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AND INDUSTRIAL WORLD  
DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

Vol. 34.

TORONTO, MARCH 5, 1897.

No. 5.

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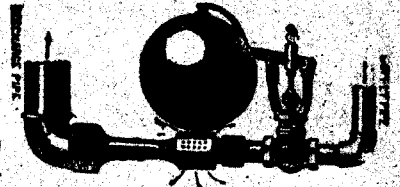
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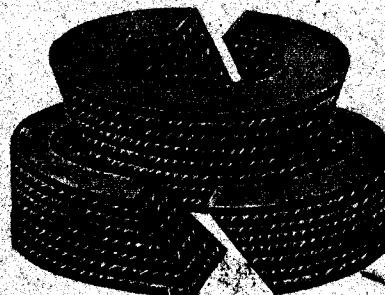
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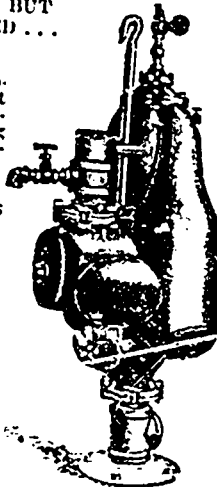
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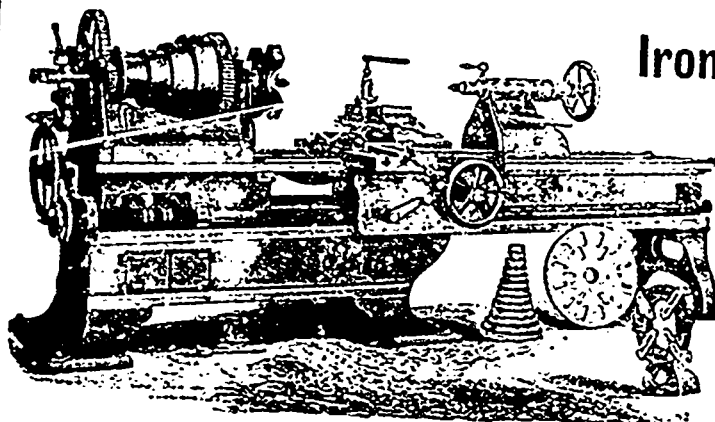
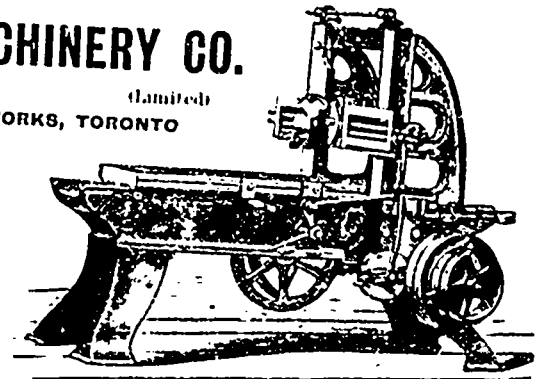
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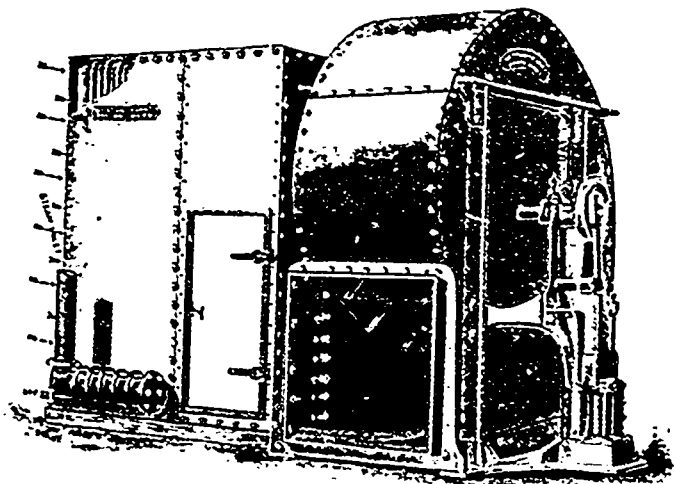
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To enable those in all branches of manufacturing enterprises to act in concert, as a united body, whenever action in behalf of any particular industry, or of the whole body, is necessary.

To maintain Canada for Canadians.

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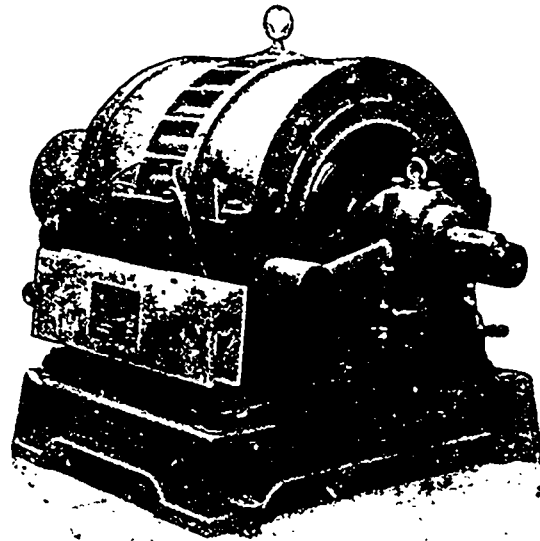
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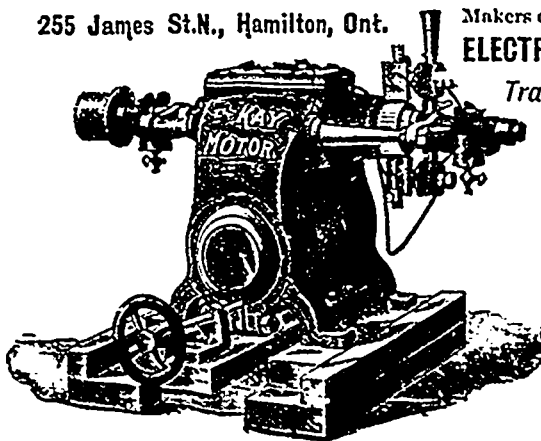
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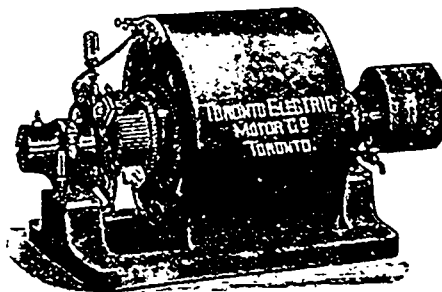
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This Machine Leads; Others try to Follow!

**READ** *USERS' EXPERIENCE OF THE PLANSIFTER BELOW*  
 THEN HAD YOU BETTER NOT ACT AND TRY THE MACHINE YOURSELF

The "Plansifter" in  
 125-Bbl Mill.

GLENCAHNS, ONT.,  
 January 28, 1897.

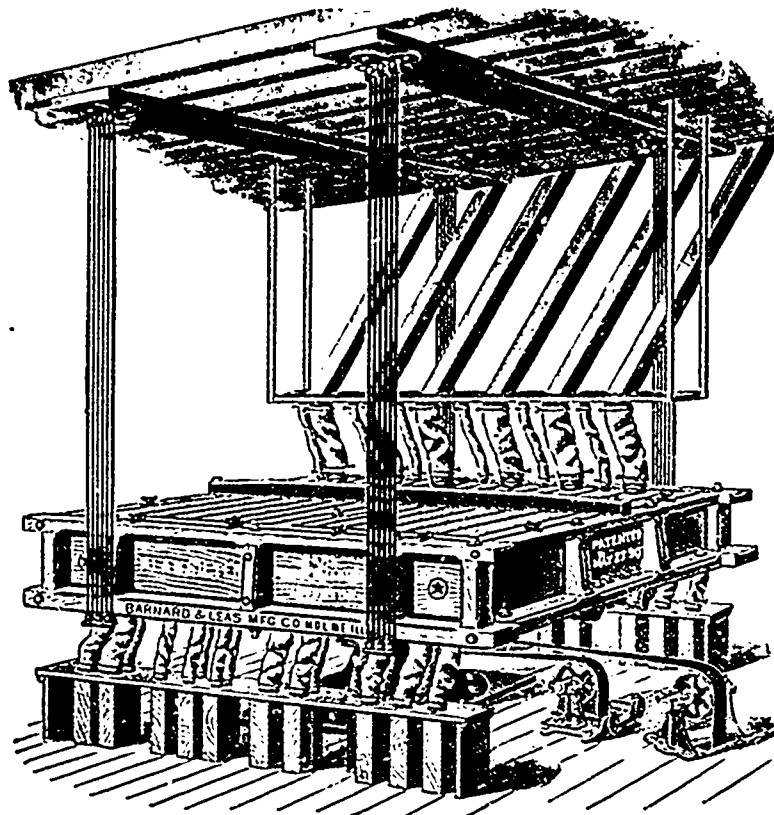
MESSRS. WM. & J. G. GREY,  
 Toronto, Ont.:

DEAR SIRS:—We would have written you sooner with reference to the "Plansifter" which you put in for us about four months ago, but thought it better to wait until we had given it a pretty fair trial. This machine has taken the place of six reels, and after four months' constant use, we find a decided improvement in color of both "Patent" and "Break" flour, and a better yield, and a largely increased capacity, with the same power. The "Plansifter" is most certainly a wonderful machine, and with our present knowledge of it, we would not be induced to return to the old system of bolting flour on reels.

Wishing you every success, we remain, Yours very truly,

M. N. STEPHENS & SONS.

*The above letter is a good illustration of how easily the "Plansifter" can be satisfactorily operated by millers having no previous experience with the machine. In the case of the above machine, owing to an accident with Messrs. Stephens' Mill Pond, our millwright, had to come away before the machine was started. None of us have been near the mill since. This testimonial is therefore full of meaning as to the excellence of the "Plansifter."*



The "Plansifter" in a  
 50-Bbl Mill.

WARSAW, February 1, 1897.  
 DEAR SIR: In answer to your letter I can recommend the "Plansifter" as being a first-class machine in every respect. It does its work first-class, runs without any trouble whatever in the hands of a practical miller, and is a great saving in power from the reel system, as it does not take any more power to drive a "Plansifter" than it does to drive one round reel. We have a No. 2 "Plansifter" in our mill here, and it does all the scalping and bolting for ten pairs of 9x1 1/2 inch rolls with the aid of two little Wonder Reels to dust the tailings or shorts. We have made several tests as to capacity and yield. The mill was guaranteed to grind fifty bbls. per day, but we have made ten bbls. more than that with ease. Our last test was made on No. 2 Manitoba hard wheat, we made a barrel of flour out of a shade less than four bushels, twenty-six pounds, with a low grade taken off. The flour was of excellent quality, and I feel confident that I can make a lower yield and still have good flour. If you are going to build a mill I should certainly say, put in a "Plansifter," as it is in advance of the Reel system, especially on hard wheat.

I remain yours truly,  
 ALFRED BLIGHT, Head Miller  
 and Manager for

John Watson

*The above letter was written by Mr. Blight, in answer to an enquiry from a party desiring information regarding the "Plansifter," and speaks for itself.*

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It Saves Space  
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 It Saves Cloth  
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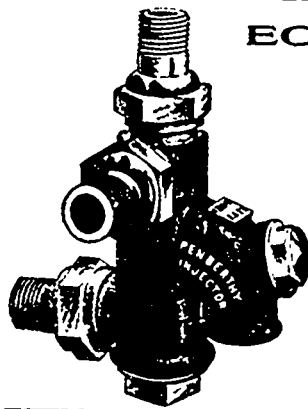
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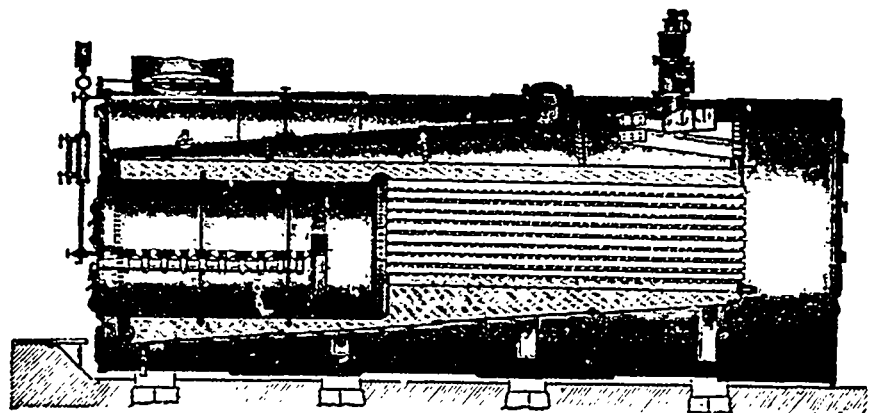
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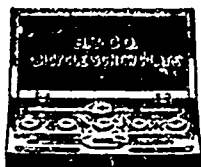
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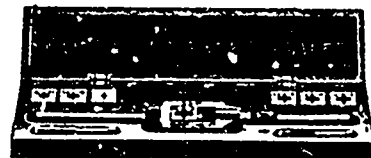
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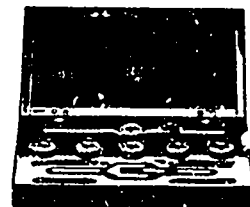
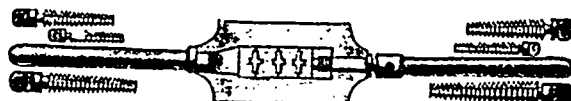


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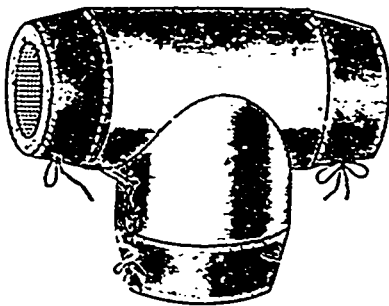
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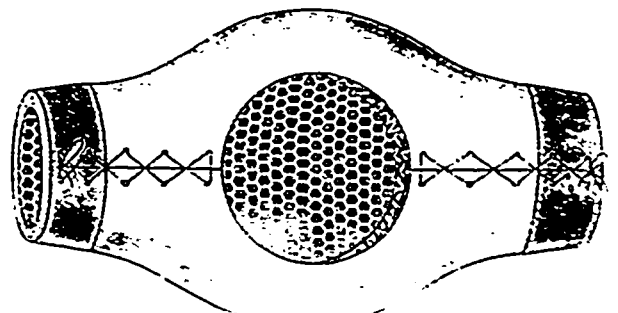
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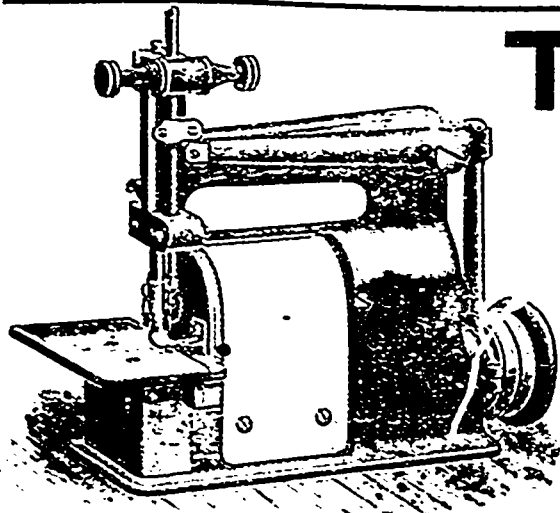
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CONSISTENCY IS A JEWEL.

Some Tory papers find fault with the bank note printing contract because the contractors will establish a new plant in Ottawa, and may bring in skilled laborers with them. That, coming from N. P. papers, is rather rich. Heretofore the coming in of a foreign company and the bringing of a number of families to settle among us has been heralded as a proof of the virtue of the N. P.—Hamilton Times.

Our esteemed contemporary can be quite stupid sometimes. When such concerns as the Meriden Britannia works, or the

Westinghouse works, came to Canada, forced to come by the N. P., and introducing in this country the manufacture of articles not before made here, the Tories rejoiced, and said, "Behold the good work of the great N.P." But in the case of the New York bank note printers, they are simply coming here to do work which was previously done by Canadians, and their coming throws those Canadians out of a job. Dost observe the difference, Timesey?—Hamilton Spectator.

The criticism of The Spectator is quite at fault, but also quite in line with some of its other arguments. It is not happy in its comparisons. When the Meriden Britannia works came to Canada and located at Hamilton, forced to do so by the N. P., The Spectator, and The Times also, thought it a good thing for Canada in general, and Hamilton in particular, but when, through the same influence, the American Bank Note Company comes to Canada and locates at Ottawa, The Spectator has no good word to speak upon the occasion. The same likewise, regarding the Westinghouse Company. That concern, through precisely the same influence that gave Canada the Britannia Company, and the American Bank Note Company is established at Hamilton. The Spectator welcomes it with much rejoicing although its advent is attended with circumstances that did not characterize the coming of either of the other companies, and which were in violation not only of the ethics of protection but of the law also. We are not prepared to say at this time whether the Britannia company were the first in Canada to manufacture its special lines of goods, but at this time it is only one of quite a large number of concerns engaged in that business, the presence of all of them being without doubt the result of the N.P. The Spectator will not claim that there is no room in Canada for but the original concern, neither will it deny that the presence of the many accomplishes precisely what the N.P. intended it should accomplish—the manufacture in Canada of britannia and plated ware, and at as reasonable prices as such goods can be purchased for in the United States. It is true that for some years and up to this time the British American Bank Note Company have been in business in Canada, and that it has been printing Dominion notes, postage stamps, etc., for the Government, and the notes for some of the Canadian banks, but it is also true that for reasons that The Spectator may easily imagine, notwithstanding the presence of that concern in Canada, much of that sort of work has been and is being done abroad. Why? As far as plated ware is concerned the presence of a sufficiently large number of concerns engaged in that business has resulted in such a healthy and lively competition that prices are reduced to a minimum, and the object of the N.P. in encouraging their presence accomplished. Can The Spectator say the same thing as regards the printing of bank notes? It cannot, simply because, as far as the Government printing was concerned, there was no competition. In the absence of competition it could not reasonably be expected that the British American Bank Note Company would bid against itself; and if a large portion of the bank note printing was done abroad, even in the face of the tariff protection enjoyed by the home concern, it was because it was cheaper to have it done abroad than at home. Does The Spectator see this point? Judging from the inconsistent arguments frequently advanced by The Spectator, it is not to be supposed that that journal would ever have thought of raising a protest to the acquisition to Canada of the works of the American Bank Note Company, had they been established in

Hamilton, but their establishment in Ottawa is an entirely different matter. When it was announced that the Government had awarded a contract to the American concern it was also announced that all the work would be done in Canada, which meant that the plant, machinery, material, etc., would be manufactured in Canada of Canadian materials, as far as Canada could produce them, and that upon whatever machinery or materials there must be imported, such imports would pay whatever duties there might be imposed by law. The labor, too, to be employed in the industry would be Canadian labor, of course, no matter what nationality might characterize the workman. When the capital became invested in lands, buildings, machinery and materials, it became Canadian capital; and when workmen gained employment in the industry, no matter where they were born, they became Canadian workmen.

Entire similarity of circumstances do not characterize the advent of the two concerns alluded to by *The Spectator*, established in Hamilton. The Meriden Britannia Company came to Canada to engage in the manufacture of a line of articles in constant demand by the masses of the people; the Westinghouse Company came so that they might save to themselves whatever of the profits of their monopoly they would otherwise have to pay to the Government in the way of duties upon their railway air-brakes if they preferred to manufacture them at their works in the United States. The Britannia Company were engaged in a business in which it was and is free to any other concern to engage, and in which many other concerns have engaged. The Westinghouse Company are engaged in a business in which no other concern whatever can engage, for they own the patents under which their air-brakes are made, and an injunction from a Canadian court would prevent any other concern from engaging in the business. The Britannia Company paid full duty upon all the plant and machinery that they thought necessary in the establishment of their business in Hamilton, which *The Spectator* thought was right and proper, and in full accord with the N.P. The Westinghouse Company paid no duty whatever upon their plant established in Hamilton, which the *Spectator* thinks perfectly right and proper, and praises the Laurier Government for allowing, contrary to law, and which is in violent disaccord with the N.P. Strange inconsistency, when a Grit Government do, as in the case of the establishment of the American Bank Note Company at Ottawa precisely as a Tory Government did in the case of the establishment of the Britannia Company at Hamilton, *The Spectator* raises a protest. *The Spectator* thinks it perfectly correct and proper for the Government to violate the spirit of the N.P. in the Westinghouse case—in favor of Hamilton, and thinks it is wrong for the Government to maintain the spirit of the N.P. in the American Bank Note case—in favor of Ottawa.

