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# CANADIAN MILLER

IN TRADE REVIEW

NEW SERIES "MECHANICAL AND MILLING NEWS"

Old Series, Vol. XI. Number 9.  
New Series, Vol. IV.

TORONTO, ONT., SEPTEMBER, 1894

TERMS, \$1.00 PER YEAR  
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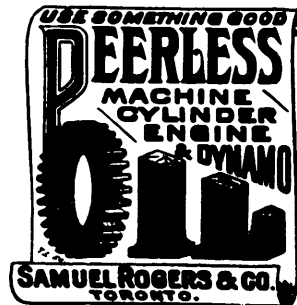
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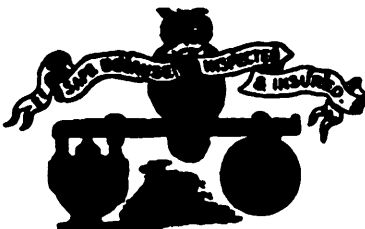
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In the Short Line to **SAGINAW AND BAY CITY** (Centres of the vast lumber in forests of Michigan)  
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 AND **MILWAUKEE, WIS.**

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 This road traverses a section of Michigan with unequalled advantages to settlers. Cheap lands, thriving villages and towns, well watered with streams in all directions a market for every product of Forest and Field.  
 The policy of the "F & P M." is known to all travellers and settlers.  
**A. PATRIARCHE, Traffic Manager**  
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**\$185.00**  
**Highest Grade CYCLES.**

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These Wheels will be sent subject to examination to any part of Ontario, on receipt of a sufficient sum to cover express charges.  
**FULLY GUARANTEED**  
 These Wheels are equal to any, and bear the highest testimonials, which will be forwarded on application.

**GEO. F. BOSTWICK**  
 24 WEST FRONT ST. - TORONTO.  
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**FLOUR MILL MACHINERY FOR SALE**  
 AT PETERBOROUGH, ONT.

THE UNDERSIGNED has had placed in his hands for sale at a bargain the following Mill Machinery belonging to the estate of the Peterborough Milling Co., Ltd., Peterborough. The whole of the machinery is new, having been run only long enough to test its quality.

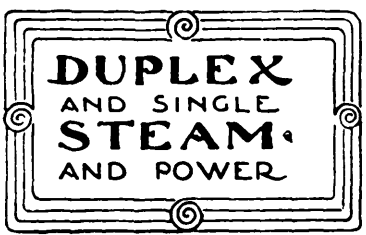
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- 2 Power Packers with Tubes and 18 Stand of Elevators Complete with Head and Foot Pulleys, Belts, Cups, made sectional and all screw nailed, each stand complete 30 00

Also of Line Shafting, 2 1/2, 3, 4, 5, 6, 8, and 10" diameter, together with Pulleys for driving above Machinery, heavily built heavy Shafting, all turned Couplings, Air Goods, per lb. 4c.  
 Roll and Sucker adjustable Hangers, Ball-bearings for above, also Pillow Blocks and Post Boxes all adjustable, per lb. 3c.  
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Millers wanting anything in this line should not fail to come and see these Machines as a chance to get such goods at less than half-price does not come every day. These Machines are of the latest pattern and are the equal of any new machines on the market.

**W. A. MELDRUM.**

**Pumps & HYDRAULIC MACHINERY**



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# THE CANADIAN MILLER

OLD SERIES, Vol. XI. NUMBER 9.  
NEW SERIES, Vol. IV.

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## CHARACTER SKETCH.

**HAROLD BARRETT,**

PRESIDENT THE DOMINION MILLERS' ASSOCIATION.

"Time and patience change the mulberry leaf to satin."—Eastern Proverb.

A LITERARY critic has said of the biography of Dr. J. G. Holland, founder, and until the time of his death, editor of Scribner's Magazine, as well as author of such commonsense and widely read works as "Timothy Titcomb's Letters," "Lessons from Life," etc., that it is lacking to some extent in interest because Dr. Holland's career was, for the most part, one of uninterrupted success, which was steadily cumulative—his life wanted the necessity for battle with the world, which has given zest to the lives of so many successful men.

We may envy those who have been born, as the saying runs, with a silver spoon in their mouth, and who are permitted to spend their days on a bed of roses, but after all such lives are often wearisome itself.

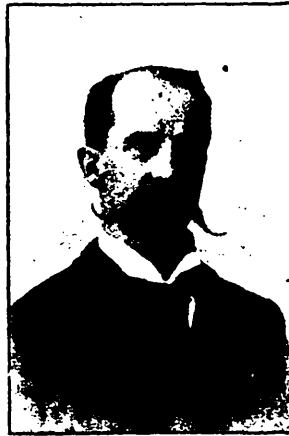
Mr. Harold Barrett, of Port Hope, Ont., who at the last meeting of the Dominion Millers' Association, was unanimously chosen president for the new year, was early obliged to shoulder the responsibilities of life, and with innate energy and pluck, he has steadily fought its battles ever since. Mr. Barrett was born in Port Hope, Sept. 9, 1858, of English parents. His father was the owner of the local flour mill, and at the age of 13 the younger Barrett went to work in the mill. So that it can be said of him—as of many others prominent in milling circles in Canada—that he was to the manner born. At the age of sixteen the death of his father occurred, and within the next year young Barrett took over the milling business from the executors of his father's estate. A result has been, as a friend has well said: "Mr. Barrett has acquired a varied experience of business vicissitudes from fire, flood and fluctuating markets, and had passed through these long before many young men think of undertaking a business on their own account."

It is sometimes said that this is an old man's age, from the fact that Gladstone, Bismark, Caprivi, Crispi, Pope Leo XIII, Sir Oliver Mowat and others far advanced in years have continued in the lead of public affairs. This from one point of view is true, and yet one cannot exercise their observation without being impressed with the fact that at the head of many of the greatest enterprises and most successful business undertakings of the day are men, who in every sense of the term may be known as young men. This has indeed been the case with men successful in many undertakings. In literature the originators of the Edinburgh Review—Sidney Smith, Jeffrey and Brougham—were young men. Burns and Byron had accomplished their work before they were 37. Newton's best work in science and Watt's in mechanics were placed on record while these men were young. And was not William Pitt Prime Minister of England at 24? Mr. Barrett has in his career, whether as a business man or in a more public way, furnished another illustration of the success that may come to a young man before he has reached 40, for it is to be remarked that Mr. Barrett has little more than turned his 36th year.

In his own town perhaps no citizen is more highly respected than Mr. Barrett. That he holds a high position in the confidence of his fellow-townsmen is shown by the fact that for several years he has held a seat on the council board and to-day occupies the important position there as chairman of the finance committee. He is also one of the Board of Harbor Commissioners who control the Port Hope harbor. The same diligence and business capacity that for 20 years he has brought to bear in the management of his own

business, he has thrown into the affairs of the town, where he was born and has during his lifetime lived.

From the early days of its organization Mr. Barrett has taken an active and intelligent interest in the affairs of the Dominion Millers' Association. He has ever been known for his unassuming and modest demeanor, and he has required just a little pushing by his friends sometimes to place him in the positions of responsibility for which his talents well fitted him. A year ago he was elected vice-president of the Association and in this position he showed himself throughout the year to be a valued member of the executive. Aggressive in his stand against any wrong bearing against the milling trades, he was able to give good service in fighting extortionate freight rates and the furtherance of other reforms during his period of office. At the meeting of the Association last month his fellow members showed their



MR. HAROLD BARRETT.

appreciation of these services by at once electing him to the office of president. He will be known as the youngest president of the Association. Not at any time is he given to much talking, and yet when he discusses any question it has been shown that he has obtained a good mastery of the subject under consideration. His paper on "Doubtful Milling Patents," read at the August meeting, showed very clearly the thorough manner in which Mr. Barrett prepares himself for any particular undertaking. The paper was full of carefully collated information on the subject dealt with, while its suggestions show the practical and common-sense turn that Mr. Barrett gives to any subject that he touches. Following in the footsteps of Thomas Goldie, E. Peplow, M. McLaughlin, and N. H. Baird, though a younger man than any of these, Mr. Barrett may be expected to represent in a creditable and able manner this Association, which is perhaps the best organized and business-like managed millers' organization on the continent.

De Maistre says that: "To know how to wait is the great secret of success," and an Italian proverb has it: "Who goes slowly, goes long and goes far." Mr. Barrett has that strong element of hanging on, or to use a more modern phrase, sticktoitiveness, that it has well been said is the true spirit of genius, and that brings certain success wherever exercised. Mr. Barrett from boyhood days has always "got there," and as the executive head of the Dominion Millers' Association this year his record will no doubt be one of equal success.

## RUSTING OF BOILER SHELLS.

IN a paper read in Germany on the rusting of boiler shells, the author concludes that the most serious cause is the introduction of air with the feed water. If the feed water enters the boiler near the low-water level he concludes that it will soon be expelled with the steam, unless it has a chance to accumulate in pockets. Such pockets rust rapidly. The feeding, he advises, should be completed before stopping for the day, so that the water standing in the boiler over night shall be as free from air as practicable. Faulty construction, the author believes, is the frequent cause of internal rusting. For preventing rusting he recommends: First, while the boiler is working—(1) Removing the air from the feed water before it enters the boiler. (2) Removing air from the water while in the boiler, and preventing its accumulation in pockets, etc. (3) Addition of chemicals to the feed water. (4) Protective coatings applied to the inside of the shell. Second, while the boiler is standing idle—(1) Removing all moisture from the boiler, (2) by blowing it off while hot, (3) by producing an air current through it, (4) by placing hygroscopic bodies inside. (2) Direct protection of the shells, (a) by painting with tar, varnish, etc., (b) by covering with protecting the shells from varying temperatures by keeping the draft in the flues constant, and so as to prevent moisture alternately depositing and evaporating on the shell. (4) Protecting the shell by completely filling the boiler with water from which all air has been expelled.

## MICROBES IN BREAD.

DOCTOR Trotzki, writing in the Russian medical periodical *Vratch*, states that he has found that new and uncut bread contains no micro-organisms, as the heat necessary to bake the bread is sufficient to kill them all. As soon as the bread is cut and is allowed to lie about uncovered, not only harmless, but also pathogenic, microbes find in it an excellent nutrient medium. White or wheatmeal bread is a better medium than black or rye bread, as the latter contains a greater percentage of acidity. Dr. Trotzki's experiments with pathogenic bacteria gave the following results: *Streptococcus pyogenes aureus* retains its vitality on the crumb of wheatmeal bread for 28 to 31 days, on the crust for 20 to 25 days; the bacillus of anthrax (without spores) remains alive on the crumb for 30 to 37 days, and on the crust for 31 to 33 days; the typhoid bacillus remains active 25 to 30 days on the crumb and 26 to 28 on the crust, while the bacillus of cholera lives 23 to 25 to 27 days on both.

## EXPORTS AND IMPORTS OF WHEAT.

THE following table exhibits the approximate exports of wheat from the following countries for the twelve months ending July 31:

	Bushels.
United States and Canada	157,280,000
Russia, Poland S. E. Europe	138,400,000
India	20,000,000
Austria-Hungary	8,640,000
Argentina	48,000,000
Australia	8,800,000
Chili, North Africa, etc.	11,200,000
Total	392,320,000

The imports into the following countries for the same period was as follows:

	Bushels.
United Kingdom	176,000,000
France	56,000,000
Northern Europe and Switzerland	80,000,000
Italy, Spain and Portugal	42,400,000
Scandinavia	10,000,000
Greece	2,800,000
China, etc.	20,000,000

Total 387,200,000

## TRANSPORTATION: OUR WATERWAYS.

TWO IMPORTANT CONTRIBUTIONS ON THE SUBJECT BY MR. JAMES B. CAMPBELL, OF MONTREAL, WELLS, A SPECIAL ARTICLE FOR THE MILLER BY MR. JAMES FISHER, M. P. P., OF WINNIPEG.

FEW more important questions of a commercial character are before our people to-day than a consideration of the best course to pursue in the development of our waterways. It may be expected that the coming international convention to consider the subject, and which is to meet in this city very shortly, will throw some light on the question. The fact that such a meeting has been called, and that leading citizens of Canada and the United States are interesting themselves actively in the matter, may be taken as good evidence that the question is a live one.

The MILLER has already published several contributions on the question, and this month further supplements these by an article specially written for these columns by Mr. James B. Campbell, of Montreal, in which the Welland Canal, as a factor in proposed plans, is discussed. And following Mr. Campbell's paper are the views of Mr. Fisher, M. P. P., of Winnipeg, who has been a close student of the subject for years.

### WHAT MR. CAMPBELL SAYS.

It is with pleasure I notice that the CANADIAN MILLER invites discussion on the important problem of transportation in Canada. If by throwing your columns open to the question, you can lead Canadians on, either to criticize or to suggest improvements, the whole question of transportation is certain to be a gainer thereby.

The problem for us is, the transportation of the product of the great West to the consumers in Europe. There is no system of transportation by land which can compete in cheapness with the transportation by water, represented by a carrier of say 100,000 bushels in bulk down through the great lakes. The watershed of the United States drifting to the Gulf of Mexico has been of little use to the Americans of the Northern States, and they have bent all their energies to something else; a great development and a keen competition in their land carriage has led some people to imagine that the railway and not the watercourse was the true vehicle of transportation. In our country a glance at the map will convince anyone that a great development of business along our watercourse should be the aim of our business men and of our statesmen entrusted with power. Our watershed, clear and distinct from that of the United States, extends from the Rocky Mountains through our land to the Atlantic, and represents the artery of life for our country. It is true that this great artery is closed for 5 months in the year, but so is the whole transportation service of the great lakes, and the more the North West develops, the more evident it becomes that their future is dependent on this season of open water for its transportation. Far be it that I should depreciate in any way our railway system, more especially that portion of it west of Port Arthur, without which we could not have opened up that great empire in the west; however transportation by water east of Port Arthur is the portion of our watershed up for discussion at present.

These general remarks are preparatory to taking up the question to which this letter is devoted—the Welland Canal. The proposition to deepen the canals has become crystallized. Almost every writer and public speaker seeking to account for the stagnation of trade on the St. Lawrence route, seeking to account for the fact that Montreal tranships 25 millions against Buffalo's 200 millions, winds up with, "Deepen the canals." Competent engineers assent, I believe, that to deepen the Welland to a level of 20 feet, would mean an expenditure of 15 millions of dollars. The question is, Would it pay? Why is it so easy for grain to drift to the sea via Buffalo, and so difficult to bring it our way? In the answer will be found the answer to the question, "Would it pay?" The general modern tonnage of the upper lakes is now represented by vessels of 300 to 340 feet in length, and our Welland locks are only 270 feet; consequently for freights through to Kingston or Ogdensburg we are dependent on the smaller freighter and generally speaking the older boat. It is the larger vessels that make the freight rates, and as the older and smaller boats fall out, it is probable that it will become more and more

difficult to get capital to replace them. The season during which these lake craft can earn a dividend is short; freight rates are low, it is difficult to see what is to advance them, and their only salvation lies in the number of quick trips at the low price. The time for a propeller from Chicago to Port Colborne or Buffalo is about 4½ days. Our Welland has 20 locks, and a vessel making the trip in and out of Lake Ontario loses from 30 to 40 hours in that canal. A vessel owner will not voluntarily surrender that time, except at a compensating rate of freight, and the moment higher rates are established, the route is handicapped with the extra charge. This would apply with the same force were the locks 350 feet and their depth 20 feet. Towards the close of navigation, when the pressure of fall shipments is on, this loss of time in the Welland is a very serious consideration, and is a damper for the Canadian route. As an illustration take the rates of freights to-day wheat is being carried from Duluth to Buffalo for 1¼ a bushel and on to New York for 3 cents - 4¼ in all, while so light is the trade via the St. Lawrence, that it is difficult to get Welland canal vessels under 2½ cents to Kingston, tolls paid, and with the 2½ river freight, say 5 cents to Montreal. The largest carrier is the cheapest freighter; it will make the freight rates and take the trade with it. Until that far distant day arrives when Chicago elevators move out to the breakwater, capital investing in lake tonnage for general business will limit the draught of the vessel to the depth of water in the Chicago river; this river is narrow, its banks are muddy, and notwithstanding decrees at Washington, I doubt if it will ever stand dredging to 20 feet. If my memory does not deceive me, the depth at present is 15 6 and to call the last six inches water is to insult teetotallers. I have frequently seen the ordinary Buffalo propellers stuck in the sediment at the Clark street bridge. It is not the want of water in the Welland which sends the grain to Buffalo, for there is really very little difference between the Welland and the Chicago river. The reasons are, the shortness of the locks, the time lost in the canal, no return cargo, the limited amount of ocean tonnage at the Port of Montreal, sundry charges which should be borne by the nation, and the unlimited amount of ocean tonnage at the Port of New York. That is what is the matter with our trade.

Until we have a larger freight market at the Port of Montreal, there is not the slightest use in spending money on increasing the depth or lengthening the locks of the Welland. The only way in which we can increase this freight market is to buy more stuff where we hope to sell. The true solution, I think, for trade via the Welland is a transportation company, transhipping the grain at Port Colborne, into wooden barges and freighting it straight to Montreal. The vessel owner at Chicago, Duluth and Port Arthur would carry the grain to Port Colborne at Buffalo rates in competition, he would not figure on time lost in the canal; if we could not supply him with a return cargo, it would be no trick to run into Buffalo light, get his return cargo there, and travel west as happy as his rates of freight could make him. By this means we could make use of the United States west bound traffic to help our shipments via the St. Lawrence, until such time as we created a through trade of our own. Arranging our affairs to take advantage of the Buffalo coal trade would be a point gained for us, and western men equally with ourselves would reap whatever advantage there was in it, but so long as we depend upon the Welland canal only, we can never hope to do the business which our favorable position on this continent would seem to justify. The canal is, however, quite sufficient for the Montreal freight market at present. If we could not barge grain from Port Colborne to Montreal in 50,000 bushel lots cheaper than from Buffalo to New York via the little Erie in 6,000 bushel lots, there is no use in patting ourselves on the back over our natural water route. The demands of marine insurance, that such lake vessels carry sails, could easily be covered on 50,000 bushel barges, and the tow come on to Montreal. Do not let us hear anything about more elevators at Port Colborne. Put the price of the elevators into barges, we want the stuff to come through not stop there. At Buffalo the little floating elevators forced the big land elevators to buy them out. Cheap floating elevators will beat land elevators out of the transfer

trade. Such a transportation company would, however, have to be one of large capital. At Port Colborne the propellers would come into harbour from Chicago, Duluth and Port Arthur, with 100,000 bushel lots, and would have to be unloaded promptly, with the present depth of our river canals and channel, and at the rate they are giving this much talked of deepening of that important part of our route to 14 feet, will see two elections and ten years time pass over our heads. The grain would have to be transferred into 4 or 5 barges, these barges would have to be camped out for at least a fortnight, and others ready to take their places. The season is short in which to make a dividend, and with our little bit of a freight market at Montreal, a Welland and Montreal transportation company would not make expenses. To do the thing right it must be prepared to handle the western trade on a western basis, and there is not the tonnage at the Port of Montreal to do it. With more freight room, and 14 feet of water in our river channel and canals, barges freighting 50 to 60 thousand bushels, Port Colborne to Montreal, preserving the identity of the grain, especially the fine spring wheat of the north, would leave New York with its larger freightage and little 6,000 bushel boat loads high and dry at competing prices for the spring wheat trade, but a larger freight market at Montreal is an absolute necessity. As to what could be done in the way of increasing our ocean freight market, it is only necessary to quote a well known axiom: "Those who can reach the markets of the world cheapest, shall control the markets of the world"—and it applies with the same force to imports that it does to exports.

The general conclusion is, that until there is trade enough to push a transportation company on the Welland-Montreal route, to the full capacity of that canal, it would be very little benefit to the country enlarging it. When that day comes it might pay better to build another, for there would not only be room for two, but for many other transportation routes through Ontario. Mr. Hill, President of the Northern Pacific Railroad, said, Canada has advantages which are peculiarly her own, and that there was room for a far greater development of trade than most people imagined.

