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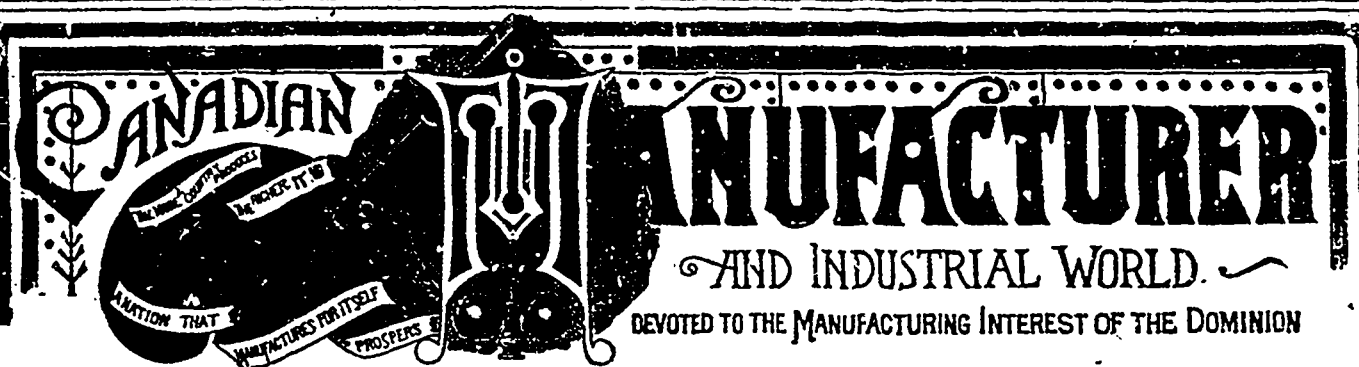
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Vol. 49. TORONTO, JULY 15, 1904. No. 2.

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Over 4 MILLION H.P. in use.  
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STEAM SUPERHEATERS.  
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HIGH PRESSURE Sheet Packing  
MAKES PERFECT JOINTS.  
Does not blow out and requires no following up.  
Try a sample lot and be convinced of its merits.  
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**OTIS ELEVATORS**  
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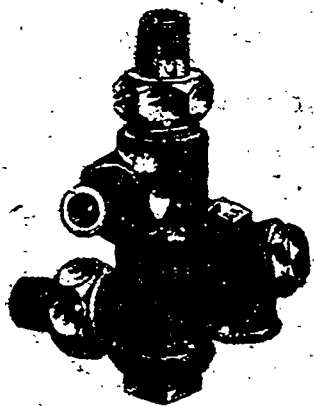
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Emery is an iron ore containing 30% to 40% Corundum, it will neither polish nor cut like Craig Mine Corundum which is virtually pure. Write us regarding a yearly contract.

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For all power purposes.

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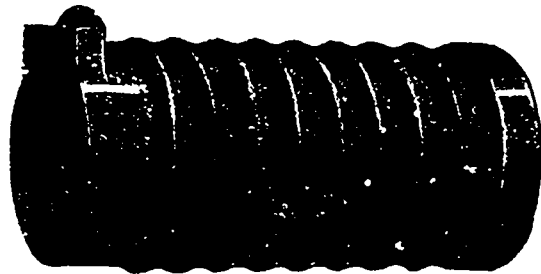
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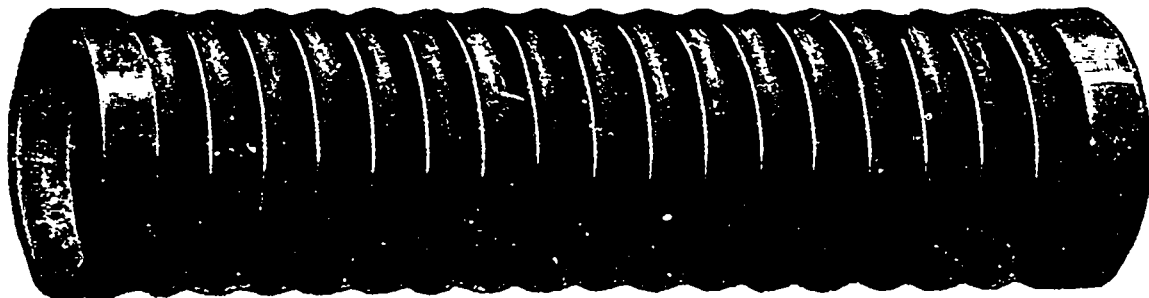


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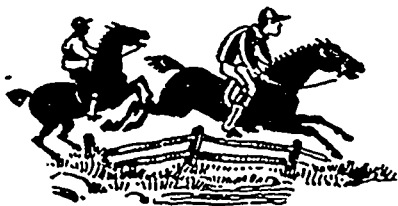
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Every pound guaranteed.

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**Operating 2,500 Coal Cars.**

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**HOLLOW BUILDING BLOCKS**

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Shipments via all railroads centering Pittsburg, Pa.,  
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SEALED TENDERS addressed to the undersigned, and endorsed "Tender for Supplying Coal for the Dominion Buildings," will be received at this office until Monday, July 25, 1904, inclusively, for the supply of Coal for the Public Buildings throughout the Dominion.

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 decline to enter into a contract when called upon to do so, or if he fail 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 and acting Deputy Minister.

Department of Public Works, Ottawa, June 21 1904.

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Pittsburgh,

Rooms 64 and 65

Youghiogeny,

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**BUFFALO,**

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400 Individual Cars.

**D**URING the ten months ending April 30, 1904, Canada imported 3,542,661 tons of Bituminous Coal, a gain of 645,388 tons over the same period of last year.

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Made at SHALLOW LAKE, ONT.

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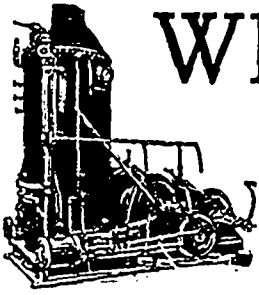
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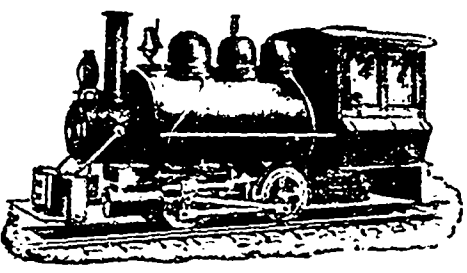


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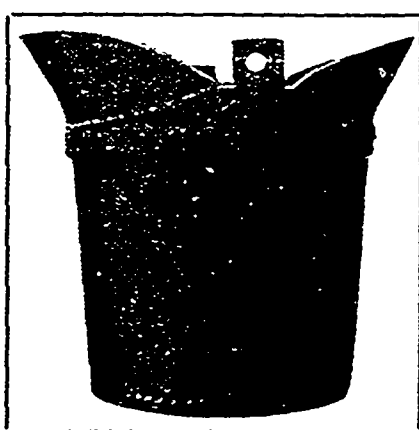


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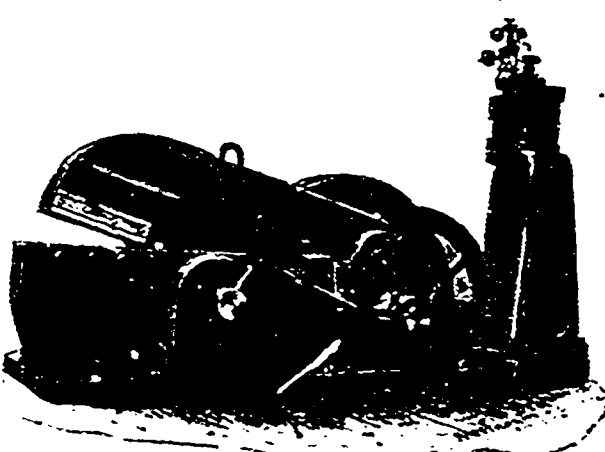
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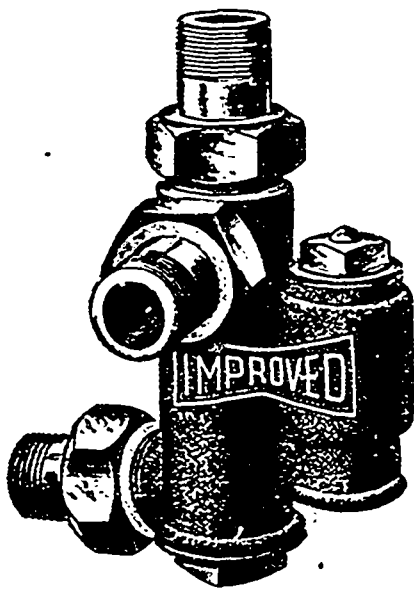
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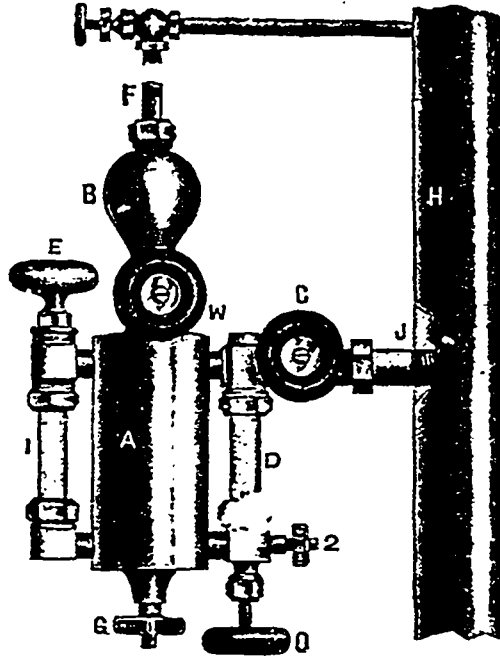
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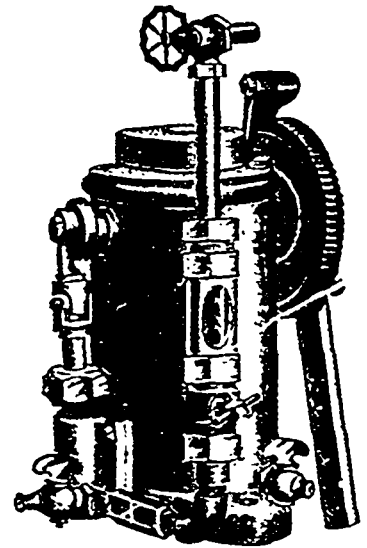
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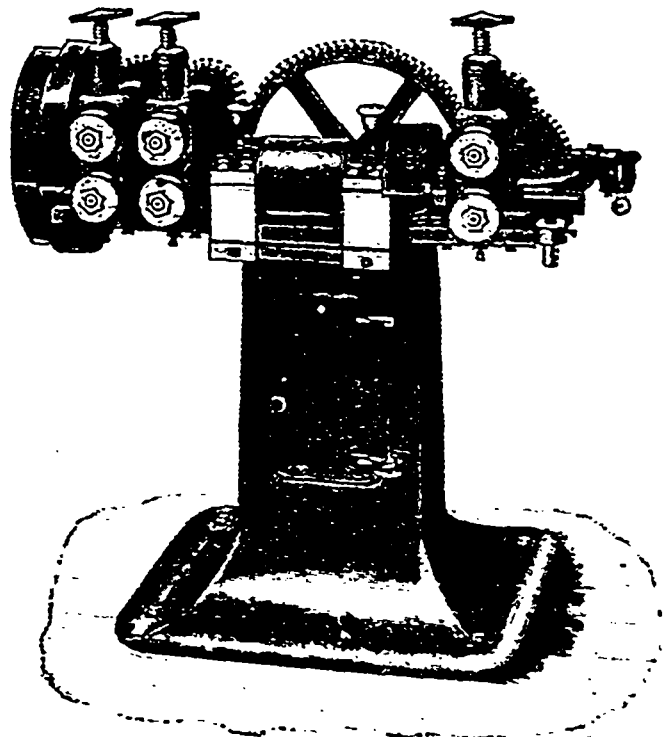
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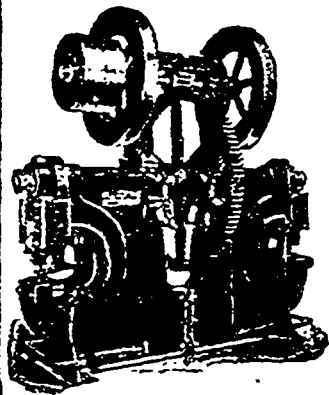
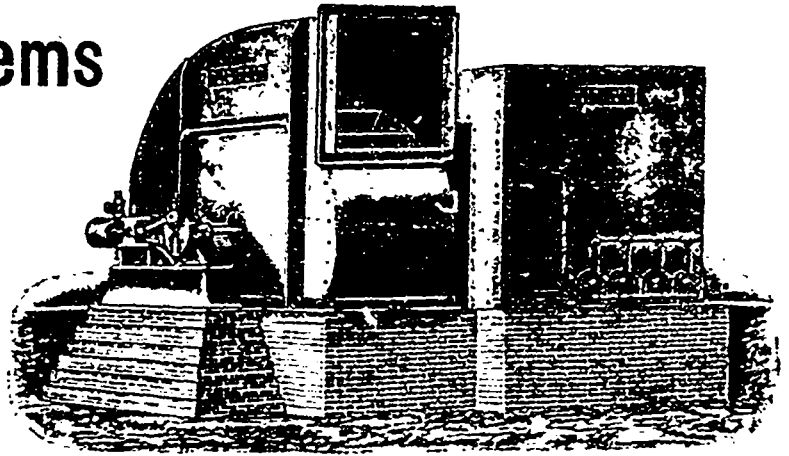
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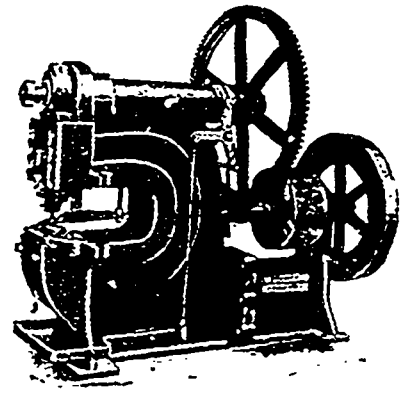
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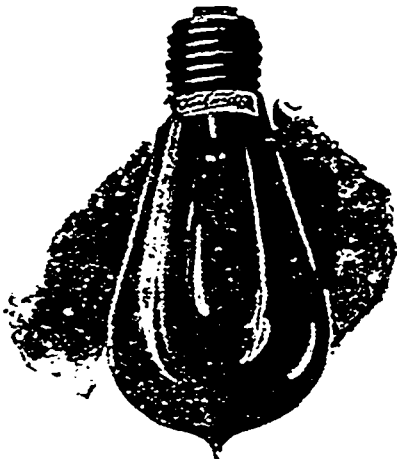
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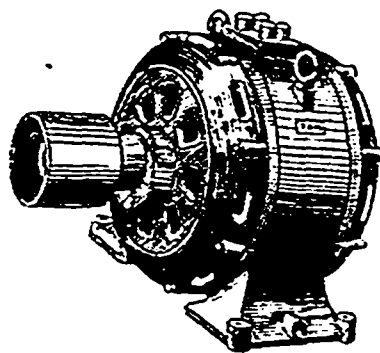
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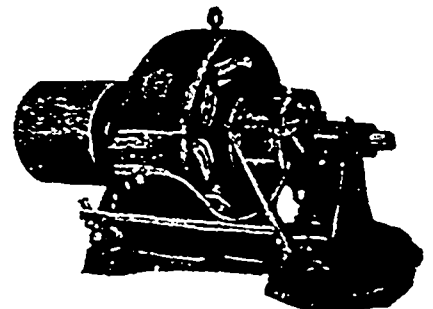
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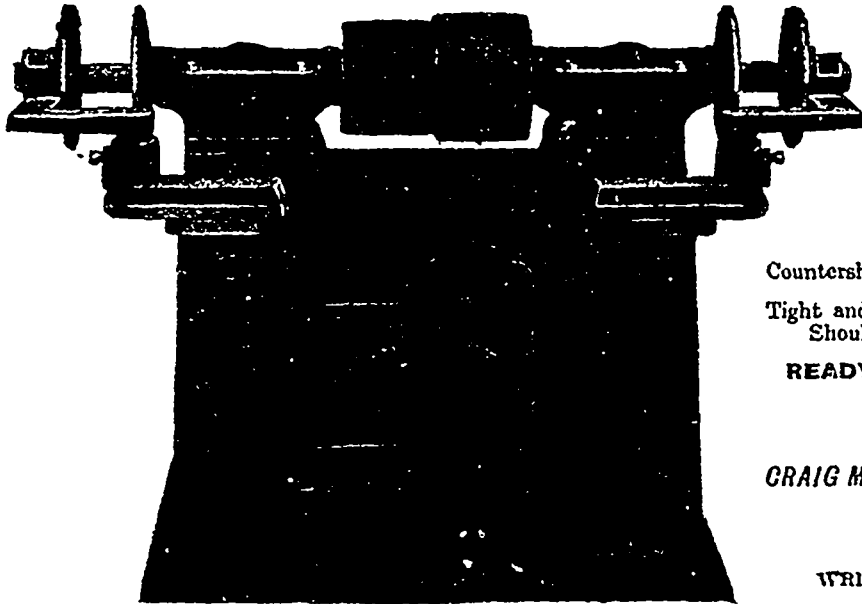


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McKinnon Building, Cor. Melinda and Jordan Sts., Toronto.

Cable address: "CANAMAN." Western Union Telegraphic Code used.

#### SUBSCRIPTIONS:

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## THE CANADIAN MANUFACTURER

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

### THE TARIFF CHANGES.

In the Dominion House of Commons a few days ago Finance Minister Fielding brought down some additional changes he proposes to make in the tariff. He announced that since making his budget speech on June 7, he had decided to make certain changes, most of which were technical, while others were changes in rates. He explained as follows:

The gauge for metal sheets and wire is changed from Stuob's gauge to Imperial standard.

In the "dumping clause," the Minister of Customs is empowered to suspend the clause in the case of goods which are not manufactured in Canada in substantial quantities or not manufactured under free competition, that is, those which might be in the hands of a few firms.

Spirits in flasks and bottles—Changes in regulations which do not affect the rates of duty.

Coal oil—Changes in the phraseology, but not in duty.

Window glass—British window glass was by the new duty reduced to 7½ per cent. It had been represented that the British window glass trade was in the hands of a few firms, especially the export trade, and therefore to give freedom it had been decided to reduce the duty on foreign glass from 20 to 15 per cent.

Free silk for neckwear—This was formerly confined to men's neckwear; it is to be free when imported to be used in making neckties for either sex.

Artificial teeth—The going into effect of the clause to allow these in free is deferred to April 1 next. In the meantime the duty is reduced from 20 to 10 per cent.

Tableware—To the words porcelain, chinaware, etc., are added the words "or white clay," to show what kinds are not included.

Sugar manufacturing machinery—Provision for its free importation extended for another year.

Molasses—To be imported free; this must be brought in direct from country of manufacture, to prevent mixing and adulteration.

Printing presses—The word "rotary" is added to the description, so that these kinds only are to be admitted free.

Usually new duties go into effect upon the day of the budget speech, but owing to representation of importers, especially of woollens, that many goods had been ordered and sold in advance, which orders could not be cancelled, it had been decided to allow goods actually ordered before June 7 and entered in Canada before Aug. 31 to come in at the old rate of duty.

While Mr. Fielding would not discuss the changes, he stated that the increased duty paid on goods imported since

June 7 would be refunded, provided they were ordered before that date.

### THEY COMMEND THE TARIFF.

The following statement respecting the Canadian tariff was adopted by the Executive Council of the Canadian Manufacturers' Association at its regular monthly meeting, held in Toronto in June:

The Canadian Manufacturers' Association commends the general tendency of the recent tariff changes announced by the Minister of Finance, inasmuch as they provide increased protection for certain Canadian industries.

The Association, while pleased that the Government has favorably considered the necessities of the woolen and twine industries, does not consider the measure of protection granted as sufficient, and does not approve of the departure made by the Government in increasing the protection by decreasing the preference. Such action will probably be misinterpreted in Great Britain, whereas an increase in the regular duties on these lines would still have maintained the principle of a uniform preference for British goods.

The Association, while gratified to note that the evil of "dumping" has been recognized by the Government, is of the opinion that it cannot be effectually remedied except by increased duties in necessary cases.

This conclusion is reached because of certain difficulties presented by the new regulations, as follows:

1. The difficulty presents itself at each of the five hundred ports of entry in Canada of a knowledge of what goods are made in the Dominion, this knowledge being necessary in order to determine the application of this clause.

2. While a sufficiently high tariff would minimize the evils of "dumping," the new regulation still leaves room for evasion of the law and the slaughtering of foreign goods upon the Canadian market through rebates, commissions, and similar methods.

3. The Association is of the opinion that if this regulation is to be operated with any chance of success, the exporters in foreign countries who send goods to Canada should be required to accompany each invoice of such exports with a declaration, stating not only that the prices named in the invoice are the ordinary credit prices in the manufacturer's market, but that no arrangement for rebate, reduction, or compensation has been or is being made with the importing firm, either directly or indirectly.

4. If the new clause is to be operated effectively, a large and competent staff of experts is immediately rendered necessary.

The Association still has the earnest conviction that "the changed conditions which now obtain in Canada demand the immediate and thorough revision of the tariff upon lines which



will more effectually transfer to the workshops of our Dominion the manufacture of many of the goods which we now import from other countries."

The Association welcomes the announcement that a tariff commission will be appointed by the Government in the near future, and takes this opportunity of expressing the hope that such commission will be of the nature recommended by the Association in the resolution passed at its annual meeting in 1903, as follows:

"That we recommend that the Dominion Government establish in Canada a permanent tariff commission of experts, who, under the direction of the Dominion Government, shall have constant supervision of the Canadian tariff, with a view of making such recommendation to the Government as will best conserve and advance the interests of the Dominion."

In the opinion of the Association, the present conditions demand immediate action by the appointment of a competent commission of the nature outlined.

#### THE GRAND TRUNK PACIFIC.

One of the most important and interesting subjects now being considered in the Dominion Parliament and by the people of Canada is that of the construction of the Grand Trunk Pacific Railway. It involves the expenditure of millions of dollars and the employment of thousands of workers, calling for the best services of the most skillful artisans the country can produce, and creating demands for machines and machinery of many kinds that will tax to their utmost capacity every important industrial establishment we have.

How important is it, then, that the people of Canada should be well acquainted with the reasons for undertaking this vast enterprise, and the views of our legislators and others regarding the probable cost of it, and upon whose shoulders that cost is to be laid. We find this information quite fully set forth in Mr. J. Castell Hopkins' Canadian Annual Review, in which considerable space is given to facts and figures which should be within the reach of everyone who might be interested in them. Mr. Hopkins points out that the pivotal subject of political discussion in parliament, and the country, during 1903 was the scheme of a new transcontinental railway extending from Port Simpson on the Pacific Coast to Moncton on the Atlantic. The road was to be known as the Grand Trunk Pacific Railway Company, the proposed route being from the City of Quebec to Gravenhurst or North Bay, Ont., thence, passing to the north of Lake Nepigon to Winnipeg, Man., thence through Battleford, Edmonton and Duvegan, N.W.T., to Port Simpson, with branch lines to Port Arthur, Brandon, Regina and Calgary, respectively, and a branch from British Columbia to Dawson City; the capital stock of the company to be \$75,000,000. Under the proposed arrangement the Government were to construct a line from Moncton to Winnipeg, via Quebec, and then lease it to the proposed transcontinental road.

There has been an infinite variety of calculation, speculation and estimate as to the cost of the proposed road. Some of the leading newspapers estimate as follows: Montreal Gazette, \$30,000,000; Toronto Star, an annual charge on the country at \$2,000,000 per year for ten years; Toronto Mail and Empire, \$14,880,000. Toronto News, increase of the national debt, \$75,740,000, and subventions to the company, \$21,740,000; Hon. A. G. Blair, then Minister of Railways, estimated the cost at \$138,850,620. Mr. John Charlton, \$68,190,000; Hon. W. S. Fielding, Minister of Finance, \$11,500,000; Hon. John Haggart, \$125,000,000; Sir Richard Cartwright, Minister of Trade and Commerce, "We shall have a road of 3,500 miles available for the people of Canada for a total expenditure of about \$14,000,000." Sir William Mulock, Postmaster General, \$127,000,000. Whatever the final cost of the road

will be, and wherever the burden may fall, it is certain that the construction of it means giving an impetus to all industrial pursuits in Canada for many years to come.

