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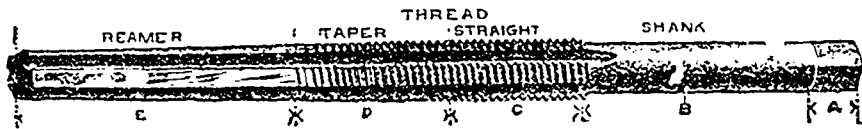
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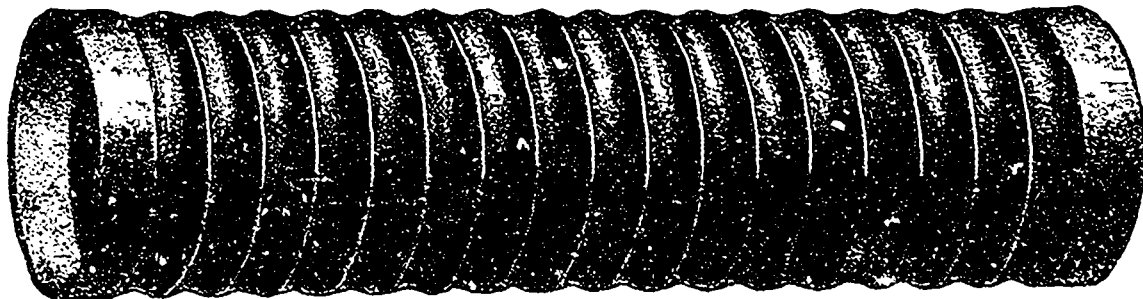
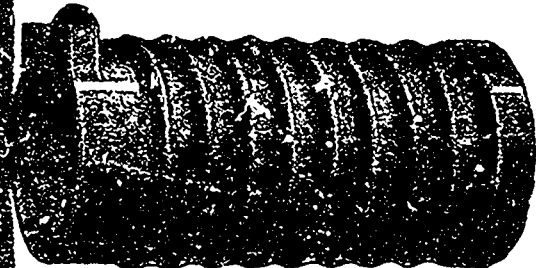
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With Plain Ends or Flanged to any required shape.

Uniform Thickness, Easily Cleaned, Unexcelled for Strength, Unsurpassed for Steaming Capacity.

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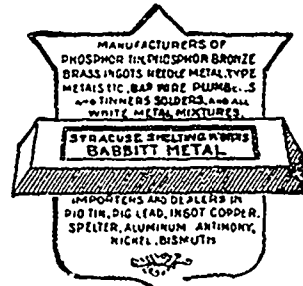
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Operating 2,500 Coal Cars.

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Genuine Thacker Coal

Strongest and Best of West Virginia
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400 Individual Cars.

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MINED IN WEST VIRGINIA.

The Best Bituminous Coal for Steam and Domestic Purposes.

Has a tough and blocky structure.
Smallest percentage of fine coal.
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Not subject to spontaneous combustion.
Nothing better for malleable iron works.
One of the strongest steam coals.

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Anthracite See "Steam," published by Babcock & Wilcox Co., 13,986.

"RED JACKET". Determined by 50 weeks' test at Cincinnati Edison Plant, in 1902, the daily use of the coal tested being two hundred tons, 13,600.

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Water apparently evaporated under actual conditions per pound of coal, 10 1/2 lbs.
Equivalent evaporated from and at 212 degrees per pound of combustible pounds, 12:33.

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From Kanawha, Hocking and Fairmont Mines

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Shipments direct from mines to all points in Canada

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During the year ending June 30, 1904, Canada imported 2,496,068 tons of Anthracite Coal and Coke, valued at \$11,226,346 and 4,661,941, tons of Bituminous Coal, valued at \$9,652,331 and Charcoal valued at \$22,224, upon which duties were paid to the amount of \$2,211,864, there being no duty on Hard Coal or Coke.

EVERY STEAM POWER PLANT IN CANADA USES COAL.

EVERY FOUNDRY USES COKE.

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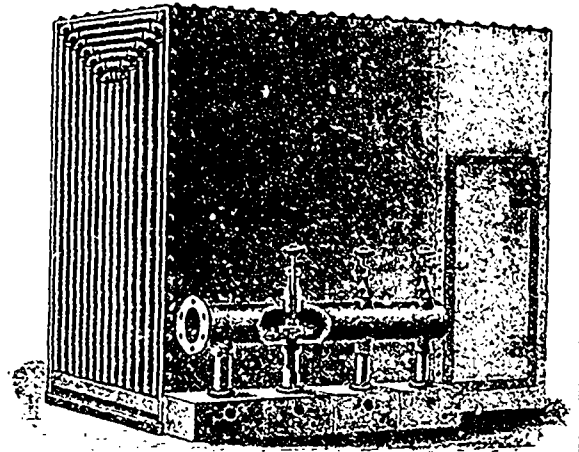
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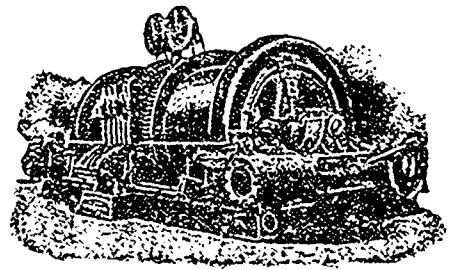
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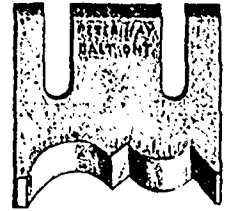
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 Stone Crushers, Concrete Mixers, Rock Drills,
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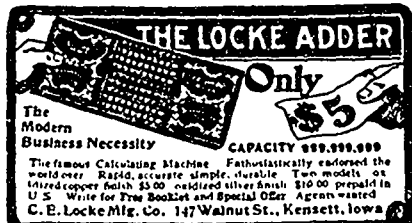
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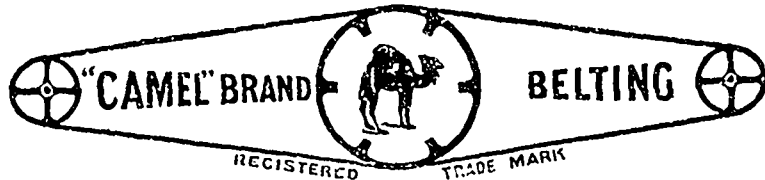
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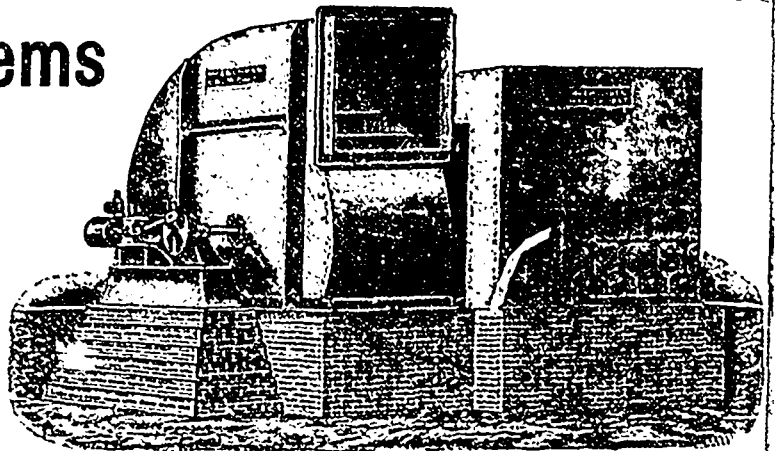
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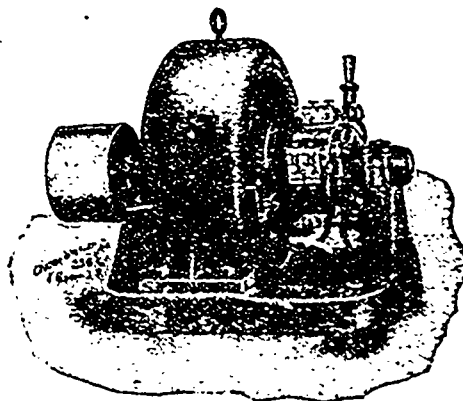
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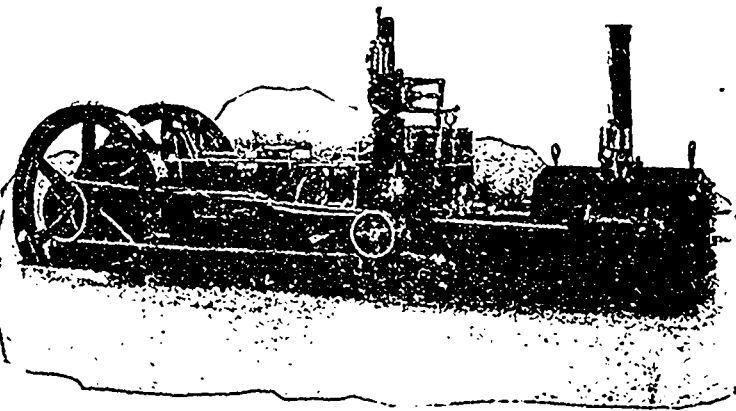
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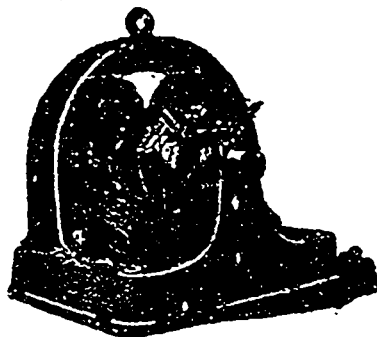
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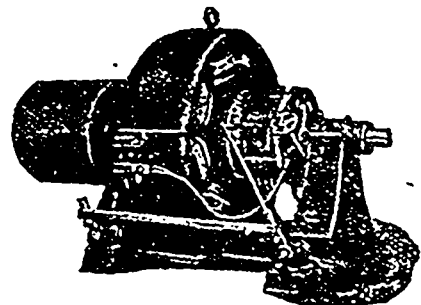
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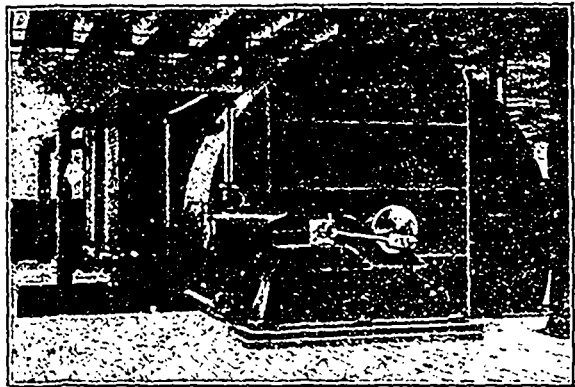
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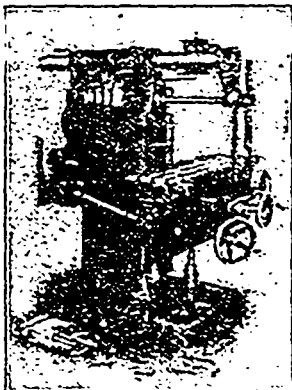
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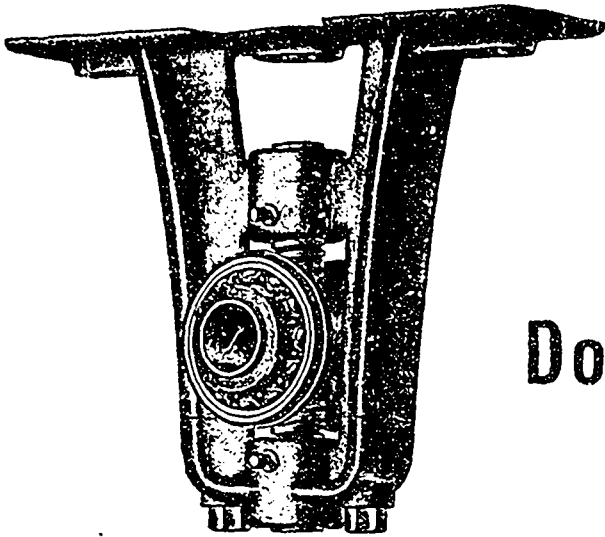
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J. J. CASSIDY, Editor and Manager

Classified IndexPage 41
Index to AdvertisersPage 49

Another Tariff Edition.

As soon as the proposed revision of the tariff has been made and adopted by the Dominion Parliament, thus becoming the law of the land, a full and absolutely correct reproduction of it copied from the official document, will be published in the Canadian Manufacturer. It is impossible at this time to say just when that event will occur, probably about the latter part of next year. In the same special edition will be published in full, as heretofore, the tariff of the United States, both under the one cover, a convenience which will be fully recognized by our readers.

CANADIAN TRADE IN 1905

The total trade of Canada, as shown by statistics prepared by the Customs Department for the fiscal year ending June 30 last, increased about a quarter of a million dollars. There was a falling off during the past year of over eight million dollars in exports of domestic produce, and about two millions in exports of foreign produce, as well as a reduction of about three-quarters of a million in coin and bullion, but this was a little more than made up for in the increased volume of imports for consumption. It is worthy of note that the exports of domestic manufactures for the last year was \$1,250,000 in excess of the previous year. The total aggregate trade of the Dominion on the basis of imports for consumption and domestic exports was \$465,228,307, compared with \$464,981,972 for 1904. The summary of the trade for the past two years is as follows:

	1904.	1905.
Imports for consumption	\$251,460,737	\$261,911,435
Domestic exports	198,414,439	190,854,946
Foreign exports	12,641,239	10,617,115
Coin and bullion..	2,467,557	1,844,811
Totals.	\$464,981,972	\$465,228,307
Duty collected.	40,952,810	42,021,386

The details of the trade are as follows:

	1904.	1905.
Imports—		
Dutiable goods..	\$148,902,381	\$150,914,668
Free goods..	94,684,043	100,688,332
Coin and bullion..	7,874,313	10,308,435
Totals..	\$251,460,737	\$261,911,435
Domestic exports—		
The mine...	\$33,626,739	31,932,325
Fisheries.	10,759,029	11,114,318
Forest	33,091,922	33,235,688
Animals and their products.	63,812,117	63,337,458
Agriculture ..	37,138,875	29,994,150
Manufactures..	19,864,049	21,191,333
Miscellaneous...	121,708	49,675
Totals.....	\$198,414,439	\$190,854,946

PROTECTION MUST BE THERE.

Last week Mr. George, president of the Canadian Manufacturers' Association, had a interview with Mr. Balfour, the Prime Minister, and Mr. Austen Chamberlain, the Chancellor of the Exchequer, and in his speech at last Wednesday's banquet, Mr. George told his hearers something of the message he left with British Ministers. We may be sure that Mr. George was sympathetically received, and learnt from the lips of British Ministers how warmly British public opinion appreciates Canada's general attitude towards the Empire. Mr. George, speaking on behalf of Canadian manufacturers generally, assured British Ministers that Canada did not dream of asking for a protective tariff against the United Kingdom, but she did ask, and must, in her own industrial interests, insist upon a competitive Canadian tariff which would at least put Canadian manufacturers on an equivalent footing with the manufacturers of the United Kingdom, considering the difference in the rates of wages, and the older, wealthier, and more highly specialized character of British undertakings. In a word, there must be a Canadian tariff, but Canadians desired that Great Britain should have absolute fair play, and a paramount and preferential place among all outside caterers for Canadian markets. It is obvious, as Mr. George says, that Canada will, as the years go on, prove to be a much more profitable market for British manufacturers even than it has been in the past, inasmuch as its purchasing power is destined to undergo illimitable expansion as the country develops. We can well believe with what interest Mr. Balfour heard Mr. George's views, for they have a most important bearing on the British fiscal struggle in which Mr. Balfour is at this moment playing so important a part.—Canadian Gazette, London, England.

If there is anything that Canadian manufacturers generally or in any other way dream of and hope for, and are determined to have, if possible, is a protective tariff against the United Kingdom as well as against all other countries. There may be a preferential tariff

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in favor of British merchandise but the protective feature must be there.

BRITISH MANUFACTURERS' ASSOCIATION.

An association of British manufacturers and traders interested in export business, is being formed in Great Britain under the name of the Manufacturers' Association of Great Britain. Its object is similar to those of the Canadian Manufacturers' Association, and the National Association of Manufacturers of the United States, namely, by the co-ordination of the industrial forces and co-operation among the leading manufacturers' and merchants, chambers of commerce and shipping, and like bodies, to promote and expand British trade in foreign and colonial markets. The means by which these objects will be obtained include the appointment of correspondents in all parts of the world to report on openings for trade and local changes and conditions within their respective spheres, and the distribution of such information among firms which it will most benefit.

A trade index to British manufacturers is to be compiled in the chief commercial languages of the world and distributed free to chambers of commerce, leading merchants, and others in the colonies and foreign markets. Information regarding the commercial standing of any firm of merchants, and respecting railway rates and shipping freights all over the world, will be collected and supplied, and a staff will be organized capable of corresponding on technical and commercial subjects in any language, and also of translating into and from English commercial catalogues and similar documents.

One of the main objects of the association will be the systematic dissemination of the knowledge of British goods in all possible over-sea markets.

The Birmingham Daily Post, in commenting on this, speaks of it as evidently an inspired paragraph, and that it would be rather difficult to decide at present as to the soundness of the scheme or its prospects of success; but whether the association is to be formed or not, the Post believes that "one of the most hopeful signs for the future of British industry is the ability of the British manufacturer and merchant to learn from the experience of their competitors," and that "while in the past they have been accused of, and often rightly, being old-fashioned and unable to adapt themselves to the new conditions and requirements of foreign markets, of late there have been signs of that awakening which the Prince of Wales declared necessary." Continuing, the Post says:

At home manufacturers have shown much less hesitation in "scrapping" their obsolete plants, and in the Midlands, in common with other parts of the country, we have had instances where this has been effectively done, and the best ideas have been borrowed from abroad in the re-equipment of factories which now are foremost in maintaining their position in face of domestic and international competition keener than has ever been known before. Whether selling methods in foreign markets have been equally improved is difficult to decide, in view of the absence of visible evidence such as that presented by reorganized factories; but this is known—our export

trade for close upon a year has been steadily expanding both in volume and total value.

Discussing the plan of the British Manufacturers' Association, the Post thinks it is questionable "whether the promoters are not seeking to duplicate machinery which already exists, and of which sufficient advantage is not taken."

ANOTHER NATIONAL RECIPROCITY CONFERENCE.

The establishment of fairer trade relations with other nations is a matter that affects the prosperity of every farmer, stock-grower and exporting manufacturer in the United States is the well thought out conclusion of a number of large and influential associations in that country, the members of which are engaged in many of the industries in the lines indicated. They realize that one by one foreign governments are tightening the coils intended to strangle as far as possible the American export trade in both manufactured goods and agricultural products. They realize that they are now actually face to face with a new and prohibitive German tariff designed to keep out of that country every pound of American breadstuffs and provisions possible. Retaliation has been tried at tremendous cost to American interests and is an entire failure; and now they are further troubled at the knowledge that Canada has a tariff commission whose duty it is to formulate a tariff system, one feature of which will be a schedule intended to force American manufacturers and producers to pay much higher rates when entering this market as long as American tariff charges against Canadian products are of the altitudinous character which now characterizes them.

Standing on the broad platform enunciated by President McKinley in his last speech at Buffalo, the representatives of many of these alarmed Americans industries have called a general conference upon the subject to be held at Chicago, August 16 and 17 to urge the wisdom of substituting in the foreign relations of the United States the principle of reciprocity for that of exclusion and retaliation. They do not care whether the future of their foreign trade be safe-guarded by means of direct reciprocity treaties or under the provisions of a fair drawn maximum and minimum tariff law under the terms of which their government could directly negotiate advantageous international agreements; but the situation demands, in their opinion, the establishment at once of some form of the underlying principle of conceding something to such nations as will concede other valuable trading rights to them. The time is at hand, they say, when the matter of obtaining broader markets for the surplus products, and of guaranteeing the markets they already enjoy, must receive the serious attention of the demands.

The seriousness of the situation regarding this and other important matters touching the prosperity of the United States has impelled President Roosevelt to call an extra session of Congress to assemble November 11, to consider them—that date being only twenty-three days in advance of the first Monday in December, the date named in the Constitution for the annual meeting of the Co-

gress. Of course the "Old Guard" protectionists are alive to the emergency of the occasion, doing all they can to discourage tariff revision of any sort. Still there are those who incline to the maximum-minimum tariff proposition, the effect of which would be to give Great Britain the benefit of all the minimums, in return for her policy of free acceptance of all American goods, and to impose the maximum on all goods received from Germany. This, they argue, would serve the double purpose of punishing Germany and discouraging the Chamberlain movement in Great Britain.

The results of such a policy would probably be: a reduction in the present amount on Germany's exports to the United States; increasing England's exports to the United States by giving her the chance to do the business that Germany is now doing; convincing Great Britain that she can get a square commercial deal without inaugurating the Chamberlain policy, which would favor the colonies against the United States; and protecting America's great and growing trade with Canada against the possible blight that might follow the inauguration of a British tariff union.

The United States will find that the proposed maximum-minimum Canadian tariff will have to be reckoned with in the future.

THE BUREAU OF LABOR REPORT.

The fifth annual report of the Ontario Bureau of Labor was issued last week by Hon. Dr. Reaume, Minister of Public Works. Mr. Robert Glockling, the secretary of the bureau, states that he had been at much pains to provide reliable figures, and the report presents a fair conception of the condition of labor interests and manufacturing industries in the province.

