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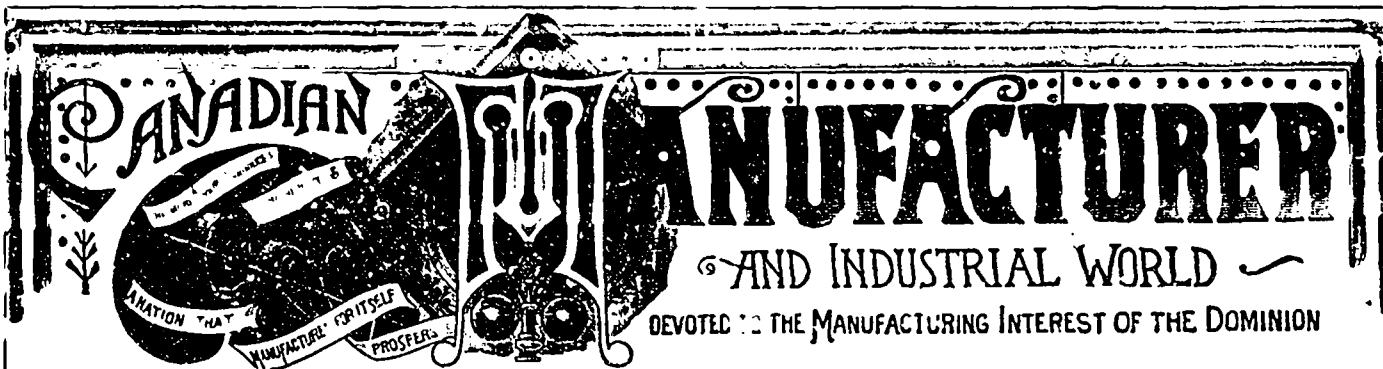
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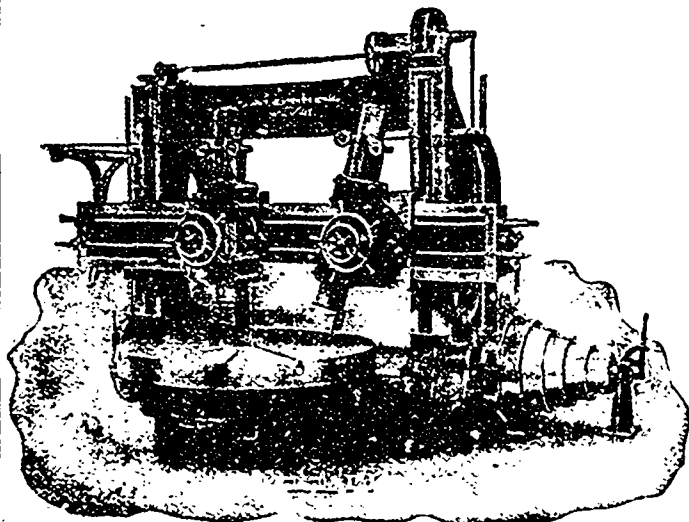
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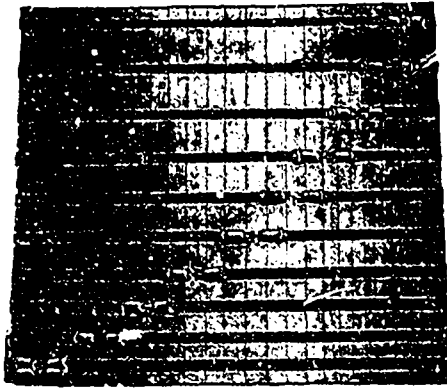
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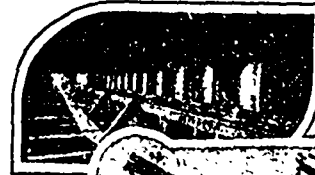
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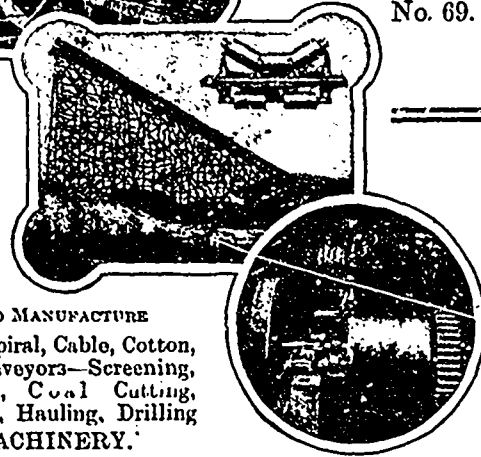
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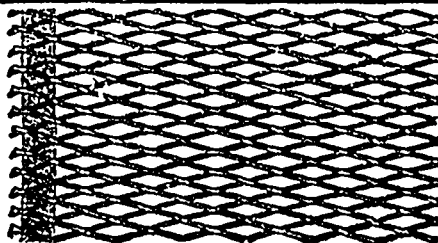
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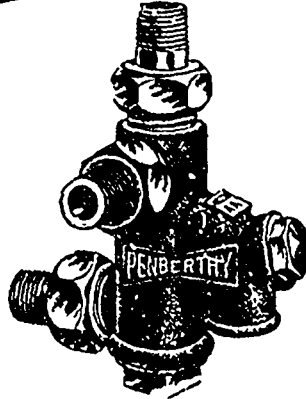
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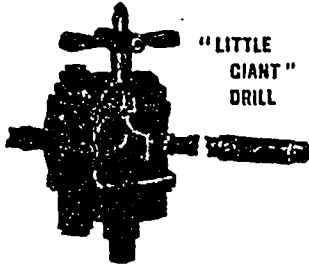
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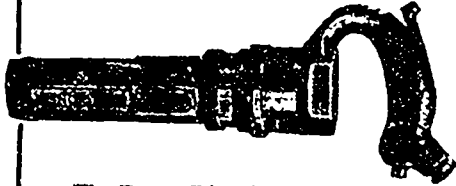
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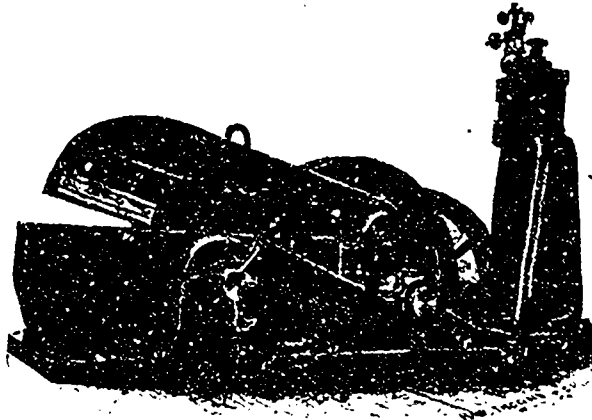
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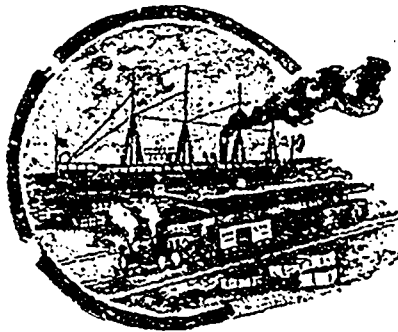
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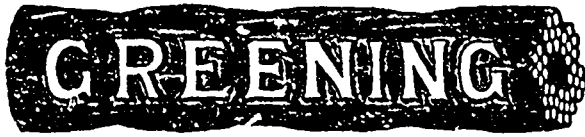
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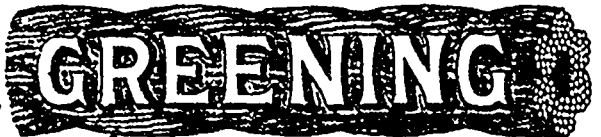
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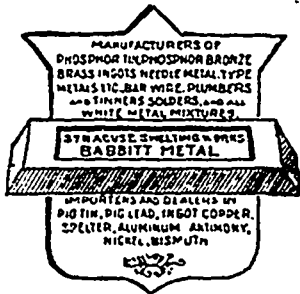
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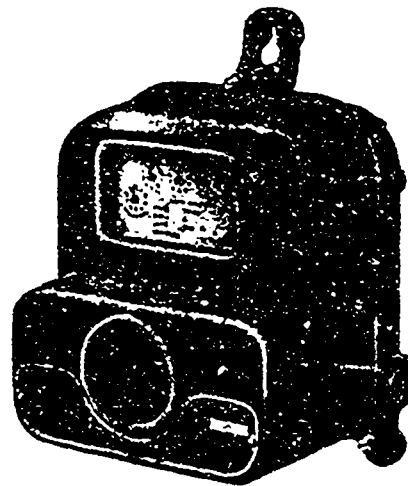
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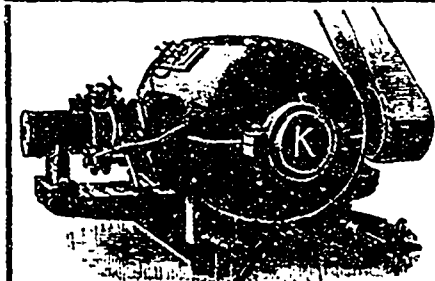
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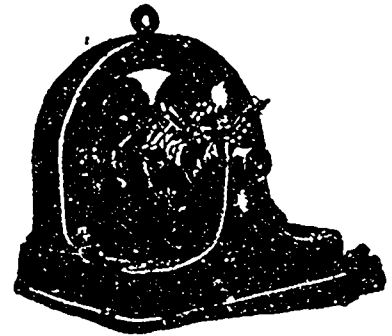
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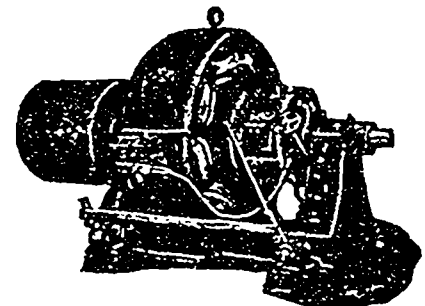
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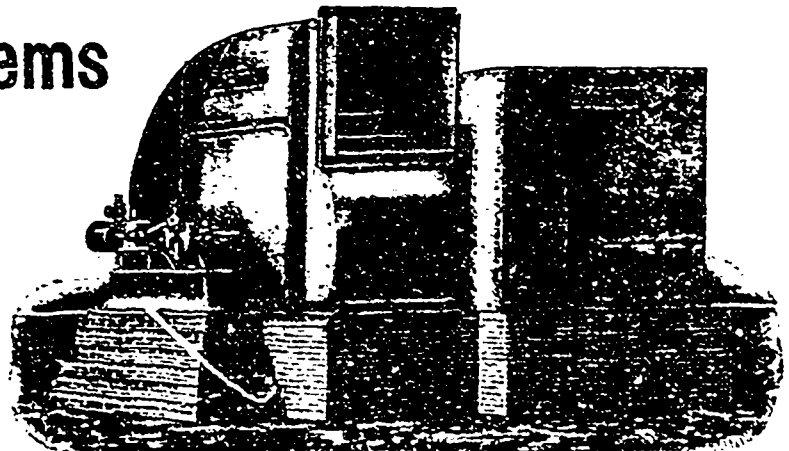
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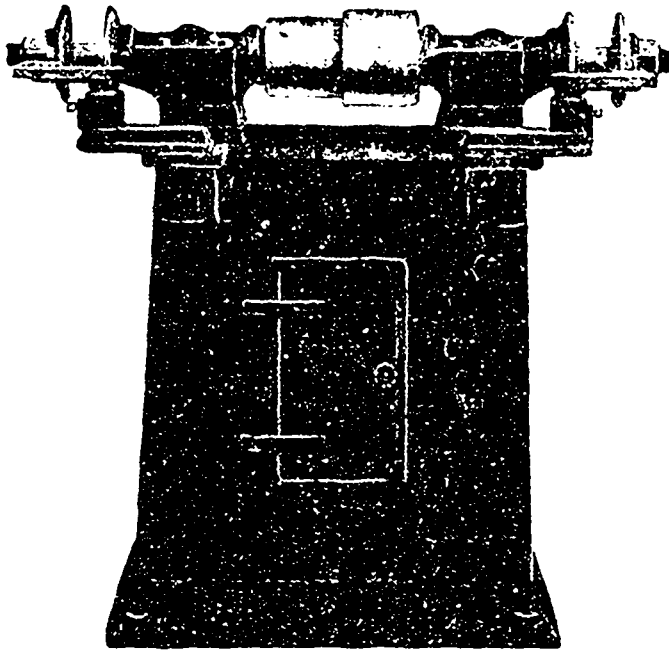
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ESTABLISHED IN 1890.

PUBLISHED ON THE FIRST AND THIRD FRIDAYS OF EACH MONTH

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J. J. CASSIDY, - - Editor and Manager.

Classified IndexPage 39
Index to AdvertisersPage 46**THE CANADIAN MANUFACTURER**

Reaches all the Blast Furnaces, Iron and Steel Works, Rolling Mills, Manufacturers of Iron and Wood-Working Machinery, Steam Engines and Boilers, Pumping and Mining Machinery, Electric Machinery, Textile, Pulp and Paper Mill Machinery, Water Power Plants, Cement, Sewer Pipe and Terra Cotta Works, Dealers in Steam Fitters' and Plumbers' Supplies, and all Hardware Merchants in Canada.

CUI BONO.

It may be that the Canadian Manufacturers' Association, as such, is agreed as to what it wants in the way of tariff changes, both as relating to reciprocity in tariffs with the United States, and also to an elevation of the schedules of the general tariff so that when a heavy discount is allowed upon British imports the net duty will afford sufficient tariff protection to Canadian industries. Speaking of American competition Mr. Drummond, the president says:—"We must adopt the same measures as our rivals, and in adopting such measures must make them thoroughly efficient;" and Mr. McNaught, chairman of the tariff committee of the Association, says:—"Our average tariff now is only equal to about one-half the average of the American tariff, whereas it ought to be equal."

In the opinion of many members of the Association, and of non-members also, it is now in order for the Association to show why Canada should adopt the same methods of conducting business as prevails in the United States; and why, because the Canadian tariff is only equal to about one-half the average of the American tariff, it should be made equal thereto. It is well known to the Association that a strenuous movement is now being made in the United States looking to a reciprocal removal of some of the barriers which for many years have obstructed trade between that country and this—not as regards all articles of commerce, it is true, but an important portion of them. Is it desirable, from the Canadian standpoint, that such a condition should eventuate? If yes, then why should the efforts of our American friends be antagonized and thwarted? According to the evidence of many influential members of the Association, and which is an admitted fact, it is impossible for Canadian manufacturers to supply the demands of the country for just such goods as they produce. Notwithstanding our tariff preference, Great Britain is really not able to supply us with many of these lines, particularly manufactures of iron and steel, nor is any other country in the world outside the United States; and yet we find it to be the sentiment and policy of the Association to bar out such articles because the United States observes a higher tariff than we do. In exemplification of this condition, showing first the demand of such articles in Canada, second, the inability of Canadian manufacturers to supply them; third, the failure of Great Britain to compete for the trade, and, fourth, the ability and willingness of the

United States to do so, in previous issues of this journal we have enumerated a selected list of eighty-four dutiable manufactures of iron and steel imported into Canada in 1902, valued at more than \$23,500,000, more than 75 per cent. of which came from the United States, while Great Britain supplied less than 13 per cent. The Association very naturally feel considerable anxiety for the general welfare of the country; but it seems to overlook the fact that these imports of machines, machinery, apparatus and appliances, bought so largely in the United States, were absolutely necessary and essential in producing and keeping up the general welfare of the country so much to be desired. The Association and many of its most influential members have repeatedly expressed satisfaction that the tariff was fairly satisfactory in protecting Canadian industries; and it is an accepted fact that many of our varied industries are enjoying an unexampled season of prosperity—a prosperity which calls for large imports of goods which we have not the capacity to produce at home; and it is now proposed to interfere with it by restricting the ability of consumers to supply their wants.

TARIFF REVISION.

The most notable feature of the speeches delivered at the banquet of the Canadian Manufacturers' Association in Toronto, on November 19, was the declaration of principles and programme of the Association made by Mr. George E. Drummond, the president.

Speaking of how and where Canadian products can be disposed of to best advantage, Mr. Drummond said: "The two great, and practically only markets available for Canadian products are, first, the home market, and, second, Great Britain. From the markets of all other great industrial nations we are shut out by the existing systems of prohibitive tariffs, under which their native enterprises have so prospered that to-day their surplus products for export must be reckoned with seriously and at once, if we are to preserve our market, our national prosperity, and, indeed our national existence. Our policy, therefore, must have a double purpose, namely to conserve, if possible, to the Canadian people, and in the case of the British market, to transfer orders for our surplus requirements to the producers of the Mother Country. Our first duty, unquestionably, is to our own people. With regard to the Mother Country, while in the opinion of this Associa-

tion our Customs tariff should primarily be framed for Canadian interests, it should, nevertheless, we think, give a substantial preference to the Mother Country, and also to any other part of the British Empire with which reciprocal preferential trade can be arranged, recognizing always that under any conditions our minimum tariff must afford adequate protection to all Canadian producers.

"We favor," said Mr. Drummond, "an immediate revision of our present Customs tariff, and the adoption of a general tariff, framed especially to meet Canadian conditions, based, in principle, upon and approximate to that now in force in the United States—a tariff that will protect Canadian industries and pursuits as efficiently as the tariff of the United States protects the industries of that country. We favor also a policy of reciprocal preferential trade within the British Empire whereby through readjustment of their respective fiscal systems, the United Kingdom and her colonies will each grant to the products of the other a substantial preference as against the products of foreign countries.

"We believe that to make our preference in favor of Great Britain of real value to her as against her foreign competitors, the base of Canada's general tariff must be raised sufficiently high to make the percentage form of preference really effective."

"Many signs point to the general election in Canada at an early date, and we therefore state our views once again so that there may not be any possible doubt as to the position which the Canadian Manufacturers' Association take in reference to the fiscal policy which is absolutely necessary for Canada."

According to Mr. Drummond the avowed policy of the Canadian Manufacturers' Association is the immediate revision of the tariff, based, in principle, upon that now in force in the United States, that will protect Canadian industries as efficiently as the tariff of the United States protects the industries of that country. In other words reciprocity of tariffs is the policy of the Association.

THE TARIFF PREFERENCE.

We favor an immediate revision of our present Customs tariff, and the adoption of a general tariff framed especially to meet Canadian conditions, based in principle upon and approximate to that now in force in the United States—a tariff that shall protect Canadian industries as efficiently as the tariff of the United States protects the industries of that country.

This is one of the declarations of policy of the Canadian Manufacturers' Association made at their banquet in Toronto last month. The Association is of the opinion that a revision of the tariff is necessary, and that it should approximate in character to the tariff of the United States.

We favor a policy of reciprocal preferential trade within the British Empire whereby through readjustment of their respective fiscal systems, the United Kingdom and her colonies will each grant to the products of the other a substantial preference as against the products of foreign countries.

To make our present preference of 33½ per cent. in favor of Great Britain of real value to her as against her foreign competitors, the base of our general tariff must be raised sufficiently high to make the percentage of preference really effective.

The adoption of a general tariff will not only have the effect of encouraging the development of Canadian resources, which would be in the best interests of the Empire, but would more effectively than now tend to divert to Great Britain our orders for surplus requirements.

We must, however, of necessity, provide that under any conditions the minimum tariff must afford a fair protection to Canadian producers, so that the high standard of wages

and living in Canada may be retained on a parity with the wages and living in the United States.

"Reciprocal preferential trade with Great Britain and such other British countries as may desire to come into the arrangement, all other countries being excluded therefrom, at the same time the preferential schedules of the tariff must be sufficiently high to afford adequate tariff protection to Canadian industries." This might be denominated a minimum tariff; and the tariff to be levied against imports from all non-British countries, including the United States, not necessary for protection, might be called the maximum or general tariff.

The question naturally presents itself why, except for sentimental reasons, Canada should extend tariff preferences to Great Britain and other countries under the British flag, and not to other countries with which we do business simply because they are not British, but foreign; and it might also be enquired why non-British countries should be discriminated against, except for retaliatory purposes?

If the schedules of the minimum tariff afford adequate protection to Canadian industries, why should there be a maximum tariff except for retaliatory purposes? Germany, France and some other countries maintain dual tariffs; and the Canadian offer to British countries other than Great Britain, provides that the preferential, or minimum tariff may apply where the tariffs of such countries are, in a general way, as favorable to Canada as our tariff is to them. Why not, then, make this offer apply to all countries? Germany applies her maximum tariff to Canadian products because Canada discriminates in favor of Great Britain; and Canada retaliates against Germany by the imposition of a sur-tax on German imports. The arrangement seems to work very well, then why should not Canada adopt a general dual system of tariffs applicable to all countries. Under such a system it would not be necessary to enact laws of a retaliatory character aimed directly against the United States; and it would be entirely for that country to decide under which tariff her imports should obtain admission to Canada. Such tariffs would be automatic, and the tendency would be to equalize and simplify all the conditions of trade.

THE BALANCE OF POWER.

Referring to a report in a Toronto paper that Mr. Drummond, president of the Canadian Manufacturers' Association had laid down the platform upon which the Association would face the people at the next Dominion election, Mr. McNaught, chairman of the tariff committee was asked what part the Association intended to play in the elections, to which he replied.—"No part whatever as a political organization. The Association is out of politics. Its members belong to both parties, and the Association will not connect itself with either party. What we purpose to do is to endeavor to pledge every candidate in the next election to the support of protection. This will be done openly, and the result in each riding publicly announced. When both candidates pledge themselves in support of our policy, the members of the Association in that riding can use their discretion as to which candidate they will vote for. Where only one candidate pledges himself, the members can still exercise their discretion. In no case will the Association do anything in an active manner to influence any one."

Mr. McNaught further stated that not a dollar of the Association's campaign fund would be used for election purposes—that this fund was being expended to promote the sentiment in favor of "Made-in-Canada" goods, as well as the cause of

protection by the dissemination of literature throughout the country, particularly the agricultural classes in North-West Canada. The results of this campaign so far, he said, had been very satisfactory, showing the growth of a strong protectionist sentiment in Canada.