#### TUNGSTEN AND MOLYBDENUM STEEL.

Professor H. M. Howe in his recent valuable work on "Iron, Steel and other Alloys," gives some interesting particulars regarding special steels.

The burglar with his blow pipe "draws the temper," that is, softens a spot on a hardened carbon steel or chrome steel safe by simply heating it, so that as soon as it has again cooled he can drill through it and introduce his charge of dynamite. But neither this nor any other known procedure softens manganese steel.

Tungsten steel, which usually contains from 5 to 10 per cent. tungsten, and from 0.4 to 2 per cent. carbon, is used for magnets because of its great retentivity, and for lathe and similar metal cutting tools which are required to cut off a thick slice at each stroke. The great friction, due to the thickness of the cut, heats the tool to a temperature at which the temper of common or carbon steel is drawn.

The merit of tungsten steel is that, like manganese steel, it retains its extreme hardness even after it has been heated to 752° Fahr. Under these conditions the Taylor & White variety retains its cutting power even when the friction is so great that the chips of metal cut are so hot as to glow visibly, and even the edge of the tool itself grows red hot. These tools, while red hot at their cutting edge appear to be still capable of cutting steel rapidly and efficiently.

Molybdenum is now often used instead of tungsten, 1 per cent. of molybdenum having the same effect as 2 per cent. of tungsten, and proves the value of the former metal to which we drew attention in the last issue of THE CANADIAN MANUFACTURER.

It is just reported that a valuable discovery of tungsten ore has been made in Cariboo District, British Columbia, which is important if found in commercial quantities, as hitherto the supply of tungsten has been quite limited and consequently has commanded a very high price.

It is much more easy to make suitable alloys of these valuable metals in the electric furnace than by old methods, and the mixtures are much more readily regulated.

#### A PROPOSED PERMANENT EXHIBITION.

The Canadian Manufacturers' Association are considering a proposal to open an office in London, England, with sufficient space for sample rooms in which to exhibit goods produced by the members, so as to secure direct representation for the Association in the commercial centre of the world. The service to be rendered to members would include investigation, answering and indexing of trade and other enquiries, care and distribution of catalogues, etc., attractive displays of samples, establishing business relations for members with buying houses, and following up business possibilities; to secure special information for members respecting Government contracts; to secure suitable expert labor for members; to address meetings and distribute information respecting Canada; to obtain information regarding the markets of the world, and regarding raw materials required in Canadian manufacturing industries.

The scheme is certainly comprehensive, and if it can be carried out in a satisfactory manner it would reflect great credit upon the Association, and be of much service to such members as might be interested in it. Large expense would

attach to the enterprise, of course, and it should be borne in mind that not all the members would be financially interested in it; and the Association would have to be taxed quite heavily aside from what individual members who might make exhibits, would be called upon to contribute. The Association recently announced that it would establish commercial agencies in a number of important trade centres in different countries, and these, in connection with its proposed permanent industrial exhibition in London, should be of great value to its members who are interested in foreign trade.

#### CANADIAN-JAMAICAN TRADE.

Mr. G. Eustace Burke, Commercial Agent for Canada at Kingston, Jamaica, has sent us the prospectus of the Anglo-Canadian Museum which proposes to establish in the city of Kingston, a permanent exclusive exhibition and sale repository of the food products and manufactures of Canada and the British Empire. As far as Canada is concerned, the affair would give to traders and consumers in the West Indies and adjacent places and countries, the opportunity for inspecting Canadian products and manufactures at all times. Everything will be done to interest local importers and traders.

The first series of the Canadian section will be opened about September 1, 1904. There is no time limit for receiving exhibits, but the earliest applicants will have the best places. A tourist information bureau, reading room and commercial bureau will be attached to the museum. We have received also a copy of the form of application for space and conditions, which can no doubt be obtained by writing to Mr. Burke. While the charges for space are moderate, special inducements are offered to exhibitors of furniture, pianos and organs, carriages, agricultural implements, carts and wagons, manufactures of lumber, leather and paper; cordage and heavy hardware. Samples and exhibits will be conveyed free of freight charges on application to Messrs. Pickford & Black, steamship agents, at Halifax, N.S.

#### THE CAPE TOWN S.A. EXHIBITION.

The Cape Town Exhibition, to be held at Cape Town, South Africa, will be opened, according to programme, November 1, 1904, and continue for three months. It is promoted by a stock company, financed chiefly in Great Britain. When first projected it was the intention to confine it entirely to goods manufactured under the British flag, but this arrangement has been changed, and exhibits are invited from all other countries. The local Government are contributing £10,000 to the enterprise. A catalogue is to be issued which will contain a complete list of all exhibitors. We are informed that the site of this International Exhibition is only about one mile from the centre of Cape Town, with tramway connection, and a light railway is being constructed by which goods may be carried from the docks direct to the exhibition grounds.

The machinery section promises to be a specially fine show, as there will be a large number of machines in motion. The South African manufacturers have taken up spaces for the display of their machinery and appliances, and to exhibit the various manufactures and products of the Colonies. The Table Bay Harbor Board will grant special dock dues, namely, the ordinary dues will be charged on goods coming to the exhibition, but on those re-shipped afterwards those dues will be refunded. The railways are granting special facilities for exhibitors and visitors. The Cape, Natal, Orange River, and Transvaal will issue return tickets to Cape Town at single fare, and goods will be brought down at the ordinary forward

rate, and those sent back afterwards will be forwarded free of charge. The exhibition will be bonded store for the time being, a great convenience to exhibitors. The directors have resolved to charge a specially low price for machinery, namely, 2s. 6d. per square foot, and for ordinary exhibits 5s. per square foot.

Agents have been appointed, we are informed, in the United Kingdom, Australasia, Canada, India, etc., and the exhibits from all parts of the world will undoubtedly make up a collection of produce and manufactures the like of which has not been got together in one place for many years past. To Canadian manufacturers this exhibition affords grand opportunities of getting their goods on the South African markets, as buyers and visitors will be brought into actual contact with the makers; therefore the go-ahead manufacturer must take advantage of this splendid opportunity of securing orders.

Plans of the exhibition grounds, sheds and other covered erections can be obtained in London from Messrs. Reuter's Telegram Co., Limited, Messrs. J. Hales, Caird & Co., Messrs. W. Wingate & Johnston, and Messrs. Davies, Turner & Co., Limited.

#### "DUMPING."

The tariff does not altogether govern the question of selling manufactured articles abroad for less than is charged at home, as the same charge is made in England against British manufactures that is made in this country against American manufacturers. British railroads are also charged with giving lower rates for export than for domestic purposes.

The Philadelphia Press points out that the Taff Vale Railroad in Great Britain, has had complaints lodged against it by large domestic consumers of Welsh coal, because it charges them 37 cents a ton for coal shipped over the road, while the same kind of coal pays only 25 cents a ton when shipped to go out of the country. This discrimination is defended on the ground that the coal could not all be sold in Great Britain. The same excuse is offered in the United States when steel is sold for less abroad than at home. But, as the London Colliery Guardian remarks, the railroads sometimes favor foreign buyers because they have the home trader in a corner, and he cannot get away.

Preferential rates are given in the United States on goods for export, and in the same way less is charged for taking foreign goods to interior cities than is charged for transporting American goods over precisely the same route. But the same thing happens in England. The British complain, with good reason, of very high rates. The Iron Trade Review gives a part of the memorial of the Midland Chamber of Commerce to the British Board of Trade, as follows:

The trading interests of Great Britain are most injuriously affected by the discrepancy between the railway rates for the carriage of goods from foreign towns to the sea and the rates charged by railway companies in this country, which discrepancy is so great that it is possible for a foreign trader to send goods from an inland town by rail and sea, and land them at a port in this country at a cheaper rate than such goods can be carried on British railways to the same port over a similar distance.

The German Government makes rates on its railroads on goods for export much lower than when intended for home consumption. London newspapers charge British roads with favoring imported goods. There is no question that such a course is unsound, no matter where practiced. There is no shadow of excuse for taking foreign products from New York to Chicago or any other city for less than is charged for similar American products, but it is done. Just who is at fault in forcing such a cut, and whether or not it is lawful, should be

ascertained by the Interstate Commerce Commission, if it has not already done so. It has had the question under investigation, but nothing has been accomplished in bringing about a change.

#### NEW ZEALAND PREFERENCE.

The Dominion Government has received the text of the Preferential and Reciprocal Trade Act recently adopted by the Parliament of New Zealand, the provisions of which are applicable to Canada as well as to other portions of the Empire. In its operation the Act is not confined entirely to the British Empire, as Clause 13 says that where any country not being part of the British dominions reduces or abolishes, or purposes to reduce or abolish, the duty on any product or manufacture of New Zealand, the Governor may enter into an agreement with that country to reduce or abolish the duty on any articles the produce or manufacture of such country to an extent that the estimated revenue so remitted shall equal as nearly as possible the estimated revenue remitted by that country. No such agreement, however, is to have effect until ratified by Parliament.

In connection with this clause the Colonial Secretary informed the Governor, the Earl of Ranfurly, then in London: "I assume your Ministers realize that any advantage which may be granted to a foreign Government in future by virtue of any reciprocal arrangement under Section 13 cannot be withheld from a third foreign power entitled by treaty to the most-favored-nation treatment in New Zealand."

There are three schedules to the new Act. In the first one is the article of cement, the duty upon which is doubled when imported from foreign countries. This change ought to benefit the cement industry in Canada, as it gives our manufacturers an advantage of 48 cents a barrel over American manufacturers, the existing duty being 48 cents.

On the following articles, which appear in the second schedule, the existing duties are increased 50 per cent. Thus in the list the first figure will be the duty on Canadian goods, the second the foreign:

Basket and wickerware, n.o.e., not being furniture, viz., from 20 per cent. to 30. Bicycles, tricycles, and the like vehicles, also finished or partly finished, or machine parts of same, n.o.e., including weldless steel tubing cut to short lengths; boots, shoes, and slippers, n.o.e., goloshes, clogs, pattens, vamps, uppers and laces, 22½ to 33¾ per cent. Caudles, 2 cents to 3 cents per pound. Carriages, curts, drays, wagons, and perambulators, and wheels for the same, 20 to 30 per cent. China, porcelain, and parian ware, 20 to 30 per cent. Clocks, 20 to 30 per cent. Cordage and rope, n.o.e., 20 to 30 per cent. Cream of tartar, 2 to 3 cents per pound. Earthenware, stoneware, and brownware, 20 to 30 per cent. Fancy goods and toys, 20 to 30 per cent. Firearms, all kinds, 20 to 30 per cent. Fish, potted and preserved, 4 to 6 cents per pound. Furniture and cabinetware, n.o.e., and other than iron, 25 to 37½ per cent. Glass, crown, sheet, and common window, 2 shillings to 3 shillings the 100 superficial feet. Glassware, also plate glass and glass polished, colored, and other kinds, n.o.e. globes and chimneys for lamps, 20 to 30 per cent. Hardware, ironmongery, and hollowware, 20 to 30 per cent. Hops, 12 to 18 cents per pound, Iron nails, 48 to 72 cents per cwt. Iron pipes and fittings for same, including main cocks, 5 to 7½ per cent. Lamps, lanterns, and lampwick, 20 to 30 per cent. Musical instruments, viz., pianos, 20 to 30 per cent. Paper hangings, paper, wrapping, viz., blue candle, glazed cap, glazed casings, small hand, lumber hand, and tissue, 5s. to 7s. 6d. per cwt. Paper, wrapping, other kinds, including brown, cartridge, and sugar papers, 5s. to 7s. 6d. Plate and plated ware, 20 to 30 per cent. Pumps and other apparatus for raising water, 20 to 30 per cent.

On the following articles, which appear in the third schedule, the existing duties are increased by 20 per cent. Most of them were dutiable at 20 per cent., so that the foreign duty will now be 25 per cent. :—Bicycles and tricycles, fittings

fer, viz., all rubber tires, pneumatic tires, outside covers, and inner tubes, rubber and cork handles, and pedal rubbers, also drop forgings and stampings, ball bearings, weldless steel tube in full lengths, rims, forks, and spokes in the rough; gas engines and hammers and oil engines; gum boots, iron and steel cordage; iron, plain black sheet, rod, bolt, bar, and plate; iron wire netting, printing paper, rails for railways and tramways, sailcloth, canvas and unbleached double warped duck, surgical and dental instruments and appliances.

#### EDITORIAL NOTES.

Speaking of the destruction of the excursion steamer General Slocum, in New York harbor, a few days ago, in which nearly a thousand people lost their lives, the Toronto Globe says:

We are naturally reluctant to believe that any company would jeopardize so many lives to save the difference between efficiency and incompetence. But the calamity has revealed the pursuit of a policy of cheapness with disregard for human life. In the presence of the tragedy the repetition of the natural warnings of the occasion seem futile. We are fortunately free from vessels of the Slocum type in Ontario, and we have also the safeguard of a thorough inspection for all vessels carrying passengers. The disasters emphasize the need of perpetual vigilance in steamboat inspection, and a careful supervision of all docks and other accessories which may prove sources of danger at any time. Vigilance is the price of safety.

The Globe and the traveling public generally live in a fool's paradise if it and they believe that there are no steamers of the Slocum type in Canada. The General Slocum, an old boat, has borne that name ever since she was built; and by a very proper law of the United States Congress, any and every vessel when first built is given a name which it carries as long as it is in existence, except under very exceptional circumstances; and therefore people never need to be deceived regarding the age of the vessel. Not so in Canada. It is a matter of constant occurrence that we find steamers employed in the excursion trade bearing unheard-of-before names, and attempts made to create the impression that they are new, when in reality, if their names had not been changed, they would be recognized vessels which had passed the zenith of their usefulness long years ago. No Canadian steamer should be allowed to engage in passenger traffic in Canadian waters unless a large and conspicuously posted announcement showed the year when it was built and the name bestowed upon it at that time, and that name should never be changed. The safeguards The Globe speaks of as attaching to some Canadian steamers are no safeguards at all, but are but too frequently cruelly deceptive.

As a basis for statistical study, the Iron Age takes the latest estimates of pig iron production in gross tons in different countries, compares it with the population estimates, and figures out the per capita production in pounds, with the following result:

PRODUCTION.	1903.	Population.	Per capita.
United States .....	18,009,252	80,047,000	499
Germany and Luxemburg ..	9,926,251	58,549,000	380
United Kingdom .....	8,811,204	41,961,000	470
France .....	2,782,986	38,962,000	160
Russia .....	*2,481,066	141,000,000	39
Austria-Hungary .....	*1,407,902	45,405,000	69
Belgium .....	1,197,275	6,694,000	401
Sweden .....	481,961	5,199,000	208
Spain .....	*344,469	18,618,000	41
Canada .....	265,418	5,457,000	109
Italy .....	*30,156	32,475,000	2
Japan .....	*24,108	45,862,000	1
Other countries .....	200,000		
Total .....	45,962,048	1,509,134,000	68

\*1902 production.

It is pointed out that while the United States is the largest producer per capita, it exports relatively less of its product than does the United Kingdom, Belgium or Germany. The real per capita consumption of the United States, which, as the Iron Age points out, is a very different thing from production, is not far from 475 pounds, as against about 300 pounds per capita in the countries named. It is also pointed out that if the rest of the world used as much iron per capita as the United States the world's production would have to be increased sevenfold.

In the Dominion House of Commons a few days ago, Sir Richard Cartwright, Minister of Trade and Commerce, stated that the following amounts in the form of bounties had been paid to the Dominion Iron & Steel Company since it began to manufacture iron and steel :

1901	October .....	\$90,588
	November .....	32,552
	December .....	39,344
1902	February .....	34,416
	March .....	22,000
	July .....	100,000
	August .....	30,000
1903	January .....	543,931
	April .....	150,000
	June .....	192,031
	August .....	75,016
	September .....	96,371
	October .....	42,103
	November .....	47,020
	December .....	65,907
1904	January .....	31,996
	February .....	20,792
	March .....	32,330
	April .....	35,023
	May .....	41,130
	Total .....	\$1,721,556

The recent disastrous fire in Toronto again called attention to the differences in hose fittings in the different cities. The Baltimore fire and the subsequent discussions of the incidents connected with it had led the chief of the fire department of Hamilton, Ont., to investigate and to find that the fittings of his department were not the same as those of Toronto, and that they would not go together. By a wise forethought he at once had thimbles or couplings made by the use of which it was possible to use the hose of either city interchangeably, and when Hamilton sent help to Toronto the hose which was carried was all available and did good service, while without the special devices for making the connections it would have been useless. It would be well for all cities to investigate the hose couplings of their neighbors and in self-defence provide for emergencies, as was done at Hamilton.

An active movement is in progress in New England in support of the negotiation of a reciprocity treaty with Canada. The sentiment toward Canadian reciprocity has always been strong in New England, but new life has been given to the agitation in favor of it by the activity of the Boston Chamber of Commerce. Through the energetic efforts of the officers of that body the manufacturers and business men of New England have given their enthusiastic support to the cultivation of more widespread sentiment on this question. It is claimed that while reciprocity with Canada would be of especial benefit to the business interests of New England, it would at the same time operate greatly to the advantage of the entire northern border of the United

States. Although the enthusiasm of those who are conducting this propaganda would seem to justify their hope of success, the movement appears to have little chance of accomplishment. Conditions have radically changed from those prevailing a few years since, when Canadian interests were earnestly seeking trade reciprocity. The manufacturing interests of Canada have attained such development that they feel entitled to their home trade. The policy of the Dominion Government appears to be in favor of thoroughly protecting domestic manufactures, even if it is necessary to go to extremes in that respect. Against such a policy we of the United States are not in a position to make any criticism or enter any protest. Our industries have been built up by the same methods. It would be of considerable advantage to us now if the Canadian Government should be willing to make a treaty for the free interchange of all the products of both countries. It is, of course, possible that some reason which does not now appear may influence Canada to favor such a step. Nevertheless it seems highly improbable.—The Iron Age.

The imports into New South Wales from the United States exceeded in 1903 those from France and Germany combined by \$8,682,430, though those countries took \$8,106,275 more from Australia than the United States did. Both France and Germany have a fine line of first-class steamers plying between Australia and Europe, and yet with all the money they expend in the furtherance of trade the value of their imports into that country falls far below that of the United States. The imports from the United States were valued at \$14,028,420 and from France and Germany at \$5,345,990. The exports to the United States and dependencies were \$10,069,045, and to France and Germany \$19,069,045.

The following is a list of the countries mentioned in the Tariff Act as being entitled to the benefits of Canada's preferential tariff:—The United Kingdom; the British Colony of Bermuda; the British colonies commonly called the British West Indies, including the following: The Bahamas; Jamaica; Turks and Caicos Islands; the Leeward Islands (Antigua, St. Christopher-Nevis, Dominica, Montserrat, and the Virgin Islands); the Windward Islands (Grenada, St. Vincent and St. Lucia); Barbados; Trinidad and Tobago; British Guiana. Since that date the following countries have been admitted by Order-in-Council, that is to say: British India, Ceylon, Straits Settlement, New Zealand, Cape of Good Hope, Natal, Orange River, Transvaal and Southern Rhodesia.

The Governor-General has approved of an Order-in-Council adding the Cape of Good Hope, Natal, Orange River, the Transvaal and Southern Rhodesia to the list of British colonies entitled to the benefits of the British preferential tariff in Canada, dating from July 1, instant. This is in return for the preference extended by the South Africa Customs Union Convention to Canada. On certain specified articles the South African preference amounts to 2½ per cent., which is the whole ad valorem duty. These articles are: Acids, bolts, nuts and rivets, chain, cranes and elevators, belting, hoes, machinery, electrical and otherwise, electric cables, piping and tubing, railway supplies of all kinds, including steel rails, sleepers, traction engines, tramway construction supplies, wire and wire netting for fencing, and wire rope. In the case of other articles imported under an ad valorem duty the preference is 25 per cent. As the ad valorem duty is 10 per cent. the duty on articles from Canada will be 7½ per cent.

### WORTHINGTON CENTRIFUGAL PUMP.

The accompanying illustration is of a 33-inch Worthington centrifugal turbine pump, manufactured by The John McDougall Caledonian Iron Works Co., Montreal, and is typical of a large variety of such pumps manufactured by them, adapted to any and all purposes where the moving of water and other liquids is required.

Few problems in the field of hydraulics present more interesting possibilities and at the same time have been so universally neglected as centrifugal pumping. The centrifugal pump is the converse of the turbine water-wheel. Its development has been analogous to that of the steam turbine in that both were pioneers in their respective fields and both were abandoned in favor of reciprocating machines before

shown under test. These pumps are recommended for heads up to 70 feet, although they will safely withstand 150 feet.

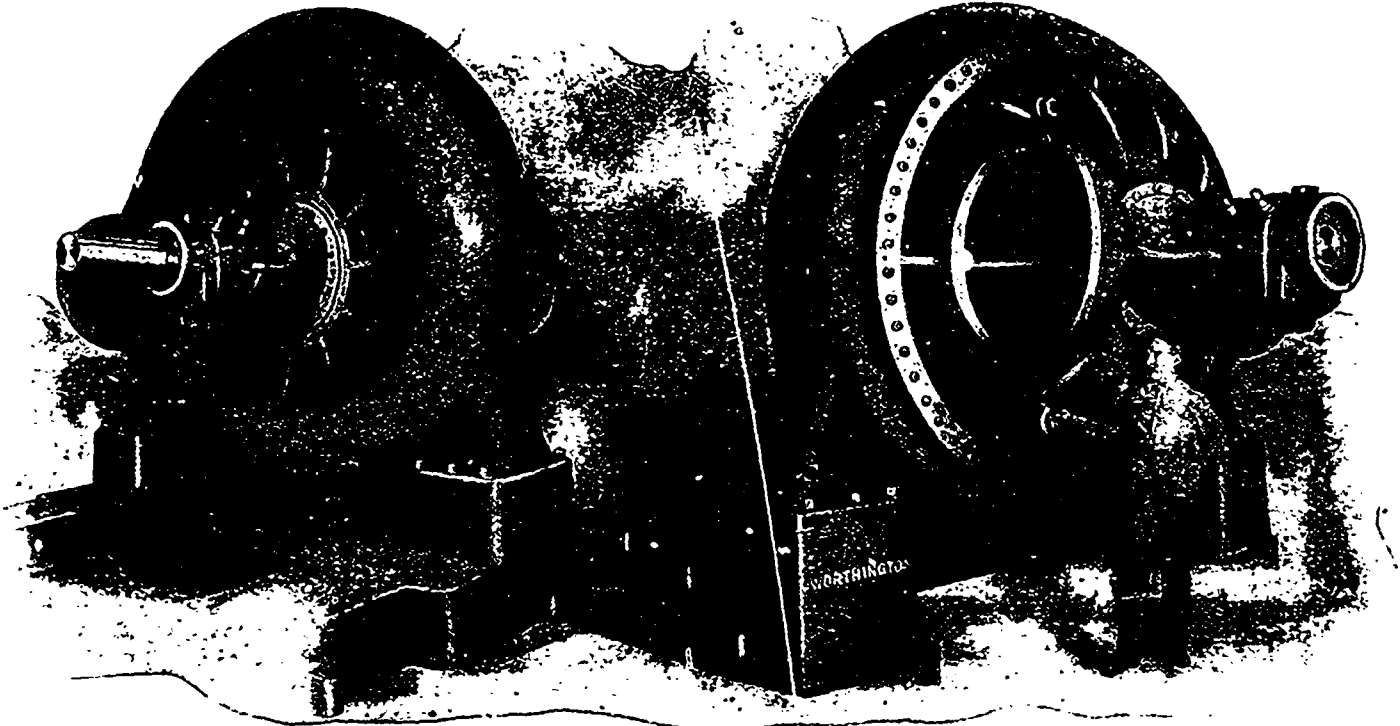
The turbine pump is suited to very high lifts, even exceeding 2,000 feet.

