added chaoticness. The good die young and we don't always realize when we miss them, but here is a case where a large aching void is felt in his absence. If the loose pulley never had existed, or rather been introduced and used on wood-working machinery, what a blessing it would have been!

How rich we all could be? We could rest at night in our downy beds of hemlock shavings and sawdust pillows undisturbed by the rattle of the imaginary loose pulleys hanging over our heads all night. We could save ourselves a multitude of sins both of omission and commission. Some one will say, "We never could have done without the loose pulley." Go to! you don't know; something better and nothing worse might have been invented to take its place. Greater things than these have been done. Where will be found in the average wood working factory a more troublesome and destructive piece of Eric-a-brac than the loose pulley? It tears its internals out in its mad frenzy, chews the shaft up, slings grease all over, spoils belts, makes men wicked, and often will get so hot and excited in its fiendishness that it will wait with the shaft and refuse to act, or rather it does act just as it shouldn't by starting up the machinery, and refuses to stop either by moral or immoral persuasion. The only virtue in a real stuck fast loose pulley is that it cannot offend the ear with its German band orchestra music. I have come to the conclusion that the great fault with loose pulleys is that they revolve, that they are used at all. Why should they be? We can get along without them in a large majority of instances. We can get along without some of their friends, such as shifting belts and wide driving pulleys.

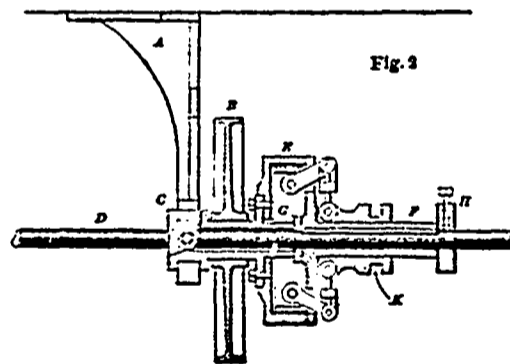
One way to avoid the use of loose pulleys is to employ a good dead pulley on the driving shaft. This is simply two pulleys side by side, one of which is fast to the shaft and does the driving. When it is desired to stop the machine, all you have to do is to shift the belt over on the dead or loose pulley, when the belt, overhead pulley and loose pulley on machine remain at rest, the loose pulleys only carrying the belt along during the shipping movement. A like reverse movement starts the machine in motion. This does away with the necessity of moving belts unnecessarily and live loose pulleys, and when applicable is much better than any loose pulley. The difference in cost over the usual wide driving pulley is

not a great deal, and it will pay for itself in the cost of belts and repairs in a comparatively short time. The objection to this dead pulley sometimes may be that it cannot be applied for lack of space to admit a shifting belt. Van Alstine & Sons recently started up a large plant and do not use any loose or dead pulleys as in ordinary use. Their rig is arranged on the line shaft as shown below:



A A are two hangers having adjustable boxes, C, that hold hollow shaft D, on which is secured driving pulley B, which carries the belt to drive the planer. The hollow shaft D is cored large enough to allow the main shaft E to pass through without touching D. On the end of D is secured the female disc F, of the friction clutch H, which is driven by a feather or sliding key on the shaft E. G is a collar set to determine the amount to throw out the friction clutch, which is done by means of a shipping lever or handle at K. The machine is started by engaging the friction clutch together and stopped by throwing it out. This is a somewhat more expensive method than the ordinary tight and loose pulley, but it can be made comparatively cheap by those engaged in such manufacture, and there is no loose pulley and no shifting of belts. The pulley B and belt stand still when the machine is not in motion, and only move when the machine is at work, avoiding all the objections of the ordinary loose pulley. Van Alstine & Son say that they would not part with it for any number of loose pulleys, and they will have no more loose pulleys when new machines are put in.

Fig. 2 shows a much more simple and a cheaper method of producing the same results as Fig. 1. In the case of Fig. 2 only one hanger A is used. It is fitted with hollow bearing encircling the main or driving shaft D; on this hollow bearing or shaft is placed the pulley B which drives the machine. The friction clutch is in all respects like that in Fig. 1, and, while not so well adapted for heavy work, if properly constructed it will drive any one machine, however large. While belt and



pulley are at rest there is no tendency of the hanger or bearing to twist or turn in the direction of the belt strain, and when they are in motion the clutch prevents any tendency of that kind because it keeps it central and adds another bearing to it, making it rigid and fixed beyond a doubt. I have mentioned now three methods by which to avoid loose pulleys. The ordinary tightener is another, and there are still many more which I will not mention at this time.

HOW KEROSENE IS DISTILLED.

Petroleum consists of a great many different fluids, which range in volatility from the boiling point of ether to nearly a red heat. Such being the case, as soon as the oil is heated at all, the most volatile products begin to come over, at first colorless as water, but very gradually assuming a yellow tinge until the most dense distillation coming over at the last is quite dark brown in color, so that if all the distillate were allowed to run into a tank together, it would not look very differently from the original petroleum.

In the ordinary process of refining petroleum the distillate is divided into three portions: The first is the lightest, colorless portion, nearly as volatile as ether, and is called crude naphtha or "benzine." Like the crude petroleum this crude naphtha may be distilled and divided into gasoline, A, B and C naphtha which are used in gas machines, for mixing paints and other similar purposes, sometimes also for burning in lamps and

stoves. The middle portion of the distillate, which is neither very light nor very heavy, and having but little color, is the crude illuminating oil or kerosene. As it runs from the still it has a very offensive odor, due to decomposition of certain portions of the petroleum at the high temperature reached in the still.

To remove the offensive compounds, the oil is first agitated with about 5 per cent. of strong oil of vitrol. This combines with the offensive oils, forming a black, carry residue that sinks to the bottom of the tank as soon as the oil is brought to rest. The mixture of acid and oil is called "sludge," and is used in large quantities in the manufacture of commercial fertilizers. After the acid is drawn off and the oil washed with water, it is again washed with a strong solution of caustic soda, which removes the excess of sulphuric acid, and also some peculiar acid compounds that exist in the oil.

The oil, after another washing with water, is nearly colorless, with the peculiar balsamic odor of kerosene, and possesses the slight opalescence peculiar to these oils. As usually prepared they belong to the class known as "high-test" kerosenes, and consist almost entirely of oils that exist in the petroleum already formed, being merely separated from the largest and heaviest portions. Such oils are called the educts of the petroleum. The heaviest portions of the distillate contain paraffine oils. They also are mainly educts of the original oil; they, however, contain a much larger proportion than the kerosene of the products of the oil. A tarry residue remains in the still called "residuum."

AMERICAN FLOUR IN ENGLAND.

The London *Millers' Gazette* has this to say concerning American wheat flour in England: "Some of the American milling journals are making much of the fact that America's exports of flour to the U. K. in 1885 exceeded those of 1884 by nearly 400,000 sacks although certain croakers have predicted a falling off. We have always held that the exports of flour in the present season of 1885-86 would show a decrease, if only for the reason that the American crop was twenty million quarters less than in 1884. There are other reasons, too, for in the North of England especially our millers have successfully managed to cut out the American product, so that it is more difficult now to sell American flour than it was formerly. England is a free country, and there is no reason why American flour, which is beyond doubt a superior article, should not find a market here; and while our millers were unable to make an equally good article it sold freely and well. But times are changing; there is now an army of something like 400 to 500 gradual reduction roller mills in this country, able—given the same wheat—to make as good an article as their American cousins, but in the absence of a general and continuous supply of that good wheat, the finer sorts of American flour will always find a market here within certain limits. Mixing flour is not an unknown practice in England, and much, we suspect, of the high-class American flour imported is used for that purpose. We have, however, in the past had too much of a good thing, the good thing being American flour. The millions of sacks of American flour imported into this country in the past few years are alone responsible for the unremunerative state of the flour trade at the present time; the trade has been overdone, and the consequence is that the home miller cannot even make in many cases his legitimate manufacturer's profit; therefore it is beyond doubt that, free as our country is in every respect, it is in no way unorthodox for our millers to endeavor by all legitimate means to keep out the ever increasing loads of foreign flour that come to these shores. America is suffering from overproduction of flour; her 18,000 mills are too many to feed the home population. Ten years ago there was a splendid opening for high-class flours in this country, and America stepped in to supply the want; but the desire to supply has outrun the capacity to buy on our part, and if, as seems to be the case now, whether it be from fictitiously high prices of wheat in America, or whether it be that there is actually less scope for the sale of American flour in this country, the prices obtainable do not leave a profit to the exporter. American millers find themselves producing something like ten million barrels per annum of flour beyond their home wants, and with no outlet for the greater part of it. With reference to the falling off in American exports this season, it is unmistakable; for the official returns show that in the seven months ended January 31, the total export only reached 4,544,025 barrels, or 1,356,068 barrels less than the corresponding period last year. The result is a large number of American export mills are working and have for some months been working on short time, a policy we advise them to continue for some months to come, for we are much mistaken if the general trade is on the point of improving."

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.

WHEAT CLEANING.

Editor M. & M. News.

In your March number I notice an article from the pen of Mr. R. Quance. In that article I see that Mr. Quance makes use of my name in such a way that the millers of Canada might think I was writing those letters as an advertising medium for my business. I wish to say I have only entered into this controversy in support of the principles I uphold in a mechanical and scientific point of view. It has always been my intention from my first commencement in the manufacture of flour mill machinery, to benefit the millers as much as possible, which I believe I have done, and which I can prove by good reliable testimonials, if it be necessary. Now I find by referring back to your January number, I did make mention of "emery wheel." I won't take back a word in this letter that I said about emery wheel scourers in that letter. Now Mr. Quance says I am very much opposed to emery scourers. I will say I am opposed to emery or stone scourers so far as to manufacture them and offer them to millers to be used as scourers to scour their wheat previous to the wheat being reduced to a floury substance. At the same time I have not the slightest objection to the millers of the world buying the emery scourer or any other machine they may feel disposed to buy. The only advice I have to offer them is to buy the best they can get, and the machine that will give them the best results under all circumstances. Using Mr. Quance's own words, he says "it will also break smut balls" I have my doubts if Mr. Quance knows this for a fact, from the fact that his wheat first passes through a Eureka Smutter, which is a beater machine. This machine will knock most any smut ball to pieces and forces it out through the openings in its case. Therefore it is questionable to my mind whether Mr. R. Quance knows for a fact whether his emery wheel scourer will break a smut ball or not. In fact so far as I know, there is nothing in the emery scourer to break a smut ball; certainly there is nothing that would force it out through the linings of the case had it broken it.

I remain, yours truly,

H. J. LIVERGOOD,
Brantford, Ont.

Editor M. & M. News.

I notice in a milling paper a brother "dusty" who says he has run off 1,000 barrels without a "choke." That record has been beaten in Canada. Messrs. Cranston & Scrimger, Galt, whose mill was recently remodelled, have run off over 2,000 barrels without a "choke," and to all appearances may run many more. I need scarcely add that the mill was remodelled by the old and reliable firm of mill-builders, Goldie & McCulloch, of Galt, and programmed by John E. Wilson, their milling expert. The mill is in charge of Mr. E. E. Cherry, as head miller, and is doing excellent work. Who is next?

DUSTY.

TORONTO, March 27th, 1886.

Editor M. & M. News.

It having been brought to our notice that a journal printed in the U. S., and circulated gratuitously among Canadian millers in the interest of certain U. S. manufacturers of mill machinery, has made some statements in respect to the recent arrest in this city of George T. Smith, of purifier notoriety, for perjury, in which some gross mis-statements are made respecting our concern, as well as on other points, we desire to correct such as refer directly to ourselves, and which are absolutely false.

First: We were not either directly or indirectly cognizant of, or interested in the laying of the charge against Mr. Smith.

Second: We did not request Mr. Smith's presence, nor make any overtures for a settlement of either of our suits to him, nor have we discovered any weakness in our defence in these actions; on the contrary the foreign evidence is of a nature highly satisfactory to us.

Third: We have not been "thrashed" or "unmercifully whipped" by him in any "legal contest."

Fourth: The only actions which there are or have been between Mr. Smith and ourselves (or rather between the Geo. T. Smith Co., of Canada, and ourselves, as there is no action in which Mr. Smith is a party) are three—Smith v. Greay No. 1 (centrifugal patent); Smith

v. Greay No. 2 (the purifier case); and Greay v. Smith. In the last action we are suing the Smith Co. of Canada for infringement of a patent on dust collectors owned by us.

Of these three actions only one has been tried, *i. e.* Smith v. Greay No. 1. We succeeded absolutely in that and non-suited the Smith Co., and they have paid us the costs of the action. The other two cases have not yet come to trial.

If the journal in question is no more reliable on other points and in other departments, we think Canadian millers will be safe in continuing to patronize home manufacturers.

Yours truly,

WM. & J. G. GREAY.

NEW INDUSTRIES.

(Under this heading we publish a list of new companies or other organizations, flouring mills, saw and planing mills, machine shops, foundries, factories, electric light plants, public buildings, hotels, etc., in contemplation or in course of erection, or of improvements or changes intended in manufacturing establishments generally. This list is especially prepared for THE DOMINION MECHANICAL & MILLING NEWS as a reference for all parties who manufacture or deal in goods pertaining to any of the above branches of trade.)

NEW COMPANIES.

BUILDING.—Oddfellows Building Ass., of Whitby, Ont. Thirty-seven residents of Whitby, incorporators. Capital stock, \$8,500, divided into 170 shares of \$50 each.

MANUFACTURING.—D. A. Jones Company (Limited) of Beeton, Ont. D. A. Jones and others incorporators. Capital stock, \$40,000, divided into 400 shares at \$100 each.

CHEESE.—Cedar Vale Cheese Manufacturing Co. of Ontario. Patrick Breen and others incorporators. Capital stock, \$2,200, divided into 220 shares of \$10 each.

BUILDING.—Hornings Mills Building & Improvement Co. John F. Mathews and others incorporators. Capital stock, \$3,000, divided into 300 shares of \$10 each.

RAILROAD.—It is stated that the Grand Trunk Railway Company are making arrangements to begin at an early date the construction of a line from Peterboro' to Ottawa on the survey of the old Toronto and Ottawa road. Such a line, it is said, running in connection with the Canada Atlantic, would be shorter than the Canadian Pacific railway line between Toronto and Montreal, even with the air line from Smith's Falls finished.

GENERAL DELIVERY.—"The City delivery service of Toronto." Wallace McLean and others, all of Toronto, incorporators. Capital stock, \$2,000, 20 shares of \$100 each.

MANUFACTURING.—"The Byng Evaporators Supply Company." Owen Drake and others, incorporators. Capital stock, \$1,000, in 100 shares of \$10 each.

SOCIAL & POLITICAL CLUB.—"The Niagara Falls Liberal Club." Alex. Logan and others, incorporators. Capital stock, \$2,000, in 200 shares of \$10 each.

BOARD OF TRADE.—Mr. Stork, Manager of the Bank of Commerce, at Windsor, Ont., has undertaken to organize a Board of Trade in that town.

FURNITURE.—Mr. Shepherd, of the firm of Shepherd Bros., furniture manufacturers, Ridgeway, contemplate removing their furniture factory to St. Thomas.

ELECTRIC LIGHT.

An electric light company has been formed at Mount Forest, Ont.

An electric light company has been formed at Owen Sound, Ont.

Belleville has completed arrangements for lighting its streets by electricity.

Guelph has adopted the electric light for illumination of its streets.

The Kingston, Ont., Gas Co., is considering buying an electric light plant.