#### AMERICAN PULP MILLS AND CANADIAN PULP WOOD.

During the past week a large sale of Canadian pulp and lumber mills, combined with timber limits, has been made to Gen. Russell A. Alger of Michigan. He has purchased of ex-United States Senator Warner Miller of Herkimer, N.Y., Warren Curtis of Palmer, N.Y., and A. Pagenstecker of New York, a controlling interest in the Laurentide Company of Grand Merc, situated near Three Rivers, in the Province of

Quebec. The Laurentide Company own many thousand acres of limits and heavy timber, both spruce and pine, and several large mills, one or two of which are devoted to the production of wood pulp. Messrs. Miller, Pagenstecker and Curtis are heavily interested in the Hudson River Pulp and Paper Company, whose immense plant is located at Palmer, in Saratoga County, N.Y. Most of the spruce wood which supplies these New York mills, is obtained from the forest controlled as above. It is likely that Gen. Alger's purchase means also the development of these lands for what pine there is left on them, as well as for the spruce, which is to be devoted mainly to wood pulp. What effect the possible imposition of an export duty of \$2 or \$3 per cord on spruce pulp wood by the Dominion Government will have upon such enterprises is yet to be seen.—*Northeastern Lumberman*.

In another item our New England contemporary informs us as follows:—

Not many years ago considerable lots of ground wood spruce pulp were shipped from this country to buyers in Great Britain and on the Continent. At that time prices were much higher than now. Competition was met through the Scandinavians, who produced cheaper wood pulp in Sweden and Norway than the Americans were willing at that time to supply, and dropped their prices, taking the market away from the United States pulp mills. Since that time prices have fallen considerably in this country, and it now looks as though they were near a point when large exporting could again begin. Low prices are not a happy state of affairs, even in this country, but it may be worth while to ship several thousand tons abroad, with the hope of lessening the supply and increasing the price in this country.

And so it all goes along the line. The spruce forests of the United States are fast disappearing—in many instances have already entirely disappeared, and American mills are almost entirely dependent upon Canadian forests for their supplies of pulp wood. American millmen and speculators are investing their capital in Canadian timber lands, and hauling away as fast as possible the wood that is necessary to keep American mills in operation, and without which many of them would be compelled to close, and yet the Canadian Government allow this depletion of our wealth to go on, while not a dollar's worth of Canadian pulp or lumber is allowed to enter the United States untaxed. How long, oh, how long, will this condition be allowed? General Alger, of Michigan, and his friends, having purchased a controlling interest in the Laurentide Company, of Quebec, who own many thousand acres of heavy timber in that province, and several mills; and General Alger and his American friends being also heavily interested in an immense plant in Saratoga county, New York, the most of the supplies for which are obtained from the Laurentide timber limits controlled as above; and in view of the duty imposed upon Canadian pulp entering the United States, there being no duty whatever upon pulp wood going there; it can readily be seen that General Alger will not operate his Canadian pulp mills to any great extent, whereby employment would be given to Canadian labor, but rather take his Canadian pulp wood to his American mills, and thereby give employment to American labor. Canada will be depleted of its forest wealth, and the United States will be enriched by the transaction.

The *Lumberman* expresses an interest in the outcome of the transaction if Canada imposes an export duty on spruce pulp wood. In our opinion the effect will be that General Alger's mills in New York will be closed down, and his Laurentide mills will be started up, and that American consumers will have to pay whatever duty their Government may be pleased

to place upon pulp. It thinks, too, that it now looks as though the American pulp manufacturers were near a point where large exporting of pulp could again begin. Low prices, it tells us, are not a happy state of affairs, even in the United States, but that it may be worth while to ship several thousand tons abroad with the hope of lessening the supply and increasing the price in that country. The low prices of which it complains is due in large part to the cheapness of Canadian pulp wood; and we suggest that if the Dominion Government were to impose an export duty on the article, as it should do, our American friends would not be such sufferers from the complained of cheapness of pulp. On the other hand, General Alger and his friends, and other Americans who have invested in Canadian timber limits, would find it much to their pecuniary advantage to start up their Canadian mills, and manufacture pulp and paper also for the British and continental market. Canada would then reap its legitimate share in the transaction.

### CANADIAN NICKEL.

In its recent review of the metal markets for 1896, The Engineering and Mining Journal says:—

The production of nickel in the United States in 1896, entirely from Canadian ores and matte, reached a total of 3,697,039 lbs., which compares with 2,678,661 lbs. in 1895, showing an increase of 1,018,378 lbs. Of the production in 1896 metallic nickel amounted to 1,600,049 lbs., the remaining 2,096,990 lbs. being in the form of oxide and sulphide.

This production may be said to represent the greater part of the world's output, as very little is reported from abroad outside of the small quantities made in Norway, Sweden and Germany. For a part of the year the Societe le Nickel, in France, has had its works and its mines in New Caledonia closed, the stocks on hand being sufficient to meet all requirements for the metal for some time to come. The demand for nickel, except for use in steel making, does not seem to increase; and the amount required for alloying steel is still comparatively small. No great increase in the use of the metal industrially can be expected until it can be furnished at a much lower price than at present.

Notwithstanding a comparatively light demand prices have been maintained at nearly the same level through the year. At the close of the year the current quotations in New York were 33c. to 36c. per pound for ton lots, and 37c. to 39c. for smaller orders. The limited extent of the trade and the absence of competition among producers have prevented fluctuations in prices.

The Official Daily Market Report of the New York Metal Exchange, discussing the same matter says:—

Consumption throughout the year has been rather poor and prices were depressed. German silver makers complained almost continually of not receiving sufficient orders to keep their mills going, and during the general depression of trade last summer, consumption of nickel was almost nil. On the other hand, iron and steel makers are taking larger quantities from year to year, in order to give their finished metal greater resistance, and although some progress has again been made during the year, it has not fully come up to expectations.

Stocks have increased somewhat during the year, and unquestionably the production exceeds consumption. Had prices not already reached a very low level, it would have been difficult to maintain present values.

A Sudbury correspondent of The Globe, speaking of the facts presented by The Engineering and Mining Journal, and alluding to the quoted prices of nickel in that market, says:

At these prices the value of the nickel produced by the mines of practically one company here last year was \$731,-

143. But to this must be added at least a third more for the copper and cobalt in the ore, making a total amount in round numbers of \$975,000. If there are no profits in nickel-mining, as those engaged in the business so persistently allege, it is rather hard to understand why the principal company in this district has just added another smelter to its plant, and is preparing to open up two new mines this coming season. The trouble is that the industry is in too few hands now, and the want of competition keeps the price of nickel too high for general use. We need one or two more companies here. There are plenty of first class properties to be had, and it is claimed that by using McDonald's self roasting process the cost of making nickel matte could be reduced by nearly one-half. A plant for this purpose would not cost any more than the ordinary smelting works at present in vogue here.

If some of the Ontario money that is going to other places for mining investments would come to this district fully as good returns might be obtained in the end. There is room for a strong nickel company, and also for any amount of capital and enterprise to develop the Wahnapiatae gold mines. Some weeks ago a party of three prospectors made a flying trip into the unexplored region north of Kookagaming Lake for fifty miles, and they report that the gold belt extends all the way to the height of land there, with plenty of territory for thousands of prospectors to work in. There is sure to be a regular stampede in that direction as soon as the snow leaves in the spring, if not before then.

At the recent tariff investigation at Washington, before the Ways and Means Committee of the House of Representatives, Representative Hermann, of Oregon, asked for a duty of at least ten cents a pound on nickel ore entering the United States. There is now no duty.

"How good are the Canadian ores as compared with ours?" Mr. Hermann was asked. "The Canadian ores average a yield of 2½ per cent. of nickel. Our Oregon ores average five per cent."

"What is the average value of the nickel ores per pound imported from abroad?" "Three cents a pound."

"And you want a duty of ten cents?" commented Mr. Dingley. "Do you realize that this means a duty of more than 300 per cent. ad valorem?" Mr. Hermann looked nonplused. In a moment he answered: "My constituents must have reference to the finished product, the metal nickel, not the ore."

"You have a duty on nickel itself of six cents a pound already, haven't you? Why do you want it raised?" "We want to build up our industry. Why, we can produce nickel in this country to-day cheaper by four cents a pound than the Canadians can produce it. The industry deserves encouragement."

"If you already have four cents advantage over the Canadians, why on earth do you want ten cents more?"

"We have no encouragement now, we need encouragement."

"Well," remarked Mr. Turner, "I wonder you don't come here asking for a bounty and have done with it."

The next witness was Mr. Robert J. Thompson, nickel refiner, of New York. "There is not," he said, "one mine in the United States which could be made to pay under the protection of any reasonable duty. We refiners are, of course, anxious to buy our nickel at home if we can find it here, but we cannot. We find some rich ores, but they are small in extent and widely scattered. The Nevada ores which have been described as so rich are found in pockets of ten, fifteen and twenty tons. If you put on the duty, the United States Government itself will pay the duty and nobody else."

Here Mr. Hermann interrupted to ask:—"Is it not true that the copper which occurs with the Canadian nickel ore is hard to extract and makes a decided drawback to the use of these ores?"

"On the contrary," answered Mr. Thompson, "the copper is easily taken out and is a valuable by-product. The Government's purchases of Canadian ores have been at a price of eleven cents a pound for the nickel and four cents for the copper contained in them, and they have turned around and sold me the copper for six cents.

In a recent issue of *The Mail and Empire* was an announcement to the following effect:

"It seems as though nickel at present is rather a drug on the refined nickel market, as the Canadian Copper Company, of Sudbury, has been obliged to discontinue for the present its shipments of matte, owing to difficulty experienced in marketing its refined nickel."

Mr. A. McCharles, of Sudbury, noting this statement, wrote as follows:

"A copy of the paper of that date was sent to nearly all the owners of nickel properties in this district, which, in itself was rather suspicious, and seemed to indicate some other purpose than merely to enlighten the world on the state of the nickel market.

"We knew here that the Canadian Copper Company had been shipping more matte this season than ever before, and also preparing to open up another mine in order to get out more ore. The above announcement therefore came like a veritable surprise to most of us, and as the matter was of vital importance to the district and the country at large, I wrote at once to New York about it, and got the following reply, which shows that the report of an overstocked market in nickel was entirely at variance with the facts of the case:—

"It is impossible to find out the exact amount of refined nickel in stock. You know that the business is in a few hands, and is very closely kept. The companies will not give any information on the point. There has been, however, no unusual pressure on the market to sell, nor are we aware that stocks are any larger than is customary at this season. We have information to the effect that the Canadian Copper Company is considering the adoption of some change in its refining processes, and that may have something to do with the matter to which you refer. At any rate, it is much more likely to be that than any increase in stock which has caused the suspension of matte shipments."

"Then, in the last issue of *The Engineering and Mining Journal*, of New York, the market report on nickel is given as follows:—"Sales have been fair, and prices are unchanged. We quote for ton lots 33 to 36 cents per lb., and 37 to 39 cents for smaller orders. London prices are steady at 14 to 15d. for large orders, and 15 to 16½d. for small lots. The New York price is about on a parity with London, allowance being made for the duty of six cents per lb. here. The Paris quotation is 4fr. per kilo, equivalent to about 36 cents per lb."

"I may say that these prices have been steadily maintained for a long time now, which would hardly be the case if nickel were a 'drug' on the market. It is quite true that the Canadian Copper Company had not been shipping any matte for a month or so this fall, but shipments were resumed last week on even an increased scale. Furthermore, the prospects of the nickel mining industry here have improved considerably

of late, and negotiations are going on for the purchase of some large properties, and the erection of new works, including a plant to test the McDonald self-roasting process in a practical way."

#### THE AMERICAN GAS SUPPLY.

The reports that reach Canada from time to time of the speeches made in the American Congress and elsewhere, especially when allusions are made to Great Britain and her dependencies, are generally of the tail twisting order that indicate that the orators are blatherskites who, in the absence of argument, vent venom and abuse, and, as far as their weak abilities go, prefer the waving of bloody shirts than the gentler ways of friendship and common sense. We know, however, that these red-mouthed politicians are not in accord with the better element in the American community, and that they are, when suitable occasions offer, denounced in most vigorous terms, an instance of which is the following from our namesake, *The Manufacturer of Philadelphia*. That journal, speaking of how the proposition for the completion of the Nicaragua canal is being talked to death, says:

There is no question but that this waterway should be built at the earliest possible day for the industrial good of this country, and this being the case, private action being unlikely to lead to definite results, the national Government should guarantee sufficient money to the enterprise to push it through to a successful outcome. It is necessary to confess, however, that the canal has some friends to-day, who had much better be shown out of the ranks, since their friendship is of the sort that does the cause no manner of good. The most conspicuous offender in this line, perhaps, is Senator Morgan, of Alabama, a master of flowing periods, who at the present day seems to stand as the special champion of this great canal. During the last few weeks, when the canal bill was before the Senate every day as the "unfinished business," he has said so much, and has often said it so violently that even long-time friends of the scheme have been repelled rather than attracted toward it. It has become the butt of all kinds of ridicule in the press; and in that portion of the press which ought to be counted safely on the side of this great improvement.

Among Morgan's latest indiscretions is a proposition to abrogate the Clayton-Bulwer treaty by which the governments of Great Britain and the United States many years ago, defined their rights as neutrals in Nicaragua. So soon as the Senate refused to listen any longer to his unreasonable speeches on other subjects, he brought forth this Clayton-Bulwer resolution, and this week he has broken out in characteristic manner on this question. He apparently has no notion as to what he is doing, or what he wants to do in this matter, except to make himself heard, and it is cause for real regret from every patriotic point of view in so far as the canal is concerned, that no way can be found of putting a stop to his indefensible proceedings. If this canal is built it will necessarily pass through neutral territory as does the Suez canal. There is no doubt that this Government should have "control" of this waterway. No friend of the canal doubts this for an instant. But the kind of control we want is to own a majority interest in the concern as England does in Suez. If the territory is neutral, we will need no further control. We can help build the canal, and open it to the traffic of the world. We will draw such dividends as the company

earns. In the case of the Suez canal, this has been, we believe, 8½ per cent. upon the cost of construction.

When Morgan or anybody else talks about forts, and gunboats, and discriminating rates, he is subjecting himself and the project which he is pretending to befriend, to the ridicule of all sensible men. Such over-heated advocates of the canal know nothing about international law, and not much about ordinary international politeness. The nations of Europe have found rules for the amicable adjustment of their respective interests, and this Government, if it wishes to be a first-class government, must treat these important international questions in the same spirit. The man who wishes to fight and kill his fellow men without pausing to think or to consider whether there is any real need for doing this or not, is the most anomalous fellow that our American public life has ever produced.

#### BUY CANADIAN MADE GOODS.

Some days ago the Montreal Herald published an article having reference to some expressions of opinion of Mr. J. P. Murray of the Toronto Carpet Manufacturing Company, in which it was urged that all Canadians, whenever possible, should purchase goods of Canadian make in preference to goods made elsewhere. Mr. Murray urged that Canadian manufacturers, so long as they gave equal value for the same money, were entitled to preference from Canadian consumers, and that no false idea of the superior qualities of English or foreign goods, simply because they were of English or foreign manufacture, should be allowed to prejudice the purchaser in making his choice. He went even further, and suggested that purchasers when buying goods, should ask for such as were of Canadian make.

The question is one which is not to be lightly passed over, says The Herald, for it directs attention to a human weakness among the Canadian people. Canadians might be more loyal than they are to their own producers, to those who have established themselves here, and who are endeavoring to build up their trade along with the development of the country in other lines. They are apt not only to look to other countries for their patterns and designs, but to see in the products of other countries a merit superior to that of their own manufacture. With the development of the Dominion it was inevitable that there should grow up, notwithstanding adverse fiscal conditions, a succession of industrial enterprises, which have engaged the capital of investors and given employment to thousands of hands. In the face of difficulties inherent in new countries, these enterprises have been pushed forward, until to day, in many lines, Canadian goods rank in merit with those which are produced in larger markets, and under auspices more favorable from an economic standpoint.

The failure of the Canadian people to act in accordance with the suggestions of Mr. Murray and of The Herald is difficult to be remedied. It is very nice of The Herald to recommend to the people that, other things being equal, they should in making purchases give the preference to home made goods, but it is a new thing for our contemporary to make any declarations that might in any manner be construed as favorable to Canadian manufactures. It has always been contrary to its political principles to do so, and even in its editorial, while it has some pleasant words to utter on the excellence of Canadian goods, it cannot refrain from ringing in its old and

threadbare song, decrying the Conservative theory of tariff protection that has built up our manufacturing industries until the excellence of the products of them squeeze an admission of the fact from it, and the suggestion that because of that excellence the goods should always be demanded by purchasers; and commending the so oft rejected Liberal theory that has always antagonized the manufacturers.

If we comprehend Mr. Murray's idea, it is, in effect, that the consuming public should be educated up to and made to appreciate the fact that Canadian goods are the equal of any foreign goods, and that in making purchases they should be given the preference; and that to do this consumers should always demand the home article; that merchants should persistently declare that they have the home article on sale, and that Canadian newspapers should in the most conspicuous manner possible advise their readers to this effect.

This latter idea is impracticable—that is, unless the manufacturers themselves adopt the very same method of bringing their goods to the attention of the public that the importers of foreign goods do—by advertising them. Newspapers, like merchants and manufacturers, make their living by their business; and if manufacturers are not as appreciative as merchants of the value of printer's ink, they should not expect newspapers to discourage the purchase of foreign goods, offered for sale by merchants and importers, who are liberal advertising customers, for the sake of increasing sales of home made goods that are not advertised. The newspaper man should not be expected to disparage the enterprise of his friends for the sake of encouraging the business of those who do nothing to help him along.

Our suggestion to all who may have merchandise to sell, whether of home or foreign make, is, if in wisdom's ways they would be wise, to hump themselves and advertise.

#### CANADIAN PIG IRON INDUSTRY.

At this time, when the advantages of the South for producing iron cheaply are being so much discussed, a comparison of those advantages, with the conditions surrounding iron manufacture in Canada, is of considerable interest. This comparison was made by Mr. C. A. Meissner, a member of the Mining Society of Nova Scotia, in a paper presented at a recent meeting of that body. In this paper Mr. Meissner held that, roughly speaking, the average cost of Southern iron is about \$4 to \$5 per ton below Nova Scotia iron, "of which probably \$3 or more is due to the peculiar labor and commissary conditions caused by the preponderance of ignorant negro labor." He admits, however, that the main reasons for this difference in cost lies first in the natural and labor advantages which the South possesses, and second, in conditions of plant and improved appliances which the Canadian iron producers have not yet had time to either introduce, or get the full benefit of, but which are bound to be remedied if the Canadian manufacturer receives the proper national encouragement.

Discussing this situation The American Manufacturer, claiming that in natural advantages the ore takes first place, directs attention to the fact that, according to Mr. Meissner, the red ores of Alabama are put in the stockhouse at a cost not exceeding seventy-five cents, and in many cases at sixty or sixty-five cents per ton. The brown ores cost at the furnace \$1 to \$1.15, varying with location of plant. Nova Scotia has



several grades of red hematites which, although rather limited in extent, are richer in iron than the average Alabama red ore, as they will average fifty to fifty-two per cent. iron, with ten per cent., to fourteen per cent. silica; they are, however, very much higher in phosphorus, running from 1.00 to 1.50 per cent., thus giving a pig iron containing up to three per cent. phosphorous if used alone, making an ideal basic pig, but too high for general foundry or mill purposes. The Newfoundland red hematite is also hard, showing about the same percentage of metallic iron with but one half per cent. of phosphorus, and hence is richer than the Alabama ores, though entirely dissimilar in physical structure and formation. They are, however, very much more distant from the furnaces, and more costly to mine, so at best these ores can only be put into the furnaces at from \$1.85 to \$2 per ton actual cost; freights running from \$1.10 to \$1.50 per ton, to these figures must be added profits, as the interests are not all united, as is the case almost entirely in Alabama, making the cost of red hematite at furnace \$2 to \$2.60, as against seventy-five cents in the Alabama ores. Of course, the higher iron percentage overcomes some of this, but there is still a large margin against the Nova Scotia furnaces.