While emphasizing the point that the Association was not a political organization, Mr. McNaught also wished to correct the misconception that might arise from the report that Mr. Drummond wanted the American tariff for Canada. "We do not want the American tariff," he said, "and Mr. Drummond did not convey that meaning. The American tariff might not be suitable for Canada. We want a tariff framed to suit Canadian interests, which will protect them as effectively as the American tariff. Our average tariff now is only equal to about one-half the average of the American tariff, whereas it ought to be equal."

A RIDICULOUS PROPOSITION.

The Mail and Empire, discussing the tariff propositions of the Canadian Manufacturers' Association, says:

Canada's market for manufactured products is of great and expanding capacity. To keep it filled, scores of thousands of hands, maintaining hundreds of thousands of other consumers dependent on them are continuously at work. Of the many millions of dollars distributed in wages for this work, a very large proportion goes to the United States. For this Canada gets no equivalent. Our neighbors are sending us goods to the value of \$125,000,000 a year and are buying from us only about half as much. They have lately redoubled their enterprise here, and their "slaughtered" goods are displacing more and more of the products of Canadian labor. To give United States manufacturers a market here for about \$60,000,000 of their annual output is to lay out that buying power to the utmost disadvantage. As our neighbors give us nothing for it, it should be taken from them. By raising our tariff to a level with their own we can close their manufacturers largely out of this market. The demand they served can then be disposed of in a way to further our interests, not theirs. We can turn it all into the hands of our own manufacturers, or we can exchange some of it for a British preference in favor of our foodstuffs. The latter arrangement would be the better, for it would make the United States' loss the direct gain of both our manufacturing and farming industries. If we take from the United States a market for, say \$40,000,000 worth of manufactured goods, the preference to Britain might be so gauged as to give her one-third of the amount.

To say that it is not possible to give both Canadian and British manufacturing interests greater advantages than they now have in this market is to imply that we either must not or cannot dispossess the American manufacturers from the large trade they hold here and for which we get nothing in return. We can exclude their goods exactly as they exclude so many million dollars' worth of our staples, namely, by establishing a tariff as high as theirs. When we have thus fenced in our own we can apportion it to our home industries and to those of Great Britain, the latter reciprocating.

The article abounds in false statements and wrong conclusions. Canada most certainly gets an equivalent for the merchandise she purchases from the United States, dollar for dollar, else there would be no purchases of American goods. If we did not want the goods we would not have purchased them; nor would we have purchased American goods could we have obtained them from Canadian manufacturers—goods "Made in Canada." If our neighbors are selling us goods to the value of \$125,000,000 a year, it is because we want them; and if they are buying from us only about half as much it is because they do not want more. What would Canadian wheat fields produce without agricultural machinery; and if our manufacturers are unable to meet the demand for it, would it not be better to buy American machinery than to let the fields lie idle?

Our wise contemporary thinks that because our neighbors supply our wants, the Canadian market "should be taken from them." Why should they not sell us their goods if we desire to purchase them? Why should our market be taken from them? How does the Mail and Empire propose to do it? It tells us it is to be done "by raising our tariff to a level with their own, thus driving their manufactures out of this market." Very sensible indeed, to increase the cost of production in Canada by increasing the duty on articles that we need and must have, although our manufacturers cannot supply them.

It is a brilliant idea, too, to suggest that after having driven American goods out of the Canadian market, we can turn the demand for them into the hands of our own manufacturers, who cannot supply them, or exchange some of the trade for a preference in the British market, unmindful of the fact that our imports of agricultural implements from Great Britain do not amount to enough in any one year to cultivate a row of beans.

We are told that we can exclude American goods, which we do want, exactly as the United States excludes Canadian goods, which they do not want, by establishing a tariff as high as theirs. In other words the United States does some thing which we do not want it to do, and to spite it we are to do just as that country does, to our own great disadvantage. A wonderful and original proposition.

MINERAL FUEL.

The imports of mineral fuel into Canada, in the fiscal year ending June 30, 1903 and the value thereof, were as follows:

	Tons.	Value.
Bituminous and slack.....	3,862,295	\$8,197,034
Anthracite and slack.....	1,456,713	7,028,664
Coke.....	256,723	1,222,756
Totals.....	5,575,731	\$16,448,454

These imports were the output of mines chiefly in the states of West Virginia, Pennsylvania, Ohio, Indiana, and Illinois. The imports from all other countries, chiefly Great Britain were as follows:

	Tons.	Value.
Bituminous and slack.....	69,779	\$220,884
Anthracite and slack.....	62,038	345,015
Coke.....	15,638	70,469
Totals.....	147,455	\$636,368

The duty upon bituminous coal is 53 cents per ton of 2,000 pounds and upon bituminous slack 20 per cent. but not to exceed 13 cents per ton. No duty is imposed upon either anthracite or coke.

Substantially all of the bituminous coal and slack imported into Canada from the United States finds entrance through ports in Ontario, in which province it finds its greatest consumption, the supply for Manitoba reaching them through Port Arthur. And this is true also regarding anthracite and coke, there being a much smaller demand in Montreal. The demand for mineral fuel in the province of Quebec is supplied almost entirely from Nova Scotia mines; and that for the mountainous sections of the Far West and of British Columbia from the mines in that province. Ontario is the largest consumer of mineral fuel, but is not a producer.

Canada, however, is an exporter of bituminous coal, our exports in 1903 being as under:

	Tons.	Value.
Great Britain.....	25,335	\$92,119
United States.....	1,719,027	4,640,064
Newfoundland.....	126,169	330,054
Other countries.....	109,420	390,197
Totals.....	1,979,951	\$5,452,434

These exports were almost entirely the output of Nova Scotia mines, 83 per cent. of which were to the New England states for consumption in industrial establishments there, and upon which, at present, no United States duty is imposed.

WHICH?

Perhaps the most important questions now being forced upon the attention of Canadians are; tariff revision, as advocated by the Canadian Manufacturers' Association, where, as it is declared, the entire schedules should be revised; a tariff of a distinctly retaliatory character against imports from the United States, the idea being to make the tariff of Canada impose as high duties against United States products as the United States tariff imposes upon Canadian products; a tariff granting an increased and enlarged preference in favor of British products, and the renewal of a reciprocal trade arrangement with the United States by which no duty would be imposed by one country upon imports of natural products produced in the other. All these propositions are now before the voters of Canada, and deserve the most careful and intelligent consideration.

It is true that at the Halifax meeting of the Manufacturers' Association a strong demand was made for an entire revision of the tariff, which, later, was reiterated at the Toronto meeting. It is the opinion of many of the members that that demand was of a perfunctory character, seeing that many of them are well satisfied with the schedules which affect their several industries, and who would not be in accord with any movement that would disturb them. It is conceded that in certain industries some important tariff changes are imperatively required, particularly in some of the primary forms of iron and steel, and in certain lines of textile fabrics; and the impression prevails that the Government are quite willing to accede to such demands; but it is quite evident that a large element of the Association would strenuously object to any general revision of the tariff.

It cannot be conceived that any intelligent element of the Association, or of manufacturers who are not members of it, and there are a great many such, nor of thinking people generally, favor the idea that because the United States tariff works, as many believe, to the injury of Canada, we should adopt a retaliatory policy and do wrong simply because wrong is done us by another country. Were such a policy adopted it would result in untold evil to us; and the efforts of the scatterbrains should be discountenanced.

It is a question as yet undecided as to the benefit that would accrue to Canada from the extension or even the continuance of the British preference. We have seen that the preference which now prevails has worked the almost ruination of a most important Canadian industry; and it is for Canada to decide if it is in our interest to have the looms in our woolen mills thrown into idleness to the end that British looms may be kept in operation. The argument of the Manufacturers' Association is that the tariff, even under the preference, should be high enough to afford adequate protection to the Canadian woolen industry, which would, of course make it substantially prohibitive, a feature that we complain of in the United States tariff, which creates a desire on the part of some for retaliation. This tariff preference is certainly objectionable because of the harm it does; but another feature of it lies in the fact that it is of no benefit whatever to another and even more important British industry—the manufacture of articles of iron and steel.

It has heretofore been shown in these pages that in 1902, in a selected list of eighty-four dutiable manufactures of iron

and steel imported into Canada, valued at \$23,528,516, more than 75 per cent. came from the United States and less than 13 per cent. from Great Britain. One-third the duty upon these British goods was remitted, and yet, notwithstanding this preference over American goods, it did not serve to increase the exploitations of British goods in the Canadian market. In examining this list it will be found that of such articles as butts and hinges, cut tacks, locomotive engines, fire extinguisher apparatus, typewriting machines, wood screws, manufactures of aluminum, etc., including twenty-two articles, the imports of which, from Great Britain, in no instance amounted to as much as one thousand dollars, and the aggregate value of all of them to only \$6,886, the aggregate value of the identical lines from the United States amounted to \$1,854,430. On the same principle as that proposed by the Manufacturers' Association of increasing the tariff before the preference is granted, it might be suggested that in all instances where the imports from Great Britain do not in any one instance amount to more than one thousand dollars, or five thousand dollars, such articles be allowed to come in duty free.

We cannot be unmindful of the fact that at this time very determined efforts are being made in the United States to bring about a substantial renewal of the conditions which prevailed under the 1854 convention by which no duty was imposed in either country upon imports of natural products of the other. After the abrogation of that convention in 1866 Canada sought long and struggled hard to obtain a renewal of it, unhappily without success; and now we find the United States in a willing mood to restore that status. Is Canada willing to accept it? Is commercial peace or hostilities to prevail between us and our nearest neighbor?

EDITORIAL NOTES.

In the United States House of Representatives, a few days ago, Mr. Williams, a member from Mississippi, and leader of the Democratic minority, protested against the inactivity of the House, particularly the pending resolution relating to reciprocity with Canada, to which Mr. Payne, a member from New York, said that the Republicans would not care to take up the question of tariff revision and disturb existing conditions on the eve of a presidential campaign, and that the time was not opportune to consider the reciprocity question. If that element of the Republican party which is striving for closer trade relations with Canada—and it is a strong and influential element—should suggest a possible coalition with the Democrats on that subject, it would be amusing to observe the agility of Mr. Payne and the ultra protectionists in changing their mind in that matter. They would much rather prefer doing the tariff revision and reciprocity business themselves, bitter though the pill would be, than allow the Democrats to do the job.

At the recent convention at Leamington, Ont., of the Ontario Fruit Growers' Association, a resolution was passed urging the Dominion Government to extend to the canning industry of the country the same system of aid already extended to other industries, by enabling them to bring in their raw materials at the lowest possible cost, and that to this end the duty on sugar used in canning, and on packages used for holding canned fruit be remitted. If this means that the duty on imported sugar and packages consumed in the preparation of fruits for export is requested, the canners should know that there is already a law to that effect. But of course such concessions could not be made in favor of goods intended for home consumption.

The meeting of the Ontario Jockey Club, which lasted from September 26 to October 3, in the city of Toronto, has called forth fresh comment upon the gambling evil as it exists in our midst. Gambling at the gaming-table is stamped by the laws of Canada as the work of thieves and not of men. According to our Criminal Code, it is an indictable offence, rendering the offender liable to one year's imprisonment and to a fine of \$1,000. Yet with startling inconsistency subsection 2 of the section setting forth this enactment makes an exception in the case of bets made on the race-course of an incorporated association during the actual progress of a race meeting. Thus the race-course gambler rests secure in the protection of the law. This is Canada's gambling school. Surely in an hour when we speak so proudly of laying "broad and deep the foundations of empire" we might look for more consistency in the legislation on which we are building.—Onward.

The mass of Canadians, notwithstanding the irritation of the moment, cherish the ideal of Imperial unity. They are not aiming at Independence. They have no thought of union with the United States. But if they should come to feel that they are weaker rather than stronger in negotiations with the United States because of the connection with the Mother Country; that the favor of Washington counts for more at Westminster than the honor and interest of Canada, and that the fair maintenance of a reasonable Canadian contention is distasteful to the Foreign Office, the results may be serious and far-reaching. For the moment, the attitude of Lord Alverstone and the utterances of some of the London journals, do not make for Imperial solidarity. It is by no means clear that we suffered material losses under the award, but it does seem that in the final steps of the negotiation Lord Alverstone considered the United States rather than Canada, and whether through sheer bungling or deliberate perversity aroused the strong resentment of the Commissioners from this country. It is, therefore, in the interest of all concerned that we should have from Lord Alverstone a frank and full explanation of his conduct, and a clear statement of the particular differences which led to such serious misunderstanding between himself and his colleagues from Canada.—Toronto News.

The American Iron and Steel Association has collected statistics showing the growth of the Canadian production of iron and steel within recent years. Beginning with 1895, the Association's figures show the following production:

	Pig Iron.	Steel Ingots.	Rolled iron and steel.
1895..... tons	37,829	17,000	66,402
1896..... "	60,030	16,000	75,043
1897..... "	53,796	18,400	77,021
1898..... "	68,755	21,540	90,303
1899..... "	94,077	22,000	110,642
1900..... "	86,000	23,577	100,690
1901..... "	244,976	26,084	112,007
1902..... "	319,557	182,037	161,485

For the present year a definite bounty of \$6 per ton on wire rods, \$3 per ton on structural shapes, \$3 per ton on plates and \$3 per ton on pig iron has stimulated production. The output is expected to greatly exceed that of last year.

We have heretofore alluded to the fact that a "Colonial Products Exhibition" of which Sir Alfred L. Jones is president, will be held in Liverpool, England, covering January 5, 6, 7 and 8. Canadian manufacturers and exporters of Canadian products should not lose this opportunity to make displays at this exhibition, for without doubt there will be a large attendance of buyers not only for the British market, but for the Continent also; and as it is expected that exhibits will be

made from South Africa, Australia, New Zealand and all other British colonies, the opportunity will be offered for visitors to become acquainted with Canadian products. Canadian exhibitors may be interested in the fact that Messrs. William B. Lewis & Co., Baltic Buildings, 9 Redcross street, Liverpool, a firm of general merchants of the highest respectability are prepared to give all information to enquirers, and to act as agents for exhibitors.

The first exposition designed to recognize motor boats as a maritime quantity will be held in New York next February. It will be known as the National Motor Boat Exposition and will be held under the direction of Mr. Robert Taylor in the Herald Square exhibition hall at the junction of Broadway and Thirty-four street, from February 8 to 20. The popularity of the motor boat, which may mean anything from a dory with a gasoline engine to a high-speed yacht, is attested by the fact that Mr. Taylor has a list of about 1,300 concerns which manufacture motor boats. The utility of the motor boat is unquestioned. Its economy commends it to the man of moderate means, and its adaptability to anyone who has anything to do with the water. It is a favorite method of locomotion on rivers and sheltered waters. Canada should be well represented at the exposition.

About \$15,000,000 of Canadian capital is invested in the Canadian woolen industry, and about 3,000 people are employed in the various factories. This includes the capital and workmen of the knitted and worsted goods factories. Yet this industry is in danger of extinction unless more protection is afforded. The difficulty is in the keen competition of the Scotch and English makers of woolen goods. Scotland is now turning out goods that serve as well for the Canadian market at a price much less than the Canadian manufacturers are able to turn them out, and they are knocking out the Canadian trade. These goods have a better finish to them than those made in Canada. They may not be just as good all through but they wear long enough for the customer, and that is all that is necessary. The English manufacturer has a start on the Canadian in many ways. Take for instance, in some of the big manufacturing districts, the waste products of one mill are the stock of another. This is passed on from mill to mill, and there is only the one freight bill against it. They have it manufactured and sent out here for about the price of the freight on the raw material to the Canadian manufacturer. Then again there is the item of labor. Labor commands a much higher price here, and there are troubles in sight. The only thing that will save the industry in Canada is more protection. Even with more protection the consumer will not have to bear the brunt, for the competition in Canada would be so keen that the surplus would be wiped off.

In the competition of the three great commercial nations of the day, Great Britain, United States and Germany, the latter has led the world in education, in industrial training and in economic industry. The United States, far surpassing all other countries in the area unvexed by customs restraints, and in the bounties of nature, with an enterprising and adventurous people, and with the stimulus of high wages to force the development of labor-saving machinery and cheap production, has naturally developed economically faster than any other nation. The commissioners sent to the United States by the London Times, or drawn there by their individual curiosity to study the causes of American success, have gone back to England and told the whole truth regarding the relative decline in British commerce. The British people have not the education of the Germans, they have not the alertness of the Americans, and her labor organizations, far more powerful than in the United States or Germany, have resisted the increase in quantity and the decrease in cost of production. At the same time the heads of her manufacturing concerns are largely the inheritors and not the creators of the business under their care: they have been rather timid about advancing, and too much disposed to rely upon the great achievements of their fathers and their grandfathers.

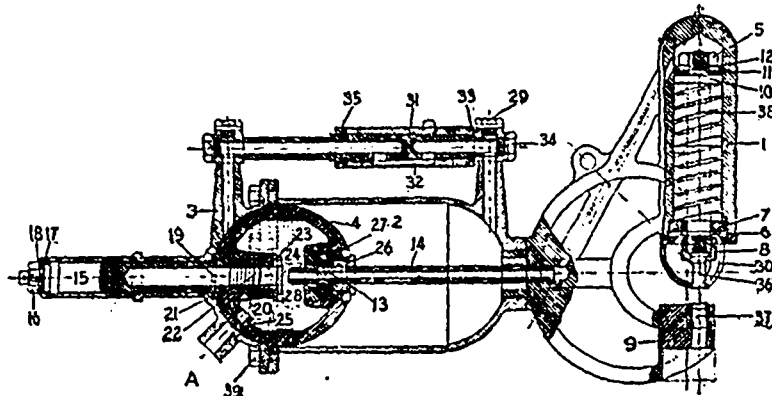
CASKEY PNEUMATIC PUNCH.

This device is another of the constantly increasing examples of the successful application of compressed air to practical uses. The first Caskey punch ever built, while of crude design and entirely different from the finished product on the market to-day, actually punched 90 per cent. of the holes in two torpedo boat destroyers. It was not until two years later

punch would pay for itself over and over in time and labor saved.

Portability, speed, accuracy, lightness of weight, and convenience, are but a few of the numerous advantages which it combines to a remarkable degree, and the fact has been demonstrated time and again that wherever it is cheaper to move the tool than the work—there the Caskey punch is invaluable.

Regarding the operation of the Caskey punch, the ball piston No. 4, carrying the tail rod or intensifier 15, is seen in



McCaskey Pneumatic Punch—Sectional View.

that these machines were placed on the market, and the interim was of course devoted to perfecting and improving them. This practice has been continued, until at the present day the Caskey punch stands, it is claimed, without an equal in its line.

The legitimate field in which it can be operated is, apparently, unlimited, but they are of particular value in the machine shop, and a glance at the illustration will undoubtedly bring to the mind of the engineer, foreman, or superintendent, numerous cases where a Caskey

extreme rearward position, the extremity of the stationary hollow rod, 14, being at the approximate centre of the ball piston. When the piston begins its stroke, impelled by the constant air pressure from A, the rod 14 telescopes into tail rod 15, at once sealing all communication between the tail rod and the interior of the piston proper.

As the piston and rods 14 and 15 are kept filled with oil, it will be apparent that the entire air pressure back of the piston is concentrated upon the column of oil contained in rod 14, and the pas-

sages leading to the punch ram chamber. Further, the volume of oil so moved at each stroke being just sufficient to depress the punch 36 the proper distance, as soon as hole is punched no further downward motion is possible. It will be clear that all jarring and undue strain on the parts are thus prevented, and a steady, yet positive action gained.

When the piston has completed its working stroke a slight turn of the valve 32, admits the air to the other end of the cylinder thus equalizing the air pressure on both sides of the piston; but the area of the stationary rod 14 being less than that of the tail rod 15, the ball piston is forced back in position for another stroke. A great saving in air consumption is effected by this arrangement, the same air being utilized to drive the piston in both directions.

Owing to the peculiar construction and arrangement of the ball piston and parts coacting therewith, it is impossible for any air to get into the high pressure passages, unless the oil level in piston is permitted to fall below the top of opening in the tail rod, when piston must be refilled at once. A great annoyance and drawback incident to the use of other hydro-pneumatic tools, is thus entirely eliminated.

The materials used are the best obtainable, no expense being spared to make each part as nearly perfect for its purpose as possible. A special alloy of aluminum is used wherever suitable, thus reducing weight to a minimum.

This machine has recently been placed on the market by the Chicago Pneumatic Tool Co., 1010 Fisher Building, Chicago, Ill., who invite correspondence regarding it; and they will have pleasure in sending illustrated catalogue containing complete description of it.

THE GRANBY SMELTER

Ore shipments from the Granby mines at Phoenix, B.C., are now being increased to the rate which is expected to be continued for months to come, namely, from 1,200 tons daily to 2,000 tons each 24 hours, and Canadian Pacific Railway officials are straining every effort to supply the dump cars and the motive power to handle this increased tonnage between the mines and the smelter. There are now six furnaces in blast at the company's smelter at Grand Forks, B.C., giving the works the maximum capacity of which they are capable until further contemplated enlargements are made—some time in the coming year. The mine equipment is fully capable now, with the two 30-drill air compressors and two steam shovels, of handling a daily tonnage up to 3,000 tons. At the smelter itself the improvements that have been made in the last few months have been many, so that the normal capacity, which has been to turn out blister copper at the rate of about a million pounds monthly, will be increased now to a capacity of close to a million and a half pounds monthly. Besides the slag hauling locomotives for taking off the hot slag from the four of the six furnaces, the new additions to the

smelter include the two new water jacket furnaces, manufactured, as were the others, by the Allis-Chalmers Co., Chicago, Ill. Three new Connellsville blowers have also been added, thus providing one blower for each new furnace, with one in reserve for emergencies. The flue dust chamber has also been enlarged by 250 feet. In the electrical department the additions comprise one 25 h.p. motor in the furnace room, for the purpose of operating the additional automatic furnace charging apparatus, of the type already in use at this smelter, and which were patented by the superintendent, A. B. W. Hodges; also three 100 h.p. motors to operate the blowers. The transformer capacity has been added to the extent of 1,100 h.p., affording a total of 1,700 h.p. transformer capacity. This is for use only for the power furnished by the Cascade Water, Power & Light Co., the Granby Company having 1,100 h.p. developed in its own powerhouse on the river bank below the smelter. With these improvements the Granby smelter is now undoubtedly, with its stand of two copper converters, the largest copper smelter in the Dominion of Canada. As there seems to be no trouble in regard to the supply of coke, it is expected that the smelter will be able to operate inde-

pendently to its fullest capacity, requiring some increases in the working forces at both mines and smelter, where now about 700 men are employed.

