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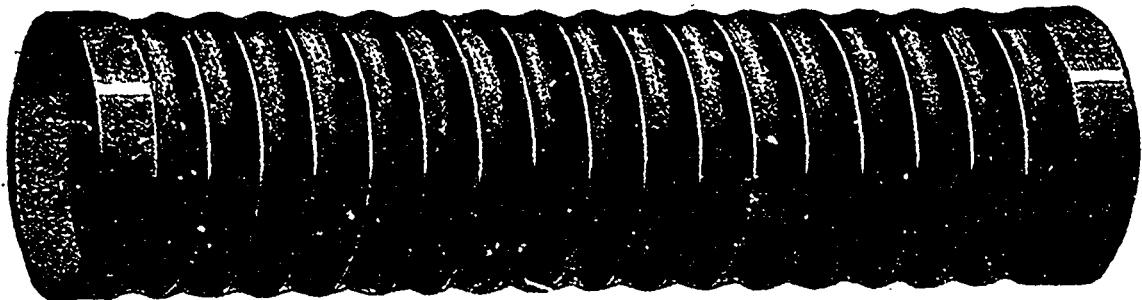
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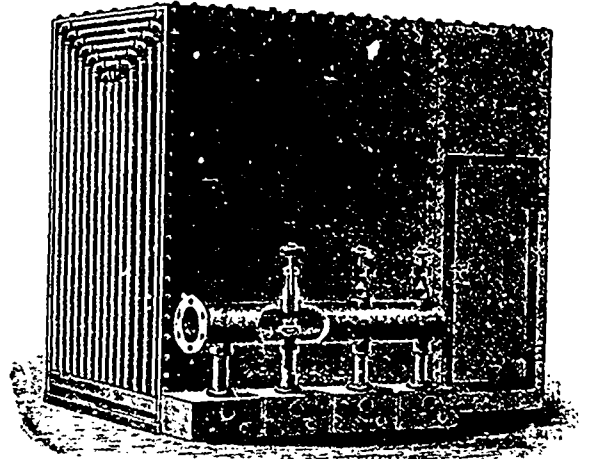
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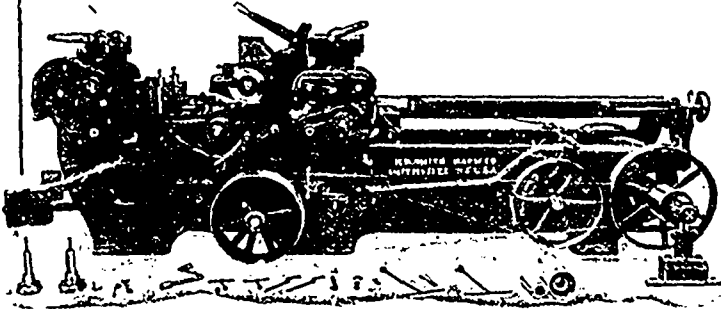
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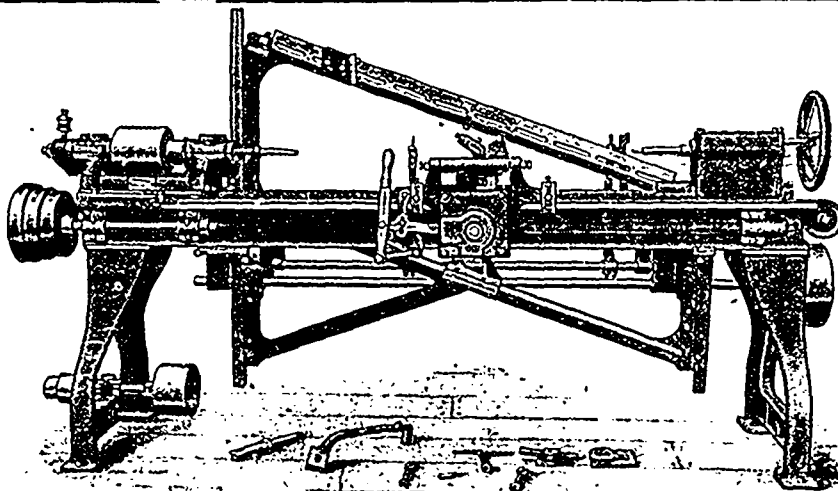
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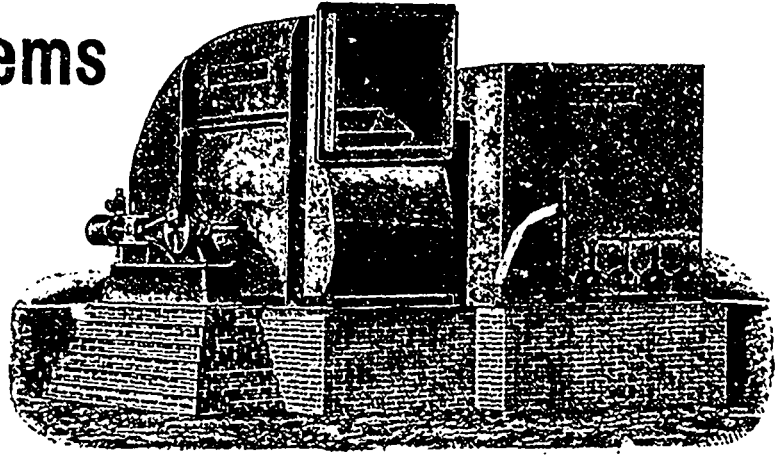
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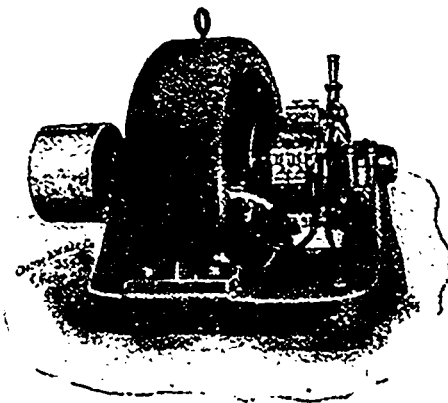
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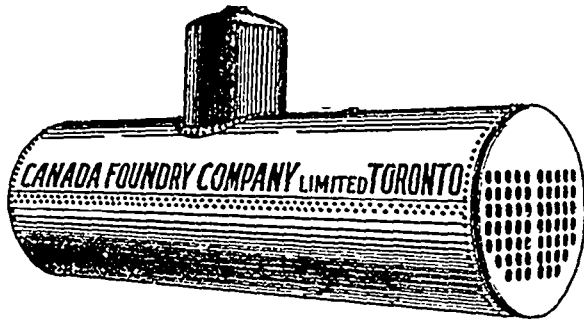
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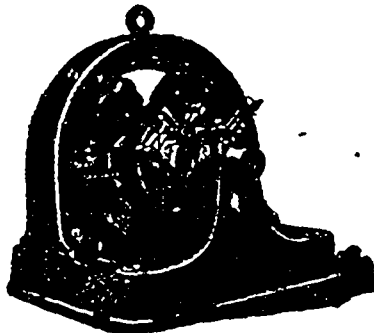
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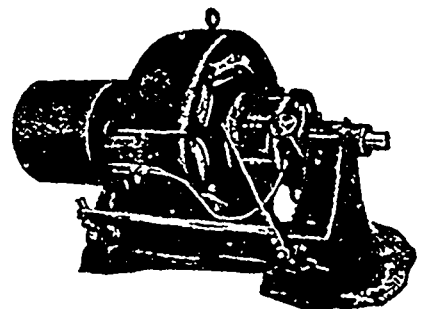
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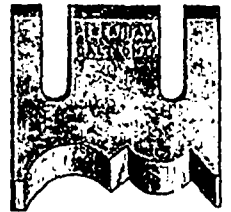
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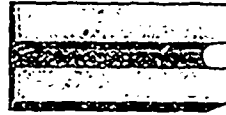
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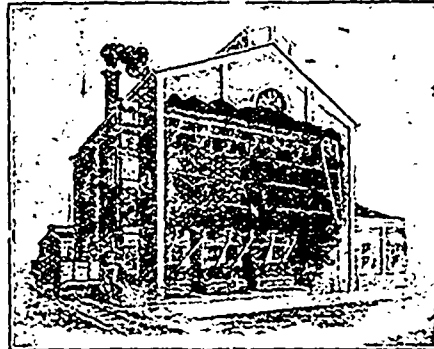
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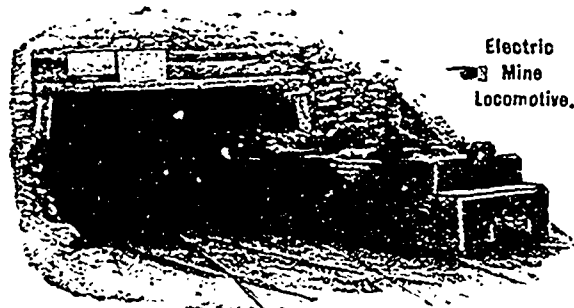