Bowmanville will shortly have its streets lit by electricity.

BREWERY.

Messrs. Jos. Lake & Sons, of Tilsonburg, have leased the East End Brewery in Brantford for five years. Mr. Sidney Lake will be the manager. The malting will be done at Tilsonburg.

TELEPHONE.

The Bell Telephone Co., will shortly extend their trunk line system from Guelph to Walkerton, Listowel to Hanover, and Listowel to Wingham.

FLOURING MILL.

Elkhorn, Man., on the main line C. P. R., offers a bonus of 8,000 bus. of good wheat and 5,000 bus. of oats towards erection of a flouring and oatmeal mill. Capacity

of former to be not less than 75 barrels. Address W. M. Cushing, Elkhorn, Man.

KNITTING FACTORY.

Berlin, Ont., is negotiating with Mr. J. G. Reiner, of Wellesley, to remove his knitting works to that town.

CHURCH.

The Methodists of Montreal have purchased property on St. Catharine Str. for \$70,000 and will build a new church, which it is proposed to make the finest Methodist church in Canada, on the site.

WATERWORKS.

J. O. Laferriere, Sec.-Treas. of Hull, Que., advertises for tenders for the building of an aqueduct and waterworks in that city.

BREAKAGE OF BAND SAWS.

Concerning the breakage of band saws the London *Timber Trade Journal* says that among the most frequent causes of breakages the following may be named: The use of inferior blades; unsuitable gauge for the size of saw pulleys; pulleys of machine being of too small a diameter; pulleys being out of balance or too heavy; the use of improper tension arrangements; saw running on a hard and unyielding covering of saw pulleys instead of rubber bands; not slackening saws after use, thus preventing the free contraction of the saw blades on cooling down after work; the framing of machine column being of too light a section or too high, thus causing excessive vibration; joint in saw not being of same thickness as the rest of the blade; imperfect guides above and below the table; improper method of receiving back-thrust of saw, consequently case-hardening the back of saw blade and cracking same; using band-saws with angular instead of with rounded gullets at root of teeth; top-pulley overrunning saw; working dull saws; feeding up work too quickly to the saw; allowing saw-dust to collect on the face of saw-wheel, thus causing it to become lumpy and uneven; operating too heavy a band-saw with too heavy a top wheel; stopping or starting a machine too suddenly, especially while using a light blade, will almost certainly snap a saw in two. When it is considered that a band-saw will run from 6000 to 9000 lineal feet per minute for days and weeks, and even months straight off, without breaking, and when the incalculable number of times that a saw bends over the two pulleys and then straightens out again is taken into consideration, it is surprising that band-saws do not break oftener. Their endurance is somewhat marvellous to contemplate. Spider or velocipede wheels are now being extensively used by some makers, and seem to be a great advantage over the old cast-iron top wheel, and in mills using light saws they are certainly a saving.

BAD BOOK-KEEPING.

"My boy kept the books. I never looked at them. If I wanted to know anything I just asked him." "Was he a competent book-keeper?" "No, he was not. He kept the accounts in his head, and on little slips of paper in his pocket. Half the time and more he didn't get my liabilities down on the accounts at all. I spoke to him about it several times, and he said he would fix up the books some time, but he never did. I now find that I owe several thousand dollars more than I supposed I did."

Such is the substance of a statement made recently by a machinery manufacturer. The statement was made to a meeting of his creditors. There is nothing new in it. Hardly a failure occurs in the manufacturing business that does not disclose a wellnigh inextricable confusion in the books of the insolvent.

This suggests an inquiry. Do the failures occur because of careless book-keeping, or is careless book-keeping used as a cloak to cover insolvency. In other words, is it a cause or an effect? We are inclined to think it is both. A business firm without true and clear accounts is like a ship without charts. It is only by good luck that it can escape the rocks. A prudent seller will therefore be very inquisitive about the book-keeping of his customers. No doubt bad book-keeping is frequently in itself a sufficient cause of insolvency.

It is also a frequent effect. The dealer who through dishonesty or incompetence has brought himself to the verge of failure is usually quite willing that his affairs should be kept from the prying eyes of a too ardent investigating committee. The absence of books of account involves in darkness the causes of his failure, and spares him from specific charges or itemized blame. Even where, as in the case of a recent failure, no such thought can be supposed to exist in form, in the mind of the debtor the essence of it often does exist there in the form of self-deception. It is a curious metaphysical fact that men are prone to deceive themselves. The man who would scorn to cheat his neighbor will not scruple to cheat himself. Don't cheat yourself.—*Trade Bureau.*

BARLEY MANUFACTURE.

WHEN the guest calls for barley soup at the three-dollar hotel, little does he think of the many processes which those little kernels of that nutritious dish have passed through while being prepared for food. Like oatmeal, this article of food is fast coming into more general use in this country. There are several reasons for this: First, foreign immigrants are large consumers of barley soup, and the American people are beginning to find out that barley is not such a bad dish after all. Then again, hard times have much to do with the quality of food. When times are very close and money hard to get, people are apt to consider which article of food is cheapest, and find that dimes and nickels will go much further in buying oatmeal or barley at five cents a pound than beefsteak at fifteen cents; besides, about one-half of the steak is waste and the balance requires considerable butter to cook it, while there is no waste to the oatmeal or barley, and all that is required to cook it is a little salt and water. Hungry persons will appreciate a dish of oatmeal or barley soup much better than almost any other equivalent, and it is much better than sweet cakes and jellies. The Germans are probably the largest consumers of pearled barley, it having been their favorite article for soup for many years. One can hardly tell where all of the pearled barley is sold, but it is sold, and a great deal of it, too. Nearly every grocery now has its keg of pearled barley. Tons of it are used in all the large cities. It is said that the New York market is always bare in October, and orders are frequently given from there for five thousand kegs at a time, and the manufacturers are usually behind orders. Considerable is now made in the way of rolled barley, and put up in packages. Like oatmeal, the manufacture of pearled barley in this country is confined to a few. Many of our large cities have nothing of the kind, and again like oatmeal, Canada is ahead of us in the number of its barley mills, having more than three mills to our one. Akron, Ohio, leads in the manufacture of pearled barley, although San Francisco is not far behind; then come Chicago, Zanesville, Ohio, New York City, Syracuse, Milwaukee, and several other places.

In speaking of the manufacture of pearled barley I shall speak of the Martin bar'ly pearling machine. It is the best. The principle of the machine is to admit automatically a certain amount of grain between stone and steel bars and while the stone is rapidly revolving the barley is rolled and tumbled against the steel bars on one side and the stone on the other, and the outer coating is gradually worn off. Now, do not form an idea here that this outer coating is easily taken off. Far from it, I assure you. They have the greatest sticking qualities of anything in the way of hulls. In fact, it requires less power to grind the barley than to pearl it, hence the objection to any and all kinds of barley mills which are claimed to take the barley in at one end and pass it over a continuous set of stones or emery wheels, and by this treatment wear off this outer coating. It won't do. It must be taken and held in a certain position where the action can be quite severe; otherwise in order to wear it off would require a very long machine and a tremendous amount of power to turn it, in fact so much power that it is not practical. It might work all right in theory, but as I am one of those who believe that a little practice is worth a good deal of theory, I say look out before you invest too much in some one else's theory.

To manufacture one hundred kegs of pearled barley a day of twelve numbers will require considerable machinery, while if but one or two grades are made the amount of machinery will be correspondingly less. First, clean the barley and grade it into three grades. The smallest size should be used for feed, or it can be made into an inferior grade of pearled barley. After grading, the barley is passed directly to the pearling machine, where it is allowed to remain a short time just long enough to remove the coarse hulls, then elevated to aspirator; the offals used for feed and the barley passed to No. 2 machine, where it is again worked and again passed to the aspirator, the offal to be used for feed and the barley passed to No. 3 machine, where it is worked down to a good grade of pearled barley and then taken to the centrifugal, the offal to be used for feed or for an inferior article of barley flour. If but coarse barley is wanted, the product is now carried to the grading machines where it is graded and then passed to the polishing machines and then to the packing machine. On the other hand, if fine barley is desired, the barley is taken from the centrifugal to the sifting machine, and then again to the pearling machines, and worked down to any desired degree of fineness, then graded and carried to the polishing machine. To manufacture one hundred kegs of barley a day will require about eighty horse power and will cost considerable money. It is hard to give the per cent. of yield, as there is a great difference

in barley, but it is safe to calculate on about 40 per cent. There is no drying about this business, and the offals find a ready sale for feed. C. O. Bartlett in *Corn Miller*.

CANADIAN VS. AMERICAN WHEAT.

Under the head "Canadian Wheat and Its Importance in the Markets of the World," Heinrich Lemecke says in *Ungarische Muehlen-Zeitung*: Wheat takes first rank among agricultural products in the food materials of the world and it was a wise idea of the United States to devote a large portion of the virgin soil of her boundless prairies to this bread grain. As a result of the wonderfully quick development of the productive lands of the Union, the wheat yield increased enormously from 1820 to 1840, and of late the quantity has become so great that the markets of the world are flooded and prices greatly influenced thereby. The cry comes from all wheat growing countries that their farmers are being ruined by the tremendous production of America. The fear of such a casualty is needless, as the fact has been for a long time recognized that if North America's wheat is the cheapest it is not the best. This lack in quality has already diminished its sale in the world's markets and will be in time a mighty protection against overproduction in the Union.

The chief requisite in a wheat is a large proportion of albumen, which should average about 20 per cent. Bread made from such wheat will, without the addition of sugar, butter or other elements, be evenly porous, light, free from acid, aromatic in taste and sugary in smell. Bread from flour of American wheat possesses none of these properties and tastes dry and weak.

A report issued by the agricultural department at Washington shows that American wheat of the various wheat growing states averages 11 per cent of albumen, that of Oregon having only 8 per cent. Canadian wheat, however, averages 19.76 per cent, while Russian and Hungarian average 19.50. The greater percentage of albumen in any American wheat was from a variety grown in Minnesota which held 17.15.

American wheat is lighter in weight, contains less water and oil and a large proportion of fibre. This report proved that the wheat in question was poorer than that of any country save Egypt and Australia. The average of albumen and mineral elements in the wheat of the Atlantic and gulf states, the middle western, the far western and those of the Pacific coast, indicates that the grain of the eastern states is poorest and smallest in berry. A regular improvement is visible from east to west until the Pacific coast is reached where it falls back in every respect. The poverty of the eastern wheat must be laid to an exhausted soil. The middle west has a lost its early productiveness and only in the far west remains the richness of soil, especially in the nitrogen elements, requisite for bringing the wheat berry to perfection. But all these are behind the Canadian, Russian and Hungarian products in albumen, the element which determines value.

Canada is doing all that is possible to place herself in condition for supplying the world's markets with wheat. The building of the Canadian Pacific Railway, a work so rapid as to approach the marvelous, and quick development of Manitoba and Canadian northwest say much for this intention.

Climate, soil and rational cultivation are factors chiefly influencing the quality of wheat. As the climate of the United States results in Indian corn better than many varieties of other countries, the climate of Canada and southern Europe produces wheat of settled superiority. Canada has snowy winters of equable temperature, and in spring when the snow melts, cool nights succeed warm days, a state of things favorable to vegetation. The summer is hot and brings the grain to full maturity. Moreover rain never fails there, while in the United States the burning heat of summer checks growth, and the earth often becomes entirely parched.

Wheat requires a humous lime soil. The black earth district of the Canadian northwest consists of deep, humous lime soil, which by analysis of the chemical laboratory, university of Kiel, Germany, is shown to contain in 100,000 parts elements as follows:

Potash	228.7
Sodium	33.8
Phosphoric acid	64.4
Lime	682.0
Magnesia	16.1
Nitrogen	46.1

This composition is universally recognized as best fitted for wheat culture. Considering that the Canadian northwest is 1,800,000 English square miles in extent, and remembering its fitness for agricultural purposes, an idea may be obtained of the influence likely to be exerted by its products, and especially its wheat, on the agriculture and the markets as well of the United States as Europe in the near future.



The cotton batting factory at Cheltenham, Ont., was completely destroyed by fire on the morning of the 12th of March.

Bell & Co., organ manufacturers of Guelph lost 50 organs on the wrecked steamer Missouri, bound for Liverpool.

At a representative public meeting held in the city of Ottawa, resolutions in favor of granting bonuses to manufacturers were carried.

Two employees of Griffin's Car Wheel Foundry, St. Thomas, broke through some inch boards carelessly left over a pit twenty feet deep and were badly hurt.

Mr. Jonathan Ellis has purchased the Norfolk Woollen Mills, Port Dover, for \$20,000. About 90 hands are at present employed in the mills.

A young man named William Smith lately had his hand so badly lacerated by machinery in Noxon's foundry at Ingersoll, Ont., that it had to be amputated at the wrist.

It is stated that the Cochrane Manufacturing Company, of St. Thomas, will shortly call a meeting of their creditors for the purpose of winding up the estate.

The Stormont Cotton Company, and the Canada Cotton Co., both of Cornwall, Ont., have each shipped a full assortment of their products to the Colonial Exhibition to be opened in London, England, next May.

The Dominion Organ Company recently shipped at one time five car loads of organs, numbering one hundred, to Germany. This is said to be the largest single shipment ever made by any Canadian firm.

Says the *Port Hope Times*: "Mr. T. D. Millar has for exhibition at the Colonial Exhibition, London, Eng., two large cheeses weighing 1,228 pounds, which consumed in making, 12,280 pounds of milk, taken from 1,228 cows."

The Joseph Hall Manufacturing Co. difficulty is yet unsettled. Mr. Ryan refused to assign until the Bank of Commerce was protected. This was agreed to, and now there are some others of his friends whom he wishes secured, and he still holds out.

A serious accident befell Mr. James Babe, of Mono Mills, Ont., while at work in his saw mill the other day. While engaged in oiling the crushing machine, his hand got caught between the cogs with the result that one finger was severed entirely, and the others severely crushed.

Mr. E. Haines, of Cheltenham, Ont., lately had a narrow escape from a fearful death. While working in his mill his coat caught on a perpendicular revolving shaft and he was whirled rapidly around, striking the wall at every revolution. Fortunately his cries were heard, and he was extricated in the nick of time. He sustained severe but not serious injuries.

John Flint, alias O'Donovan, alias Ward, alias Ashley, etc. has been arrested and imprisoned in Philadelphia. This interesting person travelled about this country and the United States selling to large manufacturing companies the right to manufacture for their own use a certain sort of lubricating oil for which he owned patents. His tactics usually were to sell the right several times over to the same company taking in its agents in different places.

Peterborough Review:—"A very fine specimen of cabinet making is to be seen in the workshop in connection with Mr. A. Clegg's furniture store. The piece of work is the pulpit for the new St. Andrew's Church. It is made of birch, accurately carved by hand, pannelled in the front and ornamented by walnut courses which form at regular distances into pendant trefoil foliations. The work is entirely done by hand, and is a piece of handiwork on which the maker, Mr. Robert Sherlock, may well look with pride."

The silver medals offered by the Manufacturers' Association for the best industrial designs by pupils of the several Art Schools throughout the Province, have been awarded to the following persons: Toronto medal to S. Wright; Ottawa medal, W. C. Eley; Kingston medal, Mrs. E. A. Powers. The London medal was not awarded, as there was no competition. It is proposed to hand over the London medal to the educational department, to be retained until next year, when it will be awarded with any other medal which may be given by the Association.