At the moment of that earthquake last spring in this city, I was talking to the owner of these fine English turret freighters which are now doing such good work on the St. Lawrence for our coal companies. It is quite possible to build a "turret" freighter for a 14 foot draught of water capable of carrying 90,000 bushels of grain through from the lake ports to England—but all the canal locks would have to be lengthened.

Regarding this business of loading at the lake ports; cheap craft of say 3000 tons represented by those "turrets" might possibly do it, but they would have to compete with the 12 or 14 thousand tonners of the ocean loading at an ocean port; the cheap craft of the lakes with a tow of barges would more than hold their own, while the turning of the grain ocean would be a decided advantage to the grain, and with regard to corn almost a necessity. The time lost in those numerous canal locks would prevent as expensive a ship as a 20 foot ocean freighter loading at a lake port in competition with cheaper tonnage. The "whaleback", suitable for the lakes is a failure on the ocean; the "turret" is still experimental for the sea and lakes, but it has established itself on our river to stay. I learn from an independent quarter that they are paying 10% on their cost—notwithstanding dull times. Let us have the 14 foot channel as quickly as possible.

### A VOICE FROM MANITOBA.

Mr. James Fisher, M. P. P., of Winnipeg, Man., when in Toronto a fortnight ago, gave expression at some length to his views on the subject of transportation and the benefits that he believes would accrue to Canada, and particularly the Northwest, by an extension of our waterways.

"The people of Manitoba," said Mr. Fisher, "are becoming more and more alive to the great importance of the deepening the channels. I believe the opinion is every day gaining ground that the surest means of deliverance from the present ruinous freight rates is to be found in the deepening of these waterways."

"What we are specially anxious for at present is to

see a speedy completion of the work now on hand, namely, the deepening of the channels to 14 feet. That once accomplished will, I am convinced, bring about of itself a very considerable reduction in the cost of transportation.

"With even a 14-foot channel the great cost and delay in transportation by barges through the St. Lawrence will be avoided. Capt. Macdougall's whalebacks will bring down to Montreal immense loads of grain without breaking bulk.

"Indeed one steamer with two barges in tow will bring a quarter of a million bushels in one load, thus cheapening very materially the cost of carriage.

"We are hoping, however, that the idea of a further deepening of the channels until we have a uniform depth of 20 feet all the way to the sea will be agitated on both sides of the line, and that finally the two nations will undertake it as a joint enterprise.

"When I say that the lakes and rivers are the heritage of both nations equally, I mean that is so in respect of all the water, right through to the ocean. It is manifestly so from the head of the lakes to the point on the St. Lawrence where the line of the international boundary leaves the river, and it is only in respect of the short distance between Cornwall and Montreal that the St. Lawrence can in any sense be called a Canadian stream, and then it must be remembered that for even that portion of it the right of American citizens to use it on equal terms with Canadians has long since been conceded by treaty, and that treaty is not by any means an ordinary one, in so far as it deals with the use of the St. Lawrence.

"Usually such a concession is made by one country to another as an equivalent for an advantage conceded by the other side, and for a limited time. In this case on the contrary, the American people always claimed that they had a right to use the St. Lawrence, irrespective of treaty, because it was a passage between two bodies of water that were common to both nations, viz., the great lakes and the Atlantic ocean."

Speaking of the difference in cost of transportation by water and by rail, Mr. Fisher said:

"There is no doubt whatever, upon this subject," answered Mr. Fisher. "The difference, indeed, is most remarkable, and possibly few recognize the extent of the reduction made where water transportation is available. As illustrating this difference in respect of transportation from the Northwest, I may give you a few examples. Our great staple in Manitoba is, of course, wheat, and it is most disheartening to feel that half the value of the grain in the English market is expended in paying the cost of transport to that market from our province.

"The greater part of our grain is taken by rail to Fort William and is thence carried by water either to Buffalo or to Montreal.

"The rate from Brandon to Fort William, a distance of 560 miles, is 11.40 cents per bushel; this, of course, is by rail. From Chicago to Buffalo, 900 miles, the rate by lake is from two to three cents per bushel. In 1891 it was less than two cents on the route (from Chicago to Buffalo by water) and it has been as low as one cent per bushel.

"From Duluth to Buffalo (by water), a distance of 1,000 miles, I understand, the usual rate is between three and four cents per bushel, the average for some seasons having been as low as three cents. From Duluth to Montreal (by water), nearly 1,400 miles, when competition is keen, I understand the rate is from six to seven cents per bushel.

"From Winnipeg to Montreal (by rail) the distance being only a few miles greater than from Duluth to Montreal, the rate is about 27 cents. The average all rail-route from Chicago to New York in 1891 was 15 cents per bushel, while the average rate by lake and canal between the same points was less than 6 cents, and this although at Buffalo it had to be transferred to the canal barges on the Erie. Again as against the rate of 11.40 cents per bushel from Brandon to Fort William, I refer to the rate of from 2½ to 3c per bushel from Buffalo to New York by the Erie canal and Hudson river, nearly as long a distance.

The average yield of wheat in Michigan this year is slightly under 15½ bushels per acre.

CAUSES OF FLOUR MILL FIRES.

A CONTEMPORARY has, recently, published a number of diagrams showing the causes of fires by classes of property. The diagram given herewith shows the causes of fires in flour, grist and oatmeal mills. It requires no explanation further than to say that the periphery of the circle is divided into 100 parts. Each part between the little marks on the inside of the circle represents 1 per cent. To ascertain the percentage of fires due to any cause, count the number of per cent. marks in the arc of the segment given to that cause. In preparing the diagram no attention was paid to exposure fires, incendiary, nor to those of unknown origin. Friction seems to be the miller's greatest enemy, nearly one-third of the fires being caused thereby, while the much feared dust explosions are reported to have

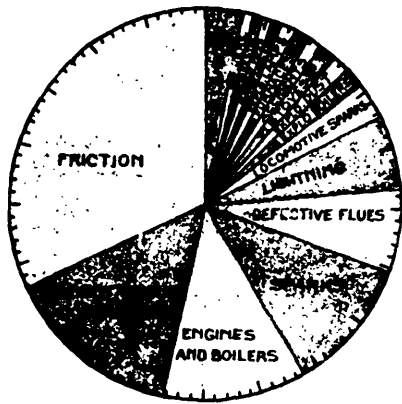


DIAGRAM SHOWING CAUSES OF FLOUR MILL FIRES.

caused but 2 per cent. of the fires. Among the causes of fires which could easily be prevented with ordinary care are friction, spontaneous combustion, defective flues, boiler explosions, furnaces, stove pipes and defective kilns.

Good oil of the proper viscosity properly applied to correctly arranged machinery will prevent fires being started by friction. Spontaneous combustion does not occur in mills where oily rags, dirt and refuse matter is not permitted to remain in corners and out of the way places, and the floor is not flooded with oil drippings from bearings. The coal pile which is a prolific source of spontaneous fires should be kept in an adjacent building by itself. Defective kilns, flues and furnaces and weak boilers and poorly jointed stove pipes are inexcusable sources of many fires.

The diagram clearly shows that the majority of mill fires are due to carelessness on the part of the miller. If you do not wish to lose your mill take care to prevent fires being started, and provide facilities for extinguishing them in their incipency.

MEAN EFFECTIVE PRESSURE.

OF course the actual mean effective pressure in the cylinder can only be had from the indicator card, but we can approximate it closely enough for calculating the power of the engine commercially, though perhaps not exactly accurately.

This will vary with the different engines, the clearance, the back pressure and the release of the exhaust will affect it somewhat, but a few figures for different cut-offs will be useful for the engineer.

The mean effective pressure in the cylinder when the cut-off at

- 1-4 stroke equals .557 of boiler pressure.
- 1-3 stroke equals .670 of boiler pressure.
- 3-8 stroke equals .743 of boiler pressure.
- 1-2 stroke equals .847 of boiler pressure.
- 5-8 stroke equals .917 of boiler pressure.
- 2-3 stroke equals .937 of boiler pressure.
- 3-4 stroke equals .966 of boiler pressure.
- 7-8 stroke equals .992 of boiler pressure.

For net effective power deduct about one-fourth for friction of engine in engines of fair size, and for small engines as high as 50 per cent. is often lost, making a far less efficient motor than the electric motor, provided the cost of power supplied to them was both the same.

BELOW COST OF PRODUCTION.

THE popular theory of wheat being below cost of production, says the Trade Bulletin, of Montreal, has been one of the chief incentives to speculative investments therein ever since the price fell below the eighties. The great bulk of speculators have, therefore, argued that as wheat could not be produced at the prices it was selling at, it was consequently a safe purchase. When the price of wheat dropped from the seventies into the sixties there was a perfect craze on the part of outsiders for the possession of wheat, and wheat they got, on margin of course, as it was then considered that a 50 per cent margin could not possibly be wiped out, it being considered as safe as buying the wheat straight out, and putting it into store. Despite the continued cry of this cereal being below cost of production it fell and fell, until investors commenced to lose faith in the theory, and many had to relinquish their deals when September option dipped below 55¢ at considerable loss. The "below cost of production" theory has been shown to be a very unreliable index in a number of instances of future values. For instance, when pork in Chicago sold at \$11.40 some years ago, it was said to be below cost of production and could not go lower, and yet in a few months afterwards it sold down to \$8.20 and had previously sold as low as \$6.50. Lard also sold as low as \$5.25, although its lowest first cost was said to be \$7. On the basis that pot ashes could not be produced under \$4.50 per bushel, a large dealer in this city, a number of years ago, had in a considerable quantity, and in spite of the theory he had so much confidence in, prices fell to \$2.50 and \$2.60 and even at these prices farmers continued to bring in their supplies, and the result was heavy losses to the dealer referred to. We mention these circumstances to show that the cost of producing any article is no guarantee of values falling below that basis. At the same time we cannot recall any unusual depression in values which was not followed by a reaction within a reasonable period. Wheat, however, has broken the record in this respect, as values have receded almost continuously during the past three years, and it is about time that a pronounced reaction from the unprofitable rates that have ruled of late took place. Since August, 1891, there has been a gradual decline from \$1.15 per bushel to 50½¢ in cash wheat in Chicago, or a drop of 62½¢ per bushel, which is about 70 per cent more than the total cost of cash wheat at time of writing. So that when the reaction does set in for good, there would appear ample room for a rise.

A CLOSE CALL.

ANOTHER narrow escape by an engineer: He was inspecting one of a pair of boilers. The water had been blown out of one, and he entered it through a small manhole in the head. After finishing his work he called out to his assistant to turn on the cold water, thinking to make his way out immediately. By mistake the fellow turned on the scalding, steaming stream from the other boiler, the hissing and pouring of which made a doubly dense roar in the surrounding cylinders, and coming at the entrance of the manhole effectually barred the exit, and made escape from a terrible death almost impossible. Creeping as close as he dared to the seething steam he shouted to his aid to turn off the water. He could hear the fellow moving around among the pipes, but waited in vain for him to come. The man had not heard him. His voice was stopped by the hissing, boiling, mocking water. It was using among the pipes, at his feet. A few moments more, he thought, and he would have been cooked alive. There was but one chance left open—to force himself through the scalding water and out the manhole. Delay any longer would be fatal, and he plunged face and hands through the cooking stream into the air beyond. Just then the steam stopped. It had been turned off at last.

According to the latest advices from Russia, this year's crop will not be much above a fair average, that is to say, less than 30,000,000 quarters in European Russia (including Poland, but excluding the Caucasus) against 40,000,000 quarters last year, but the large reserve of old wheat from last year's crop will enable Russia to fully equal last season's export of 13¼ million quarters.—Beerbohm.



PUBLISHED ON THE FIFTEENTH OF EACH MONTH

C. H. MORTIMER

CONFEDERATION LIFE BUILDING, TORONTO

BRANCH OFFICE:

NEW YORK LIFE INSURANCE BUILDING, MONTREAL

**TERMS OF SUBSCRIPTION:**

One Copy One Year, in advance ..... \$1.00  
 One Copy Six Months, in advance ..... 50  
 Foreign Subscriptions, \$1.50 a Year

ADVERTISING RATES FURNISHED ON APPLICATION

THE CANADIAN MILLER AND GRAIN TRADE REVIEW caters to the Miller and all his associations, and to the Grain Dealer with all his allied interests.

The only paper of the kind in Canada, containing full and reliable information on all topics touching our patrons, and unconnected as an organ with any manufacturing company, we will always be found honestly and earnestly endeavoring to promote the interests of our subscribers. Correspondence is invited from millers and millwrights on any subject pertaining to any branch of milling or the grain and flour trade.

**VALEDICTORY.**

It has been determined to discontinue publication of THE CANADIAN MILLER with the present number. During the six months it has been under the present management efforts have been made to put it on a satisfactory business basis. These efforts have not met with the degree of appreciation which would justify the publisher in devoting further time, money and attention to the paper, hence the decision to cease publication.

Only about one-third of the millers of Canada apparently feel any interest in having a publication devoted to their business. The others are well-nigh hopelessly apathetic regarding this or any other matter which indirectly affects their interests. There are more profitable tasks than that of endeavoring to keep men awake to their own interest, and to these our attention will in future be directed.

Our thanks are due and are hereby tendered to those who have by their subscriptions and advertisements made it possible to continue the publication of THE MILLER to the present time. To those whose subscriptions are paid in advance we will supply for the balance of the term for which they have paid, either the CANADA LUMBERMAN or the ELECTRICAL NEWS, as they may desire. Those whose subscriptions are in arrears are requested to forward the amount immediately to this office, in order that their accounts may be closed.

C. H. MORTIMER.

**FIRES AND INSURANCE.**

Two distinct problems are embraced in the title we have given to this article, and yet each is related to the other so intimately that they can be well considered together. In the July MILLER it will be remembered we published in full an able and comprehensive paper on flour mill insurance, read recently before an American Millers' Association. Elsewhere in this issue we publish two separate papers on the question of fires in flour mills. This is giving considerable attention to one subject and yet not a whit more than the subject merits. The loss each year to millers through the devouring element is something that may well cause them to halt and ponder as to the cause, and a remedy. According to the report of the Secretary of the Dominion Millers' Association, presented at the last meeting, nine millers, out of membership in the Association, suffered losses, during the past year and in almost every case of considerable amount, through fire. The one question is, what is the main cause of so many fires in flour mills? The answer, according to the papers published in this issue of the MILLER, places the responsibility in a large measure, either on the faulty character of the construction of mill buildings, or upon the carelessness of the miller and his associates. Both these evils are within the power of millers to remedy. There can hardly be any doubt that there is large room for improvement in the manner of constructing flour mills, just as there is,

though perhaps in a lesser degree, in the construction of factories generally. An exhaustive article by Mr. Edward Atkinson is published in the August number of the Engineering Magazine on the annual fire waste. Mr. Atkinson is able to speak on this question from many years of study and observation and his conclusion is that architects and builders, property owners and occupants, are to blame in nearly all cases for the destruction by fire of their properties. This phase of the subject is one worthy of careful thought by millers. As to the charge of carelessness as the cause of many fires, there can only be words of disapproval from the candid friend. It has long since been established that nearly all accidents that occur to workmen in factories are due to their own carelessness and it seems to be none the less so as regards the destruction of property by fires. He who hath ears to hear, let him hear.

The paper in our July number on flour mill insurance was an out-spoken declaration against the hardships to be endured by the miller, when fire has overtaken him, and he is called upon to adjust his fire losses with the insurance company. The complaint is not a new one against those whose business it is to adjust fire losses. We do not know why there should be any difficulty on this score. Whatever may be the reading of a fire insurance policy when it is read outside of the blackened walls of the mill there can be no doubt that when the policy was given, the application signed by the miller, and the premium received by the company or its agent, that one purpose only was supposed to have been attained, namely, that when the time came, if it should come, when fire had destroyed the property insured, the insurer would receive the amount named in his policy and for which he had been paying a premium for either a shorter or greater length of time. Legislation ought to make it so plain that it would not require the services of the law courts to decide how much, or how little rather, too often, the insurer is to receive when loss has been suffered. Millers should agitate in this direction and in the meantime they cannot be too careful when placing insurance to read with care and critical mind the wording of the policy that is supposed to give them protection in the time of need and for which they are paying.

The three papers to which allusion has been made in these comments are deserving of careful reading by all millers and one purpose in touching on the matter here is to secure for them the deserved study.

**THE SMALL MILLER.**

Is the small mill to become before long simply a matter of tradition? This question is suggested by not a few changes in the milling situation, that have taken place of late years. The growth in the number of large mills gives an impression in this direction. An interview in last month's MILLER with Mr. Jas. Stark, of Paisley, Ont., was an expression of opinion along this line. The big miller holds a place in the milling industry now of almost every country. The changes that have taken place in methods of milling have doubtless had a good deal to do with strengthening the position of the big miller, while at the same time, these have to some extent operated against the small miller. It is the men who are in business in a more limited way in any calling who experience the greater difficulty in conforming to changes in methods and adapting their properties to these changes as they come along. A British agricultural journal remarks on this point: "It is only too well known that in this country the great improvements in milling machinery made in recent years, and the extreme severity of competition resulting, partly from economy in the production of flour upon a large scale, have crowded out of the industry a great number of small millers. Thousands of the wind mills which form picturesque features in our landscape and some of the water mills have been allowed to fall into decay, and to be closed down, or to be closed, remaining as pictures of ruin, which all disinterested witnesses regret to see."

This, however, is just one side of the question. We have to admit that viewed alone the case looks somewhat discouraging for the small miller. But a writer in the Milling World has pointed out that not only is the small mill a success in the United States, despite the

large growth of the big mills of late years, but that in other countries the same history is to be recorded. France does the bulk of her flour making in small mills and her largest mills are the ones that suffer first and most in times of stagnation. The same is true in Germany and in Austria-Hungary. Even in Great Britain, affirms this writer, the small mill has come to the front and is successful in the main, when the large mills are running at a loss or on a discouragingly small margin of profit. Viator, a frequent contributor to the London, Eng., Miller, said on this subject recently: "Scattered all over the land are roller millers of 2½ to 5 sacks capacity who will tell, and what is more, show you, that they are holding their own against native and foreign competition. In almost every case the miller has the same tale of a once flourishing business, threatened or broken into by roller flour, being saved by a timely adoption of the roller system. The natural inference is that those who adopted a sound roller system early in the eighties must have quickly recouped their outlay. Of course, it is always presumed that these bold pioneers were also good millers, sound judges of wheat and clever market men. Given these three qualifications, with a good plant and with fair facilities for receiving wheat and forwarding flour, it is hard to conceive of a miller failing to prosper."

The position of the man who is engaged in flour milling in a small way is hardly parallel with, nor is the same conclusion to be drawn from the situation, as in the case of the man who may be engaged in other lines of manufacture in a restricted degree. In a rural country, at least, and how much better would be the position of some of our older countries if the rural sections were not sacrificed at the altar of the large cities, the small flour miller holds an unique position. His existence is necessary to the success of the country around about him and the anxiety displayed by farmers in all newly settled countries to have placed in their midst a flour mill is evidence on this point. So far as Canada is concerned our millers, whether great or small, are holding their position, we believe, even in these depressed times, with any other branch of manufacture. We are inclined to stand in with the Milling World and say that a careful review of the situation should not cause any alarm to the small miller.

**IRRIGATION.**

At a time when those interested are at a loss to decide what is the most profitable way to work the land so as to hold to the farming community those who are already located there it seems a work of supererogation to discuss any project which means the improving of waste lands so that they may be populated. But as studies in political economy seem to show we get back to the land as the original source of wealth in every case and though difficulties may beset the question just for the moment, we may make sure that those who seek the farm as a source of livelihood will in the end hold an advantageous position. So it is that we cannot look upon the Irrigation Congress at Denver, as a gathering discussing a question that is of no particular import. In what is known as the territories west of the 98th meridian there is to be found an immense arid district in the United States. Seventeen states and territories alike wholly or in part are within its confines, which embraces two-fifth of the national domain. The work of the Denver convention will be to discuss the possibilities of transforming this vast desert into a fruitful garden by means of irrigation. Already practical work has been done in this direction in the United States, and the census of 1890 shows that a total of 3,630,000 acres was under irrigation in the States composing the arid regions. In view of the fact that the regular farming lands of the country in the States are well taken up it means much for that country if its land resources can be added to by the utilization of this immense arid territory. What has been done shows that lands not worth \$1.25 an acre a year ago now command \$30 and \$70 an acre for improved farms and from \$300 to \$500 an acre when covered by bearing orchards. Our own Northwest is interested in a large degree in the success of irrigation methods and the Hon. Mr. Daly, it is expected, will be in attendance at the Denver convention and no doubt will be able to secure valuable information on the question.