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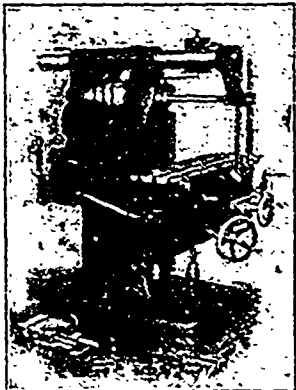


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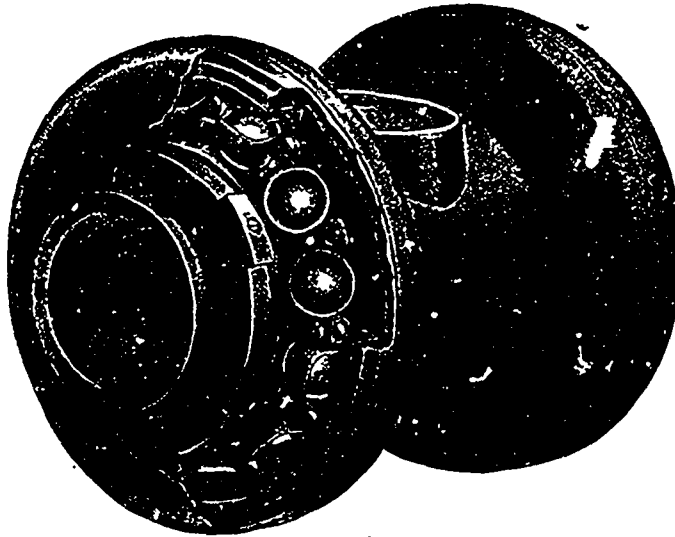
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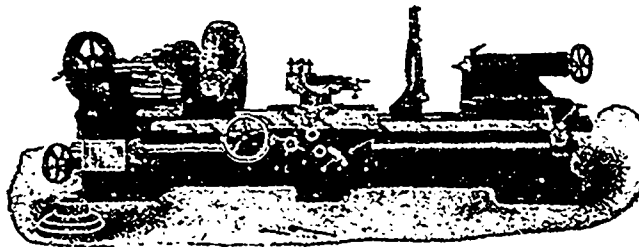
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McKinnon Building, Cor. Malinda and Jordan Sts., Toronto.

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Canada and United States \$1.50 per year. All other Countries in Postal Union ten shillings sterling, including postage.

J. J. CASSIDY, Editor and Manager

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## A WORD TO OUR READERS!

The line at the bottom of our advertising pages requests you when writing to Advertisers, to mention The Canadian Manufacturer. Compliance with the request costs nothing, but would mean a great deal to us. As the manufacturer usually grades the salary of his salesman according to the value of the orders he turns in, so the advertiser values space according to inquiries received. The only way for this journal to receive full credit for sales influenced is for our readers, when writing to advertisers, to kindly mention The Canadian Manufacturer.

### RECIPROCITY OR TARIFF REVISION.

The Iron Age, an influential trade journal ever alert to the interests of American manufacturers, sizing up the situation in that country, foreseeing the great improbability of Canada being drawn into even the consideration of any proposition looking to a reciprocity treaty, and quoting the action of the executive committee of the National Machine Tool Builders' Association, which recently decided to take definite steps "to help in the passage of any measures providing for a revision or modification of the tariff, which may eventually lead to better trade conditions between the United States and foreign countries, especially France, Russia and Canada, which have tariffs prejudicial to the importation of American machine tools," says that agitation in form of reciprocity is being vigorously conducted in New England—that the Governor of Massachusetts is an earnest supporter of the movement which has given much encouragement to those who are working for this method of extending foreign markets, and the organizations which have been formed for the purpose are applying themselves strenuously to the task of securing further influential co-operation throughout the country. The undertaking, our contemporary thinks, would be almost hopeless in view of the setback which reciprocity has experienced. It had its day during President McKinley's administration, at which time the sentiment was so strong in support of commercial treaties that the Dingley tariff was framed for the special purpose of enabling them to be effected. Numerous duties having been avowedly made higher than needed so that imposing but innocuous concessions might be granted in exchange for reductions in rates tendered by other countries; and provisions were enacted to enable such conventions to be made effective without further special legislation. These provisions have not been changed, and therefore in all respects the conditions are as favorable now as they were then. But unquestionably the sentiment of the country at large has relaxed. The provisions of the Dingley act were not sufficiently attractive to secure the needed support and approval of the United States Senate, and so all of the treaties that had up to that point been negotiated, fell to the ground. Other nations proved to be as wary as the United States in looking after their commercial interests, and the concessions they offered were not satisfactory.

At the time these futile efforts at reciprocity were being

made, says the Iron Age, the pressure for such action was strong. A combination of influences operated very actively in its favor. All Europe had taken alarm at the deluge of American merchandise pouring into the markets of the world, and comprising not merely agricultural products, but all kinds of manufactured wares. A great deal was heard of the probability of concerted action by European Governments to check the invasion of their home markets. Russia seemed to be starting the movement when the Government of that country suddenly placed a practically prohibitory duty on American machinery in retaliation for an advance in the duty on Russian sugar. The fear of further action of this kind stimulated the growth of reciprocity sentiment. Possibly if at that time it had been found that the American export trade as a whole was diminishing and that some action seemed necessary to avert a greater decline, the objections to the treaties as negotiated would have been swept aside and they would have been ratified. But European expressions of dissatisfaction gradually became less intense, fading into practical nothingness when the United States in 1902 suddenly developed such an amazing appetite for iron and steel as to devour its entire home product and eagerly seek more from every country capable of contributing to its relief. That was such a revelation of commercial possibilities, despite tariffs and the formation of colossal manufacturing corporations, that the world forgot its fears of America. The passing of European threats of hostile legislation lessened the pressure on the American Government to negotiate treaties. Meanwhile, also, American exports of highly finished products have kept increasing, instead of diminishing, so that the past four years have proved to be the best in this respect in the history of the country. In fact, in some recent months the value of manufactures exported has surpassed the value of agricultural exports.

Despite this apparently satisfactory development in foreign trade, it must be admitted that some uneasiness is felt as to the future. The Canadian market, which has long been of high importance for many American manufacturing interests, and has steadily taken increasing quantities of their products, may not continue to do so. Partly to favor their own manufacturers, and partly to cultivate closer commercial relations with Great Britain, the Canadians are placing such restrictions on American trade with them that it may be expected to find exports to Canada diminishing. The New England recipro-

city movement is largely directed toward the establishment of such relations with Canada that the Canadian market may not be lost. The purpose is commendable, but it is to be feared that even if the moribund interest in reciprocity treaties should be revived on the American side of the border it will be difficult if not impossible to prevail upon Canada to reopen negotiations to that end. Conditions have greatly changed since the failure of the last attempt by Canada to establish such relations. Canadian manufacturing interests have grown in both number and importance, and the country is every year becoming more self-reliant. When the fact comes to be fully realized that no assistance to the promotion of export interests is to be expected through reciprocity treaties with Canada or any other country, the demand for a revision of the tariff on a lower level of duties will become even more insistent. The advocates of reciprocity treaties are usually but moderate protectionists or are outspoken in favor of revenue tariffs. The New England movement couples the necessity for cheaper raw materials with the desirability of wider foreign markets. It can therefore easily divert itself to supporting a demand for lower duties if nothing can be accomplished in the direction of reciprocity.