The secretary says that he had been seriously handicapped by the neglect, both of manufacturers and of labor organizations, to reply to the Governments' request for information, and but meagre details were given by those who did reply. Only 174 manufacturers and 227 labor bodies took the trouble to report. The returns, however, afford a fair insight into the operation of the unions and the wage and labor status of the members. A directory of labor organizations in the province is included, which fills 34 pages and appears to be very complete.

Commenting upon the report, Mr. J. F. M. Stewart, Assistant-Secretary of the Canadian Manufacturers' Association, says:—"The figures, so far as Ontario is concerned, are useless except so far as they go to show how valuable a report of this kind could be made if properly collected. When it is considered that only 174 Ontario manufacturers in the province took the trouble to furnish information to the department it will be seen how utterly farcical the report must be."

Mr. Glockling, Secretary of the Labor Bureau, speaking of the criticism of the report made by Mr. Stewart, says that it showed the strength of the contention that the returns should be made mandatory, when Mr. Stewart admitted the value of the figures so far as they go. The opposition to these returns is not confined to Ontario,

and in some of the States opposition was carried so far that it was necessary to make the returns compulsory.

It will be remembered that a few weeks ago when Mr. Glockling sent out a circular to the manufacturers of Ontario requesting certain information regarding their business to be embodied in abstract form in his report, Mr. Stewart, by the direction of the Association, sent an urgent circular to the members instructing them to pay no attention to the request of the Government; and now, when the Government report is published, Mr. Stewart stigmatizes it "farcical." Why should the Association antagonize the Government in the matter?

A NEW NEWFOUNDLAND INDUSTRY.

Not the least of the triumphs of modern scientific methods in man's utilization of natural resources is forecast in the brief announcement just received from the Newfoundland whale fisheries to the extent that Professor Muller has succeeded in domesticating a herd of 50 sulphur-bottom cow whales and has perfected an apparatus for milking them.

The yield of milk from a full-grown whale is from five to seven hogsheads a day. The milk is fresh and sweet and peculiarly rich in nutritive and medicinal qualities. It is much thicker and richer than the best Jersey milk and possesses a peculiarly pleasant and distinctive flavor which those who have tasted it pronounce superior to any known product of the lacteal variety. Chemical analysis has shown that the milk of the sulphur-bottom whale is rich in those same fats and proteids which give to cod-liver oil its value as a remedial food.

Professor Muller's experiments with whales, which have been carried on in comparative secrecy for several years, have resulted in many remarkable discoveries in the line of utilizing the different parts of the huge carcasses which have hitherto gone to waste.

He has devised a process for curing and preserving the tons of meat which has always been considered worse than valueless. The meat, which compares favorably in texture and flavor with the average beef, will soon be put upon the market. The company has assurances that it will find ready sale in the West India islands and other tropical countries which now depend for their meat supply on the South America jerked beef.

Professor Muller has invented and patented a process for making leather from the intestines, pleural sacs, heart coverings and other internal membranes of the whale which, when tanned and finished, is of great durability and finer texture than any known leather. Besides its superior quality, the whale leather furnishes single pieces of much greater dimensions than it is possible to procure from any other animal. It is possible, according to the inventor, to obtain from the skin of a full-grown sulphur-bottom whale a strip of leather about 300 feet in length and 3½ feet in breadth. From the pleural lining a tube of leather 25 feet in diameter can be obtained.

Processes for grinding the mammoth skeletons into bone meal for fertilizers, and of converting the gristle and

cartilage into glue and like products, are among the minor inventions of the expert, who has secluded himself for the last five years at a little fishing village and turned his attention to the study of whales.

THE WAY THEY DO IT.

The extent to which the commercial affairs of some countries is looked after, and the methods of doing it is explained in a recent British Parliamentary blue book entitled "Reports on the Administration and Functions of Ministers of Commerce" in foreign countries. These reports have been forwarded by British ambassadors and ministers in answer to a circular sent out by the Government, and show clearly that all the chief trading countries of the world have reformed their administration of commercial affairs since June 1889, when the last return on the subject was made. The only important countries in the world which have no Government Department of Commerce are Belgium and Russia. In other countries, again, the same department combines the supervision of commerce and agriculture. This is the case in Italy, which has one single ministry of Agriculture, Industry and Commerce.

The Austrian Ministry of Commerce, which was one of the first to be established, includes postal, telegraph, and telephone business in its functions. The Hungarian Ministry is subdivided into eight departments, one of which is the Department of Foreign Trade. The United States was the latest to establish a Ministry of Commerce, though even here, nominally at least, a Ministry of Labor is combined with that of Commerce. The operative clauses of the Act constituting this new Department and defining its duties may be summarized as follows:—1. That it shall be the province and duty of said Department to foster, promote and develop the foreign and domestic commerce, the mining, manufacturing, shipping and fishery industries, the labor interests, and the transportation facilities of the United States. 2. That there shall be in the Department of Commerce and Labor a bureau to be called the Bureau of Manufactures, and a chief of said bureau, who shall be appointed by the president, and who shall receive a salary of \$4,000 per annum. It shall be the province and duty of said bureau, under the direction of the secretary, to foster, promote, and develop the various manufacturing industries of the United States, and markets for the same at home and abroad, domestic and foreign, by gathering, compiling, publishing, and supplying all available and useful information concerning such industries and such markets, and by such other methods and means as may be prescribed by the secretary or provided by law. Consular reports are to be addressed to this Department. 3. There shall be in the Department of Commerce and Labor a bureau to be called the Bureau of Corporations, and a Commissioner of Corporations. The said Commissioner shall have power and authority to make, under the direction and control of the Secretary of Commerce and Labor, diligent investigation into the organization, conduct and management of the business of any corporation,

joint-stock company, or corporate combination engaged in commerce among the several States and with foreign nations, excepting common carriers subject to "An Act to Regulate Commerce," approved February 4, 1887, and to gather such information and data as will enable the President of the United States to make recommendations to Congress for legislation for the regulation of such commerce, and to report such data to the president from time to time as he shall require; and the information so obtained, or as much thereof as the president may direct, shall be made public.

France and Germany also combine the Ministry of Commerce with the Ministry of Labor. France places her technical instruction in this Department, as also some extent does Germany. The institution in France dealing with the new work proposed to be given to the suggested Ministry of Commerce in England is the "National Office for Foreign Trade" attached to the Ministry of Commerce and Industry. This establishment was created in virtue of a decree of March 4, 1898, in accordance with an agreement between the Paris Chamber of Commerce and the Ministry of Commerce and Industry and was instituted with a view to "supply French manufacturers and merchants with commercial information of every kind calculated to contribute to the development of foreign trade and to the extension of markets for French goods in foreign countries, the French Colonies and Protectorates." The office is under the control of an Administrative Council, presided over by the Minister of Commerce and Industry, and by a Directing Committee of which the President of the Chamber of Commerce is chairman. The Council is composed of notable commercial men and certain Government officials, comprising the Director-General of Commerce, the Director-General of Customs, the Director of Consulates, two Directors from the Ministries of Commerce and Agriculture, the Director of Railways attached to the Ministry of Public Works. The Paris Chamber of Commerce grants an annual subvention of £2,160, and subscriptions received from the principal Chambers of Commerce in France. A small extra tax is further levied on the licenses in Paris for the maintenance of the establishment.

In accordance with the terms of the agreement for the creation of the National Office for Foreign Trade, it is stipulated that, with a view to supplement the commercial information furnished by the Diplomatic and Consular services, the Minister of Commerce should nominate correspondents, holding the honorary title of "Consul du Commerce Extérieur," from among the most notable French manufacturers, and merchants established in Paris, the Colonies, and abroad, carrying on an import and export business. These commercial advisers, whose functions are gratuitous, are nominated for a period of five years, which may be renewed, and appointments have now been made in practically all the important centres of trade throughout the world. Their duties consist in furnishing information to the Ministry of Commerce and the National Office for Foreign Trade on matters likely to contribute to the development of commerce.

The Prussian Ministry of Commerce includes many functions distributed in England between the Home Office, the Local Government Board, and the Board of Trade. For Germany as a whole the Minister of the Interior is responsible for many of the duties assigned to the Department of Commerce in Prussia. Among the numerous committees and offices between which its work is distributed the following are especially noticeable:—

(1) An Exchange Committee, which gives expert opinions on matters affecting stock exchange business. (2) The Statistical Office, whose duty it is to collect, investigate, and elaborate Imperial statistics, especially for commerce and industries; to collect any statistical data required, and to give opinions on statistical subjects. A special branch of this office is charged with the scientific examination and collation of information bearing on the economic and social conditions of the wage-earning classes.

EDITORIAL NOTES.

It has been officially announced that the Committee of Ministers who are to enquire into the operation of the customs tariff, with a view to some revision at the next session of Parliament, will enter upon their work about the end of August or the beginning of September. They have not yet decided upon the dates of sittings for any particular place, but a programme for the earlier part of the enquiry will shortly be announced. In the meantime the Ministers desire that all parties interested in the matter and wishing to be heard before the committee, shall at once prepare such information as they intend to submit and select representatives who are to appear. All communications respecting the enquiry should be directed to Mr. John Bain, Assistant Commissioner of Customs, Ottawa, who is to act as secretary.

About \$340,000 was paid in bounties on coal oil produced in Canada during the last fiscal year. At the rate of 1½ cents per gallon this would represent a net output of some two and one-quarter millions of gallons of crude petroleum. This output of Canadian wells is far short of the total consumption. In addition to the home production there was imported during the year about twenty-two million gallons of coal oil, naphtha, gas oil and the like products of petroleum.

President Roosevelt has decided, it is said, to call an extra session of Congress to begin November 11. In his message the President will lay stress upon the necessity of railroad legislation, and the tariff will undoubtedly receive attention. It is also intimated that some plan will be presented for congressional consideration to overcome the organized boycott by the Chinese against American trade in retaliation for the exclusion act now in force. Mr. Roosevelt feels he has gone as far as he can in modifying and lightening the strict enforcement of the law by saving Chinese merchants and travelers from annoyance in entering the United States. His efforts apparently have had little effect in China.

A telegram from Washington says:—Commercial retaliation against Germany for her recent hostility to-

wards the United States is likely to be one of the most important questions at the next session of Congress. The proposal of a maximum and minimum tariff is known to be receiving serious consideration in influential quarters. By giving Great Britain the benefit of all minimums in return for her policy of free acceptance of all American goods received at American ports from Germany, the double purpose would be served of punishing Germany and discouraging the Chamberlain movement in Great Britain. The effects of such a plan, it is urged by the leading members of Congress who oppose tariff revision, would include these:—Effective retaliations against Germany, reducing the amount of Germany's exports to this country; increasing England's exports to this country by giving her a chance to do the business Germany is now doing; convincing Great Britain that she can get a square commercial deal without inaugurating Chamberlain's policy, which would favor the colonies as against the United States; protecting America's great and growing trade with Canada against a possible blight that would follow the inauguration of a British tariff union; and forcing an issue in Germany, as between agrarians and industrials, which would probably result in a more moderate tariff policy in that country to America's ultimate advantage.

Canada's increasing consumption of products of the United States continues to be a notable feature of American commerce. Figures just compiled by the Department of Commerce and Labor, through its Bureau of Statistics, show that exports from the United States to the Dominion of Canada grew from \$51,903,579 in the ten months ending with April, 1897, to \$104,155,893 in the ten months ending with April, 1904, and to \$114,943,079 in the corresponding period of 1905. The increase here noted, says the Bulletin of the American Iron and Steel Association, is but a continuation of the growth which, with trifling exceptions, has characterized American trade with Canada since 1870. During the period from 1855 to 1866 a reciprocity treaty was in operation between the United States and Canada; from 1867 to 1897 commerce between the two countries was unaffected by special trade arrangements; from April, 1897, to August, 1898, the United States was placed at a slight disadvantage as compared with the United Kingdom, products from that country entering the Dominion being admitted at a reduction of 12½ per cent. as compared with the duties charged on importations from the United States. On August 1, 1898, this reduction in favor of the United Kingdom was increased to 25 per cent., and on July 1, 1900, was still further increased to 33½ per cent. The popularity of American goods, however, in conjunction with the advantages of contiguity, has served to maintain and even increase the volume of exports from the United States to Canada, despite the varying conditions to which our trade with that country has been subjected. In the fiscal year 1855, the first year of reciprocity with Canada, our exports to that country were \$27,741,808 in value; in 1866, the closing year of the reciprocity period, \$24,828,880. In 1897, the year which inaugurated the policy by which Great Britain and certain of her colonies were given the benefit of a special reduction in duties charged upon importations into Canada, our exports to that country were \$64,928,821, and each succeeding year has shown an increase, the total in 1904 having been \$131,274,346, while for the present fiscal year the total will be in excess of \$140,000,000.

MACHINERY AND ENGINEERING.

DRAINAGE OF THE INTERBOROUGH RAPID TRANSIT RAILROAD UNDER THE HARLEM RIVER.

Probably one of the most important engineering problems encountered in the building of the New York Rapid Transit Subway was the construction of the two tunnels, or tubes, under the Harlem River. These two tubes, through which the Subway trains are

above the ground, and then sunk to the bottom of the river; instead of having been forced through the mud under the river bottom, as had been done in such work heretofore. These twin tubes are 641 feet in length and are 16 feet in diameter, the top of the tunnel being 20 feet below the low water mark. Before the tubes were put in place, the Engineering Department of the Subway Contractors devised a system for

the breaking of a water main. The drainage and pumping system adopted, and the precautions taken to meet the possible conditions are graphically described and explained in the accompanying illustrations.

Illustration Fig. 1. shows a sectional view of the tunnel looking south-west, and showing the arrangement of the pumps which are in position in both of the tubes at the junction of the Subway and mouth of the tunnel at

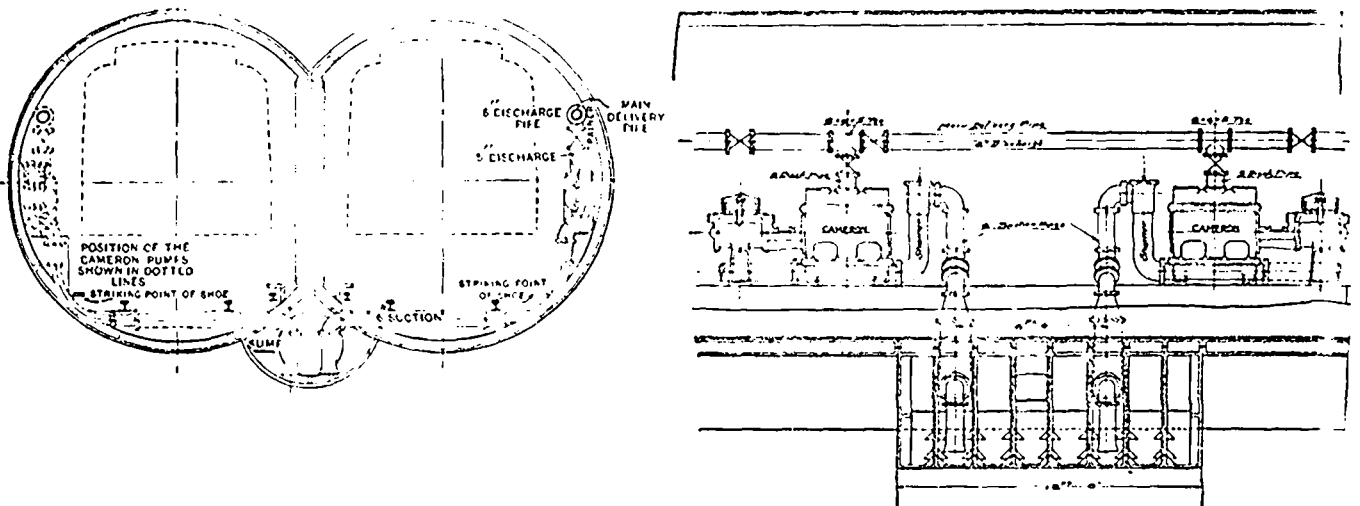


Fig. 1—SECTIONAL VIEW OF TUNNEL.

to run regularly, from the Lenox Avenue Subway continuing to the Bronx Subway, were constructed on an entirely new engineering principle; having been built of concrete

the drainage of the seepage, or the water percolating through the walls of the tubes, and also in case of emergency arising from the sudden inrush of water in the event of

Harlem River. Special pumps were adopted for this service, having been especially designed and built by the A. S. Cameron Steam Pump Works, having their general offices

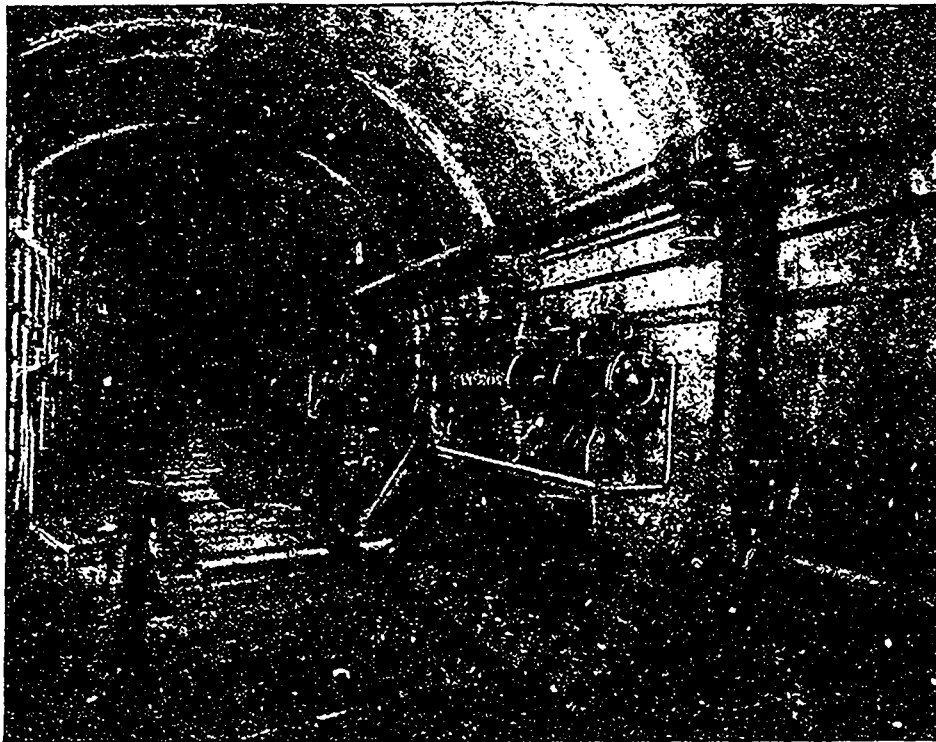


Fig. 2—SHOWS TWO OF THE PUMPS IN POSITION ON CONCRETE FOUNDATIONS WITH ARRANGEMENT OF AND CONNECTIONS.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER

and works at the foot of East 23rd Street, New York. A longitudinal arrangement of the piping and connections for the pumps is shown on the right hand side of this illustration.

Figs. II. and III. are reproductions of photographic views taken in the tubes, and show the inside construction of the tunnel with pumps in position. In the first of these two views a portion of the end of the concrete archway is shown, and it is at this point where the two tubes are joined, and the double tracks continue in one tunnel.

Fig. II. shows two of the pumps in position on concrete foundations, with the arrangement of piping and connections. Four of these pumps were installed, being of the size 12x12x18, and are of the simplex single cylinder pattern, having the Cameron regular pattern steam end, which is equally efficient with compressed air or with steam;

to them, the extreme width being only 19 inches; nevertheless they have ample water valve area. The water valves are set in removable valve decks, allowing them to be easily removed with minimum time cost. The suction valves are placed under the water cylinder, and the discharge valves are shown above the water cylinder.

Each of the pumps are separately and independently connected and are also designed with the suction and delivery flanges looking fore and aft, permitting the arrangement of the suction pipes as shown, with the pipes running under the "air end," and the foot under the air end made in two parts, straddling the six inch suction pipe, permitting the piping to be readily removed.

Each of these pumps is capable of delivering 600 gallons of water per minute while running at a normal speed, with an air pressure at the throttle of about 70 pounds per

These pumps have already been severely tested owing to the discovery of water in the tunnel some time ago, when temporary piping and connections were hurriedly made and the pumps were pressed into use at short notice, being in operation day and night, and performing good service; the inflow of water being entirely taken care of, and causing but a slight interruption in the completion of the work.

Another meritorious feature of these pumps, as well as in all types of Cameron pumps, is found in the design and construction of their operating mechanism, which has but few working parts, and no outside valve gear or rods to become broken or to get out of alignment.

Floating timbers and debris, which are oftentimes the cause of damage to submerged pumps, can do no harm to Cameron pumps, as the working parts are not exposed.



Fig. 3—DEFINES MORE CLEARLY THE OUTSIDE CONSTRUCTION OF THE PUMPS.

the motive power for these pumps being compressed air. Each of these pumps have their separate air lines to the compressor plant which is situated over three-quarters of a mile away above ground. The pumps are controlled automatically by separate floats located in the tunnel. The automatic float for one of the pumps is shown in the illustration along the wall on the left hand side. The other pump, in the distance, has its automatic float nearer the floor and attached to the pump. An air reservoir 16 inches in diameter by 36 inches long is arranged in the air pipe line at the throttle of each pump. The suction piping is also shown extending into the pump, the top of which is protected by iron gratings.

Fig. III. defines more clearly the outside construction of the pumps, the distinctive feature of which is the construction of the water cylinders, which necessarily are very compact, owing to the limited space allotted

square inch, and a total lift of 70 feet. The capacity could be increased to 1,000 gallons per minute in case of emergency.