The cotton manufacturers of the State of Maine, representing capital to the amount of \$12,000,000, met in Boston recently and formed an association to protect themselves in case of a strike, that might be ordered by the Knights of Labor. It is understood that in case any mill or mills in the association are obliged to be closed on account of any action taken by the Knights of Labor, the other members of the association shall pay into the treasury of the said mill the sum of five per cent., or at that rate on their capital stock, while operations in the said mill are suspended. This course will no doubt be followed in a measure by manufacturers in other parts of the United States and in Canada.

Mr. G. C. Cunningham, M. I. C. E., lately laid before the Institution of Civil Engineers in England, a study "On the Energy of Fuel in Locomotive Engines." The mode of investigation adopted was the comparison of the duty done by a locomotive with the fuel consumed. The results, obtained from four Canadian and American railways, are tabulated, and decidedly possess value. An analysis of the table shows an average consumption of 0.93 lb. of coal per ton of passenger train, and of 0.272 lb. of coal per freight train, per mile; the difference being attributed to the much higher rate of speed of the former. On the Canada Southern Railway the average of the whole line is said to be equal to a gradient of 5 feet to the mile, raising the resistance to haulage from 9 lb. per ton, due to friction on the level, to 11 lb. per ton. The fuel consumed in the freight trains is 0.15 lb. per gross ton moved one mile; exclusive, apparently, of the weight of the engines. This is equal to 0.1225 lbs. of coal per mile for resistance to running friction alone, independent of gravitation.

SKILL OF THE ANCIENTS.

THE expertness of the ancient engineers is attested by the remains extant. The Pools of Solomon still continue to furnish water to Jerusalem. They are three in number. The upper is 160 feet above the middle one, the latter 248 feet above the lower. The first was supplied by pipes from springs, and when full, emptied into the second, and that into the lower one. The water was used for irrigating Solomon's gardens and supplying his temple. The lower pool held about 31,442,425 gallons; the middle about 12,289,912, and the upper one contained 13,778,772—a grand total of 57,511,109 gallons, or nearly six times as much as the Kansas City reservoir, which is estimated at 10,000,000 gallons. These pools were solid rock and masonry, lined with cement, and had steps leading to the bottom. One historian says that Nebuchadnezzar, wishing to brick the bottom of the Euphrates, which flowed through the centre of Babylon, caused a reservoir forty miles square to be dug, so as to allow his masons a dry river-bed. Another historian writes that Nitocris, a daughter of Nebuchadnezzar, is said to have dug a reservoir 420 stadia in circumference, lined with stone, for the waters of the Euphrates, in order that the river-bed at Babylon should be dry, so that she could build piers for a bridge. A stadium being 625 feet, it would make this circumference forty miles. These two reservoirs may be the same, and this shows what discrepancies there are among writers.

TECHNICAL TRAINING IN AMERICA.

Professor R. H. Thurston recently delivered a thoughtful lecture on the above subject before the Board of Trade of Scranton, Pa., from which we make the following extracts:—

It is intelligence, and not brute force, that governs the universe and conquers fate. It is the humming spindles, the puffing engines, the rumbling iron-tounging mills, each directed by active brains and guided by a few skillful hands, that do the work of the world; anima power, whether human or brute, accomplishes but a very insignificant part of the work of this busy world of ours. The 3,000,000,000 bushels of grain annually grown in this country is transported to the millions fed by it over our 125,000 miles of railway, and over 3,000 miles of ocean, not by man, but by the inanimate forces commanded by his intelligence; not by human or even brute muscle, but by Nature's power, directed by the mind of insignificant man, defying Nature's wildest untrained forces. He thus summarizes the requirements in this direction:

1. A common school system of general education which shall give all young children tuition in the three studies which are the foundation of education, and which shall be administered under compulsory law, as now generally adopted by the best educated nations and States on both sides of the Atlantic.

2. A system of special adaption of this primary instruction to the needs of children who are to become unskilled laborers, in departments which offer opportunities for their advancement, when their intelligence and skill prove their fitness for such promotion, to the position of skilled artisans. Such a system would lead to the adoption of reading, writing and spelling books in which the terms peculiar to the trades, the methods of operation and the technics of the industrial arts should be given prominence, to the exclusion, if necessary, of words, phrases and reading matter of less essential importance to them.

3. A system of trade schools, in which general and special and general instruction should be given to pupils preparing to enter the several leading industries, and in which the principles underlying each industry, as well as the actual and essential manipulations should be illustrated and taught by practical exercises until the pupil is given a good knowledge of them, and more skill in conducting them. This series should include schools of carpentry, stone-cutting, blacksmithing, etc., weaving schools, schools of bleaching and dyeing, schools of agriculture, plumbing, etc.

4. At least one polytechnic school, in which the sciences should be taught and their application in the arts indicated and illustrated by laboratory work. In this school the aim should be to give a certain number of students a thoroughly scientific education and training, preparing them to make use of all new discoveries and inventions in science and art, and thus to keep themselves in the front rank.

5. A system of direct encouragement of existing established industries by every legal and proper means, as by the encouragement of improvement in our system of transportation, the relief of important undeveloped industries from State and municipal taxes, and even in exceptional cases of subsidy. It is evident that such methods of encouragement must be adopted very cir-

cumspectly and with exceedingly great caution, less serious abuses arise.

Such a complete scheme has as yet never been fully carried out; and yet it is easy to see that we are gradually working out its elements here and there piecemeal, and that the future, the near future, we may hope, will certainly see the whole system in full.

SEPARATIONS IN BUHR MILLS.

The largest amount of thought and attention which millstone mills receive is directed toward the buhrs themselves. The system of separations never received the same careful thought and attention that the buhrs did. It was the popular thing to talk about the dress of buhrs; but few ever thought about the advantages which might be derived from changes in the separating system. If there was trouble in the mill attention was largely directed toward the buhrs. Now while all of this care for the millstones was commendable in so far as it applied to the buhrs themselves, it must be acknowledged that the skill of the miller might well have been exercised in the care for the separating arrangements. An investigation as to the bolting plan of many of our buhr mills leads us to assert that there is really very little difference between the system of bolting in such mills as arranged now and as arranged at the time when all mills were operating on the early millstone system. When it comes to making definite suggestions as to a plan of bolting for such mills there is more or less difficulty, in that it is hardly possible to determine the proper scalping numbers for the first reel on account of the great differences in the various methods of grinding, some millers grind high and others grind low. In the case of high grinding it is desirable to use a coarser scalping cloth than when grinding low. In the case of buhr mills it does not often happen that the bran should be scalped over a coarser number than 6. For the sake of the rebolting idea, which we mention in another article, there should be a finer number at the head of the scalper which separates the fine middlings and flour from the coarse middlings and bran which go through the 6 cloth. Thus it is that the coarse middlings and bran are separated from the fine chop which is rebolted on the reel below. The fine scalping number may be 5 or 6, or even 7, according to the grinding. The higher the grinding the finer this number. As we know the coarse middlings will go through the coarse cloth and the bran will go over the tail, giving us three separations on this reel. It is common to place a piece of 12 at the head of the second reel followed by 14, and it is our suggestion that a piece of 16 find its place at the tail of such a reel. The use of this fine cloth lessens the proportion of cut-off. The middlings from such a mill may or may not be dusted. The quality of the stock with reference to its freedom from dust as it tails over the second reel may be regulated by the grinding if not by the number of the fine scalping cloth on the head of the first reel. If the second reel does not dust the fine middlings sufficiently the grinding should be a little higher, or the first scalping number on that reel should be a little coarser. However, it would be best if a separate dusting reel were provided for this grade of fine middlings in order to permit the use of a finer head scalping number and a uniform condition of grinding. These are items which should be considered in every buhr mill. One who is running a buhr mill wants to get all he can out of it and such a method is much better than what is commonly called an old-fashioned "straight out" of a mill. The same general principle which applies to the bolting in gradual reduction mills of the most elaborate order applies as well to the buhr mill with its two or three reels—*The Millstone*.

ONE-STAVE FLOUR BARRELS.

Flour handlers and others who use barrels are just now interested in a "one-stave" barrel, manufactured by the Anchor Manufacturing Company at their establishment near Detroit. The Company has a paid up capital of \$500,000. The establishment is now turning out 6,000 barrels per day, and will soon be making twice that number. While the size and shape of this barrel are the same as the ordinary kind, the body of the barrel consists of a single sheet of timber held by hoops. The timber used is elm, which is cheap and abundant. Canada is the main base of supplies, and timber hunters sent there have already arranged for this establishment. The logs will be rafted over during the season of navigation, and brought by rail in winter time. The logs are taken from the boom or yard into the saw mill and cut into two-barrel lengths. Thence they go into a steam-chest, where they remain until thoroughly steamed. In this condition the log is converted into thin sheets, or veneering, used in the body of the barrel. By a special process, a two-foot log becomes rolls of wooden sheeting in a minute's time. There remains upon the mandrel an

eight-inch core, which is utilized in making barrel heads. These sheets go next to a sanding machine, by which both sides are made perfectly smooth. After passing through a cutting and grooving machine, they are cut by a goring machine as to adapt them to the shape of a barrel. Thence they go to a drying-house. From the drying-house they go to the sizing saws, where they are cut the desired length, when they are ready for the cooper shop or for shipment. They are shipped in bundles and in the "knock-down" to be put up at their point of destination. Three thousand of them can be stored and forwarded in an ordinary box car. The headings are shipped in barrels.

A WORD OF ADVICE TO ENGINE OWNERS.

Why is it, remarks, the *American Engineer* that some engine owners have such false notions regarding the condition of their engines? They seem to have the idea that as long as an engine will turn over, there cannot be anything the matter with it. They do not realize the true state of the case, that such a piece of mechanism cannot, in the nature of things continue in the same condition. When it begins its life work, it must of necessity commence to deteriorate and wear out; that with the best of ordinary care it has a continual tendency to change its condition, to get out of line, wear its bearings, to have lost motion in its connections, to have the relative time of the valve motion change, to have the surfaces wear uneven, the cylinders to become untrue, the piston packing to leak, and so on through all the various parts that comprise the complete machine.

Very often the engineman finds that, calling attention to such conditions only results in his becoming aware of the disagreeable fact that if anything is the matter he must bear the responsibility; that any such deterioration must necessarily be his fault.

There are, of course, men in charge of engines who are careless and do not carefully, day by day, do what they can to make the unavoidable wear and change as slight as possible. A certain proportion of these men have not the training as machinists to make them competent to correct this deterioration. What is wanted is for the owners to realize the fact that engines will wear out. That as a rule this deterioration results in loss of economy and shortens the life of engines, and that the best results, both as regards the regulation of speed and minimum cost to run them, depends on their being frequently thoroughly examined, and these various changes corrected by competent mechanics, so that they will be kept in as complete order and condition as at first.

Especially is this the fact as regards the internal portion of the mechanism. A change in the set of the valves, a leaky piston, or valve wear, may be causing an increase of steam consumption of 25 or 30 per cent. while the external movement may not indicate any change.

A METHOD OF CLEANING STONEMWORK.

It is sometimes required to clean the surface of old masonry that has become weathered or coated by deposits from dirty water, either for the sake of appearance or to make a sound connection with new work. The only effectual method hitherto practiced for this purpose has been by completely re-dressing the surface with the chisel—a method which is tedious and costly at best, and which is seldom thoroughly carried out. A different, and, it is claimed, more satisfactory process was devised by M. de Liebhart, and used in 1884 for cleaning the walls of the quays of the Seine in Paris. These walls become in a few years covered with a shiny black deposit, which resists acids. To remove it, a paste composed of a solution of soda and lime, to which a little chloride of lime is added, was mixed to the consistency of honey, and spread over the surface, where it was allowed to remain for two or three hours, according to the condition of the stone. When it was removed, the deposit was still black, but it had become sensitive to acids. After this preliminary treatment, a workman passed over the surface (with a large gutta percha brush) a mixture called sulpho-chlorhydric, forming on the stone a kind of glue; and almost immediately afterward he syringed the surface with a jet of the same liquid. It formed an adherent paste, continuing to act upon the stone for about two or three hours. After the syringe, came a gang of men who scrubbed the surface, finishing off with a hose pipe. The sulpho-chlorhydric mixture is composed of sulphuric and hydrochloric acids mixed, empirically, according to the nature of the stone and the necessities of the case. The cost of cleaning stone walls by this method in Paris is 0.46 franc per square meter for material, and 0.50 franc for labor, by contract. The preliminary treatment by the caustic paste was paid for separately at 0.50 franc per square meter. It is said that the stone itself is not damaged by this treatment, and soon regains its natural color.



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Changes in advertisements will be made whenever desired, without cost to the advertiser, but to insure proper compliance with the instructions of the advertiser, requests for change should reach this office as early as the 22nd day of the month.

Special advertisements under the headings "For Sale," "For Rent," "Situations Wanted," &c., if not exceeding five lines, 30 cents for one insertion, or 25 cents for two insertions. If over five lines, 10 cents per line extra. Cash must accompany all orders for advertisements of this class.

SUBSCRIPTIONS.

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

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

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EDITORS' 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.

OUR thanks to the Albert (N. B.) *Maple Leaf* for the following kind notice: "We have received the February number of the MECHANICAL AND MILLING NEWS of Toronto. It is sent to any address for the small sum of \$1 a year. It is an invaluable paper for mechanics and is as richly printed and illustrated as the *Scientific American*. You had better send for it; 10 cents a copy."

AMONG a number of handsome catalogues on our table we would make special mention of those of Messrs. B. Greening & Co., the widely known wire work manufacturers, Hamilton, and Messrs. W. Stahlschmidt & Co., of Preston, Ont., who have made for themselves an excellent reputation as manufacturers of office and lodge furniture. Both of these catalogues are got up in the best style of the typographical art, finely illustrated, and convey an excellent idea of the class of goods made by the enterprising firms sending them out. They will be sent to any one making application for them, free.

MR. J. M. Case, head of the large and well-known manufacturing firm of milling machinery, the J. M. Case Manufacturing Co., of Columbus, Ohio, is in Toronto making arrangements for the manufacture of his various machines in this city. We understand that the Case Company intend going into the manufacturing business in Canada with the same vigor and energy that has always characterized their operations in the States, they holding patents on all their machines in the Dominion as well. Mr. Case seems just to be the man to make the mill-furnishing business in Canada lively for a while at least.

WE have received the first number of a new trade publication devoted to the iron industry, "*The Iron Industry Gazette*," by the American Industry Press, of Buffalo, N. Y. It is a 28 page sheet, got up in the best style of the typographical art, and will no doubt be conducted in the same able manner that characterizes the other publications issued by that enterprising concern. Foregoing the usual long "Salutory" it starts out with a brief notice "that it takes its place among the journals devoted to the iron interests of the United States and does not aspire to fill a long felt want" by any means, but proposes to operate in a field in which it sees an opportunity to be of some service to the iron manufacturers with an ultimate prospect of profit to the publishers." We wish it all possible success and trust it will prove what the publishers bespeak for it to the fullest extent. The annual subscription price is \$1.

THERE is a good opening for any one wishing to start a steam saw mill on Salmon Lake (Lac au Saumon), Province Quebec. The country abounds with cedar, pine and many other kinds of useful woods. Mr. Ignace Lavoie, Anqui, Rimouski Co., Que., will gladly give any further information.