#### FIAT JUSTITIA RUAT CÆLUM.

One of the most remarkable features of the day regarding the bad business methods and even lack of honesty prevailing in some Canadian manufacturing industries is the frequency with which publication is made of lapses from the perpendicularity which should always be a distinguishing feature of all commercial transactions. It is not infrequent that we notice cabled reports from abroad telling of questionable methods and sharp practices indulged in by Canadian concerns who are of that "get rich quick" class who ignore the fact that in all transactions, "honesty is the best policy." This feature is also noticeable in the reports made by Canadian commercial agents in different parts of the world, which are published weekly by the Dominion Department of Trade and Commerce, in which sharp criticisms are passed upon the unbusiness-like methods observed by some Canadian manufacturers in their endeavors to exploit their products in foreign markets; and the same thing crops up time and again in our legislative assemblies, when even the Government feels compelled to resort to repressive measures to prevent, if possible, the marketing both at home and abroad, of adulterated goods, sometimes of vile and harmful character. Under date of February 23, a Canadian Associated Press Despatch, from Liverpool, England, said:

A partner of a Liverpool firm, one of the largest dealers in Canadian manufactured goods, speaking to the Canadian Associated Press, said: "The cables you have just shown me about complaints in this country regarding Canadian manufacturers are absolutely correct. I can give you chapter and verse of a dozen cases where I have had experience of too sharp practices by Canadian manufacturers. Even to-day my partner is leaving for New York with the object of arranging for the manufacture of some goods there which we have been getting from Canada, but which Canadian manufacturers, though they have not filled even half of our large order, have refused to supply us, as they are trying to sell their own goods direct to the retailer. A Canadian firm, manufacturing show cases, sent their representative to us, and we gave a large order, believing his representations that the show case was patented, but it proved not to be, so that we lost heavily, as the goods were manufactured here. I could cite many more cases where Canadian manufacturers have not acted fairly. Not only do they not send goods according to sample, but, on seeing that business can be done in another way, they fail to fill an order, endeavoring to secure the trade direct."

Upon the date above indicated, in the Dominion House of Commons, some disquieting statements respecting the adulteration of food were made by Hon. L. P. Brodeur, Minister of Inland Revenue, in which he said it had been found that large quantities of imitation maple sugar were being manufactured in Montreal. He intended to introduce a very aggressive policy to prevent this. The inspectors of foods had found that Canadian jams and jellies were generally pretty pure, but that the spices varied greatly, some of them being simply horrible. One of the methods used for preventing this was the issue of regular bulletins containing lists of violations detected. The Minister announced an aggressive policy to drive out adulterated foods, and the keenness of the debate showed that the members are alive to the importance of this subject. Mr. Brodeur stated that some things sold as jams in Canada were really not composed of strawberries or raspberries and sugar, but of glucose, aniline dye, salicylic acid and hayseed, along with some fruit pulp.

Another of the most remarkable features of this situation—a condition that so vitally affects the honor and integrity of the whole country, and particularly of Canadian manufacturers as a class, is that no systematic efforts are being made to expose and denounce the unbusiness-like, and in some instances the disreputable methods of some of them. It goes without challenge that as a class Canadian manufacturers conduct their operations on a high moral and business plane, always observing the requirements of honor and integrity, and it is to be regretted that they should be so fearfully handicapped, as they undoubtedly are, by such objectionable methods as those here alluded to. There are many branches of Canadian manufacturing industries organized into their respective guilds, which, for their own protection and good name, should always be on the alert to suppress and expose those who indulge in unbusiness-like methods. Some of these guilds have so-called "organs" which should voice their sentiments; and there is a larger and more pretentious association, also with an organ, which has, thus far, declined to observe that a situation obtains which should have immediate attention.

#### THE "DUMPING" CLAUSE.

Lord Strathcona has issued in London a minute by the Canadian minister of customs dealing with points raised by the Liverpool and other Chambers of Commerce in Great Britain concerning the Customs Regulations which came into force on October 1 last. The minute deals specifically with the Liverpool resolutions, a brief summary of which is given, as they cover most of the questions raised. The resolutions had reference to: (1) The new forms of invoices prescribed; (2) the difficulty of fixing the fair market value for invoices in cases where goods are manufactured solely for export; (3) the "special" duty provided for under the new regulations; (4) the application of the "special" duty in cases where fluctuations in value occur between date of purchase and date of shipment; (5) the bearing of the new regulations in the case of goods on which duty has been paid in the United Kingdom; (6) the possibility of avoiding the "special" duty by invoicing sales as consignments; and (7) the clause in the certificate on invoices that no consideration is to be paid to anyone acting on behalf of the exporter, who is not mentioned on the invoice.

The Minister specially invites attention to the fact that under the authority of an order-in-council, a ruling has recently been given in respect of this special duty legislation, which, in his judgment, removes the strongest objection

taken in the resolution of the Liverpool Chamber of Commerce. This ruling or decision provides that the amount of any advance in the market value of goods, which may take place between the time of their purchase abroad by the importer and the date of the exportation of the goods to Canada, shall not be subject to special duty. The regulations in respect of invoices and the certification thereof to which objection has been taken in the resolution now under consideration, are, in the opinion of the Minister, necessary to ensure proper administration of the existing tariff and other Customs laws of the Dominion. He is convinced from his knowledge of the matter that, in practice, it will be found that not only will the regulations result in better and more uniform Customs administration, but they will promote the best interests of the British trader. As regards all dutiable importations into Canada, two salient points of equal importance and significance had to be determined at the Customs: (1) The actual selling price of the goods to the importer in Canada, and (2) the fair market value thereof prevailing for home consumption in the country of export at the time the goods were shipped to Canada. It will be apparent that the exporter is much better able than the importer, and indeed, is in the best possible position, to supply information as to the market value for home consumption in the country of export.

No objection is taken in the resolution of the Liverpool Chamber of Commerce to the preferential tariff or German surtax certificates, and he believes it is no doubt recognized by British merchants and manufacturers that such certificates are necessary, and further, that they are in the interests of British trade. It is highly important that the benefits of the British preferential tariff should be confined to British countries, and it is also of importance that the law in respect of the surtax on German goods should be given effect to. The certificates are designed to accomplish both these objects. The mode of invoicing and certification referred to is justified by the nature of the Customs law and also by the circumstances, and it is further submitted that the particulars to be certified to are such as should be within the knowledge of every exporter, except in case where the goods exported are not sold for home consumption. Canada, not having any consular system, has been obliged to adopt the regulations in question. Usually the value for duty can fairly be determined by ascertaining the total cost to produce the goods in condition ready for the market, including all expenses, and adding thereto the usual ratio of profit made on home consumption sales of similar lines of goods. This basis should be followed by exporters in arriving at the estimate of value to be stated by them on their invoices. In the regulations careful precaution is taken to guard against the evasion of special duty by unscrupulous dealers invoicing their sales as consignments. If the practice of selling goods for export at specially low prices be confined only to highly-protected countries, and if it be true, as claimed, that British merchants do not, as a rule, sell abroad for less than they do at home, it is obvious that the proper administration of the special duty legislation in question, which will be rendered practicable under the operation of the regulations, will be of advantage to British merchants who compete in the Canadian market with merchants and manufacturers of highly-protected countries.

According to the Birmingham, England Gazette, 45 manufacturers of that city have decided to resist the demands for payment for advertising placed with a certain Montreal trade paper. They allege that the contracts were obtained through misrepresentation.

#### GOODS EXEMPTED FROM SPECIAL DUTY.

The Dominion Department of Customs has issued a list of articles exempt from the special or "antidumping" duty, on which decisions of the Department have been requested. It reads as follows:

Boiler plate, flange plate, and fire-box plate, for use only in the manufacture of boilers, (conditional on the following declaration being subscribed and attested to by the importer on the face of the entry: "The plates above described are boiler plates, flange plate, or fire-box plates, as the case may be, which have been imported in good faith as such, and will be used only in the manufacture of boilers"); universal milled rolled-edge bridge plates, when imported by manufacturers of bridges (conditional on declaration being subscribed and attested to accordingly by the importer on the face of the entry); rolled-edge plate not less than one-half inch thick and over 15 feet long when imported, and to be used only for tires of traction engines (conditional on declaration being subscribed and attested to accordingly by the importer on the face of the entry); flat galvanized sheet iron; guns and rifles, not military; twist drills; cabinet locks; padlocks; steel beams, tees, girders for structural purposes, when not punched, drilled, or in any further stage of manufacture than as rolled; pens and pencils; double tape fuses; dictionaries, English; bicarbonate of soda; rubber brushes; spread plasters; spitting cup and refiller; vapo-cresoline; peroxide of hydrogen; hydrozone; school writing slates.