The Worthington turbine pump has created an entirely new field of application for centrifugal pumps, embracing mine drainage, water-works, and numerous other services where rotary pumps are desirable but have not been employed, owing to their former poor efficiency at high heads.

As a sinking or station pump for mine service, the turbine pump is ideal. There are no valves, guards or springs, no reciprocating parts, and, most important of all, there is not a contact surface in the entire machine except the shaft and its bearings. The design is such that parts subjected to the action of mine water may

for direct connection to electric or other high-speed motors. The general appearance is somewhat different from the ordinary centrifugal, due partly to the widening of the pump chamber to admit a special form of impeller. The latter consists of a double, conical-shaped core, on which radial vanes are cast or mounted. The peculiar shape of this core serves to modify gradually the direction of the incoming current, thereby preventing sudden changes of velocity and direction whereby power is absorbed and wasted. The pump chamber, or shell, is divided into two equal parts by a radial diaphragm, or partition, extending entirely around the interior of the chamber and enclosing the base of the conoidal impeller. This partition prevents the impingement and consequent disturbance of the two entering columns of water.

The conoidal pump is particularly ad-



33-INCH WORTHINGTON TURBINE PUMP.

Capacity, 35,000 gallons per minute against 160 feet head. Three of these pumps, each driven by a 2,000-H.P. motor, supply the Grand Cascade at the St. Louis Exposition.

having been thoroughly exploited, the pump because the principles of its action were not clearly understood, and the steam turbine because of mechanical difficulties in construction.

The Worthington centrifugal pumps are divided into three classes, viz.: Conoidal, Volute and Turbine.

The conoidal centrifugals are designed especially for low lifts and large deliveries and are adapted to irrigation work, the handling of sewage and similar purposes. They are comparatively inexpensive and operate at high rotative speeds, making possible direct connection to electric motors. For heads up to 30 feet they are unexcelled in the pumping field.

The volute centrifugals are built for medium lifts, but for all capacities. Since they run at moderate speeds, diffusion vanes are not needed, but the volute casing has been carefully designed to obtain high efficiency and 86 per cent. has been

made of acid-resisting metal, and, when desired, lead-lined pumps will be supplied. The space occupied is less than one-third of that required by a reciprocating pump of equal capacity, and the first cost, including the motor for driving, is only about one-half. Since there are no rubbing surfaces exposed to the water, the pump will run for years without renewal or repairs. In case of accident, the parts are so few and the construction so simple that any part of the machine can be replaced in less than one hour. The cost of attendance is reduced to the minimum, since the only necessary attention is to see that the pumps and motors are properly lubricated. The simplicity and reliability of the centrifugal pump make it especially suitable for isolated stations.

One of the best known of these Worthington pumps is the "Conoidal," which has been designed to meet the demand for a thoroughly well-built, compact machine

adapted to belt driving where an efficient and compact machine is desired. The space required, in relation to the quantity of water delivered, is about one-half that of an ordinary centrifugal. The conoidal is designed for a maximum head of 30 feet only, but the capacity is practically unlimited. Several of these machines are now in operation, each handling 35,000 gallons of water per minute.

It is frequently found necessary to locate a centrifugal pump in a pit below the floor level, in order to get within suction distance of the water supply. In cases of this kind the vertical centrifugal has been extensively used and has proved most satisfactory. The pump can be either belted or connected directly to vertical motors. The latter method makes an ideal pumping plant, as the motor can be located above ground where it is free from all moisture and can receive proper care. The design of the pump is such that it



requires very little attention, and it is necessary for the attendant to go down into the pit only at long intervals. A number of these pumps are being used at blast furnaces and steel mills for general water service. They are also widely used in irrigation for pumping from wells in which the water level fluctuates greatly, often submerging the pump and rendering the use of horizontal belted or motor-driven pumps inadmissible.

The electric motor enters a widened field of usefulness through the improvement of the centrifugal pump, as the two are perfectly adaptable to each other. A motor-driven pump set is very similar in operation to a motor-generator set, the output being water under pressure in the first case, instead of electric current. At constant speed the power and output are inversely proportional to the resistance to flow, and the efficiency is practically constant within wide limits.

Various applications of centrifugal pumps have been incidentally mentioned

in this article. A complete list of the uses to which these pumps can be applied profitably would be interminable, especially since the perfection of the Worthington turbine pump has made high lifts practicable. We therefore, name only a few representative applications.

For irrigation and for handling sewage and other liquids containing solids in suspension, the centrifugal pump is especially adapted on account of the absence of valves and rubbing surfaces. For cofferdam and excavating work, and for dredging, these pumps are specially designed to withstand the abrading action of stones and gravel; while for moving acids and other corrosive fluids they are lined with suitable resisting material. They can be used for conveying almost any fluid or semi-fluid substance, such as wood pulp, heavy oil, etc.

For further information regarding these pumps apply to the John McDougall Canadian Iron Works Co., Montreal.

**MINERS LAMPS.**

The accompanying illustration is of the "American Eagle" miners' and drivers' lamp, manufactured by Messrs. John Anton & Son, Monongahela, Pa. This lamp is one of the latest put on the market, having been patented in March last.



The body is described as being made in one piece, the bottom of which is set

up inside and the bowl clinched over it. At the upper extension of the spout is secured a cup-shaped spreader which serves to spread the flame and also retain any droppings of oil from the wick, thereby preventing the oil from becoming ignited and flowing down the side of the spout; and it prevents the seam in the spout from opening. The general construction of the lamp is such as to render it impossible to extinguish the flame by any sudden jar or jolt.

For further particulars, write the manufacturers as above.

**THE WETMORE GLUE HEATER.**

The accompanying illustration represents a recent shipment of the Wetmore Glue Heater to England, by the manufacturers, the Advance Machinery Co., Toledo, Ohio. The goods, we are informed, were for one of the largest chemical industries in Great Britain, who are, perhaps, the largest manufacturers of glue in Europe. The concern have written the Advance Machin-



ery Co., that they feel assured that this heater will overcome the great trouble all glue users experience in applying glue to their work.

**THE LAKE SUPERIOR CORPORATION.**

Mr. C. D. Warren and the other directors of the Lake Superior Corporation have returned from their visit to the works at Sault Ste. Marie, and speak in most hopeful terms of the outlook. Mr. Warren, who is president of the corporation, speaking on the subject, said that the Helen mine had resumed operations, and was turning out from 800 to 1,000 tons of ore per day, under the superintendence of Mr. Seeley, who had charge of the work previously.

The general manager of the whole of the works, Mr. Cornelius Shields, has the steel works in such a forward con-

dition that they will be able to turn out rails in about three weeks. The superintendent of this department, Mr. D. D. Lewis, filled a similar position under the old regime. Mr. Warren hopes that the Provincial Government will renew the order given more than a year ago for steel rails for the Temiskaming road.

Speaking of the other works, Mr. Warren said the pulp mills were working at full capacity, turning out about 100 tons daily. The sawmills are running at their full capacity. The veneer mills are as yet running only part time, and will so run probably for some time, pending improvements.

The machine shops and foundry are starting on part time at present, and the

car works will be opened as soon as orders on hand warrant such a step.

Arrangements are proceeding satisfactorily for the transfer to the new management of the Michigan Power Co., which is in the hands of the State receiver. All legal obstacles have been removed, and only certain legal notices which have to be given remain in the way. All the various industries are being carefully overhauled, and work will be resumed, including railway and vessel traffic, as speedily as possible.

Mr. Warren, as president, will be in control of the policy to be pursued. He will have an office in Toronto, and under his direction the utmost energy will be infused into the management, with rigid economy in all branches.

**GAS WORKS UNDER CONSTRUCTION.**

The Economical Gas Apparatus Construction Co., Toronto, inform us that they are not only installing a new gasometer at Winnipeg, as alluded to in our last issue, but are also under contract with the Winnipeg Electric Street Railway Co., for the construction of a new coal gas plant capable of manufacturing one million cubic feet of gas per day. This plant will include ten benches of coal gas retorts, or sixty retorts in all. The coal gas house will be equipped with coal elevators and conveyors for unloading coal from the cars, breaking and storing it in the coal sheds, also elevators and hoppers for carrying the coal from the sheds and delivering it in the retort house. The scrubbing and condensing plant will be capable of handling 1,500,000 cubic feet, and will include condensers, tar extractors, washer scrubbers and exhausters. The steam plant for operating the works will consist of three 72x18 inch tubular boilers. The purifying house will be equipped with four 25x25x5 inches cast iron purifying boxes, having the "Green" type of purifying cover, the joint between cover and the box being made with a round rubber joint. The gas holder will be 115 feet diameter, 54 feet high, to rest in a steel tank.

The Winnipeg Electric Street Railway Co., are now erecting the necessary buildings which will consist of a steel frame filled in with brick. The plant, we are informed, will be completed and in operation not later than December 1, next.

The Economical Gas Apparatus Construction Co., are also under contract with the Gas Committee of the City Council of Owen Sound, Ont., for the installation of a coal gas plant capable of producing 100,000 cubic feet of gas per day, together with condensers, tar extractors, scrubbers and purifying boxes. The scrubbing, condensing and purifying plant will be capable of handling a production of 200,000 cubic feet of gas per day, and foundations will be prepared for additional gas retorts to be placed later on.

They are also installing for the Napanee, Ont., Gas Co., a coal gas plant having a capacity of producing 50,000 cubic feet of gas in 24 hours, including scrubbers, condensers and purifiers. Mr. L. L. Merrifield is chief engineer of the company in charge of these enterprises.

# CAPTAINS OF INDUSTRY.

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

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

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

The Dominion Government will erect a building at Ottawa, for the Dominion archives.

Mr. W. E. H. Carter, secretary of the Ontario Bureau of Mines, returned to Toronto a few days ago, after making a tour of inspection of the mines of New Ontario in the neighborhood of Sault Ste. Marie and Sudbury. At Sudbury the Canadian Copper Co. have just completed a new smelter with a capacity of 1,000 tons per day, which will be put in operation at once. The company's main mine is now yielding ore at the rate of 900 tons per day. A 50-ton Elmore oil concentrator is being built by the Massey Station Mining Co.

A breakwater will be constructed in West London, Ont., at a cost of \$35,000.

The Waterous Engine Co., Brantford, Ont., have been awarded the contract for building two 1,000 gallon fire engines for the city of Montreal, at a cost of \$11,300.

The W. J. Gage Co., manufacturers of stationery, etc., Toronto, will build a new factory to be three stories high and constructed of fireproof materials.

The steam yacht Edna, was damaged by fire at Parry Sound, Ont., July 12. Loss about \$1,000.

All the vessels of the Algoma Central Steamship Co., which is the lake wing of the great Soo industries, were placed in commission within the past week. The six freighters and three passenger boats owned by the company did not turn a wheel since last fall until the past few days. The vessels of the fleet are the freight steamers Paliki, Monkshaven, Theano and Leafield, the schooners Agawa and John J. Barlum and the passenger steamers King Eta, Ossifrage and Minnie.

The lightship Anticosti, the second of the lightships built by the Polson Iron Works Co., Toronto, for the Dominion Government, made her trial trip a few days ago, and has proceeded to her station at the Island of Anticosti, in the Gulf of St. Lawrence. These vessels have a large amount of freeboard and are sheered very high in the bows, so as to keep them dry when pitching into a head sea. They are fitted with two steel pole spars, and fifty feet above the spar deck are three powerful electric lamps on each

spar. Each vessel is fitted with a large swinging bell and fog syren, worked by compressed air. The outfit is most complete and comprises steam windlass, capstan pumps, electric steering gear, complete life-saving apparatus, constituting it a well-equipped life station. The vessel is fitted with fresh water tanks having a capacity of 60,000 gallons.

Building permits were issued in Toronto in the first six months of the current year valued as follows:

728 dwellings .....	\$1,526,569
25 factories .....	309,450
23 warehouses .....	437,685
21 stores .....	46,000
2 banks .....	37,500
5 churches and missions .....	81,900
Alterations and additions .....	189,398

Following are the figures regarding the construction and re-construction of Toronto factories since 1900.

Year.	New factories.	Alterations and additions.
1900 .....	21 \$193,670	11 \$16,250
1901 .....	26 207,605	11 63,175
1902 .....	32 169,220	28 57,120
1903 .....	42 300,630	37 53,195
1904 (half year) .....	25 309,450	.....

The Toronto city clerk will receive competitive designs for a suitable tablet to be erected in the City Hall, in memory of the Toronto soldiers who lost their lives in South Africa. The cost of the work is to be limited to \$700.

Rich deposits of cobalt were found in Ontario while projecting the new Temiskaming Railway.

The increasing freight business of both railroads between Toronto and Hamilton, Ont., has made necessary the construction of a third track which will be used for freight business only.

The Grand Trunk Railway Co. will erect a large roundhouse in London, Ont., at a cost of \$75,000.

A plan to re-organize the Cramp Steel Co., Collingwood, Ontario, has been evolved by a committee consisting of J. A. Currie and others. A mortgage on the plant was about to be foreclosed by the North American Trust Co., New York, but a method of re-organization has been arranged, under which the Northern Iron & Steel Co. will be formed, with a capital of \$2,500,000.

The Oil Refinery company, at Sarnia, Ont., have acquired ten acres of additional

land and will extend their plant at a cost of \$300,000, and will give employment to 150 more men.

The Byron bridge at Londo, Ont., will be constructed of concrete and steel, and will cost about \$12,000.

Messrs. Barnet & Record, contractors, Minneapolis, Minn., have commenced construction work on the Empire Elevator Co's new elevator at Fort William, Ont.

Wm. J. Keane, Toronto, has been awarded the contract for the erection of St. Patrick's church, which will cost \$100,000. The building will be 108x80 feet.

The Walthausen Hat Corporation, Norfolk, Conn., have acquired the stock-in-trade, machinery, tools, etc., of the Union Hat Works at Brockville, Ont.

A by-law has been carried at Preston, Ont., in favor of municipal ownership of the electric lighting plants. A new power station will be erected and a first-class plant installed.

The ratepayers of Thamesville, Ont., have voted favorably on the following by-laws: To install a waterworks system for fire protection, to purchase electric light plant and run it as a municipal concern, and to spend \$6,500 for granolithic walks.

The city of Kingston recently purchased the Light, Heat & Power Co.'s plant at that place at a cost of \$182,000 and now require \$120,000, to thoroughly equip the same.

The Copeland-Chatterson Co., manufacturers of office supplies, etc., Toronto, have made a proposition to the town of Brampton, Ont., for the transferring of their works to that town. They ask the town for a loan of \$25,000 for a term of years, in return for which they will erect a building 300x75 feet at a cost of \$70,000, and will give employment to 125 hands.

The American International Harvester Co., are negotiating with the city of Brantford, Ont., for the establishment of branch works there for the manufacture of plows, etc.

Mr. J. M. Bell, who is exploring for the Ontario Crown Lands Department, the iron ranges in the Michipicoten mining division, reports that at McDougall's claim a few miles north of Pacaswa River, there is a wide band of magnetite in hornblende schists, where the ore body is about 200x350 feet in size and appears to be a valuable property.

The Canadian Northern Railway Co.'s new elevators at Port Arthur, Ont., are now completed. This gives the company a combined storage capacity at that place of 7,000,000 bushels. They will erect a cleaning and drying elevator there with a capacity of 500,000 bushels.

The Ames-Brooks Co., Duluth, Minn., are considering the erection of a large grain elevator at Fort William, Ont.

J. R. Booth, Ottawa, will erect a large paper mill and warehouse at the Chaudiere between Hull and Ottawa.

The Toronto & Niagara Falls Power Co., of which Col. H. M. Pellatt, Toronto is president, have awarded the con-

tract for six generators of 7,500 k.w. capacity each, or 45,000 k.w. in all, to the Canadian General Electric Co., Toronto.

G. W. Greene, Peterborough, Ont., will rebuild his foundry and machine shop recently damaged by fire. Plans for the new building call for about one-half more room in the foundry than there was in the old plant. A temporary building has been erected and as the cupola was very little damaged castings are being made every day with a small force. Mr. Greene expects to have his new plant completed by September.

The plant of the Imperial Steel & Wire Co., at Collingwood, Ont., which will be completed soon, will be one of the most modern wire-drawing works in America. It is laid out to accommodate an output of one hundred tons of wire daily. The buildings are of brick, consisting of boiler house 40x35 feet; engine room 50x35 feet; wire cleaning and acid mill 100x70 feet; wire-drawing mill 200x60 feet; wire nail mill 200x60 feet; galvanizing mill 225x50 feet. The buildings are served by two railway switches, and cover an area of about five acres. Ample room is provided also for a one hundred ton wire rod mill, which will be built this year. The plant is being installed and the engineering work done by Messrs. Turner, Vaughn & Taylor, the well-known firm of wire mill engineers, of Cuyahoga Falls, Ohio. The company expect to be in the market with their product in August.

Of the great abundance of water power with which the Republic of Mexico is supplied, it is estimated that not more than 250,000 h.p. is being utilized or is in the course of development at the present time. The potential horse power has never been estimated with any degree of accuracy. According to an article which appeared in the Mexican Herald, recently, the average cost of power derived from steam in that city is between \$190 and \$225 Mexican currency, or \$100 United States currency, per horse power per annum. The Mexican Light & Power Co., a Canadian company, which are installing an electric power plant at Necaxa, in the State of Puebla, proposes to sell electric power in Mexico City at \$120 to \$125 Mexican currency, or \$55 United States currency, per horse power per year. This company proposes to develop about 100,000 h.p., of which 80,000 h.p. will be transmitted to the city of Mexico. At present, according to the same authority, the total horse power derived from steam plants in that city is less than 32,000.

The development of the water power at Port Severn, Ont., has been begun, and preliminary estimates will be asked for in the near future. The site presents no serious engineering difficulties, and it is hoped that the plant will have reached an advanced stage before the end of the present year. The dams, which are now in place, give a working head of twelve feet, and there is sufficient water power available to supply the electric needs of the various neighboring towns for many years to come. Power will be transmitted to

Waubashene, Fesserton, Coldwater, Victoria Harbor, Midland, and perhaps Penetang, Ont., requiring in all some 25 miles of line. The initial installation will have a capacity of about 500 k.w., and this will be added to as rapidly as the demands require. The Electrical Supervision Society, Toronto, have charge of the work.

The hydraulic lift lock in the Trent Waterway system, near Peterborough, Ont., which was some eight years in course of construction, was opened for traffic under impressive ceremonies on July 9. The fact that this is the largest structure of the kind in the world, in addition to its great value to the midlands of Ontario, drew a great concourse of people from the surrounding country, and a large Parliamentary delegation from Ottawa. The lock now completes a chain of navigation of 160 miles, reaching from Heeley's Falls, on the Trent to within a few miles of Lake Simcoe, leaving 43 miles of the Trent Valley system still to be established, of which 17 miles of river will have to be canalized. The lock was built entirely by Canadians, and cost \$500,000. The aim of the lock is to overcome by one locking a difference in levels of 65 feet. The sub-structure is entirely of concrete and required 26,000 barrels of cement in its construction. The time of lockage is twelve minutes. The mechanism is extremely simple. The vessel desiring to be lowered sails out into a pontoon filled with water supported by a huge piston, and by adjusting the weight of water in the upper and the corresponding pontoons, then at the bottom, the one descends and the other ascends. The work has been under the direct control of the Department of Railways and Canals, and is more especially the work of Mr. R. B. Rogers, Peterborough, Superintendent of the Trent Canal, and of Mr. W. J. Francis, C.E., who since 1900 has been in charge of construction.

The Barchard Box Factory, Toronto, was damaged by fire June 28. Loss about \$2,000.

The Consumers' Gas Co., Toronto, will probably erect new gas works in the eastern part of the city.

The Owen Sound Iron Works Co., Owen Sound, Ont., have received orders from the Sun Cement Co., to build four large steel coal hoppers, several slurry pumps, and to lengthen one of the rotaries from 40 to 65 feet, and from the Owen Sound Portland Cement Co., Shallow Lake, Ont., to construct a cooler sixty feet in length and forty-two inches in diameter, made of three-eighths inch steel. They are also lengthening pebble mills for this company.

The Canadian Pacific Railway elevator "D" at Fort William, Ont., will have an additional engine installed which will double its capacity.

A new Y.W.C.A. building, 119x63 feet, will be erected in Peterborough, Ont. Messrs. McIntyre and Hartley are the contractors.

The Hawkesbury Electric Light & Power Co., Hawkesbury, Ont., have been incorporated with a capital of \$100,000, to manufacture electricity, motors, machinery, etc. The provisional directors

include Thos. Ross, Jas. Ross and J. W. Ross, Hawkesbury.

A party of American capitalists propose erecting a copper smelter to have a capacity of 150 tons per day, in the township of Salter, Ont. They have requested the Ontario Government to grant a bounty on copper produced in Ontario.

The Northern Land & Lumber Co. will install a large dry kiln at their works at Port Arthur, Ont.

A hospital building will be erected at Port Arthur, Ont., at a cost of \$10,000.

The Empire Salt Co., Sarnia, Ont., have been incorporated with a capital of \$50,000, to manufacture salt, etc. The provisional directors include J. I. Carter, C. H. Rogers and J. H. Kittermaster, Sarnia.

The Craig Ship Building Co., Toledo, Ohio, have received a contract from the Grand Trunk Railway for a car ferry to operate from the port of Milwaukee, Wis. The ferry will be 360 feet long and 56 feet beam and will cost about \$400,000.

The Woodstock Express Printing Co., Woodstock, Ont., will increase their capital from \$20,000 to \$50,000.

The Port Arthur Bazaar, Limited, Port Arthur, Ont., have been incorporated with a capital of \$40,000, to manufacture jewelry, fancy goods, etc. The provisional directors include H. G. Greenland, W. G. Bartlett and R. C. Bush, Port Arthur.

The Kearney Timber & Mfg. Co., incorporated under the laws of Great Britain, have been licensed to manufacture furniture, pulp, paper, etc., and to operate saw mills in Ontario. W. Gow, Toronto, is their attorney.

The Ashland Emery & Corundum Co., a United States incorporation, have been licensed to manufacture emery and corundum in Ontario with a capital of \$75,000.

Messrs. H. N. Bate & Sons, Ottawa, have been incorporated with a capital of \$500,000, to manufacture food products, etc. The provisional directors include H. N. Bate, T. C. Bate and F. Bate, Ottawa.

The Canada Brass Rolling Mills, of which John R. Barber, the well-known paper manufacturer of Georgetown, Ont., is president, are installing the machinery for a brass rolling mill, to make brass sheets, tubing, rods and wire, which is the only one of the kind in Canada. The recent tariff changes will give them the home market, and they expect subsidiary industries will be organized to manufacture various lines of brass goods from the raw material they will supply.

Messrs. Reid & Kilmer, Hamilton, Ont., representing the Swedish General Electric Co., have contracts for a 420 k.w. generator for the town of Fenelon Falls, Ont.; and for two generators, one 150 k.w., the other 78 k.w., for Owen Sound, Ont.

The Iron & Steel Co. of Canada, Belleville, Ont., advise us that their rolling mill department will be started up on July 18, the immediate product to be bar iron, washers and all kinds of spikes.

One of the chief attractions at the furniture exhibition recently held in Toronto was the display of Berry Brothers, yarn-



manufacturers, Walkerville, Ont. They made a demonstration of sianlac, their new substitute for shellac, covering a board with five coats within a few hours, and giving it an excellent piano finish. Several representatives of the company were on hand to explain their wares, including Mr. Wm. Horne, Toronto, Canadian representative; Mr. Robert Cornyn, western Ontario representative, and Mr. James S. Stevenson, chief chemist. The company still further increased their popularity by presenting each visitor with a new patent-folding four-foot rule, which was much appreciated.

The new Ridley College building at St. Catharines, Ont., will be completed by December and will cost about \$70,000.