CAPTAIN McDougall, the builder of the whalebacks, writes from Duluth, to the Deep Waterways Committee: "I am in favor of a 20 foot channel from Lake Superior to the sea, via the St. Lawrence route. I have given the matter a great deal of consideration, having travelled by the route many times. From what I know of the route and the kind of vessel best suited for cheap river and lake transportation, also of ocean trade, port charges, cost of transfer, the requirements of cargo stowage for an ocean voyage, the different class of men to manage ships on the sea and the lakes, I feel confident that the most profitable plan would be to transfer at Montreal and Quebec. I have just visited the Sault Ste. Marie Canal and think every Canadian has reason to be proud of that work, for doubtless it is the greatest canal construction ever known in so short a time."

Mr. Thompson, manager of the Ogilvie Milling Co., Winnipeg, who recently returned from an extended trip throughout the grain district of Manitoba, gives a very gratifying account of the crops, which he says will yield far better than has been generally counted upon. The quality is decidedly good, being nearly all No. 1 hard. Mr. Thompson has made a study of the smut question and has not found a great deal of smutty wheat in his travels. He is a firm believer in the value of blue stone as a preventative of smut and wherever this has been freely used the evil has generally been eradicated. Mr. McGaw, of the Lake of the Woods Milling Co., has also spent a considerable period driving through Manitoba examining the crops. Considering the dry weather that has prevailed this season, Mr. McGaw finds the prospects almost better than could be hoped for. The crop has rather improved since July 1st. There are some fields that make a heavy stand of straw, but light straw is the rule. There is more smut than last year in some parts, but the weather has been fine for harvesting. The general condition of the crop, Mr. McGaw believes to be, if anything, rather better than last year in point of yield, and in quality will also approximate that of last year.

The Hon. John B. Manning, of Buffalo, who is considered a high authority on the subject said of the effect of the change on barley schedule as amended by the Wilson tariff: "Under the McKinley bill a duty of 30 cents a bushel specific was imposed on barley. The present law makes it 30 per cent ad valorem. The present price of Canadian barley in Canada is 40 to 45 cents a bushel. The duty, therefore, will amount from 12 to 13½ cents a bushel, a difference in favor of the lower duty of 16½ cents a bushel. Strange as it may seem, the rate under the McKinley bill was a detriment to the growers of barley in this state. The high duty prevented the importation of Canadian barley to any extent. The result was that the brewers and malsters of this State declined to buy State barley unless they could buy it on the basis of the value of western barley. Previous to the passage of the McKinley tariff bill, when the importation of Canadian barley amounted to 10,000,000 bushels a year, instead of it being an injury to the interests of growers of barley in this state it had the opposite effect. State barley grown in the counties of Erie, Niagara and Orleans on the average is nearly as good in quality as Canadian barley, and sold within three to five cents as much per bushel, but when the prohibitory duty was placed on the barley and little or no Canadian barley imported, the brewers of this state said there was not sufficient good barley grown in this state to supply their wants, and decided to use substitutes for the better grades of barley malt, and confined their purchases to malt made from western barley. The result was that the price of barley was forced down to the basis of the better grades of western barley, and the interests of

growers of barley in this state were correspondingly injured. We may therefore reasonably look with a lower rate of duty for increased importation from Canada, and this will benefit not only the brewing and malting interests, but also the agricultural interests for the state."

Mr. W. D. Matthews, the large barley buyer of this city, says of the United States tariff bill in relation to the barley trade of Canada. "While Canada will recover a portion of the trade she lost under the McKinley bill, it will be difficult to regain our lost position entirely. I refer particularly to the barley trade. The Americans have given more attention to the cultivation of this grain since the passage of that bill, and have very much improved the quality of their barley. In addition to this the improved system of growing and the use of substitutes does not necessitate the use of high-class grades as formerly, and therefore they will not pay as great a premium as formerly to obtain high Canadian grades. One thing our farmers must not forget. They are at a disadvantage in the American market even though there was no duty at all. In addition to the 30 per cent duty there is to be considered the cost of reaching their market to compete with their home-grown grain. This will average about 10 cents per bushel. It will be difficult for us for these and other reasons therefore to entirely regain our barley trade except in years where the Americans may fall short in their supply."

A Chicago despatch of a few days ago says: "Minneapolis mills, which were using 4½ bushels of wheat for a barrel of flour, are now using 5 bushels and 45 pounds, so as to throw as much as possible into the bran for feed, for which there is an active demand. This will make a difference of 100,000 bushels of wheat a day at that point alone." Mr. M. McLaughlin spoken to about this matter said that the above statement was likely an exaggeration of the real facts. He was using more wheat to the barrel of flour for the same purpose but found that about 7 lbs. was all that could be added profitably. He was now using four bushels and 37 lbs. as against 1 bushel and 30 lbs. previously.

Senator W. D. Washburn, of Minneapolis, the well-known and extensive flour miller was in Montreal a week ago and interviewed on trade matters said: "I certainly expect prices for wheat to go up; but just what figure they will reach I would not like to say. In fact, I do not attempt to guess it. Of this, though, I am pretty firmly convinced. Prices will never be as high as they have been, and I do not think we shall ever hear of the price exceeding the dollar, unless we have some great wars or famines, restricting agricultural operations in any of the great grain-producing countries." Do you expect prices to go any lower? "No, I do not see how it could, for wheat is really worth more, and at the present prices proves a profitable investment for hog raisers to feed to hogs, and their demand for the grain will prevent the prices from falling any lower, for they are buying immense quantities of it." Will the present low price of wheat tend to reduce the acreage of this grain under cultivation do you think? "Unquestionably it will, for the farmer cannot clear himself, much less make a profit, at the present prices. He cannot afford to raise a crop at a dead loss, and will vary his crop. There will be many thousands of acres less under wheat in my own State, Minnesota, and in the Dakotas next year than ever before. The farmers find now it pays them better to raise live stock and root crops, and the soil and climate in our part of the country are as favorable for those crops as for wheat. In Southern Minnesota there are large herds of cattle now, and many of the present great wheat centers will be turned into live stock districts in a year or two. This change is due, of course, largely to the prevailing low prices of wheat, but also to the knowledge that other great wheat districts are coming in. Take Manitoba and your great North-West, for instance. Nobody likes to estimate the vast amount of wheat they can produce."

A flour packer does not improve the quality of the flour in anyway but it is one of the handiest and most useful machines in a flour mill, and saves the price of a man, and in that way makes money for the mill.

A CHAPTER ON FRICTION

FRICTION is not a force in mechanics, it is a resistance; a passive resistance to motion, writes F. J. Mosler, in the Wood Worker. It is the tendency of force to produce motion, whereas the tendency of friction is to destroy motion. Nor is the increase of friction between two surfaces [in contact] properly the amount of force necessary to produce motion, but the amount of pressure necessary to balance the friction and bring the body to a state of indifference to both rest and motion. Yet we use friction to transmit force, and it is sometimes convenient to speak of it as the force itself.

All surfaces, however highly polished, contain minute projections, hence when pressed together the asperities of the two surfaces become to some extent interlocked with each other and produce resistance to motion - and this is friction. The whole amount of friction stated in pounds of resistance, is the product of two factors. The first of these factors is called the co-efficient of friction. Co-efficient, as an adjective, means operating together; as a noun it implies co-operation - a factor in multiplication. The co-efficient of friction is a constant number which has been determined by experimenting with substances of different kinds and with surfaces in various conditions. Scientific men have made these experiments and tabulated the results of their experiments, so that now, when the practical mechanic has to solve a problem in friction, he refers to one of these tables for the co-efficient to meet the case. Oak against oak has a co-efficient varying from .975 to .064, according to exposure of grain and quantity and quality of lubrication. Iron against iron has a variation in like manner from .314 to .064. Between these two extremes in the use of iron I find six other co-efficients, so that adding the eight together the average is .148. This is for sliding surfaces; a revolving shaft requires a different co-efficient.

I want to be sure that I make clear the exact use of this co-efficient of friction. I said it was a constant number and so it is for the same conditions. In casting the interest on \$100 at six per cent, we multiply by .06, and that multiplier is the co-efficient in the problem; it is a constant number for that rate of interest. But if we change the rate of interest to five per cent, then we change our multiplier to .05, and that becomes the constant number or co-efficient for all sums of money at that rate of interest. So the co-efficient of friction might be called the rate or amount of friction that prevails with certain surfaces under given conditions of smoothness and lubrication. Then multiplying the total pressure by this rate of friction gives the amount of resistance in pounds - pressure being the same factor in computing the effect of friction.

Mill shafting in these days does not often run on iron surfaces, the boxes being lined with babbitt metal, but I have no table at hand that gives the co-efficient for an iron shaft running on babbitt metal; but on bronze I have. The co-efficient is .251, which will answer our purpose for illustration. Suppose a three inch counter-shaft with two belts each in the same direction, 1,200 pounds each. This will give 2,400 pounds belt tension. Let the weight of the shaft and pulleys be 200 pounds, making 2,600 pounds pressure on the bearings. Inertia and atmospheric influence have nothing to do with the case, I think. Now co-efficient of friction .251, pressure 2,600 pounds, what is the resistance in pounds? 2,600 multiplied by .251 equals 652.6 pounds as the effect of friction. To reduce this to terms of horse power and determine its proportion to the whole of the driving force, we must make further calculation.

Suppose the driven pulley to be two feet in diameter and making 150 revolutions per minute. This will give a belt velocity of 942 feet per minute. Then, 942 multiplied by 1,200 (driving force) equal 1,130,400 dividend by 33,000 equals 34-horse power and an insignificant fraction as the amount of driving force.

The shaft is only three inches diameter and therefore does not move with the velocity of the belt on the pulley. The surface of the shaft moves only 118 feet per minute, hence we have 652.6 pressure multiplied by 118 feet equals 77,006.8, divided by 33,000 equals 2.333-horse power as the effect of friction. This is the theory of friction with all things perfect, but it is quite likely that in practice (fair practice, too) the friction would amount to one-eighth of the driving force.



## COOPERAGE D'PT.

There is a close affinity between the work of the cooper and the business of milling. The miller is either his own cooper, having a cooperage as an adjunct to his mill, or else he rests for his supplies on an outside cooperage. The cooper in any case finds one of his best customers in the miller. The object of this department is to bring each into closer touch with the other and to materially advance the interests of both trades.

### GENERAL MARKET SURVEY.

THE cooperage market has improved considerably. On the 28th of August, the new American Tariff Bill came into force on which staves go on the free list and the duty on hoops and heading is reduced to . . . While, this still practically excludes hoops and heading from the United States market, on prices which are at present in force there, still at times it will enable Canadian hoops and heading to go into the United States. Owing to the duty going off staves, the prices have advanced a little here but the effect has not yet been felt to any great extent on the other side, as there are very small stocks of staves on hand in the United States and manufacturers consequently take the advantage of rebate of duty here and do not give it to the American consumers.

The Canadian producer will get the benefit this year of the rebate of duty, and it will go in their pockets instead of the pockets of the American consumer.

The flour trade is very quiet all over Canada, and with the exception of a few of the largest mills, most of the flour is going into sacks and bags. A great many of the largest mills are running strictly on barrels, both for flour and corn meal, and they all anticipate a good run for the balance of this season.

The following are the present prices for flour and apple barrel stock F.O.B. cars Toronto.

	Per net 1,000
No. 1, 28 1/2 or 30" jointed elm staves	\$1 80
No. 2, 28 1/2 or 30" "	\$1 55
M.R. 28 1/2 or 30" "	\$5 45
No. 1, 24" jointed elm staves	\$4 60
No. 1, 5 1/2 ft. patent coiled hoops	\$5 00
No. 1, 6 ft. "	\$6 35
No. 1, 6 1/2 ft. "	\$6 60
Per net	
No. 1, 17 1/2" kiln dried basswood heading	4 1/2c
No. 2, 17 1/2" "	3 1/2c
M.R. 17 1/2" "	3 1/2c

### AMERICAN MARKETS.

THE probable effect of the new tariff on the price of staves is open to various interpretations in United States markets. The Northwestern Miller, of Minneapolis, says: "As far as is known, Canadian dealers are holding for \$6.50 per M. for No. 1, especially on future contracts. That the tariff question will make any material difference in prices has not fully developed. The opinion now seems to prevail that the new tariff law will be interpreted as making Canadian staves free. There are still more or less elm staves reported offered from Michigan and other domestic manufacturers, for prompt shipment, at prices all the way from \$6.15 to \$6.50. These staves are regarded as of varying quality, ranging from very poor to fairly good. Heading is not changed in position. While 3 1/2c per set is the recognized market price, it is stated that some parties are so reckless as to be willing to sell for less." The Lumberman of the same place, remarks: "The association price for heading has been forced down. At the last meeting of the association, some months ago, the association price was lowered from 4 1/2 cents per set to 4 cents and it was hoped that it could be held there until there was a sufficient demand to return it to the old figure. The stocks of manufacturers outside of the association, were supposed to be small, and it was expected that they would be exhausted in a short time, so that the association could control the market. These stocks, however, held out right along and the owners were continually cutting into the market with goods offered at a lower price. The association held on for a long time, but finally it was decided that there was no further use to make the effort and continue losing trade, and so the association price has been reduced to a minimum limit of 3 1/2 cents per set. At this figure the heading is sold at below cost but this low limit was placed in order that the members should be at liberty to compete with those outside of the association. Minneapolis coopers are not very well pleased at this turn of affairs, as most of them have already contracted for some time ahead at 4 cents, and to

see the market drop a whole half cent below their contracts, gives them the idea that they are not as well off as they might be. Elm staves are still at the same figure, though the change in the tariff is expected to be felt before long, when there will very likely be a drop. The Canadian manufacturer who has heretofore had to compete with the manufacturers on this side of the line, as well as the tariff of 4 1/2 cents per M, will be in a position to make a lower price than has been quoted, and the native manufacturer, in order to hold his trade will have to make a like move. Prices are already weakening, and it is reported that Ohio and Michigan staves can now be secured at prices varying from \$6.25 to \$6.50 per M."

### THE MANUFACTURE OF BARRELS.

IN the several articles on cooperage that have appeared in these pages for some months, the writer Mr. B. F. Pratt, of the Wood Worker, has been dealing largely with the question of stave making and the labor back of that in securing the raw material from the forests. He now brings us up to that point in the trade where he deals more directly with the manufacture of the barrel itself. Mr. Pratt says: "I have tried to reach a point when I could introduce the reader to manufacturing barrels, but through the details of such a thing as stave making and other things relative thereto, we have only now reached it by the straits made in this direction.

Commencing in the woods, originally this form of barrel making was but little thought of, as skilled workmen could only be found in large cities; but in order to work up the waste of stave yards, coopers have been induced to go to the country for the class of work we use in picking houses only—which is made by the hand cooper; pickle work is made of the same material, but usually the staves are shipped to market for pickle-barrel coopers. That, however, is done more extensively by machinery. We will first take the original way of making barrels and come to the progressive way later on.

The hand cooper in a good timber region can start a cooper shop if he has a suitable building for one or two men to work in—any kind of an old log house or wooden structure, with windows for light and a large chimney for firing barrels—providing he has tools, with an investment of \$25, by buying rough or sawed oil-barrel staves or heading to work. Of course, he depends on selling his barrels every week to a dealer. One man, who is a rapid workman, can usually make twenty tierces, often twenty-five, per week, of stock like split staves, and make his own heads. Coopers find it profitable, usually, when they can get heading ready made, to buy it; but in the woods our country cooper takes split heading, and with a broad axe hews off the surplus weight from the smooth side of the head or the side he intends for the outside, then sits down to a shaving horse and with a heading knife (a long drawing knife) he smooths his heading up for the jointer. With a hand-jointer with a concave face, he makes a joint that is dished slightly; then with a hand-doweling machine he bores holes for the dowel-pins, which are also made by hand, with a form which is simply a hole in a piece of iron or steel, three-eighths or five-sixteenths in size, through which pieces of tough dry oak or hickory are driven to make pins the right size and kind. Now the pieces of heading are doweled together, first putting in strips of flag between each joint, and the head is in shape to get the circumference so as to turn it down to fit the barrel. Coopers make heading for a day's work usually in the morning, leaving it square until their barrel is set up. They use a "float" to smooth the rough, outside places, especially in working sawed heading, as this is by far the easiest to work.

Now for the preparation of the staves and hoops: This must be done in order to make three or four barrels a day, which is a good day's work. Split staves are treated the same as heading; often the froe is used to hew and split off the surplus and defective wood; then with a backing knife the stave is backed perfectly. Then a knife the shape of the hollow is used to hollow it out: each edge is listed and the stave is ready for the hand jointer. This is a plane longer than a heading jointer and faced convex, so if the bit is set correctly, when the stave fills the shape of the plane it is slightly convex, so when the two edges are set together the stave will only be touching in one place, or, as coopers term it, rolling from the end of the stave to the center or

bilge. How much this is done depends on the width of staves. A man with a mechanical eye always knows by the run of the width of his staves how much joint to put on.

Staves from oil barrel culls usually run eighteen or nineteen to the barrel. If sound knots are in the stave that will come under the hoops they often put in wide staves of this character and thus get out a barrel of average appearance. If a good mechanic sets it up this is done by taking a lard tierce set of tress hoops, with twenty-one inch head hoop (the hoops are made so the bilge or largest of the set will slip over the head hoop), and the set of staves is held against the body and the head hoop is made to take in the set of staves, which, after being jointed, the set can be fitted by taking out one that is too narrow and inserting a wider stave until the hoops are full, a bilge hoop being driven down to the center or so near it the cooper finds his joint and everything is all right. He leaves the bilge hoop to hold the barrel in shape and knocks his head hoop off, putting on the quarter hoop. Now he puts on the head hoop again, and driving his hoops on tight with an adze or hammer, sets his barrel on a cresset, a slow wood fire being prepared of the chips and waste from staves and heading, and barrel No. 1 is set on to fire. If he has tress hoops to get another barrel ready to fire, he does this while the first barrel is firing; if not, he splits his poles and shaves his hoops while the barrel is getting hot, after which he takes it off and, with a band windlass consisting of a rope sufficiently stout and long to go to the end that is not in tress hoops, his wooden windlass is set to work and this end is brought to a close and the end tress hoop driven on while it is in the windlass; then the bilge hoop goes on and the quarter hoop, and the barrel is put on the fire for at least ten minutes and made perfectly hot. Care must be taken to not char or blacken the inside of the package. There must be one level place in a cooper shop and now is the time to find it. The tress hoops are driven in their places and the barrel leveled up. A knife known as a chamfering knife is used to make the chamfer or bevel; a leveling plane to level it off; then a bowl to bowl out the surplus wood; then a croze is cut with a lance. All of these tools are specially made for the business, and each set is made to suit the size of the package they are to work on.

The only mechanical work now left to do is putting in the head. This is done by the use of a compass. The barrel is stepped around for times with a compass, and if the point comes exactly or a little scant of sticking the starting point, you have the center of the head and the head is then circled and made to fit. The barrel has got cold and the head is made perfectly tight by flagging the stave joints all around the head. Hoops, having been set up beside the chimney, are now hot. Measuring from the center of the head to the outside of the barrel, we have the distance it requires hooping, or one-third is the space necessary to be covered on each end. The locks to each hoop are cut by measuring around the barrel. The hoop is tried. If too long, the "dutchman," a small piece of wood cut triangularly, is fitted in and the hoop driven to its place. This is done until about eight hoops are made to cover each end, and the barrel or tierce is fully two-thirds covered with hoops—"a standard package." This must be thirty-three inches long and twenty-one inches in the head.