Customs rulings regarding articles subject to special duty on which decisions of the Department have been requested embrace the following: Air-brake equipment, air pumps; boilers; cranes (electric traveling), cranes (hand power), cranes (water), castings (heavy machinery, columns); diggers (beaver post hole); fences (hammered iron); grilles (door, bank, etc.); hydrants (for fire purposes); injectors (easy); locomotives; momentum brake; nuts (cold pressed); pumping machinery, pipe (water, gas, and heavy flanged); screws (set, cap, etc.); structural work (including bridges); trucks (street railway, Cartis type specials, such as tees, ells, etc.); trucks (railway freight); valves; water towers; insulated wires and cables, incandescent and arc lamp sockets, receptacles, cut-outs, plugs, rosettes, and wiring accessories, cross arms, switches, porcelain insulators, and cleats, lightning arrestors, electric meters, transformers, dynamos, and generators, motors, switch boards; wrought-iron pipe, 3 inches and under; stationary boilers and steam engines; meat choppers, wire rods; saws; steel billets; hoop iron and steel, 16-gauge and thicker; steel rails; horseshoes, horseshoe nails; steel plate, 50 and less in width, three-fourths and less in thickness, but not thinner than No. 12 gauge; railway fish plates; glazier points; steel angles up to 5 by 5; writing ink, typewriter ribbons, carbon paper; carpets; cartridges and ammunition; mucilage; dynamite; electric fuse for blasting purposes; pails and tubs; patent medicine, nonalcoholic; photographic dry plates; soap of all kinds; powder detonators; confectionery of all kinds; baking powder; postum cereal, grape nuts, shredded wheat biscuit, and other breakfast foods; almond paste; gun wads; sen-sen; plumber's earthenware; stove polish; grass mats; linoleum and oilcloth; linseed oil; paper; glass bottles; bou ami scouring soap; card games (such as playing cards, etc.); games (such as parchesi, halma, soldier boy, etc., made of strawboard and cardboard); antiseptic gauze, hermetically sealed tube dressings, absorbent cotton, absorbent lint, antiseptic jute, antiseptic oakum, antiseptic sponges, antiseptic zimocca sponges, antiseptic abdominal sponges, Ashton's abdominal absorbent pads, Ashton's laparotomy set, antiseptic

absorbent cotton mops, ligatures and sutures, surgeon's twisted silk, surgeons' braided silk, pure white braided silk, "cable twist," surgeons' silk, Lawson Taite's silk, raw twisted surgeons' silk, plaster of Paris bandages, double or tubular stockinette, gray open woven bandages, unbleached roller bandages, washed and ironed roller bandages, antiseptic gauze absorbing bandages, medicated gauze bandages, heavy crinolin bandages, flannel bandages, rubber bandages, Esmarch's triangular bandages, first aid packets; elastic hosiery, belts, and supporters, elastic stockings; trusses; Tom Thumb jujubes, Sa Yo mint jujubes; indelible ink; licorice pastilles; iodide of potassium; flat iron and steel bars, all sizes up to and including 10 inches in width, and up to 1½ inches in thickness; round steel up to 5 inches in diameter; polished shafting up to 5 inches in diameter; square bars up to 12 inches square; car axles, steel sections, such as plows, beams, channel steel, binder bars, tee bars, cutter bars, small channels, rake teeth, concave and convex sleigh-shoe steel, drill-hoe points, bevel-edge bars, rifle bars, tie plate, special fish plate, angle bars, half rounds, half ovals, toe calk sections, half-round shaft steel, channel sleigh-shoe steel, spring steel, sleigh-shoe steel, tire steel, machine steel, harrow-tooth steel, polished shafting, forging, all kinds of shape work, iron or steel washers; lead pipe wire, all kinds, sizes, and gauges, bale ties, wire nails, sash pins, escutcheon pins, spikes, wrought and wire, all kinds and sizes; bolts, all kinds and sizes; coach screws, lag screws, nuts, washers, rivets, all kinds and sizes; picture-frame points, felloe plates, tacks, all kinds and sizes, including nails, rivets for shoemakers' use; staples, all kinds and sizes; tufting buttons; white lead (ground in oil), putty; shot, all kinds and sizes; refined sugar imported after November 23, 1904 (except sugar refined in a British country granted tariff preference by Canada).

A recent decision of the board of appraisers points out that it is provided in section 67 of the customs act that charges for packing, or for straw, twine, cord, paper, cording, wiring, or cutting, or for any expense incurred or said to have been incurred in the preparation and packing of goods for shipment, shall be included as part of the value for duty. In order that duty may be uniformly assessed on the charges for packing and straw on chinaware, crockery, earthenware and glassware imported from Europe, it has been declared that one-fourth of the invoice charge for the "packages and straw" or for the "packages" (when no charge appears for the "straw" and "packing") shall form part of the value for duty of chinaware, crockery, earthenware, and glassware so imported. Officers of customs are instructed to make their appraisements accordingly.

#### SOUTH AFRICAN TRADE.

Canada at last seems to have secured a firm grip of the South African market, in spite of inadequate trading methods and a certain lack of enterprise on the part of its manufacturers. Less than a dozen years ago, says a London contemporary, £5,000 would have amply covered the annual value of Dominion commercial transactions with South Africa; now the amount is over £500,000, or more than a hundredfold increase. It was during the war, and, in fact, in consequence of it, that the present trade expansion originated. Beginning with War Office orders for the British troops at the front, it received further stimulus from the glowing reports as to possible outlets for Canadian produce and manufactures in South Africa received from the enterprising sons of the Dominion who volunteered for service under the British flag. During the war the exports from

Canada were almost wholly on war account, no figures for which are available; but immediately on the conclusion of hostilities the general trade leaped forward to a remarkable extent, the volume for 1903 being actually more than seven times that of 1902. The following are Canada's exports of goods (absolutely exclusive of military stores) from 1894 to the end of last year, as given by the South African Customs Departments:

Year.	Value.	Year.	Value.	Year.	Value.
1894.....	£1,300	1898.....	£3,691	1902.....	£61,577
1895.....	4,503	1899.....	13,674	1903.....	462,817
1896.....	14,012	1900.....	5,292	1904.....	556,000
1897.....	11,447	1901.....	5,510		(approx.)

It is, of course, natural that the larger proportion of the Canadian shipments should be foodstuffs; as a matter of fact, 56.5 per cent. of the total exports to South Africa came under this category in 1904. The largest item in the whole list is flour, shipped to close on £180,000, showing a good increase on the amount for the previous year, and hopes are strong that the trade will assume very much larger dimensions still, in spite of the big surplus available from Australia. There were increases also in wheat and other cereals; a really considerable advance in hams and pork; and a noteworthy improvement in condensed milk. An important item, which we have included under "meat," is poultry, shipped to the extent of over £2,000, and comprising fowls, geese, ducks, and turkeys, this line, however, finding considerable competition from Australia. Other items which do not appear in the table but deserve mention, are apples and canned salmon, in both of which considerable headway is being made.

About 20 per cent. of the entire trade is in respect of timber and wooden manufacturers, deals and planks being the principal items, and each showing enormous increase. The inclusion of match blocks shows the dependence of South Africa on Canadian produce for one of its principal industrial ventures. Formerly all this timber trade came via New York, but the direct line of steamers, inaugurated some time since, has already been successful in winning back a considerable portion of the consignments, which can be put on board at Montreal cheaper than at New York, although the freight rates are about the same. One boat alone recently took out to South Africa as many as 30,000 deals. A large share of the Canadian timber shipments is for Johannesburg.

The metal manufactures shipped from Canada to South Africa are, up to the present, of no considerable volume, representing no more than 5 per cent. of the total. They may be taken, however, as the nucleus of a more expanded trade in the near future, and, as such, are not without their importance. Machinery, it will be noted, has doubled the figures for the former year. In other lines there are good increases, viz., in carriages and cycles, and textile goods. The decline in oats and hay may be ascribed to the withdrawal of British troops from South Africa. Altogether, the figures are sufficient to show that Canadian trade with the sub-Continent is now on a firmer basis, and, with enterprise and prudent cultivation on the part of Canadians themselves, should develop into one of the most important links in the great Imperial commercial chain that is rapidly being forged.

#### EDITORIAL NOTES.

The instructions to the Canadian section of the International Commission to investigate and report upon the conditions and uses of the waters adjacent to the boundary line between the United States and Canada have been framed by the Dominion Government. Among the subjects that may

come up for consideration before this commission are the following:

The proposed diversion southward by the Minnesota Canal & Power Co. of Duluth, of certain waters in the State of Minnesota that now flow north into the Rainy River and the Lake of the Woods.

The diversion about a mile and a half east of the town of Sault Ste. Marie of part of the waters of the St. Mary River into the Hay Canal entirely through American territory. The river St. Mary now forms part of the boundary between the United States and Canada, and the waters of the river are clearly international. The Canadian vessels of necessity are using the Hay Canal, but no treaty has been made confirming their right.

Enquiry into the effect on the levels of Lakes Huron and Erie by the construction of the Chicago Canal.