The valve chambers are so constructed as to permit of easy access for inspection and necessary repairs. The water piston and rods are of composition, and owing to the liability of the water being dirty and very gritty, the water cylinders are constructed with removable composition metal bushings. The suction pipes of the pumps are supplied with Cameron strainers of the gooseneck pattern to keep out the dirt and rubbish and to insure the priming of the pumps by keeping the suction chambers filled with water; thus the cylinders will be flooded with water at all times, permitting the pumps to be started up at any time by the automatic floats. In the event of the water rising, each of the pumps would immediately start pumping as soon as the water would reach the float level.

Often a Cameron pump has been submerged under water for weeks and has kept right on pumping to the limit of its capacity until it has cleared the shaft or mine.

The Jenckes Machine Co., Sherbrooke, Que., are Canadian agents for the A. S. Cameron Steam Pump Works, and carry in stock full lines of Cameron pumps; also illustrated catalogues relating to them, printed in all languages, which are obtainable on request.

Mr. R. A. Broomfield, Pittsburg, Pa., secretary of the Dominion Natural Gas Co., was in Toronto recently in connection with that company supplying the city with natural gas at the rate of forty-five cents per thousand feet. The fields of the supply of gas are located between Dunnville and Port Dover, Ont., running along the lake shore a distance of forty miles, and sixteen miles in width of proven territory.

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.

Some of the contracts being filled by the Polson Iron Works Co., Toronto, are as follows:—A 24-inch hydraulic suction dredge for the Dominion Government, to be completed and listed here, and delivered this fall at Prince Edward Island; a 15-inch dredge of the same kind for Toronto, valued at \$52,000, to be used at the Island, and a snag-boat for use in the rivers of Manitoba, for removing trees and other obstructions. The Government steamers Speedy and Aberdeen are being supplied with new boilers, and undergoing extensive repairs to the hulls as well. Both will be used on the St. Lawrence, and are for the Departments of Public Works and Marine respectively.

The Canadian Northern Railway Co., will build a new boiler house at Kenora, Ont., to cost about \$20,000.

The Toronto & Niagara Power Co. will not only bring Niagara power to Toronto, but will act as a distributor for practically the whole Western Ontario peninsula.

The Toronto Incandescent Light Co., Toronto, are building an addition to their power house.

W. H. Green, Teeswater, Ont., is considering installing additional apparatus to the electric light plant there.

The town council of St. Mary's, Ont., is considering the extension of the electric light plant.

The Maple Leaf Automobile & Electrical Mfg. Co., London, Ont., manufacturers of motors, etc., have succeeded Messrs. Barton & Co.

The Goldie & McCulloch Co., Galt, Ont., received the contract for the supply of engine, condenser, pump and piping for Guelph, Ont.

The Canadian Pacific Railway Co. are considering installing an electric plant at Owen Sound, Ont., for lighting their buildings and for the operation of the coal hoisting plant.

The town council of Newmarket, Ont., are contemplating extending the electric light system.

Messrs. W. J. Stevenson and W. J. Nediger have taken over the electric light plant at Clinton, Ont.

The Grand Trunk Railway will erect a new round house at Hamilton, Ont., at a cost of about \$20,000.

Messrs. Fetherstonhaugh & Co., patent barristers, Toronto, Montreal, Ottawa and Washington, D.C., have recently obtained Canadian patents for the following:—H. E. Soullard, Lambton, Que., lanterns; F. M. Howard, Hamilton, Ont., organs; Theo. Malo, Montreal, game boards; Thos. Pilgrim, Toronto, tuning pins for pianos; W. T. Watson, Vancouver, B.C., signs; H. A. Sheldon, Aylmer, Ont., handles for trucks; H. L. Gullin, Granby, Que., tents; W. I. Hogarth, Ingersoll, Ont., advertising devices; E. L. Ethier, Montreal, ballot boxes; J. J. Cassidey, Toronto, ballot boxes; D. C. Ferguson, Ottawa, ballot boxes; A. Welsh, Kincardine, Ont.,

rotary cement block machines; J. R. Smith, Ottawa, ballot boxes; Austin Berry, Ottawa, adjustable suspenders for electrical devices.

The Department of Public Works, Ottawa, have awarded the following contracts recently:—Addition to Toronto Drill Hall, Wickett Bros., Toronto, at a cost of \$16,000; Rondeau harbor, construction of two breakwaters, to the Pacific Construction Co., Ottawa, to cost \$110,000; Port Burwell harbor, dredging to the Dominion Dredging & Construction Co., Ottawa; Kaministiquia River, Fort William and Port Arthur harbors, dredging to A. F. Bowman, and dredging at Hawkesbury, Rigaud, Como and St. Andrew's, to L. Cohen & Son, Montreal; and New Carlisle wharf extension to Henry & Smith, Ottawa, to cost \$20,000.

E. W. Backus and associates will be incorporated as the International Lumber Co. to operate a sawmill with a capacity of 25,000,000 feet of lumber per year, at Fort Frances, Ont.

Emery & Thompson, Fort Frances, Ont., will increase their sawmill plant.

The Toronto Ferry Co., Toronto, are having plans prepared by the Canadian Shipbuilding Co., Toronto, for two new ferries to have a capacity of 1,800 passengers. They will cost about \$50,000 each.

The Canadian Shipbuilding Co., Toronto, are building a tug and two steel barges for the Great Lakes Dredging Co.

The United Gas & Oil Co., Windsor, Ont., struck a large well near Wheatley, Ont. It has flowed 150 barrels and is still flowing.

The Michigan Central Railroad, St. Thomas, Ont., will expend \$190,000 for improvements in their shops and equipment at that place.

The values represented by permits issued in Toronto for three days amount to \$234,000. The Henderson Roller Bearing Co. will erect a \$30,000 brick and stone factory; J. W. Lee & Co., a brick and stone factory to cost \$9,000; the Imperial Bank, a new branch office to cost \$16,500, and Mr. John Ross Robertson, a new nurses' home for the Sick Children's Hospital, to cost \$60,000.

The Windsor Hotel, Mimico, Ont., was destroyed by fire, July 23. Loss about \$10,000.

Capt. Doty of the Goderich Engine Works, has purchased of the Cleveland underwriters the hull of the steamer City of Collingwood which was recently burned, paying \$15,000 for the wreck. He will probably rebuild her at the Collingwood, Ont., dock. The passenger steamer Lincoln, formerly on the Windsor and Pelee Island route, which was burned at Sandwich two months ago, is now being rebuilt at Goderich, Ont., by Captain Doty, who also purchased that wreck.

The ratepayers of Waterloo, Ont., have voted favorably on a by-law to spend \$3,000 for improvements to the town and fire halls.

A pork packing plant will be erected by the D. Gunn Co., at Toronto Junction, Ont., at a cost of about \$225,000.

The meteorological observatory will be transferred from Toronto to Ottawa a year hence, a building now being erected for that purpose.

The dredge, Sir Wilfrid Laurier, which sank on October 6, 1902, while being towed from Polson's Shipyard, Toronto, to Montreal, has been located in 78 feet of water between Newcastle and Port Hope.

The archbishop of St. Boniface, Man., has decided to have the new church at Rainy River, Ont., proceeded with at once. It will cost about \$6,000.

The Baptist congregation of Fort William, Ont., will erect a church building to cost about \$10,000.

John Galt, C.E., Toronto, has submitted his report on a water supply for Fort William, Ont., which he estimates will cost \$215,000 made up as follows:—Loch Lomond and tunnel, \$120,000; 16-inch supply main \$17,000; compensating steel storage tank, \$16,000; 18-inch cast iron main, \$48,000 river crossing, \$14,000.

It is stated that the Grand Trunk Railway Co. will build a spur line on the west side of the Welland Canal to reach the large 2,000,000 bushel elevator, which is being built by the Government.

The Power & Gas Machine Co., Galt, Ont. will erect a plant for the manufacture of cement blocks.

The ratepayers of Stratford, Ont., have voted favorably on a by-law guaranteeing the bonds of the Dominion Thread Co. for \$30,000. The company agree to erect an up-to-date factory immediately.

The Canada Fence Co., are considering establishing a factory at Ingersoll, Ont. to cost about \$30,000.

L. Christie, Fort Frances, Ont., will erect a two story block at that place at a cost of about \$16,000.

It is understood that the Pittsburg Building Co. have been organized to erect three hundred dwelling houses in the factory section of Hamilton, Ont., chiefly for the purposes of the employes of the Canadian Westinghouse Co.

The Electrical Development Co. of Ontario, whose construction of a transmission line between Niagara Falls and Toronto is nearing completion, have decided to extend their line westward to London, Ont., as quickly as possible, touching at Brantford, Paris, Ingersoll, Woodstock and intermediate points.

The International Bridge Co., will erect at Fort Frances, Ont., a combined passenger street car and railway bridge at that place.

The Keewatin Flour Mills Co., Keewatin, Ont., will erect a mill with a capacity of 6,000 barrels per day and a storage capacity of 500,000 bushels, to cost about \$750,000.

A sanitarium for consumptives will be erected at Galt, Ont., for further particulars of which address Premier Whitney, Toronto.

The Elmira Upholstering Co., Elmira, Ont., will erect a 60x60 foot factory, three stories high.

The Grand Trunk Railway Co. will build a subway at Port Hope, Ont.

The Grand Trunk Railway Co. will erect a depot at Guelph, Ont., at a cost of about \$50,000.

The Dryden Pulp Mills, Dryden, Ont., will erect a large factory at that place, the town having granted them exemption from taxation for twenty years.

The Grand Trunk Pacific Railway is negotiating with the Canadian Northern Railway for the purchase of the property now being used as coal docks.

Wallingford Bros., Limited, Ottawa, have been incorporated with a capital of \$45,000, to carry on a mining, milling and reduction business. The provisional directors include Edward Wallingford and S. Shirley, Ottawa.

The Brading Brewing Co., Ottawa, have been incorporated with a capital of \$100,000, to carry on a business of brewers, maltsters, etc. The provisional directors include Harry Brading and W. T. Brading, Ottawa.

Messrs. Haney & Miller, Montreal, have been awarded the contract for the new breakwater at Port Stanley, Ont., for \$100,000.

The Fielding Chemical Co., Limited, Guelph, Ont., have been incorporated with a capital of \$40,000, to manufacture chemicals, drugs, etc., and to acquire business of Colonial & Chemical Co. The provisional directors include W. J. Fielding, Edward Fielding and G. C. Campbell, Toronto.

The Horse Shoe Quarry Co. have increased their capital stock from \$40,000 to \$100,000.

The Eastern Coal Co., Toronto, have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business. The provisional directors include J. S. Lovell, S. G. Crowell and W. H. Blake, Toronto.

The Lawrence Dairy Supply Co., Ottawa, have been incorporated with a capital of \$25,000, to manufacture cheese factory outfits, etc. The provisional directors include W. S. Lawrence, Ottawa; J. F. McGregor, Alexandria, Ont., and K. C. Turnbull, Stratford, Ont.

The Spider Lake Mining Co., Windsor, Ont., have been incorporated with a capital of \$1,000,000, to carry on a milling, mining and reduction business. The provisional directors include H. D. Keller, A. H. Reehm, Detroit, Mich., and A. R. Bartlett, Windsor, Ont.

E. Bowrick's two elevators at Shelburne, Ont., were destroyed by fire July 26. Loss about \$30,000.

The Bond Hardware Co., Guelph, Ont., have been incorporated with a capital of \$100,000, to carry on a hardware business. The provisional directors include J. M. Bond, W. G. Bond and T. A. Keating, Guelph.

The Ogden Oil Co., Windsor, Ont., have been incorporated with a capital of \$50,000, to bore for oil, gas, etc., and to construct pipe lines. The provisional directors include W. W. Taberner, Chicago, Ill.; J. W. Hanna, Windsor, Ont., and Frederick Rehm, Detroit, Mich.

The cheese factory of Mr. May, at Cornwall, Ont., was destroyed by fire July 28.

The building of the Knickerbocker Ice Co. Toronto, was destroyed by fire July 28. Loss about \$6,000.

At a meeting of the Board of Trustees of the Toronto Free Hospital for Consumptives held in Toronto a few days ago, it was decided to erect a new building and install a new heating plant for both the new and

existing buildings. The cost of building and equipment will be about \$20,000.

The Huyler Co., chocolate manufacturers, New York City, have purchased property in Toronto, where they will establish an up-to-date building for the sale and manufacture of chocolates, etc.

J. T. Woods, Ottawa, manufacturer of tents, shanty supplies, etc., will erect a large branch factory in Hull, Que.

The Durham Rubber Co., Bowmanville, Ont., have turned the first sod of the ground for the new factory. The town granted the company a bonus of \$15,000.

The American Radiator Co., of Chicago, Ill., have recently acquired the foundry plant of the Cockshutt Plow Co. at Brantford, Ont. They will rapidly remodel these works with a view to making lines of "Ideal" steam and water boilers, for which a good demand already exists throughout the Dominion. The company will not for the present manufacture radiators there.

The contracts for supplying the provincial institutions have been awarded by the Ontario Public Works Department as follows:—Wm. McGill Coal Co., Toronto, receive the contract for supplying coal for the Normal and Model Schools, Osgoode Hall, Government House, School of Practical Science and the Parliament Buildings. The Imperial Coal Co., Toronto, got the contract for supplying the soft coal, lump size, to all the above-mentioned buildings with the exception of the Parliament Buildings.

The steamer Argyle struck a rock near Oshawa, Ont., July 29, causing considerable damage to her hull. The Donnelly Wrecking Co. have placed her in dry dock at Kingston, Ont.

The Monarch Supply Co., Toronto, have been incorporated with a capital of \$6,000, to produce electricity for lighting, heating and power purposes. The provisional directors include J. S. Lovell, W. W. McNeill and W. F. Ralph, Toronto.

The Chester Construction Co., Toronto, have been incorporated with a capital of \$40,000, to carry on the business of a land company. The provisional directors include Duncan Donald, G. W. Mason and H. S. White, Toronto.

George J. Foy, Limited, Toronto, have been incorporated with a capital of \$400,000, to manufacture mineral waters, cigars, etc. The provisional directors include F. J. Foy, G. J. Foy, Jr., and R. L. Blatchford, Toronto.

The Toronto Launch & Engine Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture boats, launches, steam and gasoline engines, etc. The provisional directors include G. E. Buck, J. C. McLaughlin and R. G. Copeland, Toronto.

The Canadian Towing & Wrecking Co., Port Arthur, Ont., have been incorporated with a capital of \$100,000, to carry on a general dredging, wrecking and towing business, and to build steamboats, tugs, scows, dredges, etc. The provisional directors include J. T. Horne, Fort William, Ont.; C. M. Bowman, Southampton, Ont., and James Whalen, Port Arthur, Ont.

The Loughborough Mining Co., Sydenham, Ont., have been incorporated with a capital of \$10,000, to carry on a mining, milling and reduction business. The provisional di-

rectors include M. F. Westover, Edward Clark, Schenectady, N.Y., and G. W. McNaughton, Sydenham, Ont.

Berry Bros., Limited, Walkerville, Ont., have been granted a license to do business in Canada with a capital of \$100,000.

The Dominion Natural Gas Co. have increased their capital from \$500,000 to \$1,000,000.

Arch'd W. Smith & Partners, Limited, Toronto, have been incorporated with a capital of \$20,000, to carry on a business of printers, publishers, etc. The provisional directors include A. W. Smith, A. M. Wickens, Toronto, and J. A. De Camp, New York City.

The Architectural & Engineering Co. of Canada, Ottawa, have been incorporated with a capital of \$10,000, to carry on a business of architecture and architectural engineering. The provisional directors include C. P. Band, Toronto; C. J. Burritt, Ottawa, and H. E. Ewart, Winnipeg, Man.

One of the largest ice-breaking tugs ever built in Canada was launched at the shipyards of the Canadian Shipbuilding Co., Toronto, a few days ago. The tug has been built for the Great Lakes Dredging Co., and will be used in keeping Port Arthur, Ont., harbor open during the winter, besides its regular work in connection with the dredging of the harbor there. The tug is of the following dimensions—Length over all, 110 feet; length of keel, 98 feet; breadth of beam, 24 feet; draft of water, loaded, 12 feet. The machinery is of the fore and aft compound type, with cylinders 20" and 40" by 36" stroke, turning a steel screw propeller 10 feet in diameter.

The Upper Ottawa Improvement Co., Ottawa, will bring 3,000,000 logs down the river this summer.

The Rathbun Co., Deseronto, Ont., have acquired the old Gilmour sawmill at Trenton, Ont., and will put it in operation in the near future, employing several hundred men.

The Consolidated Hardware Co., Hamilton, Ont., manufacturers of hardware, wire goods, tacks, etc., will commence operations immediately.

The building of the Michigan Central Railway double tunnel under the Detroit River, to cost upward of \$10,000,000, will provide an immense amount of work for a foundry plant, and it is likely that a plant costing \$500,000 will be a profitable investment. As the tunnel is to be constructed from the Windsor end direct to the Detroit terminal before the surface is disturbed on the Detroit side, it is quite possible that the foundry may be located on the Canada side of the river and built of Canadian material to avoid the duties which would have to be paid on the material if imported from the United States.]

The City Council of Stratford, Ont., have passed an agreement to grant \$30,000 to the Canadian Pacific Railway Co. for the purchase of a right of way to enter the city and also to grant a right of way on city property.

George Sterne & Son, Brantford, Ont., manufacturers of fireproof putty and cement building blocks, will erect a factory 40x30 feet, two stories high.

The Grand Trunk Railway Co. will enlarge their freight shed at Brantford, Ont., 75

feet, and will erect an agent's office 60x40 feet.

The Waterous Engine Works Co., Brantford, Ont., recently delivered a new steam fire engine to the corporation of the City of Toronto. The engine has a capacity of 1,200 gallons per minute.

The Lake of the Woods Milling Co., will erect an elevator near Midland, Ont.

The Michigan Central Railway Co. will expend \$100,000 for improvements and equipment at their St. Thomas, Ont., shops.

An opera house will be erected at Berlin, Ont., at a cost of about \$35,000. McPhee & Mahoney, Guelph, Ont., are preparing the plans.

McKie Bros., Plattsville, Ont., are removing their carriage manufacturing plant to Hamilton, Ont.

The Hamilton Bridge Works, Hamilton, Ont., have the contract for the steel construction of the Traders' Bank Building, Toronto.

The special building provided by the Canadian National Exhibition, Toronto, for a display of processes of manufacture will be fitted up this year for the accommodation of binder twine making, the manufacture of many different specimens of pure food, the weaving of carpets, and other forms of textile manufacture, such as cotton and cheese cloth, boot and shoe making, from the raw material to the finished article, Canadian tweeds and other cloths, and a number of other articles, making in all one of the most interesting features of the great exhibition.

The Ottawa Cement Block Co., Ottawa, have been awarded the contract for the new dairy building to be erected on the Ottawa Exhibition grounds.

As soon as the Niagara power is turned on the construction of the new electric railway to Niagara from Toronto will be started. In the construction of this line and in the conversion of power plants there will be from \$2,500,000 to \$3,000,000 of work, the bulk of which will go to the Canadian General Electric Co., Toronto.

The Massey-Harris Co., Toronto, are erecting large warehouses of heavy mill construction, the walls being of brick.

The Banner Oil Co., Petrolia, Ont., have been incorporated with a capital of \$100,000, to manufacture well-drilling tools and machinery, etc. The provisional directors include J. C. Winters, Mount Morris, N.Y., and C. H. Palmer, Rochester, N.Y.

The Ossington Ave. Baptist congregation, Toronto, intend erecting a church building to cost about \$10,500.

D. H. Porter, New York City, is considering the establishment at Thorold, Ont., of a plant for the manufacture of pulp containers, etc.

W. B. Burwell & Co., Brantford, Ont., have under consideration the erection of a pipe and sewer foundry at Fort William, Ont.

The Penman Mfg. Co., Paris, Ont., will build a large addition to their factory.

J. E. Armstrong, M.P., for East Lambton, is the projector of a cold storage and transportation company, to have a capital of \$5,000,000. It will be the largest of the

kind in Canada, and will seek the right to carry on the business of a general cold storage and transportation company; to establish cold storage plants at all points deemed expedient; to build and operate steamships; to construct refrigerator cars for use on any railway, and the right to acquire at any time any existing company doing business in the same direction. Among those interested are Hon. John Dryden, ex-minister of agriculture for Ontario; Hon. Thomas Greenway, Geo. E. Foster, Senator Black of Amherst, N.S.; R. J. Graham of the Belleville Cold Storage Co.; E. Kidd, ex-M.P., Carleton; R. M. Ballantyne, president of the Montreal Produce Markets Association; Pickford & Black, steamship owners, of Halifax, N.S.; George McAvity, St. John, N.B.

The Lightning Cashier Co., Montreal, have been incorporated with a capital of \$20,000. The charter members include S. W. Tilden, J. O. Lalonde and S. P. Leet, Montreal.

The Quebec Auto Car Co., Quebec City, have been incorporated with a capital of \$20,000 to manufacture automobiles, motor cars, etc. The charter members include G. G. Stuart, J. G. Scott and J. M. McCarthy, Quebec.

La Compagnie de l'Aqueduc de la Jeune Lorette, St. Ambrose de la Jeune Lorette, Que., have been incorporated with a capital of \$18,000, to develop water powers. The charter members include C. Renaud, P. Borvin and C. Villeneuve, St. Ambrose de la Jeune Lorette, Que.

The Quebec Harbor Commissioners have awarded to M. P. & J. T. Davis the contract for the crib work outside the wall in the inner basin.

The Canadian Pacific Railway Co. are building new box cars at their Angus, Que., shops, having turned out nearly a thousand in the last two months. The cars will be used in hauling the wheat crop of the North-West.