In considering fuel costs Mr. Meissner states that the cost of Nova Scotia coke is rather higher than that of the Alabama product. But the most interesting feature of his paper, was that part relating to labor in Southern iron production. He declares that he has had five years' experience in handling Southern colored labor. The negro, he says, is, in most cases, paid through the company's store. Some few will have a large portion of their pay coming to them at the end of the month, especially in town districts, but in more remote districts there is no question but that any considerable amounts of cash on pay-day is a rarity. Owing to his ignorance the temptation arises to charge him heavy prices, and the result is that cheap Southern iron is largely due to store profits. And the contract prison labor system by which prisoners are auctioned off to the highest bidder, allows of very cheap mining, for, while the men are usually treated quite fairly, every effort is made to get the most work out of them for the least expenditure.

Assertion similar to the foregoing have been made by gentlemen connected with Southern iron production, says our contemporary, and have been as promptly denied by others. Some of the largest iron-producing concerns in the South have stated that they are in no way connected with company stores. It is a fact, however, that others do owe a large measure of their success to the company store system, which permits the employer to make a profit on what the laborer consumes, as well as on what he produces. The showing of the cost of iron-making in Canada, in comparison with Alabama figures, is interesting, although some may not fully accept the figures given.

#### THE DARKNESS OF IGNORANCE.

Scarcely a day passes that the Hamilton Times and The Hamilton Spectator do not engage in scrapping matches, the fortunes of their newspaper warfare generally being about equally divided. We cannot speak in very high praise of the perspicacity of The Times, for it frequently fails to observe some of the weak points of its adversary; and we can say less for the knowledge The Spectator occasionally does not exhibit of things that it ought to be well acquainted with; and this

has never been more apparent than in a recent combat between these ink-slinging warriors, regarding the imposition of an export duty on saw logs and pulp wood. Discussing the question The Times says:—

The United States can yet supply itself better with pine logs and spruce pulp wood than Canada can supply herself with raw cotton and anthracite coal. How would a United States export duty on those two commodities affect our cotton mills and the temperature of our dwelling houses?

To which The Spectator replies as follows:—

If the United States Congress thought it would be to the interest of the United States to prohibit the export of cotton and coal to Canada, it would immediately pass the prohibitory law, and it would be perfectly right in doing so. It would be simple, ordinary, every day, common business.

The dark ignorance in which these two representatives of Canadian journalism slumber consists in the fact that under the laws of Canada, this country is free to impose an export duty on logs or anything else, and has frequently exercised that right, while the constitution of the United States absolutely prohibits the imposition of any export duty whatever, and that the Congress of that country has therefore no right to impose any such duty. If The Times and The Spectator had, before discussing the question as they have done, asked information of any ten year old school girl, even in Hamilton, regarding it, they would not have shown the dark ignorance their controversy indicates.

#### CANADIAN TRADE RETURNS.

The Trade and Navigation Returns of the Dominion of Canada for the fiscal year ending June 30, 1896, has been published, and from a copy thereof now before us we collate some interesting facts as follows:—

The grand aggregate trade of the Dominion which was \$137,027,532 at Confederation reached \$239,025,360 last year the highest in any year since that time, with the exception of 1892, 1893 and 1894. In 1893 the grand aggregate trade reached its highest water mark being \$247,683,638, in 1892 it was \$241,369,443 and in 1894, \$240,990,889. In 1873 the grand aggregate trade rose from \$131,027,532, in 1868 to \$217,801,203. It remained stationary for a couple of years, afterwards dropped considerably, and it was not until 1882 that it again got back to the figures of 1873. In 1882 the aggregate trade was \$221,565,703 and in 1883, \$230,339,826. So that with the exception of these two years the aggregate trade of the Dominion was not so high as it was in 1873 until 1890. Only in one year, that of 1893, were the imports so high as in 1873. The figures for the last seven years are as follows:—

YEAR.	EXPORTS.	IMPORTS.	AGGREGATE TRADE.
1890.....	\$96,749,149	\$121,858,241	\$218,607,390
1891.....	98,417,296	119,967,638	218,384,934
1892.....	113,963,375	127,406,068	241,369,443
1893.....	118,564,352	120,074,268	247,638,620
1894.....	117,524,049	123,474,940	240,999,889
1895.....	113,638,803	110,781,682	224,400,485
1896.....	121,013,852	118,011,508	239,025,360

#### GOODS FOR CONSUMPTION.

The goods entered for consumption at Confederation in 1868 was \$71,985,306 and the duty paid was \$8,819,431. In 1873 there was entered for consumption \$127,514,594 and the duty was \$13,017,730. In 1875 the duty was \$15,361,382 and it was not until 1881 that it again reached these figures. In that year it was \$18,500,708. The largest duty collected was in 1890. The goods entered for consumption and the duty collected since that year are as follows:—

YEAR.	CONSUMPTION.	DUTY.
1890.....	\$112,765,584	\$24,041,098
1891.....	113,345,144	23,481,069
1892.....	116,978,943	20,550,581
1893.....	121,705,030	21,161,710
1894.....	113,093,983	19,379,822
1895.....	105,252,511	17,887,269
1896.....	110,587,480	20,219,037

The excess of imports over exports since Confederation was \$521,719,423, and the average per year was \$174,990,325.

The aggregate trade of the Dominion with Great Britain has never reached the point it was at in 1874, when it was \$108,083,642. In the same year the aggregate trade of the Dominion with the United States was \$90,524,060. The figures since 1890 with both countries are as follows.—

YEAR.	GREAT BRITAIN.	UNITED STATES.
1890.....	\$91,743,935	\$92,814,783
1891.....	91,328,384	94,824,352
1892.....	106,254,984	92,125,599
1893.....	107,228,906	102,144,986
1894.....	107,256,123	88,844,040
1895.....	92,988,727	95,932,197
1896.....	99,670,030	103,022,434

The value of exports from Canada to Great Britain and the United States was as follows since 1890:—

YEAR.	GREAT BRITAIN.	UNITED STATES.
1890.....	\$48,353,694	\$40,522,810
1891.....	49,280,958	47,138,695
1892.....	64,906,549	38,988,027
1893.....	64,080,493	43,923,010
1894.....	68,538,856	35,809,940
1895.....	61,856,990	41,297,676
1896.....	66,690,288	44,448,410

The imports for the same period were as follows from Great Britain and the United States:—

YEAR.	GREAT BRITAIN.	UNITED STATES.
1890.....	\$43,390,241	\$52,231,979
1891.....	42,047,526	53,685,657
1892.....	41,348,435	53,137,572
1893.....	43,148,413	58,221,976
1894.....	38,717,267	53,034,100
1895.....	31,131,737	54,634,521
1896.....	32,979,742	58,574,024

The duty collected on British goods in 1896 was \$7,358,514, compared with \$7,006,676 in 1895. In 1895 the duty collected on United States goods was \$6,897,395, and in 1896, \$7,767,092. The duty collected on goods from Germany was \$1,329,186, and on goods from France, \$1,020,804. In 1895 the duty on German goods was \$892,547, and on French goods \$985,945.

The amount of customs duties paid per head of the population is placed at 3.94, compared with 3.52 in 1895. The percentage of duty on total value of goods imported dutiable and free was 17.13, compared with 16.14 in 1895, and on goods entered for consumption 18.28 compared with 16.99 in 1895. The expenses of collections were 04.43 compared with 05.13 in 1895.

EDITORIAL NOTES.

Messrs. T. H. Freeland, Vice-President, and T. Robertson, Secretary of the American Bank Note Engraving Company of New York were in Ottawa a few days ago in connection with the contract which has been awarded the company by the Government for engraving Dominion notes, stamps, etc. The contract permits the company to import their dies so that the engraving of them will be done in New York. The gentlemen were asked as to their intentions about employing Canadian labor. They replied that they did not intend to bring over any Americans to Ottawa. On the contrary, it was their intention to take some young Canadians to New York to teach them the American Bank Note Company's methods of

business. "We can get all the men we require in Ottawa," said Mr. Freeland, "and we don't therefore intend to employ anything but Canadian labor. Why should we bring men to Ottawa, when we can get them here?"

Application is being made for the incorporation of a company in Hamilton to be known as the Lake Medad Portland Cement Company. The formation of the company is the result of a discovery made some months ago at Lake Medad, a short distance north of the city of Hamilton. This lake, which had always been credited with an unknown depth of water, was found to have a bottom of rich cement marl, which extended for a distance of several hundred feet back from the shores of the lake at a depth of about twenty feet. The deposit has been analysed, and found to be very rich, and the land about the lake has been secured by the new company. Portland and hydraulic cements, lime, and other builders' supplies will be the company's output.

"Why do men leave the farm?" is a familiar question. Such migration is in accordance with a Government policy maintained for eighteen years.—The Globe.

There are said to be more Irishmen in the United States than there are in Ireland; more Welshmen than there are in Wales; as many Scotchmen as there are in Scotland, and almost as many Englishmen as there are in England. And yet in the United States a Government policy of protection has been maintained, in greater or less force, for over a hundred years, while in Great Britain, the country from which these adopted American citizens emigrated, the Governmental policy of free trade has been in force for a half century.

It is believed that President-elect McKinley has practically determined upon the personnel of his Cabinet as follows:—Secretary of State, John Sherman, of Ohio; Secretary of the Treasury, Lyman J. Gage, of Illinois; Secretary of War, Russell A. Alger, of Michigan; Attorney General, John J. McCook, of New York; Postmaster General, James A. Gary, of Maryland; Secretary of the Navy, John D. Long, of Massachusetts; Secretary of the Interior, Joseph McKenna, of California; Secretary of Agriculture, James Wilson, of Iowa.

For eighteen years the London Advertiser cast its eagle eye up and down the land for the discovery of calamities under the villainous N.P. Now the same paper, under the same N.P., is filling its columns with cheerful news of "the industrial development of Canada." All of which goes to show that Brer Clarke can be a real Canadian—when his party is in power.—Hamilton Spectator.

True enough; and the circumstance illustrates the fact that the Opposition, meaning The Advertiser and its party, were more solicitous to get the other fellows out of power and to get themselves in, than they were to destroy the N.P. While the lamp holds out to burn, the vilest sinner may return; and we would much rather see The Advertiser filling its columns with cheerful news of the industrial development of Canada, as it does do, than to see The Spectator going back on the N.P. as it has in the instance of applauding Mr. Laurier's Government for passing an Order in Council, admitting duty free the plant, machinery, etc., of the Westinghouse Company, recently located in Hamilton, an act entirely at variance with the spirit of the N.P. and in contravention of the law.

Reciprocity between the United States and Canada is not as promising as our friends in the Dominion would wish. The fact is, our people in the United States have passed through a protracted period of free-trade experiment, and are not disposed to permit the farm products and products of the forest to come in from Canada without a duty. The new tariff bill will no doubt afford reasonable protection on both lumber and agricultural products. There is not much advantage in reciprocity with a country which produces the identical articles which we produce, and we cannot see how Canada could afford us any inducement at extended reciprocity unless it permitted the entry of American manufactures practically free from duty into Canada, which would crush out the manufacturing interests of that province.—Northeastern Lumberman.

Agreeing with the argument so frequently advanced by this journal, that protection cheapens prices, The American Economist, applying the argument to the United States, says:—

When the McKinley bill was passed, the Tariff had not received a thorough revision for thirty years. The people were unprepared for the radical changes which had been made necessary by the changed conditions during those thirty years. Comparatively few of the people in general realize yet how the McKinley bill enlarged the free list or know in how many cases it lowered Tariff rates. These things, the Free-Traders, for their own purposes, passed by. They dwelt on the cases where an increase of duty had been found necessary. People in general, were deceived into thinking that the McKinley bill had advanced rates without reason or consideration. They did not understand the necessity for the increased rates where they were made and they feared the results. This state of affairs does not exist to-day, and will not work the destruction of the new Tariff law. However the people may lack knowledge still of the specific provisions of the McKinley law, they lack no appreciation of its beneficent results. They have come to understand the scientific and statesmanlike methods which underlay that measure. They have come to realize the changed industrial conditions, and to know that Tariff changes are made to meet changed conditions and not merely to express the whims of the framers of the bill. Moreover they will not be afraid of high duties *per se*. There were plenty of instances under the McKinley law where the duty on an article was materially raised, but still the price of the article did not advance. Take the case of tin plate, for instance. The duty was materially increased, and yet the retail price of tin plate did not advance. The only result of the increased duty was the establishment of many mills for the manufacture of tin plate, and the giving of employment to many thousands of hands. The people can stand as many results of this kind as the new Tariff law chooses to give. The Free-Traders will have to do something more than cry "high Tariff," if they want to have any effect in the future. The people are not going to give the attention to that empty charge that they did before their experience under the McKinley law taught them that "high Tariff" and low prices often go hand in hand.

A number of members of the Canadian parliament have been in Washington trying to look after Canadian interests, which they fear may be injured by the new Tariff policy to be adopted. We have good will for all and "malice toward none," but we confess that we would rather have Canadian interests threatened than American interests, as was the case when the present Free-Trade administration came into power four years ago. There are no means of knowing just what arrangements

will be made with the Canadians, but there is no reason to suppose that it will expose the farmers of the northern border to the evils of free admittance of Canadian eggs, butter, hay, etc., or which will continue to admit Canadian lumber on present terms. Both farmers and lumbermen have suffered too much already under the present law. It was for something different that they rolled up their big majorities for McKinley and Protection.—American Economist.

Speaking of Tariff making and the delay of the Dominion Government in calling Parliament together, the Montreal Star says:

The ingredients for the tariff "pudding" are now all gathered; and the proof that comes with the eating, ought not, according to the programme, to be long delayed. The "Home" Commission has heard the evidence of manufacturers in Toronto and of farmers in Winnipeg, of coal and iron men in Nova Scotia and of coal and iron consumers in Ontario, of coal oil refiners from Petrolia and of coal oil burners from the four corners of the Dominion; and can now sit down in Ottawa and make a tariff to suit every one and turn prosperity into a common place. The "Foreign" Commission, too, has come back from Washington with pretty full information likely as to what the Americans will not do, and a plan for appointing another Commission which can be depended upon to keep the question open for some little time. It is, of course, less than a month to the meeting of Parliament; but a good deal of work of a sand-papering kind can be accomplished within that period.

The task of the tariff makers will be rendered the easier by certain limits of the "non-possimus" order that lie across their path. Thus the attitude of the United States renders it impossible that they should reduce the tariff very considerably on the side toward the Republic; and the pledge not to lead a cavalry charge through the established industries and vested interests of the country is a barrier to revolutions that protects much the same ground. Then, with these checks on a radical change holding their hands, the Government must pay attention to the needs of the revenue. Whatever a revenue tariff might produce, a slightly trimmed protective tariff is likely to be disappointing in the matter of revenue, as was shown in the case of the Wilson bill across the border. Nor do the demands for revenue exhibit any signs of falling off. The last reports indicate an increase of expenditure thus far for the current fiscal year; and the Crow's Nest Railway project, the bills for all these Commissions, the West Block fire, and the other signs of the times, do not promise very much of a reduction.

Still there is a very vigorous demand in the country for tariff reform. The Commissioners have really heard a great deal of it; though it has more often taken the form of a demand for the removal of anomalies in the existing schedules than of a cry for drastic measures, such as was heard at Winnipeg. There seems to be a general admission of the impossibility of revolution; but a general belief that the tariff needs levelling and simplifying and a squaring to the rule of justice. As has been true for years, the class in greatest need of tariff relief is the farming community. In their success are we all bound up. The key note of the new McKinley policy at Washington is to take especial care of the American farmer; and the Canadian Government cannot permit themselves to be outdone or even equalled in this item of the programme. We have a long advantage of our neighbors in the matter of land, and ought to be able to make Canada conspicuously the farmer's paradise of this continent. Something may be done toward this end in various ways; but the tariff is probably the first instrument at hand. The Fielding schedules will be judged a failure if they do not leave the farmers in a conspicuously better position than they are to-day.

At a meeting of the executive committee of the Canadian Electrical Association, held on February 25th, it was decided to hold the next Convention of the Association at Niagara Falls, Ont., on June 2nd, 3rd and 4th next.

The serious break in steel rail prices has already resulted in a reduction in wages at most of the mills represented in the late association, and a reduction will doubtless follow at all of them. This is not the sort of "prosperity" that we all hoped and worked for only a few months ago. The railroads get their rails almost as a free gift, the manufacturers lose money, and the men who make the rails have their wages cut down. But the Free Traders are happy!—The Bulletin.

There is undoubtedly great expansion in the near future to be expected in the sale of American paper in foreign markets. With the present range of low prices in the United States, it cannot be possible that foreign manufacturers of paper can produce the article as low as it is being sold in this country to-day, hence the natural outlet for much of the surplus will be in foreign markets. We look to see a large trade in American news paper in British markets, as well as in Australian and South American markets.—Northeastern Lumberman.

The range of low prices our contemporary alludes to may be attributed to a large extent to the fact that Canada's immense spruce forests supply the American papermakers with their raw materials. Another contributor to the low prices is the fact that under the pinch of hard times in the United States, caused by the reduction of the tariff, and the business uncertainty incident thereto, the hire of the laborer is reduced to the starvation point. The hope of Canada in this respect is that the Government who wield our destinies will make it impossible for American manufacturers to obtain their supplies of pulp wood as cheaply as heretofore. An export duty should be imposed upon pulp wood.

The Carnegie Company at Homestead have taken orders in Britain for 100,000 tons of steel, and have made a sale to the Canadian Pacific Railway. Both Britain and Canada will come in for a small share of the gain through the breaking of the steel trust.—The Globe.

If it had not been for tariff protection in the United States the production of steel rails would have been an impossibility. If the manufacture of steel rails had been encouraged in Canada, as it was in the United States, the Canadian Pacific Railway would not now be purchasing American rails as cheaply as they are. They would have been made in Canada. Protection fosters production; production fosters competition, and competition reduces prices. See?

When a tariff rate is about to be lowered, and when the tariff policy of a country is drifting towards free trade, then we may expect dullness and demoralization in manufacturing and trade. No one wishes to hold a stock of goods. On the other hand, when as at present, all the indications are in favor of increased government revenue and increased tariff protection, then we may expect a general revival of industries and a general desire to hold stocks of goods for an expected rise. As soon as it is certain the new Dingley tariff bill will pass at the extra session of Congress to be called in March we believe there will be a general revival of industries such as we have not witnessed since 1880.—Northeastern Lumberman.

It is argued by a newspaper opposed to the acceptance of the lowest tender for printing Canadian paper currency that the profits, "which are admittedly large, will go into the pockets of Americans." What word would describe the size of the profits had the highest tender been accepted? The size of profits is an important point to the men who pay them.—The Globe.

Those who have to foot the bills, to wit, the people of Canada, are interested not only in the face value of the bills, but also in those to whom the value goes—the wage earners. It is possible, nay very probable, that if the Government had not required that the printing should be done in Canada, but in the United States, the charge for the service would be less; which would have been according to the free trade idea; but being done in Canada, even at a slightly greater cost, those who foot the bills are well satisfied, seeing that it is in harmony with the idea of protection.

The pulp and paper manufacturers in Canada are still very much exercised over the subject of placing an export duty on spruce pulp wood. F. H. Clergue, of Sault Ste. Marie, was recently in Toronto, and said that the pulp manufacturers would shortly hold a meeting, and act in concert, in requesting the Dominion Government to put an export duty on pulp manufactures, especially on pulp wood sent to countries which do not allow these goods in on the same terms that their goods are admitted to Canada.—Northeastern Lumberman.

Canadian industry may well feel uneasy under a government which carries the principle of free trade to such a point that it will go to foreign manufacturers for its Dominion dollar bills and postage stamps.—Mail and Empire.

Why should Canadian industry feel uneasy? What constitutes being a foreign manufacturer? Our contemporary does not seem to comprehend even the primary element of the National Policy. The object of that policy was and is to encourage the establishment and increase of manufacturing industries in Canada; and if the manufacture of Dominion dollars bills is done in Canada, the object of the National Policy, in that respect, is accomplished. In requiring the American Bank Note Company to establish a plant in Canada wherewith to perform the production of the notes, postage stamps, etc., required of them, the government made a very distinct departure from the principles of free trade, and adopted the very spirit and intent of protection.

Allusion has heretofore been made in these pages to the fact that the Gurney Foundry Company, of Toronto, was about establishing a branch of their concern in London, England, for the special purpose of introducing the Gurney systems of hot water and other heating for residences, hotels, offices, public buildings, etc., into Great Britain and the continent. These systems are well and most widely known in Canada and the United States, and to a certain extent in England, and the fine opportunity presented for pushing this Canadian enterprise abroad was the inducement to institute the London office. Of course, the success of so important an undertaking would depend almost absolutely upon the business and social character of the representative of the company who is to have charge of it; and it affords us much pleasure to know that the gentleman who has been thus entrusted by the Gurney Foundry Company to represent their interests on the other side of the

ocean, is Mr. George Taylor, who has for many long years been connected with that company, and who is held in the very highest esteem by all who have ever known him, either in business or in the social walks of life. Mr. Taylor has already appeared upon the scene of his labors in London.