The building of a dam and other obstructions on the St. John River, flowing through the State of Maine into New Brunswick, contrary to the express stipulation of the Ashburton treaty.

The London *Economist*, in an article entitled "Chamberlain's Inaccuracies," says: "Mr. Chamberlain's contention that the total value of Canadian imports from this country having risen during the period from June, 1897, to 1904 from \$24,000,000 to \$48,000,000, was due to the operation of the preferential tariff will not bear a moment's examination. If the tariff operated as Mr. Chamberlain asserts, the figures would show that our share of Canada's import trade had grown at the expense of our foreign rivals. The very opposite is the fact. Between June, 1897, and June, 1903, the value of Canadian imports rose by fully \$5,000,000, but in the same period the Canadian imports from the States rose \$13,000,000, and whereas the proportion which imports from this country bore towards the total imports of Canada fell from 26.4 per cent. in 1896-97, to 25.2 per cent. in 1902-3, the proportion of imports from the United States to the total increased from 55.4 per cent. to 58.9 per cent. It is possible that without the preferential tariff our proportion might have declined to an even greater extent, but the figures prove decisively the falsity of the idea that the preference has given us a preponderance in Canadian markets, so that Mr. Chamberlain's calculations of the employment given the people here are altogether beside the mark."

The crusade of the Manufacturers' Association against American silver in Canada is not likely to be any more effective than some previous ones were. The only way to succeed is to induce Canadians to refuse the foreign coins, and this they will not do.—*Toronto Globe*.

Why does *The Globe* object to the crusade against the circulation of American silver coin in Canada, or any other crusade in which the Association takes interest? They afford some sort of occupation to the embryotic statesmen of the Association and a large amount of amusement to the public.

A parcels-post treaty between the United States and Great Britain has been signed by President Roosevelt, Secretary of State Hay and Postmaster-General Wynne. It will take effect April 1.

The maximum weight allowed is four pounds six ounces. The rate fixed is 12 cents a pound, or fraction of a pound, in the United States, and two shillings per parcel in England.

Packages are limited in value to \$50. The sea post service between the United States and England is also to be improved. At present two of the steamship lines have set aside rooms on their vessels in which American postal clerks assort and distribute the mails for the United States on the west-bound trips, the expense for this one-way service being borne by the United States Government. The same service is not performed on the east-bound trips because the English Government until now has declined to enter into the arrangement despite the facilitation of their mails that would result. That Government has finally agreed that if the steamship lines give it the same terms it will provide the same service of distribution of mails for British points on the east-bound trips as American clerks now perform for American-bound mail on the west-bound trips.

The new machine which is said to be capable of turning out 10,000,000 matches a day, requiring the employment of but three or four operatives to run it at that pace, is another reminder of the way labor saving machinery is getting in its lively work in these modern days. Time was when there was apprehension lest labor might suffer on this account, but there is no longer any particular anxiety on that score. The consumption of matches grows quite as fast as the improved methods of turning them out. And it is so with about all the products of labor saving machinery.

Concrete examples of the abuse of the franking system furnished a basis for a warm discussion in the House of Commons this week. An interesting development of the debate was the fact that large quantities of literature had been sent out last year by the Canadian Manufacturers' Association with the frank of Mr. George Taylor, the Conservative Whip. Mr. Taylor tried to justify this by saying that the literature was an appeal for support for national industries.

The Georgian Bay Canal survey has been completed past the village of Bryson, Que. A snow plough is run across the river at intervals of about 50 feet to remove the snow down to the ice. Along this track holes are made through the ice at intervals of 25 feet and the depth of water measured. If over twenty feet of water is found nothing further is required, as that is the proposed depth of the waterway. If less than twenty feet of water is found borings are made to the depth of twenty feet, or until rock is struck, to ascertain the character of the bottom. A record of all soundings and borings is kept, and thus the entire bed of the stream is mapped in sections of 50x25 feet.

In the House of Commons a few days ago, Hon. Mr. Fitzpatrick's bill respecting contracts for Government works was put through the committee stages. The measure varies somewhat the practice in regard to the placing of contracts for Government works in that it requires all contracts for works which cost over \$5,000 to be awarded by the Governor-in-Council. Under the old system the Minister in charge of the department awarded the contract without consultation with his colleagues, who will in the future share the responsibility. The construction of works in cases of emergency or those costing less than \$5,000, without calling for tenders by day labor, is also given legislative sanction by the bill.



## The Supply of Water for Steam Boilers and the Prevention of Boiler Scale.

A PAPER READ BEFORE THE SOCIETY OF CHEMICAL INDUSTRY,  
TORONTO, BY PROF. JAMES H. BOWMAN, CHEMIST, OF THE  
CANADA CHEMICAL MANUFACTURING CO.

The steam boiler is an agency for the conversion of heat into power. It had its beginning probably in the tea-kettle episode, credited to Watt. From this small seed have grown the giants of stupendous force that have revolutionized the commercial world.

Throughout its whole course, the history of the steam boiler has been marked by constant improvements. Again and again has it been prophesied that the limit in this direction had been reached, but all such predictions have proved erroneous.

As business competition produces the keen financier or the bankrupt, so it is in our processes and methods of manufacture. The history of artificial illuminants furnishes an apt illustration. The candle outrivaled by gas, is improved by substituting paraffine for tallow; gas again leads; then the electric light enters the race, but it is only beginning to score when the Welsback mantle is invented; and so, see-saw, the battle had been waged. The candle has about gone into bankruptcy.

The manufacture of soda has been a repetition of the same thing, and now sulphuric acid is passing through an era of progress of which, no doubt, there will be the survival of the fittest. It may, therefore, be accounted as noteworthy that the turning of heat into power through the boiler remained for so long a time the practically unchallenged method. Today, electricity, the water turbine, and the gas engine are powerful competitors and many aver that the sun of the boiler has about set. Whether this be so or not, we cannot tell; but of this we may be sure that it will need every improvement it can acquire, if it is to remain a permanent factor in mechanics.

When one soberly considers the steam boiler as the medium through which heat becomes a working force, he is amazed at the dire wastefulness of the process.

At the last meeting of this section it was pointed out by Professor Cohoe that a group of losses occurs in the combustion of the fuel, as a result of which only 80% of the heat from the coal is communicated to the boiler, and this where the very best conditions prevail. The average efficiency would probably not exceed 60%. A second group of losses is consequent upon the conduction of the heat to the water and the conversion of the water into steam. A third group comprises the losses by radiation from boiler and pipes and by imperfect condensation in the engine.

In discussing the subject of Boiler Feed-Waters and Boiler Scale, we would naturally have to do with the second group.

The steam boiler is made of steel because of the strength of this material and of its conducting powers, the steel plate affording an easy passage for heat from the fire to the water.

When in use an impairment of the conducting power of the boiler takes place through the formation of layers of sediment, which by the fierce heat of the fire, are formed into what is known as boiler scale. This is an insulator or non-conductor of heat, but it is unfortunately deposited where a non-conductor is least needed. There is an old fashioned definition of dirt which might be aptly borrowed just here—it is "Dirt is matter in the wrong place." Now if the steam boiler could be induced to deposit its scale as an outer covering and not an inner lining, generations of firemen would rise up to call it blessed. I am afraid the language it does evoke is not of that nature.

As scale is a product of the water, and its nature and thickness (which are elements of great importance) depend mainly on the character of the water, let us make this our first enquiry.

Lakes, rivers, springs, wells and even the rain-fall on roofs are the sources of supply. Canada is exceedingly well furnished with waters of acceptable quality for steam production. If you refer to a map of our country and notice their distribution, you will see that, from a centre, rivers and river-linked chains of lakes run to the west, the north and the east, giving an impartial and abundant supply.

Water is a great solvent of solids and of gases and because of this takes its character from the country which it traverses. So the waters of Canada are as varied as its soils.

On our ocean borders we have saline and brackish waters, but throughout the interior they are fresh. In Ontario, if a line be drawn east and west at a point about 100 miles north of Toronto, it will be found that the streams and lakes north of this line are simply ideal, as they contain practically no scale forming ingredients. Tests of waters of the Magnetawan River (which is typical of Northern Ontario waters) show no lime salts.

The question is frequently asked. How is it that these waters are so soft, seeing that many of the springs which feed them are strongly impregnated with lime? Is it that the silica from the feldspars forms insoluble silicates, or is it that the hemlock logs and barks which are abundant along all these northern water-courses, supply tannin which precipitates the lime salts? Probably both are factors in producing their exquisite softness.