The Booth Copper Co., of Toronto, have established an office in Montreal, with F. P. Miller as principal agent.

Hutchinson & Wood, Montreal, architects, are preparing plans for the new Windsor Hotel, to be erected there at a cost of about \$1,500,000.

A Joker fire alarm system will be installed in Montreal at a cost of about \$40,000.

The Walter M. Lowney Chocolate Co., Boston, Mass., will erect a factory in Montreal, 100x100 feet, six stories high, at a cost of about \$63,000.

The Canadian Fairbanks Co., Montreal, have been awarded the contract for supplying the transmission material to be used in the Canadian Government canal repair shop at Cornwall, Ont.

The McLennan Lumber Co., Montreal, have been incorporated with a capital of \$100,000, to manufacture sashes, doors, blinds, etc. The provisional directors include Hugh McLennan, Buffalo, N.Y.; C. Stewart and D. H. McLennan, Montreal.

W. F. Winton, Montreal, will erect a brick block, to cost about \$12,000.

The Economical Drug Co. of Canada, Montreal, have been incorporated with a capital of \$5,000, to manufacture drugs, patent medicines, etc. The provisional di-

rectors include J. A. Leduc, Paul Leduc and Louis Fortin, Montreal.

The Canada-Mexico Mercantile Co., Montreal, have been incorporated with a capital of \$40,000, to carry on a business of merchant importers, exporters, etc. The provisional directors include George Cushing, City of Mexico; M. P. Cochrane and W. A. Brown, Montreal.

The Steel Concrete Co., Montreal, have been incorporated with a capital of \$200,000 to carry on a business of engineers, contractors, etc. The provisional directors include E. A. Wallberg, W. F. Boggis, Montreal and John Murphy, Ottawa.

A new armory is to be erected in Montreal plans for which are being prepared by Lind & Spence. The central portion of the building will consist of a drill shed 100x80 feet.

Messrs. Babcock & Wilcox, Montreal, have recently installed boilers as follows:—Canadian Pacific Railway Co., Montreal shop, 1,400 h.p. additional, equipped with Babcock patent superheaters and automatic chain grate stokers; Winnipeg City Water Electric Light plant, Winnipeg, Man., 500 h.p., equipped with Babcock patent superheaters and automatic chain grate stokers; Winnipeg Electric Railway Co., Winnipeg, Man., 2,000 h.p., equipped with "Necemes" patent shaking grates, etc.; Dominion Co. Co., Sydney, N.S., 2,500 h.p.; J. R. Booth, Ottawa, 2,000 h.p., boilers and superheaters; Belgo-Canadian Pulp & Paper Co., 500 h.p. additional; Canadian Pacific Railway, Winnipeg hotel and station, 800 h.p.; Canadian Pacific Railway shops, Winnipeg, Man., 1,500 h.p. with superheaters; Canada Car Co., Montreal, 1,500 h.p., with superheaters; Calgary Electric Lighting plant, Calgary, N.W.T., 500 h.p., with "Necemes" shaking grates; F. W. Bird & Son, Hamilton, Ont., 75 h.p. South Western Traction Co., London, Ont., 900 h.p.; Singer Mfg. Co., St. Johns, Que., 1,625 h.p. The Dominion Government has installed Babcock & Wilcox marine boilers in the Dominion icebreaker "Montcalm," which was used so successfully in breaking the ice on the St. Lawrence during the past winter. The Babcock & Wilcox Co. are installing an additional economizer and reduced draft plant for the Canadian Pacific Railway at Fort William, Ont.

Sugars, Limited, Montreal, have been incorporated with a capital of \$20,000, to manufacture sugars, confectionery, etc. The provisional directors include C. A. MacMillan, J. W. MacMillan and Thomas Keyes, Montreal.

Messrs. L. H. Packard & Co., Montreal, manufacturers of shoe dressing, etc., are erecting a large factory building 100x100 feet.

The town of Magog, Que., has purchased the waterworks from L. A. Audet for \$150,000. At a meeting of the Mexican Light & Power Co., held in Montreal recently, the shareholders authorized the Board of Directors to organize the Mexican Electric Light & Power Co., Limited, to acquire the properties of the two other companies now doing business in the city of Mexico. The former company have just received a contract to supply 5,000 h.p. to the Street Railway Co. and 2,000 h.p. for pumping purposes.

The Wire & Cable Co., Montreal, recently received an order from the Midland Co.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

Construction Co., London, Ont., for 100,000 lbs. of trolley wire.

Messrs. Marion & Marion, patent attorneys, Montreal and Washington, D.C., have obtained the following Canadian patents recently—C. A. Juengst, Croton Falls, N.Y., machine for wire stitching signatures and sheets in book binding; E. C. Thorschmidt, Brooklyn, N.Y., barrels; E. C. Thorschmidt, Brooklyn, N.Y., devices for heading and looping casks or barrels; U. L. Gaudreau, St. Damase, Que., cutting system; John Sheppard, Minto, Man., oil can and the like; Messrs. Gutteridge & McConnell, Hamiota, Man., concrete mixer; Dr. August Voelker, Berlin, Germany, incandescent electric material; F. E. Holt, Vancouver, B.C., electric water heater; J. C. Roy, Pt. St. Charles, Que., spoke extractor; Louis Cote, St. Hyacinthe, Que., proportional divider; Theophile Taillefer, Montreal, butter cutting and measuring device; L. N. Beauchemin, Montreal, nailless horse shoe; J. P. Ewing, Drayton, Ont., traction wheel; J. S. N. Guindon, Montreal, fire alarm apparatus; John Crozier, Ste. Agathe (Lotbiniere), Que., railway rail chair; Wm. N. Garrett, Amherst, N.S., door guide bracket; Gustave Gin, Paris, France, process for the electro-metallurgical manufacture of metals or alloys free from carbon; F. C. Buck, Prahran, Victoria, Australia, valves and cocks; George Bryan, Clarenceville, Que.; mud and dust guard; Leon D'Amour, Trois-Pistoles, Que., improvements in vehicles; G. P. Johnston, Hamilton, Ont., cream separator.

The Canadian Pacific Railway Co. have purchased four large steam shovels from the Locomotive & Machine Co., of Montreal. This order is the first of its kind to be placed in Canada, all steam shovels having been purchased heretofore in the United States.

The following buildings are now in course of construction in Montreal:—Congregation of Notre Dame Convent, \$1,000,000; Notre Dame Hospital, \$900,000; apartment house, \$300,000; Grosvenor Apartments, \$150,000; Mount Royal Club, \$120,000; Sherbrooke Apartments (addition), \$100,000; New Protestant school, \$100,000; McGill University Y.M.C.A., \$70,000; McGill University Union, \$150,000; Church of the Messiah, \$50,000.

The Ateshian Tobacco Co., Montreal, have been incorporated with a capital of \$20,000, to manufacture tobacco, etc. The incorporators include C. Ateshian, Henry Keller and J. A. Trickey, Montreal.

The Northern Construction Co., Montreal, have been incorporated with a capital of \$100,000, to carry on a business of builders and contractors. The incorporators include E. M. O'Brien, J. B. Rose and W. R. Stavely, Montreal.

W. Thompson, vice-president and managing director of the Ogilvie Flour Mills Co., Montreal, and others, contemplate the formation of a company with a capital of \$10,000,000 to \$12,000,000 for the purpose of building from 300 to 500 elevators throughout the Canadian North-West. These elevators are to be of the most modern and up-to-date type. It is also proposed to erect two large flour mills in Great Britain, the whole to be under the direction of Mr. Thompson.

The Simplex Railway Appliance Co., St. Henri, Que., will erect a new plant at

Lachine, Que. The company will soon be in the market for considerable equipment in the way of machine tools. The Simplex bolsters, side bearings, break beams and structural steel used in the construction of steel cars will be manufactured in the new plant.

The outbuildings of the Friars' School near Iberville, Que., were recently destroyed by fire. Loss about \$3,000.

The Nova Scotia Eastern Railway Co. will build a line from Dartmouth, N.S., to the Strait of Canso, and from New Glasgow, N.S., to the county harbor, at a cost of about \$7,000,000.

A shipbuilding company, headed by Messrs. Mayhew and Gladstone, with a capital of \$12,000,000, will locate at Sydney, N.S., having been granted a free site.

An extensive cement plant will be located at St. Peters, N.S.

Senator Mitchell, a director of the Rhodes, Curry Co., Amherst, N.S., was in that place recently in connection with the constructing of a central power station at Chignecto Mines, N.S.

Messrs. Rhodes, Curry & Co., Amherst, N.S., have purchased the property and plant of the Sydney Mfg. Co., which they will enlarge. The company will manufacture pressed steel cars.

The Nova Scotia Steel & Coal Co., New Glasgow, N.S., have their blast furnace and open hearth plant in full operation. The open hearth plant consists of a battery of three furnaces each with a capacity of forty tons. Provisions have been made for the installation of two additional furnaces, the whole plant comprising, apart from the furnaces, a fifty-ton mixer, a ladle drying apparatus, gas producing battery, electric cranes and such accessories was erected by the company's own employes and is of the most modern type obtainable. The blast furnace has a capacity of 180 tons, but its entire product will now be utilized in the manufacture of steel. Its type is similar to that of the furnaces of the Dominion Steel Co. The coke plant comprises 150 ovens. This plant is conveniently located near the furnaces as well as are the electric power house and different shops.

T. A. Rickard was in Halifax, N.S., recently to look over the gold mining camps in the province with a view to undertaking the preparation of a comprehensive report on the gold measures.

The Dominion Iron & Steel Co., Sydney, N.S., have their rail mill put on double shift. The rod and blooming mills are also on double shift.

A rich coal strike was made recently near Lingan, N.S., which shows six feet of clean coal land, area of about 100 square miles or 619,526,000 tons of coal.

The Anglican church at Hopewell Hill, N.S., was destroyed by fire July 24.

In the last six months the Nova Scotia Steel & Coal Co., New Glasgow, N.S., have shipped 206,376 tons of coal, against 196,652 tons last year for the same period, an increase of 9,723 tons.

The Cape Breton Coal, Iron & Railway Co. is negotiating for the purchase of the Cape Breton Railway Co., which now has a line complete from Hawkesbury to St.

Peter's, N.S., and has made surveys from the latter point to Sydney, N.S., and Louisburg, N.S. A slight deviation from the surveyed route would bring the new line through the coal properties of the Cape Breton Coal, Iron & Railway Co.

The Dominion Coal Co., Sydney, N.S., have placed an order for 150 steel cars, the capacity of each is about 100,000 pounds. The amount of the contract was \$150,000.

The United Shoe Machinery Co., Halifax, N.S., will erect an addition to their present plant, at a cost of about \$20,000.

The Dominion Carriage & Bearing Co., Amherst, N.S., will apply for incorporation with a capital of \$200,000.

Mr. H. J. Crowe, Halifax, N.S., recently obtained an option upon three Newfoundland properties, viz., the Newfoundland Pulp & Lumber Co., the Newland Co., and the Lumber Estates Co., embracing an area of 1,600,000 acres. Mr. Crowe has succeeded in forming a syndicate embracing representative financiers and publishers in London, England, with Boston, Mass., and Montreal capitalists, with a capital of \$5,000,000. This syndicate will take over the properties and proceed to develop them.

The New York Rock Plaster Co. will commence the development of a gypsum deposit near Hampton, N.B. It is expected the yearly output will amount to about 50,000 tons.

Two spans of the bridge between Fredericton, N.B., and St. Mary's, N.B., were destroyed by fire recently. Loss about \$10,000.

The corporation of Dalhousie, N.B., will install waterworks and sewerage systems and an electric light plant.

The Miramichi Mercantile Co., Chatham, N.B., have been incorporated with a capital of \$24,000, to carry on a general mercantile and manufacturing business. The provisional directors include H. E. Gross, Moncton, N.B.; R. A. Murdoch, Chatham, N.B., and I. S. Dawson, Dawson Settlement, N.B.

The premises of the Miller's Tanning Extract Co., Millerton, N.B., were destroyed by fire recently. Loss about \$20,000.

The Edrans-Brandon Pressed Brick Co., Edrans, Man., have been incorporated with a capital of \$100,000, to manufacture pressed brick.

The McDonald-McMillan Contracting Co., Winnipeg, Man., have received the contract for the grading and steel laying of the first eighty miles of the new Hudson's Bay railway, which is being built by the Canadian Northern Railway Co.

The T. Eaton Co., Winnipeg, Man., will build another story to their present building, and in the spring will add two more, to be used temporarily for factory purposes.

The Farmers' Advocate of Winnipeg, Winnipeg, Man., have been incorporated with a capital of \$100,000, to acquire business of Farmers' Advocate & Home Magazine and to carry on business of printers, publishers, etc. The incorporators include Joseph Weld, J. C. Snell, London, Ont., and W. E. Gunn, Winnipeg, Man.

The Ninga Milling Co., Ninga, Man., have been incorporated with a capital of \$35,000, to carry on a milling business. The incorporators include S. M. McKinley, J. D. Fisher and G. T. Robinson, Ninga.

The Manitoba Canning Co., Winnipeg, Man., have increased their capital stock from \$50,000 to \$60,000.

The Canadian Mineral Wool Co., have changed the name of the company to the Canadian Iron Wool Co.

The Dominion Bridge Co., Montreal, will install a plant at Winnipeg, Man., to manufacture for their Western business. The building will be 300x100 feet, and will be equipped with shears for cutting the heavy steel, and punches and riveters for setting the material up.

The Scott Furniture Co., Winnipeg, Man., will rebuild their warehouse at a cost of about \$80,000.

Messrs. Fusee & McFectors, Neepawa, Man., have received the contract for the Empire block, their tender being \$51,000.

The Catholic Club, Winnipeg, Man., will erect a large building to cost about \$70,000.

The Great Western Insurance Co., Winnipeg, Man., will erect an office building at that place.

J. W. Yeo is interested in the construction of a steel bridge across the Rosseau river at Stuartburn, Man.

The Canadian Northern Railroad will build an 800-foot bridge across the Red river at Morris, Man.

The Clanwilliam-Neepawa branch of the Canadian Northern Railroad will be extended north to the main line near Kamsack, N.W.T.

S. P. Hodgson, Swan Lake, Man., will erect a 100-barrel flour mill and a 30,000 bushel elevator.

The city engineer of Winnipeg, Man., has recommended the boring of two more artesian wells at an estimated cost of \$100,000.

The McLaughlin Carriage Co., Oshawa, Ont., will erect a five story brick addition to their branch in Winnipeg, Man.

A high school building will be erected at Carberry, Man.

A mission building will be erected at Griswold, Man.

The large warehouse of the Imperial Implement Co., Winnipeg, Man., collapsed recently, the damage amounting to about \$150,000.

The Melita Roller Mills Co., Melita, Man., will overhaul the mill and install a new bolting system.

G. H. Charleson's machine shop, Minnedosa, Man., was destroyed by fire recently. Loss about \$6,000.

Foley, Lock & Larson, Winnipeg, Man., are erecting a five story factory 116x100 feet, for the manufacture of biscuits and confectionery.

The premises of the Winnipeg Bag Works, Winnipeg, Man., were destroyed by fire July 21. Loss about \$15,000.

The Grand Trunk Pacific Railway Co. will call for tenders for the construction of the western section of the road. The route is definitely located westward to the intersection with the Regina-Prince Albert branch of the Canadian Pacific Railway and provisionally to Edmonton, Alberta. Construction will begin in the vicinity of Portage la Prairie, Man., and the first contracts will cover a section 400 miles in length.

H. A. Richardson will establish a peat-making industry at Winnipeg, Man.

The Canadian Pacific Railway Co. have let the contract to J. D. McArthur for the extension of the Selkirk branch from Winnipeg, Man., to Gimli.

Alloway & Champion will erect a bank building in Winnipeg, Man.

Anderson & Co., Winnipeg, Man., are erecting a warehouse, 120x100 feet, three stories high, at a cost of about \$25,000, for farm implements.

The Canadian Pacific Railway Co. have awarded the contract for the double-tracking system from Fort William, Ont., to Winnipeg, Man., a distance of 426 miles, to Foley Bros., Minneapolis, Minn.

The Edmonton Tent & Mattress Co., Edmonton, Alta., will erect a three story brick factory at that place.

F. Fitzgerald and H. Rowen, Edmonton, Alta., will erect a theatre there at a cost of about \$20,000.

The Canadian Pacific Railway Co. will build a large grain elevator at Innisfail, Alta.

St. Paul's Church, Regina, Assa., will be enlarged at a cost of \$10,000.

George Hutton will erect a large hotel at Edmonton, Alta.

The Canada Mortgage Corporation have established their terminal headquarters at Regina, Assa., where they will erect an office building to cost about \$20,000.

A by-law is being prepared in Edmonton, Alta., to raise money for the purchase and installation of a testing pump.

A new school house is being built at Oxbow, N.W.T., for which furniture will be required.

Stoughton, Assa., is to have a school house erected at once, for which general fittings will be wanted.

The Merchants Bank will erect a building at a cost of about \$40,000 in Edmonton, Alta.

The Calgary Colonization Co. are considering the erection of ten grain elevators on the line south of Calgary, N.W.T., and twelve on the north line, the elevators to have an average capacity of 30,000 bushels.

Frank Danner will build a flour mill at Lacombe, N.W.T.

The ratepayers of Edmonton, Alta., will vote on a by-law to raise \$30,000 for extensions and improvements to the markets.

The Canadian Bank of Commerce will erect an office building in Prince Albert, N.W.T., to cost about \$14,000.

The Alberta Flour Mills Co., Edmonton, Alta., will build a 30,000 bushel elevator at Ponoka, Alta., and a flour mill and elevator at Edmonton.

Battleford, N.W.T., will purchase a \$2,000 fire engine.

Weyburn, N.W.T., is considering a fire protection scheme including gasoline and chemical engines.

The Canadian Northern Railway Co. will erect a large depot at Edmonton, Alta.

A proposition has been submitted by Mr. Johnston of Regina, Assa., for the installation of an electric light plant at Saskatoon, N.W.T.

J. A. Gardiner, Barrington, N.S., will es-

tablish marine iron works at North Vancouver, B.C.

English capitalists will erect a hotel at New Westminster, B.C., for which \$250,000 has been subscribed.

The British Columbia Pottery Co., Vancouver, B.C., have received an order for 80,000 superficial feet of partition tile for the new Canadian Pacific Railway between Victoria, B.C.

The ratepayers of Victoria, B.C., will on a by-law to raise \$100,000 for further tending the sewers.

A college will be built in North Vancouver, B.C., at a cost of \$50,000.

Pither & Leiser, Vancouver, B.C., will erect a three story block in that city at about \$15,000.

The Melrose Paint & Glass Co., Vancouver, B.C., are erecting an office and warehouse building.

R. V. Winch, Vancouver, B.C., will erect a building 120x52 feet, three stories high, to cost about \$30,000.

The Standard Oil Co., Grand Forks, B.C., will erect a large warehouse.

The Vancouver, Westminster & Victoria Railway Co. are erecting a round house at Vancouver, B.C., to cost about \$10,000.

The provincial government of British Columbia will erect a public school building in Mount Pleasant, B.C., to cost about \$20,000.

Messrs. Grant & Henderson are the architects for a three story building, 125x100 feet, which is to be erected in Vancouver.

The Great Northern Railroad will erect a new station in Vancouver, B.C.

A by-law will be submitted to the ratepayers of Victoria, B.C., to raise \$50,000 to erect a new school.

The Fraser River Tannery Co., New Westminster, B.C., will erect three buildings, largest of which will be 300x150 feet, three stories high. The machinery will cost about \$10,000.

The Cascade Hotel, Cascade, B.C., destroyed by fire recently. Loss about \$15,000.

The Unuk River Smelting & Transporting Co., Vancouver, B.C., will put in a road to tide-water to their mine at a cost of \$50,000.

The city council of Victoria, B.C., are considering waterworks improvements, which will cost over \$600,000.

The Miners' Union, Phoenix, B.C., will erect a combined hall and opera house at a cost about \$8,000.

Paul Penplier will build a house at Vernon, B.C.

Vancouver, B.C., is to have a new fire station which will be 75x66 feet, two stories high.

W. F. Almy and W. S. Woods, proprietors of the Mass. manager and secretary of the Victoria mine, Kalso, B.C., are preparing plans for a compressor plant and mill.

The total production of lead in British Columbia for the fiscal year ending July 31, 1905, is officially stated to be 35,200 pounds, or a little over 27,871 tons. For the year 1904 the total production was 31,000 tons; 1903, 9,014; 1902, 11,268; 1901, 19,000, 31,674. The figures tell of an industry which had dwindled to less than one-

North of the top production in three years and which in two years more, through the bounty, has almost regained its old position. The production of the year is the best but one in any twelve months in the history of the province. Of the 27,871 tons produced this year, 11,000 tons have been exported, while the remainder, nearly 17,000 tons, has been supplied in British Columbia. The rate of bounty paid varies with the London price, and is less for exported lead than for that treated locally, viz., \$10 a ton in the first year, \$15 in the second. It is roughly figured that the total amount of bounty paid will be about \$310,000 out of the \$500,000 set aside by the government for that purpose. The value of the total production of lead in British Columbia in 1904 is officially reported as amounting to \$1,421,374, while the combined product of lead in all the other provinces of Canada is given as \$215,546.

The British Columbia Telephone Co. will make extensive improvements and have awarded a contract to J. Brombley, Phoenix, B.C., for 1,200 cedar poles for the new line to be built from Cascade, B.C., to Phoenix. The Brackman-Ker Milling Co. will erect a warehouse and wharf at New Westminster, B.C.