Whether Canada and the United States are to make a league of commercial reciprocity or to pursue towards one another a policy of repulsion, is a question which, if it had to be decided to-day, could scarcely receive a hopeful answer. The Ways and Means Committee at Washington countenances a duty of 75c. per ton on Canadian coal. Mr. Fielding is not without hope that the threatened blow may be averted; but, if it cannot, he says plainly he would be in favor of Canada putting on a countervailing duty of like amount. On another point, the exclusion from the United States of Canadian workmen on the frontier, unless they are willing to renounce their allegiance to their own country and change their flag, the Canadian Premier has let it be known that he would favor reciprocation. It does not follow, however, that retaliation, in these cases, would be good policy; its effect, in the case of anthracite coal, would be to tax the power of our manufacturers, to deepen the chill of poverty in the homes of the poor, to make dearer the fuel of all classes. And it is not probable that as a measure of coercion it would have any other effect than to estrange two neighboring people. A thousand Americans in British Columbia call on the President to veto the obnoxious emigrant bill. He has asked information on it from one of the heads of Departments. But even the presidential veto might not satisfy, and would most likely greatly dissatisfy, those who are clamoring for rigid restriction at the frontier.—Monetary Times.

Though Michigan has fallen from its high estate as a great pine-lumber-producing section, yet the statement for 1896 shows that the State produced during that year 2,196,252,982 feet of lumber, and 941,527,200 shingles. At the close of the year there was in the hands of manufacturers 1,140,316,185 feet of lumber, and 280,300,000 shingles. The Michigan output for 1896, as compared with 1895, shows a decrease of 565,000,000 feet, and when compared with the output of 1892, a decrease of 1,565,000,000 feet. As showing the dullness of the lumber trade, we note that at the close of the manufacturing season there was on hand only 12,000,000 feet less than the quantity on hand at the close of 1895, when the year 1896 showed a falling off in production of nearly 600,000,000 feet. The production of lumber in Michigan would be very much less than the above, were it not that 300,000,000 or more of logs produced in Georgian Bay, Canada, had been towed across to Saginaw and Bay City for sawing there.—Northeastern Lumberman.

Analysis of the above shows, even from the American standpoint, that one-sixth of the lumber produced in Michigan last year was cut from Canadian logs, showing the dependence of the American mills upon Canada. It also shows that if the output of Michigan mills was 565,000,000 feet less in 1896 than in 1895, with a dependence upon Canada for 300,000,000 feet of logs, upon which no duty was imposed, the decrease will be more accentuated when Canada imposes an export duty on logs.

The American Consul at Havre sends the United States Government an interesting report on the beet-sugar industry of France. The report is worthy of consideration by the agri-

culturists of this country, and by the Government. The best crop, the Consul states, pays the French farmer better than wheat or any other agricultural product, and hence a large acreage is devoted to the cultivation of this product. In 1894 the area was 1,700,000 acres and the production almost 18,500,000 tons, or nearly eleven tons to the acre. Fifty to sixty per cent. of all this is used for the production of sugar. The experience of French cultivators is stated to be that the cost of growing an acre of beets is \$10, omitting the cost of fertilizers, which it is not always necessary to employ. It is said, too, that the leaves and stocks left on the field will furnish much more manure, after they have been fed to cattle, than the beet requires. The bounty paid on sugar exported from Germany has led to less activity in beet-sugar production in France in the last two years. Nevertheless, the total quantity exported in 1894-95 was 186,287 tons, of which 119,139 tons went to England. The advantage of beet cultivation is that there is no waste; every part of the vegetable can be used in one way or another. The pulp, after the juice has been expressed for sugar, is largely eaten by cattle, and is found to be very nourishing. The leaves and stalks, when fresh, increase a cow's milk; when dry they afford excellent winter food. "Altogether, the beetroot, or the residue after the juice has been expressed, supplies, with the leaves and stalks, nourishment for cattle and sheep more abundant, perhaps, than any other forage that could have been cultivated upon the land." It is said that the leaves are frequently used for adulterating tobacco. The French experience is that all land suitable for growing wheat will also grow beets; but it is necessary to avoid a soil too compact or containing too much clay. The report enters into some detail in the question of soils, position, manuring (when necessary), modes of cultivation, harvesting, and preserving the crop, and a few words are added as to the manufacture of sugar.—The World.

The Hamilton Spectator speaks of the presence in that city of a representation of a large mining machinery manufacturing concern of Chicago, who wish to establish a branch of their work in Canada. If the concern come to Canada it will be because the N. P. compels them to come. Perhaps they will ask the Government to remit the duty upon whatever machinery they may require, and the question is whether that remission will be granted, and if The Spectator will advocate and excuse it, as in the case of the Westinghouse company.

A meeting was recently held at Portland, Oregon, for the purpose of taking steps to encourage the beet-sugar industry in that State. It was decided to delegate to a committee the work of securing the passage by the Legislature of a bill providing for a bounty of one cent a pound upon all sugar manufactured from beets for which \$5 or more per ton shall have been paid by the manufacturer. Similar steps have been taken in the State of Washington, and a similar bill prepared for presentation to the Legislature.

The bookbinders want the duty on book-cloth lowered, while the cotton manufacturers want it retained. If the duty could be taken from raw material and put on finished products how happy we would be. There is no such thing as raw material.—The Globe.

We congratulate The Globe at having at last awakened to the economic fact that there is no such thing as raw material. Nor is there. Better late than never, Dear Globe.

It seems a ridiculous position for this Government to expect Canada to submit to the payment of an export duty on the lumber she ships into this country, and at the same time to suppose that Canada will permit us to go into her domain, cut all the logs we are willing to pay for, and bring them into our country free of export duty, thereby enabling us to introduce Canada lumber free of duty into this country, while the Canadian manufacturers are forced to pay \$2 per thousand duty. We do not see why Canada should furnish us the raw material, in the shape of logs, to beat her in selling the manufactured article, in the shape of lumber. Again, what sort of protection is it to American lumbermen if logs, both spruce and pine, are to be permitted to enter this country free of duty and free of Canadian export duty, to compete direct with American logs, in American mills? We do not think such an arrangement would be equitable, and we do not blame Canada for a disposition to tax logs if her lumber is forced to pay an import duty into this country.—*Northeastern Lumberman.*

The shipment of frozen milk has proved a success after many experiments, and the Belgian Government will give a bonus of £10,000 a year to encourage the output of the new commodity. Here is another advantage for free trade England. The Belgians will labor under heavier taxation than the British may get a better allowance of milk. If the Belgians should send over their milk bricks gratis, John Bull would quietly thaw them out and dilute his tea and coffee with them. It is remarkable what a fine time John has through his aversion to theorizing.—*The Globe.*

John Bull may have an aversion to theorizing, but the theory of the Belgian Government is of that practical sort that will most assuredly result in much benefit to the people of that country. By giving a bonus of £10,000 per year for a few years, a new trade will be built up that will repay the investment many times over.

The Free Traders used to tell us, during the good times of the McKinley bill, that the reason the people did not rise up as one man and sweep away the Protective Tariff was that they did not know that the Tariff was hurting them. No, they didn't know it. There is no doubt about that. And they have found out now, even if they didn't know it before, that a man isn't hurt very much when he doesn't know it. There has been no difficulty about knowing that they have been hurt during the last four years, since the Free Trade party has been in power. They have not needed any one to tell them about it, nor needed long arguments to prove that they were hurt but didn't know it. The hurts given by Free Trade are not of that mild nature. Naturally the people prefer the system which brings such prosperity that they "don't know" they are hurt, and they have decided to go back to it.—*American Economist.*

Much as we may regret it there is one important point in favor of Great Britain and Canada that must not be lost sight of in discussing the question of abrogating the agreement which prevents the building of war vessels on the lakes. The St. Lawrence canals, which form the only connection between the lakes and the seaboard that will admit of the passage of torpedo vessels and small gunboats, are open to our merchant vessels, but would Great Britain consent to allowing war vessels of any kind to pass through these canals? Probably not, unless it might be under a proposition that would disturb

the entire canal regulations now existing between the two countries. This was the snag struck by Senator McMillan when he went into this question very thoroughly a few years ago.—*Cleveland, O., Marine Review.*

Dr. Drewsen, a leading chemist of New York and an expert in the manufacture of wood pulp for paper making, was in Ottawa a few days ago, advising the E. B. Eddy Company in regard to certain matters affecting their business. Dr. Drewsen, who is a Norwegian by birth, takes great interest in matters affecting the United States and Canada, and in conversation freely discussed the present position of the pulp industry. He admits that the supply of pulp wood is failing in the United States, and that the manufacturers there are now looking to Canada to keep their mills going. If an export duty were placed on pulp wood Dr. Drewsen sees no other alternative open to American manufacturers than that they must come and manufacture their pulp in this country. This is a pointer to the Government and Parliament which is well worthy of consideration, more especially as the United States is about to increase the duty on sawn lumber.

There is nothing that Richard Harding Davis describes with more skill than a gorgeous pageant, and "The Banderium of Hungary," which leads the March Scribner's, is one of the brightest exhibitions of his pictorial ability. The celebration at Budapest, last June, of the thousandth year of the existence of Hungary as a Kingdom passed almost unnoticed, and this is the first magazine account of a unique spectacle. The second instalment of "London as Seen by C. D. Gibson," deepens the impression that here is an artist who makes every experience count for something in his work. "The Business of a Factory," by Philip G. Hubert, Jr., is the third of the series describing the Conduct of Great Businesses. This is not a technical article about the machinery of great mills, or a social article about the status of the mill hands; it is a study of the tremendous business problems that confront a man or a corporation owning a mill.

The first article of a notable series describing the official, social and domestic sides of life in the White House, is one of the admirable features of the March Ladies' Home Journal. It is by ex-President Harrison, and presents a vivid picture of "A Day With the President at His Desk." Another article, "When Lincoln was First Inaugurated," tells the incidents of Mr. Lincoln's trip to Washington and his inauguration, the apprehension for his safety, and the excited condition of the country at that time. Edward W. Bok speaks to the point regarding the "fast" young man; discusses the rewards of literature and uses of adversity. Evangelist Moody addresses his Bible Class on "Regeneration." William George Jordan tells many remarkable anatomical facts about "These Wonderful Bodies of Ours." The Curtis Publishing Company, Philadelphia. One dollar per year.

Outing for March is a very strong number, carrying a wealth of beautiful illustrations. Prominent among its many good things are: "Sportsmen's Dogs—The Pointer," by Ed. W. Sandys, the second of a finely illustrated series; "Maximus," a complete story by Adene Williams; "Cruising Among the Salt Lake Islands," by Ninetta Eames; "Something About Siam," by E. M. Allaire; "Through the Land of the Marseillaise," by Birge Harrison, and "Quick Photography Afield," by Dr. John Nicol. Many breezy sketches of sport and adventure complete the long list of attractions.

An article which will attract much attention in The Methodist Magazine and Review for March is Chancellor Burwash's review of Dr. Goldwin Smith's "Guesses at the Riddle of Existence." This Dr. Burwash describes as "the saddest book he has read for many a year." "The Unspeakable Turk," with numerous illustrations, is an indictment of the Great Assassin on the Bosphorus. "Around the World with the Union Jack," describes the Great Britain of the Southern Seas—New Zealand, with the sister colony of Tasmania. Dr. Wilfred Grenfell describes that little-known dependency of Canada, Labrador, and its Medical Missions, and the Rev. Arthur Browning gives a graphic sketch of the "Gold Boom in Cariboo," with its romance and tragedy. William Briggs, Toronto, publisher. \$2 a year:

## ADVANTAGES OF COMPRESSED AIR.

BY JAS. F. LEWIS, CHICAGO.

The first recorded experiments in compressing air were made by Hero of Alexandria, who flourished 150 years before Christ. Papin in the seventeenth century, investigated the subject to some extent, and according to Ganot's Physics, the air pump was invented in 1650 by Otto Guericke.

In 1726, 1753 and 1757, patents were taken out for different methods in compressing air. From 1810 to 1860, quite a number of patents were issued along this line, but the first work of any moment done by compressed air was in 1861, driving the Mt. Conis Tunnel. The honor of first applying successfully to any great extent compressed air for the purpose of driving rock drills in America belongs to one of your prominent and highly respected citizens, Mr. Walter Shanly, when he was driving the Hoosic Tunnel from Dec. 1868 to Dec. 1874. This tunnel is 24,100 feet long 361,500 cubic yards of rock excavated, 544,735 lbs. nitro-glycerine and mica powder burned. Mr. Shanly in that early day found great saving in cost over hand labor, as well as time in completing his work.

It was in this tunnel also that nitro-glycerine was first introduced in this country. Therefore, Mr. Shanly has the honor of being the first to make a success of the three great powers that have been instrumental not only in developing the great mining industries of this country—sinking to great depth for the precious metals—but making it possible to carry out wonderful engineering projects, driving tunnels and excavating canals from one to thirty-four miles long, air compressors, rock drills and high explosives. We might say that these three powers have revolutionized the world. I would call to your minds the excavating of Flood Rock in the East River, N.Y. In this work 21,669 feet of tunnel was driven, 80,232 cubic yards of rock excavated, and about 480,000 lbs. of high explosive consumed. After this ground had been taken out, 12,561 holes or 113,162 feet of borings were made in the roof and top of pillars, in order to blow them down. These holes were filled with 240,399 lbs. of rickarock powder, and 42,331 lbs. of dynamite, or a total of 282,730 lbs. of high explosive, costing \$106,509.93. The total amount of rock broken by the final blast was 270,717 cubic yards, making a total of 350,949 cubic yards, of rock excavated from under the East River, requiring 762,730 lbs. of explosives—about 2.17 lbs. to the cubic yard of rock.

The driving of the New York Aqueduct tunnel, thirty-four miles long, fourteen to sixteen feet diameter, excavated through thirty-two shafts from 60 to 387 feet deep. Time required about five years.

The Chicago Drainage Canal, twenty-eight miles long, with fourteen miles of rock sections, 160 feet wide, thirty-five feet deep, fourteen dirt or glacial drift, sections 210 feet wide at bottom, 350 feet wide at top. Total excavation of rock 12,343,316 cubic yards, 28,059,488 cubic yards of glacial drift.

Also copper mining in Lake Superior, where from 1881 to 1887 inclusive, was mined 467,459,465 lbs. of copper from shafts 3,000 feet deep, from 1887 to 1897, nine years, they have taken out 999,854,186 lbs. One of these mines, the Atlantic, pays good dividends with rock carrying only .61 of one per cent. of copper.

The mining industries of Quebec, copper, mica, asbestos, and the nickel and copper mining of Ontario; the gold mining of Nova Scotia and the extensive coal mines of Cape Breton, coal being taken out from under the sea so cheaply that they are able to ship it to the States. Also British Columbia, where a great many towns are being built, and large dividends paid monthly from precious metals taken from the bowels of the earth.

These and many other large industries have been made possible by the use of compressed air.

The largest compressed air plant in the country is at Quinsec Falls, on the Menomonee River, the falls being forty-seven feet in height and furnishing unlimited power, which has been harnessed by modern skill to do economic duty.

This plant consists of three pairs of air compressors, 32 inches in diameter by 60 inch stroke, and one pair 36 inches in diameter by 60 inches stroke, delivering 3,000 h.p. through 3½ miles of pipe to the Chapin and Ludington Iron Mines at Iron Mountain, for pumping, hoisting and motive power engines above ground, and direct acting pumps and rock drills below ground. This power is carried through a twenty-four inch pipe, with a loss of only one pound in pressure, and the superintendent figures that he gets an efficiency of seventy five per cent.

The second largest plant is at the Calumet and Hecla Copper Mines. They have three pairs of compressors, 28 inch diameter by 48 inch stroke, 32 inches diameter by 48 inch stroke, 36 inches diameter by 60 inch stroke respectively. During the first craze for electricity, this company re-fitted their mines with electric power. After working it two or three years they became convinced that it

was costing them much more money than when they used compressed air, therefore the electrical machinery was discarded and they returned to the use of air.

Until quite recently the mine owner has taken no thought as to the economy or the efficiency in compressed air, feeling that it was a necessity and caring little about the cost, so long as it enabled him to prosecute his work, but during the last three or four years, there has been a great change in this respect. The mining engineer has been looking carefully into the question of economy and the manufacturers find with pleasure that they are willing to pay for the highest type of air compressors. The same may be said also of contractors. They are fast becoming educated by experience to the fact that there can be a great saving made by using the most economical machinery for their work.

The Chicago Drainage Canal has been a great educator in this respect. It was a long time before the contractors on that work could be convinced that it was economy to use compressed air as a power on open work as against steam. Finally, however, Mason, Hoge, King & Co., and E. D. Smith & Co., were persuaded to purchase



High-class Economical Steam Driven Compressor.

compressed air plants, but before they could be installed, the work had been prosecuted for six months by the use of a number of small steam plants scattered over the mile sections. The air plants were installed in the centre of the section, and the air carried in pipes along the banks of the excavation, and after working six months with compressed air, they were fully convinced that it was at least twenty per cent. cheaper than the use of steam for the same work. Therefore, ten rock sections out of fourteen were worked with compressed air. The other four with steam, and from data thus obtained, it shows conclusively that air was the most economical. The cost of drilling with steam was 8.64 cents per cubic yard of rock, with air 6.30 cents per cubic yard of rock.

Two of the contractors had the courage to purchase a high type of air compressor and the saving in the coal pile was greatly to their advantage and very soon paid for the extra cost of the compressors.

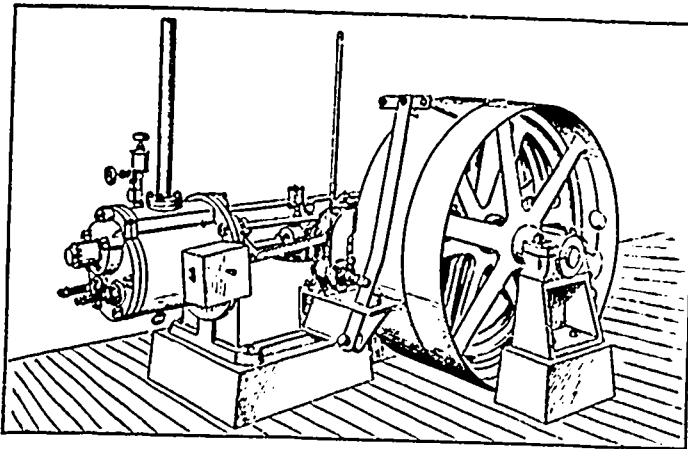
Messrs. E. D. Smith & Co., who excavated two miles of the Chicago Drainage Canal, are now driving a two-mile tunnel near Boston. From the experience they had on the canal, they equipped the two miles of tunnel with two first class Corliss engine air compressors, both of them duplex machines, 20 inch diameter cylinders by 36 inch stroke. The plant is installed at one end of the tunnel, the air carried the two miles through pipes and the entire work of pumping, hoisting and drilling is done by compressed air.

This same company is also doing a large piece of work at Niagara Falls, excavating for the new wheel pits, which are to be 185 feet deep, 20 feet wide and 180 feet long. The entire work of drilling and channeling is being done with compressed air.

Great progress has been made during the past four or five years with compressed air as a power in mechanics. In fact, it is fast becoming universal for use in machine shops, boiler shops, foundries, railway shops, bicycle shops, and also for deep well pumping.

There is yet much skepticism as to its economy or efficiency for mechanical purposes, but a great change of opinion has and is taking place among many of our most thoughtful mechanical engineers. They are becoming converted rapidly in favor of compressed air. They find no end to its uses, after it is once introduced into the shop or foundry. The advantages of it as a motive power in shops are numerous. It is easy to handle, it is clean and neat, it is always ready to do its work the moment the throttle is opened, it can be carried from one end of the shop or yard without loss, if properly piped.

It has been considered until quite recently rather of an expensive power, because railway shops have labored under the same impression as mining men—that any old cylinder or machine was good enough to make compressed air. For instance—you will find railway shops using five or six locomotive pumps that produce from fifty to sixty cubic feet of free air per minute. This means an investment of \$600 or \$700 tied up on the wall. With an air compressor, that would not cost over \$500, they can produce double this quantity of air with one-fifth the amount of steam. Many railway shops are being fitted up with the most economical air compressors,



Belt Driven Compressor for Small Machine Shops.

and mechanics are becoming ready to testify to its efficiency and great saving over other powers.