Some packers want all hickory hoops, some end and bilge hoops hickory and the balance oak, and others say all oak is good enough so they are not too high in price. So it is. Oak is the best if exposed to too much water, but for all kinds of service one is about as good as the other. "Olio" packages are made exactly like a tierce except the steel hoops used on them, which are the same as the beef tierces of 1860 and 1870, except the beef tierce was made free from sap.

Pork barrels and half barrels are made exactly as the tierce, only requiring special tools for the work. Lard kegs are a thing of the past. They were made in like manner, but are not likely to ever come into use again. Pickle barrels are made, when wood-bound, free from objectionable sap, and quarter-bound only, having fourteen hoops, and are all, like the cider barrel, made in seventeen and one-half-inch tress-hoops. They are not likely to soon be changed from the old style.

FLOUR MILL FIRES.

By J. C. BOWERS, IN "MILLING."

**T**HE rapid increase in the number and magnitude of fires in past years seems to many people who have given but little attention to the subject to be a mystery. This subtle element, so useful to mankind when confined within the limits of safety, now so often bursts those bounds that we may reasonably suppose there is never a moment when there is not somewhere, more or less destruction in its ravages. Ever somewhere may be seen the cloud of smoke by day, or the crimsoning sky by night, telling of distress and disaster from this prolific source of evil.

A comparatively large portion of these fires may be traced directly to flouring mills. In no building used for manufacturing purposes, is the danger of fire more apparent than in that of the flouring mill. The rapid spread of fire from floor to floor, often directly from basement to attic, is many times due to faulty construction, especially of the interior, for where great pains and expense are expended on solid and comparatively indestructible outside walls, the interior construction is likely to be decidedly unsafe. Every mill, as a matter of course, is composed of material which is of a highly inflammable character. There is a network of spouts, elevators, posts, floor beams, belting, etc., all of which are so closely interwoven that in many places the light is almost entirely shut out. The elevator legs form a large number of wooden flues, which constitute excellent concealed passages for smoke and flames. By means of these hidden flues a fire has a chance to spread unobserved with astounding celerity, at the same time, most difficult to reach the flames with water.

Brick or stone buildings, as usually constructed, are no better nor safer than frame structures. It is true, stone and brick walls afford protection against flames from the outside, but they form merely the outer shell. The walls are often so thoroughly protected that there is but little chance to act upon a fire from without and the building forms a roaring furnace which no one dares to enter, in fact those who chance to be within often barely escape with their lives when the fire has made itself apparent to them.

Another great inducement for a fire to spread upward and in all directions is the open stairway. There is every opportunity for fire to play "hide-and-go-seek" from cellar to attic in spite of the shrieks of the watchman and neighbors, and the yells of the populace, or the earnest, hard work of the fire department, when they arrive too late to be of any service. When we read: "The elegant mill of \_\_\_\_\_ took fire last night, and in spite of the most heroic efforts of the firemen was totally destroyed. Every effort was made, by those who first saw the fire, to extinguish it, but it had burned its way into the stair way (or hatchway) where it could not be reached, and the smoke soon drove those who were so earnestly engaged out of the mill. The loss could not be less than anywhere from \$10,000 to \$100,000. We most sincerely sympathize, etc." But not one word of wisdom or caution as to the manner of building, or procuring means to prevent the destruction of another when by carelessness or accident it once takes fire.

The secret of fireproof building is this: It must be made impossible for the flames to pass through the floors or up the stairway. This, of course, is rather difficult to accomplish in the construction of a flouring mill. An effort should be made, at least, to avoid the danger as much as possible. The following suggestions might be offered: Lay a flooring of the thinnest sheet iron over the joists, and the wood flooring upon that, and sheathe the stairs with the same material. A floor will not burn without a supply of air under it. Throw a dry board you upon a perfectly flat pavement and kindle it as it lies if can. You may make a fire upon it and in time consume it, but it will require a long time. By using thin iron it could be easily cut with cold chisels and shears for spout holes and the edges turned up. A short section of spout made of sheet iron could be made use of above floor. A drop valve made of sheet iron could be applied to guard against fire entering a spout from below. These sections of spouts would add very little to the cost. They could be made quite cheap by any tinner or sheet iron worker and cut to the proper bevel by the millwright.

A difficult task would be to prevent fire from going up

the elevator legs. The draught, however, could be checked, in a measure, by the application of brushes, the frame of which to be lined with iron. They would serve the purpose of dampers to check draught as well as to be of service as a brush. They could be applied to each elevator at intervals of ten feet apart. The stairway should be enclosed with fire brick walls or at least a wooden partition lined with iron. The main upright belts should be enclosed. As few belts as possible, however, should be used from one floor to another. Prevent draughts and, though there will still be fires, the chances are that discovery is certain in time to prevent any great calamity.

An item which helps to fill the newspapers, therefore, is somewhat as follows: "Destructive fire. The mill of \_\_\_\_\_ was found on fire last night by persons passing on the street. There seemed to be but little fire and that in the basement. It soon, however, reached from one floor on to the next and although the fire department was on hand as usual, yet before they got to work the flames had found their way through the roof and contents were all ablaze. The department succeeded in confining the fire to the \_\_\_\_\_." This would be varied, not exactly according to the weather, but of the wind. Why, then are not the mills provided with safety stairs or hatchways, which can never be open except when in use? Why are not stairways enclosed with fireproof material and the doors made fireproof and self-adjusting? Because it is not the law, with a severe penalty, that they should be placed in every mill, warehouses, etc. That is the simplest reason. It cost something.

When fire catches at the bottom it rushes up the narrow space, roaring like a chimney on fire, and in a moment or two, often before an alarm can be sounded, the great building is on fire in every story. Before a fire extinguisher can be got to work the fire has enveloped the building and become so intense that even the extinguisher can be of little other use than to confine the fire to the mill itself. If the fire can be kept in one story the first engine would have made short work of it. For want of that it was in every story before it got to work at it.

A certain mill may be found to be on fire in the third or fourth story, having caught in the basement, and at first seen up there, though it was at work in all the lower stories. There is not the smallest chance to put out such a fire from destroying other buildings.

A great many such fires are seen when so small that with the same coolness and presence of mind with which we attend to other affairs, and with proper implements for extinguishing them, such as are provided for our other work, would be put out in a few minutes, and with so little loss as to hardly be worth telling of to the neighbors. It is indeed an exceptional fire that could not have been extinguished in its earlier stages, if the means at hand had been used with intelligence and energy. As in every other crisis of life, organization is superior to random effort. The thinking must be done beforehand. It is bad generalship to form the plan of battle in the presence of the enemy.

In the construction of a flouring mill the most effective means of retarding the spread of fire should be employed, the aim being that the limits of destruction shall be reduced to a minimum by making mills slow-burning rather than striving to make them fireproof. A fireproof factory building is considered a commercial impossibility—how then about a fireproof mill?

CLEANING WHEAT IN THE MILLS OF SCOTLAND.

**M**R. W. G. ANDERSON, manager of the Dundee Flour Mills, recently delivered a lecture in Dundee on "Wheat, Flour Manufacture, and Bread." After describing the methods of storing the grain, he passed on to explain the process of wheat cleaning. In Scotland what was looked upon as a full and complete wheat cleaning system was not required, for the simple reason that only the best, and therefore the cleanest, wheat could be used to make that high quality of flour demanded by Scotch people. Most of the Indian, and many sorts of Russian and La Plata wheats, were so dirty that nothing short of what their Yankee cousins called "the laundry system"—a thorough washing and drying—was absolutely necessary to put them in

proper condition for flour making. Indian wheat especially was so dirty that in some years the import of dirt into the United Kingdom has been estimated at over 3,000,000 hundred weight, the whole of which, with the exception, perhaps, of a very infinitesimal proportion, found its way into English ports. It was, however, surprising to note the quantity of refuse that came from even the finest, cleanest looking wheats. The removal of all impurities and foreign matter before sending the wheat into the mill to be ground, was one of the most important duties. If these impurities were not entirely removed before milling, their presence for evil was felt to a greater or less extent throughout the whole mill. It might happen that an ordinary quality of wheat well cleaned would yield a flour as good as, if not superior to, that made from a finer quality carelessly cleaned.

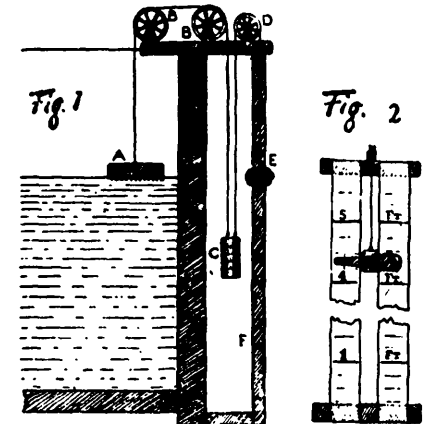
The outstanding principle involved in the machines used in the cleaning house was separation. This was effected by the use of machines based on the principle of separation by difference in weight and size, by difference in structure or shape, by friction, and by magnetism.

AN INDICATOR FOR WATER TANKS.

**A** CORRESPONDENT of the *Sawmill Gazette* gives the following description of an indicator he put on a water tank and found to work perfectly:

The ordinary indicators used on tanks have the figures reversed, that is to say, the indicator goes down as the water in the tank goes up. With this indicator, although simple in construction, the finger always remained precisely at the level of the water.

In Fig. 1, which is a sectional view of the tank and indicator, the usual float is represented at A. It can be made of tin or wood, as necessity or convenience dictates. From the float a stout cord or piece of pliable wire runs over the small pulleys BB to the weight C. From the weight another smaller cord runs back up and over pulley D to the indicator E. It is plain that when



AN INDICATOR FOR WATER TANKS.

the float goes up the weight will descend, and when the weight goes down the indicator will ascend. When the three are properly adjusted the indicator will constantly remain at the level of the water. Care must be taken with regard to the weights of the float, indicator, etc. The weight of the float and indicator must be sufficient to overcome friction and fall readily and also sufficient to overbalance the weight C, so that when the water falls the combined weight of float and indicator will lift it. On the other hand C must be heavier than E, so that when the water floats A the weight will immediately pull the wires tight and maintain the correct position of the indicator.

In Fig. 2 the front of the indicator is shown. Two narrow boards are fastened so that a slot is left between them in which the indicator block may slide. The block should fit loosely in the slot and have the finger and a piece on the back, shown by dotted lines, bolted to it. In constructing the indicator plenty of space should be left between the tank and the boards F to permit the weight to rise freely. If the wind blows the weight about, the space which it occupies should be boxed in.



Office of the CANADIAN MILLER,  
September 10, 1894.)

#### THE GENERAL SURVEY.

HOW will the present crop compare with that of a year ago is a question that is being actively discussed at the present time. Harvesting is well enough advanced to enable one to look into the question with more certainty of arriving at actual results than even a month ago.

The Vienna report of the world's wheat crop for 1894 has been issued. Whilst in some quarters this report is viewed with authority, yet there has been good reason to discredit some statements made in former years. The method adopted in giving the yield of European countries for 1894 is by percentages with 100 as the standard for 1893 making comparisons as follows:

	Wheat.	Rye.	Barley.	Oats.
Austria	100	93	98	96
Hungary	99	96	94	98
Germany	107	95	107	105
France	120	125	100	115
Great Britain	17	110	110	105
Russia	82	97	97	86
Moldavia	87	90	90	90
Wallachia	87	40	40	40
Netherlands	87	97	92	112
Belgium	102	107	100	102
Switzerland	100	110	100	100
Denmark	105	95	100	100
Sweden and Norway	95	92	102	102

The yield of the United States is placed at 370,000,000 bushels of wheat against 382,000,000 last year. It is well known, however, that these figures, as giving the crop in the States a year ago, are wide of the mark, and in this particular reflects unfavorably on the Vienna report.

Taking our information from another source, namely, the calculations made by the London Economist, it is stated that the crop in the United Kingdom will be bountiful, though the acreage will show a diminution over a year ago. The total yield is placed at 6,000,000 bushels greater than last year. Spain, Portugal, Italy, Germany, Holland and Belgium all show an increase over a year ago. Austria-Hungary and probably Russia do not show up as favorably. The crop in the United States is placed at something between 400,000,000 and 475,000,000 bushels, which is likely to be nearer the mark than the Vienna report. The conclusions of the London Economist are summed up in these words: "Both Europe and America will probably produce less than the quantities grown in 1894; but unless other parts of the world fall off greatly the total production can hardly fall below a year's consumption, while there are still remnants of the great accumulations of the last three years to clear off, so that there is nothing at present to indicate any substantial improvement in the price of wheat."

In our country the prospects are favorable. Ontario's crop has been placed at about the same figure as last year. It may be, however, that the intensely dry spell of the past two months will have affected the quality of the grain when it comes to be threshed. It looks as though Manitoba would be favored with a crop averaging an increase over some other years. The yield per acre in many quarters is turning out better than was shown by reports of a month ago. The government bulletin for August estimates the yield as follows: Wheat, 17,761,868 bushels, and the average for the province 15.6 bushels per acre. Oats, 12,197,772 bushels; barley, 2,182,320 bushels; peas, 20,000 bushels; flax, 282,480 bushels; rye, 53,074 bushels. The gross total is 30,497,714 bushels.

These figures are improved upon by conditions since the August report was issued. The condition of the weather, with heavy dews and cold nights, has caused the wheat to fill out well in the face of the unusually dry spell. In some parts of the Assiniboia district it is not

supposed that the crops will figure out as well as in Manitoba.

When we get away from a study of these figures, and conclusions as to results in the future will vary according as the individual makes his calculations even from the same data, and faces the situation just as it meets us today, there is still very little of a hopeful outlook for wheat.

Senator Washburn, of Minneapolis, the great flour miller, when in Montreal a few days ago, reiterated the opinion that has been several times given on good authority, that it is hardly possible for prices to go any lower, because "wheat is really worth more," but as the Montreal Trade Bulletin very plainly says in an article, which we reprint elsewhere, to rest on the supposition that wheat or any other commodity cannot get below what it costs to produce it, is a broken reed to rest on. The facts are that the price of wheat keeps down, and when we consider the size of the new crop, take whatever estimate one may, and remember that in public and private store houses in Canada and the United States there are still immense quantities of old wheat, it does not seem as though there were any circumstances shaping to cause wheat to go up permanently in price.

#### CURRENT PRICES OF BREAKSTUFFS.

WHEAT—Toronto—New winter wheat has been offering at about 52c. west. The purchases by the millers at the price are small. Manitoba No. 1 hard west, offers at 68c. and east at 70c. Montreal: No. 2 Manitoba hard, 66c. to 68c. Chicago: No. 3 spring wheat, nominal; No. 2 red, 58c. Duluth: No. 1 hard, 61½c. for Sept.; No. 1 northern, 55c. for Sept.; No. 1 northern, 56c. for Dec.; No. 1 northern, 67½c. for May. Toledo: No. 2 cash and Sept. 53½c.; Oct. 54½c.; Dec. 56½c.; May 61½c.

BARLEY—Toronto—An unsettled market. Feed sold outside at 38c. to 40c. In United States markets there is a fair enquiry for barley and prices are gradually creeping up under the influence of a strong market in the West. No Western is offered at Buffalo below 55c. and from that up to 60c. Canada, although nothing has been done, is being figured on to considerable extent. The range is placed at from 60c. to 65c. in Buffalo.

OATS—Toronto—White oats for milling have been sold west within the week at 29½c. Mixed in demand at 25c. White quoted at 26c. to 27c.

PEAS—Toronto—No very large call, but feeling steady. Car lots of choice new peas are being taken for export; middle freights west, at 56.

#### THE FLOUR MARKET.

The flour market remains practically where it stood a month ago. Millers are yet buying slowly of new wheat and the disposition is to wait a little and see how conditions shape. Export markets do not improve to give any new encouragement in that direction. The demand for mill feed is firm and active. In the course of another month the trade will be able to speak in a more definite manner as to the prospects for fall trade.

#### PRICES OF FLOUR AND MEALS.

TORONTO—Flour: Toronto freights, Manitoba patents, \$3.40 to \$3.60; Manitoba strong bakers, \$3.30 to \$3.40; Ontario patents, \$2.90 to \$3.00; straight rollers, \$2.50 to \$2.70; extras, \$2.50 to \$2.60; low grades per bag, 85c. Bran, \$13 to \$13.50. Shorts, \$16.50 to \$17.00.

MONTREAL—Patent winter, \$3.30 to \$3.40; patent spring, \$3.40 to \$3.50; straight rollers, \$3.70 to \$3.90; extra, \$2.40 to \$2.50; superfine, \$2.30 to \$2.40; strong bakers, \$3.25 to \$3.40; Ontario bags, \$1.30 to \$1.40.

#### RUSSIA'S FLOUR TRADE.

SAYS the London, England, Milling and Market News: There were in operation in 1893 along the basin of the Volga 189 flour mills, and the flour produced amounted to 7,365,000 sacks of 280 pounds. When considering the rapid development of flour-milling in Russia, it may surprise some of our readers to know that last year the exports of Russian flour were represented by 385,700 sacks, and of rye meal by 565,500 sacks of 280 pounds, in comparison with 332,600 sacks of the former and 526,000 sacks of the latter in 1892.

#### SELECTING WHEAT FOR THE MILL.

BEING able to intelligently and properly select wheat for the mill is a matter of both knowledge and experience. The proper person to make the selection is the one who knows about what kind and what quantity of flour it will make, as different varieties of wheat differ very materially in this respect.

One kind of wheat has heavier and more bran in it than another, and hence does not yield so well. Then again some kinds will make whiter flour than others, and all grow in the same neighborhood. Occasionally, too, the same varieties vary some in this respect just as the soil varies in chemical combination.

There are still other conditions of an artificial nature that have to be taken into consideration and are best judged by men of experience. Wheat that has been badly taken care of by the producers and allowed to get damp and musty, or if only tinted in that way is not so valuable as sound and sweet wheat. Unless quite damp and otherwise badly damaged it may not be detected by the inexperienced buyer and the mill get a supply of inferior wheat.

As a rule, in mills of ordinary size the owner or whoever may have charge of the office has the wheat buying and very often such men have but little knowledge of it, none, as a rule, but what is acquired by force, and that is all right provided the practice has been long enough, but the misfortune is that many of them jump into the buyer's position without practice or experience of any kind and go it blind, to the injury of the business.

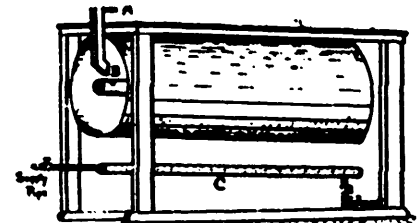
The miller, if he is a miller, is in reality the proper person to select the wheat for the mill. Selecting in this case is scarcely the proper term, because most mills, in the country especially, that depend on farmer's deliveries, are obliged to take everything that is offered if not too badly damaged. But what is here meant is that selections should be made in reference to relative value for flour making purposes and the different kinds of wheat distributed accordingly into different bins, where they can readily be made available for the kind of work they are best suited for, and of that the miller is the only judge.

To save disputes with the farmers, the millers as a rule pay the same price for all kinds of sound wheat that weigh about the same, notwithstanding there may be considerable difference in real value. But even though that is done the miller should still do the selecting to the extent of assigning each kind to its proper place in the warehouse.

Millers should always refuse to accept badly damaged and unsound wheat, as it is not fit to make flour with and by mixing it with good stock they so damage flour as to cause them primary loss as well as loss of reputation.—The Trade-man.

#### A HOME-MADE WHEAT STEAMER.

THE wheat steamer, here illustrated, is a design furnished by C. E. Lees for the American Miller, and can be made at a small cost by any miller or millwright, and will prove very satisfactory. The wide at A is to regulate the amount of wheat going to the reel. At B is a



A HOME-MADE WHEAT STEAMER.

swinging door which prevents the steam from going up the wheat apart, and at C is a perforated pipe supplied with steam by the steam supply pipe.