The Canadian Pacific Railway Co. have placed a contract with the British Columbia General Contract Co. for the replacing of the wooden piers of their main line across the Pitt river, with concrete piers, the price being \$30,000.

The Vancouver, Westminster & Yukon Railway Co. will construct a bridge approximately 2,000 feet long across the Hood narrows to the north shore of Burrard Inlet.

The business section of Fernie, B.C., was destroyed by fire July 26, including the Free Press office, Northern Hotel, Great Northern Hotel and Waldorf Hotel. Loss about \$50,000.

The contract for the hydraulic and electric power plant for the city of Nelson, B.C., awarded to Ahs-Chalmers-Bullock, Limited, Montreal.

The Dundee Gold Mining & Milling Co., Vancouver, Wash. have been granted a license to carry on business in British Columbia. The local office at Nelson, B.C. Joseph Argall is attorney.

A quartz lead of silver ore has been discovered on the Swede claim at Nelson, B.C. The best assays run over \$100,000 to the ton.

The Jwasi Bay Lumber Co. have been organized at Victoria, B.C., with a capital of \$10,000 to manufacture lumber, etc.

The Pacific Loan Co. have been incorporated at Victoria, B.C., with a capital of \$50,000 to carry on the business of a loan and investment company.

The Nelson Oil & Coal Co., Nelson, B.C., have been incorporated with a capital of \$10,000 to acquire and develop mines, etc.

The Gold Park Mining Co. have been incorporated at Victoria, B.C., with a capital of \$10,000 to engage in a mining business.

The Vancouver Mineral Water Co., Vancouver, B.C., have been incorporated with a capital of \$10,000, to manufacture glass and soda water, etc., mineral waters, etc.

The Imperial Timber & Trading Co., have been incorporated at Victoria, B.C., with a capital of \$25,000, to manufacture lumber, etc.

The McArthur & Harper Co. have been incorporated at Victoria, B.C., with a capital of \$100,000, to manufacture hardware, rubber goods, etc.

The Kamloops Mines, Limited, Kamloops, B.C., have been granted a license to carry on business in British Columbia. Joseph Argall is the attorney.

The Kootenay & Columbia Prospecting & Mining Co., Ottawa, have been granted a license to carry on business in British Columbia, with head office at Whitewater, B.C. W. G. Robb is attorney.

ELECTRICITY.

Electrical machinery and appliances of all kinds, electrical power plants and other progress in the electrical industries will be noted here.

G. F. Grant has submitted a proposition to supply electric power for Calgary, N.W.T.

J. Bradley will investigate and report on the advisability of the establishment of an electric light plant at Fort Frances, Ont.

The city engineer of Toronto has reported that it would cost \$90,000 to install an electric lighting plant at the Island.

The city of Salaberry de Valleyfield, Que., will install an electric light plant.

The Northern Electric Co., Montreal, will erect a new building to cost about \$30,000.

The city electrician of Victoria, B.C., has been instructed to report on the cost of building and equipping a civic lighting plant.

The ratepayers of Berlin, Ont., will vote on a by-law to raise \$50,000 for improvements to the lighting plant.

The ratepayers of Edmonton, Alta., will vote on a by-law to raise \$15,000 for improvements to the electric lighting plant.

The Ontario Niagara Power Co., Niagara Falls, Ont., will soon begin to supply power and will increase their output in the next two years until a maximum of 200,000 h.p. is attained.

The two 13,000 h.p. generators ordered by the Cataract Power Co. from the Westinghouse Co., are being built at the latter company's works in Hamilton.

It is announced that a big exhibition of electrical machinery and appliances will open in Kieff, Germany, next year, immediately after Easter. In connection with the exhibition there will be several large meetings of electrical experts and engineers from all over the world for the consideration of topics of common interest to the electrical industry and its numerous branches. All foreign goods sent to Kieff for exhibition purposes will be entered in bond and returned to their owners without the payment of import duties of any kind.

The Temiskaming & Northern Ontario Railway will most likely be operated by electricity. After a thorough investigation of all practical systems and consideration of local conditions, Mr. B. J. Arnold, expert electrical engineer of the Hydro-Electric Power Commission, has recommended for adoption the single-phase system of which

the Westinghouse Co. have already installed ten lines in the United States. A locomotive built to be operated by this system, weighing 136 tons, has been demonstrated at Pittsburg, Pa., to be equal to the heaviest strain ever placed on a draw bar.

ELECTRIC RAILROADING.

At meetings of the Temiskaming & Northern Ontario Railway Commission and the Hydro-Electric Power Commission, held in Toronto last week, it was decided to engage and occupy a joint office and have a common staff.

The Power Commission have fully considered the electric systems already in use, including the direct current system employed in city traffic, which is first-class over limited areas; the three phase system of the Hungarian railways, which is also used in Germany and the north of Italy, and which has proved satisfactory for long distance lines, and the single phase system, of which the Westinghouse Company has already installed ten lines in the United States. A locomotive, built to be operated by this system, weighing 136 tons, has been demonstrated at Pittsburg to be equal to the heaviest strain ever placed on a draw bar. It is this single phase system which the expert electric engineer of the Temiskaming Railway Commission, Mr. Bion J. Arnold, has recommended for adoption, and which the commission has decided upon should the Government decide to acquiesce in the recommendation they have made to install an electric system on the railway.

Full account has been taken of the local conditions, and the cost of water-power contrasted with coal, and the estimate is in favor of electricity. Fountain Falls, on the Montreal River, has been selected for the development of power, and with 70 feet headwater the 4,000 h.p. can easily be obtained, as 15,000 h.p. is available. Pending a decision definitely to adopt electric power, the Government has instructed the commission to proceed with the preparation of plans and specifications to that end.

ONTARIO HYDRO-ELECTRIC POWER.

As a result of the appointment of the Hydro-Electric Power Commission by the Ontario Government, it is clear that when the report of the commission is submitted a vast amount of information will be made public, not only relating to the hydro-electric power development at Niagara Falls, but also in regard to other water power possibilities in the Province of Ontario. Much interest centres on the appointment of the commission because the government has been advised to take over the Niagara water power privileges and operate the great plants for the public benefit. This would indeed be a notable step, and would command the attention of the world.

The commission has named Hon. Adam Beck as chairman and Cecil B. Smith as engineer. In addition to Mr. Beck the other commissioners are Mr. George Pattinson, M.P.P., Preston, Ont., and Mr. P. W. Ellis, Toronto. The order-in-council directs them to secure the following data and information.

"The present and probable demand for hydraulic and electric power in the various districts capable of being supplied from the

different water powers within the legislative jurisdiction of the Province of Ontario.

"The location, capacity and capital cost of development of the various water powers within the legislative jurisdiction of the Province of Ontario at present undeveloped, but whose development is required to supply the present and probable needs of the surrounding district, and to ascertain the probable cost of the attendant transmission plants necessary to the utilization of electric or hydraulic power to be derived from the aforesaid water powers within the respective surrounding districts.

"To ascertain the rates or prices that would require to be charged, the various classes of consumers of hydraulic or electrical power within the respective districts, in order to meet all expenditure of maintenance and operation.

"To enquire into and ascertain the annual savings accruing to the consumers in the various districts aforesaid by the substitution of the rates or prices to be ascertained under the next preceding paragraph, for the rates paid at present in the said districts, so far as the commissioners may be able to ascertain or estimate them.

"To enquire into and ascertain the cash capital cost of the hydraulic and electrical power undertakings of existing companies located within the Province of Ontario; the capacity and state of development thereof, and to ascertain further: (a) The quantities of power supplied and contracted for and the rates charged, and to be charged, under such contracts by these companies for hydraulic or electric power. (b) The actual present value of the said undertakings, after making such fair and reasonable allowance for existing conditions as in the judgment of the commissioners seems necessary or expedient. (c) The estimated capital outlay, if any, necessary to complete these undertakings."

The time is not far in the past when the ordinary electric lighting and power plant comprised an engine built by one manufacturer and a dynamo built by another. The responsibility for successful operation was thereby divided, while the difficulties in the way of placing an order and installing the equipment were greatly increased. Even at the present time there are comparatively few concerns in America that build both the engine and the generator. Prominent among these is the B. F. Sturtevant Co., Boston, Mass., whose name is almost synonymous with "blower." It is certainly a misfortune that this world-wide reputation as blower manufacturers has partially obscured the magnitude of its business in engines, motors and generating sets. In fact, however, the B. F. Sturtevant Co. has for years made a specialty of high-grade generating sets, with the engine and generator designed each for the other, and combining maximum efficiency with minimum space and weight; elements which are particularly essential in machinery built for export. This company now catalogues no less than thirty-six different sizes and types of units ranging from 3 to 100 k.w. Each is absolutely complete in its parts, being carried upon a bedplate which is common to both. The size and weight of all but the larger sizes are such as to permit of export shipment without separating of parts, so that the machine stands ready for operation as soon as it is unpacked.

FUEL.

For names of fuel dealers see "Coal and Coke" in Classified Index.

The fuel supply question is a most important one to Canadian manufacturers. The information published in this department will keep the readers posted on sources of production.

The Toledo Gas, Light & Coke Co., and the Toledo Heating & Lighting Co., Toledo, Ohio, have been amalgamated as the Toledo Gas, Electric & Heating Co., with a capital of \$2,500,000.

The Carnegie Coal Co., Pittsburg, Pa., and the Chartiers Coal & Coke Co., have amalgamated as the Carnegie Coal Co., with capital of \$500,000. The company will have an annual capacity of 1,000,000 tons of coal.

The steamer "Christian Knudsen," a new type of collier, came into the port of Montreal from Sydney on Saturday with nearly 6,000 tons of coal for the Dominion Coal Co., to which she is chartered, and left again in seven hours. This rapid discharge, is due to her peculiar construction, for though she is over 51 feet beam, she has no hold or lower deck beams, being designed on the principle of cantilever transverse frames. She is a self-trimmer and can carry over 2,000 tons of water ballast mostly in her double bottom. The hatches are 30 feet wide. She has twenty derricks and has eleven dwarf masts to support same. The "Christian Knudsen" has a peculiar appearance, but her first voyage has been eminently successful. Her length is 360 feet, beam 51 feet, and depth of hold 25 feet. Her triple expansion engines propel her 10½ knots when loaded, and she only draws 22½ feet of water. She was built by Sir Raylton Dixon & Co., at Middlesboro, England, and is owned by Mr. G. Knudsen, of Persgrund, Norway.—Montreal Herald.

The Imperial Oil Co., Sarnia, Ont., will erect a coal handling plant to cost about \$40,000. The company will also build a short line for handling coal, which will be equipped with two locomotives and sixteen cars.

The output of the Reserve colliery is likely to be increased to 1,000,000 tons of coal per year, if the plans for the working of the old Emery seam by the Dominion Coal Co., Sydney, N.S., prove successful. The company have decided to work this seam of the Reserve from the main slope. They expect to increase the output of the colliery by at least 1,000 tons a day within a year. Last year's output at Reserve was in the vicinity of 800,000 tons, the largest of any single colliery in the world.

Mr. W. R. Holloway, United States Consul General at Halifax, N.S., writes to his government regarding the newly discovered coal field in Nova Scotia as follows:—The recent discovery of coal about 20 miles south of Springhill is the most important mining event in many years in Nova Scotia. It is the direct result of deduction from painstaking investigations of the geological conditions at Springhill. Dawson, who stood in the front rank of Canadian geologists and whose conclusions were generally accepted without reserve, judged that the conglomerate rock that appears at Springhill and extends south was deposited before the coal measures; hence, where the conglomerate appears at

the surface the conclusion was that no existed. Coal prospectors have, since that day, generally accepted the conglomerate district as nonproductive. Mr. Fletcher, the geological survey of Canada, undertook a long and laborious examination of the face indications, and arrived at conclusions directly at variance with Dawson's, namely that the conglomerate was of a later age than the coal, and that there was no apparent reason why there were not coal seams at Springhill under the conglomerate. It was the theory that a number of coal measures had an association to bore at a spot indicated by Mr. Fletcher. The work has resulted in the discovery of a fine coal field, which is not entirely new, is at least an extension of the Springhill field, embracing an area of 200 square miles or more. Mr. Fletcher assumed that coal would be reached at a depth of from 2,000 to 3,000 feet, and operations were commenced with that in view. The drill first pierced some 810 feet of Permian sandstone, etc., belonging to the Permian formation; then about 150 feet of conglomerate was met; then some 100 feet of sandstone, when the coal was reached. The drill went through some 12 feet of coal, but it made no core, and as the position of the seam is unknown its exact thickness cannot be determined as yet.

Practically complete returns to the United States Geological Survey for 1904 collected by Edward W. Parker, state that the production of coal in the United States last year amounted to 351,000,000 short tons, having a total value at the mines of \$445,643,528. Compared with 1903, there shows a falling off of 6,159,463 short tons, a quantity and of \$58,080,853 in value. This decrease, although proportionately small, the figures of value, does not indicate a serious interruption to the generally prevailing conditions which have prevailed during the last eight years. It was simply a reaction from the abnormal activity which had been maintained throughout the mining regions in 1903, due to the exhaustion of all coal stocks on hand by the effects of the strike of 1902. In order to renew the industry and at the same time provide a more immediate use of the coal mines in 1904, the industry should probably say, to the capacity of the railroads to handle the output. As a result, the enormous production of 351,000,000 short tons was recorded. Prices raised by the famine of 1902 remained high for a large part of the year, and the total value of coal at the mines before any export transportation or selling costs had been added amounted to \$503,724,381, an increase of \$136,600,000 over that of 1902. The production in 1904, while less than that of 1903, shows an increase when compared with the production during the ten preceding years. The average price for all coal mined in 1904 was \$1.27, as compared with \$1.22 in 1903 and \$1.22 in 1902.

The National Wholesale Lumber Association of America will hold a convention at Ottawa, August 16. This is an entirely new departure for the part of the Association, and is the result of the invitation extended by Mr. Edwards, of the W. C. Edwards Co. of

OPPORTUNITIES.

Manufacturers and others in need of machinery, supplies, etc., of any kind are requested to consult our advertising columns, and if they cannot find just what they want, if they will send us particulars we will make their wants known free of cost, and in this way secure the attention of those who may be able to supply them. No charge for publishing what is wanted nor for giving information. When writing to enquirers kindly mention The Canadian Manufacturer.

There is a great demand throughout the African continent for what may be termed ready-made houses and fittings, such as doors, windows, roofings, etc. The style of house which is now being erected in various parts of the continent is to outside appearances an ordinary brick house finished in rough cast. The foundations are of stone, but the general system of construction is unique, no bricks being used except in the chimneys. The walls are composed of metal plates, and are fixed to a substantial timber frame, especially braced so as to withstand every possible strain. On this is placed a heavy coat of specially prepared plaster, the exterior being finished in rough cast of a natural color.

Tenders for the contract for pumping machinery for the waterworks system of Portage la Prairie, Man., will be called.

The city electrician of Winnipeg, Man., will receive tenders for two new engines for the city lighting plant.

G. Caron, Headingly, Man., will receive tenders for the erection of a school building.

The council of Edmonton, Alta., will call for tenders for two 16 gallon chemical engines.

The city clerk of Regina, Assa., is inviting competitive plans for a \$60,000 city hall.

The mayor of Prince Albert, N.W.T., will receive tenders up to August 16, for piping, valves, specials and water town, for a pump house, pumping machinery, aeration basins, intake wells, and two tubular boilers. Plans and specifications may be seen at office of Willis Chipman, C. L., Toronto.

W. Horwood, Winnipeg, Man., is calling for tenders for school house to be erected at St. Boniface, Man.

W. Pearson & Co., are inviting tenders for brick warehouse for Western Milling Co., Winnipeg, Man.

R. Evans, Winnipeg, Man., is inviting tenders for an assembly hall at Sanford, Man.

W. Horwood, Winnipeg, Man., will receive tenders for Ryan block, cost \$22,000.

K. Hunter, Regina, Assa., will receive tenders for 1600 feet of concrete.

W. Horwood, Winnipeg, Man., is calling for tenders for town hall at St. Boniface, cost \$10,000.

K. Hunter, Regina, Assa., is calling for constructing a septic tank.

R. Evans, Winnipeg, Man., is inviting tenders for brick school house at Shoal Lake.

The city clerk of Winnipeg, Man., is inviting tenders for supply of valves and hydraulic supply sewer pipe, two weigh scales.

J. Brudgeman, Winnipeg, Man., is calling for tenders for a \$25,000 warehouse.

The town clerk of Indian Head, N.W.T., is calling for tenders for complete waterworks and electric lighting machinery.

Arthur H. Merriam, Hanover Square Building, New York city, desires quotations at once on 600 cubic feet of Canadian elm in logs, 25 feet long and one foot in diameter, fresh sap wood. The lumber is desired for shipment to Egypt.

The Grand Trunk Pacific Railway Co., will call for tenders for the construction of the western division of the line. The estimated cost of the work is about \$100,000,000.

PUBLICATIONS.

The publishers of The Canadian Manufacturer solicit in advance, if possible, catalogues, circulars, and other industrial publications issued by manufacturers. We wish to review such literature, and bring the principal points to the attention of our readers.

The Koerting two cycle gas engine is elaborately illustrated and described in the latest catalogue issued by De La Vergne Machine Co., East 138 Street, New York city. The modern Koerting gas engine presents an exterior appearance closely resembling the modern steam engine. It has many mechanical advantages and is claimed to have attained an advantage in thermal efficiency of at least 100 per cent. over the average steam engine.

Daniel Stern, he of the American Artisan, Chicago, has published an alphabetical library covering the ground all the way from A to Z, including the opinions of twenty-six advertisers expressed in twenty-six letters regarding the advantages derived from advertising in his most excellent journal.

The publishers, the S. E. Hendricks Co., 76 Elm street, New York, have sent us a handsomely bound copy of the fourteenth annual edition of Hendricks Commercial Register of the United States. It is intended for the use of both buyers and sellers, and its 1,279 pages are especially devoted to the interests of the Architectural, Mechanical, Engineering, Contracting, Electrical, Railroad, Iron, Steel, Mining, Mill, Quarrying and kindred industries. The book constitutes a complete annual of the above named industries, and contains over 350,000 names, addresses and business classifications, with full lists of the manufacturers of and dealers in everything employed in the manufacture of material, machinery, etc., used in these industries. Price, \$7.00.

Mr. George Johnson, Dominion statistician, has sent us a handsomely bound copy of The Statistical Year Book of Canada, for 1901--the twentieth year of issue. As usual the subjects alluded to cover, in abstract manner, about all the important events relating to Canada from the discovery of Nova Scotia, in 1497, by John and Sebastian Cabot to date. It is a most useful handbook that the editor has constant use for.

The Payne Machinery Exchange Co. Elmira, N.Y., have issued price list No. 36, which contains full particulars for those desiring to purchase machinery of all kinds.

We call attention to the advertisement of the Locke Adder which will be found in this issue. This is a little machine which one can carry in his breast pocket. for addition, subtraction, multiplication and division. It

has been upon the market for only a short time, but is already in use all over the world. The manufacturers claim that its use will effect an immense saving in time, labor and mental strain, besides insuring accuracy in the work. They have hundreds of testimonials from people in all classes of business. The price prepaid in the United States is only \$5.00 or \$10.00 according to the style desired.

The Locomotive & Machine Co., Montreal, have published a catalogue descriptive of the Atlantic Shovel designed by A. W. Robinson. The catalogue contains an interesting preface relating to the requirements of the modern shovel.

PERSONALS.

Hon. S. N. Parent, ex-Prime Minister of Quebec, has accepted the chairmanship of the National Transcontinental Railway Commission.

Messrs. Wayland, Williams & Dadson, who are making a specialty of gas engines and gas-producing plants, have removed their offices from the Board of Trade Building to 321 St. James Street, Montreal.

The International Deep Waterways Commission will not resume its sittings until September, but several committees have been appointed to examine into subjects coming within the scope of the commission, to which they will make reports at the next meeting, which has been fixed for September 11 and 12 at Buffalo. The following meetings will also be held:--At Niagara Falls, September 13 and 14; Toronto, September 15; Hamilton, September 16. The levels at the Soo will be reported upon by one committee. Another will examine the case of the Minnesota Canal & Power Co., which desires to divert a portion of the waters of the Rainy River flowing into the Lake of the Woods.

Mr. B. B. Kelliher has been appointed chief engineer of the Grand Trunk Railway Co., with headquarters at Montreal.

The annual convention of the Canadian Manufacturers' Association will be held in the city of Quebec on September 18, 19 and 20.

Collingwood Schreiber, deputy minister of railways and canals for Canada, has been appointed consulting engineer to the government and will have supervision over the selection of the terminals and location of the Grand Trunk Pacific Railroad.

M. J. Butler, who has been assistant engineer to the government transcontinental commission, has been appointed deputy minister of railways and canals for Canada.

The annual outing of the Engineers' Club, of Toronto, occurred on July 28. The happy "outers" went by steamer Turbinia to Burlington Beach, thence by special electric car which took them to the works of the Hamilton Steel & Iron Co., the International Harvester Co., and the Cataract Power Co., all in Hamilton. After lunch at the Royal Hotel they visited many other places of interest, thence they went to the Brant House, on Burlington Beach for supper, and, then being more or less fatigued, they re-embarked for Toronto. Willis Chipman, secretary of the Club, looked after the boys.

Mr. W. J. Crossen, head of the Crossen Car Mfg. Co., Cobourg, Ont., is seriously ill at his home there.

Mr. William Jessop, chairman of Wm. Jessop & Sons, Limited, died at his home, Bradfield, England, on July 4.