Four or five years ago the Messrs. Cramp installed a large economical air compressor in their ship yard, piping the air throughout their works. They say to-day that it has been one of the greatest money saving machines they ever purchased.

About a year and a half ago, the Atchison, Topeka & Santa Fe Railway installed a duplex 20x48 air compressor in their shops at Topeka. They have now about five miles of air pipe running through their shops and yards. Since then they have purchased six compressors for their different line shops.

It may be interesting for you to know what their master mechanic says regarding the saving over the old way, by using the Baird Portable Machine Co.'s tools, run by compressed air. Of course, this saving is figured on the basis of the tools working steadily through the day.

With the ten foot reach stationary riveting machine you can drive 2,000 rivets per day of ten hours with three laborers at a total cost of \$4.75 per day. This compared with hand labor three men total \$7 per day will drive 200 rivets.

The six foot riveter, combination flange punch and riveting machine, and the bridge and girder riveter will each average about the same as the ten foot riveter.

The truck riveters, one machine operated by two laborers, total \$3 per day, drive 3,000 rivets in a day of ten hours, as compared with hand labor, three men at \$6 of a total, in the same class of work will only drive 175 rivets.

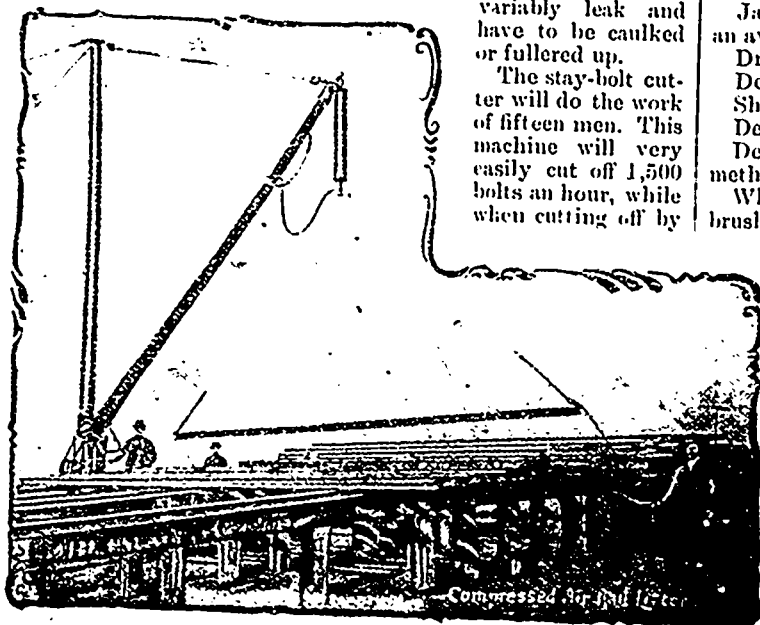
The frame riveter will average about the same as the truck riveter.

The stay-bolt breaker will make an average saving of \$8 a day.

The tank riveter will make an average saving of \$10 a day.

The mud ring riveter will drive as many rivets as can be handed to it, and will make a saving of from \$12 to \$15 a day for that class of work. Not only does it make a great saving, but it insures every rivet hole being entirely filled and insures tight work, while with hand driven rivets in mud rings a large per cent. of them invariably leak and have to be caulked or fullered up.

The stay-bolt cutter will do the work of fifteen men. This machine will very easily cut off 1,500 bolts an hour, while when cutting off by



the old method of hand hammer and chisel you must agree it goes very slow and it is hard work.

The rotary tapping and drilling machine will do the work of four men.

The rotary grinder saves the work of six men.

Rotary saw for sawing car roofs saves the work of four men.

Pneumatic hammer will save the work of three men.

Crown bar bolt machine saves the work of three lathes.

Rail saw saves the work of two men.

Rail drill saves the work of two men.

Device for operating transfer table saves \$6 per day.

Device for revolving driving wheels for setting valves saves the labor of two men.

Device for shearing bolts saves the labor of two men.

Thirty hoists in shops save the labor of ten men at \$1.50 per day.

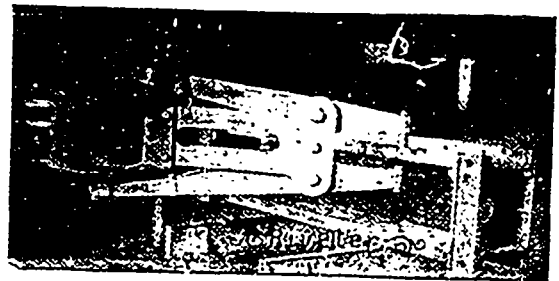
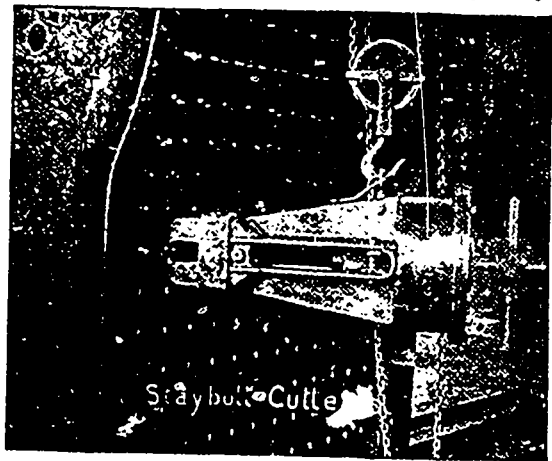
Device for loading and unloading oil at storehouse saves \$6 per day over the old method.

Jack for pulling down car draft sills saves \$10 per day.

Device for fitting up hose couplings over the old method saves \$15 per day.

Pneumatic painting machine; one man does the work of ten using a hand brush.

Machine for tearing down old car roofs saves \$8 per day.



Jack for raising and lowering freight and passenger cars makes an average saving of three men.

Drop pit makes an average saving of three men.

Device for sanding engines saves one man.

Shifter for switching cars in shop yard saves \$50 per week.

Device for cleaning coaches saves ten men.

Device for rolling flues makes a saving of two men over the old method.

White washing, when in use, will do the work of ten men with a brush.

Mr. J. H. McConnell, Superintendent of motive power of the Union Pacific Railway, furnished the following interesting and reliable figures showing what can be done by the use of compressed air in shops. He says;—

The many savings through the use of air in shops of the Union Pacific system aggregate \$10,000 per year in labor alone. Savings per day:

Putting wheels in wheel lathe, three lathes in the shop, an average of one change a day, saves one man in handling this work . . . .	\$1 60
Hoisting steel tired wheels and axles in lathe, an average of six changes a day, saves one hour in time, twenty cents, and one man less to handle the the work, \$1.60 . . . . .	1 80
Hoisting axles into cut-off lathe, an average of ten changes a day, saves one hour per day in time . . . . .	25



One large boring mill averages two changes a day, \$1.60, saving of time of thirty minutes and the use of one helper, fifteen cents .....	1 85
Handling cylinders in large boring mill and planer, saves the labor of one man and one-half hour each change	1 60
Three men working on pistons, etc., in raising them from the floor to the bench, serving three machinists, saves one helper a day.....	85
Raising chucks, face plates and other heavy work, air hoists in the machine shop saves one helper a day.	1 50
Lifting driving wheels and other heavy work on the large slotting machine, saves the time of one man and twenty minutes .....	1 50
In applying cylinders on boilers, saves one machinist and helper's time of ten hours .....	2 40
Facing valves, saves helper's time of four hours .....	60
Pressing on driving wheels and axles, etc., three less helpers one hour each .....	45
Boring out cylinders, three helpers' time, four hours ..	1 80
Applying driving brakes to old engines, drilling holes, reaming, etc., saving fifteen hours of time of machinist and helper .....	6 70
Pneumatic tin and galvanized iron press, in getting out stock for twenty dozen water buckets, get it out in eight hours, where it previously took forty hours.	
In making brake shoes, stamping a loup to have casting run on, previously one man would do 200 in a day, where he now does 600. All work on this machine saves in the neighborhood of from fifty to sixty per cent.	

Cleaning a car by air saves ten per cent. in time. Air white-washing machine, where it took ten men five days, it now takes four men one day, and a seventy-five per cent. better job.

New applications of compressed air are made daily, two of the most recent being an air motor attached to a differential hoist, and a portable stay-bolt cutter, that can be operated in the hands of one man, thus doing away with the cumbersome affair hung on a post."

Geo. D. Brooke, Master Mechanic of the St. Paul & Duluth R.R. says:—

We are rapidly increasing the use of the air in the shape of hoists, air boring machines, air bull dozer for blacksmith shop, air flue welder, and a four inch cylinder air hammer for light forgings, and drawing out the ends of driving and truck springs. It is giving perfect satisfaction and will soon pay for itself in the item of saving in laboring help, independent of shortening the time of doing work.

He also sends the following data of a test of R. & A. Air Compressor 7½ by 14 inch diameter by 16 inch stroke air cylinders with 10 by 16 duplex steam cylinders.

Steam pressure .....	70 lbs.
Air pressure .....	110 "
Revolutions per minute .....	35
Temperature of cooling water .....	55 Fr.
Temperature of discharge water from cylinder jackets and intercooler .....	62 "
Temperature of engine room .....	80 "
Temperature of cold air inlet .....	70 "

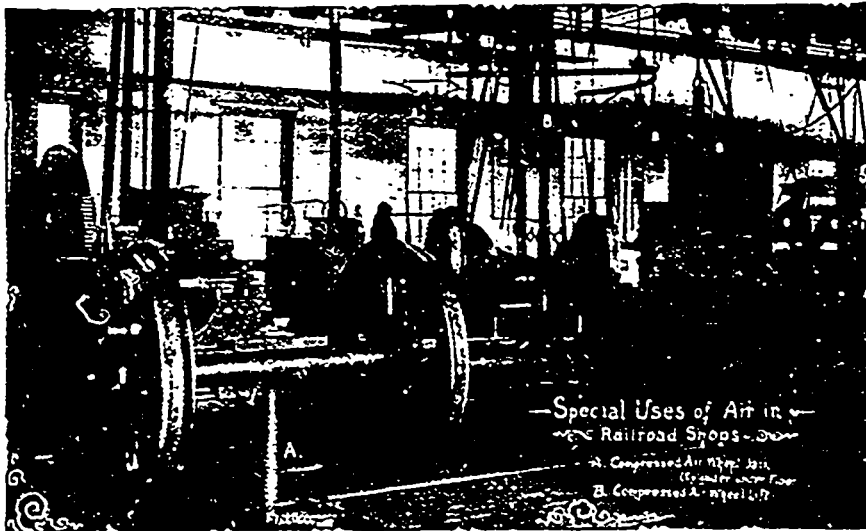
Temperature of discharge air from low pressure cylinder .....	170 "
Temperature of air entering high pressure cylinder.....	65 "
Temperature of discharge air from high pressure cylinder .....	135 "
Average from a number of indicator cards.	
Two steam cylinders 10x16 inches initial pressure 54 lbs., M.E.P. 40.4 lbs., I. H.P. ....	17.95
Low pressure air cylinder 14x16 inches M.E.P. 21.3 lbs., I. H.P. ....	9.24
High pressure air cylinder 7½x16 inches M.E.P. 21.3, 46.0 lbs. I.H.P. ....	5.75
Both air cylinders (high pressure reduced to low) M.E. P. 34.5. I.H.P. ....	14.99
Friction of compressor, 16.4 per cent. I.H.P. ....	2.96
Steam per I.H.P. per hour ....	29.33 lbs.
Cubic feet of free air compressed to 110 lbs. pressure per pound of steam at 54 lbs. initial pressure....	10.6

Efficiency of air cylinders..... 91.5 per cent. The apparent large loss due to friction of machine was entirely brought about by the machine being new and stiff, and the slow speed which we ran it governed by the air consumption.

Mr. F. L. Wanklyn, Master Mechanic of the Grand Trunk Railway System has been greatly interested in the use of compressed air for a long time, and has made it quite a study so far as he could with the machine that the company was willing to give him, which consists of an old engine taken out of the scrap heap, to which he fitted an air cylinder. He is using air for the following work and says:—

The uses to be found for compressed air seems to be inexhaustible as far as a machine shop is concerned, as hardly a day passes without some suggestion being made for a new and advantageous application of this handy and expeditious system of transmitting power.

- 1.—For hoisting.
- 2.—For running small reciprocating engines and rotary motor for drilling and tapping especially in connection with stay-bolts of fire boxes, also for facing valve seats and re-boring cylinders.
- 3.—For breaking stay bolts when removing old inside fireboxes.
- 4.—For cutting off projecting ends of new staybolts prior to rivetting.
- 5.—For chipping and caulking, and driving and snapping tank rivets.
- 6.—For whitewashing.
- 7.—For operating moulding machines.
- 8.—For testing air brake apparatus, and blowing through air and steam pipes.



—Special Uses of Air in Railroad Shops—  
A. Compressed Air Hoist  
B. Compressed Air Hoist

Running foundry elevator with the air hoist saves twenty-five per cent. of one man's time.

Saves seventy-five per cent. time putting in stay bolts in a fire box by using air motor for tapping out holes and screwing in bolts.

Save in the neighborhood of fifty per cent. in using pneumatic hammers for caulking both flues and boilers.

Take engines in and out of round house when necessary to change them, saves the work of six men pinching, possibly forty-five minutes, not counting the delay of men waiting to go back to work on the engine.

Blowing out engines with air, saves a cord of wood, besides the inconvenience and delay, as the men cannot work around a hot engine to advantage.

Handle all engines on the transfer tables, now run by air, previously run by crank. One man does now what six did before. Where six men move a foot in a minute, air motor under like conditions will move twelve feet. As this is moved several times a day this is in itself a great saving.

Pneumatic hoist for unloading scrap at the foundry. The old method took six men ten hours, under the same conditions with the hoist, two men will do it in four hours.

Unloading a car of wheels it takes six men half an hour, now three will do it in fifteen minutes.

Sandpapering off a fifty foot baggage car by hand took in the neighborhood of sixty hours, now it takes fourteen hours with the sandpapering machine.

Air jacks for raising and lowering freight cars now take one man three minutes, where previously it took two men ten minutes.

Truck jacks to remove three pairs of wheels takes 1½ hours, the old method takes six hours.

- 9.—For supplying necessary blast in connection with oil gas furnaces for setting and removing tires.
- 10.—For supplying blast to rivetting fires in portable forges.
- 11.—For operating cinder hoist in connection with round house ash pit.
- 12.—For operating small pneumatic jacks to take the place of the holder-up in rivetting over firebox staybolts.

In a discussion on the advantages of compressed air at a meeting of the Western Railway Club, Mr. E. M. Herr, then Master Mechanic of the Chicago & Northwestern Railway, now Superintendent of motive power of the Northern Pacific Railway says:—

Compressed air is advantageous about a railway shop for another reason, in this it differs from electricity and has an advantage over it, that is, that when the storage is not being drawn upon the plant can be shut down absolutely and still the reservoir with the power is at hand at all times for use. This is of great advantage in a place where but a small amount of compressed air is used and used occasionally. For instance, at night it might be very advantageous to have compressed air at hand for use at intervals, when a compressor that would probably work an hour or an hour and a half at night, would compress all the air that was necessary. This being stored in the reservoirs can be drawn upon and the compressor would automatically shut down when the desired pressure was attained.

There has been but very little data accumulated from actual practice regarding the cost of making compressed air. We have the following from the A.T. & S.F. railway shops at Topeka:—

Steam pressure.....	80 lbs.
Air pressure.....	100 "
Tons of coal of 2,000 lbs. per month...	155
Cost of coal per month.....	\$139.50
Cost of coal per ton.....	.90
Amount of free air per minute.....	1,712 cubic feet.
Amount of free air per day of 10 hours.	1,027,584 "
Amount of free air per month of 31 days	31,855,104 "
Revolutions per minute.....	50
Pounds of coal per 1,000 feet of free air	9.7 lbs.
Cost per 1,000 feet of free air.....	.00437 c.

The above compressor is fitted with Meyer adjustable steam valve, compound air cylinders with mechanical air valves on low pressure cylinders. Air taken from outside the engine room.

The above cost is for the air delivered from the compressor for fuel only, that is, the cost of oil, labor and interest on cost of plant not considered.

Steam cylinders 20 by 48 inches, air cylinders 28 and 16 by 48 inches, h.p. 310.

Mr. Wm. Forsyth of the C.B. & Q.R.R., says regarding the cost of compressed air:—

We have indicated the engine with the air compressor free, and also when it was compressing air to 80 lbs. and found that it required 40 h.p. We get a horse power with the Corliss engine with 41 lbs. of coal per hour, and the air compressor consumes 204 lbs. of coal per hour, and at \$3 a ton the cost of a thousand cubic feet of free air compressed to 80 lbs. is 10 cents. With coal at \$1.50 per ton, it is of course only 5 cents per 1,000 cubic feet.

Mr. Wm. Renshaw, Superintendent of motive power and machinery of the Illinois Central R.R. Co., says:—

We installed at our Burnside shops, about a year ago, a Rand Duplex Corliss Air Compressor with compound air cylinders, and at present are using compressed air for the following purposes.

- Elevating sand at engine sand house, elevating oil at oil house, hoisting heavy castings and parts, at machine tools, etc., forcing couplings on air hose, operating cylinder boring bar, operating valve facing machine, filling cylinders of hydraulic presses, removing and applying driving tires, testing water pumps after repairs, drilling with motor, tapping with motor, ramming with motor, cleaning boilers, cleaning machinery, punching jacket rivet holes, taking old paint off tin roofs, rolling and heading flues, chipping, cutting, caulking, small bull dozer, elevating water from deep wells, testing air and driver brakes, elevators in store house, operating letter presses, cutting out staybolt stubs, jacking up cars and trucks, cleaning interior of coaches, cleaning upholstered work, burning paint off coaches, painting cars, sand blast ends of cars, gas-line heater, cutting off staybolts, screwing in staybolts, rivet forges, one blacksmith forge, pressing in driving box brasses, operating flange clamp, swedging flues.

This is the list to date, but we are finding further use for the compressed air every day, and we could not afford to be without it.

I consider it the best means of transmitting power in and about shops: First, on account of the many uses to which it is adapted, and the simple appliances needed in connection with its use. Second, with but few exceptions in the above list steam and elec-

tricity could not perform the work without more complicated apparatus, and in a great many instances, air alone is applicable. Third, most of the appliances used are of our own manufacture, and in connection with the pipe line are easily kept in repair by our own shop men. Fourth, there is no element of danger, and the apparatus requires no skilled mechanic to handle same, and it is safe to use in places where steam or electricity might be objectionable. Fifth, it can be carried greater distances without loss than steam, and taking into consideration cost of plant, cost of maintenance, skilled help required, etc., it can be produced for less money than electricity.

As regards saving made over old methods would say, taking into consideration all things, that an average all round saving of from twenty-five to thirty per cent. could easily be realized.

Take for instance, the saving effected by use of air hoists alone, which though hard to figure, will assume large proportions when the amount of labor they take the place of is taken into consideration.

We figure a saving of sixty per cent. in burning paint off passenger cars, and fifty per cent. in painting freight cars and passenger trucks.

This compressor is a duplex, with steam cylinders 20 inches diameter by 30 inch stroke, fitted with improved Corliss valve gear. The air cylinders are compound, 26 by 30 inches low pressure air cylinder, 15 by 30 inches high pressure air cylinder, having an intercooler which carries the air from the low pressure cylinder to the high pressure, through pipes that are surrounded with water, thus cooling the air after the first compression, before it goes into the second compression cylinder. The intake cylinder has a hooded head, arranged so as to take the air from the outside of the building. Whenever required, it gives them the air compressed to 150 lbs., with steam pressure at eighty lbs.

The same type of compressor is used by the St. Paul & Duluth Railway Co., also Atchison, Topeka & Santa Fe Railway Co., also the Michigan Central R.R. at St. Thomas.

In a paper read before the Western Foundrymen's Association by Mr. Geo. A. True:—

Taking a basis of 2,000 ton-feet per day, assuming the operators labor at \$2 per day, we have an operating or attending labor of about twenty-five cents per 1,000 ton-feet. The total cost, therefore, of hoisting one ton 1,000 feet will be about thirty-two cents, or in a foundry of thirty tons daily capacity about sixty-five cents per day, using direct acting vertical hoists, or roughly, in a thirty ton per day foundry, \$5 per day represents the labor of hoisting by hand power, against sixty-five cents per day by air hoists, a saving well worth considering.