AFTER several months of silence, for they have been too busy to talk, Messrs. Wm. & J. G. Greey, the widely known mill-furnishers of Toronto, again make their bow to the milling community in a four-page special advertisement, which bears testimony to the booming trade they are constantly doing. By strict business integrity, and giving their customers in all instances reliable and good work at prices cut down to the lowest possible figure commensurate with the superior quality of all the furnishings supplied by them, they have succeeded in building up a trade that not only extends over all parts of the country, but to far distant climes, and is not only a credit to themselves but to the Canadian mill-furnishing business in general.

THE prospects, to which we have previously at various times directed attention, that Toronto is bound to eventually become the great centre for the large majority of the manufacturing industries of Ontario seem to be realizing more and more. The firm of Wm. Stahlschmidt & Co., manufacturers of office, church and lodge furniture, now located at Preston, Ont., have decided to transfer their works to Toronto at an early date and Mr. John Abell, founder and machinist hitherto at Woodbridge, Ont., has already advertised that his business has been moved to Toronto. There is little doubt but that many other manufacturing firms through the province will soon follow the general exodus to Ontario's go-ahead capital, which in the course of comparatively few years will not only be a great city but also a large manufacturing centre. Come on, gentlemen, there is plenty of room for you in Toronto yet.

THE exhibits of Canadian manufacturers for the Colonial Exhibition, to be opened in London, Eng., on May 1st, are pretty nearly all despatched. The Canadian exhibit will be a very large and fine one and will certainly take the front rank. It will open the eyes of the old country people, who in many instances have very primitive and narrow ideas and views concerning that big "north pre-country," Canada, as to what her citizens are able to do in the manufacturing line and the high grade of perfection they have attained in the various industrial branches. During the exhibition a Canadian journal, to be printed on Canadian paper, with Canadian ink, from Canadian type, on a Canadian press, and to be edited by Canadians, to be called the *Canadian Exhibitor*, will be published in the Canadian section, for the purpose of disseminating information and knowledge concerning this country throughout Great Britain and her dependencies. This is a good project, which ought to have the cordial support of Canadian exhibitors generally.

REGARDING the coming annual convention of the National Association of British and Irish Millers, to be held at Dublin, the *Millers' Gazette* says that the Irish millers are making the most elaborate preparations to give their English and Scotch brethren a hearty welcome. Several meetings have been held, and a committee composed of millers from all parts of Ireland will shortly be appointed to carry out all the arrangements. On the first two days of the convention papers on milling subjects will be read by a number of gentlemen, including one by T. W. Hubbard, owner of the Albert mill, Gloucester, on "Milling 'st and Mellow Wheat," and one by Gilbert Little, manager for Mr. Carter, entitled, "Shall We Utilize the Latent Abilities of the Operatives in Milling?" As the Irish wheats are softer than those imported from abroad, Mr. Hubbard's paper will be specially interesting to Irish millers; while Mr. Little's paper, which will formulate a scheme by means of which the workmen who invent or improve any machine, or discover any new principle by means of which the work of the mill or the milling engineer's establishment is either improved in quality or rendered more economical in cost, will be awarded a sum of money which the board appointed to consider such claims may deem equitable according to the value of such invention, improvement, or discovery. It will also be appropriate in view of the great spread of technical education among milling operatives, and such scheme cannot but stimulate the latent abilities of the workmen. The last three or four days will be occupied by the millers visiting the mills from Cork to Londonderry, and as many English and Scotch millers will be accompanied by their wives, special excursions and entertainments will be provided for the ladies.

PROCTOR'S POINTS.

That question in your February number: "How many horse power will an 8 in. belt convey from a line shaft with 30 in. pulley and making 265 revolutions per minute, to a countershaft having a 20 in. pulley, and how much to a countershaft having a 10 in. pulley? Why the difference, if any?" has set me thinking and I am persuaded that the answer of your correspondent "B" in the March number of your paper was not full enough to suit your questioner, who, I think desires to know more than the mere figures in the final result, that is:— I think he desires to have the whole demonstration of his problem. I propose therefore to devote this article to a discussion of a few of the "Points" that enter into the calculation. I cannot fully discuss all the points in this letter because I have not the time at command nor have you the space to spare, but I will try and make a few of the important points intelligible to the ordinary reader and if I don't, I would like to have them say so.

First, in relation to the pulleys, we have to take into consideration:

Diameter of driver (D) = 30 inches.

" driven (d) = 20 "

Periphery speed, (S) = $30 \times 265 \times 3.14159$.

S = 2,497,64 inches = 2081.3 feet.

Circumference of driver (C) = $30 \times 3.14159 = 94.25$ in.

" driven (c) = $20 \times 3.14159 = 62.83$ in.

Quality of pulleys: This your questioner has not given, and as it is an important factor, I substitute the style most general use viz, iron pulleys, slightly crowning; although leather covered pulleys will convey more power because of the greater adhesion of leather to leather than of leather to iron (some users of power are now experimenting on paper covering for pulleys. If any of them can give any reliable data in relation thereto, your readers would no doubt be glad to hear from them.)

Distance apart: This your questioner has also not given, but for the purposes of this calculation I will put the distance from centre to centre of shafts at 10 feet, which will answer all the purposes of this computation, and the requirements of your questioner.

Second, in relation to the belt, we must take into consideration:

Width (W) = 8 in.

Length (L) = $2B + \frac{1}{2}(C+c) + 1.10(D-d)$.

(L) = $(2 \times 120) + \frac{(94.25 + 62.83)}{2} + \frac{(30 - 20)}{12}$

(L) = $240 + 78.54 + 1$.

(L) = 319½ in. or 26 in. 7½ in.

Quality of belt: Your questioner has not given the quality of the belt to be used, and, as I incidentally demonstrated in your February number, everything in the transmission of power (in this calculation) depends upon the quality of the belting. In leather belting, for instance, the range of quality is all the way from "Hemlock tanned Canadian," weighing 12 to 14 ozs. to the square foot, and having no reliable strength or uniform homogeneity, to "English oak tanned," weighing 20 to 28 ozs. to the square foot, and being a full 7.32 in. thick, with all joints glued, laced and rivetted, and capable of standing a breaking strain of 800 lbs. to the 1 inch of width. Therefore for the purposes of this calculation we will put on a good belt, even if the discount isn't as large as your questioner would like.

Lacing: In such a belt as we are using in this calculation, the lacing, or joint which makes the belt endless, is always the weak part, (1) because the lace leather, though tough and strong, cannot be expected when cut into strings to be as strong as solid, closely-tanned leather, and (2) the belt itself having been punched or cut away, is thereby considerably weakened. We will consider, however, that your questioner uses "Lewis tan" lace leather (which the writer has proved by experimental tests to be the toughest and strongest made in Canada) which in this belt will bear a tensional breaking strain of say 200 lbs. to the inch of width, and a safe working tensional strain of 70 lbs. to the inch when in use.

Friction: We now come to the most difficult factor to obtain, or estimate on, in the whole calculation, and yet it is the all-important one, and the one upon which the accuracy of the whole computation depends. A large number of experiments have been made, at one time and another, by careful engineers to obtain data of adhesion or the "co-efficient of friction" of all kinds of belts over different kinds of pulleys, and instead of going into the matter more fully, it will be sufficient for me to say that the "co-efficient of friction" of a leather belt over an iron pulley has been placed at 0.4. Now

WRENCHES, THEIR USE AND ABUSE.

WEBSTER defines "Wrench" thus: Wrench, to pull with a twist, to wrest, twist, or force by violence, as to wrench a sword from another's hand

2. To strain, to sprain, to distort.

You *wrenched* your foot against a stone. (Swift.)

"Wrench." A violent twist or a pull with twisting

2. A sprain: an injury by twisting as in a joint. Locke. An instrument for screwing and unscrewing iron work. Means of compulsion (not used). (Bacon.)

I think the last definition ought to be as much in use as either of the other ones, for how could thousands of old rusty bolts have the nuts taken off unless there was some means of compulsion or force? I think if the venerable Noah, to whom we all bow in humble deference of opinion in matters relating to the definition of words, had ever been for one single time in as close a place as your humble servant has, and done his level best with a wrench, he would have said "a means of compulsion" was a perfectly legitimate definition.

In speaking of wrenches now that is the only sense they are to be taken in. I'll tell you how I came to take the subject of "Wrenches" as a text from which to write up an article for publication. I was down under a Schenck planer and matcher taking up the end motion in the side cutter spindle a machine that has come under my care within a few days, and I had hunted all over the mill and got a dozen wrenches piled up and not one in the lot would fit the nut. Why didn't I use a slide wrench? Good gracious, don't you know that there's lots of places where a slide wrench is of no more use than a chipmunk's tail. The fact is just patent that when a man gets a machine of any kind he wants to go all through it and dissect it and find out what size and shape of wrenches he wants, and if he can't buy them make a pattern and have them made to order. More time is spent in hunting after wrenches sometimes than a good sized tool box full would cost.

I know that many machines are seemingly set up as if the maker tried to see how many sized nuts he could put into it. And I also know that in some places where machines are used that if a nut is lost and any sized nut can be found in some old scrap box or heap that can possibly be forced on to the bolt with any kind of a wrench, on she goes, if the wrench holds out. No one dreams whether it will ever have to come off or not. The only thought is to get it on "by means of compulsion" brought to bear on it by means of the aforementioned wrench.

Now a wrench in itself is a very simple piece of mechanism, but the use it is put to and the many kind of places where we must use it, or them, make it one of the most necessary tools in use, and their particular value lies in being able to use them just where they are wanted.

A common slide wrench is valuable for many places where the work is easily got at and not a very hard strain is to be put on them. It is a very easy thing to spring one of them, and after they are sprung they are of very little use only to slip off and jamb your fingers, or, perhaps, give your hand a terrible cut on the edge of a knife. I have got one mutilated hand from just this cause. I would not by any means throw aside the good grades of the common slide wrench, for they are a valuable tool, but they have only their places of usefulness, like policemen, and when they go outside of that, like the common policeman, they are of no value.

It is a common saying that "it takes all sorts of folks to make a world," and it is exactly so in regard to wrenches. It takes all sorts of them to do all our work. Now, in the first place, as I referred to in the first part of this article, I had a piece three-fourths of an inch wide and three inches high and two inches to the bolt head. Now, what good was a slide wrench in such a place as that, or what good was a straight open-ended solid wrench on a square head even if it would fit, or even an S wrench unless the bolt happened to be turned just right for you to get hold of it. I had all these, but like King Dick who was in a tight place, and roared out in terrible anguish, "a horse, a horse, my kingdom for a horse," no "horse," or rather wrench, came. I was all humped up under a machine and in a terrible hurry and a dozen pieces of iron and steel piled up and not one of them of the least use to me.

I think I hear lots of you say, why in the name of reason didn't you take a hammer and cold chisel and start it? Now, I want to tell you all that I am not one of the hammer and cold chisel kind, only as the very last resort. Just suppose I had hit that bolt head a good crack and off the head had come. Here was a good two hours work before me, or even if I had not broken it, I should have mutilated the head so nobody could have done anything with it afterwards.

Now, all you cold chisel and hammer fellows please

take notice that it costs more to work in that way and get your bolts and nuts on and off, it costs you ten times as much to work so than to have a wrench made to fit the place and keep it in a safe spot till you want to use it. Maybe you will not want it for a year, but when you do want it you know exactly where it is, and it will save time enough to pay for two or three such wrenches.

I got out of my trouble by taking an S wrench to the forge and bending it a little. This did not hurt it for other purposes, but for all that I had a wrench made for just that place and I have it snugly stowed away in the locker for future use when it is needed, which will probably be in a few days, for I believe in having side cutter spindles have as little end motion as possible to have them run cool.

"Now, let me tell you all my ideas about wrenches for common use. You want a 6-inch, a 10-inch, a 12-inch, a 20-inch (or longer if you can get it) slide wrenches, in good condition, on hand all the time, and just where you can put your hand on them. You will find use for all those sizes of slide wrenches and the want of either of the above sizes may often cost you in loss of time and the consequences more than the whole of them would cost.

"I want to unship my oar just long enough to say that there is any quantity of men so penurious and stingy that they would only buy one wrench of any kind to keep off the grim messenger of death, and yet would fuss and fool away time enough on some little break down to buy as many as a horse could draw. Experience never teaches them wisdom and they are always having broken down machines, because they never furnish tools to keep them in decent repair.

"Shipping my oar again, I will say, as I have said before, that the value of a wrench to us is the necessity of it, and the economy of one is to have it fit the nut or bolt head, and not have to lose three dollars worth of time for that which might have cost us a comparative trifle.

"The first thing is to reduce as far as possible the number of different sized nuts on which we are obliged to use wrenches. For instance we may, and ought to have as many as ten sets of matcher heads, and every one of them should have the same sized bolts for tightening the bits. And the screws to lift and alter the height of the head on the stuff should be the same size. The jamb nuts on all these adjusting screws should be the same size. Oh, what a terrible bother it is to have several sizes of wrenches to handle side cutters with. Let one wrench fit the whole lot of jamb nuts on the side cutters if there are fifty sets of them. And one wrench for the tightening bolts for the bits, and one wrench for the set screws that fasten the heads to the spindles, only three of them, that's enough. There are some tight spots about every machine, such as the fastenings of the tops of the side cutter frames and screws or bolts that adjust the rollers to the proper height. A socket wrench comes in good play in adjusting rollers, but for the tops of the side cutter frames generally we want a wrench just for the place.

"A good stock of the different sizes of socket wrenches is not money thrown away, and an eagle claw can always be found use for, and often pays for itself in a short time. And last, but not by any means least, come pipe wrenches, taking from one-quarter to three inches, ought always to be found in every shop of any size.

"There is no place about any kind of machine, either for wood or iron, but ought to have a wrench that will fit every nut in any place hard to get at. You can keep these just as nice as you choose, nickel plate them if you wish, but keep them where you know where they are. They don't eat corn or oats, or chew tobacco, or drink lager, so it don't cost anything to keep them. And I warrant you that they will never cause regret for keeping them on hand ready for any emergency that may arise. —J. T. Langdon in New York *Builder & Woodworker*.

A CHINESE METHOD OF MAKING SHOVELS.

A Shanghai paper states that a novel branch of industry has recently sprung up at Chefoo. It is the manufacture of iron shovels. And I suppose your numerous readers could never guess what they are made of. They are made from old boiler tubes. Hundreds of men and boys are now engaged in this business. The old tubes are cut into short cylinders, just the length of the shovel, and then ripped open, flattened out, and hammered into shape. Piles of these old boiler tubes may be seen everywhere in the back courts of the native Hong's. Mule loads of these shovels are to be seen every day going into the country, and I learn that for one or two hundred miles in the country there is now scarcely a farmer that has not an iron shovel. The prices vary from 25 to 40 cents apiece, according to quality, thus bringing this useful implement within reach of all.

USEFUL INFORMATION

A new composition for water-proofing paper consists of the following ingredients, combined in the proportions stated viz resin, 50 per cent; paraffine, 45 per cent; silicate of soda, 5 per cent. These ingredients are thoroughly mingled by heating them together and by agitation.

A simple method of measuring belting in a roll, which is very nearly correct, is as follows: The sum of the diameters of the top and the eye in inches, multiplied by the number of turns made by the belt, and this product multiplied by the decimal .1309 will be the length of the belt in feet.

For sharpening tools, instead of oil, which thickens and sweats the stone, a mixture of glycerine is recommended. The proportions of the composition vary according to the class of tools to be sharpened. One with a relatively large surface is best sharpened with a clear fluid, three parts of glycerine being mixed with one part of spirits. A graver, having a small cutting surface, only requires a small pressure on the stone, and in such cases the glycerine should be mixed with only two or three drops of spirits.