A NEW MACHINE CO.

The Niagara Falls Machine & Foundry Co., Niagara Falls, Ont., is one of the comparatively new industries of Canada, and one which has made remarkable progress during the past year or so. The company have a thoroughly equipped foundry and machine shop, and while they do all kinds of work along these lines, they have recently turned their attention to the manufacture of heavy hoisting engines, cranes and similar machinery. They have furnished nearly all the equipment of this kind required in the great work being done by the different power companies at Niagara Falls. Mr. O. D. Glasgow, a well-known business man, of Niagara Falls, is general manager of the company, and is largely responsible for the remarkable success of it.

A gas tank in St. Andrew's Sunday school building at Kippen, Ont., exploded, November 24, completely wrecking it. Loss about \$3,000.

NICKEL DEPOSITS OF ONTARIO.

For some time past the Government of Ontario have had under consideration the question of withdrawing from sale or lease all or part of the known nickel lands in the Province, and offering them to the Imperial Government to provide war material for the manufacture of armor plate and British guns. The Order-in-Council of November 11, withdrawing a belt of land ten miles wide on each side of the Temiskaming and Northern Ontario Railway, so as to reserve the minerals, especially the nickel ores, is the first step towards making possible British ownership of the nickel of Ontario which is now absolutely controlled by the International Nickel Trust, a corporation having its members and headquarters in the United States. The time has clearly arrived when the nickel of Ontario must no longer find its way into the iron walls of British battleships and guns through the medium of a foreign trust, who sell it at their own price without competition. It is conceivable that at a critical time when the Empire most required it, supplies of this necessary material might not be available.

The nickel supply of the world is at the present time derived from two sources. The most important is the Sudbury district of this Province; the other in New Caledonia, a French penal settlement or colony situated in the Southern Pacific Ocean, about four days' sail from Sydney, New South Wales. Consequently, amongst the great powers, France and Great Britain are at present the only ones possessing nickel to any appreciable extent for use in their respective armaments, and in modern armaments nickel is now indispensable, and increasingly so. There is reason to believe that if the British Imperial authorities fall in with Canada's desire to conserve the nickel of Ontario for Imperial uses, France will at once take similar steps in regard to the nickel supply from New Caledonia.

If France and Great Britain act on similar lines in regard to the nickel supply in their territories respectively, it would have the effect of putting the United States International Nickel Trust out of business except on less favored terms than the British or French producer. For Great Britain it would be quite unnecessary for its Government to go into the mining and manufacture of nickel in Ontario. All that will be necessary would be for the British Admiralty and War Office, in making any contracts, to stipulate in the specifications that nickel used under the contracts must be of British origin and entirely of British production, provided it could be obtained at certain specified rates. One of the managing directors of Krupps, the celebrated German gun manufacturers, is credited with the statement that "there was no limit to the extent to which nickel could be used, if the consumer could get it at about half the present price," the wholesale price then being probably about forty cents per pound. An American metallurgist of high scientific attainments, and also a practical smelter, laughed on having repeated to him the foregoing remark. With a thorough

When writing to

knowledge of the Sudbury nickel belt he gave it as his positive opinion that nickel could be mined, smelted, refined and put on the market for twenty cents a pound, out of which there would be about ten cents a pound profit to the producer, provided the volume of trade were large enough.

This offer of Ontario nickel to the Imperial Government for naval and military uses, as the Toronto News observes, is not a new thing, as such an offer was made in 1891, when Lord Knutsford was Secretary of State for the Colonies. That was before the era of Imperialism that set in at the Colonial Office with the advent of Mr. Chamberlain. The offer made then was civilly declined, probably with but scant consideration. A renewal of the offer to-day will receive far different consideration from the leaders of an Administration that, especially at the present time, is most anxious to cultivate Canadian sympathy and support. Of course, Ontario, as a Province, cannot make an offer to the Imperial Government direct, but must transmit it through the Secretary of State of the Dominion Government. That was done in the case of the 1891 offer, but as the matter was one of great urgency, the then Attorney-General of the Province, the late Sir Oliver Mowat, addressed a letter to the Colonial Secretary, Lord Knutsford, direct, telling him of the despatch that would reach him through the Dominion Government and the Governor-General, and asking that a confidential cable reply be sent giving some indication as to the views of the Imperial Government on the proposition suggested. The Order-in-Council of April 7, 1891, adopted a lengthy report from the Commissioner of Crown Lands, Hon. Arthur S. Hardy, to the Lieutenant-Governor-in-Council, and ordered its transmission to the Imperial Government. There have been many changes in the nickel situation since Mr. Hardy's report was made in 1891, but some of it may be usefully re-printed at the present time.

Mr. Hardy begins his report by calling attention to the fact that "already numerous locations have been acquired from the Province by mining corporations and private individuals, and some progress has been made in development." Incidentally, Mr. Hardy gives the credit for first publicly calling attention to the value of nickel when alloyed with iron and steel, to Mr. James Riley, manager of the Glasgow Steel Works, who read a paper on the subject at a meeting of the Iron and Steel Institute in May, 1889. After referring to various tests and to the interest taken by Germany, France and the United States in the new alloy as material for the military engineer, the report states:

The superiority of nickel steel armor plate over the Cornwall armor plate was so clearly demonstrated at the tests made under the direction of the United States Secretary of the Navy six months ago, that Congress has unhesitatingly transferred nickel to the free list, besides placing \$1,000,000 at the disposal of the Navy Department to purchase a supply of the metal to be used in the manufacture of armor plates for the new battleships now in course of construction. The whole

of the nickel ore required for this purpose has been supplied by the Ontario mines, and the result of experiments already made would appear to justify the expectation that the demand will increase and continue.

In view, therefore, of the important national uses to which nickel is being applied by foreign governments, and of the consequent demand for mining locations here, it has occurred to the undersigned that an arrangement might be made under which the government of the United Kingdom should acquire a substantial, possibly a controlling interest, in the nickel deposits of this province.

After stating that the area over which the nickel ore had been found up to 1891 was seventy miles in length and fifty in breadth, and within this limit, known as the "Sudbury district," the Province had sold about 135,000 acres, Mr. Hardy says:

Should the Imperial Government be inclined to entertain a proposition for negotiations, evidence may be furnished of the existence of nickel-bearing ore in economic quantities throughout the district referred to, from scientific surveys and the reports of explorers, with a view to entering into arrangements (with the assent of the Legislature) for granting to the Imperial Government conjointly with the Province, or in such other manner as may be agreed upon, control over part or all of the nickel ore in the Crown Lands of the district, subject to such arrangements for the establishment in Ontario of nickel-steel works or manufactures, the development of the mines, and considerations of royalty on the ore, as may be mutually agreed upon, and as shall be approved by the Legislature.

It is part of the scheme of the government that the iron ores of the Province, of which there are large deposits within easy reach of railway transport, should be utilized with the nickel ore in the production of nickel-steel; and for this purpose a sufficient quantity of iron lands belonging to the Province could be set apart and held by the two Governments, subject to the same arrangements as might be agreed to respecting the nickel lands, and with a like provision for payment to the Province of royalty upon the ores.

As a colony of Great Britain and a portion of the British Empire, our Province is concerned in all things which contribute to the greatness and stability of the parent State; and recognizing especially how much depends on the maintenance of her historic position as a naval power, it would be agreeable to our people that the legislature should further in any way consistent with its obligations to the Province, and the people of the Province, the means whereby that position may be most effectually safeguarded and preserved.

The British Government took some considerable time to consider the matter and then came a despatch from Lord Knutsford to Lord Stanley of Preston, then Governor-General. The despatch enclosed a letter from the Admiralty, which, omitting the formal parts, was as follows:

I am to acquaint you for the informa-

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tion of the Secretary of State for the Colonies that my Lords have most carefully considered the representation conveyed to them, and while they much appreciate the courtesy and consideration of the Ontario Government in inviting their attention to the vast resources of the nickel mines of Sudbury, they have arrived at the conclusion that it would be inexpedient to apply to Parliament for powers to acquire the controlling interest suggested in these nickel mines.

As far as can be ascertained, and judging from the great extent of the area in Canada over which nickel is found, it is not anticipated that any difficulty will arise in obtaining sufficient for the requirements of Her Majesty's service through the ordinary channels, and while desirous of thanking the Ontario Government for its friendly forethought and consideration, their Lordships consider that it will be preferable to leave the development of these mines to private enterprise, though my Lords have no doubt that the Government of Ontario will for some long period to come retain under its control some of the land in which these nickel ore deposits are to be found.

This was in 1891, and since that date the British navy and army have been paying at least double the amount that they need have done for all the nickel they have used, and this, too, to foreigners, upon whom to this day they are dependent for supplies. The International Nickel Trust, of which Mr. Chas. M. Schwab is said to be the moving spirit, has the British Government entirely at its mercy in regard to the price, production and supply of the most important metal used in the implements of modern warfare. This, too, when a great majority of the ore bodies from which the world's supply is derived are on Canadian soil, here in Ontario. At the Admiralty, War Office and Colonial Office in 1891 were "a race that knew not Joseph." Since Mr. Chamberlain began the colonial policy, which may be said to date from the Diamond Jubilee, in 1897, there has been a "shaking up of the dry bones" in the principal Departments of State in Great Britain, and if the Ontario Government again renews its offer it is likely to receive a different answer. Now, as in 1891, it will probably not suit the Imperial Government to go into business as direct producers of nickel, but there are British firms and companies willing enough to enter on the business provided they can do so without having to fight the International Nickel Trust for the British trade. In the past it has been the policy of the Canadian Copper Co., of Cleveland, Ohio, and the International Nickel Trust to buy off or to frighten off any competitor entering the Sudbury nickel belt, which they regard as strictly preserved for themselves.

In the Sudbury district since the start of the nickel industry there have been eight reduction plants either operated or arranged for. These are the Canadian Copper Co., Dominion Mineral Co., Vivian & Sons of Swansea, Wales, the Drury Nickel Co., which in 1896 became the Trill Mfg Co.; the Great Lake Copper Co., a Boston concern; the Consolidated Lake

Superior Co., of Sault Ste. Marie; the Mould Co., and the Nickel-Copper Co., of Hamilton, Ont. Of these the Canadian Copper Co. is the only one in operation, to any extent, and it is enormously increasing its capacity of production. It is drawing its ore principally from the Creighton mine, situated about eleven miles west of Sudbury on the Manitoulin and North Shore Railway, and pronounced by experts to be the greatest yet known nickel mine in the world. At the time of the recent financial collapse at Sault Ste. Marie, the nickel reduction works of the Consolidated Lake Superior Co., then under construction, were nearing completion. The buildings were erected and most of the plant was on the ground. They could be at work in a very short space of time, and provided that suitable ore were obtainable they have a capacity of dealing with 600 tons a day. This would be formidable competition for the International Nickel Trust, but so far as all-British production is concerned, the works at the "Soo" are, for the present, owned and operated by Americans, and the present plans are that in its final stage the nickel should be refined on the Michigan side of the St. Mary River. In the Sudbury nickel district there are, roughly speaking, about 47 well-defined deposits, and probably 130, all told, likely looking prospects. Of these perhaps 22 may be called mines, and 25 have been prospected with some degree of success.

The new ore discoveries, which have led to the preservation of a ten-mile strip on each side of the Temiskaming and Northern Ontario Railway, are possibly more important, if they turn out to be extensive, than any that have been found in the Sudbury belt or elsewhere in the Province. In the Sudbury ores 5 per cent. of nickel is reckoned rich, and the average is considerably less. The extraordinary value of 44 per cent. nickel which has been obtained from samples brought from the newly discovered ore bodies may be regarded as interesting from a cabinet specimen standpoint, but a great deal of exploratory work is necessary to ascertain the ore dimensions and their commercial possibilities. This work there are now plenty of British and Canadian capitalists willing and eager to undertake, provided the British Government will insist on it that the contractors for the War Office and the Admiralty use only nickel of British origin and production.

It is reported on apparently good authority that prominent members of the British Empire League have been drawing the attention of the Imperial and Provincial authorities to the present leakage of nickel into foreign channels. In this connection Inspector Carter of the Ontario Bureau of Mines called attention in a recent report to a newspaper statement that "a party has been secretly buying up all nickel properties and mines in the Sudbury region that have been available, and large sums have been spent. Nobody seems to know or to be able to guess who this party is, but it is supposed that developments of the greatest interest to the world, so far as the nickel industry and armor-plate making are concerned,

are about to be made or have been made." It is within the knowledge of the writer that the efforts of prominent Imperialists to conserve Ontario nickel for Imperial uses have not been unmarked by some of the business men who visited the Dominion during last summer. Realizing that the British Government would not operate nickel mines in Ontario directly, but under existing circumstances would be almost certain to arrange for a preference in Government contracts for nickel of British production, what is more natural than that some of these gentlemen should have secured bonds upon some of the proved and patented mines?

The recent sale of the Bruce mines for \$600,000 to the International Copper Co., which is a Charles M. Schwab property, says the Chicago Mining World, and the new name of the Canadian Copper Co., is important in considering the nickel situation. For some years the Bruce mines have been owned by Jewish financiers, well-known in connection with South African mining matters, in which they were among the largest and most successful operators. In disposing of the Bruce mines, which they acquired by accident, and had no desire to operate, it does not necessarily imply that these gentlemen, who were during the South African war amongst the largest contractors to the British Government, are to abandon other and more profitable mining in Ontario. From local information, it is well known that the superintendent at the Bruce mines, Mr. Lewis J. Abrahams, has during the past few months been steadily inspecting and reporting upon all the better-known nickel properties available for purchase, and in some instances arranging to bond them. Mr. Abrahams is, it is reported, to meet his principals in London before the close of the year. That they are financially able to carry through any mining enterprise they take up is scarcely open to question, and if the British Government show that they have become more enlightened than were their predecessors in 1891, there is every prospect that somewhere in the Sudbury district in the near future, a great hive of industry will grow up that in the mining history of the world will rank with Butte, Montana, and Pittsburg.

The Society of Naval Architects and Marine Engineers, the members of which are of the highest standing in their respective professions, held a meeting in the auditorium of the Society of Mechanical Engineers, in New York on November 19 and 20, when many important papers were read and discussed. One of them, by Mr. Albert Ladd Colby, on "Non-Corrosive Nickel Steel Boiler Tubes," exciting great interest, as showing the extended use of nickel for many purposes besides the manufacture of armor-plates. The United States Government, as is well known, is much interested in the nickel question, as is seen in the fact that the Society of Naval Architects and Marine Engineers is composed largely of naval officers and engineers in the service of that Government, some of the council of the society being Mr. Francis T. Bowles, late chief constructor of the United States Navy; Naval Constructor W. J. Baxter; Rear Admiral W. L. Capps, recently made chief con-

structor of the navy; Mr. D. H. Cox, assistant to Admiral Capps; Rear Admiral C. W. Rae; Rear Admiral Robley D. Evans; Naval Constructor J. H. Linnard; Captain W. H. Brownson, U.S.N.; and Mr. Frank E. Kirby, recently well known as having been connected with a Toronto shipbuilding works.

A report of the meeting states that when Mr. Colby, who is connected with the International Nickel Co., took up his paper, it was listened to with intense interest. It dealt with the successful manufacture in the United States, on a commercial basis, of a new boiler tube, practically non-corrosive, he said, and of much higher tensile strength than the tube now in use. The desirable properties are obtained, Mr. Colby stated, by introducing, during the manufacture of the steel, a large percentage of nickel. He exhibited at the meeting numerous samples of the tubes, 30 per cent. nickel, made by the well-known Shelby company. The tubes were first made in a commercial way in France, in 1898, and a little later on in Germany. Since then they have been under practical trial in the French, German and Dutch navies with gratifying results. Mr. Colby submitted with his paper results of a series of exhaustive tests of the tubes made by Mr. A. F. Yarrow of water-tube boiler fame in England. "The consensus of opinion abroad," he said, "is that these tubes will last at least two and one-third times longer than mild carbon steel tubes. The American tubes, having only just been successfully manufactured, have not yet been submitted to a practical trial for marine boilers. It is perfectly safe, however, to state that the American tube will have as long a life as the foreign tube, and probably a somewhat longer life, from the fact that the foreign tubes contain from 23 to 25 per cent. of nickel, whereas in the manufacture of the American tubes it was decided to use a 30 per cent. nickel steel, so as to still further increase the resistance of the tubes to corrosion. The American tubes have recently been put under trial in stationary boilers, locomotive boilers, automobile boilers, and in the very near future they will be given a practical trial by the navy, both for boilers and condensers, and possibly also for superheaters. The exhibits include 30 per cent. nickel steel tubes of American manufacture, varying from $\frac{3}{4}$ to 4 in. outside diameter, and of the usual range in gauges. They also include "bending" tests, and "expanding" and "flattening" tests, which show that they more than meet all the manipulating tests required by the navy bureau of steam engineering.

Among foreign samples in the exhibit is one of the ordinary carbon steel tubes, and it is interesting to compare the marked corrosion of this tube with the 25 per cent. French nickel steel tubes, which show no evidence whatever of having corroded. Increased cost is the only disadvantage with these tubes, but they are offered here at lower cost than is demanded by the French and German makers. Advantages of the high nickel steel tube are:

1. High tensile strength in comparison with that of mild carbon steel.
2. Entire absence of brittleness, as evi-

When writing to

denced by the severe manipulating tests which they will stand.

3. Higher elastic limit, which prevents leaks where the ends of the tubes pass through the flue-sheets. Expansion of the flue-sheets, when heated, compresses the tube at the point where it passes through the flue-sheet, and in the mild carbon steel tube, with its low elastic limit, this causes a permanent deformation, which results in leakage and necessitates expanding the tubes. High nickel steel, with its much higher elastic limit, resists this compression.

4. Resistance to corrosion, as proved conclusively by Mr. Yarrow's tests, which are before you.

5. Saving in weight made possible by the lighter gauges of the nickel steel tubes, which are perfectly safe owing to the increased tensile strength. There is a saving in weight in stationary boilers of over two tons in a boiler installation of 500 h.p. and no less than 8.6 tons in an installation of 2,000 h.p. In the case of the torpedo-boat destroyer Hopkins, which was taken as a standard, the adoption of a No. 14 gauge tube in place of the tube now in use of No. 11 gauge, makes a saving in weight of no less than 24,881 lbs., or 11.1 tons, and similarly in the battleships Rhode Island and New Jersey, the saving in weight amounts to 85,093 lbs., or no less than 38 tons.

It is unnecessary for me to call the attention of marine engineers to the importance of these figures; nor do I need to more than refer to the practical advantage of the use of a lighter gauge in the saving of fuel due to the extra steaming efficiency of a boiler equipped with lighter-gauged tubes.

The only disadvantage of these tubes is their cost, which per pound is about three times that of mild carbon steel tubes. The $1\frac{1}{4}$ -in. tubes used in torpedo-boat destroyers which now cost 15 cents a pound will if of nickel steel cost 45 cents a pound, and for the 2 and 4-in. tubes used in battleships, now costing 12 cents a pound, the price will be 35 cents a pound. This difference in cost is reduced in the first place by salvage that can be obtained in the sale of the nickel steel tubes when they are finally taken out of the boiler. Old tubes can be sold for 6.4 cents a pound. The costs per pound are furthermore not directly comparable, owing to the fact that less weight of the nickel steel tubes is purchased, on account of their lighter gauges, and when it is borne in mind that these tubes have a life of at least two and one-third times that of the mild carbon steel, the increased cost is really more than offset by the expenses incident to the more frequent re-tubing of the boiler when mild carbon steel tubes are used; this, to say nothing of the expense and annoyance of putting vessels more frequently out of commission for repair of boilers.

Col. R. M. Thompson in discussing Mr. Colby's paper, said that he did not think Mr. Colby had presented the saving of cost in as many ways as he might. He figured that battleships cost approximately \$500 per ton and that the saving of each ton of weight is \$500 saved. Nickel steel tubes being lighter than mild carbon steel, would result

in a saving of weight of 58 tons in a battleship, which is the practical equivalent of \$20,000. He believed that this amount should be deducted in order to fairly arrive at the extra cost of nickel steel. By the same reasoning a torpedo boat costs practically \$1,000 a ton and as nickel steel tubes would result in a saving of ten tons it virtually meant a saving of \$10,000, which should also be deducted in arriving at the actual cost of nickel steel. He said that the boilers of a vessel always caused the most trouble, taking the various parts of a vessel as a unit, and anything that tended to improve their efficiency should be encouraged.

Mr. E. E. Roberts asked whether nickel steel had a tendency to prevent the adhesion of oil or scale, but Mr. Colby gave no information on that score.

Mr. John Platt said that the question of wear was an important one, that some tubes gave out in twelve months, others in six and some lasted years; but that if nickel steel had a wearing life two and a half times greater than mild carbon steel, it was a highly important discovery.

Will cold bending affect nickel steel? asked Col. Stevens.

There is absolutely no deficiency in cold bending in nickel steel, replied Mr. Colby. It does not have as high a contraction of area as carbon steel. Moreover, if you plunge nickel steel red hot into water it will soften instead of harden—in other words it acts precisely the reverse of carbon steel under such conditions.

"JIM DUMPS."