To the south of the line referred to, are the chief manufacturing centres of Ontario. Here we have, also, the great lakes and connecting rivers. The waters of which are of fair quality and do not form a very heavy scale. The problem grows more serious as we travel inland where the rivers have forced their narrowly confining banks to pay a heavy toll in dissolved mineral matter. The scale thus formed is thick and hard and the application of a remedy for the evil is rendered doubly difficult because the amount of the formation is dependent on the changing seasons. In spring and early summer and during abundant rains, the waters being high have their scale forming constituents greatly reduced, while the reverse is the case in fall and winter, or time of drought.

But we experience still greater difficulties with the waters of our springs and wells. Limestone abounds in Southern Ontario and heavily charges them with carbonates and sulphates of lime and magnesia. Some districts as at Paris, Brantford and Berlin have underlying dolomites and here the waters are uncommonly bad. Fortunately, these cases are exceptional and in general our boiler feed water is good or can be readily rendered so.

In locating an industrial plant, the fuel supplies, the labor market, and the transportation facilities are always considered. But too frequently the character of the water is not sufficiently taken into account. More and more, however, will this be a determining factor, as we better understand its full import.

We have already referred to the scale produced by the action of heat upon hard water and that the compact deposit thus formed is a non-conductor and partially cuts off the water from the influence of the fire. To such an extent does this occur that it is estimated, a scale of 1/16th inch thick

causes a loss of 12% of heat, and  $\frac{1}{2}$  inch a loss of 40% and with thicker scale it is worse still. Added to this the scale separates the plate at the bottom of the boiler from the cooling influence of the water and the very high temperatures produced cause blistering of the iron, loosening of the rivets and burning out of the boiler bottom, eventuating in both expense and loss of time. These are very serious bar-sinisters on the fair fame of the steam boiler.

If the heat from the fuel, having suffered a loss of 40% in the fire-place, now has to traverse  $\frac{1}{2}$  inch of scale (which is not unusual)-there will be a further reduction of 24% amounting to a waste of 64% and leaving us with the account still unclosed.

The water, then, that is required, is one free from scale forming ingredients. When nature does not furnish such, the chemist's alchemy must transform these mineral laden liquids that are the manufacturers' bane by neutralizing the harmful ingredients.

As already stated, scale producing waters contain mostly carbonates and sulphates of magnesia and lime, suspended earthy matter, oxide of iron and alumina and organic matter. The scale is of great variety according to its composition. That resulting from carbonates of lime and magnesia is rather soft, that from sulphate of lime is like adamant, while between are all grades. If we free our waters from carbonates of lime and magnesia and sulphate of lime, as a rule its scale forming propensities will disappear.

More than fifty years ago an English chemist, by the name of Clarke, found that lime in solution is precipitated by the addition of more lime, this seeming paradox is easily explained when we consider that the lime in solution is the bicarbonate. The lime that is added is quick-lime (oxide) and this converts the soluble bicarbonate into insoluble carbonate. This is a most important chemical truth and applies to magnesia as well as to lime. Of perhaps more consequence is this fact, that when water containing lime and magnesia bicarbonates is boiled, or agitated, these, by loss of carbonic acid, are precipitated. In cases where scale results from these salts only, the prevention is very simple, viz., either a treatment with lime before entering the boiler, or preferably, by boiling in a container and filtering or allowing the sediment to subside before coming into the boiler. Unfortunately, we rarely find this simple combination in our scale forming waters, nearly always to the carbonates are added sulphates and chlorides, as well. Now sulphates and chlorides of lime and magnesia are precipitated by carbonate of soda, by tri-sodium phosphate or by tannate of soda.

In the following group of chemicals we have those that are the reasonable and effective precipitants of scale producing waters, viz., lime, carbonate of soda (soda ash), tannate of soda, caustic soda, and tri-sodium phosphate. Prof. McGill in his article on "Improvements in Boiler-Feed Waters" calls attention to the virtues of barium hydrate but adds that its cost makes its use almost prohibitive.

Besides these, boiler-compound men give us as many wonderful combinations as there are cures for rheumatism; mixtures, the virtues of which are known to them alone and are claimed to prevent scale under any and all circumstances, either of boiler or of water. I will enumerate a few, viz., coal oil, crude oil, Irish moss, slippery elm bark, potatoes, oyster shells, cutch, gambier, bichromate of potash, fluoride of sodium, soda ash mixed with sawdust, or tanbark. Of these, carbonate of soda mixtures are most frequent and according to the usual direction are to be used in the boiler. Whatever advantage may be gained in this way must be offset by the following considerations. The scale deposit is not prevented. To be sure it is of less dense quality but as the foaming tendency of the water is increased, the trifling benefit is overbalanced.

In any rational system of treatment as much of the carbonates of lime and magnesia as possible should be precipitated before the water enters the boiler. To this end either a chemical or a mechanical method should be used. The chemical, consisting of the addition of lime, is cheap, is very efficient and when rightly applied does not add objectionable material to the water. It, however, has this drawback, that while it must be added in sufficient quantity to convert the bicarbonates into carbonates, if more be used it becomes a scale forming impurity itself. This chemical process is especially adapted to systems where condensed steam cannot be

returned, where heaters are impracticable and where the precipitation needs to take place in the cold. Such conditions prevail in towns and cities, in laundries and in railway systems, etc.

The mechanical method relies on the heater. It is quite effective and should be used in all systems where there are stationary boilers.

The heater has many virtues. By it, large proportions of the condensed waters (free from scale-forming material) are returned to the boiler; and by it, also, the feed water is heated to the boiling point and the precipitation of most of the lime and magnesia carbonates is effected. Of course, this is only a partial cure, for the sulphates and chlorides of lime and magnesia are yet to be reckoned with. To precipitate these latter, carbonate of soda, tannate of soda or tri-sodium phosphate should be employed.

If carbonate of soda (soda ash) be the selected remedy the precipitation must take place in a tank outside the boiler, after passing the heater, and be followed by a filtering or settling of the water. The objection, as previously stated, to carbonate of soda within the boiler is the precipitation of a scale that though not very dense is still very troublesome.

Tannate of soda may be used, outside or inside the boiler. The precipitation which it induces is light and flocculent and does not readily harden into scale. But the price of tannates is high and their combining power small, so that the cost would rule it out where economy is studied.

Tri-sodium phosphate offers many advantages and can be used the same way as the tannate of soda. With the lime sulphates or chlorides and any lime carbonates which the heater has not removed, it forms a light precipitate which does not harden or adhere to the boiler. This is gotten rid of by the occasional use of a "blow-off" cock at the bottom of the boiler.

Growing out of the foregoing and in order to make their application as plain as possible, I will outline with more definiteness the three methods which appear to me best adapted to the work and the steps that should be taken to remove scale-forming material from the water.

In the first case, let us consider the purification of a supply where the water cannot be readily heated, and contains carbonates and sulphates of lime and magnesia. Lime is first mixed in a tank with the water in proportion nearly equivalent to the free and half-bound carbonic acid. This precipitates the carbonates of lime and magnesia. From here it is led into another tank where it mingles with solution of soda ash causing the precipitation of the rest of the lime, which had existed as sulphate or chloride. It is then passed through excelsior which separates the solids and goes into a receiving tank or reservoir in a fairly pure condition. There is probably no method cheaper than this and it is especially adapted to very impure waters.

The second and third illustrations will concern themselves with waters to be used in stationary plants and such as are supplied by our lakes; as for instance, those required in power-houses and manufactories in Toronto. The feed water is brought into a heater where by the influence of the exhaust steam it drops nearly all its carbonates of lime and magnesia. From here it is passed into a tank into which solution of soda ash is fed. It is then filtered through a bed of excelsior which retains the precipitates; and is finally pumped into the boiler. This, also, is a good method but does not in practice completely remove the scale elements.

The third case deals with the same problem. The feed water is passed through a heater where, as before, the lime and magnesia carbonates are mostly precipitated. From here it is pumped direct into the boiler, the feed pipe of which is connected with a valve-regulated smaller pipe, through which tri-sodium phosphate is drawn. Separation of the solids of the water takes place in this instance in the boiler; and being flocculent and light are removed at intervals by a blow-off cock at the bottom. As the water in the boiler must be frequently changed the process of "blowing off" is salutary for reasons other than that of the precipitate's removal. The preventing of scale is in this case complete and there is no tendency to redissolve as there sometimes is when soda ash or other compounds are used. The cost is somewhat more but the results are better and the machinery less.

Any one of these three methods is admirable and in the case of the water specified (viz., Lake Ontario water) would cost less than 1½ cents per 1,000 gallons.