Messrs. C. A. Graham & Co.'s carriage factory at Napanee, Ont., was destroyed by fire July 6. Loss about \$7,000.

J. Becker's hotel at New Hamburg, Ont., was partially destroyed by a storm July 4. Loss about \$1,000.

The Verity Plow Co., Brantford, Ont., will add one story, 167x56 feet, to their grey-iron building and will erect a two story building, 154x56 feet, which will double their capacity and give employment to 200 more men.

A by-law has been passed at East Toronto, granting \$55,000 for water works.

The Department of Railways and Canals, Ottawa, are inviting tenders for the erection of workshops at Cornwall, Ont., on Cornwall Canal; also for improving the channel west of the upper entrance to the canal.

Hon. H. R. Emmerson, Minister of Railways, Ottawa, has appointed Mr. James Jameson, Montreal, to prepare plans for the erection of a large grain elevator at Port Colborne, Ont., at a cost of \$1,250,000.

Messrs. Foley Bros., Montreal, will erect a furniture factory, 70x50 feet, two stories high, at Fort William, Ont.

The Dominion Paving & Constructing Co. have written the Toronto City Engineer to the effect that it is impossible to get a supply of Canadian bricks for the Dundas street pavement. Mr. Rust recommends that the contractors be allowed to use American brick.

Messrs. Peters & Cairns' sawmill at Haliburton, Ont., was wrecked by a boiler explosion July 5. Loss about \$8,000.

The Toronto Railway Co. have completed the doubling of their power plant's capacity, which was commenced last fall. The last link in the chain has been completed and the new storage batteries connected up and the surplus power generated during the hours of the light load was stored to assist in the work of transporting the crowds at six o'clock. The system works without a hitch. During the day 6,000 h.p. is stored up, which may either be utilized in the hour between 5.30 and 6.30, or called into service in any quantity desired, and distributed over a longer period. The extreme capacity of the storage batteries is 6,000 h.p. for an hour.

The Mexican Light & Power Co., Montreal, of which James Ross is president, have placed a large order for copper cable

with the Ansonia Brass & Copper Co., Ansonia, Conn. The order calls for 1,500 miles of cable, weighing upwards of 2,000 tons. The cable is to be built from the company's Neeaxa power plant to Mexico City, and from there on to El Oro mining district, a distance of 12 miles. The line will be supported on steel towers in spans of 500 feet.

E. J. Walsh, consulting engineer, Ottawa, will prepare plans for the construction of the proposed high level basin at Montreal.

Messrs. Peter Lyall & Sons, Montreal, have commenced work on the construction of the steel freight sheds at that city.

The John S. Metcalf Co., engineers, builders of grain elevators, Chicago, Ill., inform us that they are the supervising engineers for the erection of the new Grand Trunk Railway grain elevator of more than a million bushels capacity, being erected at Montreal.

St. Paul's Catholic church at Aylmer, Que., was destroyed by fire June 29. Loss about \$40,000. The congregation will rebuild at once.

The Canada Optical Co., Montreal, have been incorporated with a capital of \$20,000, to manufacture optical goods, jewellery, etc. The provisional directors include J. E. Normandin, W. R. Brown and Geo. Gonthier, Montreal.

The Montreal Copper Co., Montreal, have been incorporated with a capital of \$150,000 to carry on a mining, smelting and refining business. The provisional directors include L. Sapery, H. Sapery and E. Fountain, Montreal.

The Megantic Mining & Dredging Co., Montreal, have been incorporated with a capital of \$500,000, to carry on a mining and dredging business. The provisional directors include T. Doucet, L. Sohler and W. H. Phillips, Montreal.

The Canadian Hansa Cement Co., Montreal, have been incorporated with a capital of \$500,000, to manufacture cement machinery, cement, tiles, bricks, etc. The provisional directors include G. A. P. Dillon, W. P. Sharp and R. C. McMichael, Montreal.

La Compagnie Drolet, St. Germain de Grantham, Que., have been incorporated with a capital of \$8,000, to manufacture lumber, etc. The provisional directors include L. N. Cotnoir, L. A. Brien and H. Drolet, St. Germain de Grantham.

Within the last few days Messrs. Marion & Marion, patent attorneys, Montreal and Washington, have obtained patents as follows:—George Bryar, St. John, N. B., nut lock; Fabien Beauregard, Montreal, washing machine; John M. Young, Keremeos, B.C., rail chain; John McLean, Moosomin, N. W. T., scrub hook; Alexander Murray, Goldsbie, Ont., gate latch; Wm. Cross, Medicine Hat, N. W. T., washing and drying apparatus for photographic films; John A. Ransom, Carberry, Man., grain drill shoe; Herminas LaRose, Vercheres, Que., baling press.

In our last issue it was stated that the contract for the new Grand Trunk elevator to be erected at Montreal had been

let to the John S. Metcalf Co., of Chicago. That concern now write us that they are not the contractors for the erection of the elevator, but are the supervising engineers for the work.

An 18 h.p. gas engine with a gas-producing plant has just been installed in the boot and shoe factory of Messrs. Dufresne & Locke, at Maisonneuve, near Montreal, the cost of operating which is, we are informed, only sixty cents for ten hours' work. This plant is the first suction gas plant ever erected in America. The producer was constructed by Messrs. Farand & Delorme, of Montreal, under the direction of Mr. J. de Clercy, C.E., the inventor, 363 Dorchester Street, Montreal. A similar equipment and gas engine and gas producer of 22 h.p., has also been installed by Mr. de Clercy at the Mount St. Louis College, Three Rivers, Que. Its use is to drive a dynamo for lighting the college, the expense of operating which is the cost of only one and a half pounds of coal per kilowatt per hour.

The spring and blacksmith shops of the Grand Trunk Railway at Point St. Charles, Que., were destroyed by fire July 11. Loss about \$10,000.

The Department of Colonization and Public Works, Quebec city, are inviting tenders for the construction of the abutment, piers and approaches of a bridge to be erected on Metapedia River, Que.

Messrs. Masson & Edge's sash factory was partially destroyed by fire July 8. Loss about \$10,000.

One million feet of lumber owned by King Bros., at Newport, Que., was destroyed by fire June 30. Loss about \$30,000.

The Dominion Government will erect a new Inland Revenue building in Montreal at a cost of \$100,000.

Business men in the mining districts of Cape Breton are agitating for a trolley freight service over the Sydney and Glace Bay electric tramway.

The Dominion Coal Co. will erect a dam over 700 feet long, constructed of stone faced cribwork, on McAskill's Brook, near Glace Bay, N.S.

Some of the Nova Scotian newspapers are publishing a despatch signed by Henry N. Paint, which reads: The contract for the railway bridge over the Strait of Canso has been let. Mr. Waddell, chief engineer, will be on the ground at an early date. The Canso bridge will cost \$6,000,000 and will be one of the largest and costliest bridges in the world.

The Baker Brook Mfg. Co., St. John, N.B., have been incorporated with a capital of \$20,000, to carry on a lumber and saw-milling business. The provisional directors include D. Fraser, Fredericton, N.B., A. Fraser, Woodstock, N.B. and Wm. Matheson, St. John, N.B.

The Whelpley Skate & Mfg. Co., Greenwich, N.B., have been incorporated with a capital of \$4,000, to manufacture skates, etc. The provisional directors include F. W. Whelpley, D. R. Whelpley and E. D. Whelpley, Greenwich.

The New Brunswick Central Railway

Co., Coal Branch, N.B., recently organized with a capital of \$100,000, purpose building and operating a railway from Coal Branch, Kent County, to Richibucto, and also to Chipman, Queen's County, N.B.

The Intercolonial Railway Co., Montreal, N.B., are inviting tenders for the erection of a brick station and baggage room at Stellarton, N.S.; for the construction of a cribwork protection pier at Point Tupper, N.S.; to supply pipes, fittings, valves, etc., in connection with the pipe-fitting in the engine houses at St. John, N.B., Chaudiere Junction, Que. and Ste. Flavie, Que.; also for the erection of an engine house and office at Pirate Harbor, near Mulgrave, N.S.

The Wolfville hotel at Wolfville, N.S., was destroyed by fire July 8.

The Sydney Mines hotel at Sydney Mines, N.S., was destroyed by fire July 5. Loss about \$5,000.

Operations have been begun near Mauuels, Nfld., at the tale mine, thirty men being at work there. A number of others have been set to work grading a through siding to the terminal. The aerial tramway will be built over 43 towers, varying from 50 to 20 feet in height according to the lay of the land over which the line will pass. Two large cables will convey large buckets filled with the material to the terminal, and it will then be carried on cars to the shipping place, Duffs, where a large pier will be built, and where there is plenty of water for the largest of ships.

The Midland Oil & Gas Co. have been organized at Halifax, N.S., to develop some 8,000 acres of oil lands at Scotch Village and Brooklyn, N.S. The following are the officers of the company — I. B. Shaffner, president; H. B. Dustan, vice-president, and F. P. Ronnan, treasurer, all of Halifax; E. C. Puttner, secretary, Rawdon, N.S.; E. A. Charters, assistant secretary and managing director, Sussex, N.B.

The Sydney Boot & Shoe Co., Sydney, N.S., have been incorporated with a capital of \$50,000, to manufacture boots, shoes, leather goods, etc. The provisional directors include J. J. Mosley, A. M. Crofton and C. P. Fullerton, Sydney.

The Cheticamp Copper Co., Halifax, N.S., have been incorporated with a capital of \$2,000,000, to carry on a copper mining and smelting business. The provisional directors include W. R. Dunn, J. W. Regan and F. P. Ronnan, Halifax.

The Amherst Decorative Marble & Flooring Co., Amherst, N.S., have been incorporated with a capital of \$100,000, to manufacture marble for building decorations, etc. The provisional directors include C. J. Silliker, C. A. Lusby and H. W. Rogers, Amherst.

The Mic Mac Gold Mining Co., Bridgewater, N.S., will run their plant by electricity.

The Club Building Co., Halifax, N.S., have been incorporated with a capital of \$10,000. The provisional directors include W. A. Black, W. M. Botsford and W. B. A. Ritchie, Halifax.

The Cape Breton Iron & Steel Co.,

Sydney, N.S., have been incorporated with a capital of \$250,000, to manufacture steel and iron goods, etc. The provisional directors include K. J. Morrison, P. R. Bentley and F. A. Hatfield, Sydney.

The International Automatic Machine Co., New Glasgow, N.S., have been incorporated with a capital of \$350,000, to manufacture automatic machinery, tools, etc. The provisional directors include F. W. Wright, Jas. Munro, Geo. Patterson, New Glasgow.

Architect Frazer, Indian Head, N.W.T., is preparing plans for an opera house, fire hall, council chamber, etc., for the Town of Yorkton, Man. These buildings will be constructed of cement blocks.

The Universal Co-operative Investment Co. are building a business block at Virden, Man.

The Union Supply Co. are erecting a grain elevator with a capacity of 45,000 bushels at Rosthern, N.W.T.

Messrs. Smith & Sharpe have been awarded the contract for making alterations and additions to the Commercial Club building, Winnipeg, Man., to cost about \$50,000.

P. J. McDermott, Clan William, Man., will erect a new warehouse and lumber sheds.

The Canadian Pacific Railway will erect a new station building at Elkhorn, Man.

Messrs. Davidson Bros., contractors, Winnipeg, Man., have commenced building operations on the large new warehouse to be erected in that city for the Ontario Wind Engine & Pump Co.

The Winnipeg, Man., Free Press Co. have awarded the contract for the erection of their new building to the Manitoba Construction Co.

It is proposed to erect a large cattle market in Winnipeg, Man. Hon. John A. Hall, Calgary, N.W.T., is interested.

Architect Lailey, Brandon, Man., is inviting tenders for the erection of the new Immigration Hall there.

Messrs. Wilson and Wetenhall, Calgary, N.W.T., are inviting tenders for the erection of the Merchants Bank building at Lacombe, N.W.T., also for the erection of the Western College at Calgary.

The Winnipeg Supply Co. have acquired properties in Stonewall, Man., and will operate an extensive crushing plant and manufacture lime. The crushing machinery will be installed immediately, and a draw kiln of most improved pattern will be erected. The quarries under their control at present will turn out about 25 cars of rubble stone and four cars of lime per week. A warehouse is now being constructed in Winnipeg, and deliveries will be made of lime, stone, Portland cement, fire brick, fire clay, etc. D. Bowman is manager, and J. W. Fullbrook, Stonewall, superintendent.

The Gladstone Gas Co., Gladstone, Man., have been incorporated with a capital of \$16,000, to manufacture gas engines, pipes, gasometers, etc. The provisional directors include R. Galloway,

Wm. Galloway and Thos. Morton, Gladstone.

The Boissevain Trading Co., Boissevain, Man., are erecting a large additional warehouse for the purposes of their business.

The Athabaska Fish Co., Selkirk, Man., have been incorporated with a capital of \$100,000 to carry on a general fish packing business, etc. The provisional directors include J. K. McKenzie, R. Smith and H. C. Ray, Selkirk.

A town hall will be erected at Arcola, N.W.T., at a cost of \$12,000.

Messrs. Moorby & Balljeley, Melita, Man., will erect a large planing mill there.

The Winnipeg Stone Co., Winnipeg, Man., have increased their capital from \$10,000, to \$25,000.

W. Oliver, Lethbridge, N.W.T., will erect a large planing mill at that place.

G. Rowe will erect a new hotel at Lethbridge, N.W.T., at a cost of \$15,000.

S. Magee, Manitow, Man., will enlarge his sash and door factory by a two story addition 42x24 feet, and will install new machinery.

A company at Rosthern, N.W.T., have erected a new dry shed for the curing of clay, and will install brick making machinery. Mr. A. Welk of that place is interested.

Messrs. McDougall & Secord, Edmonton, N.W.T., will erect a block 100x75 feet, three stories high.

A new hospital building will be erected at Lloydminster, N.W.T.

The Calgary Brewing Co., Calgary, N.W.T., are erecting a building 140x60 feet, one story high, to be used as bottling works.

Mr. T. F. Lawson, Calgary, N.W.T., is preparing plans for the erection of a large brick block there.

The Manitoba Hotel at Elkhorn, Man., will be remodelled and enlarged.

The new Canadian Pacific Railway hotel at Winnipeg, Man., will be made fire-proof, at an additional cost of \$200,000.

Messrs. Czerigowski & Grant, box manufacturers at Winnipeg, Man., will erect a new factory.

The town council of Calgary, N.W.T., will erect a new fire hall at a cost of \$9,000.

Mr. H. S. Price will erect a large hardware warehouse at Boissevain, Man.

The Catholics of Maple Creek, N.W.T., will erect a convent there at a cost of \$9,000.

A public school building will be erected at Prince Albert, N.W.T., at a cost of \$9,000.

J. Marcott will enlarge his hotel at Osler, N.W.T.

Messrs. McClennan & Rhea will erect a large hotel at Minnedosa, Man.

In order to meet the demands of a rapidly increasing business, and to keep pace with the equally rapid growth of the city and country, the Vulcan Iron Works, Winnipeg, Man., have recently begun work

on their new blacksmith and boiler shops. This building will be 265x90 feet. The machinery and equipment will be modern throughout, including a 10-ton electric travelling crane, saws for cutting structural steel, steam hammers, and, in fact, everything in the machinery line necessary to the complete equipment of modern shops of this kind. The heating and ventilation of the building will be of the latest approved systems, and the electric lighting and power will be supplied from the company's own electric plant. The plans and specifications were prepared by the company, and Mr. D. Smith, architect, will supervise the erection of the building. The Street Railway Co. have recently awarded the contract to the Vulcan Co. for the supplying and erection of all the structural iron and steel in the additions to the gas plant, car shops in Fort Rouge, car barns, and roof to new boiler house; also for a steel smokestack seven feet in diameter and one hundred feet high. They are supplying the cast iron and structural steel for the following buildings, now in course of erection: Scott Furniture Co., Royal Furniture Co., Whittla Block additions, McDonald & Wright, Weldon Block, Bulman Bros., additions, Crump Block, Telfer Block, G. F. & J. Galt, additions, Canadian Pacific Railway freight offices and sheds, E. L. Drewry's new brewery, Commercial Club additions, J. C. Gordon's drug store, St. Mary's School, Mrs. A. Plaxton's Block. They are also supplying a large order of structural steel for the Edmonton jail, for Messrs. Ross Bros., contractors, and all the iron work for the new Home for Incurables at Portage la Prairie.

A portion of the barracks containing the stock of arms and ammunition at Lethbridge, N.W.T., were destroyed by fire July 11.

The Menomonic Hydraulic Press Brick Co., Minneapolis, Minn., will supply the face brick for the new Canadian Pacific Railway hotel and station now in course of erection in Winnipeg, Man.

The T. Eaton Co., Toronto, have purchased a block of land in Winnipeg, Man., upon which they will erect a large departmental store at a cost of about \$1,000,000.

Plans are being prepared for the erection of a new grain elevator at Rosthern, N.W.T.

Permits for buildings have been issued in Winnipeg, Man., for the first six months of the current year to the value of \$6,072,450.

The St. Mary's Academy, Winnipeg, Man., will be remodeled at a cost of \$10,000.

H. W. Wolfe will erect a 200-barrel flour mill at Bradwardine, Man.

The Raymond Milling & Elevator Co., Raymond, N.W.T., will build a 35,000-bushel elevator at Magrath, N.W.T.

Elevators will be built this season at the new stations of Neelins and Glenora, Man.

J. P. Friesen & Son have ordered a new engine and boiler for their flour mill at Greta, Man.

A. W. Snider, will install a new engine and boiler in his mill at Wawanesa, Man.

The ratepayers of Lethbridge, N.W.T., have voted favorably on a by-law to exempt from taxation the proposed elevator and flourmill of the Columbia Milling Co.

Architects Darling, Pearson & Over, Winnipeg, Man., are inviting tenders for the erection of a court house and jail at Morden, Man.

Johnson & Fry, gold miners and prospectors, Victoria, B.C., have discovered a rich deposit of scheelite in the Willow Creek region of Cariboo. The provincial mineralogist says it is more valuable than gold and makes fourteen cent steel worth sixty-four cents. Johnson & Fry say they have an immense deposit of the mineral, which they will work at once. It is the mineral from which tungstic acid is manufactured.

The B. C. Plate Glass & Importing Co., Vancouver, B.C., have been incorporated with a capital of \$25,000, to manufacture paints, oils, sheet and ornamental glass, etc.

Announcement from Vancouver, B.C., has been made that a new turbine steamer will be built for the British Columbia-Australian service. She will be one of the fastest steamers on the Pacific.

A new Episcopal church building will be erected at Fernie, B.C., at a cost of \$5,000.

F. D. Weeks, metallurgist, will have charge of the erection of a smelter and reduction works at the Sullivan Mines, near East Kootenay, B.C., owned by the Federal Mining & Smelting Co.

The Elk River Power & Light Co. have commenced work at Elk River Falls, B.C., and will install a large power plant.

The Mt. Meadow Gold Mines have been incorporated at Victoria, B.C., with a capital of \$200,000, to carry on a mining and smelting business.

The White Channel Gold Hill Hydraulics, Limited, have been incorporated at Victoria, B.C., with a capital of \$75,000, to carry on a mining, smelting and refining business.

The mineral output of British Columbia in 1903 was valued at \$17,495,954, an increase of \$4,404 over 1902. This small gain was due rather to increase in values of some of the mineral products of the province than to a gain in quantities. In gold the total value reported for the year was \$5,873,036, of which about five-sixths was from the quartz or lode mines, and about one-sixth was placer gold. The gold output showed a decrease from the previous year of \$88,373, of which \$75,655 was in lode gold. This decrease was chiefly due to the smaller output from the Rossland district. The heaviest falling off was found in silver, of which the output was 2,996,204 ounces, or 921,713 ounces less than in 1902, and in lead, of which there was produced 18,081,283 pounds, or 4,447,028 pounds less than in the preceding year. It is said that the current year will show a marked change in the silver-lead production, on account of the new system of bounties offered by the Canadian government. Already several important

silver-lead mines which had been closed down have been reopened and are again becoming producers. Copper alone of the metals shows an important gain. The output in 1903 was 34,359,921 pounds, an increase of 4,723,864 pounds over 1902. In the production of coal, which was 1,168,194 tons, or 229,200 tons less than in the preceding year, a moderate decrease is shown, which was due chiefly to the lighter exports to the United States. While coal production diminished, that of coke increased, however, having been 165,543 tons in 1903, a gain of 37,528 tons over the previous year. This gain is due largely to the demand from the various smelting works, which is steadily increasing.

Dixon's Pure Flake Graphite imparts to cylinders a wonderful smoothness and polish, filling in and overlaying all irregularities, scratches and the rough grain of the metal; provides a firm, new surface, enduring any temperature, reducing frictional resistance and wholly ending all groaning, grinding or cutting.

A company has recently been organized at Reidsburg, Prussia, for the purpose of distilling alcohol from peat. They are now building a distillery which they hope to be able to put in operation some time during this month. According to their process, the company will be able to distill alcohol cheaper from peat than it can be obtained from other substances, and will, therefore, be able to sell their product for fuel purposes. They will also be in a position to do an export business.

As evidence of the truth in the saying that Armour & Co. save even the squeal of a pig, is the fact that they dry the blood and use it for fertilizing purposes. The drying takes place in special kilns in which the steam hot blast apparatus is to be found. The drying by the fan system is positive, economical, efficient and always under absolute control and entirely independent of the atmospheric conditions. Armour & Co. recently placed an order with the B. F. Sturtevant Co., Boston, Mass., for a drying apparatus of this kind for their fertilizing plant at Kansas City, Mo.

A gasoline fire is best extinguished with flour, sand or earth in the order named; water should not be used. If the gasoline be confined in small space, ammonia will smother it. Some users of gasoline find it well to hang a bottle containing about a gallon of ammonia from the top of the tank or room containing the gasoline, by a string or fusible link, so that if the gasoline takes fire the bottle will fall and be broken, releasing the ammonia and promptly putting out the burning gasoline.

In the Mines and Mineral's Building at the St. Louis Exhibition, Canada makes a most excellent showing in competition with Virginia, Pennsylvania, Alabama, Colorado and other states. Nine thousand feet are taken up by the Dominion's mining exhibit, which includes 1,000 different articles and seven carloads of material. Conspicuously displayed is the statement that Canada's coal production in 1896 was 3,084,634 tons, while in 1903 it had risen to 7,996,634 tons. No coal display is to be seen in the whole build.

ing as attractive in appearance as that of Canada, and the letters of gold, which shine out from one of the pillars read:—**COAL IS KING**—Nova Scotia's most valuable asset. In 1903 Nova Scotia produced 5,100,000 tons. Londonderry has the greatest pile of iron ore in the building; manganese from Picton; copper from Cheticamp and Cape d'Or are shown, and gold from many parts of Nova Scotia; mica, asbestos, etc., from Quebec and Ontario. The vault in which, on glass shelves, samples of Yukon gold are shown, was so effective that one of the other states changed its plans and copied it.

## 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, prices, etc.

The output of coal from the Dominion Coal Co.'s mines at Glace Bay, N.S., for the month of June was 331,090 tons.

Recent explorations reveal the fact that large and deeper coal seams extend for miles beneath the thirty miles stretch of land between Springhill and the Joggins, N.S. Diamond drill boring is being steadily carried on near the stream called Little Forks.

Two seams of first-class bituminous coal have been discovered at a point near McKay's Lake, not far from Ladysmith, B.C.

The imports of bituminous coal into the United States from Canada (including Newfoundland) for eleven months ending with May, 1904, were 1,226,525 tons, and the exports from the United States to Canada in the same period were 3,939,829 tons. The exports to Canada of anthracite amounting to 1,681,162.

The Buffalo correspondent of the Coal Trade Journal says.

There is plenty of report that Canada is taking coal much more liberally than formerly and that the roads are giving pretty satisfactory service now, so that the Buffalo coal man is not engaged in rushing over there every day or two to urge sales or to pacify some customer who has happened to get more than he wants. The only explanation given of the improvement is that business is good in Canada. If that is all there is of it the demand from that source ought to remain steady and one problem is solved. The general idea is that the manufacturing industry generally will be in better shape by fall and then coal will be coal again.