The American Miller publishes a very handsome picture of the large mill in Hamilton, Ont. in which is manufactured the "Force" food consumed in Canada, and has the following to say about it.—

American manufacturers who desire to market their products in Canada find it desirable in many cases to establish branch plants there and thus avoid the Dominion tariff and the freight charges that would add greatly to the cost of the goods if made in this country and shipped to Canada. Among these is the "Force" Food Co., of Buffalo and Chicago, which has a large plant at Hamilton, Ont.

The mill is under the management of Albert J. Janraus, and, although the photograph of the plant has few of the ear-marks of a mill, is turning out "Force" in quantities sufficient to supply the Canadian trade.

The building is equipped with special machinery used in the preparation of this product. The wheat goes through an elaborate cleaning process, after which it is allowed to stand in vats of wort for four hours. It is then sent to the steam cookers where it is cooked for four or five hours. After being dried the grain is given a salt bath and put through the flaking rolls. From these it is sent to the toasting furnaces and thence to the packing floor where it is put into paper cartons by a large staff of girls. The selling end of the "Force" Food Co's business in Canada is in charge of Albert N. Reay.

Advertisers kindly mention THE CANADIAN MANUFACTURER.

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 Ontario Neckwear Co., Toronto, are considering the removal of their works to Brantford, Ont.

The Electrical Development Co., which is incorporated for the purpose of developing energy at Niagara Falls, Ont., for the Toronto & Niagara Power Co., and in which Messrs. Frederic Nicholls, Wm. Mackenzie and other Toronto capitalists are interested, have decided to erect one of the largest power houses on this continent. The building will be of solid granite, with many external decorations, will be 425 feet in length and fully 200 feet wide. The cost will exceed \$400,000, and plans and specifications are being prepared by Mr. E. J. Lennox, Toronto. Tenders will be called for immediately. A beautiful gallery will run round the top of the building, from which visitors can look down on the immense machinery plant in operation and also have a magnificent view of the Falls.

It is reported that the Canada Atlantic Railway Co. will construct a 12,000,000-bushel elevator at Depot Harbor, Ont.

The Dominion Government propose building grain elevators at Port Colborne, Ont., in connection with the extensive improvements now being made at the Lake Erie end of the Welland Canal.

Mr. Beaumont Jarvis, architect, Toronto, has prepared plans for a New York syndicate for a ten-story office building, to be erected here. The building will be almost entirely of concrete, either in mass or in block form. Four mixing machines will be used, and they will be operated by a 150 h.p. engine, which will also do all the hoisting required. In this method of construction the services of the usual army of skilled masons and bricklayers, with their attendants, will not be necessary, and Mr. Jarvis states that the cost of facings, for instance, instead of being about \$3 a foot, as in the case of stone, will not be more than 50 cents a foot. The concrete method has been used with success in the United States, and there is one building of fifteen stories in Cincinnati constructed with it. The dairy building at the Exhibition grounds was built of concrete, but, with that exception, the building which Mr. Jarvis has planned will be the first of the kind in Canada. The mixture is made of crushed white quartz and Portland cement pressed into metal moulds. The exterior will be elaborately

ornamented, and the floors will be of a marble mosaic concrete. The whole of the construction, such as beams, columns and girders, which are usually made of steel, will in this case be made of concrete, reinforced with steel, the steel simply used for increasing the tensile strength of the concrete. It is expected that by this method fully 25 per cent. of the cost of the building will be saved, and, in addition to that, the building will be fire-proof, and it will not be necessary to place any insurance upon it. The cost will be about \$500,000, and Mr. Jarvis states that there is ample New York money behind the project, and that the building will probably be erected within a block of The Globe office, the exact location being still under negotiation.

The Manning Arcade, Toronto, will be reconstructed and a three-storey addition will be added at a cost of about \$125,000.

The Rossin House, Toronto, will have extensive alterations and improvements made. A large rotunda will be included.

The main building of the Ottawa University, Ottawa, was destroyed by fire December 2. Loss about \$500,000. The building will be reconstructed at once.

The Corundum Refiners, Limited, Toronto, have been incorporated, and have obtained control of over 600 acres of corundum lands in Raglan township, Ont., where they will erect a large corundum reduction plant. Those interested are H. P. Cobourn, John H. Tilden, Hamilton, Ont.; J. H. Jewell, H. H. Dewart, K.C., Toronto, and P. Kirkegaard, who will be manager of the company.

The Marine & Fisheries Department, Ottawa, have been notified of the establishment of a factory on the north shore of the St. Lawrence, below Saguenay, to manufacture oil, glue and fertilizers out of Greenland sharks that have been infesting these waters of late. These monsters run from 300 to 600 pounds in weight, and 22 of them have been caught this past fall by fishermen who were on the lookout for other varieties of fish. The Fisheries Department thinks it as well that they should be destroyed as they are a menace to other fish and even to the fishermen themselves.

During the season of 1904, a large quantity of pulp wood will be shipped from Canada to Cape Vincent, N.Y.,

thence to various pulp mills in New York State. It is estimated that the amount will reach 100,000 cords.

The Allan Line Steamships, announce that the contract for the second of their large turbine-engined steamers has been let to Alex. Stephenson, of the Clyde. The first of the pair, to be called the Victorian, is now in course of building at Belfast. The machinery for the two vessels is to be of the turbine pattern, and the first ever constructed for trans-Atlantic trade will be made at the works of the Hon. Charles Parsons on the Tyne. The vessels will have a length of 540 feet, a breadth of 60 feet and a depth of 47½ feet. The first of these turbine steamships will probably be ready in August of next year, while the second one, which has just been let, is to be ready to be put into service in the spring of 1905.

The Barrie Carriage Co., Barrie, Ont., will erect a new factory building.

The Toronto, Hamilton & Buffalo Railway have made a proposition to build from Brantford, Ont., to Woodstock, Ont., provided sufficient inducements are offered by the municipalities.

The Canada Foundry Co's. tender for the reconstruction of the Glen Road bridge, Toronto, has been accepted by the York Township Council. The tender amounts to \$28,900.

The Chapman Double Ball Bearing Co. of Canada have secured premises for manufacturing at 39 Pearl Street, Toronto, and are installing special machinery, a considerable portion of which has already been placed in the factory.

A consolidation of the gold mining properties of Sturgeon Lake, Ont., has been made, and a company, to be known as the Northern Light Mining & Development Co., with a capitalization of \$1,000,000, organized to develop and mine the properties. The consolidation consists of nine properties, comprising 567 acres, which are all the principal gold discoveries in the Sturgeon Lake country. John H. Hill, Duluth, Minn., has organized the company. The mines will be developed and it is the intention to put in machinery at an early date.

W. J. Hill, Toronto, who has contracts for constructing some of the new pulp mills going up in Northern Ontario, says that work on the Spanish River Pulp & Paper Co. mill at Espanola is almost completed.

The National Sanitarium Association have secured options on several sites in Toronto on which they will build a free dispensary for outdoor consumptive patients.

The Canadian Pacific Railway will extend the Guelph Junction Railway from Guelph, Ont., to Goderich, Ont.

An addition will be erected to The Brantford Collegiate Institute, Brantford, Ont.

There is a swamp elm on the farm of Mr. P. Fallon, about two miles west of Norwood, Ont., which measures 23½ feet in circumference, four feet from the ground. The tree is as straight as a rule, and it is in the neighborhood of 60 feet to the first limbs.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

James Cumming's woolen factory at Norwood, Ont., was destroyed by fire a few days ago.

The Ontario Wind Engine & Pump Co., Toronto, are erecting a one-story brick galvanizing shop at a cost of about \$4,000.

The Department of Trade and Commerce, Ottawa, Ont., have received a letter from a firm at Colon, Isthmus of Panama, asking to be placed in communication with some concern in Canada manufacturing portable houses.

The Canadian Fire Underwriters' Association have submitted to the city council of London, Ont., a list of the necessary improvements in order to obtain cheaper insurance. These include a new fire engine to cost \$5,000 and new hose to cost \$2,250.

The T. Eaton Co., Toronto, are enlarging their factory buildings in this city.

The Cataract Power, Light & Traction Co., Hamilton, Ont., have let a contract to substitute aluminum for copper wire on their transmission line from De Cew Falls, Ont., to Hamilton, a distance of about 35 miles. It is expected that twice the quantity of power can be transmitted over the new as compared with the old line. The copper wires are to remain in place until the current can be turned on over the aluminum line, consequently there will be no interruption to the service.

The \$600,000 stock in the Canadian Westinghouse Co., which Ahearn & Soper, Limited, of Ottawa, Ont., undertook to place in Canada, was disposed of by November 15. A very large amount of the shares have been subscribed for in Ottawa where the greatest confidence is felt in the future of the company. This confidence is due in a large measure to the high standing of the Canadian directorate, which is mainly composed of our most successful capitalists and men intimately acquainted with the practical side of all branches of electrical industry.—Mining Review.

W. J. Hill, ex-M.P.P., has secured from the Nepigon Pulp & Paper Co., a contract for the construction of a power dam and pulp works at Nepigon, Ont. The amount of the contract is about \$400,000, which does not include the cost of material.

The Water & Light Commissioners of Whithy, Ont., invite tenders for the construction of extensions to the waterworks system of that place.

The Council of Smith's Falls, Ont., will submit a by-law to the ratepayers to raise \$14,000 for enlarging and improving the town hall.

St. Peter's congregation, Toronto, will have erected a new church at the corner of Bloor and Markham Streets.

The new flour mill to be erected by a syndicate at Keewatin, Ont., will have a capacity of 3,000 barrels a day and cost about \$1,000,000. Work on the new mill will be commenced at once, and it is hoped to have it in operation in time to grind on next year's harvest. A. W. Fraser, K.C., Ottawa, Ont., is interested.

The Damascus Gold Mining Co., Bridgeburg, Ont., have been incorporated with a capital of \$250,000, to carry on a mining, milling and reduction business. The provisional directors include J. S. Lovell, Wm. Bain and E. W. McNeill, Toronto.

The Redpath Motor Vehicle Co., Berlin, Ont., have been incorporated with a capital of \$50,000, to manufacture motor driven vehicles and gasoline engines. The provisional directors include A. H. Reid and W. Redpath, Toronto, and Geo. Seiler, Berlin.

The Toronto Iron & Steel Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture iron, steel, etc. The provisional directors include D. Muhl-felder and Wm. E. Friedman, Albany, N.Y., and R. E. Mills, Guelph, Ont.

The Ontario Pipe Line Co., St. Catharines, Ont., have been incorporated with a capital of \$40,000, to produce oil, petroleum, natural gas, etc. The provisional directors include S. E. Scheuer, J. C. McWaters and W. J. Jones, Cleveland, Ohio.

Arbuthnot & MacMillan, Limited, Toronto, have been incorporated with a capital of \$40,000, to acquire the business of Arbuthnot & MacMillan, and to manufacture paper, etc. The provisional directors include Wm. Henderson, Thos. Arbuthnot and J. A. MacMillan, Toronto.

The Valley Seating Co., Dundas, Ont., have been incorporated with a capital of \$75,000, to manufacture chairs, seats, furniture, etc. The provisional directors include J. D. Pennington, D. E. Turner and Geo. Anderson, Dundas.

The Hamilton Bros. Co., Glen Huron, Ont., have been incorporated with a capital of \$25,000, to acquire the business of Hamilton Bros., and to manufacture lumber, etc. The provisional directors include Wm. H. Hamilton, Jas. Hamilton and M. Gudway, Glen Huron.

The Toronto Coral & Mycenian Marble Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture marble, slate, onyx, etc. The provisional directors include J. W. Moyes, Wm. P. Page and Wm. Maguire, Toronto.

The Credit Forks Vitriol Stoneware Sewer Pipe Co., Toronto, have been incorporated with a capital of \$200,000, to manufacture tiles, sewer and drain pipes, etc. The provisional directors include Robt. Carroll, J. H. McKnight, Toronto, and S. G. Stone, Sault Ste. Marie, Ont.

The New York Lake Erie Oil & Gas Co. will increase their capital from \$1,000,000 to \$2,000,000.

Messrs. Mackenzie & Mann will construct large modern steel docks at Port Arthur, Ont.

The Hamilton Sanitarium Co., Hamilton, Ont., have been incorporated with a capital of \$50,000, to erect a sanitarium in that city. The provisional directors include Alex. Thomson, Geo. Watson and C. I. Kelly, Hamilton.

A company has been formed at Toronto, the name of which has not yet been decided, with a capital of \$250,000, for the purpose of erecting a twelve-story office building on King Street, opposite the

King Edward Hotel. Those interested are: president, Lieut.-Col. Mason; vice-president, Mr. S. G. Beatty; other directors, Messrs. E. R. Wood, Frederic Nicholls and Colonel H. M. Peilatt.

The Steel Lightship Lurcher, built at The Polson Iron Works, Toronto, was successfully launched November 23, and is now on her way to the coast of Nova Scotia. Her dimensions are: length over all, 124 feet; beam, 28 feet; depth from top of keel to spar deck, 21 feet 6 inches; draft, fully loaded, 11 feet 6 inches.

The Agricultural Society, Stratford, Ont., are considering the erection of new buildings.

A new high school building will be erected at North Bay, Ont., at a cost of \$15,000.

Plans have been prepared for the erection of a new Catholic church at Windsor, Ont., at a cost of about \$50,000.

Les Transports Canadiens, Limited, Toronto, have been incorporated with a capital of \$1,000,000, to carry on a ship-building and engineering business. The provisional directors include F. M. Holland, E. L. Sawyer and W. T. McMahon, Toronto.

Mr. J. Walshaw, Bolton, Ont., requests us to announce that he is inviting tenders for the installation of a plant to supply the town of Bolton with electric lighting.

We reported in our issue of October 16 that the Brant Milling Co., Brantford, Ont., had placed an order with J. C. Wilson & Co., Glenora, Ont., for a 10-inch "Little Giant" turbine. We now learn that they have since ordered another, an 8-inch wheel with brass buckets, which will make the seventh "Little Giant" to be installed by them.

The Wolfe Island, Ont., township council has entered into a contract with the Bertram Engine Works Co., Toronto, to construct a ferry steamer at a cost of \$25,000.

The Polson Iron Works, Toronto, are building an 80-foot steamer for service on the Mackenzie River. She will be sent in sections to Athabasca Landing for the opening of navigation in the spring.

The Lake Erie & Detroit River Railway have entered into an agreement with the St. Thomas, Ont., City Council to establish their repair shops in that city. They bind themselves to do the repairs for four hundred miles of track and to install sixty locomotives. The buildings are to cost \$75,000, and the plant and machinery \$50,000. About 150 to 200 men are to be employed. In return the city agrees to give the company a bonus of \$20,000, exemption from taxation for ten years except school taxes, and water at six cents per hundred cubic feet. The by-law will be submitted in January.

J. C. Wilson & Co., Glenora, Ont., have just received export orders for three "Little Giant" turbines, a 33-inch, 21-inch and 10-inch, to be shipped to Great Britain. The demand from abroad for this particular wheel is constantly increasing, and the manufacturers inform us their order book indicates shipments to many parts of the old world.

The Canadian Northern Road are completing at Port Arthur, Ont., what is claimed to be the largest grain storage warehouse in the world. It will exceed in capacity the great concrete storage of the Peavey Co. at Duluth by 500,000 bushels. The Canadian Northern elevator consists of 160 cylindrical tins, each 21 feet in diameter and 85 feet deep to a concrete foundation. There is absolutely no wood about the entire structure, for the bins are of tile, arranged in double walls with steel tie rods surrounding each roof tile. Each cylinder touches those adjoining at four points, forming smaller bins, with concave sides, and these are also to be filled with grain. Sixteen thousand tons of tile were made in Illinois and shipped here for the work, and the builders are a Minneapolis concern. This elevator is connected with a wood and steel working house and contains nothing in the way of machinery but rubber belts running in concrete tunnels. The working house has a capacity for 1,250,000 bushels, giving the road in this group a total capacity for storing 5,750,000 bushels of wheat. One half the tile storage was built a year ago and successfully carried grain through last winter.

The House of Refuge at Clinton, Ont., will be enlarged by an addition 60x48 feet, two storeys and basement, at a cost of about \$10,000.

The Pacific Coal & Oil Co., Toronto, have been incorporated with a capital of \$17,500,000, to carry on a mining, milling and reduction business, and to produce and refine petroleum oil, etc. The provisional directors include Jas. S. Lovell, Wm. Bain and Robt. Gowans, Toronto.

One of the railway projects to which a subsidy was voted in the session of the Dominion Parliament which has recently closed, is the Temagami Railway, which is to run from Sturgeon Falls, Ont. The Minister of Public Works recommended it on the ground that it would open up a large section of pulp wood country and thus be of benefit to the works of the Sturgeon Falls Pulp & Paper Co. It will undoubtedly promote the settlement of the country along its fifty miles of track and in this way conduce to the prosperity of the pulp industry, for the settlement of the country means the clearing of the land, and the profitable clearing of the land means the marketing of the pulp wood.

The Algoma Steam Laundry Co. will erect a laundry building at Port Arthur, Ont., at a cost of about \$10,000.

A large pier, breakwater and dry dock will be constructed at Prescott, Ont., by the Dominion Government.

W. J. Morrow, Brown's Brac, Ont., has recently placed an order with J. C. Wilson & Co., Glenora, Ont., for a 24-inch "Little Giant" turbine, gearing, shafting, etc., to be installed in a sawmill he is fitting up at that place.

The Imperial Construction Co., Toronto, have been incorporated with a capital of \$199,000, to manufacture contractors' supplies, etc. The provisional directors include C. A. Masten, J. R. L. Starr and J. H. Spence, Toronto.

The Windsor House at Gravenhurst, Ont., was destroyed by fire November 20. Loss about \$10,000.

J. F. Burgoyne is fitting up the old mill at Croydon, Ont., replacing the old water wheel by a 28-inch "Little Giant," procured from J. C. Wilson & Co., Glenora, Ont.

The Ontario Mining & Smelting Co. are working the Wolf Lead Mine at Bauuockburn, Ont., which is said to be the richest deposit of galena in Ontario. The vein is thirty inches wide, and runs 85 per cent. lead.

The B. & I. Bias Filled Corset Co., Toronto, have been incorporated with a capital of \$100,000 to manufacture corsets, whitewear, etc., and to acquire the business of Messrs. Belcher & Snider. The provisional directors include J. D. Belcher, H. G. Snider and Chas. Millward, Toronto.

The Mikado Gold Mining Co., incorporated under the laws of Great Britain, have been licensed to do a mining, milling and reduction business in Ontario with a capital of \$175,000. William Davidson, Toronto, is their attorney.

The Toronto Bedding Co., Toronto, will increase their capital from \$15,000 to \$50,000.

The Standard Chemical Co., Toronto, will increase their capital from \$450,000 to \$1,000,000.

The Clark, Wood Co., London, Ont., have been incorporated with a capital of \$50,000, to manufacture fancy goods, millinery, etc. The provisional directors include A. A. Clark, Geo. Wood and Jas. England, London.

The Masonic Hall Co., Tilsonburg, Ont., have been incorporated with a capital of \$10,000, to erect buildings for societies, associations, etc. The provisional directors include Wm. McDonald, J. Aspiwall and L. B. Livingstone, Tilsonburg.

Fred and Frank Carney, of Menominee, Mich., stockholders in the Witbeck Lumber Co., have closed a deal for the purchase of two hundred million feet of pine timber on Spanish River, Ont., from Ferguson Bros. & McFadden. The consideration is a half million dollars. The sawmill of the Witbeck Co., which is one of the oldest on Menominee River, will be moved next fall to Massey, Ont., where it will cut this timber. The purchase will keep the mill going for nearly twenty years. Carney Bros. now have three logging camps in operation, and will get out two million of this timber this winter to be saved on contract next season.

Messrs. Williams & Wilson, Montreal, have recently ordered from J. C. Wilson & Co., Glenora, Ont., a 38-inch vertical "Little Giant" turbine for the Ogilvie Milling Co's. mill in that city.

The Grand Trunk Railway authorities hope to have the new freight sheds at Simcoe and John Streets, Toronto, finished shortly. The new buildings will more than double the freight storage capacity of the company. At the corner of John and Front Streets a two-story office building is being constructed, which will

be 180 feet long by 48 feet wide. The building will be of pressed brick trimmed with cut stone. Back of this building and extending along to John Street a distance of 915 feet will be the one-story outward freight shed, which will be 50 feet wide and one of the largest in the Dominion. Trains will enter from the rear of the yard on the John Street side, and there will be seven tracks into the yard. Along Simcoe Street the office building will be continued for 180 feet, and the bottom story of this will be open, so that the cars will be run into the lower story. The upper portion of the building will be used as offices. Dividing the tracks there will be a long loading platform, which will extend the entire length of the yards. The cost of the works will be about \$60,000. Probably next year the company will build an "inward" freight house, to parallel the "outward" house. It will be of the same dimensions and will lie on the other side of the property.

Messrs. Pilkington Bros., glass manufacturers, St. Helen's, England, have purchased a site in Toronto, upon which they will erect a large warehouse at a cost of about \$38,000.

This has been an active season in improvements along the water front of Montreal. The principal work has been conducted on the new high level shore wharves, and the new wharves at Windmill Point. In all, 1,660 feet of high level wharf has been added along the shore, while the remainder has been filled in so that the entire surface can now be used. In all there are now four longitudinal lines of railway, with branch lines to the different piers. At the Windmill Point wharf the operations have been carried on very actively, and of the new 3,700 foot wharf, that it is intended to build on the city side, over 2,000 feet have been completed. By far the most difficult part of the work has been completed, and on this account it will not take nearly as long to finish the remaining portion. On the south side of Windmill Point 800 feet of wharf have been added, and considerable work has been done about the wharves and basins to maintain the depth of the water at 30 feet, the same as in the channel.

La Fondrie de Thetford will erect a foundry and machine shop at a cost of \$30,000 at Kingsville, Que.