In most cases of cure of scale-forming waters, by chemical means, a soluble compound takes the place of the precipitated material, and if the waters are very bad, the amount left in solution is so great as to cause foaming. The same effect is produced by concentration of the waters within the boiler, even where the softened waters have but small quantity of soluble matter. Hence, the necessity of a frequent change of the water in the boiler. Where tri-sodium phosphate is used the occasional "blowing-off" to remove the precipitated matter at the same time affects the change of water desired and foaming does not occur.

While the softening of water is more important, probably, to the steam user than to any other, yet there are industries

which are very seriously affected by the presence of lime and magnesia salts, and it would be quite in order to here mention some of them, viz.: In tanning, lime in the water robs the hemlock bark of its tannin and may become a big bill of expense if the water contains much of these salts. In laundries, silk, cotton and wool factories, where soap is used, each grain of lime per gallon in the water destroys 1½ lbs. of best hard soap per 1,000 gallons of water. The paper mills require a water free from sediment in the manufacture of their expensive papers, as the pulp is an absorbent of such matters and is deteriorated by them.

In concluding this paper, I would say to steam users—If you want to save coal, if you want to save repair bills, if you want to prevent shut-downs, if you want to lengthen the life of your boilers, if you want to increase their efficiency—then scale formation must be prevented.

### LOOSE PULLEYS.

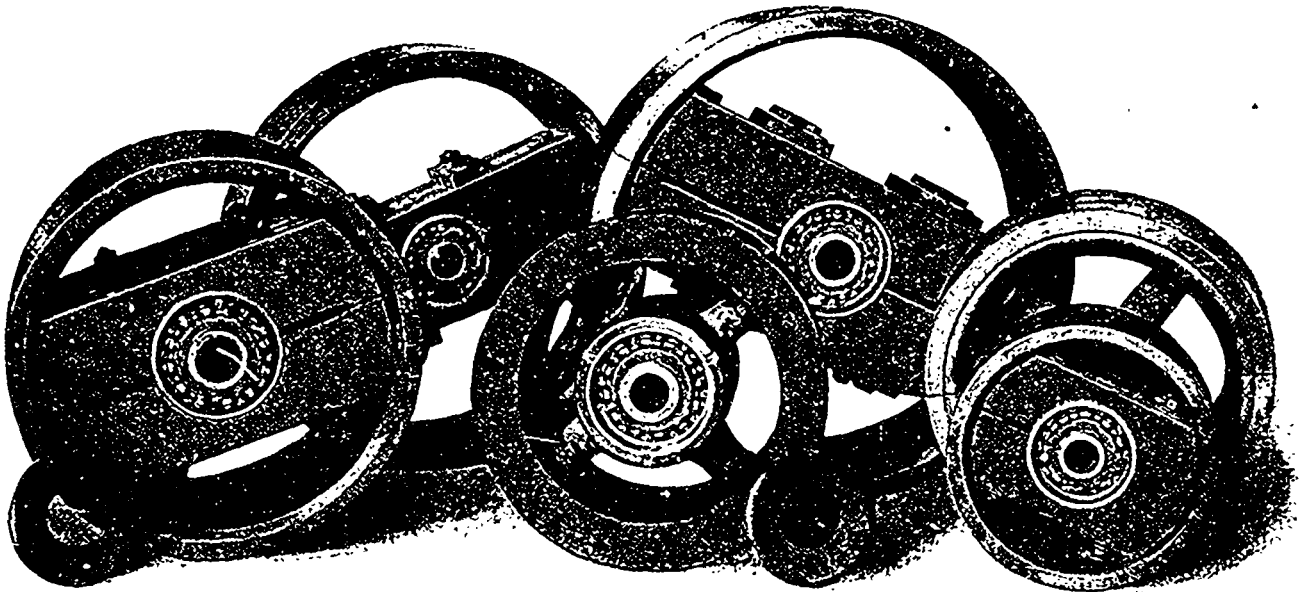
A constant source of annoyance in factories is the loose pulleys. In many cases these pulleys run at a high rate of speed, and as the oil space is small they require constant attention, and even with the best of care they need frequent re-babbiting to prevent heating and cutting of the shafting.

To meet the needs of manufacturers in this direction, and to do away with this difficulty, the Chapman Double Ball Bearing Co., Toronto, have recently placed on the market a ball bearing loose pulley. The bearing in general may be said to consist of the ordinary ball bear-

the right angle drive, and this of course means the mule stand and its attendant disadvantages. Not only is there a great loss in power with this method of drive but the cost of maintaining a device of this kind if kept as a separate account for a number of years would in most cases surprise its owner by the amount of maintenance outlay in the cost of babbit, oil, goods spoiled from dripping and damage done to belting. By the adoption of the Chapman bearing these features at once disappear and the friction becomes a factor of small moment, and the cost for oil, babbit, etc. is practically nothing.

Within the past few months since these two specialties have been placed on the

remain out of service for the least possible time. During the winter months the time required for melting snow and ice from the running gear and putting the engine in shape for another run has been very materially reduced by modern methods of heating and ventilating the round house. A thoroughly up-to-date example is that of the Blair Furnace round house of the Pennsylvania Railroad at Altoona, Pa. Here a large steam hot blast apparatus constructed by the B. F. Sturtevant Co., Boston, Mass., is employed to distribute heated air throughout the building, and also to force it in large quantities into the pits beneath the locomotives. The time required for cleaning and re-



THE CHAPMAN DOUBLE BALL BEARING LOOSE PULLEYS.

ing as designed for shafting and illustrated in the company's catalogue, with the exception that it is contained in a straight body, thus enabling any of the standard pulleys to be fitted to it. In fact the only change necessary is that of making the bore of the pulley slightly larger than in ordinary practice. In a loose pulley of this kind the advantages are of course readily apparent; the bearing being self contained and the question of lubrication almost entirely eliminated, it at once becomes a commercial factor of no small import.

In ordinary mill and shop practice in many cases it becomes necessary to adopt

market thirty of the best manufacturing plants in Canada have adopted them, which testifies to the value of the device from a practical standpoint.

The Edison Sault Electric Co., Sault Ste. Marie, Mich., will erect a large power plant on St. Mary's Rapids, an expenditure of \$120,000 will be made this year.

The progressive railroad manager of the present day seeks success in his motive power department by driving his engines to the limit and permitting them to

pairs is thereby reduced by 60 or 70 per cent.

W. S. Hutton, in his "Steam Boiler Construction," states that "the economy that may be obtained by combustion with forced draft in a steam boiler is due to the increased rate of combustion and increased efficiency of the heating surfaces produced by it, resulting in increased boiler power. The increase of power obtained depends principally upon the quantity of air brought into intimate contact with the fuel in a given time, but the power of the boiler may generally be increased from 40 to 100 per cent. by the application of well arranged forced draft."



## 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 on 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, alkalis, etc. It is well worth the while of every reader of the Canadian Manufacturer to closely inspect all items under the head of Captains of Industry.

It is stated that the Canadian Pacific Railway Co., will construct an electric line from Hamilton, Ont., to Niagara Falls, Ont.

A modern steel and concrete bridge, 120 feet long, will be built over the river Thames at Putnam, Ont., to replace the wooden structure now standing. The new bridge will cost about \$4,500.

The sash and door factory of Knight Bros., Burk's Falls, Ont., was destroyed by fire February 22. Loss about \$25,000.

The steel works of the Lake Superior Corporation at Sault Ste. Marie, Ont., are now receiving iron ore at the rate of about 35 tons a day from the Williams mine. It is claimed to be of Bessemer quality and the output will shortly be increased. Another prospective source of supply is a mine situated about 25 miles below the Sault, which will be in operation before long. The steel works are turning out daily between 350 and 500 tons of steel rails on their contract with the Canadian Pacific Railway.

The Dryden Board Mills Co., Dryden, Ont., have been incorporated with a capital of \$1,000,000. C. B. Gordon is manager of the company. The buildings will be constructed of stone, concrete, brick and steel. To develop the power, which is to be obtained from the Wahnapitae River, a wing dam must be built. The power house will be 95x70 feet. The dimensions of the two main buildings will be 294x40 feet and 168x55 feet, respectively. The boiler-house will be 50x45 feet. Two sidings from the Canadian Pacific Railway will run into the pulp mill. The works will require 2,500 h.p. for their operation.

The Bertram Engine Works Co., Toronto, are adding a new covered deck to the Modjeska, of the Hamilton Steamboat Co.; and repairing the Niagara Navigation Co.'s steamer Chicora, which was considerably damaged by a breakdown of her engines; and the Richelieu & Ontario Navigation Co.'s steamer Spartan.