Some, in fact quite a number, 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 murate of zinc, or muratic acid and zinc. It has no bad smell.

In order to take away ink spots from paper it is customary to use a blotter which freely soaks up the liquid, and if by this means all traces of ink do not disappear, recourse is had to a salt or some substance having the property of bleaching paper, for instance, oxalate of potassium, etc., to attain this end. A simple modification of this renders still better services. Take a thick blotting paper or board, steep it several times in a solution of oxalic acid or oxalate of potassium. Then dry it. If there is a spot to be taken away, apply the blotter, which has been prepared in this fashion, to the same. In proceeding thus, the ink is entirely removed. The blotter drinks up the ink, and whitens the paper at the same time.

PARAFFINE AS A PRESERVATIVE FOR MARBLE. Since the obelisk in Central Park, in New York city, was smeared with paraffine to prevent its disintegration from atmospheric changes, the application of that substance to buildings of marble or stone is becoming quite common. The latest example is the Exchange Building, Broadway, which has been treated with acids over its entire front as a cleansing process. Mechanics are now going over the surface of every block, column, sill and pediment, with a sort of frozen blow-pipe, from which three strong pencils of flame are projected against the marble for the purpose of heating it. This done, the paraffine is applied with a small brush. The buildings appear to be thoroughly renovated by this treatment.

Mr. Frederick Siemens has discovered, and to some extent applied in manufacture, a method of toughening glass, which he claims to produce a material as superior to ordinary glass as tempered steel is to iron. The process is substantially to take the article after it has been shaped in the ordinary way and expose it to a radiated heat until it is soft and pliable, when it is placed between properly shaped cold metal surfaces and cooled very suddenly. He claims that this makes an article at least eight times as strong as ordinary glass, and so hard that a diamond will not scratch it. Great care has to be taken in the manufacture, as any unequal heating or cooling, or great inequalities in thickness will cause it to crack.

SOLDER FOR GLASS, PORCELAIN AND METALS.—Glass, porcelain and other metals can be soldered, according to the *Practical Engineer*, by an alloy made as follows: Copper dust obtained by precipitation from a solution of the sulphate by means of zinc is put in a cast iron or porcelain lined mortar and mixed with strong sulphuric acid, specific gravity, 1.85. From 30 to 35 or 40 parts of the dust are taken, according to the hardness desired. To the cake formed of acid and copper there is added under constant stirring, 70 parts of mercury. When well mixed the amalgam is carefully rinsed with warm water to remove all the acid, and then set aside to cool. In 10 or 12 hours it is hard enough to scratch tin. When required for use it is to be heated so hot that when worked over and laved in a mortar it becomes as soft as wax. In this ductile form it can be spread on any surface, to which it adheres with great tenacity when it becomes cold and hard. It is intended for this alloy to be used to solder such articles as will not bear a high temperature.

One of the simplest methods of making shingles fire proof is the use of white-wash. Wood can be rendered practically fire proof by first drying it thoroughly and then coating it with common white-wash. The coat of white shells off, but still it is a difficult matter to burn wood that has been coated with whitening or even lime-wash. A mixture of borax and sulphate of magnesia is also recommended. To prepare this use three pounds of borax and two and one-half pounds of sulphate of magnesia, with twenty pounds of water. The action of the mixture depends on the formation of a borate of magnesia insoluble in water, hot or cold, which surrounds and impregnates the fibres of the wood, and thus renders the development of the combustible gases and the spread of flame very difficult. A mixture of sulphate of ammonium and sulphate of lime and gypsum is also applied. The action of this mixture depends upon an incrustation of filices which prevents the spreading of fire, and on the other hand extinguishes flame by the volatilization of the salt of ammonium at a high temperature. Take one pound of liquid ammonia and two pounds of sulphate lime. A single coat of this concentrated solution is not incombustible, but it is not easy to light, and ceases to burn when the action of foreign inflammable substances come to an end.

CONTINENTAL ANNUAL GRAIN REVIEWS.

IN the leading annual grain reviews as published on the continent about the middle of January last, we find a good many instructive reflections, and shall therefore endeavor to make a summing up from these interesting papers.

So far as the international grain trade is concerned, 1885 has not been a favorable year. The trade has gradually been thoroughly revolutionized by improved means of transportation. No single country can nowadays shape the course of prices, for partial short crops have ceased to materially influence the price. Prices are brought to a level much more rapidly than formerly through the possibility of getting merchandise from whatever point of the globe within a given time. In this manner certain countries, especially in the wheat trade, whom few people formerly even thought of, have been able to furnish astounding amounts. It is curious to note how this has been brought about. Germany, for example, up to about the year 1867, was still an exporter of grain, and of wheat in particular, to England, and was seldom compelled to import, in fact only in years when there was a poor rye crop, when rye and rye flour had to be procured from Russia. Germany's population meanwhile increased at a rapid rate, and so did its manufacturing industry, so that it became imperative to look for steady, permanent grain importation. In 1866 Germany and other Continental countries as well as England chiefly ordered from Galicia, in 1867 from Hungary and Russia, next the United States were resorted to on a rapidly increasing scale, then, more recently Australia and Chili, and finally India came forward with its colossal offers of wheat. In this manner the United States have ceased to command the wheat market, the American supply having lost much of its importance since the rapid railroad development in the Indian wheat belt, the eventual capabilities are beyond all calculation.

In 1870 England received 10,000,000 cwt. of 112 pounds from Russia, 12,000,000 from the United States and 11,000,000 from India. During this comparatively short space of time England's total trade with India has risen from £11,000,000 to £80,000,000. The wailings of European farmers about the great change thus brought about in the face of which they are at a loss as to what should be done, are legitimate certainly, but they are mistaken if they think protective grain duties are to be counted among the remedies. There is in fact but one remedy left them: a more thorough cultivation, and certain changes which science recommends. In spite of all measures of a legislative kind to come to their support, grain prices have further declined in 1885. The visible wheat supply in the United States on December 31, last, was 58,600,000 bushels, against 43,100,000 on December 31, 1884, while there were in sight 10,200,000 bushels of Indian corn, against 4,300,000. The accumulation of similar stocks defies all protective measures which single European states may take.

The pressure of remainders from former crops is such on all hands that the poor American and Russian crops have had no influence whatever, the less so as everywhere else the 1885 crop was satisfactory. It had indeed been estimated that 35,000,000 quarters, (half of which for England alone) would be wanted to square requirements, and that the wheat exporting countries would be able to furnish 26,000,000 quarters surplus and no more. Even admitting that approximately these figures were correct, the old reserves were such that no one acquainted with the world's wheat situation felt the least uneasiness on that score.

As for wheat and rye prices on the Continent, the figures for futures on the Berlin corn exchange, being a central market, will afford the best criterion:

Wheat.	Jan. 31		Dec. 31	
	1885.	Marks. 1884.	1885.	Marks. 1884.
Current month.	172	172	157	157
April-May	166.25	174	154	163
May-June	169	176	156.50	165.25
June-July.	172	178	159	167.25
Rye.				
Current month.	147.50	147	130	140.75
April-May	147.25	147.25	135	140.75
May-June	147.25	147.25	134	140.75
June-July	147.75	148	135	140.75

It will next be of interest to examine the ruling at different points:

Wheat, New York, red winter, cents.	1885.	
	Jan. 1.	Dec. 31
Wheat, New York, red winter, cents.	83	92 1/2
Vienna, florins	5 1/2	5 1/2
Paris, francs	20 1/2	21
Berlin, April-May, marks	162	153
Indian corn at New York, cents	55 1/2	48 1/2
Rye at St. Petersburg, rubles	8 1/2	7 1/2
Rye at Berlin, April-May, marks	140 1/2	133
Flour at New York, dollars	3 1/2	3 1/2
Flour at Paris, francs	44	46 1/2

Seldom was there much of a rise in grain in 1885 in Europe. While there was an upward movement early in the year while the Anglo-Russian Afghanistan scare

was kept alive, prices subsequently gave way almost continually and the grain trade remained a dragging one during the rest of the year. At no time were consumers at all anxious to secure a supply, in view of the overwhelming offers pouring in all the time, and speculation was virtually lame most of the time. In Germany the new law taxing speculative dealings on exchange, had a depressing effect on transactions in grain futures.

By way of summing up we may add that the foregoing recapitulation of European annual reviews forcibly demonstrates the precarious nature of grain speculation in all countries where the speculator is kept too much under mere exclusively local influences, like, for example, in our Western centers of distribution under the fallacy that this country still commands the wheat market, about which we should at length discard all illusions.—C. Kirchhoff in *The Millstone*.

ORIGIN OF COLD WAVES.

These waves, as they have been named, are supposed to originate in British America northwest of Hudson Bay, thence taking a westerly course to the Rocky Mountains. Here they are deflected and follow the range on the eastern side, across Montana and Dakota as far south as the 40th parallel of latitude. Here again they take a turn, to the eastward, following the course of the great lakes, and spread out over the eastern portion of the country, considerably reduced in severity, one portion extending southward as far as Virginia and to sea until the warm temperature over the Gulf Stream is reached, while another portion works north-eastward, across the maritime provinces of Canada, and into the cold north again. These waves, as well as many of the storm areas, are detected in the northwest and then advance to the east, and unless the intervening atmosphere is charged with moisture, they are predicted as an advancing cold wave. Some three years ago they were traced, and their mean time from a certain point in the north-west to Boston and other places was found to average: From Fort Dunvegan to Bismark, 22 hours; Boston, 52 hours, 37 hours from Bismark to Boston, being at the rate of nearly 40 miles an hour, but of course this varies. Other cold waves originate in the northern part of North America and pass over to Siberia. Several have been so traced and found to travel about 16 miles per hour, contesting their way doubtless with storms. These waves start as often as once a week, but in passing over the continent meet other waves that change their course or break them up into storms, so it is rare that we have them oftener than twice a month.

AS TO ADVERTISING.

If you have goods to sell, advertise the fact. Hire a man with a lampblack kettle and a brush to paint your name and number on all the railroad fences. The cars go whizzing by so fast that none can read them, to be sure, but perhaps the conductor will be obliging enough to stop the train for inquisitive passengers.

Remember the fences by the roadside well. Nothing is so attractive to the passer-by as a well-painted sign: "Mullington's Medical Mixture for Numps."

Have your cards on the hotel register, by all means. Strangers stopping at the hotel for the night generally buy a cigar before leaving town, and they need some inspiring literary food besides.

If an advertising agent wants to advertise your business in a fancy frame at the depot, pay him about two hundred per cent. more than it is worth, and let him put it there. When a man has three-quarters of a second in which to catch a train, he invariably stops to read depot advertisements, and your card might take his eye.

Of course the street thermometer dodge is excellent. When a man's fingers and ears are freezing, or he is puffing or "phewing" at the heat, is the time above all others when he reads a thermometer advertisement.

Print, in the blackest ink, a great sprawling card on your wrapping paper. Ladies returning from a shopping tour like to be walking bulletins, and if the ink rubs off and spoils some of their finery, no matter.

Don't fail to advertise in every circus programme. It will help the circus to pay their bills, and visitors can relieve the tedium of the clown's jokes by looking over your interesting remarks about "ten per cent. below cost," &c.

A boy with a big placard on a pole is an interesting object on the street, and lends a dignified air to your establishment. Hire a couple.

Advertise on a calendar. People never look at a calendar to see what day of the month it is. They merely glance hurriedly at it so as to be sure that your name is spelled with or without a "p," that's all.

When the breezes blow, wafted by a paper fan in the hands of a lovely woman, 'tis well to have the air recedent

with the perfume of the carmine ink in which your business address is printed. This will make the market for decent fans very brisk.

Patronizing every agent that shows you an advertising tablet, card, directory, dictionary, or even an advertising bible, if one is offered at a reasonable price, shows that you know where to invest your money.

But don't think of advertising in a well-established, legitimate newspaper. Not for a moment. Your advertisement would be nicely printed, and would find its way into all the thrifty households of the region, where the farmer, the mechanic, the tradesman, and others, live, and into the wealthy and refined—all who have articles to buy and the money to buy them; and in the quiet of the evening, after the news of the day has been digested, it would be read and pondered, and the next day people would come down to your store and patronize you, and keep coming in increasing numbers, and you might have to hire an extra clerk or two, move into a larger block and more favorable location, and do a bigger business: but of course, it would be more expensive—and bring bigger profits.—*New Haven Register*.

CO-OPERATIVE BARREL MAKING.

Minneapolis is famous for its flour mills and its development of co-operative industry. The latter is an outgrowth of the former. Barrel-making is an important branch of business in a town which turns out flour by the thousands of tons. Previous to 1875 cooperage at Minneapolis was conducted in the usual manner in shops owned by individuals. In the autumn of 1874 a co-operative company was organized with a capital stock of \$15,000 each member paying in \$15 and a weekly assessment of \$5. The enterprise was a success almost from the first, and in 1877 another company was organized, followed in 1880 by a third, and in 1881 by a fourth and fifth, and subsequently by two more—all of which are now doing well. The companies possess good properties, and have capital stocks ranging from \$15,000 to \$70,000, all paid up. They supply all the flour mills except three, claim six-sevenths of all the work done, and have run out every "boss shop" except one, the owner of which has tried several times to sell out to the workmen.

The mills find it to their interest to favor the co-operative shops. The shops help each other when in a pinch, divide orders, and otherwise equalize matters. The members of the companies are of various nationalities—Americans, Germans, Scandinavians, Irish and Italians, but they work together harmoniously, and have unlimited faith in co-operation—a faith justified by experience. During their existence the shops have had several sets of officers, not one of whom has proven careless or dishonest, and not a deficit or defalcation has occurred. It is now admitted that so long as they remain united these shops are unassailable and unconquerable. They are now doing a business aggregating \$1,000,000 a year.

The stock is held only by practical workmen, and each stockholder has but one vote, no matter how many shares he may own, which tends to prevent concentration of stock in a few hands. Not the least good effect which has followed the establishment of the co-operative system has been its influence upon the character of the workmen. Under the old conditions of employment the coopers had rather a bad reputation for sobriety and the observance of law and order. Now they stand high in the estimate of the community as estimable citizens.

NEW STEEL PROCESS.

A new process for making steel directly from iron in two hours' time is agitating the iron men of Pittsburg. The ore is broken into small pieces and mixed with 20 per cent. of Rhode Island graphite, a substance which, heretofore, has had no commercial value. This mixture is then placed in an ordinary heating furnace and reduced to a spongy mass at a low temperature, and it is claimed that the phosphorus and other impurities flow off with the slag. In two hours the mass is ready to be drawn. The heater has nothing to do but wait until the mass comes to nature. Then it is balled up and drawn. In this condition it is a spongy, porous mass, and is ready for the squeezers or shingling hammer. Nothing else is needed, and the best quality of steel is the result. It is claimed that by this method steel blooms can be produced for about the cost of pig iron.—*Journal of Commerce*.

Canadian millers who read carefully THE DOMINION MECHANICAL & MILLING NEWS, and put to practical use the hints which it throws out to them, will soon be ready to testify that they have obtained from it information which is worth to them many times the amount of their subscription to the paper. Try it.

THE GREAT JAY GOULD STRIKE.

(Special Correspondence P. M. & M. News.)

ST. LOUIS, Mo., March, 24th, 1886.

Seldom has any strike been commenced by organized labor against capital, which has assumed such proportions as the strike which is now raging here in St. Louis and through the southwest part of the United States.