Searchlights have been introduced upon the vessels of the Richelieu & Ontario Navigation Co., plying between Montreal and Quebec. The lights are of 4,000 candle power each, and have been placed on the steamers Virginia, Quebec and Canada. Their power is sufficient to bring out objects distinctly at a distance of a mile or more. This will allow of the picking up of the buoys and making the ports with greater facility than formerly, and will give added pleasure to travellers on the trip up the Saguenau River, which is always made at night. Next season the searchlights will be placed upon the other vessels of the company.

The new post office building to be erected at St. Louis, Que., will cost about \$20,000.

Messrs. A. H. Brown & Co., Limited, Montreal, have been incorporated with a capital of \$20,000, to acquire the business of A. H. Brown & Co., and to manufacture ales, mineral waters, etc. The provisional directors include A. H. Brown, A. Turdiff and S. R. Gauthier, Montreal.

Messrs. Shearer, Brown & Wills, Limited, Montreal, have been incorporated with a capital of \$500,000, to acquire the business of Shearer & Brown Co., to manufacture timber, sashes, blinds, boxes, etc., to erect sawmills and sash and door factories. The provisional directors include Jas. Shearer, B. H. Wills, Westmount, Que., and J. Brown, Montreal.

The American Asbestos Co., Montreal, have been incorporated with a capital of \$1,000,000, to mine and manufacture asbestos, etc., and to generate electricity. The provisional directors include H. M. Whitney, Boston, Mass.; Geo. W. Apsey, Somerville, Mass.; and R. F. Pearson, Halifax, N.S.

Canadian Contractors, Limited, Montreal, have been incorporated with a capital of \$3,000,000, to carry on a general construction and contracting business. The provisional directors include E. L. Sawyer, W. T. McMahon and Wm. Bain, Toronto.

Messrs. Price Bros., Quebec City, will erect a paper mill.

A. O. Norton, Coaticook, Que., has recently designed and brought out a new ball-bearing ratchet screw jack having a capacity of 60 tons, and which is intended for use under 80,000 lbs., and 100,000 lbs. loaded cars, as well as for wrecking equipment. This jack is similar in construction to the earlier type of Norton ball-bearing jack, in that the gears are cut from solid steel forgings, and it has ball-bearings to reduce the friction. Mr. Norton says that all the working parts are protected from grit and rust; that, being a screw jack without filling, packing or valves, it is absolutely safe under all conditions; that it cannot slip or drop the load, and is always ready for instant use.

The Institut Dentaire Franco-Canadien, Montreal, have been incorporated with a capital of \$10,000, to manufacture dental machinery and supplies. The provisional directors include E. Paquet, G. Langlois and G. Maillet, Montreal.

Messrs. Watson & Todd, lumber shippers at Liverpool, England, have purchased the entire cut of red and white pine deals to be sawn by the Hull, Que., Lumber Co. at their various mills during the season of 1904. This deal covers from fifteen to twenty million feet of lumber.

The Denaber & McLendy Co., Detroit, Mich., have purchased two hundred square miles of spruce and cedar lands in the Province of Quebec.

It is the intention of the Singer Sewing Machine Co., with head offices at New York, to shortly begin the erection of a large factory in Canada, which, when complete, will cost in the neighborhood of \$700,000, and the chances are that some site in or near the city of Montreal will be chosen.

The ratepayers of Gould, Que., have granted a bonus to Messrs. Cowan & Mooney for the erection of a creamery and sawmill there.

The Millstream Lumber Co., Quebec City, recently incorporated, will erect mills at Metapedia, Que.

The Canada Wood Mfg. Co., Farnham, Que., which recently acquired the beet root factory building there, are progressing well with their work. They have thoroughly repaired the building, put in new floors, new partitions, fireproof doors, etc., and are now installing their machinery.

The National Light, Heat & Power Co., Farnham, Que., under the management of Mr. P. Reynolds, expect to commence shortly turning out compressed peat. They will start with a capacity of 45 to 50 tons per day, and if satisfactory will greatly increase that amount.

Representatives of the Self-Closing Bag & Paper Co., Nashua, N.H., have been inspecting Shawinigan Falls, Que., with a view to establishing a pulp and paper mill there. The company have a capital of \$500,000, composed entirely of French Canadians.

The Duplessis Independent Shoe Machinery Co., St. Hyacinthe, Que., have been incorporated with a capital of \$2,000,000, to manufacture machinery, tools, pegs, nails, etc., and to acquire the business of The Duplessis Shoe Machinery Co. The provisional directors include J. C. Desautels, P. A. Labadie and C. A. Beaudry, St. Hyacinthe.

The Montreal Plate Glass & Mirror Co., Montreal, have been incorporated with a capital of \$25,000, to manufacture mirrors, plate and ornamental glass, etc. The provisional directors include W. V. Eastmure, H. S. Lightbourn and Alex. Stewart, Montreal.

Geo. A. Mace's paper box factory at Montreal was partially destroyed by fire November 23. Loss about \$15,000.

At a recent meeting of the Montreal Harbor Board it was decided to call for tenders at once for scoria and granite blocks for the wharf-sheds, the wharves and approaches. The lower floors of the sheds are to be paved with Scoria blocks, while all the approaches, wharves, etc., are to have granite blocks. Tenders will also be asked for immediately for the lumber for next season's uses.

The Montreal Harbor Board have received a tender from the Canadian Locomotive Works Co., of that city, for the construction of the new steel sheds to be erected on the wharves there, on the lines outlined in the plans prepared by Mr. John Kennedy, the chief engineer. The amount allotted for the construction of the sheds is \$3,000,000, but it is stated that the tenders submitted by the Locomotive Works Co. amount to a little more than \$2,600,000.

The Montreal Box Co., Montreal, have been incorporated with a capital of \$100,000, to manufacture cigar boxes, tobacco manufacturers' supplies, etc., and to acquire the business of Adam Beck. The provisional directors include A. Beck,

London, Ont.; F. E. Meredith and A. E. Woodworth, Montreal.

J. C. Michaud's chair factory at Farnham, Que., has been put in operation, and will soon be turning out about 1,000 chairs per day.

At a recent meeting of the Provincial Government at St. John, N.B., it was understood that an increase in the stumpage on lumber cut in that Province was decided upon. The new rate will be \$1.50 per thousand feet upon spruce and pine, and in proportion upon other timber. The old rate was \$1 per thousand.

The Pugwash R. & Copper Co., incorporated under the laws of Massachusetts, with a capital of \$100,000, will develop a stretch of copper areas at Upper Pugwash, N.S. The officers of the company are Arthur MacCabe, president; E. P. Wouson, vice-president; and A. P. Merchant, secretary, Gloucester, Mass.

The Steamship Sealac Co., Rothesay, N.B., have been incorporated with a capital of \$80,000, to construct wharves, docks, etc., and to carry on a general shipping business. The provisional directors include Robt. Thomson, J. R. Armstrong and R. T. Leavitt, St. John, N.B.

The Maritime Dairy Co., Sussex, N.B., have been incorporated with a capital of \$48,000, to manufacture dairy machinery, cheese, butter, etc. The provisional directors include J. D. Frier, S. H. White and W. J. Mills, Sussex.

Cornelius Shields, of the Clergue Works at Sault Ste. Marie, Ont., was in St. John's, Newfoundland, recently, arranging with the company headed by Henry M. Whitney for the establishment of a large pulp enterprise in Newfoundland.

The shipments of coal by the Dominion Coal Co., Sydney, N.S., for the ten months ending October last, were 2,376,633 tons. For the same period last year the shipments were 2,436,667 tons. These figures show a decrease for the present year of 60,034 tons. This is accounted for by the fire at Dominion No. 1. The shipments of the Nova Scotia Steel & Coal Co. show an increase over last year.

A new railway station will be constructed at Sydney, N.S.

Messrs. C. Flood & Sons, St. John, N.B., have been incorporated with a capital of \$100,000, to manufacture ornaments, jewellery, musical instruments, etc. The provisional directors include C. Flood, E. H. S. Flood and Geo. H. Flood, St. John.

The question of increased wharf accommodation at St. John, N.B., is being considered by the Canadian Pacific Railway authorities and the local authorities. The present accommodation is insufficient to meet the requirements of the Canadian Pacific Railway for its steamship service and the demands of other steamship companies.

A new self-revolving tippie will likely soon replace the old one in the third seam bankhead at Albion Mines, N.S. It will be made by the Brown Machine Co., New Glasgow, who make a specialty of coal screening plant.

The Ottumna box car coal loader which has been installed at the Albion Mines, and the first mechanical loader so far introduced in Nova Scotia, has all the latest improvements. It is claimed that a box car has been loaded in six minutes and eleven hundred tons disposed of in ten hours by this style of loader.

The Cumberland Railway & Coal Co. will extend their road from Parrsboro, N.S., to East Bay, and a deep water pier with modern shipping appliances will be constructed.

John McNaughton, Chatham, N.B., will erect a flour mill to cost \$7,000 at Black River, N.B.

The University of New Brunswick at Fredericton will have a gymnasium erected 80x40 feet at a cost of about \$7,000.

An Old Men's Home will be erected in Halifax, N.S. C. C. Blackadars is interested.

The First Methodist Church, Charlottetown, P.E.I., will have a Sunday school building erected at a cost of about \$10,000.

The new hoisting engine at Hub colliery, Sydney, N.S., is ready for work. Three batteries of boilers have been put in and are under steam, a new steel smoke stack erected, and the foundation of the Capel fan laid. An eight inch compressed air pipe line will be laid from Dominion No. 2 to operate the Hub colliery machines.

The Dauphin Milling Co., Dauphin, Man., are building a 66-foot addition to their warehouse. They have recently completed a large packing house near their mill.

A. R. Fleming, of Moosomin, N.W.T., has been awarded the contract for building the Massey-Harris implement hall at Regina, N.W.T. The building will absorb more than a quarter of a million feet of lumber and will cost about \$15,000.

The Canadian Pacific Railway have let a contract for the erection of an addition to their shops at Calgary, N.W.T. The cost will be about \$30,000.

The Manitoba Iron Works, Winnipeg, Man., have added another department to their extensive business, and will hereafter carry stocks of boiler tubes, pipe, fire brick, etc.

There has been a great business in Winnipeg, Man., and the West this year in passenger and freight elevators for buildings. The Stuart Machinery Co. Winnipeg, Man., have the following electric power elevators in hand at present: Two for the Foley, Lock & Larson building, one for Turnbull & McManus, one for McNab & Roberts, one for Bright & Johnston, two for the new factory for the Kemp Mfg. Co. One hand power elevator is being placed for the following: John Thomson, D. D'Aoust, Winnipeg, Grenfell Milling & Elevator Co., Grenfell, Assa., Geo. Drewry, Rainy River.

A report from Lethbridge, Man., recently stated that work will be begun in a few days upon an irrigating system designed to bring under the canal about 40,000 acres of land in the vicinity of Raymond. Cazier Bros., large contrac-

tors, have arrived from the United States, en route to their new field of labor. The contracts for the canal will aggregate about \$200,000, and require that it shall be ready for the delivery of water at Raymond by May 1, 1904. The water will be taken from a point near Milk River station, about forty miles west of Raymond. The canal will be twenty-five feet wide on the bottom with a general depth of about six feet, and is intended to divert practically the entire flow of Milk River not otherwise appropriated. It will pass through an immense tract of country, but no attempt will be made to irrigate any land except about 40,000 acres controlled by the Knights. This land will be prepared for the cultivation of sugar beets to supply the factory lately started. It is estimated that the supply for the factory next year will not be less than 1,000,000 tons of beets.

The Brandon Binder Twine Co., Brandon, Man., will increase their capital from \$100,000, to \$200,000.

Messrs. Dickson & Coulter, Edmonton, N.W.T., propose the erection of a linen factory 500x100 feet, at a cost of about \$15,000. The town has granted a bonus of \$5,000, for the purpose.

The Winnipeg Ceiling & Roofing Co., Winnipeg, Man., have purchased a site 400x200 feet upon which they will erect a factory building.

The Last Mountain Land & Development Co., Winnipeg, Man., have been incorporated with a capital of \$250,000, to build roads and tramways, and to manufacture bricks, tiles, sewer pipes, etc. The provisional directors include Wm. Pearson, Winnipeg, D. McKillop and H. Ormond, Portage la Prairie, Man.

The Manitoba government purpose constructing a new legislative chamber building in Winnipeg with a provincial library attached.

Messrs. McLennan & Rae, Minnedosa, Man., will erect a hotel to cost \$25,000 at Portage la Prairie, Man.

The management of the Canadian Pacific Railway in Montreal, have still under consideration the plans of the new hotel station and terminal facilities at Winnipeg, Man. Upon these, in conjunction with the new workshops at that point, the company will likely spend about two million and a half dollars.

Allward & McCormick, stained glass manufacturers, Winnipeg, Man., have begun the erection of a new factory which will give them much better accommodation for their business. The building will be 120x40 feet, three stories, including basement.

Messrs. Stewart & Bird's trunk factory at Winnipeg, Man., was destroyed by fire a few days ago.

The Brandon Binder Twine Co., Brandon, Man., have changed their name to The Consumers Co-operative Co.

Messrs. Reeves & Co., Columbus, Ind., manufacturers of threshing machinery and plow engines, have opened a branch in Winnipeg, Man.

The waterpower plant at Dashwood Falls, near Lac du Bonnet, Man., owned

by the Winnipeg Power Co., Winnipeg, is being developed rapidly, and work is progressing on the long sluice, which is being cut through solid rock to give the necessary rush of water for the purposes of generating electrical energy. Nearly \$500,000 is being spent on the plant.

The Great West Saddlery Co., Winnipeg, Man., are making a large expansion of their business facilities this season. Upwards of \$65,000 have been expended or provided for in new buildings, and a further sum of \$35,000 has been authorized for investment in new plant. The new buildings include an addition to the Winnipeg factory, a new factory at Calgary and a new store building at Prince Albert. The enlargement of the Winnipeg factory includes a new building adjoining the old factory size 136x25 feet, five stories and basement. Another story will be added to the old factory, though that may not be undertaken until next spring. At Calgary a large, new factory will be built, which will be one of the largest institutions west of Winnipeg.

Mr. H. I. Frank, Frank, N.W.T., Mr. John Forman, Montreal, and Hon. A. E. Spriggs, Montana, have purchased 17,000 acres of black spruce, and in addition have leased 187 square miles of timber limits from the Dominion Government, situated in the region around the Jacques Cartier River. A large pulp mill will be established at the mouth of Jacques Cartier River, where 8,000 h.p. is available.

The mill of the Meyers Milling Co., Listowel, Ont., is now running full time. It was recently overhauled and remodeled and some new machinery installed. The new equipment includes a Whitelaw Controllable Swing Sifter installed by Messrs. Whitelaw, of Woodstock, Ont. The mill now has a capacity of 175 barrels per day.

The Canadian Northern Railway Co., have sold 50,000 acres of land to Wm. Pearson, Winnipeg, Man., and Brown Bros., Portage la Prairie, Man.

It is proposed to generate and transmit 5,000 h.p. to Calgary, N.W.T., from Kananski Falls, for municipal lighting power, and for the operation of the waterworks plant. It is estimated that the amount of power available at the falls is 25,000 h.p., and of this amount Calgary expects ultimately to use at least 10,000 h.p., the second 5,000 h.p. to be generated and transmitted as the needs of the municipality require it. Mr. R. J. Parke, Toronto, is the consulting electrical engineer of the town, and has just returned from a survey of the power field. It is estimated that a plant for the development, generation and transmission of 10,000 h.p. will cost \$500,000 and for half that much power \$250,000.

It is reported that the Doukhobors in Yorkton District, N.W.T., will erect four factories next spring, including a felt mill, a saw mill and a flour mill.

The Blairmore Coal & Coke Co., have been formed at Blairmore, N.W.T., to take over certain coal lands at that point and operate them. They will have 6,000 acres of coal land. The officers of the company are E. H. Fishburn, president;

V. Hyde Baker, vice-president; Mr. McNeill, secretary; T. Procter, treasurer.

The Hutchinson Lumber Co., have been incorporated at Victoria, B. C., with a capital of \$20,000, to carry on a general sawmilling business and to acquire the business of J. G. Hutchinson at Eburne, B. C.

The office of the Yukon Sun, at Dawson City, Yukon, was wrecked by an explosion of gasoline November 19. Loss about \$25,000.

Messrs Goldrick & Lammers will erect a saw mill at Nelson, B. C., at a cost of \$10,000.

The concentrator to be erected near Trail by the Rossland Power Co., Rossland, B. C., will be on an extensive scale. It will be 186x60 feet, 90 feet high, and the tailings building 109x72 feet and 60 feet high.

An amalgamation of the Snowshoe Gold & Copper Mines, Limited, and the British Columbia Copper Co. is being arranged. The former company is a subsidiary company of the British Columbia (Rossland-Slocan) Syndicate operating the Snowshoe property in the Boundary District of British Columbia, and is now shipping an average of 2,000 tons a week. The British Columbia Copper Co. owns the Mother Lode Mine, and also an extensive smelting plant at Greenwood, B. C., which at present is running two blast furnaces, and will shortly install a copper converter.

The Canadian Smelting Works, Trail, B. C., are in a position they claim, to supply Eastern Canada with whatever pig lead they may require, fine gold ready for minting purposes, fine silver, copper sulphate for use in Manitoba and the North-West Territories, and will in a few months be turning out metallic antimony which will be used in making various babbitt metals.

Capt. Noll of Victoria, B. C., is organizing a company to build a 1,000-ton steamer with accommodation for a large number of passengers to trade between Victoria and northern British Columbia ports.

The Crow's Nest Southern Railway Co. will make their terminus at Morrissey, B. C., and erect a depot and freight sheds.

A syndicate has been formed to build a line from Spence's Bridge to Nicola, B. C. Mr. E. A. Jukes of Toronto is interested.

The Big Bend Lumber Co. are building a saw mill at Arrowhead, B. C., which will have a capacity of 25,000,000 feet of lumber per year.

The Canadian Pacific Railway have placed an order with a Vancouver, B. C. mill for 2,000,000 feet of lumber to be used in the construction of their new shops at Winnipeg, Man.

The American Steam Gauge & Valve Mfg. Co., Boston, Mass., have again been compelled to seek new quarters, owing to the increase of their business, and are at present removing their entire plant and offices from Bismark Street, to the large brick buildings, 208-220 Camden street, that city. The buildings have floor space of 85,000 square feet. The Mowry & Phillips foundry department will also be

removed from South Boston and all branches of the business will be consolidated at the Camden street factory. The new plant will be of more than double the present capacity, and will be employed in producing valves, gauges and indicators; also special metals and foundry work in the Mowry & Phillips department.

The proposed steamship service between Canada and France will be inaugurated in April next with a fleet of 4,000 ton steamers which Mr. Colombier of Bordeaux, France, is now having built. The Dominion government is to pay to Mr. Colombier a subsidy of \$133,133.33 per annum. Of the four steamers to be put into the service, two are to fly the British flag, and will, of course by that act be excluded from French bounty.

Replying to a query regarding molybdenum, the New York Engineering and Mining Journal gives the following particulars:—In recent years there has sprung up a good demand for molybdenum steel, which possesses special qualities. Besides metallic molybdenum and ferromolybdenum, other alloys are prepared for various purposes. The ore molybdenite is valued according to its content of the metal and purity; to be marketable it must carry over 45 per cent. molybdenum, and be free from copper. When analyzing 50 to 55 per cent. MO, the ore is worth approximately \$300 per long ton. Metallic molybdenum, assaying 95 per cent. and upward, is priced at \$1.55 to \$2 per pound, while ferro-molybdenum and other alloys sell proportionately, as to the tenor of their metallic contents.

Work is fast nearing completion upon the new power plant of the B. F. Sturtevant Co. at Hyde Park, Mass. This bids fair to be one of the most complete plants of its kind in the country, special care having been taken in connection with every detail to secure the highest efficiency and the most modern equipment. The plant will comprise four water tube boilers, with stokers supplied by Sturtevant forced draft, an economizer with Sturtevant induced draft, and a complete outfit of Sturtevant generating sets, together with condenser, air compressor, etc. The Sturtevant exhaust head is used for separating the water and oil from the exhaust steam.

Improvements which are now under way and planned at the Tacoma smelter when completed will give it a daily capacity of 300 tons of copper and 500 tons of lead. During the winter the company will build another mechanical "roaster" to add to the three already in operation, which will be about 100 by 220 feet in size, including the ore-sheds. The improvements under way include a "bag-house" and a blast furnace, the former of which will cost about \$25,000.

The Lackawanna Steel Co., Buffalo, N. Y., have placed an order with Morgan Construction Co., Worcester, Mass., for a merchant bar mill plant complete with accessory equipment. This mill is designed to take 6x6 inch billets and reduce them to all sizes of merchant bar in ordinary use. The Lackawanna Steel

Co. have also placed an order with the same company for a gas plant to include sixteen Morgan Continuous Gas Producers equipped with George Automatic Coal Feeds. These producers will furnish gas for the Steel Company's No. 32 slabbing mill and 48 inch universal plate mill. The buildings for both installations have been ordered by Morgan Construction Co. of McClintic-Marshall Construction Co., Pittsburg.

Mr. N. A. Rhodes, of Messrs. Rhodes, Curry & Co., the well-known Eastern manufacturers and contractors, was in town last week examining some extensive works and reporting on same on behalf of the proprietors. Mr. A. J. Stevens, civil mechanical engineer, was associated with him on the same work.

Messrs. Richard J. Chown and William Hartley, the former master mechanic and the latter boss warper of the Auburn Woolen Mills at Peterborough, Ont., have just been granted United States patents of a most important invention and one which has been in very successful use in the Auburn mills for some time. The invention is an improvement on warping reels, and Mr. Hartley will in a few days leave to complete arrangements with the Davis Furber Co., of North Andover, Mass., who are anxious to secure the right to manufacture the machines for the United States. Negotiations are in progress with a New York firm for the patent rights for France, Great Britain, Belgium and Sweden. The inventors have been working for years on this machine, which weavers say will revolutionize the weaving of woolen goods.