It is reported that the Pittsburg Coal Co., Pittsburg, Pa., have acquired 35 acres of land at Fort William, Ont., upon which to erect a coal handling and storage plant. The property has a frontage on the Kaministiquia and the McKeller Rivers, and it is understood that the company intend to establish a plant equal in efficiency to the new one of the Canadian Pacific Railway and capable of storing 1,000,000 tons of coal, as they propose to

make Fort William one of their principal distributing points in the North-West.

Owing to the anticipated demand for cars to handle the prospective crops in the fall, the Canadian Pacific Railway have issued a circular announcing that during the months of October and November they will not supply any cars for the shipment of coal. It has heretofore been the custom of many of the Canadian dealers to defer the purchase of their season's stock until fall, when the railroad was making every effort to furnish cars for the grain shippers, and this action of the company is expected to result in an earlier buying movement.

Representatives of the firm of R. Dunsmuir & Sons, operating coal mines on Vancouver Island, are in Mexico, where it is said they are negotiating with President Diaz for concessions for a steamship line which it is proposed to establish between British Columbia ports and the coast of Mexico. Under a recent agreement entered into by Mexico and Canada, subsidies for such a line, aggregating about \$100,000 annually, will be granted by each of the governments. It is said that the Dunsmuir firm are particularly anxious to establish a Mexican market for Canadian coal and coke.

Foundations have been completed for 400 coke ovens which the International Coal & Coke Co. are constructing at Coleman, B.C. The company have about 600 men employed opening mines, building ovens and getting ready to develop their property. The company expect to be soon producing about 1,000 tons of coal per day, all of which will be taken by the railroad company until the coke ovens are completed. The fire brick used in the construction of these ovens were supplied by the Dunbar Fire Brick Co., Pittsburg, Pa.

E. J. Corbett, coal dealer, 800 Union Trust Building, Detroit, Mich., has sent us a "Cracker Jack" good thing in which he quotes his July 1 prices for coal and coke. For Canadian trade he mentions Pittsburg Freeport vein for delivery via Port Stanley, Rondeau and Buffalo, and Shawmut coal via Buffalo.

Messrs. J. H. Milnes & Co., Toronto, have been awarded the contract for the supply of coal for the schools at the following prices—Coal, stove, egg and nut, \$6.15 per ton; grate, \$5.00 per ton; soft lump, \$4.50 per ton.

A dispatch from Sydney, N.S., says that the development of the properties of the Cape Breton Coal, Iron & Railway Co., at Cochrane Lake, near Port Morien, is now an assured fact. Options of the lease of properties held by the company have passed into the hands of an English syndicate, headed by Horace Mayhew, an English coal owner and operator. David Bennett King, of New York, will be succeeded as president of the company by Mr. Mayhew. Thomas Lancaster will continue as resident general manager. Upon the English syndicate acquiring possession, it is understood the work of opening up the properties will be proceeded with as rapidly as practicable. Mr. Mayhew visited Cape Breton a few months ago at the invitation of Mr. Lancaster, and the

outlook at Cochrane Lake impressed him so favorably that he decided to become interested.

Mr. John M. Hancock, of Messrs. John M. Hancock & Co., Niagara Falls, N.Y., is probably the oldest wholesale shipper of anthracite coal into Canada, having been engaged in that trade for half a century. The Plymouth hard coal handled by the company is well known to Canadian fuel users. The company also handle Youghiogheny Gas Coal, Morris Run Smithing Coal, and Connelville Coke, shipping into Canada by Buffalo and Detroit. Mr. Hancock, who is mayor of Niagara Falls, is president of the company, and Mr. W. B. Reilly, well known to Canadian coal dealers, is general manager.

The Coaldale Mining Co., of New York and Buffalo, have had plans prepared for large coal trestles and handling plants at Brockville and Port Hope, Ont. The company will bring the coal to these points by water and ship by rail to Ottawa and other eastern Ontario points.

The Dominion Coal Co., Glace Bay, N.S., will erect a new colliery office at Dominion No. 2, and will install three new air motors and a high speed compressor in No. 2 colliery.

It is reported that the Great Northern Railway have entered into a contract to take 1,400 tons of coal per day from the Morrissey, B.C., mines.

## THE PERCENTAGE OF SMALL COAL.

In the preparation of anthracite coal there is bound to be a certain percentage of small coal, although it is the effort of all operators to avoid the unnecessary breakage of coal as much as possible in their breaker preparation, says the Coal Trade Journal.

In the first place, when the coal comes out of the mines in the mine cars, there is a large percentage of small coal contained therein. This is particularly the case in what is known as pitch mining, where the coal is mined on a steep pitch, and drawn by gravity through chutes into mine cars. The grinding or crushing of the coal as it comes down the incline is bound to result in a greater degradation than in the mining of a flat seam, where the coal is blasted and shovelled into cars.

To reduce the large lumps of coal that come from the mines into prepared sizes necessitates running them through rolls to break down. Every time a lump of coal is broken it results in producing a certain percentage of small coal, on account of its brittle nature.

The finer the coal is cracked the greater the degradation is bound to be. In the Schuykill region, where the fracture is flat, the coal brittle, and where pitch coal is principally mined, the percentage of steam sizes produced to domestic sizes is larger than in the Wyoming region.

The reason the percentage of small coal produced at breakers to-day is greater than a few years ago is owing to the fact that to-day there is a market for what is known as rice and barley coal.

A few years ago breakers were equipped to recover only pea and buck-wheat sizes. All coal below those sizes was allowed to go to the banks. In the last few years, however, many of the breakers have been remodelled and washery annexes built to enable them by means of water to reclaim these smaller sizes, so that but few breakers are allowing to-day any merchantable coal to go to the banks, whereas, on the other hand, the small sizes of coal in some of the old banks are being reclaimed by the erection of washeries.

Pea coal ought not to be considered a competitor of bituminous coal, as unquestionably pea is going to be used more and more each year for household purposes; in fact, 90 per cent. of the pea coal that is sold at what is known as line points is now used for domestic purposes.

#### LIGNITE.

A fortune is in store for the man who will invent some way of briquetting lignite, says the New York Sun. North-western railroad men are deeply interested, for success would mean the opening of vast mines in their territory. If the experiments now being conducted with a view to briquetting this coal prove successful, it is possible the entire fuel problem will be revolutionized. North Dakota has a supply of this fuel so vast that under a universal consumption it would serve for hundreds of years, for the amount is practically limitless. It has been largely used by settlers, and has proved a veritable boom on the treeless plains.

Though lignite has not always given satisfaction on account of its rapid consumption and tendency to clog fires, fire boxes have recently been constructed especially for it and locomotives have been designed for its use. With the ordinary engine the lignite produces too many sparks, endangering crops and property, but it is hoped to avoid this in the new locomotives. Some experimenters with the fuel declare it will not be necessary to use a binder in making a satisfactory fuel, but the most interested contend that some binder, perhaps similar to that used for briquetting in Germany will be needed.

One trouble with lignite is its dampness, and another is that the air makes rapid consumption; but, mixed with some slowly burning substance, and pressed into briquettes by powerful machines, these failings may be done away with. This expels the moisture and checks the tendency to slake. Vast quantities of this coal are found near Bismarck, N.D., and mines near the town are opened up so that more than one thousand tons a day are taken out. It is almost the only kind of fuel used there and its consumption in Fargo and other nearby towns is enormous.

The method of mining is unique. Usually the mines are entered by means of a drift which taps the veins of coal at a depth of forty to fifty feet. This is done in sections so that the whole mine is a series of galleries divided by coal partitions. Later these are removed, and, blasting with electricity, enormous

chunks of coal are blown down. These are carted away after the miners have broken them into the receiving cars. Immense chutes carry the lignite to the cars which are waiting on the tracks, and so expert is the whole process, even at this initial stage, that the raw material costs only 40 cents or thereabouts a ton.

#### A CANADIAN COAL DEPOSIT.

More than twenty-five years ago Mr. Hugh Sutherland and a friend were crossing the prairie at Short Creek, near Roche Perce, eleven miles southwest of Estevan, in Southeastern Assinaboina. Upon investigation they found when they noticed smoke issuing from a ravine that it did not proceed from a camp fire, but from a burning bed of coal. In such manner was coal first discovered in the Canadian North-West. Mr. Sutherland was quick to recognize the importance of the discovery.

Winnipeg was young then, but at that time gave promise of the importance it has since attained, and Mr. Sutherland saw the immense advantage it would be could this coal be profitably shipped to Winnipeg. He determined to try the experiment. Returning to where he had first seen the burning coal bed, he purchased some land around and started mining operations. To get the coal to Winnipeg he constructed a number of flat-bottomed barges, and these, loaded with coal, he floated out of Short Creek and down the Souris and Assinaboina Rivers to Winnipeg. The arrival of this coal at the time created much excitement among the inhabitants of the Prairie City, who thought that the problem of their fuel supply was forever solved. Their rejoicings, however, were premature. The coal was to be had, it was true, but it cost too much to transport it to Winnipeg, and the enterprise was reluctantly given up. Time has its revenge, however. With the opening up of the country by the railroads, the economic conditions were changed, and now from the very neighborhood where in the eighties Mr. Hugh Sutherland was unable to make his venture a success thousands of tons are being yearly mined and some of the fuel finds its way to Winnipeg for the use of manufacturers there.

It is claimed that this territory is one immense bed of lignite. From investigations carried on there is a belief that the coal extends southerly to the Gulf of Mexico, and it is said to run westward as far as Medicine Hat, where mining operations are also conducted. The farmer here, while digging a cellar, is as likely as not to strike a bed of coal, and thus he is excavating his cellar, while at the same time securing a supply of fuel perhaps not very good coal, but still something that will burn and throw out heat. In sinking for a well it is a frequent occurrence to go through a coal bed, while on the banks of some of the creeks coal may be had for the digging. Within three miles of Estevan there are eight small mines, the larger mines being at Roche Perce, and at Bienfait, a station eight miles east of Estevan, where the Canadian Pacific Railway is operating an

extensive property. The coal itself is a quality of lignite, very soft, and when exposed to the air for any length of time slacks and crumbles almost into dust. It is transported many hundred miles, though, being used at nearly all the stations as far as Brandon, and some, as I have said, going to Winnipeg. The Ogilvie Company there use this coal for steaming purposes. To the farmers it is most valuable for fuel, and they can purchase it at the mouth of the mine for \$1.50 a ton. At Winnipeg it would cost about \$5 a ton.

When what is now the Souris branch of the Canadian Pacific Railway was granted a subsidy it was part of the agreement that this coal delivered at any station in Manitoba should not cost more than \$4 a ton. It was an attempt to increase this price that brought the Canadian Pacific into the coal mining business. It opened a mine for its own protection.

The old coal miner of Pennsylvania would be inclined to laugh at the way in which coal is mined here. There is no sinking of shafts at all. The coal is easily and inexpensively worked, for it crops right out in the ravines, and all there is to do is to cut a tunnel in and take out the coal. The dangers encountered in the mines of Pennsylvania and other places do not exist here, for fire damp is unknown, and the miners work with a little oil lamp stuck in their caps.

The existence of these ravines where the coal is found is accounted for in an ingenious way. The theory is that these are old burned-out coal-beds, and that when the coal beneath the surface was all consumed the land simply caved in, forming the ravines. It is in these that all the mines around in that section are located.

The largest mines at present in operation are at Roche Perce, or Pierced Rock, where the Souris Coal Mining Co. Limited, have a number of properties. This company is an amalgamation of several companies that were operating in the neighborhood, and their managers are concentrating their efforts at present on what is known as the Hassard mine. Quite a little village has sprung up there. The company employ from 200 to 250 men in summer, and 300 to 350 in winter. A branch railroad extends from the Canadian Pacific Soo line to the mine.

The mines owned by the Canadian Pacific at Bienfait are said to have a seam running through twelve feet deep. When fully developed it is expected that the railroad company will take out quite one thousand tons a day. This coal will be used in the stations along the lines of the railroad. It is unsuited for locomotive coal, although with stationary engines it gives satisfactory results.

#### THE FUEL OF THE FUTURE.

This name is given by Popular Mechanics to compressed briquettes of peat. One-seventh of the area of Ireland, it says, consists of peat bog, at present unprofitable, but soon to be worth as much as so many coal-mines, owing to improved and cheapened methods of collecting, drying, and preparing peat for fuel. Even now Sweden uses 2,000,000



tons of peat briquettes yearly, while within fifty miles of Chicago are unused fields of the substance containing enough to supply that city for a century. Of a new method of preparation the writer says:

In this new process the peat is excavated from the bog by machinery and conveyed directly to the plant without the long delay of air-drying. Here it is packed into rotary cylinders, which are revolved at great speed, the peat being beaten by an interior heating device while the cylinders rotate. The centrifugal force expels the moisture so that it is a very low percentage. Then, by means of electrodes connected by conductors with a dynamo, the centrifugally dried peat is included in an electric circuit; the resistance of the peat generates heat and it is carbonized. A mass of black globules represents the results and retains all the valuable properties of the raw material. It then passes to kneading machines, and after being well kneaded it is either moulded into briquettes or left to dry and harden, in which latter case it is afterward broken, screened, and graded. As has been stated, the value of this process lies greatly in the fact that in climates where the drying season is short it can be prepared despite the weather conditions. In Alaska a supply could hardly be prepared after other methods, and what a boon prepared peat fuel would be in that climate! It is a fact that the peat supply increases proportionately with the distance from the equator, and, under the eternal law of compensation, there must be some means by which it can be utilized in those cold countries where it abounds. Again, in the electrical process there is no loss, no escaping of valuable elements in the form of gases. One ton can be produced at the almost incredible cost of \$1.21. Prepared peat is an almost smokeless fuel. It burns to the last vestige, leaves a clean, white ash and no clinker.

### INDUSTRIAL 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 Methodist Magazine and Review for July begins its sixtieth volume with a special patriotic number containing seven illustrated articles on Canada and its progress. These range from "Louisburg, Cape Breton," with an account of its famous siege, to the far Yukon. They describe "New Ontario and its Problems," "The Lumber Jack and his Work," and "Missions to the Lumbermen," "Rideau Hall, Past and Present," "Glimpses of New Canada," and diagrams showing the wonderful development of the Dominion.

A 72-page catalogue of the Chicago Pneumatic Tool Co., Chicago, Ill., is devoted to the air compressors built at the Franklin, Pa., plant of this company. The statement is made that calculations on compressors should be based on a range of air pressure from

60 to 100 pounds per square inch for pneumatic tools in machine or boiler shops, foundries, mines and quarries. The catalogue is well illustrated and has tables giving full details of the various types of steam or belt driven air compressors.

Walter H. Whiteside has been made general manager of sales for all departments of the Allis-Chalmers Co., including the Bullock Electric Mfg. Co. He has been manager of the detail and supply department of the Westinghouse Electric & Mfg. Co., Pittsburg, and at the same time general manager of the Sawyer-Man Electric Co., of New York. From 1885 to 1896 he was connected with the Cleveland Electrical Mfg. Co., Cleveland, most of the time as manager of the Chicago office. In 1896 he was made manager of engine sales for the Gates Iron Works, Chicago, and in 1898 became connected with the Westinghouse interests.

The R. McDougall Co., Galt, Ont., have issued a handsome new catalogue, on planers. A number of fine illustrations and complete specifications are given.

Bulletin 923 of the Canadian General Electric Co., Toronto, refers to generators.

"Bundy Steam Traps" is the title of a new catalogue by the A. A. Griffing Iron Works, Newark, N.J. This line of goods is represented in Canada by the A. R. Williams Machinery Co., Toronto.

Darling Bros. "Reliance Works," Montreal, have just issued Section VII. of their general catalogue, which they devote to the Webster system of steam circulation for heating purposes at or below the pressure of the atmosphere. Manufacturers, architects and all those interested in building should acquaint themselves with this system.

"Slipping Belts, Conditions, Causes Cures," by the Joseph Dixon Crucible Co., Jersey City, N.J., gives some observations on the value of dressing for leather belting.

The Advance Machinery Co., Toledo, Ohio, represented in Canada by the A. R. Williams Machinery Co., have issued an attractive booklet which tells of the advantages of the Wetmore Glue Tank Heater, now in use by more than 3,000 American and many Canadian wood-workers and others using glue. Either of the above companies will supply the booklet and other information on this economic appliance.

The National Twist Drill Co., Detroit, Mich., have issued a new catalogue and price list of their reamers, cutters and special tools.

Sinclair's patent coupler is described and illustrated in a folder recently issued by the manufacturers, G. S. Sinclair & Sons, Warton, Ont.

One of the most interesting and valuable publications that has reached us—perhaps the most valuable—is the Canadian Annual Review of Public Affairs, by J. Castell Hopkins, published by the Annual Review Publishing Co., Toronto. Written in the most impartial spirit, it constitutes a textbook and encyclopedia of Canadian events and Canada's relationship with other countries, that should be in the hands of every one who takes interest in public

affairs. There is no other work of this scope or style in Canada. The different sections of it include Dominion and Provincial Political Affairs, Relations with the Empire and with the United States, the Militia, Transportation, Agriculture, Mineral Resources and Productions, Forests and Fisheries, Trade and Commerce, Finance, Education, etc. One of the most important divisions of the book is that having reference to the Industrial Interests of Canada. Mr. Hopkins is a fluent and intelligent writer, and his book cannot but be of much value in the study of Canada from any standpoint. It is a continuous and permanent yearly record of Canadian development and history.

Notice has been sent to the trade to the effect that the "American Carpet and Upholstery Journal," of Philadelphia, will hereafter be issued, beginning with the July number, on the 10th of each month instead of the 1st. This journal has been published continuously in Philadelphia since 1875, the past 21 years having been under the same management headed by John R. Kendrick. It has been very successful and has a larger circle of patrons and readers now than ever before.

The "American" Buyers' Directory for 1904, just issued, contains 176 pages of valuable matter for every dealer in carpets, floor coverings, upholstery goods, rugs and decorative interior furnishings generally, excepting furniture. The work, we are informed, cost over \$2,500 to compile and the index to contents discloses complete carefully classified lists of manufacturers, importers and jobbers of carpets, rugs, upholsteries, wall decorations and all kindred products. Lists of brand and trade-mark names used in the furnishing industries, mill-titles, selling agencies, jobbers and department stores handling carpets and upholsteries are also included. The book is published by The Trades Publishing Co., 102 S. 12th Street, Philadelphia, Pa.

A handsome catalogue is being sent to steam users by the Philip Carey Mfg. Co., Lockland, Ohio, and Toronto, Canada. It is excellently illustrated and neatly printed and goes into the details of heat insulation, especially relative to the magnesia steam pipe and boiler coverings made by the Carey Company.

The Chicago Pneumatic Tool Co., Chicago, Canadian offices, Temple Building, Toronto, have issued a folder on the "Duntley Air Cooled Electric Drill," a handy little tool now in wide use.

Mr. D. Sleeth, 13 St. John Street, Montreal, sole agent in Canada for the Geo. W. Lord Co., water purifying chemists, Philadelphia, Pa., has issued a circular to the effect that if any steam user has trouble with his boiler plant from incrustation or corrosion, and will send him a sample of the feed water which he uses, or a small piece of the scale which forms in the boiler, he will, from it, make an analysis to show the quantity of foreign matter which they contain, and from it he could formulate chemical preparations with which to purify the feed water, remove scale, and prevent corrosion.

We have from the British Foreign Office, London, Diplomatic and Consular

Reports as follows: United States—trade of Porto Rico, of Consular District of Boston, of California, Nevada, Utah and Arizona; Germany—Navigation Schools, Projected Rhine, Neckar, Danube Ship canal, Consular District of Hamburg; France—Consular District of Brest, trade of Cochin, China, Consular District of Bordeaux; Spain—Consular District of Malaga; Portugal—Consular District of Berva, trade of South Portugal, trade of North Portugal; Belgium—Customs Tariff; Denmark—Trade of, for 1903; Sweden—Trade of Stockholm and eastern coast of Sweden; Turkey—Trade of Beirut and the coast of Syria; Greece—Trade of the Cyclades; Persia—Trade of the Persian Gulf, Trade of Revinciushah and district; China—Trade of Ningpo; Brazil—Trade of Consular District of Rio Grande de Siel.

We have received the summary report of the Geological Survey Department. It is a well-executed book of 218 pages, with a table of contents and an index. It contains eight good maps and sections to illustrate the surveys of some of the field parties who were employed in all parts of the Dominion from the Yukon Territory to Nova Scotia.

The Joseph Dixon Crucible Co. have just published the eighth edition, revised and enlarged, of "Graphite as a Lubricant," discussing in detail the theory of graphite lubrication and its practical benefits. Copies will be freely sent upon request.

Mr. J. Obalski, M.E., Inspector of Mines for the Department of Lands, Mines and Fisheries, has sent us "Mining Operations in the Province of Quebec for 1903" in connection with the annual report of that Department for the fiscal year 1902-03. The publication is most valuable, showing the extent and value of the metallic and non-metallic operations being carried on in that province.

We are under obligation to Mr. George Johnson, Dominion Statistician, for a copy of the "Statistical Year Book of Canada for 1903," being the nineteenth year of issue. Of course, no newspaper editor can get along without this most invaluable book of reference regarding Canada, to which we have occasion so frequently to refer.

We are informed by Dr. Eugene Haanal, Ottawa, Dominion Superintendent of Mines, that he is now engaged in preparing the report of the Commission of which he was head re the electric smelting of ores. It will be some time before the report, with its many drawings and illustrations, is ready to go into the hands of the Government printer.

## PERSONALS.

The Westinghouse Companies extend to their friends a cordial invitation to visit their headquarters in the Palace of Machinery, and to their other exhibits in the Palace of Electricity and the Palace of Transportation, at the St. Louis Exposition.

W. F. Warden, president and general manager of the Burt Mfg. Co., Akron, Ohio, has just returned from an extended business and pleasure trip abroad, having

visited England, France, Germany, Switzerland and other countries, calling upon old agencies and establishing new ones. The Cross oil filter, manufactured by this company, is known wherever lubricating oil is used and its use is becoming more extensive.

The Dominion government have retained the service of J. A. Jamieson, Montreal, the Canadian grain elevator engineer, to prepare plans and specifications for the large fire-proof grain elevator to be built at Port Colborne, the Lake Erie entrance to the Welland Canal, and which will be an adjunct to the canal system. The transportation commission recently recommended that an elevator be built at this point for the purpose of transferring grain from the large lake vessels which carry cargoes of 150,000 to 250,000 bushels to canal sized vessels or barges which will then transport it through the Welland, Lake Ontario and St. Lawrence canals to Montreal.

Mr. Alex. Gartshore, president of the Gartshore-Thomson Pipe & Foundry Co., Hamilton, Ont., died at his home in that city on Wednesday last, July 13. He was born in Dundas, Ont., about 70 years ago. His father, John Gartshore, was one of the first manufacturers of flour mills in Canada, his foundry and shops in Dundas being famous for this work. He was also the builder of the first compound steam engine in America, and the class of work he did may still be seen in the engines of the car ferry "Great Western," still running between Windsor and Detroit. Mr. Alex. Gartshore learned the foundry business in his father's shop and always remained in the same business. His two brothers, John J. Gartshore, of Toronto, and Wm. M. Gartshore, of London, Ont., are both well known in the iron business in Canada.

Mr. F. H. Clergue, H. C. Hamilton, Jas. Connee and C. N. Smith, Sault Ste. Marie, Ont., were in Toronto a few days ago in connection with the Lake Superior Corporation. Mr. Smith said that the "Soo" was resuming its old-time activity and that the reappointment of Mr. Shields had brought about a feeling of great confidence. The steel plant is in splendid shape, and one hundred and fifty thousand tons of ore will be shipped from the Helen mine this season. Mr. Smith added that too much credit could not be given to Mr. T. J. Drummond, of Montreal, for his great work on the Reorganization Committee, and later for his invaluable services as vice-president.