In steaming with this appliance the wheat enters a short reel about four feet long, clothed with coarse wire or perforated metal. Directly under the reel is the perforated steam pipe. The steam in rising passes through the cloth, and as the reel revolves it steams every grain as thoroughly as desired.

**VIEWS AND INTERVIEWS.**

**Flour and Grain Prices.**

The average export price of wheat from the United States for the year ending June 30, says Price Current, was 67.2 cents per bushel, compared with 79.9 for the preceding year, and an annual average of 90 cents for a period of ten years ending with 1893. The average price of flour exported for the year was \$4.11 per barrel, compared with \$4.54 the preceding year, and an annual average of \$4.81 for ten years ending with 1893. The decline in valuation of flour being less than in wheat, is suggestive of the view that the exports embrace a higher average in quality compared with the previous years.

**Testing Flour.**

Just what ground should be covered in testing flour is a moot question with millers and bakers. A writer in the *Helper*, however, says that for all practical purposes it is only necessary in testing flours to find color, water-strength and gluten. Although the natural moisture in the samples under examination may vary from ten to fourteen per cent., yet this makes no difference in the end, if the other points are known. For instance, take two flours alike in general respects, but one having fourteen per cent. of moisture and absorbing sixty-five per cent of water to make a dough, and the other having ten per cent. of moisture and absorbing only fifty per cent. of water to make a dough; it follows that the former is the cheaper flour notwithstanding the fact that it has more moisture. Hence, the determination of moisture in a sample of flour is only valuable in an educative sense. If the purchase of grain for horse feed were under consideration then it would be profitable to weigh a hundred grains of each sample offered and dry them till they lost no more weight, then weigh again; the difference is water evaporated; and the sample having the greatest weight when dried, is the cheapest to buy, other conditions being equal. Remarks as to moisture also apply to the soluble extract of flour. This is found by mixing a known weight of flour and measure of water together in a bottle and allowing the flour to settle; then decanting off a certain measure of the clear liquid and evaporating to dryness. As a general rule, the finding of the weight and character of the gluten will fairly determine whether there is present a dangerous amount of the soluble extract.

**The Trade Journal.**

The following from a British journal in the printing trade, is well worth reading by tradesmen in all lines:—  
 "From being a mere advertising sheet, representing only special individual interests, the trade journal has become the great organ of communication between manufacturers and dealers and their customers, and has helped and is helping to bring them into closer relations with one another. It has become one of the best educators, and, since the general abrogation of trade mysteries—better known as secrets of the trade—it has done a good work in the spread of technical knowledge among all classes, to the benefit of the entire community. So well has this become recognized that a man is regarded as behind the times who does not take and read at least one journal devoted to his trade or profession. There are many who may say—and some who actually believe—that they cannot afford to take a trade paper, when the truth is they cannot afford to do without one. If a man is content to follow in one beaten path all his life; if he is so wise in his own conceit that he thinks he knows it all, and that nobody can teach him anything; if he is content to remain in sudden ignorance because he cannot see that the knowledge offered him is going to bring him an immediate return in cash—then, in all such cases, a man cannot afford to pay for a trade journal. But if he would keep abreast of the times in his own calling; if he would know what new inventions and discoveries are being made that directly affect his own interests; if he would profit by the experience of others as told in print; if he would know everything possible connected with his own calling, so that he may be able to converse intelligently, not only with his co-workers, but with outsiders seeking information—then the trade journal is indispensable. It is a power in the land, and

he who rejects its friendly aid will soon find himself at the rear end of the procession. He cannot know too much of his own calling."

**Feeding Flour to Stock.**

Wherever we turn the question of feeding flour to stock is being widely discussed. Experimental stations are making the matter one of investigation. Millers are talking it; farmers are talking it; the grain man is thinking about it. It is a live subject in Canada, as also in the country to the south of us. A milling firm in Winona, Minn., write at some length on the subject in a late issue of the *Northwestern Miller*. They say: "It seems to us that millers should join hands in circulating the results obtained by state experimental stations, in the use of millfeed and low grade flour for feeding stock. This is one thing, at least, on which all millers can unite without arousing the jealousies and antagonisms of the past, and which will largely solve the problem of over-production and lack of milling profit. If the miller could run into one bin all below a patent (or a choice bakers') and have a demand at home for such a feed, his cares and lamentations would be greatly reduced. There would be no difficulty in grinding practically all the wheat grown in this country, if the farmers would use such a feed for their stock, in place of corn, oats, etc., for we would have only patent flour to export, which we could easily afford to sell in competition with the world. All millers should do their utmost to induce farmers to stop feeding wheat entire, as being an extravagant method of using wheat, and, instead, advocate their buying the less valuable part of wheat, i. e., all below a patent flour, as being fully as valuable for feeding as wheat entire, or ground without the patent being saved. The low prices now quoted abroad for bakers' and low grades are brought about by our forcing on the markets far more than their requirements of such flour. Now is the time to work these grades off at home, relieving foreign markets, and opening, for years to come, a new outlet, and one that will consume vast quantities of the product of our mills. There is no reason why millers should not see as profitable milling as in years gone by, but it will be when we export only patent flour, and all below that grade will be consumed at home by our farmers in feeding it to cattle and hogs. There will be no cry of over-production, as our mills will be unable to grind up the wheat grown and now going abroad for foreign millers to reap the profit we should have in grinding. May it come soon—the sooner the better."

**FLOUR: A BRITISH VIEW.**

THE Miller, of London, Eng. in its flour trade review of the month is concerned over the condition of the wheat and flour market, as is everyone else, and says: Wheat at 20s. per quarter is an event by the side of which other trade occurrences may be regarded as insignificant. That not one sort of wheat alone is down to that price, but that there are at least three competitive sellers thereof is in a different way an even more notable fact. Discussions as to the lowest price at which wheat can be profitably grown are for the time being superseded. Neither by the La Plata or the Mississippi, nor on the broad steppes of Russia, or in the rich alluvial delta of the Punjab can wheat be profitably grown and sold from ships anchored in the Thames for 20s. per qr. Freights may be low, trade charges may be cut down, insurance offices may bid against each other for custom, but put all these charges at the lowest, and still the thing is out of the question. Wheat at 20s., delivered in the port of London, is not an article which has paid the producer his "living wage," or which, having paid that wage to the producer, has remunerated the middleman, the intermediary between the foreign wheat grower and the English miller. We are, therefore, witnessing a competition such as in the old coaching days was not infrequent. It is no jest, but a veritable occurrence, that the coach fare from Exeter to Plymouth having come down through competition to 5s., one of the rivals ran for nothing, while the others rejoined by taking all recognized customers gratis, and sending them a free dinner en route. The object, of course, was to run rivals off the road, and temporary sacrifices became possible good policy with a view to a permanent assured position for the future. The sooner it is recognized that without formal resolution

Argentina, America, Russia and India have none the less entered upon this last and destructive phase of competition, the better it will be for English farmers, who will scarcely venture to be a fifth in the field. The question of the hour for millers is as to how long the present stage of competition can possibly endure. Is it "the accepted hour" for them to buy and store, so as to profit by the situation, or is the struggle destined to last for a long while, and are present prices rather the beginning of a protracted end than the end itself?

**A MONTREAL GRIEVANCE.**

THE following letter is published in a late issue of the *Montreal Trade Bulletin* over the signature of "A Victim":

Your last issue has a very good article on this subject, and your remarks as to why this trade is going past Montreal should be taken up in earnest by our Board of Trade and Corn Exchange, and a little of the energy which they give to *Civic Finances* might very profitably be expended on this point.

The want of official inspection has so often been ventilated in your columns, and the loss of trade is suffering has been so clearly proved that it is needless to go over it again.

But the following is a positive fact, and will serve to reiterate the need of inspection if Canadian flour is not to be taken as a word of condemnation.

Two cars of a choice Canadian Patent were bought by a firm here and shipped to the Lower Ports. Complaints were received that the flour in barrels was not uniform, and on a very careful examination it was found that choice patent flour was at the top and bottom of the barrel and low grade in the middle.

How it was done, it is hard to say, but there is no doubt about it, that a Canadian miller did it.

Are our shippers to be exposed to these frauds without a chance of its being detected until it is found out by the consumer?

Are we to wait till we get a touch of national humiliation before this matter is taken up?

Echo answers, our Board of Trade and Corn Exchange have got something else to think about.

**THE NEW METHOD OF MAKING TUBES.**

THE new German method, announced some time since, of making steel tubes by punching the pipes from hot metal, is said to promise success in the manufacture of seamless tubes of moderate lengths: the process consisting simply in placing a bar of steel of square cross section in a matrix of sufficient length, then, without allowing time for the steel to cool, a mandrel having a rounded end is forced lengthwise into the mass. It is stated that in this way tubes nearly eight inches in diameter are produced, the pressure required to operate the mandrel being 180 tons. The end of the heated bar furthest from the mandrel is first made to abut against a strong and heavy slide, and, when the rounded nose of the mandrel has nearly passed through the bar, this slide is moved transversely so as to bring a hole in line with the advancing mandrel, which, continuing to move, punches its way through, the protruding end being then seized by tongs and entirely withdrawn. After the completion of these first operations, the bar, with its perforation, is subjected to a finishing treatment of drawing and redrawing until the required thickness of the shell is reached.

**THE FATIGUE OF METALS.**

THE metallic parts of machines that are in constant use if they are not fully strong enough for the work required of them, undergo what is known scientifically as fatigue. In metals there is a point in their resistance to pulling, bending or crushing which is known as the elastic limit. Beyond this limit, if continued in use, permanent strain begins. When machines are submitted to this limit of strain if it is not kept up too long, they may be restored to normal condition, just as a muscle is by resting. If the strength and power of a machine is fully equal to the task imposed upon it, it does not undergo this fatigue and the use of it may be kept up continuously until impaired by friction. The resemblance in this particular, to the muscles of man and other animals is very striking.



The particular purpose of this department is to create an increased market for Canadian mill products—flour, oatmeal, cornmeal, rolled oats, pot barley, horse meal, split peas, etc.—at home and abroad. The interests of the miller who grows the grain will have thoughtful consideration. Any matter that is likely to lead to an improvement of conditions in the local market of any of the various provinces of the Dominion will be carefully considered in this department. A close study will be made of the foreign markets with the aim of further developing the Canadian export trade. The Mill Law Commission covers very effectively the field of flour handling and buyers of mill products, not only within the borders of the Canadian confederation, but in Newfoundland, the West Indies, Great Britain and other European centres. This department will be made valuable to them in discussions of the conditions of the market in this country, reliable market data, the manufacture of mill products, methods of transportation and shipping, intelligence in its bearings and relationship to the milling industries. We invite correspondence from millers, shippers and buyers on any matter touching these important questions.

#### TARIFF CHANGES.

THE changes in the United States tariff will not, it is anticipated, help the milling and grain trades of this country to any remarkable extent, though we observe that some of our milling contemporaries in the States do not like even the little lowering of the duties that have been made on grain and flour. Wheat flour is simply reduced from 25 to 20 ¢. Oatmeal is lowered from 10 ¢ per lb. to 15 ¢ ad val.; oats and buckwheat from 15 ¢ per bushel to 20 ¢ ad val., and barley from 30 ¢ per bushel to 30 ¢ ad val. It is apprehended in some quarters that even in flour Canadians will be able through this reduction of 50 ¢ to place certain grades at points conveniently located for shipping. We do not ourselves see where there is much development to be looked for in this direction. The oatmeal trades ought to be strengthened by the change, just as they felt the pressure of the increased duties that came with the McKinley act. The greater benefit will come possibly to barley growers. An effort has been made by certain commercial journals in the States to pooh-pooh the necessity for the importation of any quantity of Canadian barley for malting purposes, but the most significant reply to this criticism is the comment of the malsters themselves, who say that they must have Canadian barley and who do not hesitate to affirm that their trade has suffered since the McKinley bill came into force. They now hope to be able to import larger quantities of Canadian grown barley.

#### PATENT FLOUR MAKING.

IS patent flour making the proper caper? is the question asked by the well-known writer on milling topics, Mr. R. James Abernethy, in a late issue of the Tradesman.

In briefly reviewing the subject, Mr. Abernethy says, it is necessary to go back a little way to examine the rise and progress of the custom in order to more clearly understand the matter.

Middlings flour making had its origin in continental Europe, but then it has never been known as patent flour making, but generally by numbers, according to grade, there being a great many different grades. The true patent flour was first applied in this country and still applied in this country only. The reason why it was first called patent flour has already been explained in these columns.

Looking backward upon the scene from the standpoint now occupied by the milling industry, it is a curious fact that the wheat of which some of the finest and most reputable flours are now made was a quarter of a century ago regarded with distrust by millers in general and the flour made of it commanded no respect in any market and had no standing above second grade. Many of the active population of this country, and among them millers, are not aware of this fact, but it is true nevertheless.

Hard spring wheat was difficult to mill and no miller wanted it, and when milled the flour was not valuable. To day it is reduced with the greatest ease and the flour is among the most valuable made.

The temporary success of the Hungarian flour makers along with the introduction of the purifier was what caused the change.

The trouble with the old-time millers was they did not understand how to successfully handle middlings—the art had not then been taught; and as hard wheat could not then be ground without a large production of middlings they did not know what to do. Of course they understood grinding middlings, but the result was second-grade flour, more of it than they had any use for; more of it than they, as a rule, could place with profit. The millers of that day ground wheat to make flour and not to make middlings, and when they got hold of wheat that made little flour and much middlings they were in trouble; and that is the reason why what is now known as the great Scotch Fife wheat was then in disrepute. It had as good flour making qualities then as now, but the millers did not know how to handle it.

The introduction of the purifier solved the problem. The middlings were run through the purifier and cleaned before being re-ground, and to what a change! Compared with any that had ever previously been made of the same wheat the flour was really magnificent, and when taking into consideration its natural strength and superior bread making qualifications, it took a position in advance of all flours made in the United States and soon commanded a higher price. This in connection with the fact that both wheat and flour were high priced in those days, made the business of patent flour making very profitable, and it at once became the craze in all hard wheat sections and later in the winter wheat sections as well.

For a number of years the conditions remained substantially the same. Profits continued to be good and the business of flour making very profitable, especially in the northwest. Gradually the soft wheat millers dropped into line and in a little while the practice of middlings milling and patent flour making became almost universal in the great flour making districts, and all for a time were making money. All this was then done with burrs. A little later the rolls, as substitutes for burrs, were introduced and middlings making received a new impetus. After that it can be fairly said the practice was pushed to extremes and a desire to make all middlings and no flour seized the millers of the country. But while this could not and cannot be done, the effort to do so has undoubtedly resulted in injury to the industry. Like all new things that are profitable and upon which there is no license or royalty to pay, patent flour making became in time such a large industry and so common as to wear out the novelty of it and in proportion reduce the profits on it. And to make it still worse an era of descending values set in and the very high prices obtained for all kinds of flour when patent flour making was first introduced has continued to fall until at last the lowest point on record has been reached. Flour is now so low in value that even a fair per cent. of profit would require a magnifying glass to find it at the close of the year's business when all other expenses not generally taken account of, when ordinarily figuring profits through the year, are taken out of it. The average aggregate profits are very small indeed.

The chief cause of the misfortune that has overtaken the business, leaving out of the question the present generally bad condition of business affairs, is that the quantity of patent flour has become so very large in proportion to the whole amount made that it is now and for several years been the basis upon which all flour values are fixed. It is the one leading staple commodity, instead of as it first was a luxury, so to speak, a scarce article for which the maker could obtain his own price.

In that respect it assumed the position that its name implied. It possessed the prerogatives of a patented article, not because protected by letters patent, but rather because the demand was far in excess of the supply. Had it been patented and controlled as patented devices generally are it would have remained a profitable business until very recently, at least. As it was, however, every miller had a right to make it, and every miller that could arrange for it did and does make it, and the aim of all that make a business of it was and is to make all that it is possible to make, until, as above stated, it has become the flour of commerce, upon which all value ratings are based.

It is an inviolable law of trade and commerce that sooner or later fixes profits upon commodities on the basis of the cost of production. Sometimes, of course,

profits are higher and then again lower, depending somewhat on the supply and demand, but in legitimate trade there is always a profit based on the cost of production.

The production of patent flour being so large, it is necessarily expected by commerce as the staple upon which the prices of flour are fixed, in accordance with the above mentioned laws of trade.

If the entire output of the mill was patent or could be made such, or even if 80 per cent. of it was, this way of fixing values would be all right and the flour makers would at all times be assured of a living profit. Unfortunately, however, such is not the case, for while some of the best hard wheat mills are able to make 70 per cent. of patent flour the average, taking both winter and spring wheat, will probably not much exceed 50 per cent. But if we allow it to be 60 per cent., there is still a remainder of 40 per cent. that commercial regulations take no account of. It regulates the price of the patent in accordance with the cost of the raw material of which the flour is made, without reference to the other 40 per cent. which is thus obliged to tail on behind, and have fixed upon it a price in relation to its quality as compared with the patent. And now when prices are very low and aggregate profits are small on the patent flour basis, it follows conclusively that the 40 per cent. uncared for must sell at a price all the way down from actual cost to a loss about equal the profits on the patent, which often leaves the mill with no actual profits and scarcely interest.

This being the fact, and there is scarcely a doubt of it, it requires no sage observer to see that there is something radically wrong with the practice and that some other course ought to be pursued by the millers in order to save themselves from the incubus imposed upon them by the abnormal lengths in patent flour making.

Before patent flour was made the aim of all good millers was to make substantially a straight or as much of a straight as it was possible to make, and on that product values were based. It is true that lower grades of stock had, then as now, to be made into lower grades of flour; but the leading commercial flour was in the order of a straight into which all that was possible was worked and the remaining products that could not be safely worked into the leader had to be worked into lower grades.

Now, then, the question comes up, would it not be better business practice, or a better business policy, to turn backward: a step and at least consider whether or not the millers of those days acted wisely? It may of course be said that they were unable to do any other way, as they did not know how to do differently, nor had they the facilities.

The probability of that will be granted, and for the sake of the argument it will be admitted that they were obliged to mill in that way, would it not now be acting the part of wisdom for our millers to go back and inquire into the merits of that way of doing it, as compared with the present plan?

The writer believes that in that respect the old way was much the best and much the surest money maker, when the results of years are added together. It is not exclusively for fun that flour mills are run, nor are they usually run for the benefit of the health of the owners, but for making money, or at least that is the aim, whether any money is made or not.

The patent flour certainly crushes the life and thereby all the profits out of the lower grades and is so doing leaves nothing for the miller but his feed and not always that. If it does not do that is it not a thing to be hated rather than loved and petted as it now is?

#### SAFETY VALVE.

IT is the prompt attention to little things that makes the successful engineer. The careless man is dropped at a convenient moment, and he has hard work to get another "job." The greater dangers are seen by all, and almost anyone can make the proper provisions. The engineer who sees danger, which may result in two or three day's "shut down," or a possible explosion, is the one who gains his employer's confidence and finally lands on top. Safety-Valve.

CORRESPONDENCE

Letters are invited from our readers on matters of practical and timely interest to the milling and grain trades. To secure insertion all communications must be accompanied with name and address of writer, not necessarily for publication. The publisher will not hold himself responsible for opinions of correspondents.

TERMINAL ELEVATOR CHARGES.

To the Editor of the CANADIAN MILLER.

Sir, The interest that is taken by your journal in matters pertaining to Manitoba and the Northwest ought to be pleasing to all interested in grain and milling affairs in these territories. I am constrained to write to you to-day on the matter of terminal elevator charges, suggested by the fact that the Great Northern Railway Company have recently reduced their elevator rates at Duluth to one-half cent per bushel for receiving, elevating, and discharging, including storage for 15 days, which is only one-half their former rate. Why should this rate exist at all? As one of our local journals here has pointed out, "railway elevators are simply freight or storage warehouses, built by the railways for their own convenience in handling their traffic. They make no charge for handling ordinary freight through their storage houses, and why should they charge for handling wheat, any more than for handling cases of dry-goods and boxes of groceries?" This may possibly be putting the matter just a little too strongly. Grain, as an item of storage, holds a somewhat different position to goods that are packed and are more easily handled than wheat or any other cereal. But it has been apparent for a long time that the charges for this work have been altogether excessive. I should certainly not object if the storage of grain could be placed upon just the same basis as ordinary freight, but it is not expecting too much that our railways, and that speedily, should reduce their rates for the storage and handling of grain. These rates ought to be reduced, if for no other reason, because of the reduction that has taken place in the values of grain during the last year or two. Expenses in other directions are coming down as a result of these changes, and why not elevator charges?