INDUSTRIAL PUBLICATIONS.

The Globe Machine & Stamping Co., Cleveland, Ohio, have issued a new booklet on their line of drop forgings, dies, etc., and describing their new tumbling barrels. The Robb Engineering Co., Amherst, N. S., recently purchased one of the latter machines.

"Canadian Industrial Blue Book" is the happily chosen title for "The Manufacturers' List Buyers' Guide of Canada" the 1904 edition of which is now being printed, and which will be published, we are informed, before the expiration of the current year. Part I. of the work includes an index of all commercial articles manufactured in Canada, with reference to the names of the manufacturers of them; Part II. is a classified list of the industrial cities and towns in Canada, giving the names of the manufacturers therein and a description of their power plants; Part III. contains a classified list of Canadian manufacturers under article headings, and Part IV. is a general list of all manufacturers not fully listed under article headings. This Blue Book cannot but be of the greatest value to those interested in the development of Canadian manufacturing enterprises, and exporters will find it of exceeding value, seeing that it gives the names and addresses of every important manufacturer in the country, and is not loaded with extraneous matter.

The Canadian Manufacturers' Association have just published a new edition of the Canadian Trade Index, being the third publication of that kind issued by it. In the 480 pages is contained the names of the 1,300 members of the Association, (not all of whom, however, are manufacturers) with a brief description of the business of each. These descriptions refer to 2,395 different articles manufactured by the members, classified alphabetically, translated into both French and Spanish; and there is a map of Canada with statistical information relating to the country. While the names of only 1,300 manufacturers are included in the Index, who produce only 2,395 different articles, it should be borne in mind that there are more than 13,000 important manufacturing concerns in Canada which produce more than 20,000 different articles.

"Handy Lumber Tables" is the title of a valuable little book issued by the Industrial Publication Co., New York. Price 10 cents.

N. A. Watson, Erie, Pa., has issued a circular on the "Excelsior Boiler Feeder" which he manufactures.

The Sawyer-Man Electric Co., New York, have issued a booklet giving some information concerning incandescent lamps and lighting.

The address of Mr. J. W. Langmuir, chairman of the Queen Victoria Park Commission on the occasion of the recent visit of the members of the American Out-Door Art Association, has just been issued in book form.

The United Telpherage Co., Westfield, N.J., have just issued three bulletins devoted to the uses of telpherage in various forms.

The Hazard Mfg. Co., Wilkesbarre, Pa., have issued a new catalogue of their manufacture.

"Graphite" for November contains the usual quantity of information that instructs people in the use of the different forms of graphite. It is the monthly publication of the Joseph Dixon Crucible Co., Jersey City, N.J., and is full of valuable data that will interest manufacturers and others. Send for copies.

The Ingersoll-Sergeant Drill Co., New York, which is represented in Canada by the James Cooper Mfg. Co., Montreal have issued an illustrated catalogue on Ingersoll-Haeseler hammers, drills and couplings.

The official organ of the Canadian Railway Club in its last issue contains a paper on "Apprenticeship" and discussion of same. Mr. W. H. Rosevear, Jr., is secretary of the club.

The second edition of Catalogue No. 115, the condensed general catalogue of the B. F. Sturtevant Co., Jamaica Plain, Mass., has gone to press and will very soon be ready for distribution. A few pages in this revised edition have been devoted to factory and industrial railway equipments, a new departure of this enterprising concern. The outgrowth of the success attained in equipping their

new plant at Hyde Park, Mass., was the manufacture of this new line of products.

PERSONALS.

The Rockwell Engineering Co., have removed their engineering and executive departments to the factory, Jersey City, N.J. The sales offices will be, as formerly, at 26 Cortlandt street, New York City.

Mr. Arthur Hatch has resigned the management of the Toronto business of the Gault Brothers Co., to become manager of the newly formed Dominion Steel Mills Co., with works in Leamington, Ont., and head office in Toronto. Two other factories will be erected in Ontario towns, the names of which are not yet announced.

The forty-eighth meeting of the American Society of Mechanical Engineers began in New York, December 1, inst., and was continued on the 2nd, 3rd and 4th. Mr. James M. Dodge, President of the Society, was booked to deliver the usual annual address, his subject to be "The Money Value of Technical Training." A large number of professional papers were read and discussed. Power stations and other points of interest in and about New York were visited by members and their friends, and a good time generally was had.

The International Harvester Co., comprising the Deering, McCormick, Plano, Champion and Milwaukee companies, have, after a year's labor, perfected the consolidation and centralization of these interests. The executive offices are concentrated at 7 Monroe street, Chicago, instead of being divided among the various plants as heretofore. A further saving will be effected by dispensing with several thousand general agents and canvassers, who formerly carried on extensive competition for the farmers' trade. Manufacturing costs will be reduced by giving to each plant the kind of work that it is best fitted to do, because of its geographical location or for other reasons. In the sales department one general agent will handle all the five lines of machines in his territory, and canvassers will be furnished to local agents as before, though in a greatly reduced number, because the element of competition is practically eliminated. The various departments of the executive end of the business are centralized as above indicated.

The Boston office of the Cassella Color Co., has been removed to Room 24 at 68 Essex street, that city.

The management of the Dominion Iron & Steel Co., on the recommendation of Mr. Graham Fraser, have appointed Mr. A. Fraser, superintendent of the blast furnaces at Sydney, N.S. Mr. Fraser will replace Mr. J. H. Means, who has taken a position with the American Steel Co.

Mr. E. W. Rathbun, Deseronto, Ont., the head of the great railroading, lumbering and manufacturing firm of the Rathbun Co., died at that place November 24. Mr. Rathbun was born at

Auburn, N.Y., in 1842. In 1861 he joined his father, who had been carrying on lumber operations at Deseronto. He took charge of the business under the firm name of H. B. Rathbun & Co., which in 1883 became the Rathbun Co.; of which he was president. He was also president of the Bay of Quinte Railway Co. The Rathbun Co., under his management has become the pioneer in many industrial enterprises in Canada, including the roller process flour mill. In 1897 he was included in the Royal Commission to examine and report upon the forests of Canada.

The first appointment to be announced in connection with the Grand Trunk Pacific Railway is that of Mr. J. W. Kuesshaw, heretofore Assistant Purchasing Agent of the Grand Trunk at Detroit, now to be Purchasing Agent of the Grand Trunk Pacific, with headquarters in Winnipeg, Man. The purchasing for the road during the surveying and construction of the new line will be a heavy undertaking. There are now sixteen surveying parties in the field, and about ten more will soon be added.

CALIFORNIA-OREGON EXCURSIONS.

Every day in the year single and round trip excursions via the Chicago, Union Pacific and North Western Line. Through first-class Pullman and tourist sleeping cars daily, to points in California and Oregon. Personally conducted excursions from Chicago to San Francisco, Los Angeles and other Pacific Coast points, leaving Chicago on Tuesdays, Wednesdays, Thursdays and Fridays. Lowest rates, shortest time on the road. Finest scenery. For maps, illustrated folders and rates, write B. H. Bennett, 2 East King street, Toronto.

PACKARD LAMPS.

The immense sale which the Packard Electric Co., St. Catharines, Ont., and of Montreal have had on their well known make of lamps has necessitated enlargements of their factory equipment devoted to this branch of the business. Even with these increased facilities the company are barely able to meet the ingrowing demands, but still further additions are contemplated which will place them in a position to meet all orders quickly no matter how large.

The meter department of this company is running overtime and indications are that it will be necessary to do so for many months to come, for one order alone, for export, calls for the delivery of 8,000 type "G" Packard Recording Watt Meters. This order as well as many other large orders received from within the Dominion is a tribute to the worth of this meter.

MARINE ENGINEERING.

The British steamship "Lord London-derry," from Cardiff to Montreal, with coal, is the first vessel that passed up the St. Lawrence river at night. This she accomplished during this week by the aid of the high-powered, gas-lighted buoys which the Minister of Marine and Fish-

eries for the Dominion of Canada has installed to mark channels. Masters of ships plying on the St. Lawrence river are loud in their praise of these gas-lighted buoys which make the passage as safe as that of a pedestrian in the best-lighted streets of Montreal. These buoys, says the American Syren and Shipping, are made by the Safety Car Heating and Lighting Co. of New York, who have devoted years of close study to the special requirements for gas-lighted buoys for use in rivers and harbors. The Honorable James Sutherland, when he was the Minister of Marine and Fisheries for Canada, mapped out a broad and comprehensive plan for aids to navigation in rivers and harbors that elicited commendations from the maritime interests of the Dominion. His successor, the Honorable Raymond Prefontaine, the present incumbent of that distinguished post of public service, is most assiduous in his devotion to river and harbor work and is going ahead with his plans as rapidly as he can with the funds at his disposal. It is the set purpose of the Ministry to remove every preventable cause for complaint against the St. Lawrence river route to the end that charges for freight and insurance may be reduced to the lowest possible rates. As the improvements projected by the Ministry of Marine and Fisheries are forwarded, marine insurance is reduced. Gas-lighted buoys are of inestimable value along the St. Lawrence river route, as they enable ships to utilize the night hours for progress. For something more than five months a year winter holds the noble St. Lawrence river in fetters. Hence during the seven months when ships can go up and down between Upper Canada and Europe it behooves the masters of ships to bear in mind that time is money. We have letters from merchants in Montreal who tell us that by their aid to this season's navigation the gas-lighted buoys have paid for themselves twice over. This has been a very busy year for the installation of buoys, beacons, sirens, fog whistles, light houses and new apparatus for light-houses in the Dominion of Canada. The Ministry of Marine and Fisheries recognizes that Canada is making great strides forward in its development and that ere long its wheat belts will be the world's largest and best granaries and that in line with the triumphant march of her wheat industry Canada will see other interests, both agricultural and manufacturing, keeping step to the music of commercial prosperity.

THE CANADIAN LEAD INDUSTRY.

Whilst it is true that the lead mining industry is somewhat improved during the last few months, its present conditions cannot be considered satisfactory, and in view of the strong representations made to the Government at Ottawa by a deputation from British Columbia, who were trying to obtain Government aid, it is regrettable that more definite information has not been afforded as to the reasons why, since the decision to grant a bonus of five hundred thousand dollars, the results have not been more pronounced. Having instituted careful inquiries we

are able to say that the present position can be explained upon satisfactory grounds which do not for one moment admit of doubt either as to the ultimate revival of the industry or the immense benefit of the bonus.

While it is nearly three months since Mr. Fielding made the promise, it was only a few weeks ago that the Government officially ratified the grant and the various lead mining companies were either unable or unwilling to proceed with the heavy expenditure necessary to re-open the mines until the payment of the bonus was an assured fact. This made it too late in the season to do very much as in the Sandon District snow fell in the middle of October, meanwhile however with the single exception of the St. Eugene Mine, at Moyie, there has been an all round increase in the staff and every effort put forward to secure large outputs. Only those on the spot know the adverse conditions which have to be contended with in deporting the products of the British Columbia lead mines. Many of the mines are of great elevation and quite inaccessible to mechanical traction. These depend upon raw-hiding which cannot be commenced until there is a heavy fall of snow and considerable frost. Allowance must also be made for the fact that in consequence of the long continued depression in this industry many of the men have become scattered and the majority have returned to the Western States, principally to Idaho and Washington. It takes a long time to secure the return of these men, and to get the necessary supplies. We are satisfied that the present aspect of things as it appears to the on-looker is not a true index of the effect of the bonus or of the extent to which it has already stimulated activity in the lead mines of B.C. The work which counts does not show at the present stage, it is being vigorously carried on and will bear fruit next season in the undoubted revival of this important industry. Whether ultimately the bonus will have as wide a spread and permanent an effect as the tariff legislation asked for remains to be seen; but if the result is that the Government aid attains what it aimed at then the logical sequence is to make that aid permanent by incorporating it with the tariff.—Canadian Mining Review.

PIG IRON PRICES IN GREAT BRITAIN.

Messrs. William Jacks & Co., London E.C. England, under date November 20, 1903, write as follows:

Since writing you last, business here has been very quiet indeed, owing to the dullness of trade and large sales of American and Canadian iron and steel. Today's quotations are as follows:

No. 1 Gartsherrie Pig Iron, 61/- per ton, f.o.b. Glasgow, including dues.
 No. 3 Gartsherrie Pig Iron, . 53/- per ton, f.o.b. Glasgow, including dues.
 M/Nos. West Coast Hematite, 61/- per ton, f. o. b. Liverpool.
 No. 3 G.M.B., Middlesbro Pig Iron, 43/3 per ton, f.o.b. makers wharf, Middlesbro.

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OPPORTUNITIES.

The following enquiries have been received at the offices of the High Commissioner for Canada in London, and at the Canadian Section of the Imperial Institute, London, England.

NOTE.—Those who may wish to correspond with any of these enquirers can obtain the names and addresses by applying to the CANADIAN MANUFACTURER, Toronto. No charge for giving information. When writing refer to the numerals opposite the enquiries, and enclose 2c. postage stamp for reply.

1128. A firm of export merchants with good connections are desirous of opening up business relations with Canada, and are anxious to get into touch with Canadian houses requiring representation in England. Will undertake buying agencies or give attention to sale of goods.

1129. A London firm interested in the flax trade inquire for names of exporters from Canada of this article or of parties who would be exporters if opportunity offered.

1130. Some makers of patent fireproof goods are seeking supplies of plaster (gypsum) or any other cohesive material produced in Canada and obtainable at a moderate figure in fair quantities.

1131. A firm of general merchants and direct importers at Christiana, Transvaal, South Africa, desire correspondence with Canadian manufacturers of furniture, farm implements and machinery, canned goods, etc. Address THE CANADIAN MANUFACTURER, Toronto.

1132. A company manufacturing insulated electric wires and cables asks to be placed in correspondence with Canadian firms buying their lines.

1133. The manufacturers of an agricultural motor are desirous of establishing trade in Canada and wish to hear from Canadian firms prepared to handle their motors.

1134. A North of England firm desires to get into touch with one or two good Canadian houses importing old iron and steel in the shape of rails, ship-plates, etc.

1135. The representative of an English group is about to visit Canada, and will entertain proposals for the purchase or development of established industrial enterprises of a sound character, suitable for the English market.

The receipts by the Toronto Railway Company are still growing with extraordinary rapidity. Last month showed an increase of \$21,767.03 over November, 1902, and the city received \$1,741.36 more in consequence. The traffic has grown steadily since 1895, as shown by the following figures:

	1895	1903
Gross receipts...	\$78,592.60	\$174,058.78
City's percentage	6,287.41	13,932.10

PATENTS

FOR SALE — Two valuable patents, Builder's Hardware Line. For information address, M. J. DAIN, Frick Building, Pittsburg, U.S.A.

BUTTER-MAKING MACHINERY.

Mr. F. S. S. Johnson, United States Commercial Agent at Stanbridge, Que., writing to his Government re butter-making machinery in Canada, says: Quebec and Ontario are the best butter-producing Provinces in the Dominion of Canada. One can hardly travel in any direction without seeing a creamery or cheese factory. Small farms are scarce; on the other hand the acreage to a farm is generally 200 or more, most of which is given up to pasturing and the raising of hay and grain. The average number of cattle to a farm is 30 or more. Since the establishment of creameries at almost every hamlet or village in these provinces the making of butter by hand has been done away with. I find that separators from the United States can compete with those of Canadian make, and as separators are on the free list I am surprised that our manufacturers have not taken advantage of this, as well as of the excellent market, to extend their trade in these provinces. In Canada, I am convinced, there is a splendid field for our people to

operate in. The Canadians, as a rule, are anxious to try our machinery, which is superior to their own, as well as cheaper in price, and I would suggest that our manufacturers send their salesmen to these provinces to work up this trade.

BROWN MACHINE CO.

The Brown Machine Co., New Glasgow, N. S., have for some time been doing a large amount of work in connection with the coal mining industry of the Maritime provinces. The company constructs and installs haulage systems, tipples of all patterns, picking tables and screening plants, and also furnishes rope wheels, pumps, belting, etc. They have a thoroughly equipped foundry and machine shop, and aside from the special work which they do in connection with the mining interests they do a general foundry and machine shop business. They have installed various equipments for most of the coal mines of Nova Scotia and are now reaching out for other lines of work.

NICKEL IN TEMISKAMING.

The Ontario Government has, by an order-in-council, dated November, 11 inst., withdrawn from sale, lease or exploration under the provisions of the mines act, a belt of land ten miles wide on each side of the Temiskaming & Northern Ontario Railway, extending from the north boundary of the Township of Widdifield to the town of New Liskeard, the present terminus. Important discoveries of the ores of nickel, cobalt, silver and arsenic have recently been made near the shore of Long Lake, a short distance south of the township of Bucke, and elsewhere.

Some of the ores are unlike any that have hitherto been found in quantity in this Province. For instance, the mineral niccolite, otherwise known as kupfernickel, which contains about 44 per cent. of nickel, and which, up to the present, has furnished cabinet specimens only, has been discovered in what, judging from surface indication, seems to be commercial quantities. A cobalt-nickel arsenide has also been found resembling



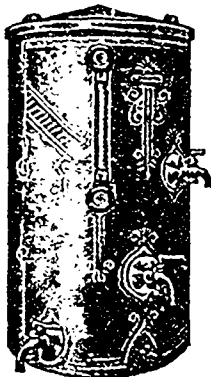
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which refines dirty, watery, and gritty oil and delivers it perfectly clean and pure, and the same oil may be refined and re-used many times over—a saving of half in the cost.

The Cross Oil Filter saves 90 per cent. in the cost of oil for the Flushing Coal Co., of Elyria, Ohio, as stated in their letter dated December 11, 1902.

"We conferred with our engineer at the mine, who informed us that he was greatly pleased with your Cross Oil Filter and that the saving in oil would exceed 50 per cent., in fact he thought the saving at least 90 per cent."

30 Days Free Trial to demonstrate the merits of our filter and to prove that it will save 50 per cent. of your oil money. We will ship on thirty days trial free, a Cross Oil Filter and if unsatisfactory return at our expense.

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smaltite and carrying, according to one assay, 6 per cent. of nickel and 18 per cent. of cobalt. Both the niccolite and smaltite are rich in arsenic, the former carrying 56 per cent. and the latter up to 72 per cent.

In addition to these, native silver occurs, some exceedingly handsome specimens of which have been found.

Mr. T. W. Gibson, Director of the Bureau of Mines, while in the region obtained some specimens of the niccolite, and, on returning to the city, instructed Prof. W. G. Miller, Provincial Geologist and Inspector of Mines, to make an examination. Mr. Miller's letters confirm the impression that a valuable mineral area has been discovered. He writes that one vein is about three and a half feet wide. Most of the ore consists of what seems to be a cobalt-nickel arsenide. There is also considerable native silver and niccolite.

One specimen of silver obtained by Mr. Miller was about the size of his hand and half an inch thick. Another property near by contains a vein which has been opened up at three points, and shows a length so far of one hundred feet. The length of the vein appears to be much greater than is shown by the stripping. The deposit should also continue in depth, and 14 inches of so rich an ore should constitute a deposit large enough to work. In a subsequent letter Mr. Miller states that he has secured a good set of samples of native silver, smaltite and niccolite, and that the silver specimens obtainable almost discount those of the Port Arthur district. The discoveries above referred to are situated about five miles from Haileybury. Niccolite has also been found about five miles west of this point.

The lands along the Temiskaming &

Northern Ontario Railway to the extent of 20,000 acres per mile are appropriated to assist in defraying the cost. In view of this fact, and also to permit of a policy being framed which will insure to the province the full benefit of any industry which may arise out of these discoveries, should they prove as important as they now appear, the lands have been temporarily withdrawn from sale, lease or exploration.

The value of these discoveries, if they turn out to be extensive, can be realized by a comparison with the famous Sudbury deposits. In Sudbury three per cent. of nickel in the ore is the average, and five per cent. is exceedingly rich. In the new discoveries the ore carries 44 per cent. of nickel. A much smaller body of nickel therefore in Temiskaming will constitute a mine than in the nickeliferous pyrrhotite region of Sudbury.

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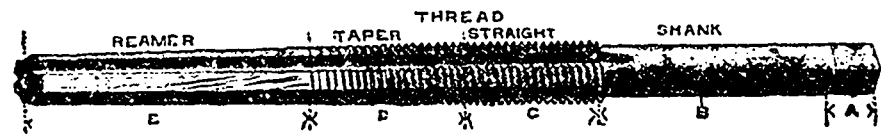


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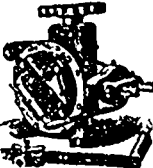
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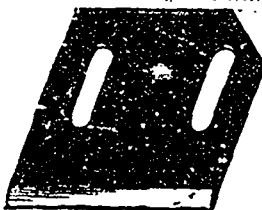
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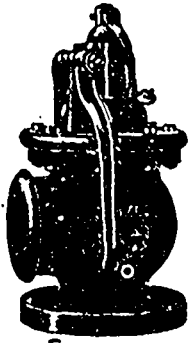


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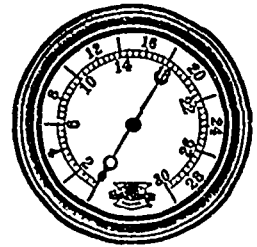
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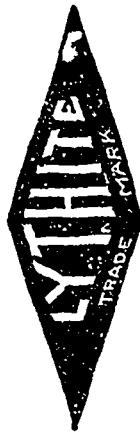
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An American manufacturing concern recently erected in Peterborough a Canadian branch factory—having a capacity to give employment to 800 hands—for export and Canadian trade.

The following letter, addressed to a Peterborough newspaper, gives the reason why :

" We notice in your issue of Saturday, September 27, 1903, a statement by Mr. ——— at the meeting of the Peterborough Board of Trade, that we were induced to locate here through the influence of one man.