Mr. Louis Terven, E.E., has recently been appointed chief electrician of the Nernst Lamp Co., Pittsburgh, Pa. Mr. Terven was for some time electrician of the United States Navy Yard, at Port Royal, S.C., which position he resigned to enter the experimental laboratory of the Nernst Lamp Co., and later he was given charge of the Chemical Engineering Department of the company. A second promotion in so short a time speaks well for the engineering ability of Mr. Terven.

The Engineers' Club, of Toronto, will take their annual summer outing on July 22 to the electrical power development at

De Cew Falls, near St. Catharines, Ont., leaving Toronto by steamer Garden City at 8 o'clock a.m., and arriving back at 9.30 p.m. The route will be via Port Dalhousie and St. Catharines, at which latter place luncheon will be served at noon, and dinner at 5 p.m. Capt. Killaly Gamble, president of the club, and Mr. Willis Chipman, secretary, will chaperone the party.

## THE LAKE SUPERIOR CORPORATION.

While the reorganization of what was known as the Clergue Industries was in process of development Mr. F. H. Clergue furnished the Ontario Government with the statement which appears below containing the valuations placed by the officials of the consolidated companies upon the assets of the companies embraced in the consolidation and now in the possession of the Lake Superior Corporation, of which Mr. C. D. Warren, of Toronto, is president. The statement shows the condition of the various companies at the time of the consolidation and the original cost of the properties:—

The Lake Superior Power Co.—Power development, \$283,442.92; power building, \$393,110.93; power canal, \$200,092.70; compensating works, \$288,820.77; power canal No. 2, \$22,212.12; Gertrude nickel mine, developed; a part of 75,000 acres of nickel property owned by company in Sudbury district, \$273,811.76. Nickel smelters, finished and in operation, etc., one 120-ton and one 220-ton capacity, \$42,296.99. Helen iron mine, non-bessemer, October 12, 1903, blocked out and drilled 2,615,200 tons. Siderite deposit represents millions of tons of bessemer ore, \$259,100.02. Cariboo copper mine, not developed, \$11,046.11; copper nickel reduction, all finished, consisting of sulph, acid, briquetting, roasting, water, gas and oxygen plants, capacity 50 tons. Ferro-nickel dailly, \$513,657.28; copper-nickel converting plant, nearly completed. Converter in place and machinery all ready to install, to convert 325 tons of ore per day, \$65,320.96. Brick plant, finished and working, capacity 16,000 pressed bricks per day; 5 kilns and 80 furnaces. Clay bank owned by company about 2,000 feet from plant, \$102,382.70. Chemical laboratory, one of the finest private laboratories on the continent, \$6,929.93. Chemical laboratory equipment, \$10,299.66. Docks forming connections with the Algoma Central and Hudson Bay Railroad. Vessels of largest type on great lakes can load or unload, \$8,460.47. Real estate, comprising a stretch of land (water front) for nearly five miles up the St. Mary's River (Canadian side), and other properties; riparian rights, \$432,716.68. Iron range explorations, \$56,793.89. Office building, \$85,527.76. Tagona Inn, \$29,093.96. Miscellaneous buildings and equipment, \$27,007.11. Limestone quarry, at Cockburn, in Michigan, \$6,103.99. Warehouses, \$10,589.63. Steamship Siesta, \$42,421.23. Rights to cut pulp wood, transferred to Commercial Co., including camps, equipment, etc., \$118,243.03. Total, \$3,289,492.60.

The Michigan Lake Superior Co.—Power canal, completed and in operation, 2½ miles long, \$3,622,804.54. Power building, completed and in operation. Develops 44,000 h.p. or 60,000 electrical h.p. 25,000 h.p. sold. Owns a large acreage of land and water front. This land is becoming more valuable as the United States Government is increasing its holdings for park and other purposes, \$11,717,661.79. Electric transmission line, \$23,306.28. Real estate, river front property, extending inland. This property has increased very greatly in value within two years; all within city limits, \$217,238.45. Docks, located on St. Mary's River, \$34,184.25. Total, \$5,665,195.31.

The Sault Ste. Marie Pulp & Paper Co.—Ground wood pulp mill, capacity 80 tons daily, \$181,348.40. Ground wood pulp mill—tools and machinery, \$327,683.49. Sulphite pulp mill capacity 60 tons daily \$328,281.89. Sulphite pulp mill—Tools and machinery, right to cut pulp wood, \$217,751.02. Boiler house, \$6,077.05. Paper bag mill, in Michigan Power Building; completed. Also makes building paper, utilizing only waste pulp from both pulp

mills for its full capacity, \$23,323.81. Warehouse at Sault Ste. Marie, Ont., \$16,330.10. Total, \$1,100,895.76.

Algoma Iron Works—Machine shop—Tools and machinery for same. A complete and splendidly-designed shop in every detail and equipment, \$67,472.67. Foundry, fully equipped. Kept busy all the time on work for the sub-companies, \$67,807.44. Foundry—Tools and machinery. The machine shop, foundry and blacksmith shop are capable of building railroad locomotives or any other engines; exceptional equipment, \$1,363.45. Blacksmith shop, works in connection with foundry and machine shop, \$13,243.51. Pattern shop, is fully equipped with every modern device in the way of tools, etc. Pattern shop—Tools, etc., \$12,586.74. Pattern shop—Tools and machinery, cost included in foundry tools and machinery, \$12,586.74. Miscellaneous property, \$497.12. Total, \$295,159.81.

Tagona Water & Light Co. Electrical plant, lights. Towns of Sault Ste. Marie and Tagona \$127,701.88. Water service, towns of Sault Ste. Marie and Tagona. This company is a steady

earner, with increasing possibilities as towns grow, \$245,554.70. Total, \$373,256.58.

The Algoma Commercial Co. Limited—Josephine iron mine, not entirely developed, seven analyses show iron 63.78, Sulp. .209, Phos. .023; two ore bodies, one Bessemer and one non-Bessemer; drills indicate a rich deposit; two drills have been worked, \$111,263.41. Frances iron mine, "Identical with Vermillion Range formation," \$75,370.64. Grace gold mine, developed; 1,500 feet of shafts and drifts, \$133,896.27. Emily gold mine, undeveloped, but all indications point to richer deposit than in Grace mine, \$18,849.04. Elsie nickel mine, developed and productive, \$190,245.49. Woodbridge iron mine, undeveloped, located in Mesaba District; 3,000,000 tons measured up, \$119,073.42. International dock and railway terminals and hotel, railway terminal, site for Union Station to be used by Algoma Central, Manitoulin & North Shore Railway Co., \$93,519.18. Soo saw mill dock, loading station for lumber; this dock holds 3,000,000 feet of lumber; another dock must be built to hold extra

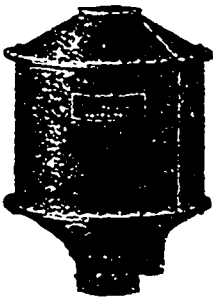
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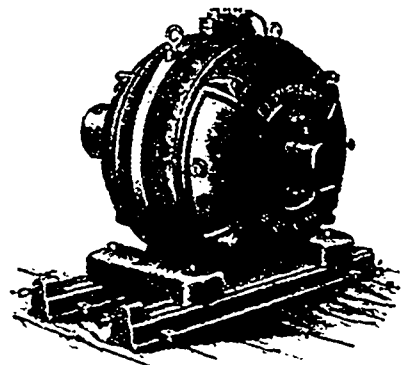
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lumber, \$14,888.78. Michipicoten Hotel, Algoma Inn, \$14,067.36. Tagona Inn equipment, hotel owned by Lake Superior Power Co., \$9,527.91. Veneer mill, in full operation, turning out 80,000 square feet per day; all product sold ahead, \$112,483.06. Soo saw mill, in full operation, product all sold, cutting 30,000,000 feet lumber a year, \$142,564.30. Real estate, franchises, etc., increasing materially in value daily, \$435,716.18. Land grants—Algoma C. & H. B. R. R., 673,400 acres earned subject to conditions; 814,000 acres more will be earned when railway is completed from Soo to Josephine Junction, and when completed to Missinaibi 185,000 additional; total, 1,672,400 acres, \$412,065.69. Manitoulin & North Shore R. R., 99,900 acres earned, subject to conditions. Investments at Michipicoten, consisting of buildings, warehouses, docks, etc., also at Searchmont, and at Goulais, of saw mills, etc., \$61,859.83. Logging operations, supplies timber to pulp mills, saw mills, veneer mills, charcoal retort plant and kilns, etc., \$180,847.64. Total, \$2,126,238.23.

The Algoma Steel Co., Limited.—Bessemer steel works, 750 tons Bessemer ingots per day, \$2,277,181.36. Blooming and rail mill, 1,000 tons per day, dependent upon capacity of blast furnace at present, \$155,734.27. Charcoal blast furnace, 150 tons per day; constructed to use either coke or charcoal with equal efficiency. Coke blast furnace, 250 tons per day; these two furnaces, with all accessories, such as blowing engines, elevated railroad skips, bins, electrical unloaders are of the latest type, \$1,805,316.22. Charcoal retort and by-product, the finest and largest in the world; the product is 1,600 gallons, 85 p.c. alcohol, 8,000 bushels charcoal, 240 cwt. gray acetate of lime, daily, \$503,197.60. Charcoal kilns, located at Wilde and Searchmont on Algoma Central & Hudson Bay Railroad, 56 kilns, daily capacity 4,000 bushels charcoal, \$130,020.36. Wharves, at steel plant; these wharves are well built and very extensive, with electrical travelling unloaders for ores and coal, etc., \$229,414.36. Limestone properties, one located in Michigan at Petoskey, and the other, Bruce Mines, Ont., \$7,975.28. Power transmission line, from power house to steel plant, about one mile long, \$30,747.03. Residences and cottages, located at Tagona; one hundred and thirty-four cottages and six houses of large size for superintendents; all in excellent condition, \$192,339.15. Total, \$5,331,925.63.

Algoma Central & Hudson Bay R.R. Co.—Railroad and equipment; over 100 miles in operation, large portion of the balance of the line graded and ties on ground; the road is splendidly built in every way, with con-

crete culverts, etc. Nineteen locomotives, 200 steel ore cars, 25 gondolas, 23 charcoal, 94 dump, 497 flat, 10 passenger, 36 box, 28 work cars, \$8,179,586.61. Steamships and barges, 3 passenger steamers, 1 tug, 4 ore steamers, capacity 9,150 tons, 2 ore barges, capacity 8,000 tons—17,150 tons, total, \$837,710.66. Car shops, at Sault Ste. Marie; capacity, 7 flat or 6 box cars per day. Total, \$9,017,297.27.

Manitoulin & North Shore R.R. Co.—Railroad, 14 miles constructed from Sudbury to Nickel Mines; this road uses rolling stock belonging to the Algoma Central & Hudson Bay Railroad. Total, \$533,186.95.

Trans. St. Mary's Traction Co.—Street car lines, in full operation; street car lines owning franchises for streets in Sault, Mich.; the two lines are on the American and Canadian sides, and have a mileage of about 16 miles, and operate 15 passenger cars. Total, \$217,784.41.

International Transit Co.—Street car lines and ferries. Street car lines in Sault, Ont., and Tagona; also operates ferry between the two Soos in connection with the street cars; in full operation. Total, \$308,744.51.

The British-American Express Co., Limited.—Conducting express business on the railroad and steamship lines of the Algoma Central & Hudson Bay Railway Co. and Manitoulin and North Shore Railway Co. Grand total, \$28,259,177.06.

Investments in other companies.—The Lake Superior Power Co., \$282,600. The Algoma Commercial Co., Limited, \$168,334.24; The Michigan Lake Superior Power Co., \$106,184.80. Total, \$28,816,296.10.

The material and supplies in hand are valued at \$2,699,390.72. The capital stock is stated to be \$46,350,000, and the bonds \$30,517,572.

#### AN IMPORTANT IRRIGATION SCHEME.

By the immense irrigation scheme which the Canadian Pacific Railway have now under way, commencing at Calgary, N.W.T., an immense tract of land is being opened up for settlement. The work is being done by the company on their own initiative. The headgates of the main irrigation canal are on the Bow River, just outside of Calgary, and a large force of men is now employed upon the work. Mr. J. S. Dennis, who was recently appointed assistant to Mr. William White, second vice-president of the road, is the superintendent of irrigation, and the work is going on under his personal supervision.

The project is probably the largest irrigation undertaking on this continent. It embraces an area extending east of Calgary for 150 miles, and runs 60 miles

north and south. Through the centre of this tract the main line of the Canadian Pacific Railway runs. The soil in this large district is first-class, and during most seasons it affords a good summer range for cattle. The rainfall, however, is usually insufficient to secure crops, and, although the climate is good, being milder than the wheat belts farther east, in Assiniboia and Manitoba, the district is at present practically unsettled and undeveloped, while other portions of the Territories are settling up very fast.

The Bow River is a stream having its source in the Rocky Mountains to the west, and at Calgary carries about three thousand feet of water per second, at extreme low water, with a high water or flood discharge of thirty to forty thousand feet per second.

The preliminary surveys of the proposed canal scheme and the land to be served therefrom indicates that about one-half, or fifteen hundred thousand acres, of the block can be irrigated at an

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# This Rule Free.

JUST to get acquainted, we would like the opportunity of sending one of these beveled edged rules free to every engineer. They are finely finished, **one foot long**, inch and metric systems. All that we ask is that you send us the coupon properly filled out, and a few small samples of the scale from your boiler. We will analyze this scale and send you a certificate of analysis. This is also free of any charge whatever.

We do this to learn about your feed water, that we may prove to you how and why Lord's Water Purifying Chemicals are the only compounds that will free your boiler from scale and keep it free.

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GENTLEMEN. - I am sending you a sample of scale from our boiler. You are to analyze it, and send me a certificate of analysis and the rule, free of charge.

Number of boilers in use.....  
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 Boilers are used about.....hours out of the 24  
 Name.....  
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 City.....Province.....  
 Firm's Name.....

ultimate cost of between four and five million dollars.

The actual construction of the first section of the undertaking is now being proceeded with, a main canal twenty miles in length, with a bed width of sixty feet, and carrying water to a depth of ten feet, the canal being so located that its bed width and discharge capacity can be doubled.

Some eighty-five miles of secondary or distributing canals have also been located, and the completion of this section of the scheme, at an estimated cost of about \$1,300,000, will irrigate an area of 300,000 acres, and render available a contiguous area of about 400,000 acres for grazing and dairying.

This portion of the scheme is to be first completed and proved a success before any further extension is undertaken, but if success is obtained, then the necessary extensions will be undertaken to finally irrigate the full amount of 1,500,000 acres, and develop the remaining 1,500,000 acres for grazing and dairying. This extension will involve the enlargement of the main canal to double its present capacity, the development of several large natural basins as storage reservoirs, and the construction of a second canal for diversion of water from the Bow River at a point about eighty miles down the stream from the intake of the main canal now being constructed.

Irrigation is not in any sense an experiment in Alberta, there already being one hundred and sixty canals and ditches, comprising a total length of four hundred miles, which are delivering water for irrigation.

Within the region of irrigation development at the present time stands about as follows:—Number of canals and ditches constructed, 163; length of constructed canals and ditches, 475 miles; number of acres susceptible of irrigation under constructed canals and ditches, 700,000; approximate increased value of land susceptible of irrigation, \$1,850,000.

The larger number of the canals and ditches are small undertakings, designed for the irrigation of individual holdings of small area. One or two of the larger canals, however, are designed to supply water for the irrigation of an extensive acreage, and will develop large tracts of country. Among these the most important canal so far constructed and in operation is that of the Canadian North-West Irrigation Co., whose scheme comprises the district south and southeast of Lethbridge, in Southern Alberta. The area embraced in this scheme is about 500,000 acres, but a further extension of the scheme is now under construction. When this company commenced operations the large area embraced in their scheme was practically unoccupied, and devoted entirely to the grazing of a few isolated bunches of cattle and sheep. To-day there is a large population in the tract, which is traversed by a narrow-gauge railway, and now possesses a large beet-sugar factory and flour mill.

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via the Chicago, Union Pacific and North Western line, from Chicago, August 15 to September 10. Choice of routes going and returning. Correspondingly low

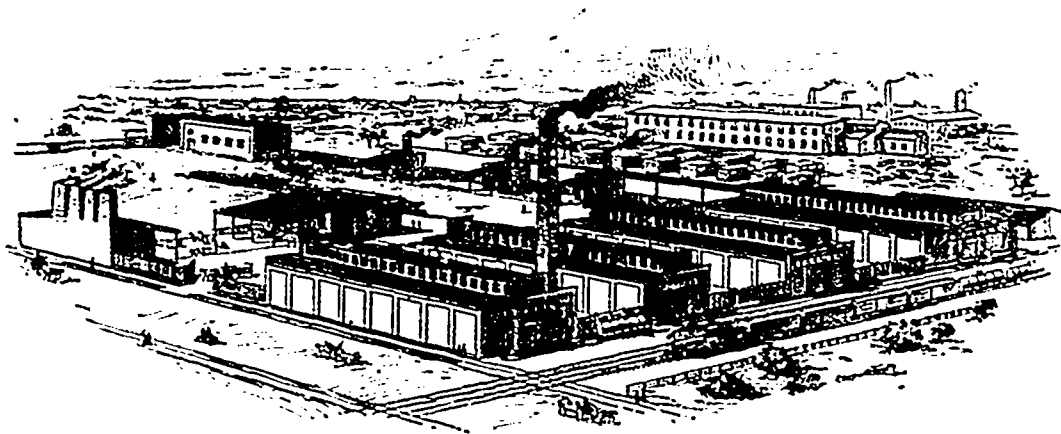
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**RUTILE.**—The American Rutile Co., Pacific Building, Washington, D.C., desire correspondence with Canadian concern who will manufacture a ferro-titanium alloy out of their rutile. They manufacture high-grade rutile concentrates for titanium alloys, mordants, pigments, etc.; in iron and steel, enameling, electrical, dyeing, etc.

The G. B. Perry Knitting Co., Hamilton, Ont., are doubling their capacity and desire to hear from parties having good secondhand machinery for sale. They make women's and children's cotton and wool ribbed underwear, and now operate 10 latch needle machines and 10 sewing machines.



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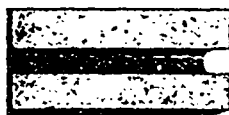


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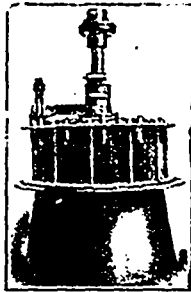
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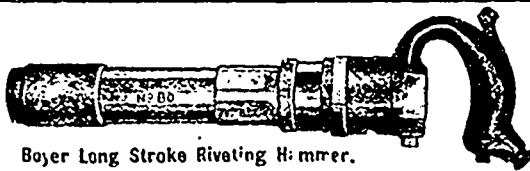
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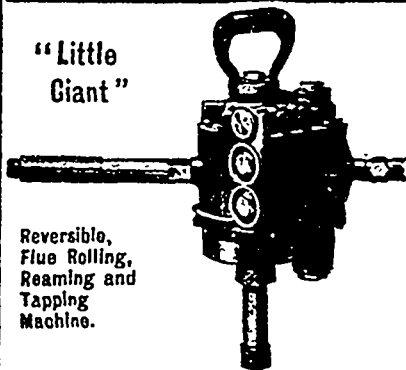


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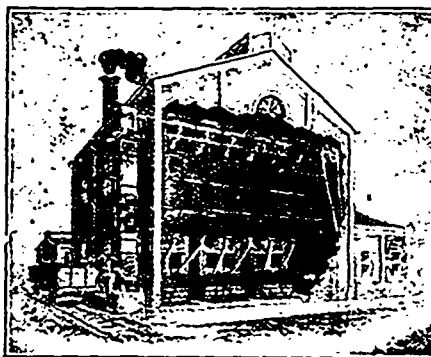
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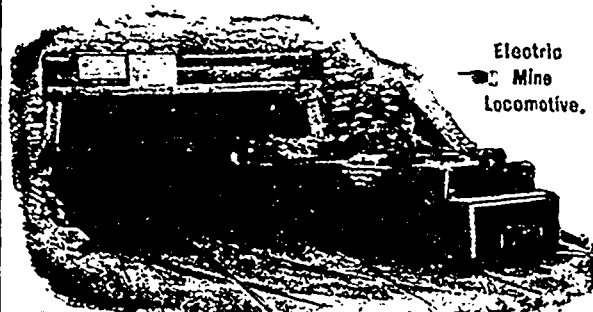


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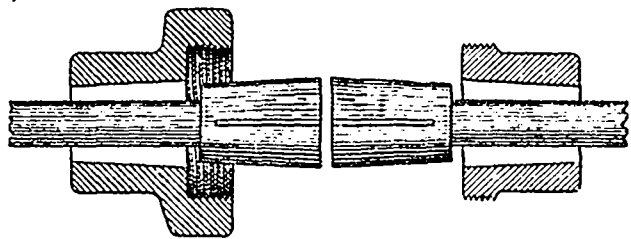
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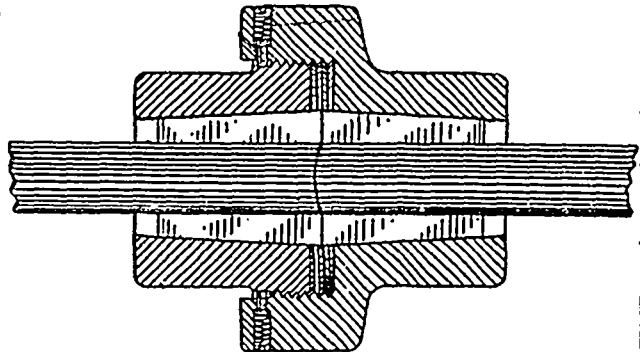
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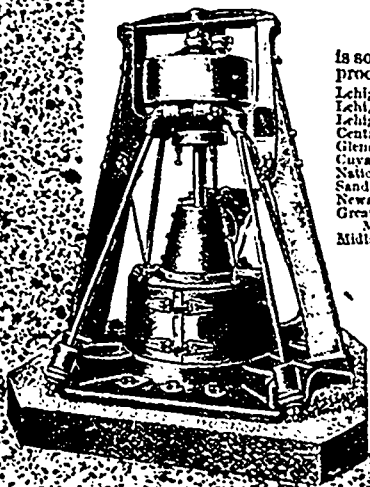
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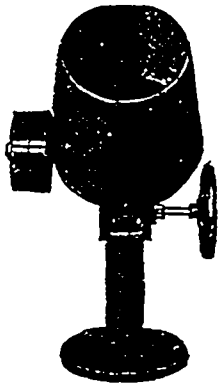
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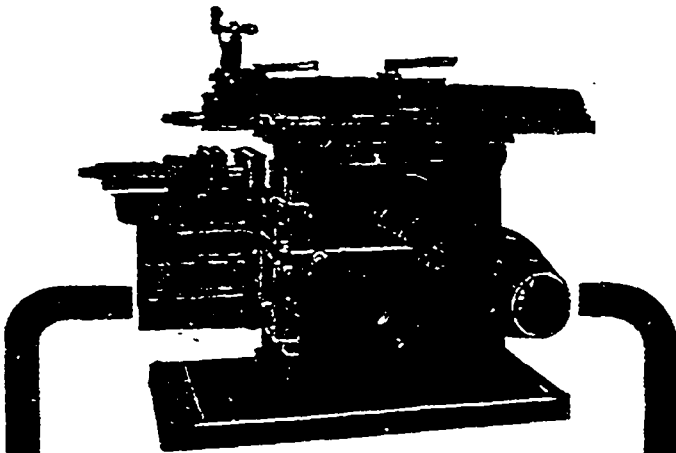
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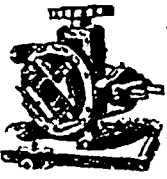


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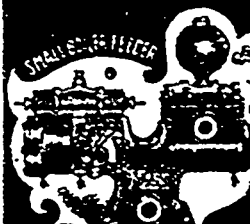
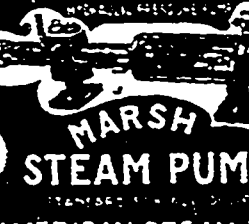
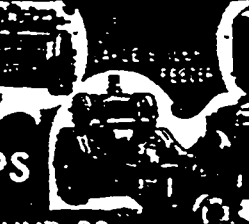


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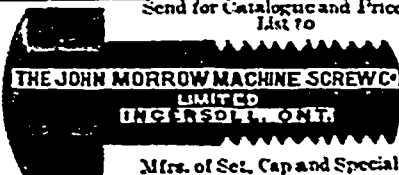
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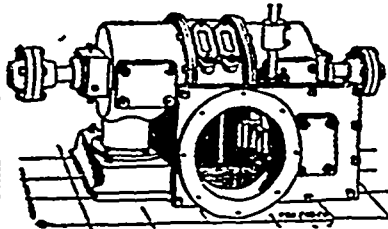
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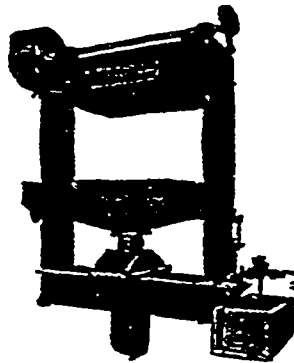
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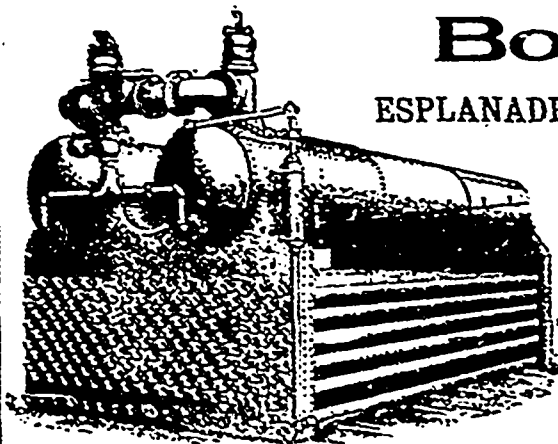
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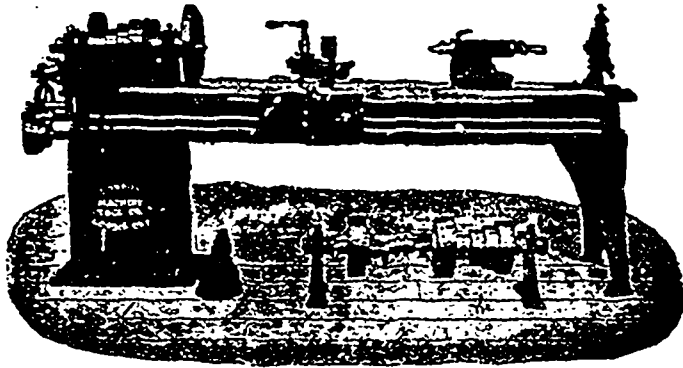


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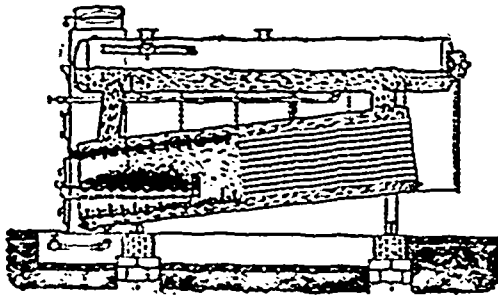
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(CONTINUED).