Yours, etc.,

MANITOBAN.

MARKING PROGRESS.

To the Editor of the CANADIAN MILLER:

Sir,—In this western hemisphere we are apt to pride ourselves on the perfect and progressive character of our business methods. We talk of ourselves as a go-ahead people, and it is true that there is a good deal of go-aheadiness about us, if that means sometimes a lack of care and conservatism. We are seldom afraid to experiment; at the same time it is fair to say that this spirit has led us to be in advance in many matters of the older countries. We find an illustration of this kind of thing if we look at the mills of this country as compared with those in certain parts of Europe. We could at one time and that not very long since apply this remark to Great Britain, but John Bull has caught on all right and his flour mills are about as perfect as you find flour mills anywhere. What John Bull has done other countries are doing to-day. Russia is developing her milling system quite rapidly and we are now told that western methods of the elevator system are being adopted in the land of the Czar. The point I want to get at is this, for I do not believe in lengthy letters, is that it is a difficult matter for any people to long hold supremacy of methods of manufacture in milling or any other line of business. And this condition makes it necessary, when we discuss the milling and grain situation, to remember that there must come into all calculations the fact, that even a country, so far a back number in many points of civilization as Russia, is to be counted as a well equipped competitor in milling and grain business to-day. And as with Russia so with other countries. Methods of transit, the railroad, the telegraph, the telephone, the cablegram, quick methods of putting the people of every country in touch with the rest of the world, are revolutionizing business to-day.

J. T. L.

The Chicago Board of Trade and the elevator proprietors have compromised their recent dispute. The rates on grain are to be 1/2 c. per bushel for the first ten days, and 1/4 c. for each additional ten days.

MILLING IN FRANCE

FOLLOWING is a summation of a "Traité Pratique de la Meunerie" published recently in France: Among the ancient Gauls the grain was not ground, but was eaten in its natural state. Later the underground was cooked and eaten in "pâtis" or in puddings. The first attempts to convert the grain into meal or flour followed the system in use among the ancient Greeks, who covered stones with a light layer of damp grain, which was then dried in the sun and afterwards crushed with a heavy roller of stone or metal. The next stage in the evolution of the mill was the pounding of the grain in mortars with wooden pestles. Then came the flat millstones, which were made to revolve, the one on the other, at first by hand and later by animal power. Windmills, of which quite a number are still in operation in Brittany, and which are said to have been in use in the Orient long before the Crusades, were at this epoch introduced into France and generally utilized until about the middle of the eleventh century; then, because of their irregularity, they began to be supplanted by water-mills. These were, at first, operated on boats anchored in bodies of water, but later were fixed in permanent constructions on the banks of streams. It was not until 1780 the art of modern milling was invented, as is claimed by two Frenchmen, Col. Ducrest and the engineer Favre. Their attempts to introduce the new process into France were futile, and they therefore went to the United States, where, with the co-operation of the American engineer, Oliver Evans, they established the first mill in the world using the *meunerie basine*. The first mill of this kind in England dates from 1780, and the first in France only from 1816. Since that time three kinds of mills have been in use in this country, windmills, water mills, and steam mills. Except in Brittany, where windmills do the grinding for the small farmers, these mills have practically fallen into desuetude in France. A steam mill was, it is claimed, built in France as long ago as 1742, but it was not until 1816 the development of these mills began. The grinding was all done by millstones until 1873, when the system of porcelain cylinders, supplanted later by metal (steel or *fonte dur*) cylinders, was introduced. This system had been in use in Switzerland since 1832 and in Hungary and Italy for a number of years prior to 1873. A number of mills now use the cylinders; in others the wheat is ground by millstones and compressors with cylinders are used to convert the grits into flour. The record gives the following comparative results obtained per 100 kilograms (220.46 pounds) of wheat by mill stone and by cylinder grinding:

Products.	By millstones.		By cylinders.	
	Flour (low) Kilo.	Flour (high) Kilo.	Flour (low) Kilo.	Flour (high) Kilo.
Flour of grits	68	30	72	36
First quality	75	35	78	38
Second quality	85	40	82	40
Third quality	90	42	85	42
Fourth quality	95	44	88	44
Losses	20	10	15	11
Waste	4.75	3	3	4
Total	100	100	100	100

The cylinder mills yield a greater proportion of superior flour than other mills, and their product is in greater demand among bakers and pastry cooks, especially in Paris. It produces not only a finer quality of bread and pastry, but it yields from 3 to 4 per cent. more bread than other flour. There are in France about 50,000 mills occupied exclusively with the grinding of grain. The annual consumption of wheat in France is about 340,536,700 bushels. This represents the respectable sum of \$358,980,000. These 93,000,000 quintals of wheat when ground into flour produce:

Description.	Per cent. quantity.	Metric quintals.	Price per quintal.	Value.	
				France.	Foreign.
Flour:					
First quality	70	65,100,000	\$1.50	\$97,650,000	\$107,350,000
Second quality	20	18,600,000	1.40	26,040,000	26,040,000
Third quality	10	9,300,000	1.20	11,160,000	11,160,000
Losses (Metric)	10	9,300,000	1.20	11,160,000	11,160,000
Waste	0	0	0	0	0
Total	100	102,300,000	1.20	122,710,000	135,710,000

The millers not only grind wheat, but also the inferior grains, rye, barley, maize, buckwheat and oats. By adding the value of these different grains for the quantity that passes annually through the mills we reach a figure above \$482,500,000. These figures are made upon the basis of the unprecedentedly low prices of grain prevailing this year. At the prices prevailing in a year of scarcity they would exceed \$772,000,000. The French milling

industry is thoroughly organized. In 1886 the National Association of French Millers was founded. Its headquarters are in Paris, and it numbers more than 3,000 members, including the owners of all the great mills in the country. This powerful association holds an annual congress in Paris in September, where the various questions of practical or commercial interest to the trade are discussed. In connection with the congress a splendid exposition is made of milling apparatus, tools and materials. This organization is constantly on the alert against foreign competition in the French market and is a factor always to be considered by those who are interested in extending the demand for flour in France.

ONTARIO CROPS.

THE crop bulletin of the Ontario Government up to the middle of August is practically up to harvesting time. Fall wheat is reported a successful crop which was got in favorably, but spring wheat owing to droughts in the west, and excessive rains eastward, is light in both quantity and weight. Of barley, reports are that the average is low and only a limited quantity will be available for export. Oats will not be a large crop, and that of peas will fall much under the average. In regard to hay it must be remembered that the yield of 1892 was over one million tons greater than the average of the 11 years, 1882-92, and that the yield of 1883 was nearly 600,000 tons greater than that of 1892. The yields per acre of the past three years were as follows: 1891, 0.94; 1892, 1.74; 1893, 1.79 tons per acre. That of the present year is 1.39 tons per acre. The larger portion of the present crop is timothy and native grasses. There is less clover than usual in the first cutting. On the whole the quality is reported very good, as good harvesting weather prevailed over all parts except in a few eastern sections. Since the day of the report a severe drought has prevailed, which has done very serious injury.

Corn is a very variable crop this season, but on the whole, not likely to be an average one, the weather not having been favorable either in the earlier or later stages of growth and ripening. The same difference occurs in potatoes, western yields being very light, while others are excellent.

The average yields for 1894 are based on reports dated August 15. These are subject to revision after threshing. Revised reports will appear in the November bulletin. In 1893 and 1892 the November returns were less than those of August. Owing to the extraordinary drought the yields of the spring grain here given may be reduced. The report of hay is final.

Crops.	Year.	Yield
		per acre. Bush.
Fall wheat	1894	21.6
	1893	19.2
	1882-93	20.0
Spring wheat	1894	16.1
	1893	11.7
	1882-93	15.2
Barley	1894	22.7
	1893	21.0
	1882-93	25.7
Oats	1894	30.4
	1893	30.3
	1882-93	36.6
Rye	1894	15.7
	1893	14.5
	1882-93	16.1
Peas	1894	17.5
	1893	19.2
	1882-93	20.4
Beans	1894	14.6
	1893	13.6
	1882-93	17.1
Hay and Clover	1894	1.39
	1893	1.79
	1882-93	1.43

The total area under the above crops is 8,217,321 acres, as compared with 8,054,612 acres in 1893. The area devoted to pasture is 2,703,241 acres in an increase of 91,561 acres over 1893. Taking the report of Ontario crops as a whole they may be estimated as a low average, the variations in yield in different parts of the Province being unusually great.

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## BY THE WAY.

LARGE milling centers have usually been built up around valuable grain growing districts. Minneapolis is an instance before us. A more recent illustration is found in the development of milling operations in the Duluth and Superior sections of country. With some of the best wheat grown in America, and added to this excellent opportunities for shipment by water, we see to-day the milling strength of Duluth growing apace. Along this line the suggestion has frequently been made that ultimately Manitoba and the Northwest, because of their superior position as wheat growing countries, must also become a large milling territory. There is not a little force in this contention, despite the fact that there would not seem to be at the present time any necessity for an expansion of milling operations in this or almost any country. But the whirligig of time brings about many changes, and who would venture to say that changes helpful to milling on this continent may not appear in the horizon shortly? We are reminded of a possible outlook for Winnipeg as a large milling center in the strength that is being given to the water power of that district suggested by the fact that a company is building works to utilize the immense water of the Lake of the Woods at Keewatin, and that this power will be transmitted to Winnipeg by electricity. There would be here one strong advantage held by Winnipeg were it to enter into milling.

x x x x

Those interested in agricultural callings continue to give thought to the question whether they must in the near future switch off from growing wheat as a leading product of the farm to utilizing the land in a more profitable way. The wide gulf between the returns for wheat and that from other products is perhaps rather absurdly illustrated in the story of the Wisconsin farmer who received a return of over \$600 worth of fruit per acre from 10 acres on which were grown black berries. Contrast this with say 15 bushels of wheat to the acre at even 60c, or \$9, per acre, and the inducements to continue as wheat growers is not strong. We cannot, however, turn the large acreage that has all along been grown in wheat into black berries, but many farmers are already switching off into dairying, cattle raising, and in disposing of a considerable percentage of their wheat feeding cattle.

x x x x

On another page we publish a valuable contribution from Mr. James B. Campbell, of Montreal, on the waterways of Canada and along with this will be found the views of Mr. James Fisher, M. P., of Winnipeg, on the same subject, giving the Manitoban opinion. It is hardly possible that something practical will not grow out of the amount of thought and consideration that is being given to this question at the present time. The subject has broadened, for not alone is it an uppermost question with the Canadian people, but its overlapping character is seen in the fact that it is a prominent subject of discussion in the United States. The fact is that the matter of canal building in the light of the scientific and mechanical progress that has been made in modern days, makes it reasonably certain that with the growth of railways in the past half century or less there is also to come an expansion of our waterways as a medium for the carrying trade of the country, that must also reach large dimensions. Chicago at the present time is planning a new waterway from Chicago to the Gulf of Mexico, which it is supposed will connect the Gulf of St. Lawrence with the Gulf of Mexico and give the windy city a supremacy as a commercial centre that cannot be attained by any other city. Suggested by this projected Chicago canal and like works in progress in other parts of the country Harper's Weekly of recent date devotes large attention to the question pointing out that the work of canal building to-day may be greatly reduced in cost as compared with the methods hitherto employed. Were something practical to be secured in this direction it would help to solve the canal question in Canada, for with the statement of the Minister of Railways and Canals that it would cost \$130,000,000, to make a soft channel from Lake Erie to Montreal, at present what seems an unsurmountable difficulty, is the matter of cost. But the contention of Harper's Weekly is that by means of improved dynamite dredges the work of excavation,

transporting and depositing is greatly simplified and the cost reduced. The statement is made that this work would be done at less than half the cost of similar work on the Manchester canal. If our people can see their way out of the financial difficulties of canal building one great obstacle will have been removed.

x x x x

A letter from a correspondent in Manitoba, published in another column, referring to the high elevator charges, was evidently written before he had received news of the reduction in the charges for handling grain on both interior and terminal points made by the Canadian Pacific Railway. This railway has reduced terminal elevator rates to about 50c, and a reduction of 1/2c a bushel has been announced in interior elevator rates. "This," says the Commercial, of Winnipeg, "will amount to a saving of about one-quarter million dollars in handling this crop and will be of great benefit to the farmers."

x x x x

The Globe a few days ago made the following criticism on the changing of standards of grain every year: The present method is to strike an average of weight, fullness and other qualities by examining many samples, and to establish that for the season as "No. 1 hard"; wheat of better quality is graded "extra," and the lower grades is "No. 2 hard." A purchaser in Europe buying wheat from many countries deals in Canadian "No. 1 hard," and naturally regards it as a fixed standard. A favorable year advances the quality of this standard, and the buyer is reluctant about advancing the price in comparison with fixed grades. An unfavorable year lowers the standard, and has a tendency to make buyers suspicious. They expect certain qualities in Canadian "No. 1 hard," and are disappointed. Another objection is the necessary delay in the early fall before the standards are fixed. The inspectors will not leave for Manitoba until Saturday next, and until they make their selections and fix the standards there can be practically no trade in wheat. There would be many advantages in the adoption of permanent standards, which could be learned and recognized in European markets.

## FREIGHT RATES AGITATION.

THE Commercial, of Winnipeg, Man., suggests that if the Dominion Government is seriously looking about for a policy to go to the country with at the next election, it will find such in the question of freight rates, as fixed by our leading railways. There can be no doubt that this grievance of excessive, unfair, and discriminating rates is one that is being shoved to the front as a question that the government cannot ignore. It may seem at first thought that this is a matter which simply interests the commercial classes. They are indeed deeply interested, as in some shape or other the matter is constantly before them. In a measure they are daily paying the price. But the grievance is more wide spread than this. The prices charged for every article of consumption sold over the counters of the smallest corner store are effected by the charges for carrying made by our railways. The millers of the country have been pushing the agitation against excessive freight rates with more vigour, perhaps, than any other branch of business. Some of the evils of discrimination have come home to them more closely, possibly, than to other lines of manufacture, because of the condition of the milling trades at this time. Profits in milling have got down to so fine a figure that a slight difference in freight rates, when the miller is brought into competition with millers of other countries, is enough to easily wipe out the margin of profit that he may have figured on. During the period of a year or more, however, that the freight committee of the Dominion Millers' Association has been investigating this question illustrations have come before them more than once showing that to a relative extent the evil in freight rates that they complain of has a lodgment in other departments of trade besides milling.

In Manitoba and the Northwest, the agitation for relief in this direction is growing with unmistakable force, and there can be no doubt that, whether the government makes the question a plank in their platform when they appeal to the country for public approval at another time, or quietly ignore it, the question will certainly, so

far as Manitoba is concerned, confront them with marked determination.

Writing simply from the millers' point of view the railways and the government may rest assured that there is no intention to ease off on this agitation until relief is secured, and more and more it becomes apparent that the question is one confined to no one class of the community. Patrons are devoting their share of attention to the matter from the standpoint of the consumer and when the subject comes to be one of popular agitation both on the part of the man who sells the goods and he who buys them, we may expect that there will be rather more than a "tempest in a tea pot" for all who have authority to make or regulate freight rates.

What is worth remarking here is that this agitation for lower freight rates is not confined to Canada. United States shippers of wheat and flour, especially those in the northwest, southwest and the Pacific coast, are moving actively for a reform in this direction. The Chicago Elevator and Grain Trade of recent date has an article on the question where it is significantly said: "The carriers' old rule for fixing rates—'what the traffic will stand'—could be applied to the re-establishment of the rates on wheat with satisfactory effect."

## A DIFFERENTIAL SPRING GOVERNOR.

A DIFFERENTIAL spring governor for steam engines is among the recent mechanical inventions of note, the device possessing the advantage of being applicable either to control a valve by which steam is admitted to the engine valve chambers, or to directly actuate the cut-off mechanism of any customary type of valve. In its construction there is a fulcrum lever, one arm of which connects the device with the valve or cut-off stem, and the other with a collar sliding upon the governor spindle. The governor balls, or weights, have short arms connecting with a bar fixed to and rotating with the spindle, and other arms extending outwardly on the opposite side connecting with the bar which is slidable upon the spindle and which actuates the movable collar. The angles formed by the levers—which extend out from the opposite side of the balls or weights—are internal angles, so that, as the balls are thrown outward, these balls are brought more nearly into a straight line with each other. A compression spring acts to return the parts when the centrifugal force is reduced.

## MILLING RYE.

RYE milling methods, says the American Miller, are larger than corn and shorter than wheat. The longest thing about rye milling is the cleaning of the grain in its preparation for reduction. While rye is of the same general form as wheat and looks a good deal like it, yet it is an entirely different grain to mill, and more particularly so in the matter of its cleaning. An analysis shows that the cells, germ, epidermis, in short the whole texture is of an entirely different nature from that of wheat. Examining the epidermis, or outer layer of hull, or bran on the rye berry, it will be seen that it is much lighter, thinner and darker than on the wheat berry, and is partially loose on the berry and can be easily removed by rubbing. This covering seems to be somewhat of a scaly nature.

In cleaning wheat we have been taught to be very careful not to be too severe. In cleaning rye we have to be careful to be severe enough and remove all of this outer covering before attempting to reduce the grain. Not being tough like bran, this covering will become detached and pulverized in a way to make rye flour specky and generally of less value.

## A SUGGESTION RE. PULLEYS.

THE editor of the Engineering Magazine says that the flesh side of leather is the best to place against the pulley when such leather is used as a belt, notwithstanding this to be contrary to the most usual practice, but this general practice is due to the ideas of belt makers rather than to those of belt users. Traction, he says, is greater than where the surface is elastic and has a clinging tendency than where it is hard and smooth. This is because this kind of surface clutches the pulley more securely by being pressed into all the pores and interstices of the metal or varnish.



**EUROPEAN MILLING INVENTIONS.**

**I**NVENTIONS in the line of milling machinery in the United States nowadays are few and far between. Over in Europe there is some activity, mostly in unimportant lines. Among recent inventions patented in Great Britain is a cleaning and dressing machine, the invention of F. Holzhausen, of Nossen, Saxony, Germany. This invention relates to a machine suitable for treating grain or granular materials. A drum carrying brushes or emery composition is mounted on and driven by a central shaft within a perforated casing. The casing is supported and driven by friction-wheels placed one at each end. The casing is further supported by wheels at each side, which may be adjusted to regulate the distance between the casing and the central drum. The method of adjustment for the wheels consists in mounting them on the side, which is hinged or equivalently secured at its lower end and is provided with arms at its upper end, which may be fixed in any position between nuts in the threaded rod.

Another is a middlings-purifier, invented by W. W. Willis, of Ipswich, England. This is a machine for sorting or purifying middlings or the like by means of a current of air, which is caused to circulate continuously within the enclosed casing of the machine. The figure shows one modification, in which a sieve is introduced to assist still further the purification of the middlings. The middlings are fed from a hopper through the current of air as it passes the fan. The middlings fall, according to specific gravity, into three hoppers. The contents of the first hopper fall on the sieve formed in sections and carried in a frame having pieces of flexible cloth all round to prevent the entrance of air and operated by an eccentric. The material passing through the sieve falls into a hopper in the bottom of which are a number of valves, by means of which any portion of the siftings may be discharged into either one of two conveyors placed side by side and arranged to discharge the material through shoots. The overtails fall down the shoot into one of the conveyors, being subjected to aspiration by a current of air passing up a channel. The contents of the second hopper pass down a trough to be mixed with the overtails. The finished offal is discharged from the machine by a shoot and is collected in the shoot from trays, which are placed over the sieve from a valve, through which all the material which falls into the third hopper is passed, and lastly from a valve, through which all the material which collects in the hopper of the aspirator is passed. The dust is collected in and discharged from a hopper. The dust is separated from the air in a chamber, in which are a number of baffles, and in an expansion chamber, in the bottom of which works a brush which sweeps the dust into the hopper. The air-current is produced by a fan. Suitable valves are provided for directing and regulating the strength of the current. A modification is described, in which one of the sieves are dispensed with.