It is easier to start a strike than to stop one after it has been started, and this present strike was ostensibly started because a man named Hall, employed by the Texas and Pacific Railroad Co., had been discharged without just cause, thereupon the Knights of Labor took up the aggressive and demanded that he be at once reinstated; this being refused the present strike commenced.

Finding themselves unable to coerce the Texas & Pacific R. R., the Knights of Labor then struck on the Missouri Pacific R. R., of which company Jay Gould is the president. Both these companies are on the Gould system, and as the strike grows, other roads will be drawn out on strike, because they are either tributaries to, or are themselves recognized as belonging to the great Gould system.

If this strike were between the Knights of Labor and Jay Gould personally, and fought on a just cause, the public would sympathize heart and soul with the strikers, but the present strike is not so.

It is claimed that the T. & P. R. R., being in the hands of the receiver of the United States Court; the other railroads have no influence over it, and have no power to cause Hall to be re-instated, and are therefore powerless to interfere. The K. of L. claim that both roads are identical, and it is only by striking at the Jay Gould system that they can gain their point.

But opinion is very decided whether they will gain any point at all; in fact this strike has done much to belittle the Knights of Labor in the eyes of the general public. It was most injudiciously started, and now it is most difficult to stop it. Neither side are inclined to give way, and crippled as the business of the city is, on account of the non-arrival of their merchandise, and unable to ship their goods out of the city to their customers, yet every morning we go down town to business we expect to hear that other railroads have been drawn out on strike on the east side of the river. If that is so the consequences will be most serious for the business of this city.

At present several of the leading houses in the city have been compelled to discharge great numbers of their hands on account of not having any means to receive or ship their goods.

The general public, whilst sympathizing with the men to a certain extent, do not justify them in the course they have taken, and at the same time they cannot and will not sympathize with Jay Gould and the railroads.

No man in the States, from New York to San Francisco has such an unenviable reputation as Jay Gould, the oppressor of the oppressed.

It does seem that business is entitled to some protection from the injury inflicted by these conflicts between the roads and their employees. It is proposed that railroad employees be required by law to sign an agreement that they will individually refer all grievances to court, and abide by the judgment thereof. This looks very nice on paper, but to go against a man who never keeps his promises with his employees, who breaks faith with all, to go into court against a man who is able to buy up the judge and jury and all the court, such a thing is out of all question, for you must bear in mind that the courts of this country are altogether different to those of Canada. Liberty, equality, and justice are things heard of but not seen here.

Mr. Powderly, General Master Workman of the K. of L., said a few days ago, "Cardily, I do not see the necessity for this strike or its continuance. In fact, the day of the strike is past, I never ordered one in my life, and with two exceptions, never failed in an endeavor to meet employers for settlement of differences with employees."

A strike started without a real grievance, previously stated and left unredressed, is against the spirit of the age, and is certain in the end to be more harmful to labor than to capital. A strike with a real grievance, the statement of which has been scornfully met, and the redress of which has been unjustly refused, is an honorable struggle which appeals to the best elements in man's nature. Let the grievances of labor be first discussed, then presented, and then arbitrated. There will then be very few strikes in the land, and the few there are will be winning strikes.

On the first day of the strike a local paper asked the Knights of Labor to remember that "It is excellent to

have a giant's strength; but it is tyrannous to use it like a giant."

When the strike is all over and the trains are running, we shall recommend these pungent lines of Isabella to Mr. Hoxie, the Vice-President of the Missouri Pacific R. R., to the end that he may deal gently with the boys, treasure their good deeds in his memory, and bury their recent eccentricities in the deepest depths of his forgettery.

"SAFETY VALVE."

OLD JUNK.

Small boys with their arms heaped full of old scraps of tin, bits of iron and similar pieces of ruff, gathered in the streets amid men and women, lugging big baskets piled full of the same kind of freight, kept traversing Goerck street all day recently, bearing their strange burdens to the door of the uncouth two-story brick building at No. 57 Goerck street. At the door stood a shaggy-haired man in working clothes, who took in all the miscellaneous stuff that came, and paid cash for it on the spot.

"What are you buying all this old stuff for?" a reporter for the New York Sun asked of the old man, who was steadily depleting his old-fashioned pocket book.

"Dunno, can't say. Couldn't give it to you straight," said the old man, pulling his old felt hat over his left eye. "You'll have ter go down ter the Wanderbilt building if yer want ter find out exactly what fur I'm doing it."

An affable young man on the third story of the big building on Nassau street, said he knew the secret of the old man's purchase.

"Great idea," he cried, "and lots of cash in it. It is a new scheme to utilize all the waste metal of Gotham that formerly used to go to the dogs, because nobody was smart enough to find out that they could save the United States \$2,000,000 a year outlay. That's what it has cost to import Taggart iron and tin from Germany. We have discovered that we can make this kind of iron and tin out of old cans and other things just as well and very much cheaper than it can be made out of the original ore."

"And how do you do it?" was asked.

"Nothing easier," the affable young man said, "We put the waste material in an oven or grate heated by a furnace, and heat it with rollers until all the extraneous matter is removed. It is allowed to cool after that, and the scraps are sorted out according to the uses to which they are to be put. The metal sheet remnants are passed under a rubber coated roller and flattened out. Then they are piled in packs and slid between chilled iron rollers to reduce their thickness. After that they are annealed, shot through the rollers again, and then trimmed and finished off and packed ready for shipment any where. The sheets can be japanned or tinned, or galvanized, or treated in any way that the material made from the original ore is treated."

"What is it used for after it is finished?"

"Lots of things. Out of the iron we make buttons, lye cans, umbrella tips, shoe lace ends, show cards, telephones, electric lights and letter boxes. You can't get the English or German iron for this use for less than \$7.50 for a box of 112 pounds. We can make it for \$2 a box and sell it for \$5. Of the tin we make butter dishes, tops of paint and milk cans, and similar small ware. It costs \$10 a box to import the tin, which is just double what we can make it for. The tin can also be made up for ferrotypes at a selling price of \$15 a box of 112 pounds. The kind that comes from England costs from \$35 to \$50 a box, and before this photographers had to go to England for it because there was not anybody here that would make it. We weren't able to compete with England and Germany and the original ore, because it cost us more than double to manufacture than it did on the other side of the water. There is a bonanza in it, and the proof is the profit, after paying the expense of manufacture, is \$227,000 on 30,000 boxes of the iron when made from the waste material, and sold at an average of \$5 a box."

TELEGRAPHING ON MOVING TRAINS.

Quite a successful test with Edison's new invention to telegraph on a moving train was recently made on the Chicago, Milwaukee & St. Paul road between Chicago and Milwaukee. A Milwaukee dispatch stated: "The exhibition of the working of the Edison system of telegraphing to and from a moving train by induction from the road to the wires, given today on a special train run by the Chicago, Milwaukee & St. Paul road, from Chicago to Milwaukee and return was very successful. Sealed messages written by and addressed to the passengers were sent by the Morse system from Chicago to the point where condensers for the new system were placed, and from there were telegraphed to the operator on the train running thirty-five miles per hour and delivered to the writers. Practical telegraphers and electricians were unanimous in pronouncing it a wonderful invention."

MESSRS. D. & A. FISHER'S NEW MILL AT PAISLEY.

A very efficient new roller flouring mill has lately been built for Messrs. D. & A. Fisher, of Paisley, Ont., of which the Paisley Advocate gives the following description: "The new mill is built adjoining the old one and on the eastern side. It is 34 x 48, the lower flats being of stone, while the top storeys are frame, and is a very substantial structure. Being built on the bank, entrance is made on the third floor, and from this to the basement which includes also the lowest floor, where the flume is situated, and in which is contained three large Leffel water wheels, one of which drives the rolls only, while another drives the cleaning machinery, the elevators, the bolting and purifying machinery and one run of stones for grinding middlings, and the third drives a chopping stone with all its elevating of grain and middlings. The shafting from these wheels is so arranged that by means of spur gearing all the power of the three wheels may be applied to the rolls in time of backwater or in case of trouble from low water. The basement contains the principal shafting and gearing for driving the mill, together with all the cleaning machinery which comprises separators, cockle machines, scourers and brush machines of from 40 to 60 bushels per hour capacity, and this machinery either in whole or in part can be stopped by the miller without interfering with the working of other parts of the mill. From the basement, too, some 20 elevators start which run to the top of the building, and in this part of the building is situated the exhaust room from the dust collectors, and we might also mention four large receiving hoppers. Passing upwards we come to the ground floor, or third storey, which contains five double sets of rollers and two run of stone, one of which, as before stated, is used for grinding middlings, the other being used for chopping. There are on this flat six hand packers and a large power packer. Three of these packers are for flour, one being used for gristing only, the other two for merchant work. Of the other four, there is one for bran, one for shorts and two for chop. This floor may also be termed the market of the establishment, for here all the grain that is purchased is received, here customers may be supplied with anything which they may want in the line of flour and feed, and here the farmers give in and receive back their gristing. In the floor are set three sets of scales, one for grain that is purchased, one for gristing and the third for weighing barrels and sacks of flour when packing and shipping. In the spout on this flat leading to the first set of rolls, or breakers, are six powerful magnets used to extract from the wheat any metals which may not have been taken out by the cleaning machinery below. On this flat are spouts for oats, peas, cracked wheat, oatmeal, cornmeal, etc., for retail purposes, there being bins on the flat above where these are stored. Fastened in the western wall is an ingenious arrangement like a compass, by which grain that is purchased may by a simple turn of the wheel be emptied into any bin in the storehouse which may be desired. The fourth flat or bolting floor, contains one six reeled bolting chest, one centrifugal bolt, five scalping reels and two purifiers. Here also are twelve storing bins for holding flour, bran, shorts, peas, oats, chop, etc., from which spouts, as before explained, run to the ground floor. Taking next the attic floor, or fifth flat we find one four-reeled bolting chest, another centrifugal bolt, another purifier, one aspirator and one bran-duster. By means of idlers the power seems to be distributed to drive machinery in all directions on this flat. One side is cased off for dust-collecting rooms through which there is a strong current of wind passing, and from these rooms a flue passes down right to the exhaust room in the basement, to which all the dust from the purifiers and dust-collectors is conveyed and made away with.

The machinery, which is all of the latest and most improved kind, was supplied by Messrs. Wm. & J. G. Greey, of Toronto, whose millwrights put it in place, executing their work in a very efficient manner.

A despatch from Ottawa of March 19th says: Canadian lumbermen are urging the government to make such modifications in the tariff as may have a tendency, by way of reciprocity, to remove the opposition to the Morrison bill now before congress. As regards the removal of the duty on Canadian lumber, the government has already the power to remove the duties on whole or on part, by an order-in-council, when it appears that the government of the United States have made changes in the tariff duties imposed on articles imported from Canada in a reduction or repeal of the duties in force in the United States. The total value of the exports of the forest to the United States last year was \$9,355,000, or within a fraction of one-half the total forest exports of the Dominion. It is held by those interested in the manufacture of Canadian lumber that they would be able to double their production if the duty now imposed by the United States is removed, as they would be in a position to successfully compete with the Michigan and other lumbermen on the other side of the line. It is suggested that American anthracite coal be admitted free of duty if Canadian lumber is put on the free list, as proposed by Mr. Morrison's bill.

News Notes.

The Technische Safenader describes the Chinese tallow tree, a plant which is said to be increasing in commercial importance...

The knitting machine factory of Creelman Bros., at Georgetown, Ont., was partially destroyed by fire on March 19th. The fire originated in the office...

C. A. MASTEN, BARRISTER, SOLICITOR, &c. Special attention given to Patents, Trade Marks and Copyrights.

THE BOILER INSPECTION & INSURANCE CO. OF CANADA. CONSULTING ENGINEERS AND SOLICITORS' PATENTS.

HOWLAND, ARNOLDI & RYERSON, BARRISTERS, SOLICITORS, ETC., Canada Life Assurance Chambers, 46 King Street West, Toronto, Ont.

MACHINERY FOR SALE. The following Machinery is for sale by H. W. PETRIE, BRANTFORD, ONT. Send for No. 12 Catalogue.

- CHOPPING MILLS - No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

- ONE upright, 48 x 24 in. diameter, 38 2 in. tubes. ONE two flue, 44 in. diameter, 20 feet long. ONE cylinder boiler, 20 ft. x 22 in. diameter. WATER WHEELS - one 42 in. Barber & Harris, Meaford, make; one in Weston, Tate & Co., Port Perry, one at A. D. Cole, Wilson make; one 15 in. Archimedian, Goldie & McCulloch make.

HANCOCK INSPIRATORS, Korting Injectors, Standard Injectors, Michigan automatic injectors, steam pumps and plunger pumps, all sizes, constantly in stock. Get my prices before you buy.

MISCELLANEOUS MACHINERY - 0 or hydraulic ram, one letter press, six jack screws, one portable force, one card cutter, one tobacco cutter, one straw cutter, for power, one printing press, one small horse power and jack, one hot water heater, one blower wind mill, one palm mill, one cider mill and press, two fire-proof safes, one set drawing instruments, three shop heating stoves, four glue pots, one amateur lathe.

A full description of above Machinery sent free to any address.

H. W. PETRIE, BRANTFORD, ONT.

NOTICE.

SEALD TENDERS, addressed to the undersigned and endorsed "Tender for Indian Supplies," will be received at this office up to noon of WEDNESDAY, 26th April, 1886, for the delivery of Indian Supplies during the fiscal year ending 30th June, 1887, consisting of Flour, Bacon, Beef, Groceries, Ammunition, Tinned Oats, Cows, Bulls, Agricultural Implements, Tools, &c., duty paid, at various points in Manitoba and the North West Territories.

L. VANKOUGHNET, Deputy of the Superintendent-General of Indian Affairs. Department of Indian Affairs, Ottawa, 3rd March, 1886.

PERSONAL.

Hamilton, February, 1886. I beg to inform the milling, hardware and general trade, that I have discontinued business as Practical Millwright and Mechanical Engineer at my former address in Ottawa, and have associated myself with the well known Engine and Scale firm, the Osborne Killey Manufacturing Co., of Hamilton, and will continue throughout the country as the Mon Iron Works and Hamilton Scale Factory.

GRAND TRUNK RAILWAY. Trains Leave Toronto on Under: [STANDARD TIME.] MAIN LINK EAST 7 15 a.m. - Local for points East to Montreal. 8 30 a.m. - Fast express for Kingston, Ottawa, Montreal, Quebec, Portland, Boston, etc. 11 30 a.m. - Mixed for Kingston and intermediate stations. 5 30 p.m. - Local for Colborne and intermediate stations. 8 00 p.m. - Express for main points - Ottawa, Montreal, etc., runs daily.

LONDON MACHINE TOOL CO., LONDON, - ONTARIO, MANUFACTURERS OF Machinist - and - Brass - Finishers - Tools.

L. A. MORRISON, with A. R. WILLIAMS, General Agents, TORONTO, ONT. Western points. 4.00 p.m. - For Goderich, Stratford and London. Through car to Palmerston, via Guelph. 6.25 p.m. - Mixed for Stratford 11.15 p.m. - Express for Paris and western points; sleeping car for Detroit.

ARRIVE FROM THE EAST. 10.18 a.m. - Local from Colbourg, 9.18 a.m. - Express from Montreal, Ottawa, and main local points. 11.30 a.m. - Fast Express from Montreal, etc. 6.48 p.m. - Mixed from Kingston as an intermediate station. 10.35 p.m. - Express from Boston, Quebec, Portland, Montreal, Ottawa, etc.