It is stated that John Bain, Esq., assistant commissioner of customs, has been selected for the position of secretary of tariff commission.

BRITISH COLUMBIA COAL AND COKE.

The gross output of coal from all the mines of British Columbia in 1904 was 1,685,698 tons, of which 1,071,337 tons were sold as coal, 159,651 tons were consumed at the companies' works, 432,070 tons were used in making coke, and 22,640 tons were added to stock piles. The amount of coke produced was 238,428 tons, of which 229,618 tons were sold and 8,810 added to stock.

The markets in which the aggregate coal and coke output of the province was sold, the figures representing tons of 2,240 pounds, were as follows:

Canada—Coal, 537,744 tons, coke, 129,337 tons.

United States—Coal, 532,436 tons; coke, 100,231 tons.

Other Countries—Coal, 1,157 tons.

Of the coal sold, 53 per cent. was exported to the United States; practically all to California, and 20 per cent. of the coke sold found the same market. In 1902, 75 per cent. of Vancouver Island coal went to California, in 1903 about 45 per cent., and in 1904 about 53 per cent.

In 1904 the Crow's Nest Pass Coal Mining Co., mined 662,685 tons of coal, of which 168,980 tons were sold in Canada, and 118,188 tons were exported to the United States. Of the remainder to the output, 24,617 tons were consumed by the operations of the company and 350,000 were converted into coke, of which there was produced 218,857 tons. Of the production of coke, 119,004 tons were consumed by British Columbia smelters and 97,690 tons were exported to the United States.

BOILER MANUFACTURERS' ASSOCIATION.

The seventeenth annual convention of the American Boiler Manufacturers' Association of the United States and Canada began a three days' session in Toronto July 25, about 150 members being present.

Col. E. D. Meier, of St. Louis, in connection with the report of the Committee on Uniform Boiler Inspection, said an effort was being made to have a Federal commission appointed by President Roosevelt to investigate the situation relating to boiler inspection laws both Federal and State. The disaster to the steamer Slocum, which blew up in New York Harbor, had proven a lever of assistance in moving the authorities. Federal laws applied to marine boilers only, but those laws were of influence on State regulations of inspection. The committee are working for a system of rigid inspection of all boilers such as would reduce to a minimum all marine and land boiler disasters.

Mr. John J. Main, of Toronto, told the association that conditions in Canada might be improved regarding boiler inspection.

The officers elected for the ensuing year were as follows: R. Munroe, Jr., Pittsburg, Pa., president; J. D. Farasey, Cleveland, O., secretary; Joseph Wangler, St. Louis, Mo., treasurer; M. F. Cole, Newnan, Ga., first

vice-president; J. J. Main, Toronto, second vice-president; John Rourke, Savannah, Ga., third vice-president; J. Don Smith, Charleston, S.C., fourth vice-president, and G. H. Kittoe, Aurora, Ill., fifth vice-president.

Pittsburg, Pa., was selected as the meeting place next year.

THE INDUSTRIAL AWAKENING.

That the immense industrial progress shown by the larger cities of Ontario has awakened the civic Councils and Boards of Trade of the smaller towns throughout the province is evident from the returns given in the current annual report of the Bureau of Labor, issued by Secretary Glocking. Small towns, where raw materials exist in quantities, are anxious to set forth their natural advantages to manufacturers.

Among other industries the report shows that special advantages and inducements are open for canning factories at Armow, Ameliasburg, Toledo, Ancaster, Bath, Beamsville, Grimsby, St. Catharines, Bothwell, Biddulph, Chesley, Clarksburg, Dutton, Fonthill, Gordon, Harrow, Kincardine, Millford and Sterling, Woodville, Wyoming, Wingham, Stouffville, Sudbury, Paisley, New Liskeard, Milverton, Little Current, Kincardine, Gananoque and Cobden are desirous of having foundries established within their borders.

The attention of hardwood and furniture manufacturers is called to the immense amount of raw material to be had at Blind River, Beeton, Bruce Mines, Baysville, Bowmanville, Bala, Carleton Place, Thorold, Dunchurch, Emsdale, Exeter, Goderich, Lindsay, Markdale, Minden, Milton, Moonstone, Mattawa, North Bay, Pinkerton, Pembroke, Sundridge, Teeswater and Whitevale.

Thessalon, Tilbury, St. Clement's, Slate River, Sundridge, Parkhill, Penetanguishene, Presque Isle, Orrville, North Bay, Napuee, Norwich, New Liskeard, Mattawa, Milton, Minden, Marmora, Milverton, Jasper, Hillier, Eganville, Dresden, Drayton, Dutton, Collingwood, Cherry Valley, Brighton, Bonfield, Bruce Mines, Bobcaygeon, and Aylmer invite manufacturers of barrel staves, cheese boxes and similar products, and offer an abundance of raw material at their doors.

Excellent water powers are open to manufacturers at Streetsville, Whitevale, Tillsburg, Bracebridge, South River, Otterville, Newburg, Iroquois, Frankford, Eganville, Dryden, Calabogie and Antrim.

ZORENE.

The Hungarian chemist, Brunn, of the university of the same name, has not revealed, but has described in a paper which vouches for the facts as being well known in the highest scientific circles, his alleged discovery of a liquid chemical compound which renders certain kinds of matter proof against the effects of time. He asserts that it doubles the density of nearly every kind of stone and renders it waterproof. It imparts to all metals qualities which defy oxygen, and thus they cannot rust. It is also a germicide of hitherto unequalled powers.

The professor says that while travelling in Greece some 25 years ago he noticed that the mortar in stones of ruins which were known to be over 2,000 years old was as hard, fresh and tenacious as if it had been made only a year. He secured a piece of the mortar, and

has been working on it ever since until, when, he says, he has discovered the compound. The compound is a yellow liquid, which the professor has christened zorene.

An interviewer describes the following experiments: A piece of ordinary unbreakable slag after immersion in water defied the full blow of a hammer. The same effect on ordinary bricks and on a piece of red jarrah wood. All three were immersed in water for a long time. When taken out and weighed with delicate scales the presence of a single particle of added zorene could not be detected. Two pieces of iron submitted to an ammonia test equal to ten years' exposure to the air emerged from the bath as they entered it. An ordinary pocket knife which had lain open five months did not show the slightest stain.

Prof. Brunn asserts that he will be able to make dust, germ and water proof by giving a commercial value to hundreds of millions of tons of slag which is now wasted in the mining and smelting districts. It is at the very least double the life of materials exposed to the air such as in bridges, railway vessels and tanks.

AUTOMATIC SPRINKLER SYSTEM.

An automatic sprinkler equipment consists of an arrangement of pipes regulated under all ceilings and extending to all rooms, under benches and all concealed places with automatic sprinkler heads or valves attached; the system of piping being supplied automatically with water from elevators, pressure tanks, city connections or pumps. Two of any of the above sources of supply being necessary for standard equipment in cities having fire departments, steam connections are attached to the equipment in such manner that the fire department pump directly into the system, reinterposing supplies. There are two kinds of equipment: wet pipe systems in which the pipes are continuously filled with water, and dry pipe systems, the pipes of which are filled with air as far as the automatic valve which is closed by the pressure of the air. In buildings where the temperature is such that water in the pipes would be apt to freeze, dry systems are installed; wet systems are preferable as their operation is more prompt; there is less opportunity for this equipment to become disarranged as there is no obstruction to the flow of water when the main valve is open but the sprinkler valve. The sprinkler heads, or valves, are filled with fusible solder melting at temperatures ranging from 165 to 360 degrees, determined by the temperature of the place in which the sprinkler is to be located. It was found in joist construction the space between joists is to some extent out of reach of the distribution from the sprinkler heads, and obtaining headway in these spaces is not extinguished by hand. Under open joist construction the pipes should be run at an angle to joists, not more than 10 degrees, and sprinkler heads placed not more than eight feet apart on pipes and the heads staggered—that is, the sprinkler to be so located as to distribute water alternate joist channel ways.

Two sources of supply are necessary to lessen the chances of a water shortage in case of fire; one of the supplies should be water under a heavy pressure, that the sprinklers opened may be as effective

Public water works, having adequate mains and providing a continuous heavy pressure, are most desirable; next in value are pressure tanks which furnish an excellent primary supply, especially in connection with wet pipe sprinkler service; pressure tanks are not so effective for dry pipe sprinkler service, as much of the initial discharge is contained in filling of the empty pipes; the tanks should not be placed below the top floor, and water service is obtained if located upon the roof, as less air pressure would be necessary to expel all of the water under good pressure, the tank being above all of the sprinkler heads. Pressure tanks are cylindrical in shape, constructed of steel, air tight, and the size of the tank generally used is 66 inches in diameter and 25 inches in length; total capacity 4,500 gallons, water capacity 3,000 gallons; two-thirds of the tank containing water and the remainder filled with air under pressure. The number of tanks necessary depends upon the number of sprinkler heads per floor, and if the tank supply is of a capacity to supply 20 per cent of the sprinkler heads upon the floor having the greatest number, allowing 200 gallons of water per head, the supply will be considered sufficient. No tank, however, should be of less than 4,500 gallons capacity.

Greater quantities of water may be stored in gravity tanks, as no air space is required. The tanks should be of a capacity sufficient to provide 5,000 gallons for each 100 sprinkler heads upon the floor having the greatest number. The pressure of the water delivered from gravity tanks is wholly dependent upon the height of the tank above the highest sprinkler heads, and the tank should be elevated as high as possible; the bottom of the

tank should not be less than 15 feet above the highest sprinkler heads. The gravity tank is only supplementary to the main supply and also pumps as a source of supply to sprinklers are inferior to the others enumerated.

Sprinkler equipments are provided with an automatic alarm arrangement, which sounds a warning when the water within the pipe is set in motion, caused by the opening of a sprinkler head, or pipe, by accident or fire. When kept in proper order, too much importance can not be placed upon the alarm, as serious water loss may result from a small fire, which the sprinklers extinguish, if the flow of water is not checked.

A NOVEL LIFT LOCK.

One of the most remarkable locks in the world is now in operation at Foxton, Leicestershire, England, on the Grand Junction Canal, says Commercial Intelligence. It is a lift lock of an entirely novel kind, and in one operation performs a duty which hitherto necessitated the use of a staircase of ten locks. The difference of level between the two canals at this point is no less than 75 feet, and under the old system of locking, the time occupied in passing one boat through was one hour and fifteen minutes, a pair of boats taking one hour and twenty minutes.

For the purpose of improving and accelerating the system, which was a serious handicap to the success of the canal, Mr. Gordon Gale Thomas, the engineer in chief to the Grand Junction Canal, in conjunction with his brother, devised the present lift system of communication. The work of

carrying out the installation was intrusted to Messrs. J. and H. Gwynne, engineers, of Hammersmith, London, W.

The principle of the invention is two barge lifts running in opposite directions upon the counter-balancing system. An inclined plane 300 feet in length has been laid from the lower to the higher reaches. Upon this is laid eight pairs of rails, four for each lift. The gradient is in the proportion of 1 in 4, and the total height is 75 feet. The plant comprises two moveable tanks, or lifts, two fixed conduits, hydraulic gates and rams, steam engines and boilers, hydraulic pump, water accumulator, steel wire haulage ropes, hauling drums, guide pulleys, etc.

The two moveable tanks are constructed of steel plates. Each lift is carried upon eight sets of wheels, which run upon the tracks. The internal dimensions of each tank are 80 feet in length, 15 feet in breadth, and five feet in depth. These tanks are each capable of accommodating two canal boats of 33 tons apiece, or one barge carrying 70 tons. The depth of water in the lifts is sufficient to float the barges within. At each end of the tank is provided a gate or sluice, which is raised to the top of the steel frame provided for the admittance and egress of the boats within the lift. These gates are completely watertight, so that no loss of water is incurred during the passage of the lift up or down the inclined road, and no danger to, or strain upon the boat is incurred.

The two tanks travel in opposite directions, i.e., while one is ascending the other descends, and vice versa. They are connected by wire ropes in such a manner that the weight of one balances that of the other

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as they travel up and down in opposite directions between the higher and lower canals. By this arrangement the engine has no work to do, beyond overcoming the friction of the working parts.

When a boat has to be raised it is floated into whichever tank is at the lower level, through a suitable gate at the end, the water in the tank being, of course, at the same level as that in the canal; the gate is then closed by means of hydraulic cylinders, and the tank is hauled up the incline with the boats still floating; thus the boats are water-borne during the whole operation, and are not strained in any way. While the tank in question ascends, the other tank, as already explained, descends, and this also being full of water, a balance is sustained. It is scarcely necessary to point out that it is immaterial to the balancing whether there are boats in both tanks or not, as the total weight under any condition of loading is equal.

Upon arrival at the top of the inclined plane, the movable tank is held in position by means of hydraulic rams. The gate at the other end is then raised simultaneously with the gate of the fixed conduit, thus making connections with the higher canal, immediately after which the boats or barges are at liberty to continue their journey.

The wire haulage cable connecting the two

lifts, which is seven inches in diameter, is passed round the main hauling drums and guide pulleys. These are operated by an engine of the double-cylinder jet-condensing type, the drums being driven through powerful worm gearing.

In addition to the great saving of water—approximating 90 per cent. of the quantity used by the locking system—the lift lock greatly facilitates the passage of the boats. Instead of one and a quarter hours, the time now occupied in transferring a boat from one level to the other is 12 minutes. As to the cost of working, the duty, taking 15 minute intervals, between the operations, is 6,000 tons (3,000 tons in either direction) per day of 12 hours, and the cost of dealing with this tonnage, based on the actual experience of working, would be the almost nominal sum of £1 4s. 6d. per day, including coal, oil, stores, and labor.

PACIFIC COAST EXCURSIONS.

During June, July, August and September the Chicago & North-Western Railway will sell from Chicago round trip excursion tickets to San Francisco, Los Angeles, Portland, Ore., (Lewis & Clarke Exposition), Seattle, Victoria and Vancouver at very low rates. Correspond-

ingly cheap fares from all points in Canada. Choice of routes, best of train service, favorable stop-over and liberal return limits. Rates, folders and full information can be obtained from B. H. Bennet, General Agent, 2 East King Street, Toronto, Ont.

Among recent orders taken by the B. F. Sturtevant Co., Boston, Mass., for mechanical draft apparatus, are the following: Dwight Mfg. Co., Chicopee, Mass., 1,850 h.p.; Pennsylvania Salt Mfg. Co., Greenwich Point, Pa., battery of boilers and stills; Nashua River Paper Co., East Pepperell, Mass., 1,500 h.p.; Paragon Park, Nantasket Beach, Mass., 620 h.p.; and Haverhill Electric Co., Haverhill, Mass., 650 h.p.

Pausing uncertainly before a desk in the big insurance office, the Hibernian visitor said to the clerk, "Oi want to tel out a pawley."

"Life, fire or marine," drawled the dapper clerk with infinite sarcasm.

"All three, Oi'm thinkin'," retorted the applicant. "Oi'm goin' fer a stoker in th' navy."

We concentrate our energies—we make CRUCIBLES only. We make them where they are used—in the midst of the greatest steel and brass industries of the United States. We know your needs. Send us an order.

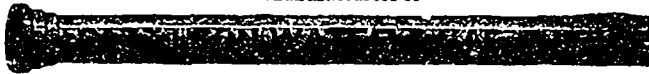
MCCULLOUGH-DALZELL CRUCIBLE CO., Pittsburgh, Pa.

MONTREAL PIPE FOUNDRY CO., LIMITED

SUCCESSORS TO

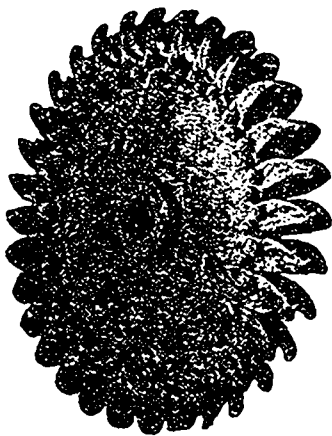
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Awarded the Grand Prize at St Louis World's Fair

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Special Machinery or Devices.

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THE GLOBE MACHINE & STAMPING CO.
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THE UNDERWOOD

Manufacturers

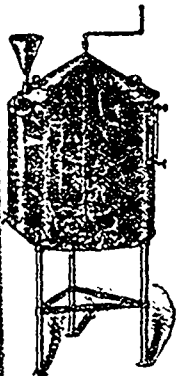
Throughout CANADA have unanimously decided in favor of the **VISIBLE UNDERWOOD** Typewriter.

Why?

Because the Underwood is the only successful invoicing and tabulating typewriter that has stood the test.

United Typewriter Co., Limited, - Toronto, Canada

The WETMORE Patent Glue Heater



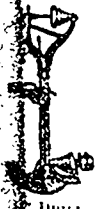
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We give you **30 Days' Free Trial** and if it does not convince you in that time that it will pay for itself in a year, send it back.

The Advance Machinery Co.,
19-23 So. Huron Street,
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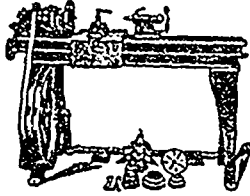


DRILL

We build a full line of **Upright Drills** from 12 inch to 31 inch.

All sizes furnished in **Gangs** when so required.

Our **Screw Cutting Lathes** are built in both power and foot power styles.



11' FOOT POWER LATHES.

We also build a very practical **Wet Tool Grinder** for general shop use.

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Ontario Agent—
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OUR PRICES ARE LOW

Rubber Belting

D. K. McLAREN

751 Craig Street, MONTREAL
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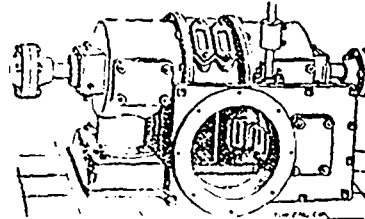
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Persons having business with any of the Inspectors will find them at the above address.

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"LITTLE GIANT" Turbine

FOR ALL PURPOSES

Horizontal Type.

HORIZONTAL AND VERTICAL. BUILT IN 44 SIZES.

We guarantee a higher percentage of power from water used than any other wheel on the market.

Water Wheel Governors, Machine Dressed Gearing, Pulleys, Shafting and Bearings.

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BLEACHING POWDER,

THE MOST ECONOMICAL FORM OF SODA FOR MANUFACTURERS OF
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and BLEACHERSHIGH STRENGTH, 35/37 IN
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Highest Awards at the World's Fair, Chicago, upon

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CANADIAN NATIONAL EXHIBITION

— OF —

1905

TORONTO

1905

Aug. 26th

Sept. 11th

The National Show of Live Stock, Agricultural and Horticultural Products, Art and Manufactures.

Processes of Manufacture are an Educational Feature of the Exhibition—demonstrating the progress of Canadian Manufactures. Special inducements are offered to Exhibitors for displays in this Department.

CORRESPONDENCE REQUESTED.



Advancement and Improvement in Every Department.

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(Acknowledged to be the finest military musical organization in the United Kingdom) will give two concerts daily.

BRILLIANT SPECTACLE EVERY EVENING

The Fall of Port Arthur

TWENTY-SEVENTH ANNUAL

Entries close Aug. 7th

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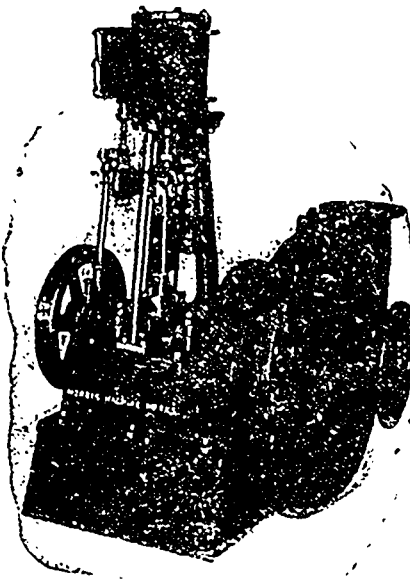
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HAMILTON, - ONT.



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BALDWINVILLE, N.Y.

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SPECIAL PUMPING OUTFITS TO SUIT
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Estimates Furnished upon Application.

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At \$2.00 and \$2.55 per 100 Square Feet.



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Send in your order for as many squares (10x10 feet) as you require to cover your new or old building. The very best roofing for this climate. We can supply **Eave Trough, all sizes, Corrugated or Plain Round, Conductor Pipes, Shoes, Elbows, Spikes, Tubes.** All goods shipped day after order is received. We are the largest concern of the kind under the British flag. Established 1861. Capital invested \$150,000.00.

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- Brantford, Ont.
- Fort William, Ont.
- Halifax, N.S.
- Hamilton, Ont.
- Lindsay, Ont.
- Peterborough, Ont.
- Regina, N.W.T.
- Sherbrooke, Que.
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Orillia Town Council has purchased a piece of property lying between two streets with a view to offering free sites to industries.

Better still, Orillia sells *Electric* developed at its municipal plant for \$15 h. p. per annum for an excellent service available 24 hours a day.

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Good locality; wool plentiful.

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On Line of Grand Trunk Railway

Near Lake Ontario, East of Toronto

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Main Building, 150x50 feet
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Combined specification and form of tender can be obtained on application at this office. Persons tendering are notified that tenders will not be considered unless made on the printed form supplied, and signed with their actual signatures. Each tender must be accompanied by an accepted cheque on a chartered bank, made payable to the order of the Honourable the Minister of Public Works, equal to ten per cent. of amount of the tender, which will be forfeited if the party tendering declines to enter into a contract when called upon to do so, or if he fails to complete the work contracted for. If the tender be not accepted the cheque will be returned. The Department does not bind itself to accept the lowest or any tender.