Making a comparison with hand power, as already stated, the cost of hoisting by manual labor in the foundry under consideration would be not far from \$5 per day, equivalent in good times to \$1,500 per year. By air it would cost \$200 per year, or, if we include interest on the investment, which is only fair, we will have a hoisting cost, when operated by hand power of about \$1,000, against \$380 using air. The saving would go far towards purchasing a first-class air plant.

Messrs. The Massey-Harris Co. of Toronto, Ont., say:—

We are using this air compressor in connection with burning oil fuel in our smith shop. We have for some years been using oil for fuel instead of coal. Last week the writer spent some hours in the factory of Wm. Deering & Co., Chicago, where they are using compressed air for hoisting cranes, which seems to work very nicely indeed. The heavy flasks in the moulding shop and the molten iron are lifted by these pneumatic hoists as well as the heavier castings in the machine shop. They are also to a limited extent using it for ramming the sand into the moulds, etc. I have no doubt it will be used to a very much greater extent in the near future than it has been in the past. So far as using it in connection with oil fires is concerned we may say that after some six years experience with oil we would not go back to coal under any consideration.

Air is being used very extensively for pumping deep wells, taking the place of the old style deep well steam pump, and in every case it increases the output of the wells from twenty-five to seventy-five per cent.

In a recent twenty-four hour test, pumping four St. Peter wells, the following data was gathered:

Wells about 400 feet deep. Water standing within about six feet of the top when not being pumped. When being pumped, the water fell to about eighty-four feet. Wells were cased with 6½ inch I.D. casing. Air pipe 1½ inches. During the twenty-four hours, there were 2,016,678 gallons of water delivered, lifting it about ninety-six feet. There was an average delivery of 11.15 gallons of water per h.p.

Cards were taken from the steam and air end of the compressor each hour. Average h.p. of steam cylinders, 125.6.

Average h.p. of air cylinders, 116.14, showing a mechanical efficiency of about ninety-two per cent., or about eight per cent. of friction.

We also have the following data taken from one month's report in pumping water from three deep wells.

Steam pressure.....	80 lbs.
Air pressure.....	68 "
Tons of coal of 2,000 lbs. per month.....	106 1/2
Cost of coal per month.....	\$167 60
Cost of coal per ton.....	\$1.57
Amount of free air per minute.....	352.8 cubic feet.
Amount of free air per day of 24 hours.....	508,032 "
Amount of free air per month.....	15,748,992 "
Revolutions per minute.....	45
Pounds of coal per 1,000 feet of free air.....	13.5
Cost per 1,000 feet of free air.....	.0106 cents.
Amount of water pumped.....	70,255,000 gallons.
Cost per 1,000 gallons.....	\$.002

The above compressor is fitted with Meyer adjustable steam valves, fourteen inches in diameter by twenty-two inches stroke, air cylinders simple, fourteen by twenty-two inches, fitted with mechanical air valves, air taken from outside of engine room. The above cost is for the air delivered from the compressor for fuel only, that is, the cost of oil, labor and interest on plant not considered, h.p. fifty-one.

The United States government made very exhaustive tests before adopting compressed air for the Navy. They have recently purchased air compressors for use on board ship, compressing the air to 600 pounds, with eighty pounds of steam pressure.

They have also purchased several compressors for their dynamite guns, using the air at 1,700 pounds pressure, with fifty pounds steam.

The efficiency of compressed air is greatly increased by re-heating before it enters the working cylinder. This has been demonstrated by experiments in our shops. Also practically demonstrated in Paris, where air is carried about the city for power purposes by what is known as the Popp system. They claim an efficiency of ninety-two per cent. by re-heating the air, as against seventy per cent. not heated.

During an experiment by the writer, in running street cars by compressed air, it was found that the cars could be run eight to ten miles when the air was re-heated before entering the cylinder, and only four to five miles with cold air. The air was carried in storage tanks at from 600 to 800 pounds pressure, being passed through water heated to 360 degrees, to a reducing valve, and used in the cylinders at from fifty to one hundred and fifty pounds pressure, according to the grades or condition of the track. This was known as the Mokaraki system, which has been used successfully in Nantes for the last eight or nine years, and three years ago three street car lines were established in Paris under the same system. They carry the air at a pressure of between 1,100 and 1,200 pounds, reducing it to the proper pressure when used.

During the experiment in this country, the cars were run about 40,000 miles, fully demonstrating that compressed air is practical, economical and most delightful for street car propulsion.

Compressed air as a power has certainly proved itself worthy of consideration, and to be produced economically it should be treated on the same basis that a mechanical engineer would treat the question of economy in a steam plant. I am happy to say that there have been rapid strides in this direction during the last two years.

There is no question but what compressed air can be produced and utilized with as much economy and as great efficiency as any other power by simply putting in economical machinery for producing it.

## THE TARIFF COMMISSION AT MONTREAL.

(Continued from last issue).

### CEMENT DEALERS.

Mr. Wm. McNally, representing the importers and dealers in Portland cement, said that about fifty-five per cent. of the cement imported came from Belgium, forty-five per cent. from England. Casks containing cement weighed 450 and 475 pounds; 282,000 casks had been imported in 1895. The present duty is forty cents per cask of 275 pounds. The present specific duty of forty cents per cask is equal to fifty-three per cent. ad valorem duty. This duty originated in March, 1896.

Owing to improvements in manufacture the sterling cost of cement had been reduced, so that the duty now represented a sterling cost of 50 to 120 per cent. The present duty was abnormally high and unwarranted. A reduction would bring about

a larger consumption, as the cement would largely replace lime in various works. Mr. McNally's suggestion was that the duty should remain specific as a maximum, and be no higher than that charged under the American duty.

Previous to the McKinley tariff it had been twenty per cent. ad valorem. The conditions of this industry in the United States are analogous to those in Canada, except that the American manufacturers are in a position to handle a much larger quantity.

Sir R. Cartwright—How many manufacturers are there in Canada?

Mr. McNally—Since 1886 six works were started, four of which are now closed down. There are now three; one near Owen Sound, one at Deseronto and one at Longue Pointe.

Sir R. Cartwright—Are they the only ones?

Mr. McNally—Yes, sir. In 1894 there were three works in Ontario and 105 workmen employed; in 1895 there was an increase of twenty-four in the number of workmen employed, and the production was 28,100 casks, valued at \$53,000.

Sir R. Cartwright—Do you not get your cement here practically in ballast?

Mr. McNally—No, sir. This is a general but mistaken impression. We pay about 6s. per ton for freight, or about one shilling per cask; six casks equal the ton.

Sir Richard Cartwright—The price has fallen, has it not?

Mr. McNally—Yes, sir.

Sir R. Cartwright—Do you know whether the Government engineers make any distinction between Canadian and other cements?

Mr. McNally—This year the preference was given to Canadian manufacturers.

Sir Richard Cartwright—Is it from Belgium that you import your cement?

Mr. McNally—Yes, sir, the larger quantity comes from Belgium. The English cement has been going behind of late years.

Mr. McNally here pointed out that the Belgian cement was cheaper owing to cheaper labor being employed.

Sir R. Cartwright—Did we understand you to say that you requested the specific duty should be lowered?

Mr. McNally—We would like that the duty should remain specific, and that it should not be made greater than the American tariff.

A member of the delegation—All Belgian cements are not cheaper than English. There are two grades. The higher priced manufactured grade is very expensive. The other is a low grade of natural cement. That accounts for the difference in prices.

### THE PRICE OF FLOUR.

Mr. David Robertson, a Montreal merchant, addressed the Commissioners, stating that he wished to protest against the duty of fifteen cents per bushel on wheat and seventy-five cents a barrel on flour, which tariff protected only three wealthy milling firms in Canada at the expense of the country. He read a letter from a friend in Manitoba who stated that the price of wheat in Manitoba this fall was at times two cents a bushel higher than the export would warrant. The prices of Manitoba were beyond their value, though the Manitoba farmers did not get the benefit of it. He had been assured by good authorities in the business, that the Manitoba farmers received this season two cents per bushel less than their American cousins similarly situated on the other side of the line. Another phase of the question was that the large millers had claimed that owing to the extreme prices they paid to the farmers for wheat they could not compete against the United States millers in the British market. He was sure the Commissioners would conclude that our millers could hold their own against the United States, in either Canadian or British markets. As for himself he was like the Prime Minister, a free trader. His policy was tariff for revenue. This had been the platform on which the election in June was fought, and he looked to the Government to carry it out. He had great sympathy with the farmers, who had very hard times. As to flour, he asked that the policy of tariff for revenue be applied. It should not be over twenty-five cents a barrel. This would not satisfy the millionaire millers, who want the earth, but if carried out would result in a long good to the trade and to the country. He did not like any tax on bread stuffs. The poor man's bread should be as free as the air he breathes. If the necessities of the Government call for a tax let it be a proper one.

At this point Mr. Robertson's remarks were taken exception to by Mr. Robert Meighen, of the Lake of the Woods Milling Company, who said that he was taken rather unawares. As to the statement that the Manitoba farmers only received a price of two cents a bushel over that obtained by the United States farmers, Mr. Meighen said that he was willing to deposit \$2,000 to \$100 deposited by the other side, for the benefit of the Montreal General Hospital, if he could not prove that the Manitoba farmer re-

ceived a better price of more than seven cents. His company had paid a price for the Manitoba hard wheat which had never been paid before, and since his company had dotted the Western prairie with mills the country had blossomed as the rose. Mr. Robertson's comparisons were very unfair. The commission merchant, such as Mr. Robertson was, was not in it to-day.

Hon. Mr. Paterson—I understand that you intend to have the home market by leaving the twenty five cents duty per barrel?

Answer—The milling plant in the Dominion to-day is not worth ten cents on the dollar if you reduce the tariff to twenty five cents. It had been said yesterday that the large millers put the price up on the small millers. They never did anything of the kind. He never tried to oppress or drive any man to the wall. An association had been formed in Manitoba in order to try to get out of the reach of the middlemen. His company held a great stock of wheat to-day for which they had paid their money in good faith. Would it be fair to them to open the American market and put us on the same basis as Europe? It would simply be wiping us out of existence. Fifty cents would not keep the American flour out. They wanted seventy-five cents a barrel kept on flour in order to keep the Americans from destroying the market. Think what the milling industry did for other businesses. If it was not for mills like this the jute business would have to shut down.

Hon. Mr. Fielding—How are the Ontario millers getting along?

Answer—Well, sir, I hope you are not in the business. I said to one man from Ontario that he was selling his flour far too cheap. He replied that the business was very bad and that they were only holding their wheat for \$1 a bushel.

In answer to a question from the Hon. Mr. Paterson as to what the result would be should the Americans enter into reciprocal arrangements with us as to wheat and flour, Mr. Meighen replied that he did not speak for the millers generally, but for himself, and that he was opposed to such an arrangement, as the Americans, owing to their trusts and combinations, and their own large market, could put down prices to a point which would be disastrous to us.

Mr. Robertson—When the day of the commission merchant is passed it will be a bad day for the millers of Manitoba. I have to distribute the flour of Manitoba.

Mr. Meighen—The point I wish to make is that it will not do the Canadians any good to take the duty off. It will kill the milling industry in Canada. I bought 100,000 bushels of wheat the other day for eighty-three cents a bushel at Fort William. Those men who think we are making a fortune make a mistake. They are children in the business, and do not understand it. His company was making 2,200 barrels a day at Keewatin, and Canada could only take 1,500 barrels a day. He exported the extra quantity. He could give the Canadian people cheaper flour by working his mills to their full capacity than if he only made 1,500 barrels a day. For several years his company had paid the Canadian farmers more than those to the south of us. He believed that as closely as he could estimate there was \$35,000,000 invested in the milling business in Canada. His company had invested something like \$100,000. It took \$3,000,000 to run the business. Think of the interest they had to pay the banks in buying wheat, and all the risk that had to be run in buying stock from December to March, whereas the United States miller could buy each day, and at each day's price. He was on a different footing to the Canadian miller. They wanted to have the home market as the Americans had.

#### AS TO RICE.

Mr. John Pinder, a dealer in rice, sugar, etc., addressed the Commission, and submitted some figures from the Blue Book for the year ending 30th June, 1895, which he said were sufficient to prove that the duty on rice was outrageous. On 5,000,000 lbs. of rice imported there was a duty of 1½ cents for a total of \$73,000. The Government collected more on the clean than on the unclean rice. There was only one rice mill in the Dominion, and it was getting three cents for rice which cost less than two. The rice miller says it costs more to clean rice here than in India. Suppose we admit that the cleaning costs more here, and we allow three-eighths of a cent per lb. for it, the miller would have a margin of one cent per lb.

In 1894 the duty was increased on uncleaned rice, I imported 1,500 bags of cleaned rice from Europe. Before it got here Mr. Foster had changed his mind, and though the tariff had been reduced before, it was now raised again, so that we had to pay the old duty of 1½ cents per lb. Mr. Pinder here submitted an invoice showing that 1,500 bags of rice weighing 360,000 lbs., costing \$1.70 per 100 lbs. in Europe, costs \$6,127. The duty on this was 1½ cents per lb., equalling \$4,505; the duty on bags was twenty per cent., equalling \$60.

Altogether, including freights and insurance they paid \$4,565 on

an invoice of rice costing \$6,127. Rice was one of the articles on which the Montreal Grocers' Guild had a combine. They charged \$3.40 per 100 lbs. The wholesale grocers refused to buy our rice. We sell it to the retailers at three cents. This did not suit the wholesalers. We pointed out to them that as the mills would not buy our rice we were obliged to offer it to the retailers.

In the spring of 1895 we imported 500 bags of rice, intending to hold them in bond until the new Government came into power. It is still in Montreal, and still in bond. As there has not been any change in duty, we are not able to offer it in Canada. We sold 100 bags to a merchant in Boston lately and have still 400 in bond. If the Government will take off the duty we can sell at two cents per pound.

Mr. Pinder here submitted a sample of rice which the millers were selling to the retailers for three cents. The rice milling company here tried to prove that owing to the loss of weight they did not make much out of the business. They cannot deny that rice is sold in Europe at one and one-eighth cents per pound and that they are getting two and seven-eighth cents a pound here for that which is not so good. They are getting \$1.50 per 100 lbs. more than the miller in Europe.

Hon. Mr. Fielding—What do you mean by saying there is a combine?

Answer—I mean that the wholesale millers have a combine in the Province of Quebec.

Mr. Laporte here said that they had not a combine. They had an agreement between the millers and the members of the Guild by which they put a small profit on the price. They were selling rice at \$3.25 which cost \$2.70.

Mr. Pinder—I am not complaining of the profit; I say that there is a combine.

Hon. Mr. Fielding—What is the nature of the agreement?

Mr. Laporte—Just an understanding among ourselves. We meet and agree to sell sugar or rice at a certain price.

Hon. Mr. Fielding—You say that there are some who are not in the agreement. And they sell at any rate they wish?

Answer—Yes, they can sell at any rate. We have no understanding with the miller, but only among ourselves. We have no combine.

Hon. Mr. Paterson—Do you speak for the trade of Montreal? Are there any who would hold the same views as Mr. Pinder?

Answer—There are some who are not in the rice arrangement.

Hon. Mr. Paterson—The impression you would have left on our minds is that you are empowered to speak for the wholesale association at Montreal.

Answer—Yes, I speak for seven-eighths of the wholesale grocers of Montreal.

Mr. Laporte—Some members are satisfied with the present state of affairs and are not in the Association.

Mr. Chaput—Some would not join us. They prefer to undersell us. We do not come asking for any change. We speak for some who are outside of our Association.

Mr. Laporte—The Province of Quebec is the largest consumer of rice, (excepting British Columbia) in the Dominion; it is estimated that two bags of rice are used in Quebec, as compared with one in Ontario. The proportion of the various kinds of rice used, is estimated as follows: two per cent. of Japan rice, three per cent. of Patra rice and ninety-five per cent. of either Arracan or Rangoon from Burmah.

The trade is well satisfied with the present state of things, and do not wish to return to the importation of rice, the experience of which was most unsatisfactory. I believe it necessary to mention the advantages deriving from the present system: The company here contracts with the wholesale grocers for the period of a season, such contract being generally made when the market is favorable; the rice is invoiced on the date of its delivery; the company delivers the goods to steamers or railway companies, to the address of our customers, thus saving to the trade the cartage, handling of goods, storage, loss in weight, deterioration, or damage by vermin, fire insurance, etc.

The mills price for "B" rice, which represents the ninety-five per cent. of the quantity used, is \$2.87½ per 100 pounds for quality, which to import to-day would cost over 3½ cents per pound. The company's price must be fifteen cents to twenty-five cents per 100 pounds below the cost of importation, in order to hold the trade, and experience has shown that such is really the case during at least nine years out of ten. The trade secures only a moderate profit, and the consumer does not lose by the present system, for experience has proven that when rice was imported from foreign countries, we were receiving in most cases, a poor article, deteriorated either by having been kept too long in store, or damaged in transit, etc., while at present we are assured of a uniform quality, with the certainty of having fresh stock; in addition to this, the mill delivers on demand rice put up in assorted

packets as small as 12½ pounds, which are of great accommodation both to trade and consumer.

A better and cheaper article cannot be obtained by farmers or workmen in any other country than Canada, if we except Great Britain.

The trade here does not consider the example of Japan rice is instanced by a merchant of Hamilton, as at a fair one, as it only concerns a trifle of the product, i.e., about two per cent. Among items incorrectly stated, I beg to mention the following. First, it is stated that the mill price for Japan rice is 4½ cents instead of 3½ cents, which is the price for the finest quality produced in Canada, so to commence with there is an overstatement of 62½ cents on the mill price. Second: The same merchants calculate the duties paid on rice at thirty cents per 100 pounds, while he should know that duty is thirty per cent. ad valorem on all rice costing one cent and over, which means duties of over sixty cents per 100 pounds on this same Japan rice. Third: He has also omitted to calculate the loss in weight on uncleaned rice, after having been milled and cleaned.

Hon. Mr. Paterson—How much is lost in the milling of rice?

Answer—The loss is generally forty per cent.

Hon. Mr. Paterson—You don't mean to say that it is all waste? You mean that it grows into less valuable products?

Answer—That is the average. I have here the average quantity for the last five years: 66,000,000 pounds had been imported, and the quantity realized of clean rice was about 40,000,000 pounds.

Sir Richard Cartwright—You are aware that the duty on the clean rice is very nearly eighty per cent. ad valorem, and you say the unclean rice comes in at a little over thirty per cent.?

Answer—The duty on clean rice is three-tenths.

Sir Richard Cartwright—I am speaking of the matter as worked out at ad valorem. The unclean rice is thirty per cent., and the clean rice is subject to a duty of eighty per cent. ad valorem.

Mr. Laporte—I must add that the price here is cheaper than any other country than Great Britain. I suppose we are not paying too much to the mills for rice. But I am not here to plead the mills' cause.

Sir Richard Cartwright—Do you think that eighty per cent. is a reasonable duty on clean rice?

Mr. Laporte—I don't think I am here to give my personal views. We are here as traders, and as traders we know certain things.

When we met in Toronto resolutions were offered to the meeting asking some change in the rice duties, and after discussing the advantage to the trade and consumers and the actual state of affairs, the proposer of the resolution withdrew his motion at the request of the president of the Dominion Association. That shows that the general trade is satisfied with the state of affairs, and we are positive there is no grievance from the consumers either.

Sir Richard Cartwright—That is a matter of opinion, but you do not dispute the representations made to us which were virtually that the clean rice is subject to a duty of eighty per cent., and that the unclean came in at an ad valorem duty of thirty per cent.; you do not dispute that, although you consider that that is modified by the circumstances you mention.

Mr. Laporte—I am not ready to accept the statements made to the Commissioners at other points that the duty is eighty per cent.

Sir Richard Cartwright—I am giving you the item roughly, as taken from the trade return, and also from the statement made by the wholesale grocers who called upon us in different places,

Answer—You see, sir, that statement was made in figuring on Japan rice.

Sir Richard Cartwright—No; the statement that I am now making to you is made on the average of all the rice imported in a clean state into the Dominion—it is not on any one particular kind?

Mr. Laporte—Yes, but if they figure the same way as they figure the Japan rice, I am not willing to accept their figures.

Sir Richard Cartwright—Then you dispute the accuracy of their statement?