ARRIVE FROM THE WEST. 8 a.m. - Mixed from Guelph, 8.10 a.m. - Express from Chicago, Detroit, Port Huron, and all western points. 12.32 p.m. - Local from London, Goderich, etc. 7.10 p.m. - Express from all points west - Chicago, Detroit, etc. 11.15 p.m. - Local from London, Stratford, etc.

CANADIAN PACIFIC RY. ONTARIO DIV. DEPARTURES - Going West - St. Louis Express at 8 10 a.m. Pacific Express, 1 05 p.m.; Express, 4 45 p.m. Going East - Limited Express, 8 25 a.m.; Mixed (for Havelock and intermediate points), 4 25 p.m.; Montreal Express, 8 00 p.m.

NORTHERN & N. W. RAILWAY. Trains Leave City Hall on under 7 55 a.m. - Mail for Gravenhurst, Orillia, Meaford, Penetang, and intermediate stations. 11 15 a.m. - Accoon Gravenhurst, Collingwood, and Meaford 5 05 p.m. Express for Collingwood, Penetang, Orillia, and Barrie. Trains are due to arrive at 10 5 a.m., 2 00 p.m., and 8 45 p.m.

CHRISTIE, KERR & CO. LUMBER DEALERS. OFFICE: No. 9 VICTORIA ST., TORONTO, ONT. LUMBER FREIGHTS AND PRICES. (Canadian Quotations furnished by above firm.)

The following are the present railroad freights From N. & N. W. R. Stations - Collingwood, Gravenhurst, Penetang, Orillia, Severn, Pelton and Wyevalle, and From G. T. R. Stations - Midland, Wauhaushene, Victoria Harbor, Sturgeon Bay and Fesserton to Suspension Bridge St. Catharines Paris Woodstock Ingersoll London Brantford Goderich Buffalo Detroit 15c. per 100 lbs.

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 specially 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. Various E. W. Co. BRANTFORD AND WINNIPEG

MARVIS PATENT FURNACE

For Setting Steam Boilers.



Economy of Fuel, with increased capacity of steam power. The same principle as the Siemens process of making steel, utilizes the waste gases with hot air on top of the fire. Will burn all kinds of waste fuel without a blast, including screenings, wet peat, wet hops, sawdust, log-wood chips, slack coal, &c.

Over 3,000 boilers set in this way in the United States and Canada.

Send for circular, and mention this paper.

JAS. R. ANNETT, Agent,
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W. A. LAW & CO., MANAGERS.

TORONTO, July 27th, 1885.

I have much pleasure in attesting to the ability of the Canadian Reporting and Collecting Association. Their ability to collect accounts in all parts of the globe cannot be better tested than in the satisfactory collecting of an apparently worthless account for me in Portland, Oregon, U. S., another in Hamilton, one in Prince Albert, M.W.T. and various others in different parts of this Continent. Such an association is a boon to business men both in this Province and the Dominion. H.H. MOORHOUSE, M.D.

LONDON, Ont., July 7th, 1885.

DEAR SIR, - We acknowledge with thanks receipt of your check for proceeds of collection of our claims of \$77.43 (less charges) on a resident of Memphis, Tenn. This we regard as so much "out of the pie" as no amount of pressure we have been able to bring hitherto has resulted in the receipt of a single dollar of it, and viewing this in connection with your very satisfactory collection of an account of a smaller amount at Chatham, Ont., we feel justified in highly recommending your Association for its diligence in prosecuting claims entrusted to it.

Yours, &c., HELLMUTH LADIES' COLLEGE,
Per J. F. Hellmuth, Vice-Pres.

BOLTING CLOTHS



IMPORTANT TO MILLERS.-Agent for the Dominion for the Celebrated *Bedmer Net Anker* Bolting Cloths, furnished by the yard, or made up to order. Full stock of all numbers on hand.

R. WHITELAW, Woodstock, Ont.

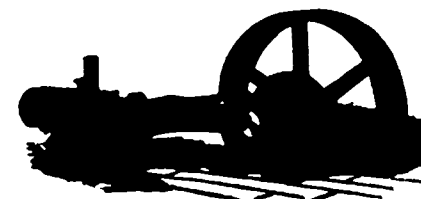
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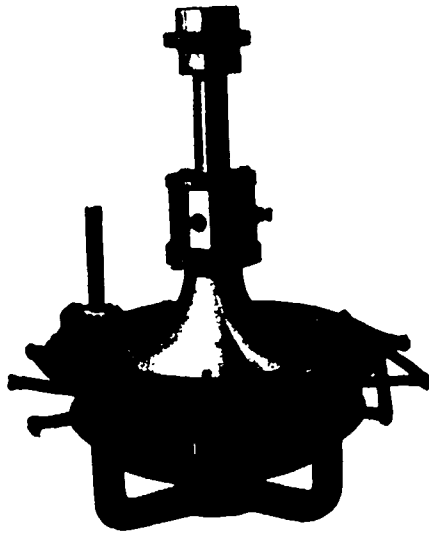
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Boilers and Every Description of Mill Machinery and Furnishings.

R. WHITELAW,

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Dominion Turbine Water Wheel.

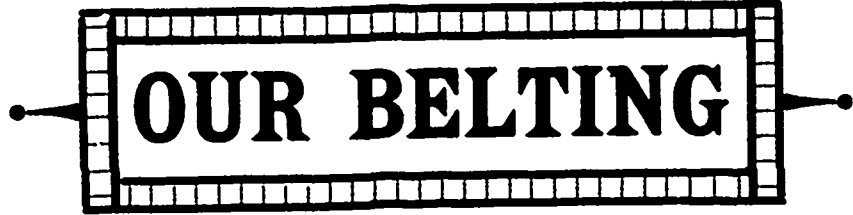


I have now made arrangements with the Wm. Hamilton Manufacturing Co., of Peterboro', to manufacture and sell my Wheels. All orders or enquiries addressed to them will have their immediate attention, and in any case where it is required, will give the placing of Wheels my personal supervision.

A. D. COLE,

120 Bellwood Ave., Toronto.

NOTICE - THE - WAY - WE - MAKE



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WE CARRY THE LARGEST STOCK OF

LEATHER BELTING

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Our Belting costs you less than American, and we guarantee it Fully Equal.

GIVE US A TRIAL AND BE CONVINCED.

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97 PER CENT.

Of the trains on the

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Arrive at their destination

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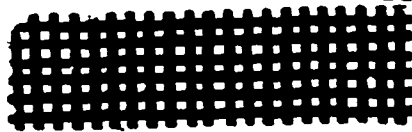
Make worth remembering when travelling.

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Plated Belting Cloth,
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Perforated Zinc,
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All Sizes Required for Milling Purposes

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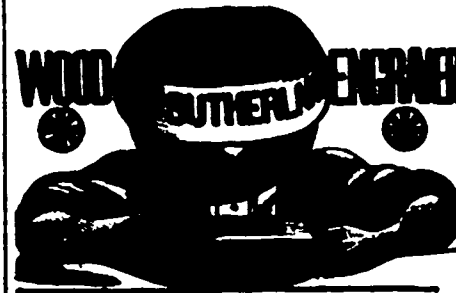


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STOCK AND MUTUAL

OBJECTS.

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

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

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

METHODS.

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

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

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

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

HUGH SCOTT, Managing Director.

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

BARTER MFG. CO.,

B. BARTER, R. C. BARTER, A. B. BARTER,

MANUFACTURERS OF

PROPRIETORS,

FLOUR MILLING MACHINERY,

OF ALL KINDS,

WHEAT CLEANING MACHINERY,

:-:-

MILL FURNISHINGS,

Factory and Office: COR. JARVIS AND LOMBARD STS., TORONTO.

Parties going to make changes please write us. We give substantial guarantee to all our customers of perfect satisfaction, and warrant results.

THIS IS THE WAY our customers write to us about
the Mills we build for them:—

BARTER MFG. CO. Toronto.

GENTLEMEN.—In reply to your enquiry as to how the mill is working would say, I have been running the mill every day for nearly five months since you finished your contract. The machinery and separate machines all run well and do their work in a very satisfactory manner. The rolls work first-class, and the new automatic cleaners on the surface of the purifier cloths do their work equal to the brush. Everything worked well from the start, and caused little or no delay. The flour I am making is a straight grade and is second to none, with the offal clean. My capacity is larger and with less power than before. Will be pleased to show the mill to any one you send and give all the information needed.

Yours truly,

MITCHELL, Ont., Feb. 10, 1886.

S. R. STUART.

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MANUFACTURERS OF

PATENT LAP-JOINT STAR RIVET

**TIMBER SALE.****LEATHER ÷ BELTING**

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TO MILL OWNERS, MANUFACTURERS, AND OTHERS REQUIRING LEATHER BELTING:

Do not buy any Belting unless with *Dixon's Patent Lap Joint*. It will last longer and do more service than any other.

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Take notice that there will be offered for sale, subject to a reserve price, at Public Auction at the Queen's Hotel, in the Village of Forest, in the County of Lambton, in the Province of Ontario, on WEDNESDAY, the 14th day of APRIL, next, at 2 o'clock p.m., all the Cedar of seven inches in diameter and over at the butt, and all other saleable Timber of thirteen inches in diameter and over at the butt, *excepting Birch and Maple*, on the Indian Reserves at Kettle Point and on the River Aux Sable, in the said County of Lambton.

The purchaser, in addition to the price paid as bonus (which must be in cash at the time of sale), will also be required to pay dues on all timber cut on the Reserve, according to the ordinary Tariff of Dues of the Department, and an annual ground rent of \$1 per square mile.

The purchaser will also be required to furnish security by a bond to be executed by himself and two responsible parties as sureties that he will work the limit continuously and otherwise comply with the conditions of the License, which will not be renewed after the expiration of the year ending 30th April, 1889.

L. VANKOUGHNET,
Deputy of the Supt. General
of Indian Affairs.

Department of Indian Affairs,
Ottawa, 17th March, 1886.

GOLDIE & McCULLOCH,

GALT, ONTARIO.

— MANUFACTURERS OF —

STEAM ENGINES, BOILERS,*Improved Turbine Water Wheels, Flour and Grist Mill Machinery,**Saw Mill Machinery, Shingle and Lath Machinery, Stave and Barrel Machinery, Wood Working Machinery,***WOOL MACHINERY, SAFES, VAULT DOORS, &C.**

SPECIALTIES:

The Wheelock Automatic Cut-off Engine,

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CHILLED IRON ROLLER MILLS, FOR THE GRADUAL REDUCTION SYSTEM OF MILLING. SOLE MAKERS IN THE DOMINION OF THESE ROLLS.

WHEAT CLEANING AND FLOUR DRESSING MACHINES OF EVERY DESCRIPTION,

MACHINE CUT GEAR-WOOD AND IRON.

Plans and Specifications for Fitting Up Flour Mills on the GRADUAL REDUCTION SYSTEM furnished at a Reasonable Cost. Rolls Re-ground and Re-Corrugated.

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FIRST PRIZES AWARDED AT THE TORONTO INDUSTRIAL EXHIBITION, 1882 AND 1884.

OUR FOUNDRY AND MACHINE WORKS,

— (ESTABLISHED IN 1844,) —

Form the Largest and Best Equipped Establishment of the kind in the Dominion, and we will spare no efforts to give our patrons satisfaction and to maintain our present reputation as manufacturers of Machinery.

SPECIAL PRICE LISTS AND ILLUSTRATED CATALOGUES FOR OUR VARIOUS DEPARTMENTS FURNISHED ON APPLICATION.

All Orders will Receive Prompt Attention.

GOLDIE & McCULLOCH, Galt, Ontario

Miscellaneous Memoranda.

Large quantities of lumber of various kinds is being got out at Turtle Creek, N. B. Some of it is for the Albert Mfg. Co., Hillsboro, 20,000 railway sleepers were got out during the winter by Solomon Berry for the Intercolonial Railway.

Mr. Bechtel, of the village of Burford, owner of the well-known flouring mills there, has failed, making an assignment last week. The liabilities are some \$11,000, and Mr. Joseph Whitman has purchased the property for something like \$7,000. Mr. Bechtel was doing a good business a few years ago, but like many others had to put in the roller system and the outlay proved too much for him. The mill is a very fine one.

A gentleman who has just made a business trip through Wentworth, Brant, Haldimand, and adjoining counties, and who has an intimate acquaintance with farming, reports the wheat crop in an unsatisfactory condition. Some localities, where the conditions are favorable, the roots are all preserved, but the heavy soil, where surface or tile draining did not remove the surface water, the effect of the accumulation of ice has been most destructive. Under the most favorable circumstances the crop, he says, cannot possibly be up to the average.

On the night of March 26th a fire broke out in the Dominion Flour Mill, at Peterboro, and the building was almost entirely destroyed. At first no approach could be made by the firemen to the river, the bank being so high and steep, and the mill, being a frame building,

was quickly burning. The heat sent out was intense, around. After a time an approach was effected, the engine was put in operation, and the efforts of the firemen were directed towards saving the flumes. The outer portions were saved but nothing else, excepting a set of scales and a few bags of wheat. The Dominion Mill was a stone process mill, and was the best equipped of its kind in the county. It contained five run of stones and all modern cleaning apparatus not connected with the roller process. It was owned by the Dickson Co., and was operated by Mr. Wm. Davidson. A considerable quantity of wheat, besides chop, etc., was burned. The loss will be well up to \$20,000. There is an insurance of \$10,000 which is held as follows:—Citizens Insurance Co., \$4,000; the Lancashire, \$4,000; the Western \$2,000. The fire resulted from a defective flue.

THE CANADIAN RUBBER COMPANY,
OF MONTREAL.

A. ALLAN, President.

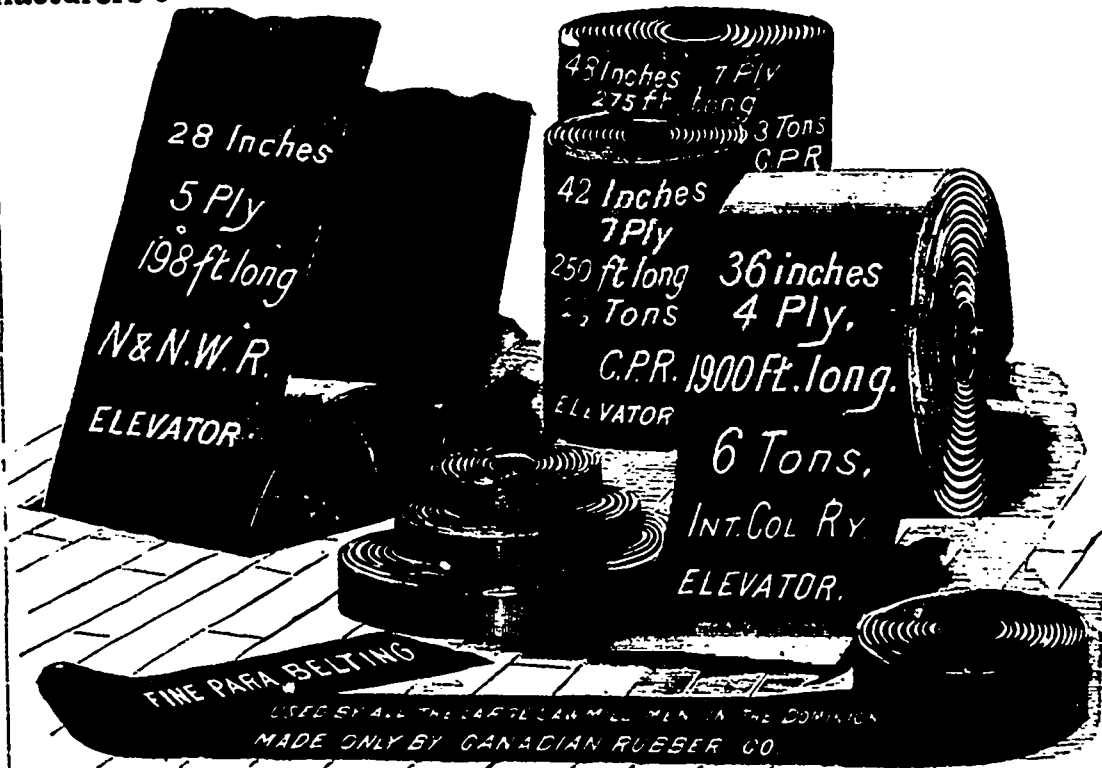
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THE BEST GOODS. — THE LOWEST PRICES.