" Please permit us to state that Mr. ——— is incorrect in making a statement of this kind, privately or publicly, and evidently speaks without full knowledge, or, in fact, without any knowledge whatever on the matter, and in correcting this mis-statement permit us to assure you and the public that our Company came here on account of the natural advantages of Peterborough, which are the geographical location, railways, the water power, and the Trent Canal, which, we were assured, would be shortly completed, and which, when finished and in operation, will, in our opinion, secure to Peterborough all the industries that your city can comfortably take care of."

Peterborough offers Tax Exemption to Manufacturers.

Peterborough is located on the Main Line of the Canadian Pacific Ry., Grand Trunk Ry. and the Trent Canal, and has with suburbs, a population of 15,000.

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J. ALEXR. CULVERWELL, Managing Director,

Address Branch Office—9 Toronto St., TORONTO.

Head Office—Cor. George & Hunter Sts., PETERBOROUGH.

CLASSIFIED INDEX.

Abrasives.

Canadian Corundum Wheel Co., Hamilton, Ont.
Hart Corundum Wheel Co., Hamilton, Ont.
Rice Lewis & Son, Toronto.
Williams, A. R., Machinery Co., Toronto.

Air Compressors

American Steam Pump Co., Battle Creek, Mich.
Canadian Rapid Drill Co., Sherbrooke, Que.
Cooper, James, Mfg. Co., Montreal.
Darling Bros., Montreal.
Jenckes Machine Co., Sherbrooke, Que.

Air Reservoirs.

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Aluminum

Syracuse Smelting Works, Montreal.

Angles, Beams and Girders

Bourne-Fuller Co., Cleveland, Ohio.
Leslie, A. C. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Annealing Boxes.

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Annealing Muffles and Furnaces.

Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor, Cuyahoga Falls, Ohio

Antimony

Samuel, M. & L. Benjamin & Co., Toronto.
Syracuse Smelting Works, Montreal.

Anvils and Vices.

Leslie, A. C. & Co., Montreal.

Architects

Edwards, R. J., Toronto.
Parke, H. J., Toronto.
Vogel, C. H., Ottawa.

Assayers.

Metallurgical Laboratory, Pittsburg, Pa.
Wentz, R. F. Engineering Co., Toronto.

Axles

Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Babbitt Metal

Samuel, M. & L. Benjamin & Co., Toronto.
Syracuse Smelting Works, Montreal.

Banks

Bank of Hamilton, Hamilton, Ont.

Bar Iron and Steel

Bourne-Fuller Co., Cleveland, Ohio.
Leslie, A. C. & Co., Montreal.
Rice Lewis & Son, Toronto.
Samuel, M. & L. Benjamin & Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Belt Dressing.

Rosendale Belting Co., Toronto.
Williams, A. R., Machinery Co., Toronto.

Bolt Fasteners.

Bristol Co., Waterbury, Conn.
Rosendale Belting Co., Toronto.
Williams, A. R., Machinery Co., Toronto.

Bolting (Cotton.)

Dominion Belting Co., Hamilton, Ont.
Flaming, W. A. & Co., Montreal.
Rosendale Belting Co., Toronto.

Bolting (Leather.)

Canadian Oak Belting Co., Brockville, Ont.
Flaming, W. A. & Co., Montreal.
McLaren, D. K., Montreal.
Rice, Lewis & Son, Toronto.
Williams, A. R., Machinery Co., Toronto.

Belting and Supplies

Bristol Co., Waterbury, Conn.
Canadian Oak Belting Co., Brockville, Ont.
Carrier, Laine & Co., Lewis, Que.
Dominion Belting Co., Hamilton, Ont.
Flaming, W. A. & Co., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
McLaren, D. K., Montreal.
Rice Lewis & Son, Toronto.
Rosendale Belting Co., Toronto.
Williams, A. R. Machinery Co., Toronto.

Billet Heating Furnaces

Morgan Construction Co., Worcester, Mass.

Bobbins

Wilson Bros. Bobbin Co., Liverpool, England.

Bolt Taps

Butterfield & Co., Rock Island, Que.

Brass

Samuel, M. & L. Benjamin & Co., Toronto.



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Sheets containing terms and conditions of Sale and information as to Areas and Lots and Concessions comprised in each Berth will be furnished on application, either personal or by letter, to the Department of Crown Lands, Toronto, or the Crown Timber Agencies at OTTAWA, SAULT STE. MARIE, PORT ARTHUR, RAT PORTAGE and FORT FRANCES.

E. J. DAVIS,

Commissioner Crown Lands.

DEPARTMENT OF CROWN LANDS,
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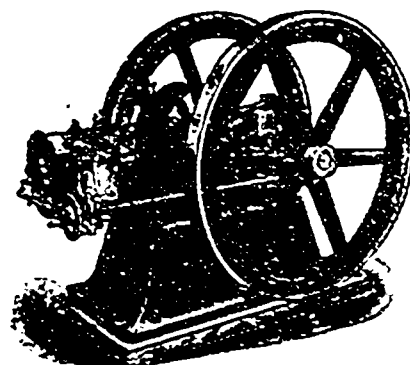
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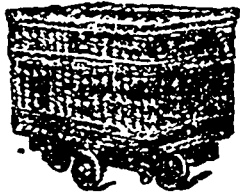
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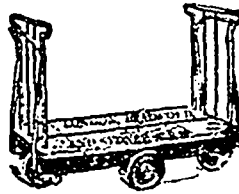
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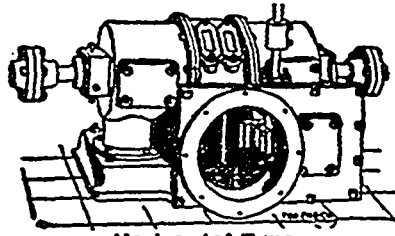
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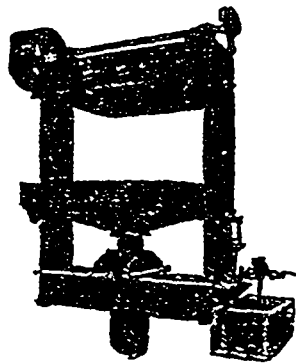
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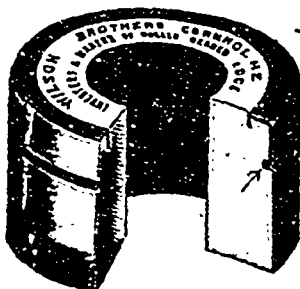


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(CONTINUED).

Brass Founders

Hamilton Brass Mfg. Co., Hamilton, Ont.
Meadows, Geo. B. Wire, Iron & Brass Works Co. Toronto.
McDougall, R. Co., Galt, Ont.
McKinnon Dash & Metal Works Co., St. Catharines, Ont.

Bridges.

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Building Iron and Steel.

Canada Foundry Co., Toronto.
Expanded Metal & Fireproofing Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Builders' Materials

Albert Mfg. Co., Hillsboro, Ont.
Canada Foundry Co., Toronto.
Canadian Oils Elevator Co., Toronto.
Canadian Portland Cement Co., Deseronto, Ont.
Expanded Metal & Fireproofing Co., Toronto.
Gartshore, John J., Toronto.
Metallic Roofing Co., Toronto.
Owen Sound Portland Cement Co., Owen Sound Ont.
Rice Lewis & Son, Toronto.
Sheldon & Sheldon, Galt, Ont.

Canada Plates

Leslie, A. C. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Samuel, M. & L. Benjamin & Co., Toronto.

Canoes

Peterborough Canoe Co., Peterborough, Ont.

Caps.

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Cast Iron Pipe

Canada Foundry Co., Toronto.
Gartshore-Thomson Pipe & Foundry Co., Hamilton, Ont.
Rice Lewis & Son, Toronto.
Montreal Pipe Foundry Co., Montreal.

Castings (Iron and Brass.)

Toronto Iron & Brass Bedstead Co., Toronto.

Cement

Canadian Portland Cement Co., Deseronto, Ont.
Owen Sound Portland Cement Co., Owen Sound, Ont.

Cement Machinery.

Wentz, R. F. Engineering Co., Toronto.

Chain Making Machinery

Turner, Vaughn & Taylor, Cuyahoga Falls, Ohio.

Channels

Bourne-Fuller Co., Cleveland, Ohio.
Leslie, A. C. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Samuel, M. & L. Benjamin & Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Charcoal Pig Iron

Canada Iron Furnace Co., Montreal.

Chemicals and Dye Stuffs

Bellhouse, Dillon & Co., Montreal.
Benson, W. T. & Co., Montreal.
Brunner, Mond & Co., Northwich, England.
Caesella Color Co., New York City.
Geigy Aniline & Extract Co., New York City.
Klipstein, A. & Co., New York City.
McArthur, Cornelle & Co., Montreal.
Winn & Holland, Montreal.

Chemists

Archbold, Dr. Geo., Prescott, Ont.
Heys, Thos. & Son, Toronto.
Metallurgical Laboratory, Pittsburg, Pa.
Wentz, R. F. Engineering Co., Toronto.

Clay Working Machinery.

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Coal and Coke

Milnea, James H. & Co., Toronto.

Coal Cutting Machines

Jeffrey Mfg. Co., Columbus, Ohio.

Coal Tipples.

Jeffrey Mfg. Co., Columbus, Ohio.

Coil Chains.

Greening R Wire Co., Hamilton, Ont.

Collection Agency

Ontario Collection Association, Toronto.

Continuous Rolling Mills

Morgan Construction Co., Worcester, Mass.

Contractors' Machinery

Carlin's, Thomas Sons Co., Allegheny, Pa.

CLASSIFIED INDEX.

(CONTINUED).

Conveying Machinery

Dodge Mfg. Co., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
Ferrin, William R., & Co., Toronto.
Slovens, Alfred J., Toronto.

Copper Materials

Greening, B., Wire Company, Hamilton, Ont.
Samuel, M. & L. Benjamin & Co., Toronto.
Syracuse Smelting Works, Montreal.
Wire & Cable Co., Montreal.

Corrugated Iron and Steel.

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Corundum.

Canada Corundum Co., Toronto.

Corundum Wheels.

Canadian Corundum Wheel Co., Hamilton, Ont.
Hart Corundum Wheel Co., Hamilton, Ont.
Rico Lewis & Son, Toronto.

Covers.

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Crayons

Lowell Crayon Co., Lowell, Mass.

Crucibles

Dixon, Joseph, Crucible Co., Jersey City, N.J.
McCullough Dalzell Crucible Co., Pittsburg, Pa.
Samuel, M. & L. Benjamin & Co., Toronto.
Syracuse Smelting Works, Montreal.

Crucible Caps and Nozzles

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Crucible Covers and Stoppers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Dies

Hamilton Stamp & Stencil Works, Hamilton, Ont.
Dies (Socket, Sewer Pipe and Tile-Clay.)
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Directories

Kelly's Directories, Limited, Toronto.

Draw Benches (Wire.)

Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Drills

Bertram, John, & Sons Co., Dundas, Ont.
Canadian Rand Drill Co., Sherbrooke, Que.
Cooper, James, Mfg. Co., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
London Machine Tool Co., London, Ont.

Dry Kilns.

Sheldon & Sheldon, Galt, Ont.
Stevens, Alfred J., Toronto.
Sturtevant, B. F. Co., Boston, Mass.

Dust and Shavings Separators

Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Electric Mine Locomotives

Jeffrey Mfg. Co., Columbus, Ohio.

Electrical Supplies

Canadian General Electric Co., Toronto.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jones & Moore Electric Co., Toronto.
Kay Electric Dynamo & Motor Co., Toronto.
Packard Electric Co., St. Catharines, Ont.
Phillips, Eugene F., Electrical Works, Montreal.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.
Worth & Martin, Toronto.

Electro-Plating

Brantford Plating Co., Brantford, Ont.

Elevators

Canadian Otis Elevator Co., Toronto.
Darling Bros., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.

Emery and Emery Wheels.

Canadian Corundum Wheel Co., Hamilton, Ont.
Forman, John, Montreal.
Hart Corundum Wheel Co., Hamilton, Ont.

Employers' Liability Insurance

Maryland Casualty Co., Toronto.

Engineers (Cement).

Wentz, R. F. Engineering Co., Toronto.

Engineers (Chemical.)

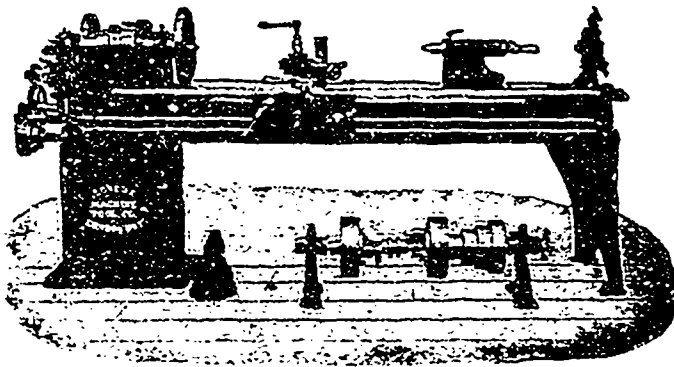
Heys, Thos. & Son, Toronto.
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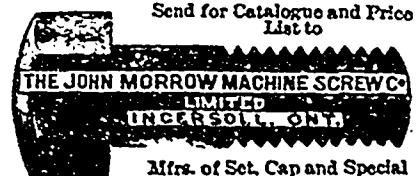
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OF ALL KINDS.

WRITE FOR PRICES

CLASSIFIED INDEX.

(CONTINUED).

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DeLano-Osborn Engineering Co., Toronto.
Kelsch, R. S., Montreal.
Parke, R. J., Toronto.
Vogel, C. H., Ottawa.

Engineers (Consulting)

DeLano-Osborn Engineering Co., Toronto.
Electrical Construction Co., London, Ont.
Kelsch, R. S., Montreal.
Morgan Construction Co., Worcester, Mass.
Parke, R. J., Toronto.
Perrin, Wm. R. & Co., Toronto.
Simpson, T. T., Deschênes, Que.
Vogel, C. H., Ottawa.
Wentz, R. F. Engineering Co., Toronto.

Engineers (Contracting)

Darling Bros., Montreal.
Electrical Construction Co., London, Ont.

Engineers (Electrical)

Canadian General Electric Co., Toronto.
DeLano-Osborn Engineering Co., Toronto.
Electrical Construction Co., London, Ont.
Electric Engineering & Supply Co., Montreal.
Jones & Moore Electric Co., Toronto.
Kay Electric Dynamo & Motor Co., Toronto.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.
Worth & Martin, Toronto.

Engineers (Mechanical)

Carrier, Laine & Co., Lewis, Quebec.
Darling Bros., Montreal.
DeLano-Osborn Engineering Co., Toronto.
Electrical Construction Co., London, Ont.
Kelsch, R. S., Montreal.
Kerr Engine Co., Walkerville, Ont.
Morgan Construction Co., Worcester, Mass.
Robb Engineering Co., Amherst, N.S.
Sheldon & Sheldon, Galt, Ont.
Wentz, R. F. Engineering Co., Toronto.

Engineers (Mill and Hydraulic)

Vogel, C. H., Ottawa.

Engineers (Mining)

Hoys, Thos. & Son, Toronto.
Metallurgical Laboratory, Pittsburg, Pa.
Mills, S. D., Toronto.

Engineers and Contractors.

Jeffrey Mfg. Co., Columbus, Ohio.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Engines and Boilers

Babcock & Wilcox, Limited, Montreal.
Canadian Heine Safety Boiler Co., Toronto.
Cowan & Co., Galt, Ont.
Goldie & McCulloch Co., Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Hyde Bros. & Co., Pittsburg, Pa.
Leonard, E. & Sons, London, Ont.
McDougall, R. Co., Galt, Ont.
Robb Engineering Co., Amherst, N.S.
Scaife Wm. B. & Sons Co., Pittsburg, Pa.
Stratford Mill Building Co., Stratford, Ont.
Williams, A. R., Machinery Co., Toronto.

Engravers

Canadian Manufacturer, Toronto.
Jones, J. L., Engraving Co., Toronto.

Exhaust Heads

Burt Mfg. Co., Akron, Ohio.
Darling Bros., Montreal.

Exporters

Canadian Export Co., Toronto.

Factory Sites

Central Ontario Power Co., Peterboro, Ont.

Films

Spence, R. & Co., Hamilton, Ont.

Financial

Bradstreet's, New York City.
Dun, R. G. & Co., Toronto.
Neil & Postelthwaite, Toronto.
Ontario Collection Association, Toronto.

Filters

Burt Mfg. Co., Akron, Ohio.
Darling Bros., Montreal.
Perrin, Wm. R. & Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Fire Brick

Hamilton Facing Mill Co., Hamilton, Ont.
Pennsylvania Fire Brick Co., Lock Haven, Pa.
Scioto Fire Brick Co., Sciotoville, Ohio.

Founders

Canada Foundry Co., Toronto.
Cowan & Co., Galt, Ont.
Gartshore-Thomson Pipe & Foundry Co., Hamil-
ton, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Karch, H. W., Hespeler, Ont.
McDougall, The R. Co., Galt, Ont.

Foundry Facing

Hamilton Facing Mill Co., Hamilton, Ont.

Galvanized Iron and Steel.

Leslie, A. C. & Co., Montreal.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Galvanizing

Brantford Plating Co., Brantford, Ont.
Ontario Wind Engine & Pump Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Galvanizing and Tinning Machinery and Furnaces (Clay.)

Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., Cuyahoga Falls
Ohio.

Gas and Gasoline Engines

Dominion Motor & Machine Co., Toronto.
Goldie & McCulloch Co., Galt, Ont.
Morrison, T. A. & Co., Montreal.
Stratford Mill Building Co., Stratford, Ont.

Gas Plants

Siche Gas Co., Toronto.

Gas Producers.

Morgan Construction Co., Worcester, Mass.

Generators

Canadian General Electric Co., Toronto.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Kay Electric Dynamo & Motor Co., Toronto.
Phillips, Eugene F., Electrical Works, Montreal.
Toronto & Hamilton Electric Co., Hamilton, Ont.

Government Notices

Factory Inspectors.
Minister of Agriculture.

Grinding Machinery

Canadian Corundum Wheel Co., Hamilton, Ont.
Hart Corundum Wheel Co., Hamilton, Ont.

Grinding Pans

Carlin's, Thomas Sons Co., Allegheny, Pa.

Hand Traveling Cranes

Morgan Construction Co., Worcester, Mass.

Hardware

Butterfield & Co., Rock Island, Que.
Cooper, James, Montreal.
Empire Machine & Metal Stamping Co., Toronto.
Gartshore, John J., Toronto.
Morrow, John, Machine Screw Co., Ingersoll, Ont.
Rice Lewis & Son, Toronto.
Samuel, M. & L. Benjamin & Co., Toronto.

Heating and Ventilating

Darling Bros., Montreal.
Leonard, E. & Sons, London, Ont.
Sheldon & Sheldon, Galt, Ont.
Stevens, Alfred J., Toronto.
Sturtevant, B. F. Co., Boston, Mass.

Hydraulic Accumulators

Morgan Construction Co., Worcester, Mass.

Hydraulic Cranes

Morgan Construction Co., Worcester, Mass.

Hydraulic Machinery

Darling Bros., Montreal.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jencks Machine Co., Sherbrooke, Que.
Morgan Construction Co., Worcester, Mass.
Perrin, Wm. R. & Co., Toronto.
Wilson, J. C., & Co., Glenora, Ont.

Iron and Steel Specialties

Abbott, William, Montreal.
Armstrong Mfg. Co., Bridgeport, Conn.
Bourne-Fuller Co., Cleveland, Ohio.
Brown & Co., Paris, Ont.
Dodge Mfg. Co., Toronto.
Karch, H. W., Hespeler, Ont.
Leslie, A. C. & Co., Montreal.
Meadows, Geo. B. Wire, Iron & Brass Works Co.
Toronto.
McDougall, R. Co., Galt, Ont.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Rice Lewis & Son, Toronto.
Samuel, M. & L. Benjamin & Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Lamps—Electric

Forman, John, Montreal.
Packard Electric Co., St. Catharines, Ont.

Lathes

Bertram, John, & Sons Co., Dundas, Ont.
London Machine Tool Co., London, Ont.
McDougall, R. Co., Galt, Ont.
Williams, A. R., & Co., Toronto.

Leather Bolting

Canadian Oak Bolting Co., Brockville, Ont.
Fleming, W. A. & Co., Montreal.
McLaren, D. K., Montreal.
Rice Lewis & Son, Toronto.
Williams, A. R. Machinery Co., Toronto.

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Machinists.

Worth & Martin, Toronto.

Machinists' Supplies

Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Rock Island, Que.
Cooper, James, Montreal.
Goldie & McCulloch Co., Galt, Ont.
Jeffroy Mfg. Co., Columbus, Ohio.
Morrow, John, Machine Screw Co., Ingersoll, Ont.
Worth & Martin, Toronto.

Machine Tools

Abbott, William, Montreal.
Bertram, John, & Sons Co., Dundas, Ont.
Darling Bros., Montreal.

Malleable Iron Castings

McKinnon Dash & Metal Works Co., St. Catharines, Ont.
Ontario Malleable Iron Co., Oshawa, Ont.
Smith's Falls Malleable Castings Co., Smith's Falls, Ont.
Walkerville Malleable Iron Co., Ltd., Walkerville, Ont.

Metal Shears

Morgan Construction Co., Worcester, Mass.

Metal Specialties

Brantford Plating Co., Brantford, Ont.

Metal Stamping

Empire Machine & Metal Stamping Co., Toronto.

Metallurgists.

Metallurgical Laboratory, Pittsburg, Pa.
Mills, S. D., Toronto.
Wontz, R. F. Engineering Co., Toronto.