By order
FRED. GELINAS,
Secretary.

Department of Public Works,
Ottawa, June 26, 1905

Newspapers inserting this advertisement without authority from the Department, will not be held for it.

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Write for prices. **TORONTO, Canada.**

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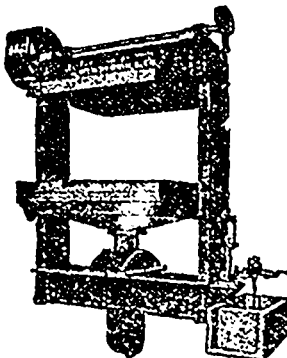
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Steam Geared or Electrically Driven.

Deep Well Pumping Systems for Cities, Railroad, Mines, Factories, etc.

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BARGAINS Money Savors. First Class.

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Fire, Wrecking, Irrigation, Water Works, Mining Pumps, Air Compressors, Tanks, Cars, Pipe Rail, Boilers, Engines, Beams, Scales, Dynamometers, Motors, Car Trucks. Our prices are of interest to close buyers.

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OFFICE, SCHOOL, CHURCH & HOUSE FURNITURE

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A WORD TO OUR READERS!

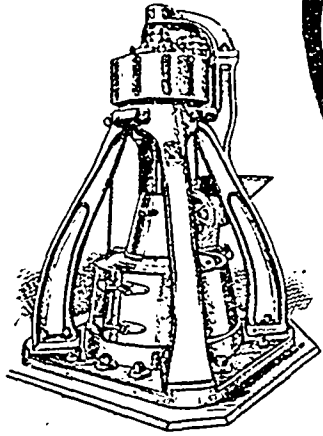
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The Greatest Pulverizing Machine in the World

Used Wherever Portland Cement is Made

OVER 50 PER CENT. OF THE PORTLAND CEMENT MANUFACTURED IN THE UNITED STATES TO-DAY IS GROUND IN THE GRIFFIN MILL.



The Griffin Mill pulverizes more cement than the combined output of all other machines used for this purpose.

Thoroughly tested by continually successful and constantly increasing use during the past sixteen years.

Portland Cement Clinker reduced from 1/2 inch to required fineness in one operation, with no auxiliary apparatus. No other machine made will do this.

Buy the GRIFFIN MILL and get the BEST. It holds the world record from every standpoint.

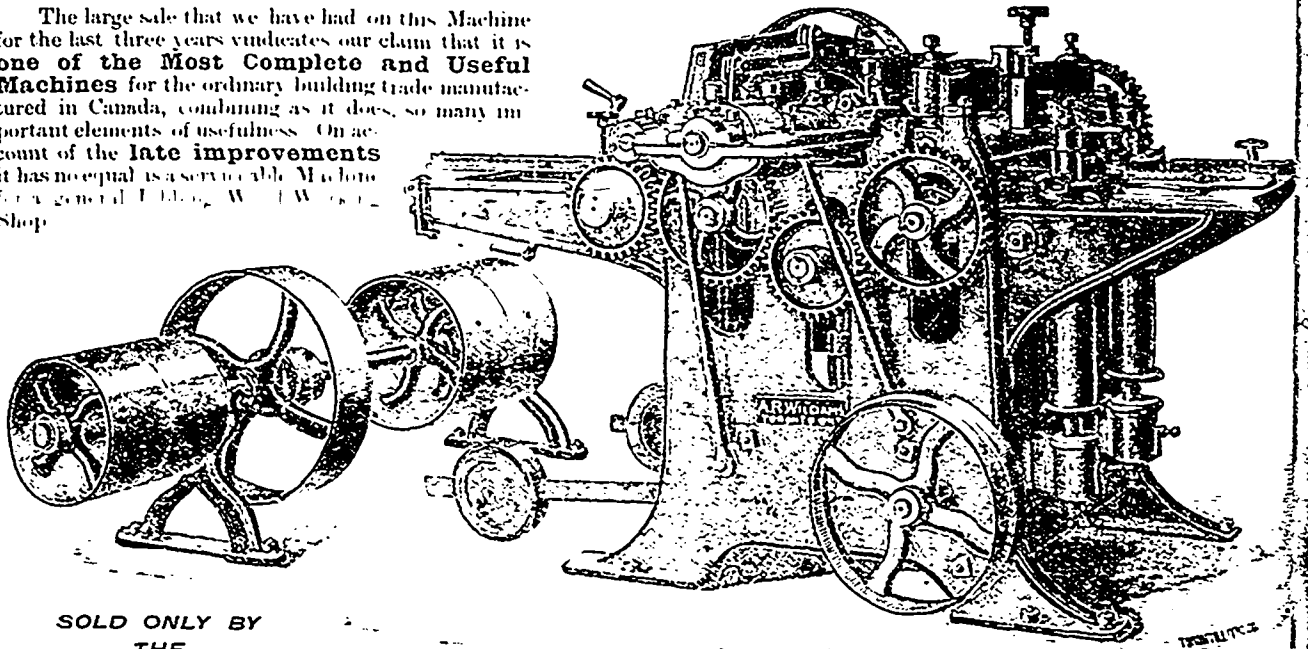
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Bradley Pulverizer Company, 92 State St., Boston



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The large sale that we have had on this Machine for the last three years vindicates our claim that it is one of the Most Complete and Useful Machines for the ordinary building trade manufactured in Canada, combining as it does, so many important elements of usefulness. On account of the late improvements it has no equal as a serviceable Machine for a general Lumber Mill or Shop.



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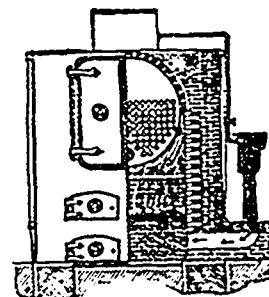
The Schutte & Koerting blowers offer a means of burning low priced fuel, such as screenings, gas works breezes and other refuse with perfect combustion, thereby making a direct reduction in cost of steam. They are used to great advantage on:

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3. Steam Boiler Furnaces.

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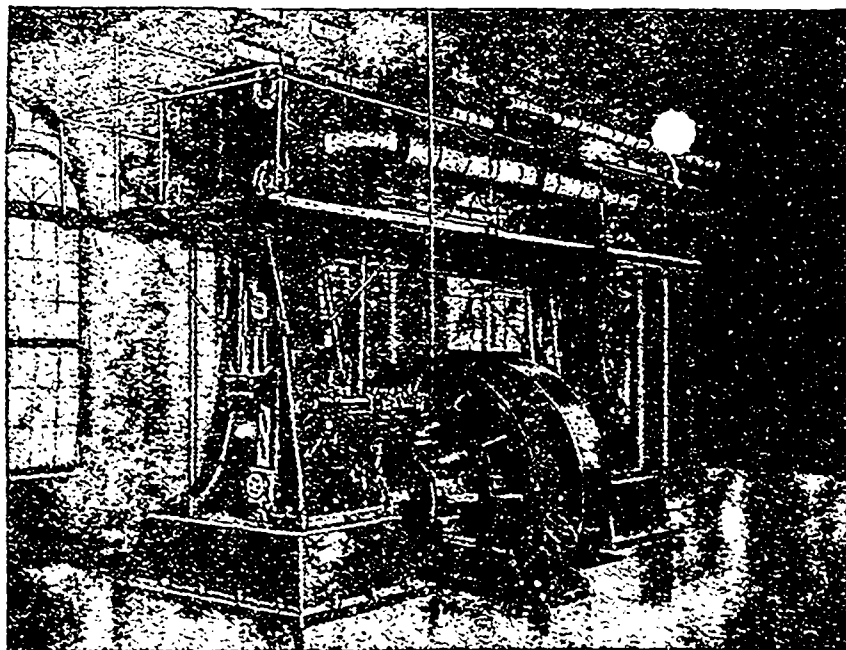


MANIPULATION

Regulate blast with side handle.
Start and stop by opening and closing a valve in steam pipe—full.

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(CONTINUED).

Belting (Rubber)

Gutta Percha & Rubber Mfg. Co., Toronto.
McLaren, D. K., Montreal and Toronto.
McLaren, J. C., Belting Co., Montreal.
Petrie, H. W., Toronto.
Sadler & Haworth, Montreal and Toronto.

Belting and Supplies

Bristol Co., Waterbury, Conn.
Dominion Belting Co., Hamilton, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
McLaren, D. K., Montreal and Toronto.
McLaren, J. C., Belting Co., Montreal and Toronto.
Petrie, H. W., Toronto.
Reddaway, F. A. Co., Manchester, England.
Rossendale Belting Co., Toronto.
Sadler & Haworth, Montreal and Toronto.
Williams A. R. Machinery Co., Toronto.

Blast Furnace Brick

Dunbar Fire Brick Co., Pittsburgh, Pa.
Hamilton Facing Mill Co., Hamilton, Ont.
Pennsylvania Fire Brick Co., Lock Haven, Pa.
Queen's Run Fire Brick Co., Lock Haven, Pa.
Reese-Hammond Fire Brick Co., Boliver, Pa.
Stowe-Fuller Co., Cleveland, Ohio.

Blowers

McEachren Heating & Ventilating Co., Galt, Ont.
Schutte & Koerting Co., Philadelphia, Pa.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Boiler Compounds

Canada Chemical Mfg. Co., London, Ont.

Boiler Inspection

Boiler Inspection & Insurance Co., Toronto.
Canadian Casualty & Boiler Insurance Co., Toronto.

BOILERS (See Engines and Boilers)

Bolts and Nuts

London Rolling Mills, London, Ont.
Morrow John, Machine Screw Co., Ingersoll, Ont.

Brass Founders

Hamilton Brass Mfg. Co., Hamilton, Ont.
Penberthy Injector Co., Windsor, Ont.

Brick and Bricklaying Machinery

Allis-Chalmers-Bullock, Limited, Montreal.

Building and Paving Brick

Dunbar Fire Brick Co., Pittsburgh, Pa.
Hamilton Facing Mill Co., Hamilton, Ont.
Pennsylvania Fire Brick Co., Lock Haven, Pa.
Queen's Run Fire Brick Co., Lock Haven, Pa.
Reese-Hammond Fire Brick Co., Boliver, Pa.
Stowe-Fuller Co., Cleveland, Ohio.

Building Iron and Steel

Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Expanded Metal & Fireproofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Builders' Materials

Albert Mfg. Co., Hillsboro, Ont.
Canada Foundry Co., Toronto.
Conduits Company, Limited, Toronto.
Expanded Metal & Fireproofing Co., Toronto.
Gartshore, John J., Toronto.
Hopkins, F. H. & Co., Montreal.
Ott-Fensom Elevator Co., Toronto.
Pedlar People, Oshawa, Ont.
Sheldon & Sheldon, Galt, Ont.

Cables

Dominion Wire Rope Co., Montreal.
Greening, B. Wire Co., Hamilton, Ont.
Phillips, Eugene F. Electrical Works, Montreal.

Canada Plates

Leslie, A. C. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Canoes

Peterborough Canoe Co., Peterborough, Ont.

Caps

McCullough-Dalsell Crucible Co., Pittsburg, Pa.

Card Clothing

McLaren, D. K., Montreal and Toronto.
McLaren, J. C., Belting Co., Montreal and Toronto.

Cast Iron Pipe

Canada Foundry Co., Toronto.
Montreal Pipe Foundry Co., Montreal.
McDougall, John, Caledonian Iron Works Co., real.

Castings (Grey Iron, Malleable Iron and International Harvester Co., Hamilton, Ont.
Jencks Machine Co., Sherbrooke, Que.
Kerr Engine Co., Walkerville, Ont.
McDougall, John, Caledonian Iron Works Co., real.

Cement Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Bradley Pulverizer Co., Boston, Mass.
McDougall, John, Caledonian Iron Works Co., real.

Centrifugal Pumping Machinery
Morris Machine Works, Baldwinville, N. Y.

Chain Making Machinery (Welded Coil Chain)

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

Channels

Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Leslie, A. C. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Charcoal Pig Iron

Canada Iron Furnace Co., Montreal.
McDougall, John, Caledonian Iron Works Co., real.

Chemicals

Canada Chemical Co., London, Ont.
Nichols Chemical Co. of Canada, Montreal

Chemists

Archbold, Dr. Geo., Prescott, Ont.
Heys, Thomas & Son, Toronto.

Clay Working Machinery

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

Coal and Coke

Bourne-Fuller Co., Cleveland, Ohio.
Ferguson, J. D., Hamilton, Ont.
Milnes, James H. & Co., Toronto.
Myles' Thos. Sons, Hamilton, Ont.
Old Colony Coal & Coke Co., Pittsburgh, Pa.
Pittsburgh Coal Co., Pittsburgh, Pa.
Shawmut Coal & Coke Co., St. Mary's, Pa.
Sawyer, Edward T., Columbus, Ohio.
Skane, E. A., Detroit, Mich.
Wick, H. K. & Co., Buffalo, N.Y.
Wilson, H. T. Coal Co., Detroit, Mich.

Coal Cutting Machines

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian Hand Drill Co., Sherbrooke, Que.
Jeffrey Mfg. Co., Columbus Ohio.

Coal Triples

Jeffrey Mfg. Co., Columbus, Ohio.
Jencks Machine Co., Sherbrooke, Que.

Coil Chains

Greening, B. Wire Co., Hamilton, Ont.
Leslie, A. C. & Co., Montreal.

Coke Oven Brick

Dunbar Fire Brick Co., Pittsburgh, Pa.
Stowe-Fuller Co., Cleveland, Ohio.

Collection Agency

Petrie, H. D., Hamilton, Ont.

Concrete Mixers

Hopkins, F. H. & Co., Montreal.
Concrete (Reinforced),
Trussed Concrete Steel Co., Detroit, Mich.
Conduits (Interior).
Conduits Company, Limited, Toronto.

Contractors' Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Gartshore, John J., Toronto.
Hopkins, F. H. & Co., Montreal.
Jencks Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., real.
Schutte & Koerting Co., Philadelphia, Pa.

Contractor's Plants

Allis-Chalmers-Bullock, Limited, Montreal.
Hopkins, F. H. & Co., Montreal.
Jencks Machine Co., Sherbrooke, Que.
Petrie, H. W., Toronto.
Von der Osten, E. & Co., Toronto.
Williams, A. R. Machinery Co., Toronto.

Conveying Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
Link-Belt Engineering Co., Philadelphia, Pa.
McDougall, John, Caledonian Iron Works Co., real.
Perrin, William R. & Co., Limited, Toronto.
Rossendale Belting Co., Toronto.

Copper Materials

Greening, B. Wire Co., Hamilton, Ont.
Phillips, Eugene F. Electrical Works, Montreal.
Syracuse Smelting Works, Montreal.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

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Cotton Banding and Rope

McLaren, J. C. Belting Co., Montreal.

Covers

McDough-Dalsell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.

Crayons

Lowell, Mass.
McLaren J. C. Belting Co., Montreal.

Crucibles

Fison, Joseph, Crucible Co., Jersey City, N.Y.
McDough-Dalsell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.
Synow Smelting Works, Montreal.

Crucible Caps

McDough-Dalsell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.

Crucible Covers

McDough-Dalsell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.

Cutter Grinding Machines

Leather-Bramard Milling Machine Co., Hyde Park, Mass.

Deep Well Engines

American Steam Pump Co., Battle Creek, Mich.

Detective Agency

Dwyer Detective Agency, St. Louis, Mo.

Dies (Socket, Sewer Pipe and Tile)

Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Directories

Directories, Limited, Toronto.

Draw Benches (Wire)

Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Drilling & Fishing Tools

National Supply Co., Leamington, Ont.
Well Supply Co., Pittsburgh, Pa.

Drilling Machines (Portable)

National Supply Co., Leamington, Ont.
Well Supply Co., Pittsburgh, Pa.

Drills

Allis-Chalmers-Bullock, Limited, Montreal.
H. F. Co., Rockford, Ill.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
H. W., Toronto.

Drills (Pneumatic and Rock)

Allis-Chalmers-Bullock, Limited, Montreal.
H. F. Co., Rockford, Ill.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
H. W., Toronto.

Drop Forgings

Machine & Stamping Co., Cleveland, Ohio.

Drop Forging Dies

Machine & Stamping Co., Cleveland, Ohio.

Dry Kiln Apparatus

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

Dust and Shavings Separators

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

Dye Stuffs and Chemicals

W. T. & Co., Montreal.
Mond & Co., Northwich, England.
Chemical Mfg. Co., London, Ont.
Color Co., New York City.
Albion & Extract Co., New York City.
C. Cornille & Co., Montreal.
Chemical Co. of Canada, Montreal.
Holland, Montreal.

DYNAMOS (See Motors and Dynamos)

Electric Motors and Transformers

Allis-Chalmers-Bullock Limited, Montreal.
Electric Co., St. Catharines, Ont.

Electric Mine Locomotives

General Electric Co., Toronto.
Westinghouse Co., Ltd., Hamilton, Ont.
Mfg. Co., Columbus, Ohio.

Electrical Repairs

Engineering Co., Toronto.

Electrical Supplies

Allis-Chalmers-Bullock, Limited, Montreal.
Bristol Co., Waterbury, Conn.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto.
Packard Electric Co., St. Catharines, Ont.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.
Worth & Martin, Toronto.

Elevators and Conveyors

Allis-Chalmers-Bullock, Limited, Montreal.
Darling Bros., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.
Link-Belt Engineering Co., Philadelphia, Pa.
Otis-Fensom Elevator Co., Toronto.

Elevator Insurance

Canadian Casualty & Boiler Insurance Co., Toronto.

Emery and Emery Wheels

Forman, John, Montreal.
Petrie, H. W., Toronto.

Engineers (Chemical)

Hoys, Thomas & Son, Toronto.
Hunt, Robert W. & Co., Chicago, Ill.

Engineers (Civil)

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

Engineers (Consulting)

Aitken, K. I., Toronto.
Canadian White Co., Montreal.
DeLano-Osborn Engineering Co., Toronto.
Electrical Construction Co., London, Ont.
Fensom, C. J., Toronto.
Hunt, Robert W. & Co., Chicago, Ill.
Keystone Engineering Co., Toronto, Ont.
Marion & Marion, Montreal.
Parke, R. J., Toronto.
Perrin, William R. & Co., Limited, Toronto.
Vogel, C. H., Ottawa.
Von der Osten, E. & Co., Toronto.

Engineers (Contracting)

Armstrong Herbert, J., Toronto.
Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Canadian White Co., Montreal.
Darling Bros., Montreal.
Electrical Construction Co., London, Ont.
Fensom, C. J., Toronto.
Keystone Engineering Co., Toronto, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
Robb Engineering Co., Amherst, N.S.

Engineers (Electrical)

Aitken, K. I., Toronto.
Allis-Chalmers-Bullock, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Canadian White Co., Montreal.
Crocker-Wheeler Co., St. Catharines, Ont.
DeLano-Osborn Engineering Co., Toronto.
Electrical Construction Co., London, Ont.
Fensom, C. J., Toronto.
Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto, Ont.
Marion & Marion, Montreal.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.
Worth & Martin, Toronto.

Engineers (Mechanical)

Allis-Chalmers-Bullock, Limited, Montreal.
Armstrong, Herbert J., Toronto.
Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
DeLano-Osborn Engineering Co., Toronto.
Electrical Construction Co., London, Ont.
Fensom, C. J., Toronto.
McDougall, John, Caledonian Iron Works Co., Montreal.
Hunt, Robert W. & Co., Chicago, Ill.
Kerr Engine Co., Warkerville, Ont.
Marion & Marion, Montreal.
Robb Engineering Co., Amherst, N.S.
Sheldon & Sheldon Galt, Ont.

Engineers (Mill and Hydraulic)

DeLano-Osborn Engineering Co., Toronto.
Fensom, C. J., Toronto.
Hawksworth, Alfred, Montreal.
Vogel, C. H., Ottawa.

Engineers (Mining)

Hoys, Thomas & Son, Toronto.
Mills, S. D., Toronto.

Engineers (Municipal)

Von der Osten, E. & Co., Toronto.

Engineers and Contractors

Canadian White Co., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.

Engines and Boilers

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Corbett, R. B., Brooklyn, N.Y.



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Ottawa, Ont.	Quebec, Que.
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Goldie & McCulloch Co., Galt, Ont.
 Hamilton, Wm. Mfg. Co., Peterborough, Ont.
 Hopkins, F. H. & Co., Montreal
 Jencks Machine Co., Sherbrooke, Que.
 Morris Machine Works, Baldwinville, N. Y.
 McDougall, John, Caledonia Iron Works Co., Montreal.
 McEachren Heating & Ventilating Co., Galt, Ont.
 National Supply Co., Leamington, Ont.
 O.A. Well Supply Co., Pittsburgh, Pa.
 Petrie, H. W., Toronto.
 Robb Engineering Co., Amherst, N.S.
 Sheldon & Sheldon, Galt, Ont.
 Sturtevant, B. F. Co., Boston, Mass.
 Williams, A. R. Machinery Co., Toronto.

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

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

Exhaust Heads
 Darling Bros., Montreal.
 Sheldon & Sheldon, Galt, Ont.
 Sturtevant, B. F. Co., Hyde Park, Mass.

Exhausters
 Schutte & Koerting Co., Philadelphia, Pa.
 Sturtevant, B. F. Co., Hyde Park, Mass.

Explorer and Geologist
 Evans, Horace F., Ashcroft, B.C.

Factory Sites
 (See Factory Locations, page 38).
 Board of Trade, Orillia, Ont.
 Central Ontario Power Co., Peterboro, Ont.
 Hutcheson, S. M., Paisley, Ont.