Another invention, by J. M. Rishworth and J. Vickers, of Leeds, England, relates to sifting or screening. In this machine, to prevent the flour from adhering as it drops from the reel, the hopper sides are arranged to slide in the frame and are provided with brackets in the paths of revolving cams, and with springs by means of which they are moved upward and then retracted respectively. The sides are readily removable to obtain access to the worm.

Another is a middlings purifier, invented by L. H. Neave, of Fordingbridge, England. In this invention the object is to collect and remove the dust from above the sieves of middlings-purifiers. Above the sieve are transverse bars with openings between them; scrapers on an endless chain travel over the bars and openings, causing the air to be drawn through the openings by the fan intermittently, and thus allowing the dust to deposit on the bars and scrapers. The scrapers are cleaned by brushes supported over a conveyor.—Milling World.

A new material intended to be used as a substitute for leather in covering belt pulleys is made of wood pulp combined with various ingredients for making it tough and pliable. It may be secured to the face of the pulley in such a way that the rivets will not show through the working face.

**BOMB ENGINEERS.**

**W**E recently came across an engineer who was grumbling over the safety valve on his boilers. Formerly he had two lever valves, one on each boiler, but some one, he says, got afraid of the lever valves and induced the owner to join the outlets from each boiler into one pipe and provide for this a long pop valve. There was no valve between the pop and boilers, which was right enough if that way of doing things was to be continued, but what the engineer objected to was having one valve do service for two boilers. The boilers must be run together or not at all, and if anything should happen to one it would not be possible to cut the other out, but both must act together. This was wrong and it ought to be obvious to all who had anything to do with these boilers, and though the engineer recognized the defect he did not have spunk enough to make a vigorous "kick" for a valve on each boiler. Such an arrangement is not safe. Each boiler should be provided with its own safety valve, and should be so piped that it can be cut out from all connection with the rest of the battery when occasion ever demands.

All engineers, however, are not like this one, and there are those to be found who have the stamina to object pretty forcibly when anything is wrong about the plant. We recently came across two such cases, and in both cases the engineer came out ahead, and with employers that had the reputation of being obdurate. Both cases were of boilers providing steam continuously, night and day and Sundays to, and in both instances there were two boilers. In one case the engineer could find no record that the boilers had ever been inspected or even shut down for cleaning out. Possibly they may have been, but not since he came there two years before. He stood it as long as he could, asking for an opportunity to inspect the boilers, but the owner would not allow the necessary shut down. Finally the engineer stated that he was prepared to leave his position unless he could inspect those boilers. He had staved around them as long as he was going to without knowing what they looked like inside, and if anything happened to the boilers he wanted the owners to understand he would be willing to say about how little care they got. The owner did not care to run any risk, but his disposition had been simply to put off the inspection as long as he could. This challenge was too much, however, and the engineer drew out the fires and cooled the boilers off for inspection, and the owner fumed and fretted for two days while the engineer was fixing things up in a manner more to his satisfaction. No defects were found, but the boilers were very dirty, and after it was all over the proprietor told us he was glad of it as he began to feel a little uneasy himself and rather welcomed his engineer's objection.

In the other case the engineer had only been at work in the place a week when he found out the plant was in poor shape and had had no regular inspection though his predecessors (there were several) had asked for it. He went up stairs and told the owner he was going to shut down one of the boilers the next day to inspect it. The storm broke over his head, but he would have nothing else and the owner gave way and the inspection revealed a pretty condition of affairs and the need of many repairs. Here again the result justified the engineer's firmness. From a somewhat varied experience with steam users of this kind we are convinced that if engineers were more positive in asking for what they wanted, coupling it with some intimation that they understood and could show exactly what the end in view was, they would get their requests more readily granted. Steam users do not, as a rule, care to run many risks, but they often hate to spend a cent, and if the engineer is timidous in asking, and they can bluff him out of it, they feel that the thing asked for was not really important or the engineer would show more plainly that it was. These two cases clearly show where some steam users stand, and if the man with the single pop valve will raise a vigorous objection he will undoubtedly get another pop so they can be separated.

The first of the two engineers above mentioned also tested his boilers by hydrostatic pressure, as well as by looking them over, and in talking it over he said, "I ran it up to 250 pounds and it did not show a weep." Now that was a good record for that boiler, but it was

a very foolish thing to do just the same, to submit any boiler to such a tremendous strain. That was not a test alone, but an effort to burst the boiler in reality. The boiler carried a steam pressure of 90 pounds, and to submit it to 250 pounds pressure was altogether out of reason and common sense, and submitting the boiler to a strain it should never be called upon to stand. The purposes of a hydrostatic test are amply answered when the pressure is run up to 50 per cent. greater than the working pressure, and such proportion should never be exceeded because it unduly strains a boiler and a boiler once so strained is never as good as before. The engineer did a good thing in getting an inspection of his boiler, but he should have known more about how to inspect that boiler.—Boston Journal of Commerce.

**FOOLISH TRADE NAMES.**

**O**NE gets sick and tired of trade names, such as victor, ideal, pragon, excelsior, and the like, also wonders how the makers of machines thus named can afford to waste the effect produced by using the maker's name instead of these pseudonyms. The name of a firm or company applied to a machine such as a waterwheel, gas engine or a moving machine, is of real trade value, and comes constantly into use, but a nickname rarely ever does. Gas engines are thus afflicted, but not steam engines, the latter being accorded too much respectability for a nickname. We have, out of regard for the machines and believing it to be vastly to the advantage of the makers, never printed one of these names when it could reasonably be avoided.—Industry.

**THE HUNGARIAN CROP REPORT.**

**T**HE annual crop estimates issued by the Hungarian minister of agriculture were published on September 1, the delay in their issuance having been due, it is alleged, to the care bestowed upon the revision of the report. According to these estimates, the wheat crop of the world will be 2,476,000,000 bushels for 1894, against 2,279,000,000 bushels for 1893 and 2,280,000,000 bushels, the official average, for the past decade. The deficit requiring to be covered by importing countries is 364,526,000 bushels for 1894, against 379,000,000 bushels in 1893. The surplus from exporting countries is 444,245,000 bushels, against 378,664,000 bushels in 1893. The detail figures representing the production and deficit of the various importing countries for the year 1894 are as follows:

	Production Bushels.	Deficit. Bushels.
Great Britain.....	60,495,000	170,220,000
France.....	354,625,700	19,859,000
Germany.....	102,132,000	32,625,000
Italy.....	130,228,000	29,728,000
Holland.....	6,241,000	11,915,000
Switzerland.....	7,376,000	11,915,000
Belgium.....	21,277,000	25,533,000
Denmark.....	4,539,000	1,702,000
Sweden and Norway.....	5,106,000	7,092,000
Spain.....	97,876,000	12,768,000
Portugal.....	9,078,000	5,675,000
Greece.....	3,404,000	3,972,000
Austria.....	45,400,000	31,774,000

The figures in detail of the production and surplus of exporting countries are these:

	Production Bushels.	Surplus Bushels.
Russia.....	363,136,000	141,850,000
Hungary.....	151,098,000	45,392,000
Roumania.....	51,066,000	19,859,000
Turkey.....	29,793,000	5,675,000
Bulgaria.....	31,207,000	13,050,000
Servia.....	9,929,000	1,985,000
United States.....	408,528,000	70,925,000
Canada.....	42,555,000	15,605,000
India.....	258,106,000	22,600,000
The rest of Asia.....	58,158,000	2,837,000
Africa.....	48,370,000	5,957,000
Australia.....	42,895,000	14,185,000
Chili.....	24,114,000	9,929,000
Argentine Republic.....	117,508,000	73,762,000

Just how far complete reliance is to be placed on these figures readers can judge in part from the information in their possession of the size of the crops near home.

**T**HE trolley car was put to a new use in a neat-by city one morning recently. A thief was escaping in a hick, and a policeman boarded a trolley car, and the motorman let her out in chase. The horse gave out first, and the thief was captured. Some good in the trolley car after all.

## INDIFFERENCE TO BOILER FIRING AND MANAGEMENT.

OBSERVATIONS extending over a period of a quarter of a century in a practical and professional way have presented opportunities to note, in the greater number of manufacturing establishments, a continuous decline in the grade of service of those in positions of firemen and boiler room managers, this corps of operatives seeming at least, to have remained *in statu quo*. The evil has become so glaring and the results so palpably fraught with disaster, destruction and waste, as to warrant an effort to call the attention of those who desire to progress to the false and inconsistent position they occupy by permitting such a narrow policy in management, so widely at variance with true economy, ignoring directly that the better intelligence renders the more valuable, and hence, more profitable service.

It goes without saying, that, during the past ten years concentration of efforts by scientists and eminent mechanics looking to the more perfect development of the steam engine in its various types, has produced results which challenge the admiration of the most critical in this line of thought.

Within the same period, from every source, there has been a multitude of features in the form of designs and novel application of boilers, all converging to the important factors of increased economy, safety and efficiency. In the engine sphere, condensing, compound and triple expansion engines, with or without jackets; in brief, seemingly all the necessary refinements have received, and are receiving close attention. In the boiler domain there has been, also the evolution from the plain cylinder type to tubular, and from that through the multifarious forms of water tubes, each striving for a superior degree of excellence. Combining these forces, viz. the boiler and the engine, the amount of research and practical application that have been, and are being applied for efficiency and economy, are such as to be almost incalculable. A retrospect of the past, viewed in the light of present results, shows that these efforts have been of an exceedingly fruitful character.

The development has carried with it the imperative advancement of those in charge of engine management to such an extent as to create almost anew this body of men. Such an intellectual advancement in the department of mechanics, we believe, is without precedent, and in every sense challenges universal admiration from every quarter. Notwithstanding these favorable features, we are constrained to say that all this is somewhat like the play of Hamlet with Hamlet left out; or in other words, we are radically defective at the very threshold of this field, by reason of relegating the firing of boilers to the most ignorant of operatives; or, to put it in a plain way, there seems to be an almost unanimous idea that anyone who can shovel and throw fuel is good enough for a fireman. Close observation and contact for a period of years with numerous plants of varied character increases the conviction upon this point. Recognizing, as we all do, that the furnace of the boiler is the prime feature and great initial point from which is the source of power, does it not follow that, if economy and efficiency are deserving of efforts in the advanced stages, as has already been pointed out, this is the very point that should be treated with every consideration of intelligence? Should not the fuel, furnace and boiler receive the thoughtful attention that the engine receives from the careful engineer? I think this will be accepted by every one interested in advanced ideas. No one, I think, will question the fact of the importance of the initial point of the boiler and its furnace, and that, upon its mismanagement, the efforts of refinement are rendered, in many cases, completely void. It would seem so simple that argument would be unnecessary, were it not that, on every hand, the matter is entirely ignored, resulting in waste and destruction. We would ask: Are not the efforts of the best furnace designers completely set at naught often by reason of the manner in which they are operated? Is it not a glaring fact that in all cities where smoke abatement has been, and is being attempted, the great stumbling block is the low grade of intelligence and difference of the operatives?

In looking up this subject from a mechanical and engineering standpoint, we are fully alive to all the

requirements to give complete combustion and thorough distribution of heat units; proportion of grate area and openings, proper amount of air, conduction of the heated gases, are all carefully considered. When all is completed, we have had the wonderful spectacle of these conditions being turned over to the simple treatment of rain jam shovelling and slice bar operations. I claim that the fireman should know, at least, the elements of combustion, the importance of the proper management of fires to produce the greatest results with the least expenditure of fuel. The intelligent engineer keeps this constantly in view as to steam economy; the valves, etc., receive his unremitting attention, unless he can properly be placed upon the same plane as the fireman that shovels without intelligence or judgment.

Now, it may be said that this is being greatly overcome by application of mechanical stokers, a point that is frequently (and I believe, without thinking) claimed by those interested in placing stokers. This is a great mistake, well known by those conducting tests, results always being superior with the greater intelligence of the operator of the machine.

This deplorable and absurd state of affairs is doubly aggravated by, not simply indifference, but actual encouragement, based upon the idea that anyone can shovel or throw in; or perhaps it is the idea of—they put it in the slot, and we do the rest. Does it ever occur to those proprietors, or the superintendents of manufacturing establishments, that while they are straining at goats in the refinement of every application in the various departments looking to more economic results, right upon the threshold, they are swallowing a camel with the greatest ease?

Within the past few years, in every community where cleanliness, taste and good health are considered, there has come forth a crying appeal to the authorities to lessen the great evil of smoke in the atmosphere. In response to this, inventive genius has promptly come forward. The multitude of devices that have been perfected and put in operation furnishes ample testimony to this fact. Many of these when properly operated, accomplish satisfactory results in smoke abatement, but no inventor has ever had the temerity to label his machine, "No skilled fireman required." Per contra, it is well known that the most intelligent fireman produces the best results, and it is also an undeniable fact that the best results are set at naught by incompetent operating. The writer has been brought in contact with large fields of boiler practice, and in many cases, aside from other disqualifications, the firemen were unable to speak or understand a word of the English language. It may be said, as I have heard it said, that these men are not paid to think, but to do. Well they do do. They will do up a coal pile, furnace and boiler with alarming rapidity. I say alarming to those whose views are broad enough to consider the initial and important points. On the other hand, it is a lamentable fact that there are a great number of persons in official positions, as superintendents and proprietors of establishments, who seem to be utterly incapable, or unwilling, to note the importance of the necessity for a higher grade of labor in the firing and management of boilers.

One of the most surprising features in connection with this state of affairs is the tendency of those to place boilers, claiming among their numerous merits, that of less attention required than others, precisely on the old exploded idea applied to engines, "No skilled engineer required." I have now before me a letter from a boiler representative who claims that his boiler will give the utmost satisfaction with one half the attention that others receive.

What is greatly needed at present is to lay aside the idea that anyone is good enough to fire and manage boilers. When you engage a man for your office, do you not require that he shall possess some qualification for the position? And if aptness is shown, do you not show appreciation by advancement to a higher plane, the interest being mutual? Why not apply this to the selection of firemen? As it now stands, we cannot but exclaim, "Strange, what a difference there should be 'twixt tweedle dum and tweedle dee!"

There are a great many plants in operation where, by incompetency in this line, the steam efficiency is greatly lessened, furnaces and boilers working in ne-

glected conditions, and the community begrimed with volumes of unnecessary smoke: and in addition to these evils, is that of jeopardizing lives and property. Unless this matter is considered, and such action taken as will improve this corps of operatives, it would seem absurd to be continually reaching and extending into the higher refinements of steam engineering, when so simple and important features are ignored at the threshold.

Under these conditions, does not the pertinent question present itself to the employer—are we not occupying a false position by this seeming indifference? Do we not retard the development of a class of labor which by recognition, by an appreciation that some skill and judgment are required, would be animated by the smallest spark of ambition to qualify for advanced position? Is not this condition of affairs a gross inconsistency, nay, a mockery, in the face of the query put by those guilty of this indifference—why can we not get better men than this? In reply to that, would say, simply, it is not sought on your part. Just as long as this class of operatives are looked upon as mere shovelers, throwers of coal and carriers of water, ignorance, with all its attendant waste, destruction of property and general demoralization, will be prominent in the boiler department.

As a fitting close to this, it would be proper to ask what degree of intelligence or knowledge would qualify one to fire boilers.

First. That the fires should be maintained with uniformity, and that no openings, in the form of bare places, show upon the bars to permit the cold air to pass through.

Second. The judgment that will enable him, by a glance at the ash-pit, to know at once, to a great extent, the condition of the fires.

Third. He should know something of the various fittings of the boilers, such as valves, etc., and the details of the furnaces.

Fourth. But not least, an ambition to grasp the details, so as to qualify him for a still higher plane, which would certainly follow, provided there was judgment enough in the superior to note such details.

Sufficient, we think, has been said to convince the most obtuse mind that the indiscriminate employment of labor for this purpose is a crying evil, and some consideration given to the claims here made, that simply because one can shovel and throw, it does not follow that he is qualified to fire and have charge of steam boilers.

## CAN IT?

It has been asserted that with the same wheat a good roller mill having a sufficient number of machines can perform its work with the same amount of power as is required by a stone mill of the same capacity. Australian, New Zealand, English and American red winter wheats, when in good condition, can, it is claimed, be reduced to flour by a roller plant with an expenditure of about 6 to 8-horse power per sack of flour. Next to these varieties might be classed ordinary English, white Canadian, and Dantric wheats, which grind easily, but, as a rule, dress badly, and therefore could not be made into flour so rapidly as the first named. If spring American, soft Indian, Saxonska, and Black Sea wheats, as well as some other European wheats, being of a glutinous and steely character, be used, more power will be consumed, and for these wheats 8 horse power as a minimum will be required. Next would come hard Indians, such as Calcutta, Kurrachee, etc., which, it is asserted, will take not less than 10 horse power.—The Miller, London.

## JOURNAL BOXES.

JOURNAL boxes are now made which retain the oil and required replenishing only three or four times a year. Their additional cost over the old style is but trifling and their use will save a large expenditure. They should be adopted by every live mechanic. Pouring oil on heated journals is wasteful; water is much better. Indeed, water is an excellent lubricant so long as it remains in place between the journals and box. If, like oil, it could be kept there, it would afford one of the best means of lubrication. Oil after having passed heated journal and box is comparatively worthless for lubricating purposes.—Tradesman.

\* By J. Ashworth, before the Engineer's Society of Pennsylvania, Nov. 27, 1893.

EXPERIMENTS WITH WINTER WHEAT.

CONFIRMING with the regular custom at the Ontario Agricultural College certain experiments were made during the past season in connection with the growing of winter wheat, and the results of these we now have in a bulletin prepared by Mr. C. A. Zavitz, B.S.A., of the College.

There were 178 plots used for the winter wheat experiments in 1894, these being divided off as follows: variety tests, 102 plots; dates of seeding, 36; methods of seeding, 12; selection of seed, 8; quantity of seed per acre, 6; sowing spring grain to act as a mulch for wheat, 4; and harvesting at different stages of maturity, 10. As the variety tests have been conducted for five years in succession and the rest of the experiments for only one or two years, this bulletin treats more particularly of the varieties grown than of the methods of cultivation.

The field upon which the grain was grown is a good average clay loam, quite uniform in character, and has a gradual slope towards the northeast. The size of all the plots was 1-100 of an acre, with the exception of those for different dates of seeding, in which case it was 1-160 of an acre. The yields per acre have been calculated from the actual results of the plots. The land was prepared on the bare fallow system, and received a dressing of fifteen tons of farmyard manure per acre in the summer of 1893. No other fertilizer was used. Four crops had been removed from the land since it had received farmyard manure previous to last year.

Seeding took place early in September, and during that month 1.3 inches of rain fell, which was slightly below the average of the four years previous. The growth of the wheats in the autumn was good, and the amount killed out during the winter, and early spring was small. April proved to be a very dry month, and May one of exceptionally wet weather; the growth of wheat, however, was quite good throughout. The ripening of the grain took place between the 15th and 23rd of July, which was fully three days earlier than in any of the four previous years. The trouble from both rust and smut was not serious this season.

Soon after the grain headed out, a storm caused the weak-strawed varieties to become considerably lodged, which interfered with the proper filling of the heads. To determine the effect produced by the lodging of the crop, an examination was made of four varieties, which were partly lodged about five weeks before the ripening season. From each of these varieties 1,000 heads were collected out of the standing grain and also 1,000 heads from the lodged portion of the crop. The sheaves were threshed separately and the results recorded, the following being the summary:

Condition of crop.	Weight of grain from 4,000 heads.	Weight of 4,000 kernels of grain.
Standing.....	121½	82
Lodged.....	67	73

Providing the plants which lodged were equal in every respect to those which did not lodge, these results go to show that the loss to the grain through lodging was about 4.5 per cent. in yield and 11 per cent. in quality.