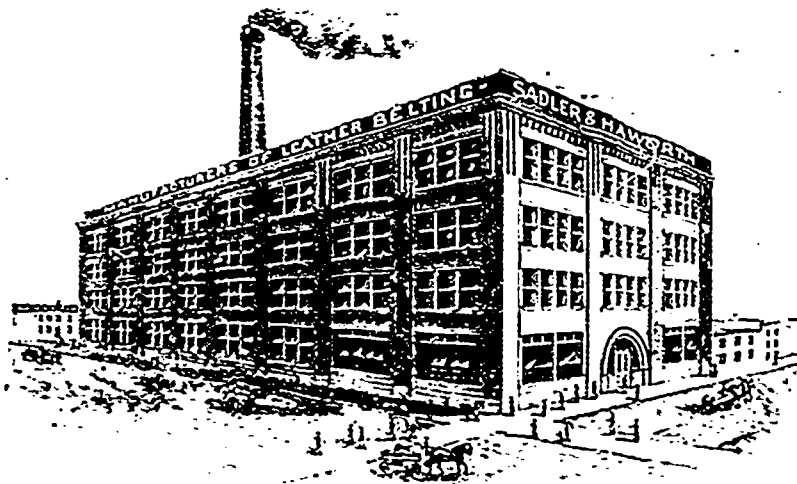
Mr. Laporte—As I proved by my statement, the mills have never taken advantage of all the production they have, and there is no mill that can take advantage of it because if they were charging exactly the price we can buy for, they would lose their trade. The present price at the mills is five-eighths of a cent less than rice can be imported from England.

Hon. Mr. Fielding—How many rice mills are there in Canada?

Answer—There are two, one in Montreal and the other in Vancouver.

Mr. Fielding—So that practically for this end of the Dominion within our reach there is only one?

Answer—Yes, the Provinces of Quebec, Ontario, and Manitoba took 66,000,000 in five years.



OUR NEW LEATHER BELTING FACTORY

Orders addressed to our Toronto or Montreal Factory will have prompt care.  
Goods will be forwarded same day as order is received.

Hon. Mr. Fielding—You know something about this rice mill at Montreal, is it a large concern?

Answer—It is a wealthy concern.

Hon. Mr. Fielding—Do they employ a large number of hands?

Mr. Tarte—I think they employ about forty hands.

Mr. Carter—What we as wholesale grocers wish to emphasize particularly is this, that we really have no complaints to make as regards existing trade relations as to rice. In other words, we are getting so well supplied, and the grade of rice is so superior to anything we have handled in the past, with less loss and dissatisfaction, that the conditions are so satisfactory that we would rather see them maintained than have any alterations whatever.

Hon. Mr. Tarte—Do you import any rice?

Answer—No sir, we do not.

Mr. Laporte—We import occasionally a small quantity of Patna rice.

Hon. Mr. Tarte—You buy nearly every pound of rice from the mill.

Mr. Laporte—It is this way, the millers generally buy their rice when the market is at the lowest point. They buy in a very large quantity, and when they have secured all the rice they want for a year, they come to us and quote so much for the rice for a year's supply. Then we contract with them at the lowest price.

Sir Richard Cartwright—How long has the Montreal factory been established?

Answer—About fifteen years.

Hon. Mr. Tarte—Are you in a position to give us the price of the rice at the mills in Montreal?

Mr. Laporte—Ninety-five per cent. of the rice we buy at \$2.87½ at the mills; that is the lowest contract we have.

Hon. Mr. Fielding—Then you think any change in the rice duties would make rice cheaper?

Mr. Laporte—I don't think it would be worth while to risk any change in the present tariff.

Sir Richard Cartwright—Practically I suppose for the last fifteen years the market has been supplied from the factory?

Answer—Yes, practically.

Sir Richard Cartwright—Very little rice in comparison has been imported?

Mr. Laporte—We bought from the mills something over 40,000,000 pounds in the last five years and imported a little over 5,000,000 pounds.

Sir Richard Cartwright—Then practically, during the time you speak of there has been very little clean rice imported?

Answer—Very little.

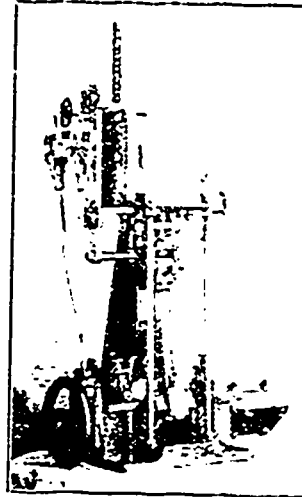
Hon. Mr. Paterson—Do you speak for the whole of the wholesale grocers?

Mr. Laporte—I speak for the Montreal wholesale grocers, but I must add that in Toronto every member of the association present was satisfied with the state of affairs.

Hon. Mr. Paterson—You are not in the mill yourself?

Answer—No.

[NOTE—The foregoing is only a part of the testimony taken at Montreal. The publication of it will be continued in our next and other issues.]



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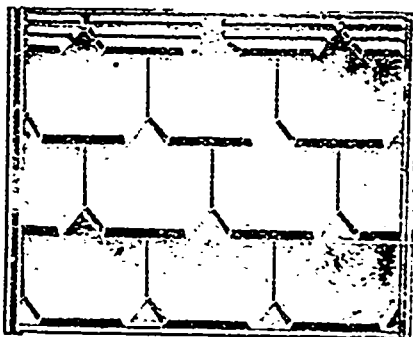
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## CAPTAINS OF INDUSTRY.

The following items of information, which are classified under the title "Captains of Industry," relate to matters that are of special interest to every advertiser in these pages, and to every concern in Canada interested in any manufacturing industry whatever, this interest extending to supply houses also.

If a new manufacturing enterprise of any kind is being started, or an electric lighting plant instituted, or an electric railroad, or a telephone, or a telegraph line is being constructed; or a saw mill, a woolen, cotton, or knitting mill; or if any industrial establishment has been destroyed by fire with a probability of its being rebuilt, our friends should understand that possibly there may be something in the event for them. Do you catch on to the idea?

The starting of any such concern means a demand for some sort of machines, machinery, or supplies, such as steam engines and boilers, shafting, pulleys, belting, lubricants, machinery supplies, wood or iron working machinery, ventilating and drying apparatus; pumps, valves, packing, dynamos, motors, wire, arc and incandescent lamps, and an infinite variety of electrical supplies, chemicals, acids, alkalis, etc. It is well worth the while of every reader of the Canadian Manufacturer to closely inspect all items under the head of Captains of Industry.

The Moncton Manufacturing Company, Moncton, N. B., has been incorporated with a capital stock of \$30,000, to manufacture agricultural machinery, engines, implements, etc.

The Watson Manufacturing Company, Woodstock, N. B., has been incorporated with a capital stock of \$15,000, to manufacture household utensils, etc.

The Woodstock Carriage Company, Woodstock, N. B., has been incorporated with a capital stock of \$40,000.

The town of Galt, Ont., proposes to spend \$50,000 on street improvements in the next three years.

The Soho, Ont., cheese factory, recently destroyed by fire, will be rebuilt at Drumbo, Ont.

The Albert Carriage Company, Albert, N. B., has been incorporated with a capital stock of \$2,000.

Mr. James Beardsford, a prospector, has discovered oil at a depth of 250 feet at Cameron's Corners, five miles from Parkhill, Ont.

A short time ago samples of lithographic stone from the quarries of W. H. Casement at Lakesfield, Ont., were sent to New York and Cambridge, Mass., to be tested and the results are said to be two fine specimens of lithographic work, one shown in the architect edition of Scientific American, New York and the other by the Riverside Press, Cambridge, Mass. The letter accompanying the prints spoke highly of the stone, saying it was equal to the best German stone.

That the construction of the proposed Rainy River Railway would do something more than develop the gold veins of this region is admitted. The Rainy River country has rich deposits of iron ores which will also be opened up by the line. It is said that the owners of a portion of the soft hematite ore deposits in the Mattawin range have been offered a contract to supply 100,000 tons to the Hamilton smelter. As soon as the railway gets to the Atikokan range, it is believed that an equally large order for magnetic ore will be given. The ore has been tested by the furnace people and is satisfactory.—Toronto World.

The Sayward-Davies sawmill at Pilot Bay, B. C., which has been idle four years, will shortly be started up by I. C. Schermerhorn.

The gold mines of Nova Scotia turned out \$500,000 worth of the yellow metal last year.

THE - - - -

# WM. HAMILTON MANUFACTURING CO., Ltd.

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## THE "RELIANCE"

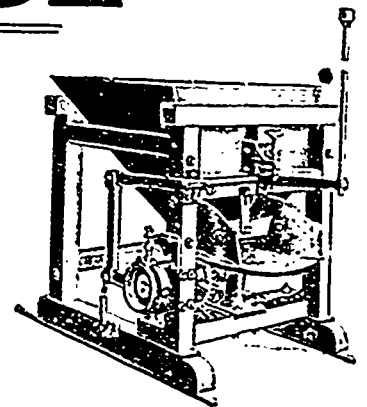
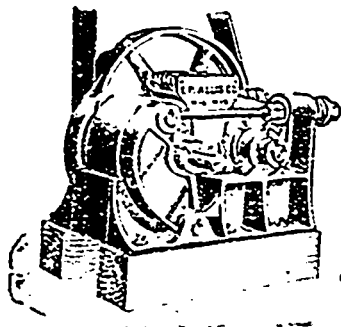
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AND

# Smelting Machinery

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Compressors, Hoists, Boilers, Engines, Water Wheels, Etc.

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VANCOUVER, B.C.

 PETERBOROUGH, ONT.

According to official returns the production of pig iron in Canada more than doubled during the last fiscal year, 84,607 tons having been produced, as against 31,641 in the previous year.

Hamelym & Ayers, Lachute Mills, Que., will build another pulp mill with a capacity of twenty tons per day. The dam, which is now half built, will be completed this coming summer, and the mill be ready to run next fall. The machinery is all ordered, and is being made in Canada.

The Holland and Emery Lumber Company, which has its nominal headquarters at East Tawas, but which is controlled by Nelson Holland of Buffalo, is preparing to move the big saw mills from that point to Byng Inlet on Georgian Bay, just as soon as the ice goes out in the spring. This company handles about 45,000,000 feet of logs, bringing them to Tawas from their Canadian lands in rafts. They have now concluded to do all their sawing in Canada. The mills are already partly dismantled. They will be moved on vessels as nearly intact as possible. As it will be impossible to begin pile-driving and dock-building at Byng Inlet until the frost is out of the ground, it will probably be August before any sawing is done there.—Cleveland Marine Record.

Mrs. H. B. Western, of this city, has perfected an invention in the shape of a corrugated bicycle tire, said to be entirely non-slipping, and has succeeded in securing patents for Canada, as well as having a good prospect of getting similar protection in the United States. It has not been decided yet what will be done with the new invention, but if it is proven all right some of the big American tire manufacturers are willing to

make offers for the rights. A peculiar circumstance about it is that since Mrs. Western perfected her idea an English inventor, with almost identically the same thought, has formed a company and begun the manufacture of a tire practically the same in style. He, however, neglected to have the invention patented, either in the United States or Canada. Hamilton Spectator.

The foundry at Simcoe, Ont. owned by John Allgeo, was destroyed by fire Feb. 27th. Loss about \$5,000.

The Holland & Emery Lumber Co., with headquarters in Buffalo, have had plans drawn for two new saw mills to be built at Byng Inlet Parry Sound, Ont., next summer.

The Newfoundland Northern R. R. shops at Whitbourne were destroyed by fire Feb. 28th. Two locomotives valued at \$12,000 each, a passenger car and all the property contained in the building were destroyed.

A bill has passed the United States House of Representatives authorizing the New York & Northern Railway Company to build a bridge across the St. Lawrence River at Ogdensburg, N. Y.

The Queen's Hotel at Moosomin, Man., was destroyed by fire Feb. 26th. Loss about \$9,000.

Messrs. Blain and McMurchy, who occupy the foundry and machine shops that were built by the late John Haggart at Brampton, Ont., finished their first engine on Feb. 27th.

The Union Colliery, Nanaimo, B. C., has put in ovens for manufacturing coke, and are now prepared to supply it as fuel to the smelters in the Kootenay district.

Messrs. Clark and Witley are erecting a saw mill at Salmo, B. C., with a capacity of 25,000 feet per day.

Messrs. J. & G. Black's gristmill at Thurso, Que., was destroyed by fire Feb. 26th.

The Northey Pump Co., Toronto, have been putting up an addition to their works. It is about 100x40 ft. brick.

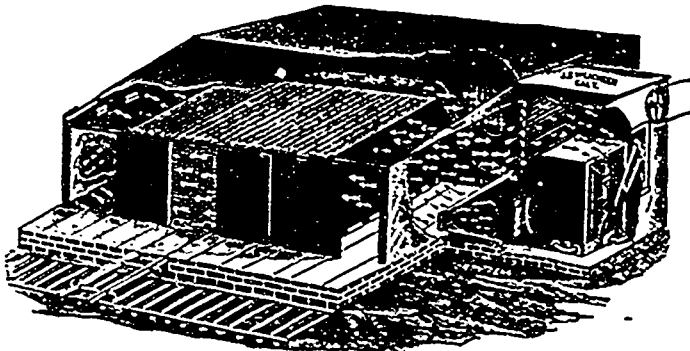
The Weeks-Eldred Co., Toronto, manufacturers of the improved Jones' under-feed mechanical stoker have lately installed this machine in the new Temple Building, Toronto, the High Level Pumping Station, Toronto, new Court House, Toronto, and the works of the Bowmanville Rubber Co., Bowmanville, Ont.

The municipal council of the City of Chatham, Ont., has agreed to submit a by-law to the people, endorsing a proposal of the Chatham City & Suburban Electric Railway for an extension of the road to Wallaceburg, Dresden, Petrolia and other northern points, as well as Blenheim, Rondeau, Charing Cross and other points south, and of granting a contract to the company for electric lighting of the city at twenty-five cents per arc lamp per night, up to not less than 100 lights.

The Metallic Roofing Co., Toronto, have secured the contract for the interior work in the Temple Building, Toronto. The work consists of all the wainscoting, embossed metal doors, etc., and amounts in value to about \$30,000, which is perhaps the largest contract for this class of work that has ever been given. The embossed metal doors are a new thing in Canada, they are made of two sheets of embossed metal, filled with asbestos.

## McEachren's System of Drying, Heating and Ventilating

Under Recent Patents.



In construction an process of drying this Kiln differs widely from all others in use. They have given entire satisfaction where all others Dry Kilns have failed. They will season More Lumber in a Given Time, with a given heating surface and a given quantity of steam than any other Kiln now in the market. Their construction and mode of operating is such as to season lumber without Case Hardening, Checking or Warping. They work equally well on Lumber Right from the Saw and on Air Seasoned Lumber, the only difference being that one takes a little more time than the other. By a Peculiar Arrangement Found Only In Our Dry Kilns we extract the moisture from the heated air, return it through the heater again and thus preserve the heat passing from the Kiln instead of wasting it as is the rule with all other Blast Kilns.

Ventilating Fans, Shaving Fans, Pressure Fans, all sizes.

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THE LARGEST DRIER IN AMERICA IS EQUIPPED WITH A "BUFFALO" HOT BLAST APPARATUS. THE OWNERS ARE ENTHUSIASTIC.

All users of Buffalo Kilns write letters similar to this one:

"The Kiln answers every purpose to perfection: the Dry Rooms are run with exhaust steam at mere nothing in the way of cost, compared with the old way. Your arrangement is very simple and easily managed, besides, being a money saver in operation. We are able, with the Kiln you sent us to dry soft woods in three days, and hardwoods in five days. That's good enough for anyone."—SMITH BROS., Sayre, Penn.

Send for Catalogue.

## Buffalo Forge Co., Buffalo, N. Y., U.S.A.

Sold in—Toronto, Ont. by H. W. Petric.

Brantford, Ont., by Canadian Machinery & Supply Co.

Montreal, Que., by Canadian Machinery Agency.

Chicago Store, 22 and 24 West Randolph Street

New York Office, 26 Cortland Street.



A joint stock company for raising flax and manufacturing linseed oil has been formed at St. Joachim, Essex County, Ont. There are forty shareholders, and each will plant one acre of flax yearly, which it is expected will produce twenty-five bushels of flax and thirty gallons of oil.

Mr. George O'Reilly has purchased land in Ottawa, on which to erect a cold storage building.

Not long ago, the Wm. Hamilton Manufacturing Company, Peterborough, Ont., shipped to the Golden Cache Mines Co., Lilloet, B. C., a ten-stamp mill, ore crusher, the necessary steam plant to furnish the motive power, etc., as well as a complete portable saw mill; and more recently to the Lilloet, Fraser River and Cariboo Gold Fields Co., Illecillowaet, B. C., two pairs turbine wheels and the necessary steel piping to be used to convey the water to the wheels.

The Jones & Moore Electric Co., Toronto, have moved to more commodious premises at 22 Adelaide St. west. They will add more machinery and will be in better shape to install electric light and power plants.

The contract for the electrical equipment of the Montreal Park & Island Railway Company's suburban lines has been awarded to Ahearn & Soper of Ottawa. Westinghouse 38-B and 12-A motors will be used throughout.

The Corporation of the City of Kingston, Ont., will ask the Legislature for power to pass a by-law granting a bonus of \$25,000 to any person or corporation who will erect an elevator there.

We have received from the Norton Emery Wheel Company, Worcester, Mass., a handsome catalogue fully illustrating and describing their emery goods and grinding machinery. This company's emery and corundum wheels are made by the vitrified process, in which they are subjected to intense heat, on which account only the purest and best quality emery and corundum can be used. The good points claimed for the Norton emery and corundum wheels are that they contain nothing but cutting properties; are free from dust or odor; fast cutting and durable; porous and open; do not heat the work; will work equally well wet or dry. This catalogue contains much information that will be appreciated by users of emery wheels and machinery connected with their use.

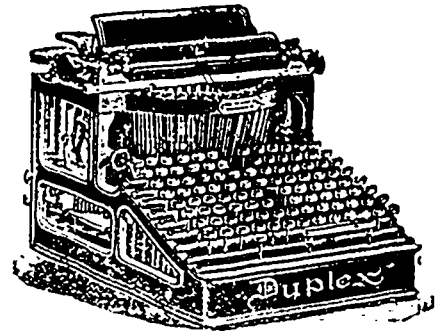
The Shuttleworth Chemical Company of Toronto is being incorporated to acquire the business heretofore carried on by T. Milburn & Co. at Toronto, and to carry on the business of manufacturing chemists, etc.

The woolen mills of A. W. Brodie, Hespeler are running overtime. New machinery is being put in.

The Guelph woolen mills, Guelph, Ont., have received an order from the Department

of the Interior for 1,000 pairs of drawers for Northwest mounted police.

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Direct Dictation Made Possible  
Will not Double Print in Rapid Work  
Both Hands Always at Work  
Two Sets of Wearing Parts - Double Durability  
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Your Time is Your Money - Save It

The "1897" TYPEWRITER

Enables an Operator to do Double the work with less labor. Prints two letters of a word while any other prints one.

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Sole Agents for SCHEEFFER RECORDING WATT METERS  
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<b>Burnham's</b>	Percentage	
	Full Gate	84
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Machinery Brushes for woollen and flour mills, jewellers, shoes, breweries, dairies, platers, foundries, and all machinery work; old rollers refiled.

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Split Maple Handles  
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Duck and Round Bill Peaveys.  
Car Load or Dozen Lots

THE PETERBOROUGH CANOE CO. LTD.  
PETERBOROUGH, Ont. Canada.  
SEND FOR CATALOGUE

The Algoma Pioneer says that upwards of \$2,000,000 have been expended in developing power, in new buildings and plant at Sault Ste. Marie, Ont, and that the company have the largest pulp mill in the world in full operation day and night and a second mill well under way; that they also have a large foundry and extensive machine shops in full blast, together with carpenter shops, sash factory etc. The company referred to is the Sault Ste. Marie Pulp and Paper Co.

The Disney and Delvin Manufacturing Company of Hanover, Ontario, are applying for supplementary letters patent to enable them to manufacture chairs and furniture in addition to the business at present carried on by them.

Engineer E. Wingate, of Hamilton, Ont., has been instructed to draw up plans and

specifications for the iron bridge over the marsh at that place.

Wm. J. Matheson & Co., 178 Front St., New York, have lately introduced a number of new colors on cotton, the latest being print patterns of Naphtindone B B, and new Methylene Blue N and a number of indigo shades dyed on calico with Diaminogone Blue B B and Diamini Azo Blue R.

It will shortly be possible to hire an electric motor or pay for it on the instalment plan. A branch company of the Lachine Hydraulic and Land Company is to be formed for this purpose in the near future and the business is expected to grow rapidly. The letting out of motors is quite a business in some parts of the United States and Europe, but is novel so far as this country is concerned.—Montreal Witness.