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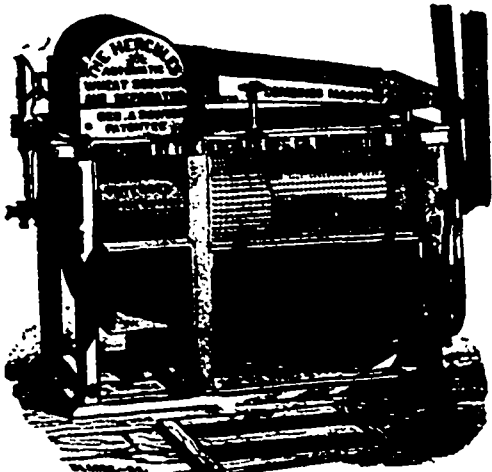
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Wheat

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Scourer

Separator



AWARDED GOLD MEDAL AT WORLD'S FAIR, NEW ORLEANS.

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

The only Automatic Wheat Scourer ever invented.

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

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CORDAGE, BINDER TWINE, ETC.,

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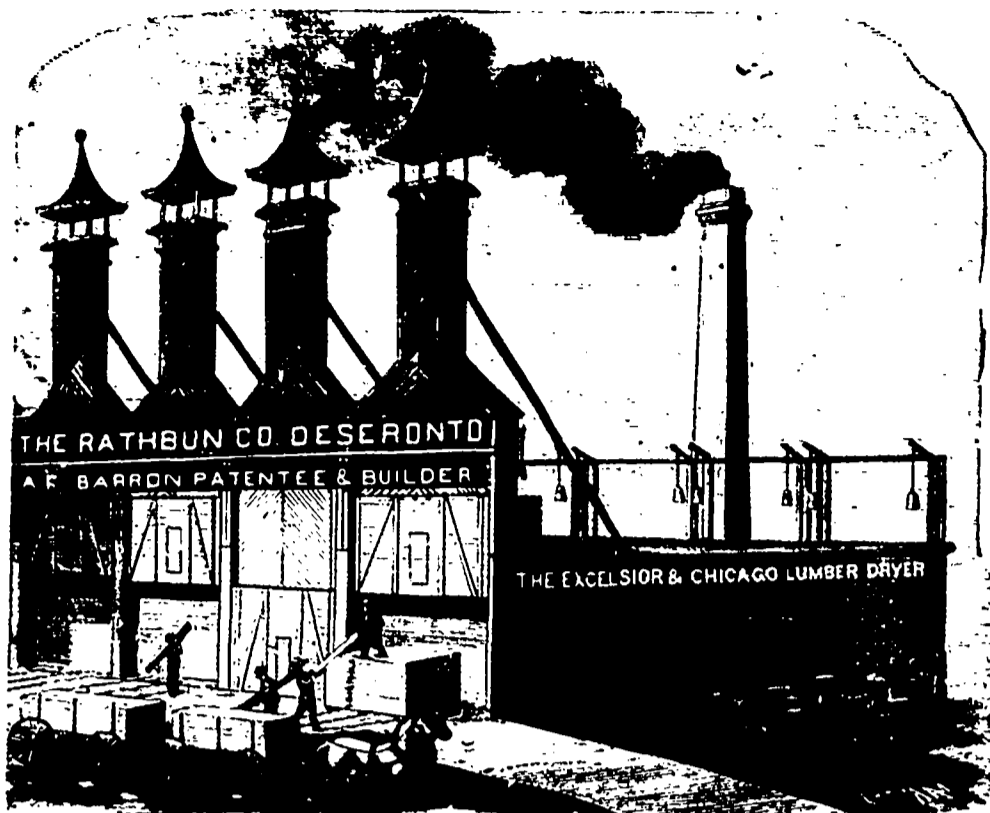
Our "RED DIAMOND" brand of Calcined Plaster is all packed in new barrels specially manufactured for our trade.

ASK FOR PRICES, TERMS, ETC.

CAPACITY OF MILLS, 30,000 barrels Calcined Land Plaster } PER ANNUM.

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BARRON'S LUMBER DRY KILNS.



THE accompanying cut illustrates four Modern Lumber Dry Kilns recently constructed for the Rathbun Company Deseronto Ont. These well-known and extensive manufacturers of Lumber, Sash, Doors, Blinds, &c., are always foremost in adding any new invention that will lessen the cost and at the same time improve their production. Their extensive mills are fully equipped with every modern invention in machinery, which, together with their new Lumber Dry Kilns will produce satisfactory results to the consumer and producer, not surpassed by any other mill in America.

Three of the four Dry Kilns here illustrated are now completed and in full running order, and prove to be the finest Kilns yet constructed, and the results are far beyond any others previously built.

Their daily seasoning capacity is about 50,000 feet of lumber taken green from the saw, and the product turns out thoroughly seasoned from the centre to the surface and nearly as white as the paper this is printed upon. Lumbermen would do well to pay Deseronto a visit, and investigate the rapid and excellent work done by these modern Dryers.

Send for Descriptive Catalogue.

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

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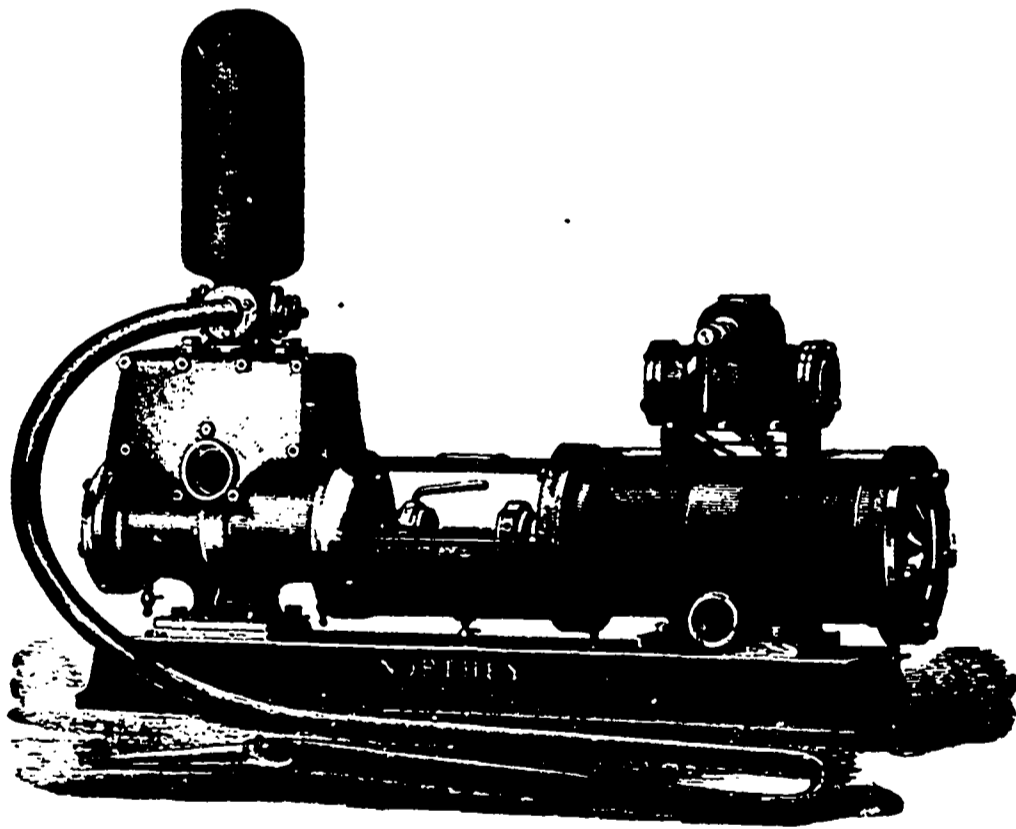


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PUMPS FOR FIRE PROTECTION,
AND
WATER WORKS,
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CORRESPONDENCE INVITED.



OUR STEAM PUMPS
Are the Simplest in the Market,
As Carefully Constructed and of as Good
Material as the Best Steam Engines.
ALWAYS GIVE SATISFACTION.

THE CROWN BOILER CLEANER

Has been used by the leading manufacturers of Ontario for over six years, and is highly approved of by all intelligent and unprejudiced engineers who know it.

It has been put on upwards of thirty boilers where the other boiler cleaners in the market have failed, and in all such cases has given entire satisfaction.

The Crown Boiler Cleaner removes old scale and prevents new scale from forming, and is a perfect barrier to foaming.

For further particulars apply to

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The Best Boiler Purgers in the Market Kept on Hand.

When writing to Advertisers please state that you saw their advertisement in the "Dominion Mechanical and Milling News."

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A SUCCESS UNPARALLELED!

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Wheat : and : Rye : Milling,

— (FOR) —

GRANULATED CORN MEAL,

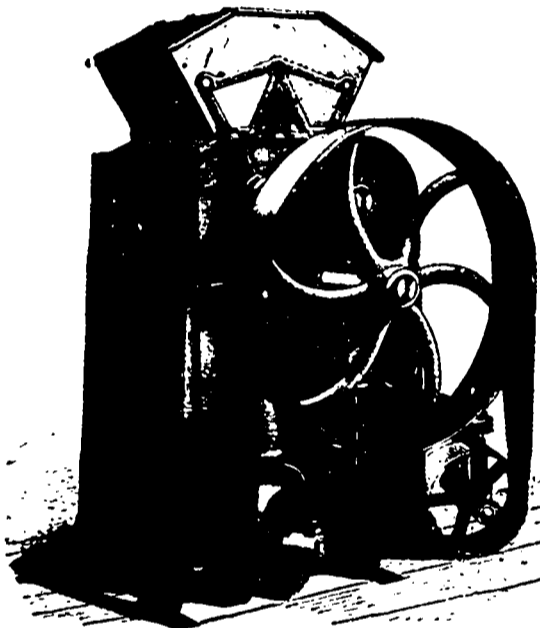
— AND THE REDUCTION OF —

OATS, BARLEY, SCREENINGS,

RICE, HOMINY OFFAL, MALT, &c.

Built in Sizes: 6x12, 6x15, 6x18, and 9x18, 9x24.

Guaranteed
To have Double the Capacity
of Stone,
with the same power



Then give
your Stone to your enemies,
and put in
a 3 High Monitor.

PERFECT BELT DRIVE

Simple Adjustments, :- The Highest Economy,

In making three Rolls do the work of four, a saving of ONE FOURTH in original cost and HALF THE POWER. By using the Monitor, elevators are saved to give stock such as chop and coarse grain two grindings.

The Best Roller Mill in the World

SATISFACTION GUARANTEED OR NO SALE.

— Send for Descriptive Circulars and Prices —

— TO —

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Box 103, Rockwood, Ont

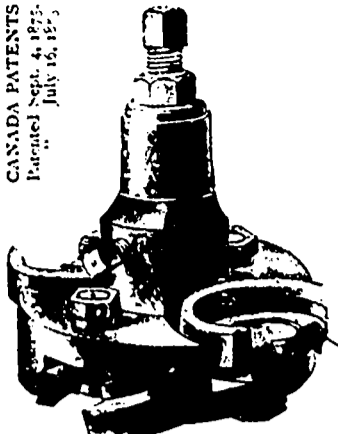
OR TO

PHENIX IRON WORKS CO.

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MINNEAPOLIS, MINN.

CANADA PATENTS
Patented Sept. 4, 1875.
July 15, 1877.



FONGUE HEAD

The SHIMER MATCHING HEADS

Have been awarded

A World-Wide Reputation

By actual Every Day Work in Almost every Planing Mill.
UPWARDS OF 11,000 NOW IN USE.
The Cheapest. The Strongest. The Most Durable,
AND THE
LIGHTEST AND EASIEST RUNNING
Matching Heads in the World

THEY FINISH HARD

Cross-Grained & Knotty Lumber

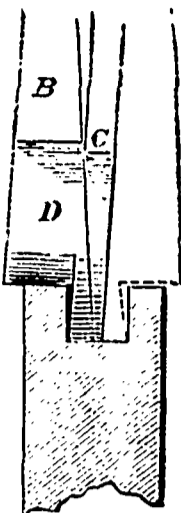
Neatly, showing Clean Edges, and often

Save their Cost in One Day's Run.

SAMUEL J. SHIMER,
(Successor to SHIMER & CO.)
MILTON, PA., U.S.



FIG. 1—A 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

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



GROOVE HEAD.

SELLING AGENT,

A. R. Williams, - - - Toronto.

U. S. PATENTS.
Patented Jan. 26, 1875.
July 27, 1875.
Re-issued Oct. 12, 1880.
Patented July 15, 1877.

A NEW ROLL!

JONES
SYSTEM
OF
ROLLER
MILLING.

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.

Write for Estimates and further particulars to

JAMES JONES,

THOROLD, ONT.

Look Out for Imitations and Infringements.

Established 1842
THE DETROIT SAW WORKS



CIRCULAR, GANG, MULAY,
DRAG AND CROSS-CUT SAWS,
Molding and Planing Knives, French Band Saws, Limer
Wheels and General Mill Supplies.

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

WIRE

Bolting Cloth,

STEEL, BRASS AND PLATED.

AND
Bran Duster Cloth,

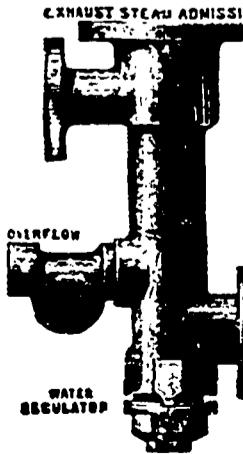
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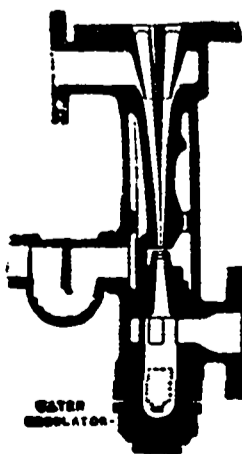
DETROIT, MICH.

The PATENT EXHAUST STEAM INJECTOR,

WORKED BY EXHAUST STEAM ONLY.



The most economical boiler feeder in existence and at the same time the simplest and most durable. Supercedes both pumps and feed-water heaters, and by condensing the exhaust steam, removes the back pressure, and consequently increases the power of the engine; utilizes a power heretofore thrown away; works automatically at a steam pressure of less than half a pound. The exhaust steam, in passing through the Injector, heats the feed-water to a temperature of 190 degrees, F., thus effecting a saving over any other Injector of from 15 to 25 per cent. in fuel.



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