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 Canadian Oak Belting Co., Brockville, Ont.  
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 Penderthy Injector Co., Windsor, Ont.

## Building Iron and Steel.

Bourne-Fuller Co., Cleveland, Ohio.  
 Canada Foundry Co., Toronto.  
 Expanded Metal & Fireproofing Co., Toronto.

## Builders' Materials

Albert Mfg. Co., Hillisboro, Ont.  
 Canada Foundry Co., Toronto.  
 Canadian Oils Elevator Co., Toronto.  
 Canadian Portland Cement Co., Deseronto, Ont.  
 Cooper, Estate late James, Montreal.  
 Expanded Metal & Fireproofing Co., Toronto.  
 Gartshore, John J., Toronto.  
 Meadows, Geo. B., Wire, Iron & Brass Works, Toronto.  
 Metallic Roofing Co., Toronto.  
 Owen Sound Portland Cement Co., Owen Sound, Ont.

Pittsburgh & Buffalo Co., Buffalo, N.Y.  
 Pittsburgh Shafting Co., Detroit, Mich.  
 Rice Lewis & Son, Toronto.  
 Sheldon & Sheldon, Galt, Ont.

## Cables

Dominion Wire Rope Co., Montreal.  
 Phillips, Eugene F., Electrical Works, Montreal.  
 Wire & Cable Co., 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-Dalzell 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.  
 Gartshore-Thomson Pipe & Foundry Co., Hamilton, Ont.  
 Rice Lewis & Son, Toronto.  
 Montreal Pipe Foundry Co., Montreal.  
 McDougall, John, Caledonian Iron Works Co., Montreal.

## Castings (Iron and Brass.)

Bull Malleable Co., Detroit, Mich.  
 Kerr Engine Co., Walkerville, Ont.  
 McDougall, John, Caledonian Iron Works Co., Montreal.

## Cement Machinery.

McDougall, John, Caledonian Iron Works Co., Montreal.  
 Wentz, H. F. Engineering Co., Toronto.

## 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., Montreal.

## Chemists

Archbold, Dr. Geo., Prescott, Ont.  
 Heys, Thos. & Son, Toronto.  
 Wentz, H. F. Engineering Co., Toronto.

## Clay Working Machinery.

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

## Coal and Coke

Alexander, John H., Windsor, Ont.  
 Bourne-Fuller Co., Cleveland, Ohio.  
 Brownlee, J. Galt, Ont.  
 Ferguson, J. D., Hamilton, Ont.  
 Hancock, J. M. & Co., Niagara Falls, N.Y.  
 Hoffman, Jules G., Detroit, Mich.  
 Milnes, James H., & Co., Toronto.  
 Ohio & Michigan Coal Co., Detroit, Mich.  
 Pittsburgh & Buffalo Co., Buffalo, N.Y.  
 Pittsburgh Coal Co., Pittsburgh, Pa.  
 Shawmut Coal & Coke Co., St. Marys, Pa.  
 Shepard, Charles G., Buffalo, N.Y.  
 Sulphian, O. W. Co., Detroit, Mich.  
 Wick, H. K. & Co., Buffalo, N.Y.

## Coal Cutting Machines

Canadian Hand Drill Co., Sherbrooke, Que.  
 Jeffrey Mfg. Co., Columbus, Ohio.

## Coal Tipples.

Jeffrey Mfg. Co., Columbus, Ohio.

## Coil Chains.

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

## Coke Oven Brick

Dunbar Fire Brick Co., Pittsburgh, Pa.

## Collection Agency

Petrie, H. D., Hamilton, Ont.

## Concrete Construction

Stevens, A. J., Toronto.

## Concrete Mixers

Cooper, Estate late James, Montreal.

## Continuous Rolling Mills

Morgan Construction Co., Worcester, Mass.

## Contractors' Machinery

Carlin's, Thomas Sons Co., Allegheny, Pa.  
 Cooper, Estate late James, Montreal.  
 Gartshore, John J., Toronto.  
 McDougall, John, Caledonian Iron Works Co., Montreal.  
 Shaw, Willis, Chicago, Ill.  
 Sinclair, G. S. & Sons, Warton, Ont.

## Contractor's Plants

Cooper, Estate late James, Montreal.  
 Petrie, H. W., Toronto.  
 Shaw, Willis, Chicago, Ill.  
 Von der Osten, E. & Co., Toronto.  
 Williams, A. H., Machinery Co., Toronto.

## Conveying Machinery

Babcock & Wilcox, Limited, Montreal.  
 Bull Malleable Co., Detroit, Mich.  
 Canada Foundry Co., Toronto.  
 Dodge Mfg. Co., Toronto.  
 Jeffrey Mfg. Co., Columbus, Ohio.  
 McDougall, John, Caledonian Iron Works Co., Montreal.  
 Perrin, William H. & Company, Limited, Toronto.  
 Pittsburgh Shafting Co., Detroit, Mich.  
 Rosendale Belting Co., Toronto.  
 Stevens, Alfred J., Toronto.

## Copper Materials

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

## Corundum.

Canada Corundum Co., Toronto.  
 Corundum Wholes.  
 Canadian Corundum Wheel Co., Hamilton, Ont.  
 Hart Corundum Wheel Co., Hamilton, Ont.  
 Rice Lewis & Son, Toronto.

## Covers.

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

## Crayons

Lowell Crayon Co., Lowell, Mass.

## Crucibles

Dixon, Joseph, Crucible Co., Jersey City, N.J.  
 McCullough-Dalzell Crucible Co., Pittsburg, Pa.  
 Pittsburg Crucible Works, Pittsburg, Pa.  
 Syracuse Smelting Works, Montreal.

Crucible Caps and Nozzles  
 McCullough-Dalzell Crucible Co., Pittsburg, Pa.  
 Pittsburg Crucible Works, Pittsburg, Pa.

## Crucible Covers and Stoppers

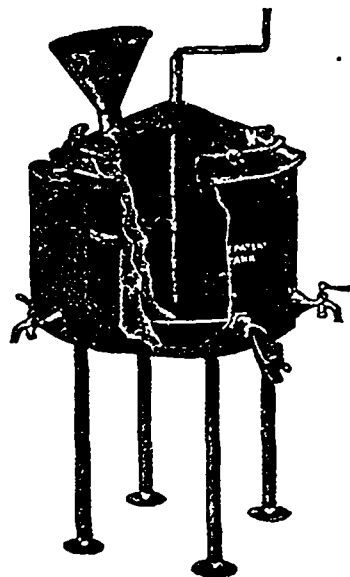
McCullough-Dalzell Crucible Co., Pittsburg, Pa.  
 Pittsburg Crucible Works, Pittsburg, Pa.

Dies (Socket, Sewer Pipe and Tile)  
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

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

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Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
London Machine Tool Co., London, Ont.  
Petrie, H. W., Toronto  
Pittsburgh Shafting Co., Detroit, Mich.  
Shaw, Willis, Chicago, Ill.

**Drills (Pneumatic and Rock)**

Canadian Rand Drill Co., Shadbrooke, Que.  
Chicago Pneumatic Tool Co., Chicago, Ill.  
Jeffrey Mfg. Co., Columbus, Ohio.

**Drills (Twist)**

Cleveland Twist Drill Co., Cleveland, Ohio.  
Pittsburg Shafting Co., Detroit, Mich.

**Drop Forgings**

Globe Machine & Stamping Co., Cleveland, Ohio.

**Drop Forging Dies**

Globe Machine & Stamping Co., Cleveland, Ohio.

**Dry Kiln Apparatus**

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

**Dust and Shavings Separators**

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

**Dye Stuffs and Chemicals**

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

**DYNAMOS (See Motors and Dynamos)****Electric Motors and Transformers**

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Canadian General Electric Co., Toronto.  
Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
Jeffrey Mfg. Co., Columbus, Ohio.  
Shaw, Willis, Chicago, Ill.

**Electrical Repairs**

Volta Electric Repair Works, Toronto.

**Electrical Supplies**

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.  
Packard Electric Co., St. Catharines, Ont.  
Toronto & Hamilton Electric Co., Hamilton, Ont.  
United Electric Co., Toronto.  
Worth & Martin, Toronto.

**Elevators and Conveyors**

Buhl Malleable Co., Detroit, Mich.  
Canadian Otis Elevator Co., Toronto.  
Darling Bros., Montreal.  
Jeffrey Mfg. Co., Columbus, Ohio.

**Elevator Insurance**

Canadian Casualty & Boiler Insurance Co., Toronto.

**Emery and Emory Wheels.**

Canadian Corundum Wheel Co., Hamilton, Ont.  
Forman, John, Montreal.  
Hart Corundum Wheel Co., Hamilton, Ont.  
Petrie, H. W., Toronto.

**Engineers (Cement)**

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

**Engineers (Chemical)**

Heys, Thos. & Son, Toronto.  
Hunt, Robert W. & Co., Chicago, Ill.

**Engineers (Civil)**

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

**Engineers (Consulting)**

DeLano-Osborn Engineering Co., Toronto.  
Electrical Construction Co., London, Ont.  
Electrical Supervision Society, Toronto.  
Hunt, Robert W. & Co., Chicago, Ill.  
Kelsch, H. S., Montreal.  
Marion & Marion, Montreal.  
Morgan Construction Co., Worcester, Mass.  
Parke, R. J., Toronto.  
Perrin, William H. & Company, Limited, Toronto.  
Simpson, T. T., Deschenes, Que.  
Vogel, C. H., Ottawa.  
Volta Electric Repair Works, Toronto.  
Von der Osten, E. & Co., Toronto.  
Wentz, R. F. Engineering Co., Toronto.

**Engineers (Contracting)**

Babecock & Wilcox, Limited, Montreal.  
Canada Foundry Co., Toronto  
Darling Bros., Montreal.  
Electrical Construction Co., London, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.

**Engineers (Electrical)**

Canadian General Electric Co., Toronto.  
Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
DeLano-Osborn Engineering Co., Toronto.  
Electric Engineering & Supply Co., Montreal.  
Electrical Construction Co., London, Ont.  
Electrical Supervision Society, Toronto.  
Kelsch, H. S., Montreal.  
Jones & Moore Electric Co., Toronto.  
Marion & Marion, Montreal.  
Toronto & Hamilton Electric Co., Hamilton, Ont.  
United Electric Co., Toronto.  
Volta Electric Repair Works, Toronto.  
Worth & Martin, Toronto.

**Engineers (Mechanical)**

Babecock & Wilcox, Limited, Montreal.  
Buhl Malleable Co., Detroit, Mich.  
Darling Bros., Montreal.  
DeLano-Osborn Engineering Co., Toronto.  
Electrical Construction Co., London, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Hunt, Robert W. & Co., Chicago, Ill.  
Kelsch, H. S., Montreal.  
Kerr Engine Co., Walkerville, Ont.  
Marion & Marion, Montreal.  
Morgan Construction Co., Worcester, Mass.  
Robb Engineering Co., Amherst, N.S.  
Sheldon & Sheldon, Galt, Ont.  
Wentz, R. F. Engineering Co., Toronto.

**Engineers (Mill and Hydraulic)**

Buhl Malleable Co., Detroit, Mich.  
DeLano-Osborn Engineering Co., Toronto.  
Vogel, C. H., Ottawa.

**Engineers (Mining)**

Buhl Malleable Co., Detroit, Mich.  
Heys, Thos. & Son, Toronto.  
Mills, S. D., Toronto.

**Engineers (Municipal)**

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

**Engineers and Contractors.**

Buhl Malleable Co., Detroit, Mich.  
Jeffrey Mfg. Co., Columbus, Ohio.

**Engines and Boilers**

Babecock & Wilcox, Limited, Montreal.  
Bertram Engine Works Co., Toronto.  
Canada Foundry Co., Toronto.  
Canadian Heine Safety Boiler Co., Toronto.  
Cooper, Estate late James, Montreal.  
Corbett, R. B., Brooklyn, N.Y.  
Goldio & McCulloch Co., Galt, Ont.  
Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
Leonard, E. & Sons, London, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Petrie, H. W., Toronto.  
Petroleum Iron Works Co., Washington, Pa.  
Pittsburgh Shafting Co., Detroit, Mich.  
Robb Engineering Co., Amherst, N.S.  
Shaw, Willis, Chicago, Ill.  
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**

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

**Food Water Heaters**

Babecock & Wilcox, Limited, Montreal.  
Darling Bros., Montreal.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Petroleum Iron Works Co., Washington, Pa.

**Files**

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

**Financial**

Badstreet's, New York City.  
Dun, R. G. & Co., Toronto.  
Seff & Postlethwaite, Toronto.  
Petrie, H. D., Hamilton, Ont.

**Filters (Oil)**

Babecock & Wilcox, Limited, Montreal.  
Burt Mfg. Co., Akron, Ohio.  
Darling Bros., Montreal.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Perrin, William H. & Company, Limited, Toronto.

**Filters and Filtering Systems (Water)**

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

# CLASSIFIED INDEX.

(CONTINUED).

## Fire Brick and Clay

Dunbar Fire Brick Co., Pittsburgh, Pa.  
Hamilton Facing Mill Co., Hamilton, Ont.  
Pennsylvania Fire Brick Co., Lock Haven.  
Pittsburgh & Buffalo Co., Buffalo, N. Y.  
Scioto Fire Brick Co., Sciotoville, Ohio.  
Stowe-Fuller Co., Cleveland, Ohio.  
Wynn, W. H. & Co., West Decatur, Pa.

## Fire Escapes

Darling Bros., Montreal.  
Meadows, Geo. B., Wire, Iron & Brass Works,  
Toronto.

## Forges and Blowers

Canada Foundry Co., Toronto.  
Sheldon & Sheldon, Galt, Ont.  
Sturtevant, H. F. Co., Boston, Mass.

## Founders

Canada Foundry Co., Toronto.  
Cowan & Co., Galt, Ont.  
Garthshore-Thomson Pipe & Foundry Co., Hamil-  
ton, Ont.  
Goldie & McCulloch Co., Galt, Ont.  
Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
Karch, H. W., Hespeler, Ont.  
McLougall, John, Caledonian Iron Works Co.,  
Montreal.  
Sinclair, G. S. & Sons, Warton, Ont.

## Foundry Facings and Supplies

Hamilton Facing Mill Co., Hamilton, Ont.

## Fuel Economizers

Babcock & Wilcox, Limited, Montreal.

## Furniture (Lodge, Opera and School)

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

## Galvanizing

Ontario Wind Engine & Pump Co., Toronto.

## Galvanizing and Tinning Machinery and Furnaces (Wire)

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

## Gas and Gasoline Engines

Goldie & McCulloch Co., Galt, Ont.  
Morrison, T. A. & Co., Montreal.

## Gas Producers.

Morgan Construction Co., Worcester, Mass.

## Gauges (Recording Pressure)

Bristol Co., Waterbury, Conn.

## Gauges (Steam)

American Steam Pump Co., Battle Creek, Mich.  
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.

## Generators

Canadian General Electric Co., Toronto.  
Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
Electrical Construction Co., London, Ont.  
Forman, John, Montreal.  
Jeffroy Mfg. Co., Columbus, Ohio.  
Jones & Moore Electric Co., Toronto.  
Phillips, Eugene F., Electrical Works, Montreal.  
Toronto & Hamilton Electric Co., Hamilton, Ont.  
Volta Electric Repair Works, Toronto.

## Gloves, Mittens and Moccasins

Storey, W. H. & Son, Acton, Ont.

## Glue Heaters

Advance Machinery Co., Toledo, Ohio.

## Glue Room 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.

## Grinding Machinery

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

## Grinding Pans

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

## Hand Traveling Cranes

Morgan Construction Co., Worcester, Mass.

## Hardware

Butterfield & Co., Rock Island, Que.  
Cleveland Twist Drill Co., Cleveland, Ohio.  
Cooper, James, Montreal.  
Garthshore, John J., Toronto.  
Globe Machine & Stamping Co., Cleveland, Ohio.  
Morrow, John, Machine Screw Co., Ingersoll, Ont.  
Hico Lewis & Son, Toronto.  
Ryall Machine Screw Co., Montreal.  
Stanyon Metallic Furniture Co., Toronto.

## Heating and Ventilating Apparatus

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

## Hoisting Engines

Bertram Engine Works Co., Toronto.

## Hoists (Chain and Pneumatic)

Canadian Rand Drill Co., Sherbrooke, Que.  
Chicago Pneumatic Tool Co., Chicago, Ill.  
Cooper, Estate late James, Montreal.

## Hose (Fire and Pneumatic)

Chicago Pneumatic Tool Co., Chicago, Ill.  
Gutta Percha & Rubber Mfg. Co., Toronto.  
McLaren, J. C. Belting Co., Montreal and Toronto.

## Hydrants

Kerr Engine Co., Walkerville, Ont.  
McLougall, John, Caledonian Iron Works Co.,  
Montreal.

## Hydraulic Accumulators

Morgan Construction Co., Worcester, Mass.  
McLougall, John, Caledonian Iron Works Co.,  
Montreal.

## Hydraulic Cranes

Morgan Construction Co., Worcester, Mass.

## Hydraulic Machinery

Canada Foundry Co., Toronto.  
Darling Bros., Montreal.  
Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
Morgan Construction Co., Worcester, Mass.  
McLougall, John, Caledonian Iron Works Co.,  
Montreal.  
Perrin, William R. & Company, Limited, Toronto.  
Petrie, H. W., Toronto.  
Wilson, J. C. & Co., Glenora, Ont.

## Industrial Plants

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

## Insulated Wires and Cables

Phillips, Eugene F., Electrical Works, Montreal.  
Wire & Cable Co., Montreal.

## Iron and Steel Specialties

Abbott, William, Montreal.  
Armstrong Mfg. Co., Bridgeport, Conn.  
Bourne-Fuller Co., Cleveland, Ohio.  
Brown & Co., Paris, Ont.  
Bull Malleable Co., Detroit, Mich.  
Canada Foundry Co., Toronto.  
Cleveland Twist Drill Co., Cleveland, Ohio.  
Karch, H. W., Hespeler, Ont.  
Leslie, A. C. & Co., Montreal.  
Lysaght, John, Limited, Bristol, England and  
Montreal.  
Meadows, Geo. B. Wire, Iron & Brass Works Co.,  
Toronto.  
Nova Scotia Steel & Coal Co., New Glasgow, N.S.  
Petrie, H. W., Toronto.  
Petroleum Iron Works Co., Washington, Pa.  
Pittsburgh Shattling Co., Detroit, Mich.  
Hico Lewis & Son, Toronto.  
Ryall Machine Screw Co., Montreal.  
Sinclair, G. S. & Sons, Warton, Ont.

## Injectors

Canada Foundry Co., Toronto.  
Hamilton Brass Mfg. Co., Hamilton, Ont.  
Penberthy Injector Co., Windsor, Ont.  
Williams, A. R. Machinery Co., Toronto.

## Iron and Steel Inspection

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

## Lamps—Electric

Canadian General Electric Co., Toronto.  
Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
Forman, John, Montreal.  
Packard Electric Co., St. Catharines, Ont.

## Lathes

Cowdroy, C. H., Machine Works, Fitchburg, Mass.  
London Machine Tool Co., London, Ont.  
Petrie, H. W., Toronto.  
Williams, A. R. & Co., Toronto.

## Lathes (Wood-Working)

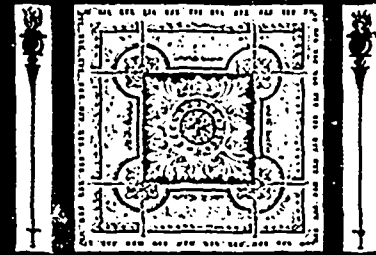
Cowan & Co., Galt, Ont.  
Goldie & McCulloch Co., Galt, Ont.  
Petrie, H. W., Toronto.  
Williams, A. R. Machinery Co., Toronto.

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TORONTO

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## CLASSIFIED INDEX.

(CONTINUED).

### Machinists.

Bertram Engine Works Co., Toronto.  
Buhl Malleable Co., Detroit, Mich.  
Goldie & McCulloch Co., Galt, Ont.  
London Machine Tool Co., London, Ont.  
Worth & Martin, Toronto.

### Machinists' Supplies

Armstrong Mfg. Co., Bridgeport, Conn.  
Buhl Malleable Co., Detroit, Mich.  
Butterfield & Co., Rock Island, Que.  
Cleveland Twist Drill Co., Cleveland, Ohio.  
Cooper, James, Montreal.  
Goldie & McCulloch Co., Galt, Ont.  
Gutta Percha & Rubber Mfg. Co., Toronto.  
Jeffrey Mfg. Co., Columbus, Ohio.  
London Machine Tool Co., London, Ont.  
Morrow, John, Machine Screw Co., Ingersoll, Ont.  
Petrie, H. W., Toronto.  
Pittsburgh Shafting Co., Detroit, Mich.  
Ryall Machine Screw Co., Montreal.  
Sinclair, G. S. & Sons, Warton, Ont.  
Worth & Martin, Toronto.