A company to be known as the Lake Medad Portland Cement Co., composed of Hamilton capitalists, is being formed to manufacture Portland cement from a marl that has been discovered at the bottom of Lake Medad near Hamilton, Ont.

The Granby rubber factory, Granby, Que., is to be enlarged the coming summer.

Three weeks ago The Miner placed an order by wire with the Barber-Ellis Company, of Toronto, for a carload of printing paper. The paper was shipped from Georgetown, Ont., fifteen days ago and Monday it was delivered at our office. The paper was only twelve days en route from Georgetown to Robson. One day was lost there and another at Trail or the carload would have been delivered to us inside of two weeks from date of shipment.—Rossland Miner.

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Machine for the Use of Foundry-  
men in Testing the Strength  
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of Iron for any work,  
thus showing positively which is  
the Best Iron for the Re-  
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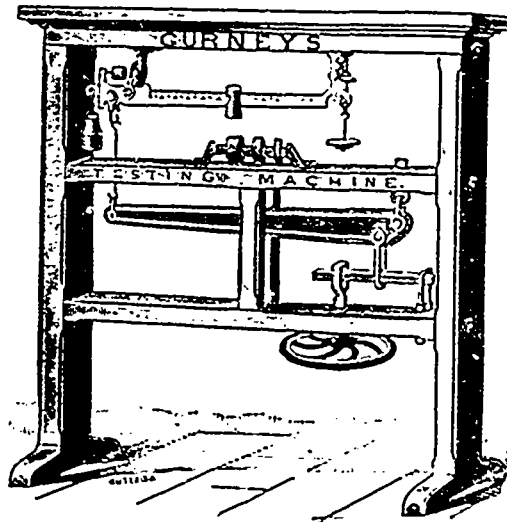
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**Canada Chemical  
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Manufacturers of

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Mixed Acids for Explosives.

Liquid Ammonia, Glauber Salts,  
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Tin Crystals, Acetic Acid, Nitrate  
Iron, Bisulphite Soda,

Acid Phosphate for Baking Pow-  
ders and General Chemicals.

Fertilizers, etc.

LONDON  
ONT.

The Stanley Piano Company of Toronto, has been incorporated with a capital stock of \$24,000

The Bluevale Flax Manufacturing Company, Bluevale, Ont., is being incorporated with a capital stock of \$6,000.

The John Inglis Company of Toronto, is being incorporated with a capital stock of \$150,000, to take over the foundry, machine shops, engine and boiler works, etc., at present carried on by the firm of John Inglis & Sons, Toronto.

Sylvester Bros. agricultural factory at Lindsay, Ont., was damaged by fire March 1st to the extent of \$2,500.

The Lake Medad Portland Cement Company, Hamilton, Ont., is being incorporated

with a capital stock of \$150,000, to manufacture Portland and hydraulic cements.

The M. Campbell Fanning Mill Company, Chatham, Ont., is being incorporated with a capital stock of \$150,000, to manufacture fanning mills, agricultural implements, etc.

The Owen Sound Dredge and Construction Company, Owen Sound, Ont., has been incorporated with a capital stock of \$50,000.

A representative of the Fraser & Chalmers Company of Chicago, manufacturers of mining machinery, has been in Toronto and elsewhere looking over the ground with a view to establish a branch of the company's works in Canada.

The Winger Woollen and Felt Co., Elmira, Ontario, are enlarging their factory.

The Peterborough Canoe Co., successors to the Ontario Canoe Co., Peterborough, Ont., have sent us a folder fully describing the various styles of canoes manufactured by them. This company also builds folding boats, skiffs, steam launches and canoe and sail fittings of all kinds.

The Djerling and Marstrand Brewing Co., Vancouver, B.C., is being incorporated with a capital stock of \$100,000.

Messrs. Henderson and Potts, Halifax, N. S., proprietors of the Nova Scotia Paint Works, are establishing a branch of their business in Montreal.

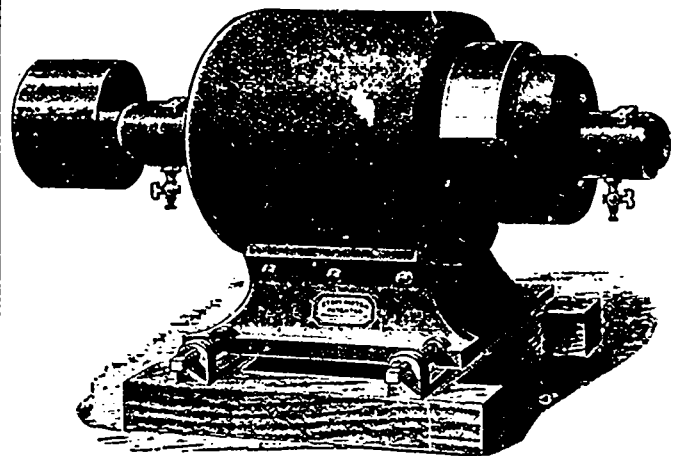
Messrs. Glass Bros.' pottery at Pottersburg, near London, Ont., was destroyed by fire a few days ago. Loss about \$40,000.

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and  
COMPRESSORS

ARE MANUFACTURED BY

THE CANADIAN  
DRILL CO  
and  
MONTREAL

THE  
Storey Motor and Dynamo



MANUFACTURED BY

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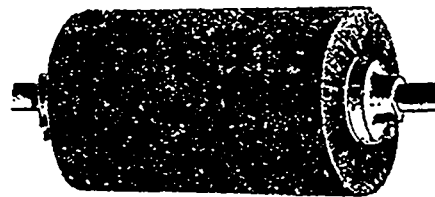
John St. North, Hamilton, Can., and Philadelphia.

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Machinery,  
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Boilers,  
Motors,  
Shafting, Etc.

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FACTORY BRUSHES



All Kinds of MACHINERY  
BRUSHES Made and  
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The Cross Typewriter Company, Toronto, is being incorporated with a capital stock of \$25,000, to manufacture typewriters, supplies, office furniture, etc.

John Patterson says that arrangements have been made by his company with the government by which it has secured a good water privilege near DeCov's Falls, and work will be commenced in a week or two putting in the plant. By July, he says, the company will be ready to supply 2,000 electric horsepower in this city at a cheap rate, and by next fall the power limit will be 5,000 h. p. A head of water has been secured that will furnish a large amount of power, the fall being 250 feet high. — Hamilton Spectator.

The "Pulsometer" pumps added to their popularity by the remarkable and valuable performance in connection with the raising

of the s. s. Orotava, which sank last December in Tilbury docks. The ordinary pumps of the vessel were, of course, entirely unable to cope with the difficulty, and three Pulsometers were therefore requisitioned, these being suspended to the hatches, fore and aft. In respect of smartness of delivery the makers also deserve a word of recognition. Within ten hours from the time when the engineers who had the matter in hand decided to apply to the Nine Elms Iron Works for aid, the pumps were on the spot. After the latter had been working from Saturday to Monday the great vessel was "coaxed" (as the Daily Telegraph has it) to rise from the muddy bed upon which she had been reclining for six days. The great advantage of the Pulsometer pumps—the fact that they will work anywhere—has been thus notably demonstrated, to the well-deserved advantage

of the makers. As is well known, this class of pump need not be fixed, a chain from which to suspend them being sufficient. Machinery Market (Eng.) [These pumps are manufactured in New York by the Pulsometer Pump Co.]

NEW ANILINE DYES.

Katigen Black Brown N. This article already brought before the public notice in the columns of THE CANADIAN MANUFACTURER is now placed upon the market by the Farbenfabriken Company, of Elberfeld, in the form of lumps. This product being hygroscopic, should be kept in covered casks.


The advantages of this brown are without limit; no mordant is required—no heat and no handling, as it dyes easily level. The color dissolves quickly in warm water, twenty

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per cent. gives a full dark brown. Use in about the following proportions.

One pound color to one gallon of water and allow the goods, if possible, to remain in the dye bath over night.

For following lots use only two-thirds the original amount of color. The fastness of this color is its remarkable feature.

Light strong acids and strong alkalis do not affect it in the slightest degree. As regards its fastness to washing, it cannot be excelled.

Dyers who are interested would do well to write for shade cards and samples also dyed skeins of yarn.

By a special process a full deep black may be produced at a very low cost, (a good Aniline black substitute).

Katigon Black Brown N. is a cotton brown and will scarcely discolor wool. Latest pattern books immediately supplied on application to the Dominion Dyewood & Chemical Co., Sole Agents in Canada for the Farbenfabriken, Vorm, Friedr Bayer & Co., Elberfeld, Germany.

Anilines fast to Chloride. Chloramine yellow and Chloramine brown G. brought out a short time ago by the Farbenfabriken

Co., of Elberfeld, are colors entirely fast to Chlorine, and which are not affected in the slightest degree by chloride of lime. These colors dyeing best on cotton with common salt are of especial value to the dyer, who requires a color fast to bleaching.

Wool Black B.—A new acid wool dyeing black of special value to light and steaming. On account of its fastness to washing, it is very suitable for dyeing yarns.

Wool Black B. gives a fine bluish black on chevots and worsteds, which can be toned to a rich deep black, by using a small quantity of orange or green in the dye bath. The resulting black is fast to carbonizing with sulphuric acid.

This black being low in price will meet with a ready demand. For latest shade cards, circulars, etc., address the Dominion Dyewood & Chemical Co., Toronto, Sole Agents for Canada.

Diazo Colors.—The list of diazotisable colors is always increasing; the latest addition is Diazo Black 3, B. This black is very similar to Diazo Black B., and is equal to the older brands of diazotisable colors in fastness to washing. A leading feature of this new brand is its property of forming in

combination with C. S. O. 4 a copper lake, without undergoing any definite change in tone, the shade produced is exceedingly fast to light.

The chief colors of the Diazo family are: Primuline Yellow, Diazo Black B., H. Diazo Brilliant Black R., Diazo Blue, Diazo Blue Black, Diazo Brown V., R. and G. and Diazo Brown R. extra. Common salt is the usual mordant; the cotton being boiled for one hour.

The goods are next diazotised for a quarter of an hour in a cold acidulated nitrite bath, rinsed and developed. The resulting shade is in accordance with the developer used.

With Primuline by using "Developer A" a fine clear bright red is obtained; with "B" a bordeaux and with "F" a bright orange. By combining the various developers many new and interesting shades may be produced.

This three bath process of "dyeing," "diazotising" and "developing" a color takes twice as long as the dyeing of an ordinary cotton color, but the resulting shades are very fast to washing and light, and do not bleed into white.

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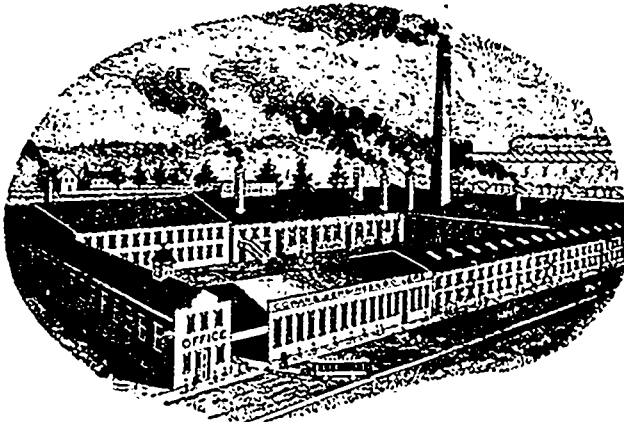
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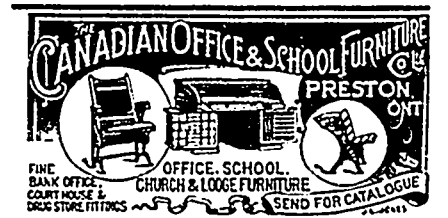
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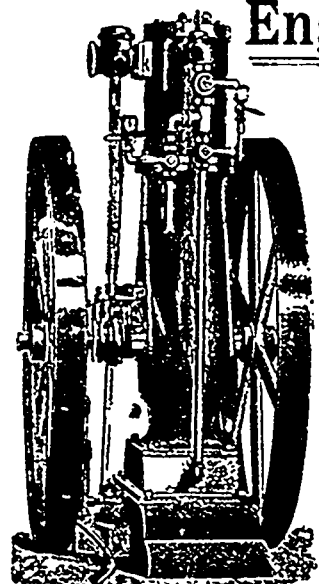


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**THE CHAMBLY RAPIDS MONTREAL POWER TRANSMISSION.**

The power transmission plant now being built under the supervision of the Royal Electric Co., of Montreal, at the Chambly Rapids of the Richelieu River, about sixteen miles east of Montreal, will involve several rather new features, the one of chief significance being the generation of the transmitting energy at the line potential of 12,000 volts without the use of step-up transformers. As this plan would hardly be considered feasible with any type of generator except an induction alternator, this plant is likely to prove the forerunner of many large electric power transmission plants in the future in which the indisputable advantage

of using a generator containing no moving conductors is combined with the evident saving in first cost due to avoiding the use of step up transformers. Each unit in this plant will consist of a 2,500 h.p. S.K.C. two phase inductor generator and two forty-eight inch twin Victor turbines, all on one horizontal shaft. It is expected that when each turbine is provided with the latest type of Stillwell Bierce gate regulator any or all of the generators may be coupled in parallel without danger of excessive idle currents or unequal distribution of load. The determination by actual test of the practicability of so operating will be watched with interest by all who have to deal with high potential multi-phase systems which depend on water-power. But when it is remembered that each generator has enormous fly wheel regulation, resulting from the great mass of the iron inductor fourteen feet in diameter, and that in addition to this the generators have no compound winding to increase the surging effect of the idle currents, and yet have an inherent regulation of four and a half per cent, it appears that the designers of the

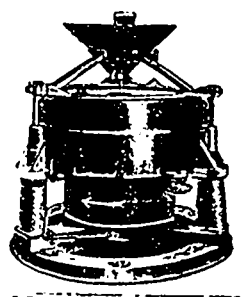
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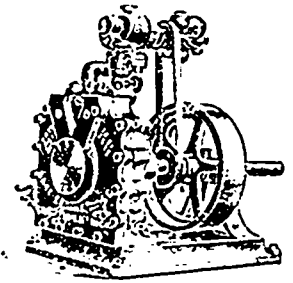
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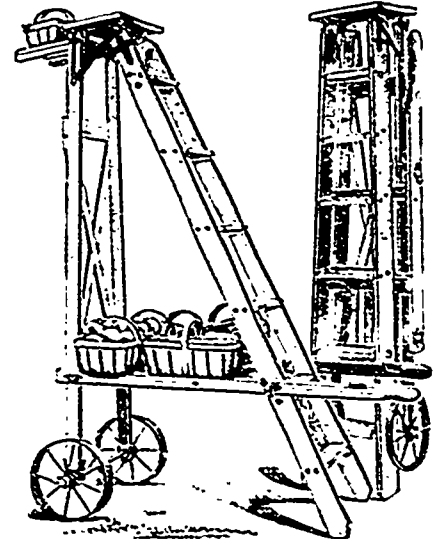
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Half Tones Made Direct from  
Photos

plant have good ground to expect to obtain satisfactory working results by the means chosen.

**ELECTRIC POWER IN A REFRIGERATING PLANT.**

The introduction of electric power in the operation of the refrigerating plant of the Quebec Storage Company, in Quebec City, is another new field for central stations, with which to increase their day load. The plant being installed to drive the refrigerating machinery consists of two fifty and two fifteen h.p., two phase S.K.C., induction motors; the larger of which are to be for the operation of the compressors, and are replacing two steam engines. These motors are belted direct to two lines of shafting, which are so arranged that they can be made one continuous line by a friction clutch, the intention being that, if necessary, either motor can operate both compressors or either of them as circumstances may require, the compressors being driven by belting from the shafting described. From this same shafting will also be operated two pumps, which are used to bring about a circulation of the brine in the pipes.

The two fifteen h.p. two phase S.K.C. induction motors will, in a like manner, be connected to two shafts arranged so that by friction clutch they can be made one. Each of these motors is so arranged to operate one fan for driving air over the pipes to be cooled, and also for operating a pump for the circulation of the brine. In this case also by the use of the friction clutch, either motor can operate one or both shafts and pumps. Each of these two fifteen h.p. motors is also used to operate a freight hoist and can be used interchangeably.

The current for driving this plant will be supplied by the Montgomery Electric Power Company from their two phase S.K.C. generating plant at Montgomery Falls, fully ten miles distant from the Quebec Storage Company's warehouse and refrigerating plant, and, as above noted, supersedes a steam plant, which has been in operation for the last few years, as they had found that the operation of the plant would be much more satisfactory and more economical by electric than by steam power.

The entire electrical plant is to be in operation by the first day of May next. The S.K.C. two phase motors, as well as the auxiliary apparatus necessary thereto,

are being supplied by the Royal Electric Company, of Montreal.

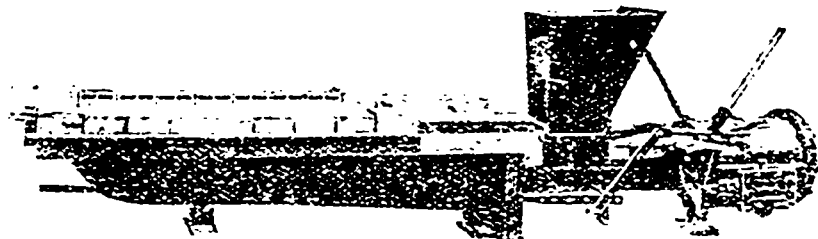
The Toronto Tire Company, Toronto, Ont., has been incorporated with a capital stock of \$50,000.

Attention is called to the adv. in another column of Messrs. Thos. Broadbent & Sons, Ltd., Central Iron Works, Huddersfield, England. This firm manufacture the Broadbent's hydro-extractor. Among the advantages claimed by this machine over belt-driven hydro-extractors are the following. It can be run independently of the main engine so that a much smaller engine will suffice; it occupies less space than other machines of this kind; it requires no foundation, being suspended on links; it is less dangerous than belt-driven machines, there being no accessories to catch the clothing; it will attain full speed in one-half the time of any belt driven machine. The cost of operating is very light, simply requiring a 4-inch steam pipe for the smaller machines and a 1-inch pipe for the larger, for driving. They are made in all sizes from 30 in. to 60 in. diameter of basket, either of copper or galvanized steel, wired or perforated.

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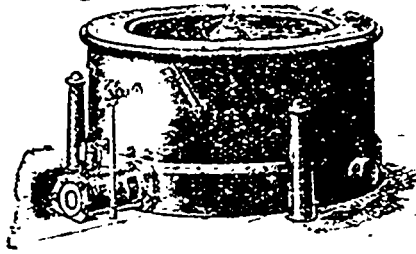
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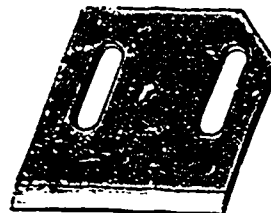
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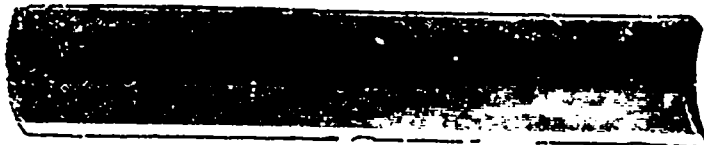
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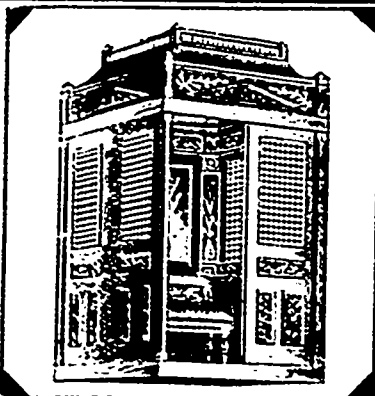
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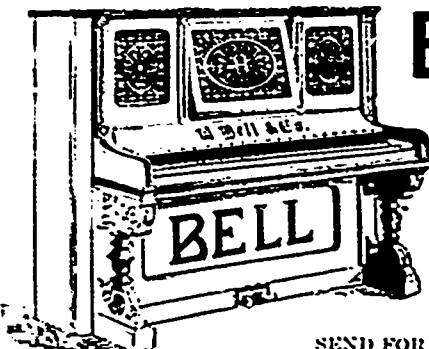
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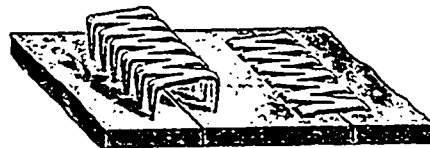
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