Mill Machinery and Supplies

Armstrong Mfg. Co., Bridgeport, Conn.
Cooper, James, Montreal.
Cooper, James, Mfg. Co., Montreal.
Cowan & Co., Galt, Ont.
Darling Bros., Montreal.
Fleming, W. A., & Co., Montreal.
Gartshore, John J., Toronto.
Goldie & McCulloch Co., Galt, Ont.
Hamilton Brass Mfg. Co., Hamilton, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Hay, Peter Knife Co., Galt, Ont.
Jeffroy Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.
Karch, H. W., Hespeler, Ont.
Leonard, E. & Sons, London, Ont.
London Machine Tool Co., London, Ont.
McDougall, R. Co., Galt, Ont.
Morrow, John, Machine Screw Co., Ingersoll, Ont.
Rice Lewis & Son, Toronto.
Robb Engineering Co., Amherst, N.S.
Samuel, M. & L. Benjamin & Co., Toronto.
Spence, R. & Co., Hamilton, Ont.
Stratford Mill Building Co., Stratford, Ont.
Wilson, J. C., & Co., Glenora, Ont.

Mining Machinery

Canadian Rand Drill Co., Sherbrooke, Que.
Cooper, James, Montreal.
Cooper, James Mfg. Co., Montreal.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jeffroy Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.
Perrin, Wm. H. & Co., Toronto.
Williams, A. R. Machinery Co., Toronto.

Motors and Dynamos

Canadian General Electric Co., Toronto.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jeffroy Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Kay Electric Dynamo and Motor Co., Toronto.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.

Novelty Manufacturers.

Worth & Martin, Toronto.

Nozzles.

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Office Furniture and Supplies

Canadian Office & School Furniture Co., Preston, Ont.

Oils and Lubricants

Dixon, Jos., Crucible Co., Jersey City, N.J.
Fleming, W. A., & Co., Montreal.
Imperial Oil Co., Petrolia, Ont.
Queen City Oil Co., Toronto.

Oil Filters

Burt Mfg. Co., Akron, Ohio.
Darling Bros., Montreal.

Paints and Colors

Bellhouse, Dillon & Co., Montreal.
Berry Bros., Walkerville, Ont.
Fleming, W. A., & Co., Montreal.
Geigy Aniline & Extract Co., New York City.
Kilstein, A., & Co., New York City.
McArthur, Cornelio & Co., Montreal.

Paper Manufacturers

Barber, Wm., & Bros., Georgetown, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Patents

Budden, Hanbury A., Montreal.
Cass, Egerton R., Toronto.
Fetherstonhaugh & Co., Toronto.
Patent Exchange & Investment Co., Toronto, Ont.

Perforated Metals

Greening, B. Wire Co., Hamilton, Ont.

Phosphorizers.

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Pig Iron

Bourne-Fuller Co., Cleveland, Ohio.
Canada Iron Furnace Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Samuel, M. & L. Benjamin & Co., Toronto.
Synceuso Smelting Works, Montreal.

Pipe Threading Machines

Armstrong Mfg. Co., Bridgeport, Conn.
Rice Lewis & Son, Toronto.

Pipe (Riveted Iron and Steel.)

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Pipes and Tubes

Abbott, William, Montreal.
Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Gartshore-Thomson Pipe & Foundry Co., Hamilton, Ont.
Montreal Pipe Foundry Co., Montreal.
Rice Lewis & Son, Toronto.
Samuel, M. & L. Benjamin & Co., Toronto.

Plaster

Albert Mfg. Co., Hillsborough, N.B.

Plates

Bourne-Fuller Co., Cleveland, Ohio.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Rice Lewis & Son, Toronto.
Samuel, M. & L. Benjamin & Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Plating

Brantford Plating Co., Brantford, Ont.

Plumbago

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Pneumatic Tools

Chicago Pneumatic Tool Co., Chicago, Ill.
Cooper, James, Mfg. Co., Montreal.
Jenckes Machine Co., Sherbrooke, Que.

Pointers (For Rods and Wire.)

Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Portland Cement

Canadian Portland Cement Co., Deseronto, Ont.
Owen Sound Portland Cement Co., Owen Sound, Ont.
Rathbun Co., Toronto.
St. Lawrence Portland Cement Co., Montreal.

Power—Electric and Water

Central Ontario Power Co., Peterboro, Ont.

Power Plants—Equipments

Canadian General Electric Co., Toronto.
Cooper, James, Mfg. Co., Montreal.
Darling Bros., Montreal.
DeLano-Osborn Engineering Co., Toronto.
Electrical Construction Co., London, Ont.
Goldie & McCulloch, Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jeffroy Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.
Jones & Moore Electric Co., Toronto.
Kay Electric Dynamo & Motor Co., Toronto.
Leonard, F. & Sons, London, Ont.
Perrin, Wm. R. & Co., Toronto.
Phillips, Eugene F. Electrical Works, Montreal.
Robb Engineering Co., Amherst, N.S.
Stovons, Alfred J., Toronto.
Sturtevant, B. F., Co., Boston, Mass.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.
Wilson, J. C., & Co., Glenora, Ont.

Processes (Tile, Sewer Pipe, Nozzles and Sleeves.)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Pulleys

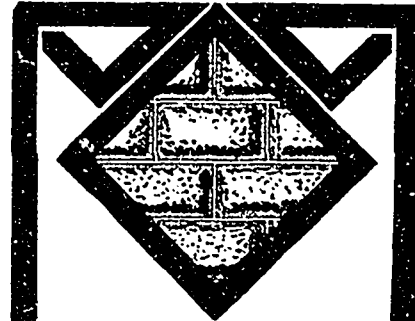
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Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jeffroy Mfg. Co., Columbus, Ohio.
Wilson, J. C., & Co., Glenora, Ont.

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Cowan & Co., Galt, Ont.
Goldie & McCulloch Co., Galt, Ont.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

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Railroads

Chicago & North-Western Ry., Toronto & St.
Paul, Minn.
Quebec Central Railway, Sherbrooke, Que.

Railway Supplies

Algoma Steel Co., Sault Ste. Marie, Ont.
Cooper, James, Montreal.
Gartshore, John J., Toronto.
Greening, B. Wire Co., Hamilton, Ont.
Montreal Steel Works, Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Phillips, Eugene F., Electrical Works, Montreal.

Rivets

Bourne-Fuller Co., Cleveland, Ohio.

Roll Lathes

Morgan Construction Co., Worcester, Mass.

Rolling Mills

Morgan Construction Co., Worcester, Mass.

Rolling Mill Engineers

Morgan Construction Co., Worcester, Mass.

Roofing

Metallic Roofing Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Rubber Goods

Gutta Percha & Rubber Mfg. Co., Toronto.

Shafting

Bourne-Fuller Co., Cleveland, Ohio.
Jeffrey Mfg. Co., Columbus, Ohio.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Shoar Knives

Carlin's, Thomas Shoes Co., Allegheny, Pa.
Hay, Peter Knife Co., Galt, Ont.

Shoots (Iron and Steel.)

Abbott, William, Montreal.
Bourne-Fuller Co., Cleveland, Ohio.
Leslie, A. C. & Co., Montreal.
Samuel, M. & L. Benjamin & Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Smoke Stacks.

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Softening Systems (Water.)

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Solder

Syracuse Smelting Co., Montreal.

Stamps & Stencils

Hamilton Stamp & Stencil Works, Hamilton, Ont.

Stand Pipes

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Steam Gauges

American Steam Pump Co., Battle Creek, Mich.
Crosby Steam Gauge & Valve Co., Boston, Mass.
Williams, A. R., Machinery Co., Toronto.

Steam Pumps

American Steam Pump Co., Battle Creek, Mich.
Darling Bros., Montreal.
Goldie & McCulloch Co., Galt, Ont.
Leonard, E. & Sons, London, Ont.
Williams, A. R., Machinery Co., Toronto.

Steam Separators

Darling Bros., Montreal.

Steam Specialties

Darling Bros., Montreal.

Steam Valves

American Steam Pump Co., Battle Creek, Mich.
Crosby Steam Gauge & Valve Co., Boston, Mass.
Darling Bros., Montreal.
Kerr Engine Co., Walkerville, Ont.
Williams, A. R., Machinery Co., Toronto.

Steel Plants

Morgan Construction Co., Worcester, Mass.

Steel Rails

Algoma Steel Co., Sault Ste. Marie, Ont.
Cooper, James, Montreal.
Drummond, McCall & Co., Montreal and Toronto.

Steel Shafting

Darling Bros., Montreal.
Dodge Mfg. Co., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Leslie, A. C. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Wilson, J. C. & Co., Glenora, Ont.

Stocks and Dies

Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Rock Island, Que.
Rico Lewis & Son, Toronto.
Worth & Martin, Toronto.

Stoppers.

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Structural Steel.

Abbott, William, Montreal.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Tanks (Iron and Steel.)

Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Tees

Bourne-Fuller Co., Cleveland, Ohio.

Textile Manufacturers

Canadian Colored Cotton Mills Co., Montreal.
Cantile, James, A., Montreal.
Dominion Oil Cloth Co., Montreal.
Hamilton Cotton Co., Hamilton, Ont.
Morris, D. Sons & Co., Montreal.
Rolcho & Co., Bradford, England.
Smith Wool Stock, Toronto.
Storey, W. H., & Sons, Acton, Ont.

Tin

Leslie, A. C. & Co., Montreal.
Samuel, M. & L. Benjamin & Co., Toronto.
Syracuse Smelting Works, Montreal.

Tin Plates

Leslie, A. C. & Co., Montreal.
Samuel, M. & L. Benjamin & Co., Toronto.

Tool Steel

Abbott, William, Montreal.
Bourne-Fuller Co., Cleveland, Ohio.
Leslie, A. C. & Co., Montreal.

Trucks

Morgan Construction Co., Worcester, Mass.
Slingsby, H. C., Montreal.

Trucks (Wire Mill)

Turner, Vaughn & Taylor Co., Cuyahoga Falls
Ohio.

Tubs (Cleaning and Coating Wire)

Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., Cuyahoga Falls
Ohio.

Turbines

Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jonckes Machine Co., Sherbrooke, Que.
Wilson, J. C. & Co., Glenora, Ont.

Typewriters and Supplies

United Typewriter Co., Toronto

Valves

American Steam Pump Co., Battle Creek, Mich.
Canada Foundry Co., Toronto.
Hamilton Brass Mfg. Co., Hamilton, Ont.
Kerr Engine Co., Walkerville, Ont.
Williams, A. R., Machinery Co., Toronto.

Ventilators

Darling Bros., Montreal.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Wagons and Carriages

Hore, F. W., & Son, Hamilton, Ont.

Washers or Hollenders (Cleaning Rubber.)
Turner, Vaughn & Taylor Co., Cuyahoga Falls,
Ohio.

Water Filters and Filtering Systems.

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Water Softening and Purifying Systems.

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Water Tanks

Caldwell, W. E. Co., Louisville, Ky.

Water Towers

Caldwell, W. E. Co., Louisville, Ky.

Weaving Machinery

Karch, H. W., Hespeler, Ont.

Wire and Wire Rope

Dominion Wire Rope Co., Montreal.
Greening, B. Wire Co., Hamilton, Ont.
Leslie, A. C. & Co., Montreal.
Samuel, M. & L. Benjamin & Co., Toronto.
Wire & Cable Co., Montreal.

Wire Cloth

Greening, B. Wire Co., Hamilton, Ont.

Wire Drawing Machinery

Morgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor, Cuyahoga Falls, Ohio.

Wire Rod Reels

Morgan Construction Co., Worcester, Mass.

Wire Specialties

Empire Machine & Metal Stamping Co., Toronto.
Mendows, Geo. B. Wire, Iron & Brass Works Co.,
Toronto.

Wire Testing Machinery

Morgan Construction Co., Worcester, Mass.

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Carrier, Laine & Co., Levis, Que.
 Cowan & Co., Galt, Ont.
 Karch, H. W., Hespeler, Ont.
 London Machine Tool Co., London, Ont.
 Sheldon & Sheldon, Galt, Ont.

Zinc

Leslie, A. C. & Co., Montreal.
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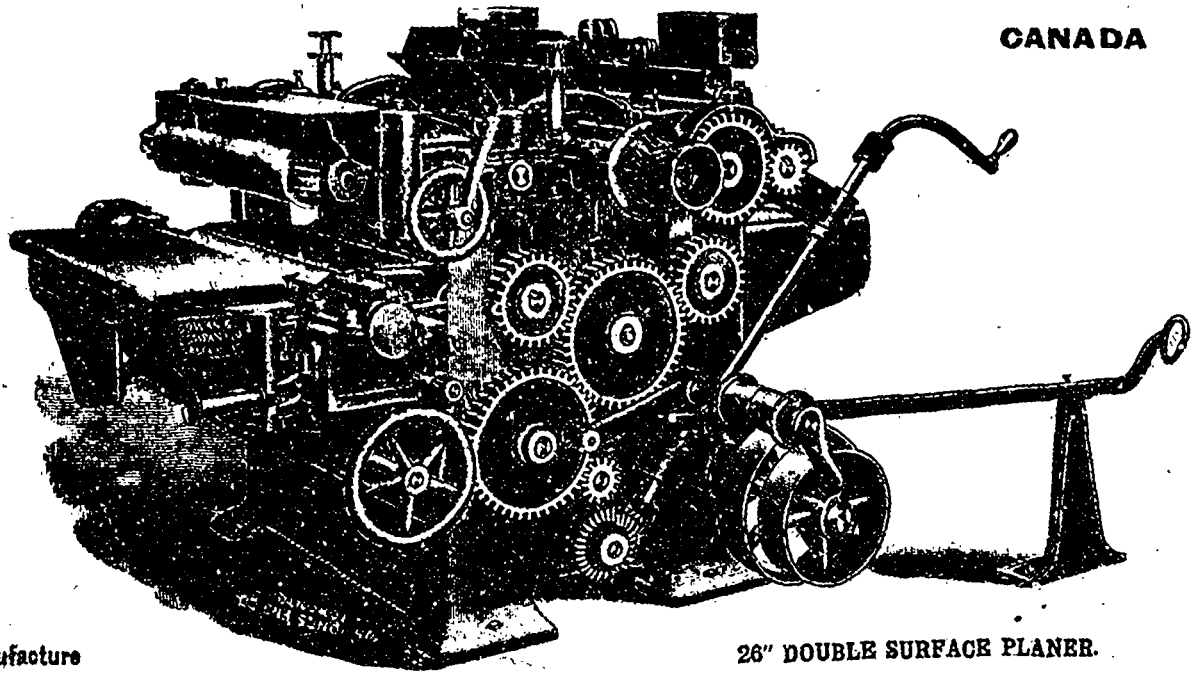
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Butterfield & Co., Rock Island, Que	34	Holden, Arthur P., Toronto	41
Caldwell, W. E. Co., Louisville, Ky.	6	Hors, F. W. & Son, Hamilton, Ont.	39
Canada Corundum Co., Toronto	2	Hyde Bros. & Co., Pittsburg, Pa.	42
Canada Foundry Co., Toronto	5	Imperial Oil Co., Petros, Ont.	35
Canada Iron Furnace Co., Montreal	36	Industrial Publication Co., New York, N.Y	45
Canadian Casualty & Boiler Assurance Co., Toronto	36	Industries, Youngstown, Ohio	45
Canadian Colored Cotton Mills Co., Montreal	33	International Safety Solvent Co., Providence, R. I.	2
Canadian Corundum Wheel Co., Hamilton, Ont.	33	Jeffrey Mfg. Co., Columbus, Ohio	36
Canadian Export Co., Toronto	10	Jenckes Machine Co., Sherbrooke, Que.	47
Canadian General Electric Co., Toronto	2	Jones & Moore Electric Co., Toronto	13
Canadian Home Safety Boiler Co., Toronto	45	Jones, J. L., Engraving Co., Toronto	obo
Canadian Manufacturing Fab. Co., Toronto	45	Karch, H. W., Hespeler, Ont.	7
Canadian Oak Belting Co., Brockville, Ont	36	Kay Electric Dynamo & Motor Co., Toronto	13
Canadian Office & School Furniture Co., Preston, Ont.	45	Kelly's Directories, Toronto and London, England	41
Canadian Otis Elevator Co., Hamilton, Ont.	obo	Kelsch, R. S., Montreal	9
Canadian Portland Cement Co., Deseronto, Ont.	7	Kerr Engine Co., Walkerville, Ont.	43
Canadian Rand Drill Co., Sherbrooke, Que.	34	Kilpaten, A. & Co., New York, N.Y.	11
Cantlie, James A., Montreal	41	Leonard, E. & Sons, London, Ont.	3
Carlin's, Thomas Sons Co., Allegheny, Pa.	10	Leslie, A. C. & Co., Montreal	4
Carrier, Laine & Co., Lenois, Que.	obo	Lewis, Rice & Son, Toronto	35
Case, Egerton R., Toronto	obo	Lewis, Wm. B. & Co., Liverpool, England	33
Cassella Color Co., New York and Montreal	11	London Machine Tool Co., London, Ont.	45
Central Ontario Power Co., Peterborough, Ont.	38	Lowell Crayon Co., Lowell, Mass.	44
Chicago & North-Western Railway, B. H. Bennett, General Agent, Toronto	38	Maryland Casualty Co., Toronto	35
Chicago Pneumatic Tool Co., Toronto and Chicago, Ill.	10	Meadows, Geo. B. Wire, Iron & Brass Works Co., Toronto	47
Coal Trade Journal, New York, N.Y.	45	Metallic Roofing Co., Toronto	37
Commissioner of Crown Lands, Toronto	39	Metallurgical Laboratory, Pittsburg, Pa.	9
Cooper, James, Montreal	4	Mills, S. D., Toronto	9
Cooper, James Mfg. Co., Montreal	4	Milnes, J. H. & Co., Toronto	5
Cowan & Co., Galt, Ont.	47	Montreal Pipe Foundry Co., Montreal	4
Crosby Steam Gauge & Valve Co., Boston, Mass.	37	Montreal Steel Works, Montreal	obo
Darling Bros., Montreal	35	Morgan Construction Co., Worcester, Mass.	34
Dolano-Osborn Engineering Co., Toronto	9	Morrison, T. A. & Co., Montreal	9
Dixon, Jos. Crucible Co., Jersey City, N.J.	41	Morrow, John, Machine Screw Co., Ingersoll, Ont.	39
Dodge Mfg. Co., Toronto	8	McArthur, Cornelio & Co., Montreal	obo
Dominion Belting Co., Hamilton, Ont.	36	McCullough-Dalzell Crucible Co., Pittsburg, Pa.	44
Dominion Motor & Machine Co., Toronto	39	McDougall, R. Co., Galt, Ont.	6
Dominion Oil Cloth Co., Montreal	39	McKinnon Dash & Metal Works Co., St. Catharines, Ont.	obo
Dominion Wire Rope Co., Montreal	39	McLaren, D. K., Montreal and Toronto	36
Drummond, McCall & Co., Montreal, Que	4	Neff & Postlethwaite, Toronto	9
Dun R. G. & Co., Toronto	44	Nova Scotia Steel & Coal Co., New Glasgow, N.S.	4
Edwards, E. J., Toronto	44	Oakey, John & Sons, London, England	3
		Ontario Collection Association, Toronto	9
		Ontario Malleable Iron Co., Oshawa, Ont.	obo
		Ontario Wind Engine & Pump Co., Toronto	43
		Owen Sound Portland Cement Co., Owen Sound, Ont.	7
		Packard Electric Co., St. Catharines, Ont.	12
		Parke, Roderick J., Toronto	9
		Patent Exchange & Investment Co., Toronto	9
		Penberthy Injector Co., Windsor, Ont.	8
		Pennsylvania Fire Brick Co., Lock Haven, Pa.	7
		Perrin, Wm. R. & Co., Toronto & Chicago, Ill.	40
		Peterborough Canoe Co., Peterborough, Ont.	45
		Phillips, Eugene F., Electrical Works, Montreal	13
		Pittsburgh Coal Co., Pittsburg, Pa.	6
		Quebec Central Railway, Shorbrooke, Que.	45
		Queen City Oil Co., Toronto	obo-35
		Reiche & Co., Bradford, England	41
		Rice Lewis & Son, Toronto	35
		Robb Engineering Co., Amherst, N.S.	34
		Rosendale Belting Co., Toronto	obo
		Rountree Publishing Co., Birmingham, Ala.	45
		Samuel, M. & L. Benjamin & Co., Toronto	5
		Scaife, Wm. B. & Sons Co., Pittsburg, Pa.	5
		Scioto Fire Brick Co., Sciotoville, Ohio	7
		Sheldon & Sheldon, Galt, Ont.	13
		Siche Gas Co., Toronto	13
		Simpson, T. T., Deschenes, Que.	9
		Silingsby, H. C. for Canada, Montreal	40
		Smith Woolstock Co., Toronto	42
		Smith's Falls Malleable Castings Co., Smith's Falls, Ont.	obo
		Spence, R. & Co., Hamilton, Ont.	45
		Steel Age, Pittsburg, Pa.	45
		Stevens, Alfred J., Toronto	9
		Storey, W. H. & Son, Acton, Ont.	39
		Stratford Mill Building Co., Stratford, Ont.	33
		Sturtevant, B. F. Co., Boston, Mass.	35
		Syracuse Smelting Co., Montreal and New York	12
		Toronto & Hamilton Electric Co., Hamilton, Ont.	13
		Toronto Iron & Brass Bedstead Co., Toronto	42
		Toronto Paper Mfg. Co., Cornwall, Ont.	42
		Turner, Vaughan & Taylor, Cuyahoga Falls, Ohio	34
		United Electric Co., Toronto	obo
		United Typewriter Co., Toronto	36
		Vogel, C. H., Ottawa	9
		Walkerville Malleable Iron Co., Walkerville, Ont.	obo
		Wardlaw T. D., Toronto	11
		Wentz, R. F. Engineering Co., Toronto	9
		Williams, A. R. Machinery Co., Toronto	37
		Winn & Holland, Montreal	11
		Wilson Bros. Bobbin Co., Todmorden, England	40
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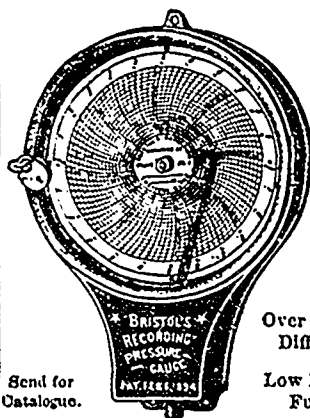
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