### Machine Tools

Abbott, William, Montreal.  
Bertram, John, & Sons Co., Dundas, Ont.  
Cleveland Twist Drill Co., Cleveland, Ohio.  
Cowdry, C. H., Machine Works, Fitchburg, Mass.  
Darling Bros., Montreal.  
London Machine Tool Co., London, Ont.  
Petrie, H. W., Toronto.

### Machinery Repairs

Bertram Engine Works Co., Toronto.

### Malleable Iron Castings

Buhl Malleable Co., Detroit, Mich.  
McKinnon Dash & Metal Works Co., St. Catharines, Ont.  
Smith's Falls Malleable Castings Co., Smith's Falls, Ont.

### Marine and Stationary Engines and Boilers

Bertram Engine Works Co., Toronto.

### Mechanical Draft

Babeock & Wilcox, Limited, Montreal.  
Sheldon & Sheldon, Galt, Ont.  
Sturtevant, B. F. Co., Boston, Mass.

### Metal Gates

Page Wire Fence Co., Walkerville, Ont.

### Metal Shafts

Morgan Construction Co., Worcester, Mass.

### Metal Stamping

Empire Machine & Metal Stamping Co., Toronto.  
Globe Machine & Stamping Co., Cleveland, Ohio.

### Metallurgists.

Mills, S. D., Toronto.  
Wentz, R. F., Engineering Co., Toronto.

### Mill Machinery and Supplies

Armstrong Mfg. Co., Bridgeport, Conn.  
Buhl Malleable Co., Detroit, Mich.  
Cleveland Twist Drill Co., Cleveland, Ohio.  
Cooper, Estate late James, Montreal.  
Cowan & Co., Galt, Ont.  
Darling Bros., Montreal.  
Fleming, W. A. & Co., Montreal.  
Gartshore, John J., Toronto.  
Goldie & McCulloch Co., Galt, Ont.  
Greer, Wm. & J. G., Toronto.  
Gutta Percha & Rubber Mfg. Co., Toronto.  
Hamilton Brass Mfg. Co., Hamilton, Ont.  
Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
Hay, Peter Knife Co., Galt, Ont.  
Jeffrey Mfg. Co., Columbus, Ohio.  
Karch, H. W., Hespeler, Ont.  
Leonard, E. & Sons, London, Ont.  
London Machine Tool Co., London, Ont.  
Morrow, John, Machine Screw Co., Ingersoll, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
McLaren, D. K., Montreal and Toronto.  
Penberthy Injector Co., Windsor, Ont.  
Petrie, H. W., Toronto.  
Pittsburgh Shafting Co., Detroit, Mich.  
Rico Lewis & Son, Toronto.  
Robb Engineering Co., Amherst, N.S.  
Ryall Machine Screw Co., Montreal.  
Sinclair, G. S. & Sons, Warton, Ont.  
Spence, R. & Co., Hamilton, Ont.  
Wilson, J. C. & Co., Glenora, Ont.

### Minors' Lamps

Anton, John & Son, Monongahela, Pa.

### Mining Machinery

Buhl Malleable Co., Detroit, Mich.  
Canadian Hand Drill Co., Sherbrooke, Que.  
Chicago Pneumatic Tool Co., Chicago, Ill.  
Cleveland Twist Drill Co., Cleveland, Ohio.  
Cooper, Estate late James, Montreal.  
Corbett, R. B., Brooklyn, N.Y.  
Gartshore, John J., Toronto.  
Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
Jeffrey Mfg. Co., Columbus, Ohio.

McDougall, John, Caledonian Iron Works Co., Montreal.  
Perrin, William R. & Company, Limited, Toronto.  
Petrie, H. W., Toronto.  
Shaw, Willis, Chicago, Ill.  
Williams, A. H. Machinery Co., Toronto.

### Motors and Dynamos

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.  
Jellroy Mfg. Co., Columbus, Ohio.  
Jones & Moore Electric Co., Toronto.  
Petrie, H. W., Toronto.  
Toronto & Hamilton Electric Co., Hamilton, Ont.  
United Electric Co., Toronto.  
Volta Electric Repair Works, Toronto.

### Moulding Sand

Hamilton Facing Mills Co., Hamilton, Ont.

### Novelty Manufacturers.

Worth & Martin, Toronto.

### Nozzles.

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

### Office and Bank Fittings

Canadian Office & School Furniture Co., Preston, Ont.  
Meadows, Geo. B., Wire, Iron & Brass Works Co., Toronto.

### Oils and Lubricants

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

### Oil Cloth

Dominion Oil Cloth Co., Montreal.

### Oil Cups

Penberthy Injector Co., Windsor, Ont.

### Paints and Colors

Bellhouse, Dillon & Co., Montreal.  
Fleming, W. A. & Co., Montreal.  
Gelgy Anilino & Extract Co., New York City.  
Kilpstein, A. & Co., New York City.  
McArthur, Cornelio & Co., Montreal.

### Paper Manufacturers

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

### Patents

Budden, Hanbury A., Montreal.  
Case, Ekerston R., Toronto.  
Fetherstonhaugh & Co., Toronto.  
Nation & Marion, Montreal.  
Patent Exchange & Investment Co., Toronto, Ont.

### Perforated Metals

Globe Machine & Stamping Co., Cleveland, Ohio.  
Greening, H. Wire Co., Hamilton, Ont.  
Stanyon Metallic Furniture Co., Toronto.

### 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.  
Shepard, Charles G., Buffalo, N.Y.  
Syracuse Smelting Works, Montreal.

### Pipe (Riveted, Iron and Steel)

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

### Pipe Threading Machines

Armstrong Mfg. Co., Bridgeport, Conn.  
Butterfield & Co., Rock Island, Que.  
Petrie, H. W., Toronto.  
Rico Lewis & Son, Toronto.

### Pipes and Tubes

Abbott, William, Montreal.  
Bourne-Fuller Co., Cleveland, Ohio.  
Canada Foundry Co., Toronto.  
Corbett, R. B., Brooklyn, N.Y.  
Gartshore-Thomson Pipe & Foundry Co., Hamilton, Ont.  
Montreal Pipe Foundry Co., Montreal.  
Rico Lewis & Son, Toronto.

### Plaster

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

### Plates

Bourne-Fuller Co., Cleveland, Ohio.  
Nova Scotia Steel & Coal Co., New Glasgow, N.S.  
Rico Lewis & Son, Toronto.



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(CONTINUED).

**Plumbago**

Hamilton Facing Mills Co., Hamilton, Ont.  
McCullough-Dubzel Crucible Co., Pittsburg, Pa.  
Pittsburg Crucible Works, Pittsburg, Pa.

**Pneumatic Tools**

Canadian Hand Drill Co., Sherbrooke, Que.  
Chicago Pneumatic Tool Co., Chicago, Ill.

**PcIntor Rolls (For Rods and Wire.)**

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

**Portland Cement**

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

**Power Plants—Equipments**

Babcock & Wilcox, Limited, Montreal.  
Canadian General Electric Co., Toronto.  
Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
Cleveland Twist Drill Co., Cleveland, Ohio.  
Corbett, R. B., Brooklyn, N.Y.  
Darling Bros., Montreal.  
DeLano-Osborn Engineering Co., Toronto.  
Electrical Construction Co., London, Ont.  
Goldie & McCulloch, Galt, Ont.  
Gutta Percha & Rubber Mfg. Co., Toronto.  
Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
Jeffrey Mfg. Co., Columbus, Ohio.  
Jones & Moore Electric Co., Toronto.  
Kolsch, R. S., Montreal.  
Leonard, E. & Sons, London, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Packard Electric Co., St. Catharines, Ont.  
Perrin, William H. & Company, Limited, Toronto.  
Petrie, H. W., Toronto.  
Phillips, Eugene F., Electrical Works, Montreal.  
Pittsburgh Shafting Co., Detroit, Mich.  
Robb Engineering Co., Amherst, N.S.  
Sinclair, G. S. & Sons, Warton, Ont.  
Stevens, Alfred J., Toronto.  
Sturtevant, H. F. Co., Boston, Mass.  
Toronto & Hamilton Electric Co., Hamilton, Ont.  
United Electric Co., Toronto.  
Wilson, J. C. & Co., Glonora, Ont.

**Presses (Tire, Saver Pipe, Nozzles and Stoves.)**

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

**Pulleys**

Darling Bros., Montreal.  
Goldie & McCulloch Co., Galt, Ont.  
Greay, Wm. & J. G., Toronto.  
Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
Jeffrey Mfg. Co., Columbus, Ohio.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
McLaren, J. C. Belting Co., Montreal and Toronto.  
Petrie, H. W., Toronto.  
Pittsburgh Shafting Co., Detroit, Mich.  
Wilson, J. C. & Co., Glonora, Ont.

**Pumps and Pumping Machinery**

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

**Punches and Shears**

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

**Purifiers**

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

**Purifying and Softening Systems (Water)**

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

**Railroads**

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

**Railway Supplies**

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

**Roamers**

Butterfield & Co., Rock Island, Que.  
Chicago Pneumatic Tool Co., Chicago, Ill.  
Cleveland Twist Drill Co., Cleveland, Ohio.

**Rivets**

Bourne-Fuller Co., Cleveland, Ohio.

**Roll Lathes**

Morgan Construction Co., Worcester, Mass.

**Roller Bearings**

Pittsburg Shafting Co., Detroit, Mich.

**Rolling Mills**

Morgan Construction Co., Worcester, Mass.

**Rolling Mill Engineers**

Bourne-Fuller Co., Cleveland, Ohio.  
Morgan Construction Co., Worcester, Mass.

**Roofing**

Bourne-Fuller Co., Cleveland, Ohio.  
Metallic Roofing Co., Toronto.

**Rubber Goods**

Gutta Percha & Rubber Mfg. Co., Toronto.  
Pittsburg Shafting Co., Detroit, Mich.

**Rubber Packing**

Gutta Percha & Rubber Mfg. Co., Toronto.

**Rubber Washing Tubs**

Turner, Vaughn & Taylor, Cuyahoga Falls, Ohio

**Rural Mail Boxes**

Globe Machine & Stamping Co., Cleveland, Ohio.

**Safes and Vaults**

Goldie & McCulloch Co., Galt, Ont.

**Screws**

Morrow, John, Machine Screw Co., Ingersoll, Ont.  
Ryall Machine Screw Co., Montreal.

**Screw Plates**

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

**Sawer Pipe**

Pittsburgh & Buffalo Co., Buffalo, N. Y.

**Shafting**

Bourne-Fuller Co., Cleveland, Ohio.  
Goldie & McCulloch Co., Galt, Ont.  
Greay, Wm. & J. G., Toronto.  
Jeffrey Mfg. Co., Columbus, Ohio.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Nova Scotia Steel & Coal Co., New Glasgow, N.S.  
Petrie, H. W., Toronto.  
Pittsburgh Shafting Co., Detroit, Mich.

**Shafting Coupler**

Sinclair, G. S. & Sons, Warton, Ont.

**Shapers and Carvers**

Advance Machinery Co., Toledo, Ohio.

**Shoar Knives**

Carlin's, Thomas Sons Co., Allegheny, Pa.  
Hart, Peter Knife Co., Galt, Ont.

**Shoos (Iron and Steel)**

Abbott, William, Montreal.  
Bourne-Fuller Co., Cleveland, Ohio.  
Leslie, A. C. & Co., Montreal.  
Lysaght, John, Limited, Bristol, England and Montreal.

**Sheet Metal Goods**

Globe Machine & Stamping Co., Cleveland, Ohio.  
Metallic Roofing Co., Toronto.  
Stanyon Metallic Furniture Co., Toronto.

**Sheet Metal Stamping**

Globe Machine & Stamping Co., Cleveland, Ohio.  
Metallic Roofing Co., Toronto.  
Ryall Machine Screw Works, Montreal.  
Stanyon Metallic Furniture Co., Toronto.

**Ship Builders**

Bertram Engine Works Co., Toronto.  
Clyde Steel Works, Toronto.

**Smoke Stacks**

Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Petroleum Iron Works Co., Washington, Pa.

**Solder**

Globe Machine & Stamping Co., Cleveland, Ohio.  
Syracuse Smelting Co., Montreal.

**Special Machinery**

Globe Machine & Stamping Co., Cleveland, Ohio.  
Stanyon Metallic Furniture Co., Toronto.

**Speed Recorders**

Bristol Co., Waterbury, Conn.  
Chicago Pneumatic Tool Co., Chicago, Ill.

**Sprinkler Insurance**

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**CLASSIFIED INDEX.**

(CONTINUED).

**Stamps & Stencils**

Globe Machine & Stamping Co., Cleveland, Ohio.  
Hamilton Stamp & Stencil Works, Hamilton, Ont.  
Stanyon Metallic Furniture Co., Toronto.

**Steam Pumps**

American Steam Pump Co., Battle Creek, Mich.  
Canada Foundry Co., Toronto.  
Darling Bros., Montreal.  
Goldie & McCulloch Co., Galt, Ont.  
Leonard, E. & Sons, London, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.

Petrie, H. W., Toronto.  
Pittsburgh Shafting Co., Detroit, Mich.  
Shaw, Willis, Chicago, Ill.  
Williams, A. R., Machinery Co., Toronto.

**Steam Separators**

Babeock & Wilcox, Limited, Montreal.  
Darling Bros., Montreal.

**Steam Specialties**

Darling Bros., Montreal.  
Penberthy Injector Co., Windsor, Ont.  
Sheldon & Sheldon, Galt, Ont.

**Steam Valves**

American Steam Pump Co., Battle Creek, Mich.  
Babeock & Wilcox, Limited, Montreal.  
Darling Bros., Montreal.  
Kerr Engine Co., Walkerville, Ont.  
Petrie, H. W., Toronto.  
Williams, A. R., Machinery Co., Toronto.

**Steel and Composite Ships**

Bertram Engine Works Co., Toronto.

**Steel Plants**

Morgan Construction Co., Worcester, Mass.

**Steel Rails**

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

**Steel Shafting**

Darling Bros., Montreal.  
Goldie & McCulloch Co., Galt, Ont.  
Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
Leslie, A. C. & Co., Montreal.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Nova Scotia Steel & Coal Co., New Glasgow, N.S.  
Pittsburgh Shafting Co., Detroit, Mich.  
Wilson, J. C. & Co., Glenora, Ont.

**Stocks and Dies**

Armstrong Mfg. Co., Bridgeport, Conn.  
Butterfield & Co., Rock Island, Que.  
Petrie, H. W., Toronto.  
Rice Lewis & Son, Toronto.  
Worth & Martin, Toronto.

**Stoppers.**

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

**Structural Steel.**

Abbott, William, Montreal.  
Bourne-Fuller Co., Cleveland, Ohio.  
Canada Foundry Co., Toronto.  
Cooper, Estate late James, Montreal.

**Suspension Furnaces**

Continental Iron Works Co., New York City.

**Tanks (Oil and Water)**

Canada Foundry Co., Toronto.  
Corbett, R. B., Brooklyn, N.Y.  
Goldie & McCulloch Co., Galt, Ont.  
Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Ontario Wind Engine & Pump Co., Toronto.  
Petroleum Iron Works Co., Washington, Pa.

**Taps and Dies**

Butterfield & Co., Rock Island, Que.  
Cleveland Twist Drill Co., Cleveland, Ohio.  
Globe Machine & Stamping Co., Cleveland, Ohio.  
Hamilton Stamp & Stencil Works, Hamilton, Ont.

**Tees**

Bourne-Fuller Co., Cleveland, Ohio.  
Canada Foundry Co., Toronto.

**Textile Manufacturers**

Canadian Colored Cotton Mills Co., Montreal.  
Dominion Oil Cloth Co., Montreal.  
Hamilton Cotton Co., Hamilton, Ont.  
Morrice, D., Sons & Co., Montreal.  
Smith Mfg. Co., Toronto.  
Storey, W. H. & Sons, Acton, Ont.

**Textile Supplies**

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

**Thermometers (Recording)**

Bristol Co., Waterbury, Conn.

**Tin**

Leslie, A. C. & Co., Montreal.  
Syracuse Smelting Works, Montreal.

**Tool Steel**

Abbott, William, Montreal.  
Bourne-Fuller Co., Cleveland, Ohio.  
Cooper, Estate late James, Montreal.  
Leslie, A. C. & Co., Montreal.

**Trucks**

Cooper, Estate late James, Montreal.  
Corbett, R. B., Brooklyn, N.Y.  
Morgan Construction Co., Worcester, Mass.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Sheldon & Sheldon, Galt, Ont.

**Trucks (Railway)**

Canada Foundry Co., Toronto.

**Trucks (Wiro Mill Supplies)**

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

**Tubs (Cleaning and Coating Wiro)**

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

**Tugs**

Bertram Engine Works Co., Toronto.

**Tumbling Barrels**

Globe Machine & Stamping Co., Cleveland, Ohio.

**Turbines**

Canada Foundry Co., Toronto.  
Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
Wilson, J. C. & Co., Glenora, Ont.

**Typewriters and Supplies**

United Typewriter Co., Toronto

**Valves**

American Steam Pump Co., Battle Creek, Mich.  
Babeock & Wilcox, Limited, Montreal.  
Canada Foundry Co., Toronto.  
Hamilton Brass Mfg. Co., Hamilton, Ont.  
Kerr Engine Co., Walkerville, Ont.  
Petrie, H. W., Toronto.  
Williams, A. R., Machinery Co., Toronto.

**Valves (Rubber)**

Chicago Pneumatic Tool Co., Chicago, Ill.  
Gutta Percha & Rubber Mfg. Co., Toronto.

**Varnishes**

Berry Bros., Walkerville, Ont.

**Ventilators**

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

**Wagon and Carriage Wood Work**

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

**Washers or Hollinders (Cleaning Rubber)**

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

**Water Purifying Chemicals**

Lord, Geo. W. Co., Philadelphia, Pa.  
Sleeth, D., Montreal.

**Weaving Machinery**

Karch, H. W., Hespeler, Ont.

**Windmills**

Ontario Wind Engine & Pump Co., Toronto.

**Wiro Mill Supplies**

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

**Wiro and Wiro Rope**

Dominion Wiro Rope Co., Montreal.  
Greening, B. Wiro Co., Hamilton, Ont.  
Leslie, A. C. & Co., Montreal.  
Phillips, Eugene F., Electrical Works, Montreal.  
Pittsburgh Shafting Co., Detroit, Mich.  
Wiro & Cable Co., Montreal.

**Wiro Rope Fittings**

Dominion Wiro Rope Co., Montreal.

**Wiro Cloth**

Greening, B. Wiro Co., Hamilton, Ont.

**Wiro Drawing Machinery**

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

**Wiro Fencing and Notting**

Page Wiro Fence Co., Walkerville, Ont.

**Wiro Rod Rails**

Morgan Construction Co., Worcester, Mass.

**Wiro Specialties**

Meadows, Geo. B. Wiro, Iron & Brass Works Co., Toronto.  
Page Wiro Fence Co., Walkerville, Ont.  
Stanyon Metallic Furniture Co., Toronto.

**Wiro Testing Machinery**

Morgan Construction Co., Worcester, Mass.

**Wood-Working Machinery**

Advance Machinery Co., Toledo, Ohio.  
Cowan & Co., Galt, Ont.  
Cowdroy, C. H., Machine Works, Fitchburg, Mass.  
Goldie & McCulloch Co., Galt, Ont.  
Karch, H. W., Hespeler, Ont.  
London Machine Tool Co., London, Ont.  
Petrie, H. W., Toronto.  
Sheldon & Sheldon, Galt, Ont.  
Stetoe, John Shaper Co., Cincinnati, Ohio.  
Williams, A. R., Machinery Co., Toronto.

**Yachts**

Bertram Engine Works Co., Toronto.

**Zinc**

Leslie, A. C. & Co., Montreal.  
Syracuse Smelting Works, Montreal.

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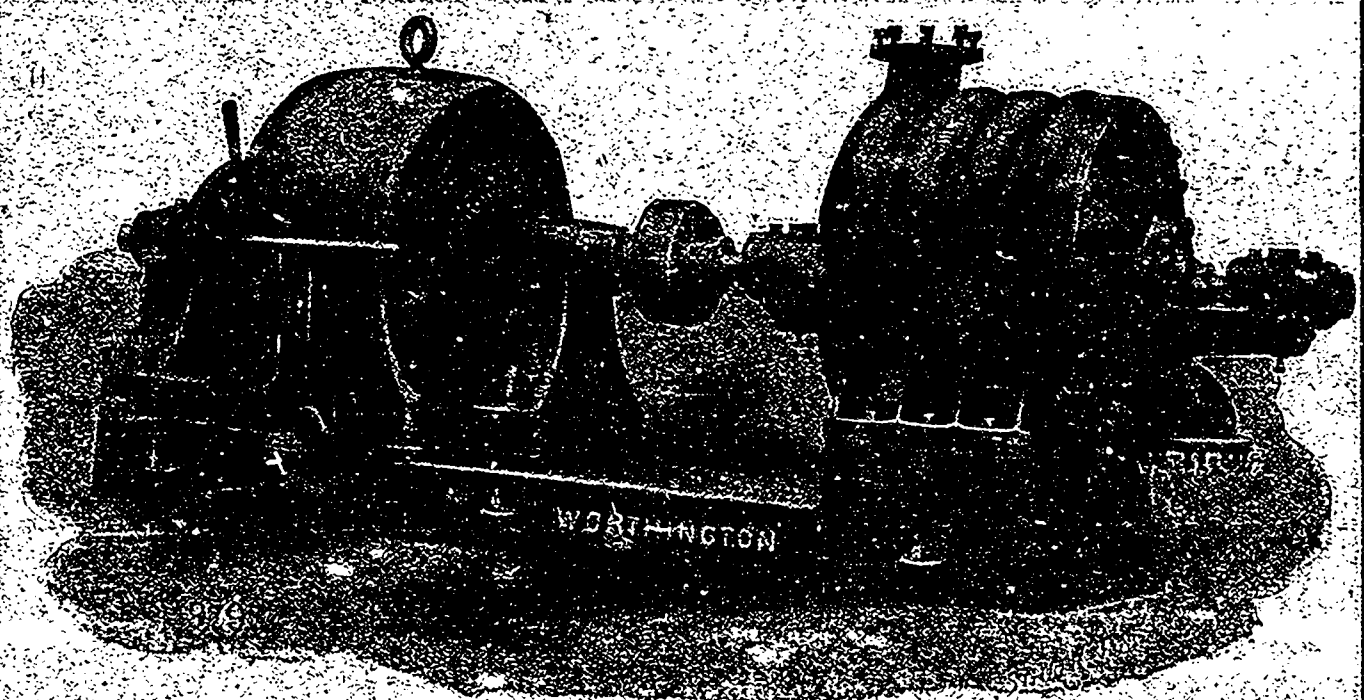
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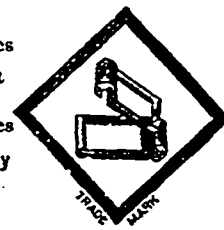
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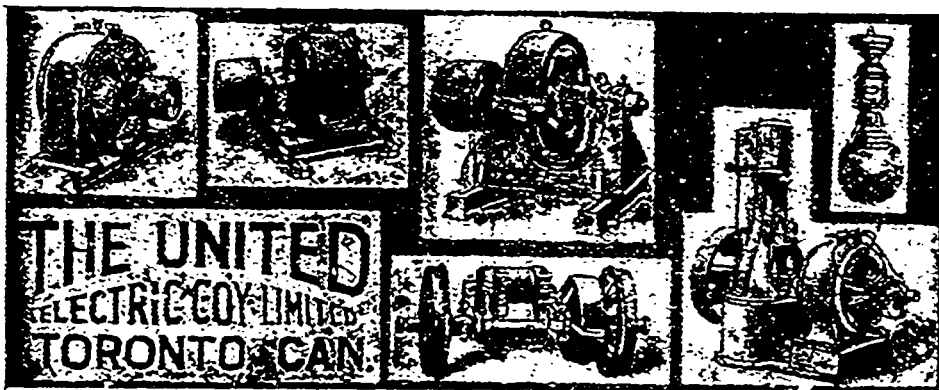
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