50 varieties of winter wheat grown in 1894 upon plots exactly similar in size and situated side by side. Paths three feet wide were left between the plots. Seeding took place on Sept. 2nd with all the varieties excepting Nos. 56, 58, and 65, which were sown three days later, and No. 54, which was sown seven days later. The grain was sown by hand at the rate of 2 bushels per acre, and then the land was harrowed. The average yield in 1894 was superior to that of 1890, 1892 or 1893, but was not equal to that of 1891.

The following remarks are made upon the varieties which have given the largest yields of grain per acre for the number of years they have been grown on the plots:

**Early Red Clawson.** This variety gave the largest average yield of grain per acre, and also the lowest average weight of grain per measured bushel among fifteen varieties grown for five years. The crop is much inclined to lodge in unfavorable seasons, but when it stands

well, the bald heads, red chaff, and white straw give this variety an attractive appearance when seen standing in the field. It will be remembered that the Early Red Clawson stood third in average yield per acre in the co-operative experiments over Ontario for 1893, at which time eleven varieties were tested.

**American Bronze.** The special feature of the American Bronze is that the crop usually stands well, while that of many other varieties becomes badly lodged. It is also a good yielder, and the average weight of grain per measured bushel for five years is nearly up to the standard. The chaff and straw are white, the heads bald, and the grains large, fairly long, and of an amber color. Among the eighty varieties of winter wheat grown on plots in 1894, the American Bronze was one of the finest looking at the time of harvest. I may add that this variety is somewhat subject to rust in unfavorable seasons.

**Dawson's Golden Chaff.** In yield of grain per acre, the Dawson's Golden Chaff takes the lead among all the varieties which have been tested at this station. In 1894 it gave 18.5 bushels per acre more than the average of the eighty varieties grown, and 5.6 bushels per acre more than the variety which stood next below it in yield. This wheat has been grown on the plots for three years, and leads in yield of grain among the forty-three varieties grown for that length of time. In the co-operative experiments over Ontario in 1893, when eleven varieties of winter wheat were tested, the Dawson's Golden Chaff not only gave the largest average yield of grain in the sixty experiments, but also headed the list in thirty-five out of sixty of the individual experiments. In three years trials, at the Experiment Station, the Dawson's Golden Chaff stands exactly equal with the American Bronze in strength of straw, these two being the stiffest strawed varieties. The average weight of grain per measured bushel for the Dawson's Golden Chaff during three years is 59.3 lb., which is also exactly the same as the average of the fifteen varieties of white wheat grown for the same length of time. This variety is apt to rust in some seasons, but it has been quite free from smut at this place, although some trouble with smut in this variety is reported from one or two of the localities where it is now grown. The Dawson's Golden Chaff is quite distinct from any of the other varieties grown, and when ripe most closely resembles the Standard and the Clawson (white) varieties. The straw is medium in length, and the crop has a golden appearance. In 1894, it was grown on eleven plots in the Experimental Department, and on about four acres in the Farm Department; and was unanimously pronounced the most attractive variety at this station by five judges who examined the standing grain.

**Early White Leander.** Although this variety gave the largest average yield of grain for two years, among eight varieties grown on the plots in 1893 for the first time, the weight of grain per measured bushel was the third lowest, among eighty varieties grown this season. It possesses long straw; long, bald heads; white chaff, and white grain of medium size.

**Early Genesee Giant.** This variety has been grown on the plots for two years, but, owing to the lateness of receiving the seed in 1892, the results were not reported the first year. It stood fourth in general appearance of standing grain, and seventh in yield of threshed grain, among eighty varieties grown this year. The straw is tall and fairly strong, the heads bearded and quite compact, the chaff red and the grain white.

Concise statements regarding the experiments in wheat cultivation:

**Different Dates of Seeding.** The average results for two years in sowing winter wheat on September 2nd, September 9th and September 17th, are slightly in favor of the middle date; but, as the crop from the first sown grain was the most lodged in 1894, future experiments may give different results.

**Methods of Seeding.** By sowing winter wheat from all the tubes of a grain drill, the average yield per acre was 44.6 bushels; from every second tube of a grain drill, 42.2 bushels; and by broadcast with the hand, 43.6 bushels.

**Selection of Seed.** Several experiments in the selection of seed grain were conducted, but they were too complicated to report in this bulletin. It might be mentioned, however, that in 1894 plump seed produced

heavier grain than shrunken seed; but the difference in the yield per acre was very small.

**Different Quantities of Seed per Acre.** Two varieties of winter wheat were each sown on small plots at the rate of 1, 1½ and 2 bushels of seed per acre, and the average results show that the largest yield was obtained from the thickest seeding, but the best quality of grain was from the medium amount of seed. The proper quantity of seed to sow can be best determined by the various wheat growers themselves, as much depends upon the variety of grain, fertility of the soil, etc.

**Sowing Spring Barley in the Autumn, to form a Mulch for Wheat in Winter.** Two varieties of wheat were sown with and without spring barley on September 5th, 1893, and the results go to show that slightly better yields were obtained when the barley was not used.

**Cutting Grain at Different Stages of Maturity.** Two varieties of winter wheat which were considered about right for cutting by the 10th of July, were cut on July 4th, 11th, 19th, and 25th, and August 2nd. The heaviest grain was from the cutting on July 19th, and the largest yield of grain on August 2nd. The lowest results, in both these particulars, were from the first cutting.

The conclusions reached as a result of the experiments are as follows:

1. The average results of winter wheat grown on the experimental plots for five years in succession are as follows: Weight of grain per measured bushel, 60.6 lbs.; yield of straw per acre, 2.74 tons; and yield of grain per acre, 40.6 bushels.
2. Among eighty varieties of winter wheat tested, the following have made high records: (1) Dawson's Golden Chaff; (2) American Bronze; (3) Early Genesee Giant; (4) Surprise; (5) Early Red Clawson; (6) Golden Drop; (7) Jones' Winter Fire; (8) Bulgarian; (9) Early Ripe; and (10) Pride of Genesee.
3. The Dawson's Golden Chaff has made the best record of all the varieties of winter wheat tested in the Experimental Department.
4. Within certain limits, the amount of straw produced by a winter wheat is a poor indication of the yield of grain.
5. For five years in succession the bearded wheats gave a larger average weight per measured bushel than the bald varieties.
6. The white wheats have given the best results in favorable years, and the red wheats in unfavorable years.

UTILIZING DISTANT WATER POWERS.

THE utilization of water power, says a writer in the Age of Steel, probably antedates written history, the interval between crude and primitive methods and the latest triumph of engineering skill at the Niagara Falls covering the entire period of human progress and civilization. Here and there where the bones of extinct races have mouldered into dust and centuries of time have been silent and blank, traces have been left of man's attempt to utilize the running stream as the falling cataract. Down to our own immediate times and in sundry fashions and places the water wheel and the dam have been familiar objects.

It has, however, been left till the advent of electricity for the real value and scope of this force to be generally recognized. By this means the conveyance of power to great distances has been made possible, its service being no longer limited to immediate localities. It is in this sense that natural forces are multiplied by extending their area of service, and each new science as developed becomes the handmaiden of the rest. In fact, none are complete until all are a unit, and till the last is added the rest are immature. Electricity promises to be one of the most potent of modern forces in making this fusion, and in the wide distribution of energy from waterfalls may practically revolutionize industrial conditions. In this country, where enterprise is alert to any and every advantage, the revival of interest in water power is spontaneous and general. There can be no doubt that this revival of interest will continue and keep pace with our industrial progress wherever water power is economically available.

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## THE NEWS.

A. Moyer & Co., of Listowel, are rebuilding their elevator recently burned.

William Gibson is putting up and will operate a grist mill at Rockburn, Que.

Joseph Kidd's new flour mill at Prince Albert, Ont., is nearing completion.

C. E. Tugwell, flour and feed, Victoria, B.C., has sold out to Rustine & Co.

Walter Welsh, a grain dealer at Stoney Point, Ont., has made an assignment.

George Hawkins has just completed the erection of a new roller mill at Delta, Ont.

The erection of a grain elevator at Oshawa, Assa., has been decided upon by K. D. Martin & Co.

Ort Bros., of Windsor, have recently erected a large elevator in connection with their flour mill.

The company recently formed to erect a flour mill at Virden, Man., have commenced operations.

Chas. H. Gould, sr., of the milling firm of Ira Gould & Sons, Montreal, died recently, at the age of 68 years.

The Montreal Transportation Co. is building a barge at Kingston to have a capacity of 55,000 bushels of grain.

Sutherland, Innes & Co., have commenced to rebuild their coöperage at Rodney, Ont., recently destroyed by fire.

E. D. Tilson, the well-known miller of Tilsonburg, is filling an order from a firm on the Canary Islands for flour and feed.

Alex. McLaren, miller and general merchant, Cobden and Osceola, Ont., is advertising general business at latter place for sale.

Over 150,000 bushels of wheat have been purchased from the farmers of the section by Mr. E. D. Tilson, of Tilsonburg, during the past year.

J. H. Dracass, proprietor of the Streetsville, Ont., roller mills, has been compelled to enlarge his elevator capacity owing to increased business.

A dispatch from Courtright, Ont., states that Phillips' heading and stave mills have been burned to the ground. Loss, \$3,000; no insurance.

The first car of new wheat was shipped from Alexander, Man., by the Ogilvie Milling Co., on Tuesday, August 21st. The grade was No. 1 hard.

Parlo's flour and grist mill at Dorchester, Ont., was consumed by fire on the 8th inst. The loss will be heavy, and is only partially covered by insurance.

The bonus for the erection of a flour mill at Elkhorn, Man., has been carried by a vote of the ratepayers. It is expected the mill will be erected at once.

Mr. Wurtele's saw and grist mills at River David, near Sorel, Que., were burned recently. We learn that the work of rebuilding will be commenced at once.

The flour milling plant of R. H. Coalbet & Co., of Windsor, N.S., has been offered for sale by tender. The plant is for a 200 barrel mill and is almost new.

The John Abell Machine Works, of Toronto, have recently supplied complete roller mill outfits to the Virden Milling Co., Virden, Man., and the York Milling Co., York, Ont.

The wheat crop in the Northwest is turning out better than was expected; the average yield will be about twenty bushels to the acre. Considerable new grain has already been marketed.

Manning's flour mill at Balmoral, Man., was destroyed by fire the early part of last month. The loss is placed at \$8,000 and the insurance \$5,000. The fire had its origin in the engine room.

Notice has been given of the incorporation of the Pembroke Milling Co., for the purpose of operating the flour and oatmeal mills of W. B. McAllister at Pembroke, Ont. The capital stock is \$75,000.

Bruce & Rutherford are placing additional machinery in their flour mill at Stonewall, Man. They experience a brisk demand for flour, owing to the recent destruction by fire of Manning's mill at Balmoral.

The chattels of the estate of Geo. H. Harper & Co., of the Ashbourne Mills, Dundas, Ont., are being offered for sale by tender by the assignee, C. W. Scott, of Hamilton. The date limit is the 17th inst.

Messrs. T. A. Crane and James Carruthers, of Montreal, and C. B. Watts and G. A. Chapman, of Toronto, have been appointed members of the western board to select grain standards. The board is to meet in Winnipeg during the present month.

J. C. Grant's grist mill at Windsor, Ont., has been destroyed by fire, supposed to have been caused by overheated bearings. Loss \$6,600; insurance, \$4,000.

A. B. White has sold out his interest in the flour mill at Pilot Mound, Man., to Geo. White, and intends engaging in business with Mr. Simmonds at Forest River.

The Forest Elevator and Milling Company's elevator at Forest, Ont., containing 6,000 bushels of wheat and 2,700 bushels of oats, was destroyed by fire on the 10th ultimo. The loss is estimated at \$6,000 and the insurance \$5,000.

The saw and grist mill at Londesborough, Ont., recently purchased by the J. Huber Estate, was sold by public auction on the 6th inst., to R. Webb, of Auburn, for \$3,550. J. L. Eidl, who had the Londesborough mill rented for the last five years has leased a mill at Auburn for a term of years and will remove there shortly.

The following examiners have been appointed by the Government for the grading of grain east of Port Arthur:—D. W. Matthews, Toronto, chairman; A. McFee, A. C. Thompson, R. M. Eudale, Montreal; W. Brodie, Quebec; R. R. Morgan, Hamilton; James Carrick, J. L. Spink, H. N. Baird, Thomas Flynn, Toronto.

The large flour mill of Tew & Marshall, at Plattsville, Ont., was destroyed by fire on the 22nd August. It was one of the finest mills in Ontario, being provided with six stones and both steam and water power. The loss on the property is estimated at \$30,000, while an insurance of only \$6,000 was carried. The fire is supposed to have originated from a defective chimney.

The large grain elevator of the Northern Elevator Co., at Winnipeg, Man., was consumed by fire about the 14th of Aug. It contained about 40,000 bushels of grain belonging to N. Hawlf, and was the only grain elevator in Winnipeg. The loss is estimated at from fifteen to twenty thousand dollars, which is covered by insurance. It is stated a new elevator will be erected at once.

Alexander, Kelly & Co.'s extensive flour mill at Brandon, Man., were burned on the 17th inst. The loss is estimated as follows: Warehouse, \$3,000; flour mill and machinery, \$50,000; oatmeal mill and machinery, \$10,000; elevator and machinery, \$7,000; engine and boilers, \$12,000. The town council have passed a by-law to grant the proprietors a bonus to enable them to rebuild, which will be voted on by the ratepayers on the 14th inst.

Following the announcement of the Canadian Pacific Railway Company of a reduction in elevator rates, the Lake of the Woods and the Ogilvie Milling companies and the Northern Elevator company, who have elevators at the chief grain shipping points in Manitoba and the Territories, have declared their intention of making a reduction of half a cent per bushel in their charges for handling grain at their interior elevators from farmers' teams to cars. The present rate is two cents per bushel, including twenty days' storage; the new rate will be one cent and a half.

## GOING BACK IN THE AGES.

SAYS the London, England, Millers' Gazette: A correspondent, who some years ago found himself stranded, owing to wet weather, in a Lincoln Hotel, beguiled the weary hours by reading what is called "The Lincoln Year Book," which was lent him by the landlord of the hotel, and from which book our correspondent made the following extracts and memoranda. Some of the earliest dates in this book, which is very scarce, are A. D. 45, 75 and 125, at which time Lincoln was probably on the sea coast: 272 Famine notified. 310 Famine notified. 4,000 died. 550 Wheat first grown. 739 Famine notified. 823 Famine notified. 864 Famine notified. 900 King Alfred divided England into counties. 954 Famine noted. 976 Famine noted. 1005 Famine noted. The stress of famine was so great that parents sold their children into slavery in order to obtain food. 1035 Frost on midsummer day. All the corn destroyed. 1073 A murrain among the people so great that the living could scarce bury the dead. 1130 A sheep was worth 4d. 1135 Rent first paid in money. 1172 Value of an ox 11; sheep 4d.; provender for 20 horses 4d.; bread for 100 men 4d. 1185 An earthquake. 1189 A Jew hunt in Lincoln. 1193 Famine and murrain among the people. 1258 A terribly wet year, and wheat rose to 20s. per quarter. 1284 Cider first brewed. 1285 Wheat 1s. 4d. per quarter. 1300 Foreign wine first brought into England. Value of a lamb 8d., and 2 pullets 2½d. 1308 Land first driven into acres. 1318 An earthquake. 1447 The king laid a tax on the city of Lincoln too heavy

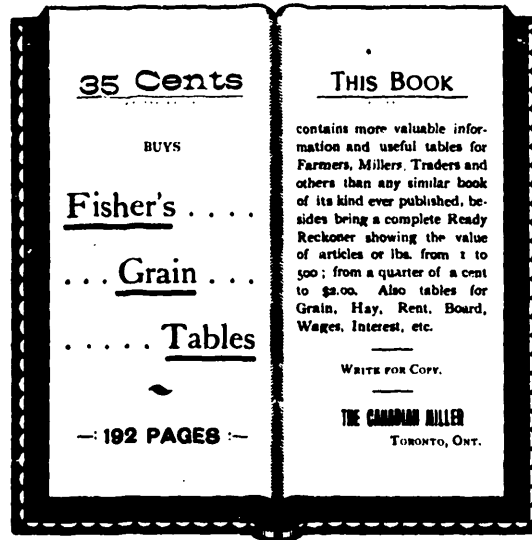
to be borne of £180 per annum. This was so burdensome, the mayor and corporation set off on horseback to London to petition the king for its mitigation. 1463 Foreign wheat first brought into England. 1493 Wheat 4s. per quarter. 1521 Wheat 20s. per quarter. 1551 Wheat 8s. per quarter. 1558 Wheat 14s. per quarter. 1579 Wheat 27s. per quarter. 1614 The sea encroached 12 miles inland in Lincoln county. 1630 Plague in Lincoln. The sheriff died of it. 1667 Bishop of Lincoln fined twice for libel. 1680 First horse races in Lincoln "where to was great resort of people." 1705 Wheat 26s. 8d. per quarter. 1722 Eleanor Elsom publicly burnt in Lincoln for the murder of her husband, being chained to a post with an iron chain and faggots and tar barrels piled around her. 1772 Intense frost. Oil flows in the public lamps. 1785 Seven men sentenced to death for murdering three turnkeys. These men were kept in a pit like a bear-pit, and when the turnkeys went into the pit to fork up the straw, they were set upon and murdered. In this year the citizens for the first time made up their minds to set a watch in the city at night. 1800 Quarter loaf 1s. 6d., wheat 100s. per quarter. 1801 A public fast because of the high price of food. 1817 First gold sovereign issued from the mint. Wheat 148s. per quarter. 1819 This year opened gloriously fine as to weather. A protracted and ruinous war, with its usual results, prostration of commerce and provisions very dear and scarce; wheat 108s.; currency depreciated; scarcity of employment and great suffering. March 25 wheat rose to 142s. per quarter; August 155s. In September a good harvest. First market day after harvest wheat fell 27s. per quarter, and next market day 31s. per quarter. Total fall in 14 days 60s. per quarter. 1824 Three prisoners escaped from the castle. One of them came back and knocked at the door craving readmission, saying he had been to see his wife and children. 1825 Inscription on an almshouse in Lincoln—"Sir W. Ellis left this for four poor widows, who shall be chaste and honest. One shall be the widow of a singing man at the cathedral, and the other three shall be the widows of freemen of this city of honest fame and good report. They shall all attend service at the cathedral and shall be able to say the Lord's Prayer and the articles of belief without a book. They shall not be brewers nor be keepers of any ale house, nor tippers of ale or beer. They shall not beg nor harbor beggars."

## WHEAT SITUATION IN MANITOBA.

THE Winnipeg Commercial, of Sept. 3rd, says: The beginning of the movements in new wheat has stirred up more interest in the situation in Manitoba markets. At some country points deliveries of new wheat were quite heavy this week, but the most of the grain was going into store in country elevators, as the buyers were not on the market. Most of the shippers will have buyers on the market on Monday. Prices offered in Manitoba country markets to farmers range about 40 to 42c per bushel, average freight rates. The wheat now coming in is from thrashing direct from stock, for which the weather has been favorable. The sample is good. Prices were easier this week, in sympathy with lower markets elsewhere. We quote No. 1 hard at 58c. to 59c. per bushel, delivered afloat Fort William and new wheat about 57c. Stocks in shore at Fort William on August 25 were 789,761 bushels. Receipts for the week were 107,786 and shipments 248,228 bushels. A year ago stocks were 1,331,000 bushels, being a decrease of 118,889 for that week. The reduction in terminal elevator rates to ¼c per bushel for handling, (including storage for twenty days,) and ¼c for 30 days subsequent storage, is a not unexpected feature of the week. In the country stacking and thrashing has made good progress, under excellent weather conditions, and the marketing shows a splendid sample of hard wheat. The western board of grain examiners meet on September the 11th in Winnipeg. As the crop is very similar in condition to last year, the work of fixing the standards for grading the crop should be comparatively easy.

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