Feed Water Heaters
 Babcock & Wilcox, Limited, Montreal.
 Darling Bros., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Robb Engineering Co., Amherst, N.S.
 Schutte & Koerting Co., Philadelphia, Pa.

Files
 Sponce, R. & Co., Hamilton, Ont.

Fillet (Pattern)
 McLaren, J. C., Belting Co., Montreal.
 Sadler & Haworth, Montreal and Toronto.

Filters (Oil)
 Babcock & Wilcox, Limited, Montreal.
 Darling Bros., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Perrin, William R. & Co., Limited, Toronto.

Filters and Filtering Systems (Water)
 Babcock & Wilcox, Limited, Montreal.
 Jencks Machine Co., Sherbrooke, Que.
 McDougall, John, Caledonian Iron Works Co., Montreal.

Financial
 Bradstreet's, New York City.
 Dun, R. G. & Co., Toronto.
 Neff & Postlethwaite, Toronto.
 Petrie, H. D., Hamilton, Ont.

Fire Brick and Clay
 Dunbar Fire Brick Co., Pittsburgh, Pa.
 Hamilton Facing Mill Co., Hamilton, Ont.
 Pennsylvania Fire Brick Co., Lock Haven, Pa.
 Queen's Run Fire Brick Co., Lock Haven, Pa.
 Reese-Hammond Fire Brick Co., Boliver, Pa.
 Stowe-Fuller Co., Cleveland, Ohio.

Fire Escapes
 Darling Bros., Montreal.

Fire Insurance
 Inter-Insurance of America, New York City.

Flour Mill Machinery
 Goldie & McCulloch Co., Galt, Ont.

Forges and Blowers
 Canada Foundry Co., Toronto.
 McEachren Heating & Ventilating Co., Galt, Ont.
 Sheldon & Sheldon, Galt, Ont.
 Sturtevant, B. F. Co., Boston, Mass.

Founders
 Canada Foundry Co., Toronto.
 Goldie & McCulloch Co., Galt, Ont.
 Hamilton, Wm. Mfg. Co., Peterborough, Ont.
 Jencks Machine Co., Sherbrooke, Que.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Robb Engineering Co., Amherst, N.S.

Foundry Facings and Supplies
 Hamilton Facing Mill Co., Hamilton, Ont.

Fuel Economizers
 Babcock & Wilcox, Limited, Montreal.
 Schutte & Koerting Co., Philadelphia, Pa.
 Sturtevant, B. F. Co., Hyde Park, Mass.

Furniture (Lodge, Opera and School)
 Canadian Office & School Furniture Co., Montreal.

Galvanizing
 Ontario Wind Engine & Pump Co., Toronto.

Galvanizing and Tinning Machinery
 Furnaces (Wire)
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Gas and Gasoline Engines
 Goldie & McCulloch Co., Galt, Ont.
 Morrison, T. A. & Co., Montreal.

Gauges (Recording Pressure)
 Bristol Co., Waterbury, Conn.

Gauges (Steam)
 Penberthy Injector Co., Windsor, Ont.
 Petrie, H. W., Toronto.
 Williams, A. R. Machinery Co., Toronto.

Gauges (Water)
 Babcock & Wilcox, Limited, Montreal.
 Penberthy Injector Co., Windsor, Ont.

Generating Sets
 Sturtevant, B. F. Co., Hyde Park, Mass.

Generators
 Allis-Chalmers-Bullock, Limited, Montreal.
 Canadian General Electric Co., Toronto.
 Canadian Westinghouse Co., Ltd., Hamilton.
 Electrical Construction Co., London, Ont.
 Forman, John, Montreal.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Jones & Moore Electric Co., Toronto.
 Phillips, Eugene F., Electrical Works, Montreal.
 Toronto & Hamilton Electric Co., Hamilton.

Gloves, Mittens and Moccasins
 Storey, W. H. & Son, Aetons, Ont.

Glue Heaters
 Advance Machinery Co., Toledo, Ohio.

Glue Boom Equipment
 Advance Machinery Co., Toledo, Ohio.

Government Notices
 Factory Inspectors,
 Minister of Agriculture.

Graphite
 Dixon, Jos., Crucible Co., Jersey City, N.J.
 McCullough-Dalzell Crucible Co., Pittsburg, Pa.
 Pittsburg Crucible Works, Pittsburg, Pa.

Grease Cups
 Penberthy Injector Co., Windsor, Ont.

Hardware
 Butterfield & Co., Rock Island, Que.
 Gartshore, John J., Toronto.
 Globe Machine & Stamping Co., Cleveland, Ohio.
 Hopkins, F. H. & Co., Montreal.
 Morrow, John, Machine Screw Co., Ingersoll, Ont.

Heating and Ventilating Apparatus
 Darling Bros., Montreal.
 McEachren Heating & Ventilating Co., Galt, Ont.
 Sheldon & Sheldon, Galt, Ont.
 Sturtevant, B. F. Co., Boston, Mass.

Hoisting Engines
 Jencks Machine Co., Sherbrooke, Que.

Hoists (Chain and Pneumatic)
 Allis-Chalmers-Bullock, Limited, Montreal.
 Canadian Rand Drill Co., Sherbrooke, Que.
 Hopkins, F. H. & Co., Montreal.

Hose (Fire and Pneumatic)
 Gutta Percha & Rubber Mfg. Co., Toronto.
 McLaren, J. C., Belting Co., Montreal and Toronto.
 Sadler & Haworth, Montreal and Toronto.

Hotel
 Gallatin Hotel, New York City.

Hydroville Ont
 Kerr Engine Co., Walkerville, Ont.
 Jencks Machine Co., Sherbrooke, Que.
 McDougall, John, Caledonian Iron Works Co., Montreal.

Hydraulic Accumulators
 Jencks Machine Co., Sherbrooke, Que.
 McDougall, John, Caledonian Iron Works Co., Montreal.

Hydraulic Leather
 McLaren, J. C., Belting Co., Montreal.
 Sadler & Haworth, Montreal and Toronto.

Hydraulic Machinery
 Canada Foundry Co., Toronto.
 Darling Bros., Montreal.
 Hamilton, Wm. Mfg. Co., Peterborough, Ont.
 Jencks Machine Co., Sherbrooke, Que.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Perrin, William R. & Co., Limited, Toronto.
 Petrie, H. W., Toronto.
 Wilson, J. C. & Co., Glenora, Ont.

Industrial Plants
 Von der Osten, E. & Co., Toronto.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

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(CONTINUED).

Insulated Wires and Cables

Phillips, Eugene F., Electrical Works, Montreal.

Iron and Steel Specialties

Armstrong Mfg. Co., Bridgeport, Conn.
Barnes-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Laska A. C. & Co., Montreal.
London Rolling Mill Co., London, Ont.
Lyons, John, Limited, Bristol, England and Montreal.
New Scotia Steel & Coal Co., New Glasgow, N.S.
Petrie, H. W., Toronto.

Injectors

Canada Foundry Co., Toronto.
Hamilton Brass Mfg. Co., Hamilton, Ont.
Penberthy Injector Co., Windsor, Ont.
Seattie & Koerting Co., Philadelphia, Pa.
Williams, A. R. Machinery Co., Toronto.

Iron and Steel Inspection

Best, R. W. & Co., Chicago, Ill.

Lamps—Electric

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Forman, John, Montreal.
Packard Electric Co., St. Catharines, Ont.
Sylvania Incandescent Lamp Co., Toronto and St. Catharines, Ont.

Lathes

Best, B. F. Co., Rockford, Ill.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Lathes (Wood-working)

Goldie & McCulloch Co., Galt, Ont.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Loom Beeds.

McLaren, J. C., Belting Co., Montreal.

Lubricators

Penberthy Injector Co., Windsor, Ont.

Machinists

Goldie & McCulloch Co., Galt, Ont.
Robb Engineering Co., Amherst, N.S.
Ward & Martin, Toronto.

Machinists' Supplies

Armstrong Mfg. Co., Bridgeport, Conn.
Best, B. F. & Co., Rock Island, Que.
Goldie & McCulloch Co., Galt, Ont.
John Percha & Rubber Mfg. Co., Toronto.
Jones, F. H. & Co., Montreal.
Laska Mfg. Co., Columbus, Ohio.
Morrow, John, Machine Screw Co., Ingersoll, Ont.
Petrie, H. W., Toronto.
Ward & Martin, Toronto.

Machine Tools

Best, B. F. Co., Rockford, Ill.
Becker-Brannard Milling Machine Co., Hyde Park, Mass.
Darling Bros., Montreal.
Petrie, H. W., Toronto.

Malleable Castings

National Harvester Co., Hamilton, Ont.
Smith's Falls Malleable Castings Co., Smith's Falls.

Marine and Stationary Engines and Boilers

Allis-Chalmers-Bullock, Limited, Montreal.
Mackay, Machine Co., Sherbrooke, Que.

Mechanical Draft

Wheeler & Wilcox, Limited, Montreal.
Wheeler Heating & Ventilating Co., Galt, Ont.
Wheeler & Sheldon, Galt, Ont.
Wheeler, H. F. Co., Boston, Mass.

Metal Stamping

Wheeler Machine & Stamping Co., Cleveland, Ohio.
Wheeler, People, Oshawa, Ont.

Metallurgists

Mills, S. D., Toronto.

Mill Machinery and Supplies

Allis-Chalmers-Bullock, Limited, Montreal.
Armstrong Mfg. Co., Bridgeport, Conn.
Becker-Brannard Milling Machine Co., Hyde Park, Mass.
Darling Bros., Montreal.
Gartshore, John J., Toronto.
Goldie & McCulloch Co., Galt, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hamilton Brass Mfg. Co., Hamilton, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Hawthornthwaite, Alfred, Montreal.
Hay, Peter Knife Co., Galt, Ont.
Hopkins, F. H. & Co., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jonckes Machine Co., Sherbrooke, Que.
Morrow, John, Machine Screw Co., Ingersoll, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.

McLaren, D. K., Montreal and Toronto.
McLaren, J. C., Belting Co., Montreal.
Penberthy Injector Co., Windsor, Ont.
Petrie, H. W., Toronto.
Reddaway, F. & Co., Manchester, England.
Robb Engineering Co., Amherst, N.S.
Spence, R. & Co., Hamilton, Ont.
Wilson, J. C. & Co., Glenora, Ont.

Milling Cutters and Machines

Becker-Brannard Milling Machine Co., Hyde Park, Mass.

Miters' Lamps

Allis-Chalmers-Bullock, Limited, Montreal.

Mining Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian Rand Drill Co., Sherbrooke, Que.
Corbett, R. B., Brooklyn, N.Y.
Gartshore, John J., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Hopkins, F. H. & Co., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jonckes Machine Co., Sherbrooke, Que.
Link-Belt Engineering Co., Philadelphia, Pa.
McDougall, John, Caledonian Iron Works Co., Montreal.

Perrin, William R. & Co., Limited, Toronto.
Petrie, H. W., Toronto.
Schutte & Koerting Co., Philadelphia, Pa.
Williams, A. R. Machinery Co., Toronto.

Motors and Dynamos

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Corbett, R. B., Brooklyn, N.Y.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto.
Petrie, H. W., Toronto.
Sturtevant, B. F. Co., Hyde Park, Mass.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.

Moulding Sand

Hamilton Facing Mills Co., Hamilton, Ont.

Nickel.

Canadian Copper Co., New York, N.Y.
Orford Copper Co., New York, N.Y.

Novelty Manufacturers

Worth & Martin, Toronto.

Nozzles

McCullough-Dalsell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.

Office and Bank Fittings

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

Oils and Lubricants

Dixon, Jos. Crucible Co., Jersey City, N.J.
Imperial Oil Co., Petros, Ont.
Queen City Oil Co., Toronto.

Oil Cloth

Dominion Oil Cloth Co., Montreal.

Oil Cups

Penberthy Injector Co., Windsor, Ont.

Oil Well Supplies

National Supply Co., Leamington, Ont.
Oil Well Supply Co., Pittsburg, Pa.

Paints and Colors

Berry Bros., Walkerville, Ont.
Geigy, Aniline & Extract Co., New York City.
McArthur, Cornelle & Co., Montreal.

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J. J. CASSIDY, Manager.

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Paper Manufacturers

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

Patents

Budden, Hanbury, A., Montreal.
Fetherstonhugh & Co., Toronto
Marion & Marion, Montreal

Perforated Metals

Globe Machine & Stamping Co., Cleveland, Ohio.
Greening, B. Wire Co., Hamilton, Ont.

Personal Accident

Canadian Casualty & Boiler Insurance Co., Toronto

Phosphorizers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.

Pig Iron

Bourne-Fuller Co., Cleveland, Ohio.
Canada Iron Furnace Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Syracuse Smelting Works, Montreal

Pipe Line Supplies

National Supply Co., Leamington, Ont.
Oil Well Supply Co., Pittsburgh, Pa.

Pipe (Riveted, Iron and Steel)

Babeock & Wilcox, Limited, Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.

Pipe Threading Machines

Armstrong Mfg Co., Bridgeport, Conn.
Butterfield & Co., Rook Island, Que.
Petrie, H. W., Toronto.

Pipes and Tubes

Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Corbett, R. B., Brooklyn, N.Y.
Montreal Pipe Foundry Co., Montreal
National Supply Co., Leamington, Ont.
Oil Well Supply Co., Pittsburgh, Pa.

Plaster

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

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

Plumbago

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McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.

Pneumatic Tools

Allis-Chalmers-Bullock, Limited, Montreal
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Pointer Rolls (For Rods and Wire)

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

Power Plants—Equipments

Allis-Chalmers-Bullock, Limited, Montreal.
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Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
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Electrical Construction Co., London, Ont.
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Gutta Percha & Rubber Mfg. Co., Toronto.
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Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
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McDougall, John, Caledonian Iron Works Co., Montreal.

Packard Electric Co., St. Catharines, Ont.
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Robb Engineering Co., Amherst, N.S.
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United Electric Co., Toronto.
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McLaren, J. C., Belting Co., Montreal and Toronto.
Petrie, H. W., Toronto.
Wilson, J. C. & Co., Glenora, Ont.

Pumps and Pumping Machinery

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Canada Foundry Co., Toronto.
Corbett, R. B., Brooklyn, N.Y.
Darling Bros., Montreal.
Downie Pump Co., Downieville, Pa.
Goldie & McCulloch Co., Galt, Ont.
Jenckes Machine Co., Sherbrooke, Que.
Kerr Engine Co., Walkerville, Ont.
Morris Machine Works, Baldwinville, N.Y.
McDougall, John, Caledonian Iron Works Co., Montreal.
Ontario Wind Engine & Pump Co., Toronto.
Petrie, H. W., Toronto.
Schutte & Koerting Co., Philadelphia, Pa.

Punches and Shears

Globe Machine & Stamping Co., Cleveland, Ohio.
Petrie, H. W., Toronto.

Purifiers

Babeock & Wilcox, Limited, Montreal.
Goldie & McCulloch Co., Galt, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.

Purifying and Softening Systems (Water)

Babeock & Wilcox, Limited, Montreal
Darling Bros., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.

Railroads

Chicago & North-Western Ry., Toronto & St. Minn.

Railway Supplies

Algoma Steel Co., Sault Ste. Marie, Ont.
Allis-Chalmers-Bullock, Limited, Montreal
Gartshore, John J., Toronto.
Greening, B. Wire Co., Hamilton, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto
Hopkins, F. H. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow
Phillips, Eugene F., Electrical Works, Montreal.

Reamers

Butterfield & Co., Rock Island, Que

Rolls

Bourne-Fuller Co., Cleveland, Ohio.
London Rolling Mills, London, Ont.

Rock and Ore Crushers

Allis-Chalmers-Bullock, Limited, Montreal.
Bradley Pulverizer Co., Boston, Mass

Rolling Mill Engineers

Bourne-Fuller Co., Cleveland, Ohio.

Roofing

Bourne-Fuller Co., Cleveland, Ohio.
Pedlar People, Oshawa, Ont.

Rubber Goods

Gutta Percha & Rubber Mfg. Co., Toronto

Rubber Packing

Gutta Percha & Rubber Mfg. Co., Toronto

Rubber Washing Tubs

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

Rural Mail Boxes

Globe Machine & Stamping Co., Cleveland, Ohio.

Safes and Vaults

Goldie & McCulloch Co., Galt, Ont

Screws

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Screw Plates

Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Rock Island, Que

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Jeffrey Mfg. Co., Columbus, Ohio.
McDougall, John, Caledonian Iron Works Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow
Petrie, H. W., Toronto

Shapers and Carvers

Advance Machinery Co., Toledo, Ohio

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Hay, Peter Knife Co., Galt, Ont.

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Bourne-Fuller Co., Cleveland, Ohio
Leslie, A. C. & Co., Montreal.
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American Architect	New York	Weekly	\$6 00	\$6 25	Harpers' Weekly	New York	Weekly	1 00
American Electrician	New York	Monthly	1 00	1 25	Illustrated London News	London	Weekly	6 00
American Federationist	Washington	Monthly	1 00	1 25	Inter-Ocean	Chicago	Weekly	1 00
American Inventor	New York	Monthly	1 50	1 75	Iron Age	New York	Weekly	5 00
Architect and Builders Magazine	New York	Monthly	2 00	2 25	Ironmonger	London	Weekly	1 00
Architectural Record	New York	Monthly	3 00	3 25	Ladies' Home Journal	Philadelphia	Monthly	1 00
Architectural Review	London	Monthly	4 00	4 25	Leslies' Monthly Magazine	New York	Monthly	1 00
Atlantic Monthly	Boston	Monthly	4 00	4 25	Literary Digest	New York	Weekly	3 00
Boys' Own Paper	London	Weekly	1 75	2 00	Machinery (Engineering Edition)	New York	Monthly	2 00
Brick-BUILDER	Boston	Monthly	5 00	5 25	McClure's Magazine	New York	Monthly	1 00
British Architect	London	Weekly	6 00	6 25	Mines and Minerals	Scranton	Monthly	2 00
Buffalo Express, Illustrated	Buffalo	Weekly	2 00	2 25	Montreal Herald	Montreal	Daily	3 00
Builders' Journal	London	Weekly	3 50	3 75	Montreal La Presse	Montreal	Daily	3 00
Camera	Philadelphia	Monthly	1 00	1 25	Montreal Witness	Montreal	Daily	3 00
Canada First	Toronto	Monthly	1 00	1 25	Motor Age	Chicago	Weekly	2 00
Canadian Magazine	Toronto	Monthly	2 50	2 75	Motoring, Illustrated	London	Weekly	2 25
Cassiers' Magazine	New York	Monthly	3 00	3 25	Municipal Journal	New York	Monthly	3 00
Chemical News	London	Weekly	5 25	5 50	National Builder	Chicago	Monthly	2 00
Colliers' Weekly	New York	Weekly	5 20	5 25	National Monthly	Toronto	Monthly	1 00
Commercial Intelligence	London	Weekly	5 00	5 25	New York Clipper	New York	Weekly	4 00
Compressed Air	New York	Monthly	1 00	1 25	New York Commercial	New York	Daily	6 00
Cooking School Magazine	Boston	Monthly	1 00	1 25	North American Review	New York	Monthly	5 00
Cornhill Magazine	London	Monthly	2 50	2 75	Our Dumb Animals	Boston	Monthly	5 00
Delmeator	New York	Monthly	1 00	1 25	Outing	New York	Monthly	3 00
Electrical Engineer	London	Weekly	4 50	4 75	Ottawa Citizen	Ottawa	Daily	3 00
Electrical Magazine	London	Monthly	2 25	2 50	Ottawa Free Press	Ottawa	Daily	3 00
Electrical Review	London	Weekly	5 75	6 00	Pearson's Magazine	New York	Monthly	1 00
Electrical World and Engineer	New York	Weekly	3 00	3 25	Photographic Journal	London	Monthly	2 00
Electrician	London	Weekly	7 30	7 50	Photographic Times	New York	Weekly	1 00
Electro Chemical Industry	New York	Monthly	2 00	2 25	Photography	London	Weekly	2 25
Engineering and Mining Journal	New York	Weekly	5 00	5 25	Popular Science Monthly	New York	Monthly	3 00
Engineering Review	New York	Monthly	1 00	1 25	Power	New York	Monthly	1 00
Engineering Review (Fieldens)	London	Monthly	3 05	3 25	Queen, The	London	Weekly	10 00
Everybody's Magazine	New York	Monthly	1 00	1 25	Review of Reviews	London	Monthly	2 00
Field and Stream	New York	Monthly	1 50	1 75	Scientific American	New York	Weekly	3 00
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Four Track News	New York	Monthly	1 00	1 25	Sporting Times	London	Weekly	3 00
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Good Housekeeping	Toronto	Monthly	1 00	1 25	Toronto Sunday World	Toronto	Weekly	2 00
Good Road's Magazine	New York	Monthly	1 00	1 25	Youth's Companion	Boston	Weekly	1 75
Hardware Dealers' Magazine	New York	Monthly	1 00	1 25	Weldon's Ladies' Journal	London	Monthly	1 25
Harpers' Magazine	New York	Monthly	4 00	4 25	Winnipeg Free Press	Winnipeg	Daily	3 00

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TORONTO, CANADA.

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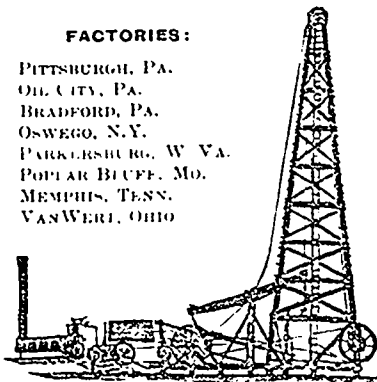
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