The Toronto Street Railway Co., Toronto, are fitting their cars with the McCann air brake, at a cost of about \$350 per car.

The Niagara Falls Electrical Transmission Co., Niagara Falls, Ont., was incorporated with a capital of \$50,000, to supply gas and electricity. The provi-

sional directors include Frederic Nicholls, E. R. Wood and D. E. Thomson, Toronto.

The oven house of the Standard Chemical Co.'s works, Longford Mills, Ont., was destroyed by fire February 18. Loss about \$30,000.

The North Street Methodist church, Goderich, Ont., will be pulled down and replaced by a more modern edifice, which will cost about \$18,000.

Keenan Bros., Owen Sound, Ont., have been incorporated with a capital of \$100,000, to manufacture baskets and butter tubs, etc.

The Industrial Exhibition Association, Toronto, will erect a new Art gallery to cost \$27,000. The building will be of brick, 128x82 feet.

The Wilkinson Plough Co., Toronto Junction, Ont., have purchased a controlling interest in the West Lorne Wagon Co., West Lorne, Ont., for \$75,000. The output consists of light and heavy wagons, carts, drays and spring coal delivery wagons.

The Ottawa Lumber Co., Ottawa, have purchased from J. P. Logne & Co., a timber limit comprising thirty square miles, situated on the Ottawa River, a short distance above Lake Temiskaming.

The Grand Trunk Railway Co., have awarded to Messrs. Ross & McRae the double-tracking of the road from London to Kingscourt Junction, Ont.

The Canada Printing Ink Co., Toronto, have increased their capital stock from \$40,000 to \$60,000.

The Canadian Pacific Railway Co.'s roundhouse was destroyed by fire February 20. Loss about \$10,000.

The Wilcox Hardware Co., Chicago, Ill., will erect a factory at Chelsea Green, Ont., to be a one-story cement building 150x50 feet. The roof to be supported by steel girders.

Messrs. McKenzie & Mann have completed the formation of a million dollar concern, known as the Atikokan Iron Co., for the purpose of mining iron ore, and manufacture of pig iron and other products of iron and steel at Port Arthur, Ont. This company will be supplemented by another to be known as the Canadian Coal & Ore Dock Co., which will construct coal and coke docks at a cost of \$500,000 and will have a storage capacity

of 200,000 tons of coal and 100,000 tons of ore. The iron company involves an investment of \$1,000,000, \$300,000 of which will be devoted to the purchase of large iron deposits on the line of the Canadian Northern and the balance to the erection of a blast furnace of a hundred tons capacity, coke ovens, and ore roasting furnaces and to working capital.

Hulet's clothing establishment, Norwich, Ont., was destroyed by fire February 17. Loss about \$10,000.

The Monterey Electric & Gas Co., Toronto, have been incorporated with a capital of \$3,000,000, to carry on the business of an electric light, heat and power company, and of a gas company. The incorporators include Wm. McKenzie, Z. A. Lash, Toronto, and H. S. Holt, Montreal.

The machinery hall of the organ factory of Wm. Doherty & Co., Clinton, Ont., was destroyed by fire February 15. Loss about \$30,000.

The Dominion Government will make considerable improvements in the Detroit River abreast of Amherstburg, Ont. The plan calls for excavating the river to a depth of 21 feet.

The Canadian Club house, Windsor, Ont., was destroyed by fire February 17. Loss about \$10,000.

The Ogilvie Flour Mills Co., have erected a grain elevator at Fort William, Ont., with a capacity of 500,000 bushels. It is constructed of steel, and is of cylindrical type, equipped with the most modern labor-saving machinery.

McDonald & Drew's hardware and implement store, Florence, Ont., was destroyed by fire February 18. Loss about \$10,000.

The post office and telegraph office of E. A. Christmas at Walsingham Centre, Ont., was destroyed by fire February 18. Loss about \$6,000.

The managers of Chalmers Presbyterian church, Toronto, will build a new Sunday School room at a cost of about \$12,000.

A large deputation from North York, headed by Hon. E. J. Davis, visited Ottawa a few days ago to interview the government, asking that the Trent Valley Canal be extended to Newmarket, Ont., and Aurora, Ont. The canal would furnish power and have a tendency to keep freight rates at a proper level.

The Dominion Government will erect a new post office at Owen Sound, Ont.

The Central Canada & Hudson Bay Railway Co., have applied for incorporation to operate a line from Heron on the north shore of Lake Superior, north-easterly to the Albany River, thence north to James Bay.

The Board of Works, Hamilton, Ont., has awarded the contract for supplies of cement to the Cayuga Lake Co., Ithaca, N. Y., at \$1.55½ per 350-pound barrel. About 15,000 barrels will be used this year. Seven Canadian firms tendered, and the board were urged to patronize Canadian enterprise, but the lowest tender got it. The paving brick contract went to the Massillon Brick Co., at \$27.40 per thousand.

Application will be made for confirmation of the by-law of Brantford, Ont., authorizing the issuing of debentures totalling \$25,000, the amount to be loaned the Copeland-Chatterton Co., Toronto, to erect a factory there.

The Thunder Bay Power Co., have applied for incorporation to take over the Kakabeka Falls Land & Electric Co.

A company will be incorporated to build an electric railway from London, Ont., to Guelph, Ont., through the counties of Middlesex, Oxford, Perth, Waterloo and Wellington.

The Ontario & Minnesota Power Co., Toronto, have been incorporated with a capital of \$3,000,000 to acquire water powers for electrical production, etc. The provisional directors include E. W. Backus, Minneapolis, Minn., R. A. Grant and Alex. McKenzie, Toronto.

The town of Peterborough, Ont., will apply for incorporation as a city and ask for the ratification of eleven money by-laws of the town, including \$50,000 for purchasing a site and erecting a collegiate institute; to provide \$10,000 for an armory site; \$3,000 for alterations in the heating apparatus of the Central Public School; \$20,000 for waterworks; \$12,000 for repairing bridges and opening new streets; to aid by grant of land and a fixed assessment of \$10,000 a year for ten years to the Peterboro' Cereal Co.; to fix at \$4,000 a year for ten years the assessment of the Peterboro' Shovel Co.

The Watson Pattern Works, Toronto, have gone into the general machinist business and have equipped a complete machine shop. Among the machine tools installed are a Warner & Swasey turning lathe, Gardner automatic gang drills and American Tool Works shaper.

The Canada Furniture Manufacturers, Ltd., are removing one of their factories from Stratford, Ont., to Seaford, Ont.

The oil well shot recently at Leamington, Ont., in the first fifteen hours flowed 350 barrels.

The high pressure system of water works to be installed in the downtown district of Toronto, will be operated from four centrifugal pumps of 5,000,000 gallons capacity each. Two of these will be driven by electric motors, and two by steam turbines. The auxiliary plant will be installed in an extension which is to be made to the main pumping station.

The contract for the big coal and ore docks at Port Arthur, Ont., has been awarded to the Barnett Record Co., Minneapolis, Minn. The docks, which will handle ore from Atikokan iron deposits in Ontario, will be equipped with the most modern handling machinery, and have a capacity of 300,000 tons.

The first iron mine in the immediate vicinity of Sault Ste. Marie has commenced operations, and ore is being shipped to the Algoma Steel Works at the rate of 35 tons a day. The ore comes from the Williams mine, a few miles from the river. The output will be increased shortly. The ore is claimed to be of Bessemer quality, and it is predicted that within a short time Minnesota and

Michigan ore will not be needed there. It is also announced that a second mine will be opened twenty-five miles below the Soo within a few days, the product to be used by the Lake Superior Ore Corporation.

The Canada Steel & Tin Plate Co., Morrisburg, Ont., have been granted the right to develop 1,100 h.p. in the Morrisburg Canal, and the town of Morrisburg intends to take advantage of this by having the company establish a big electric plant. If the by-law carries it will authorize the Council to borrow \$76,100 to be used for electric development purposes. The company's side of the agreement is to erect eight mills at a cost of \$300,000, to employ about 400 men, and to buy from the village the surplus electric power (estimated at from 400 to 500 h.p.) at \$12 50 per h.p.

The County Council of Halton, Ont., will erect a house of refuge for the indigent poor of the county.

The Eureka Planter Co., Windsor, Ont., have increased their capital from \$40,000 to \$50,000 and will remove their plant to Woodstock, Ont., where they are erecting a new factory 120x40 feet, two stories high at a cost of about \$5,000. The city council of Woodstock will grant the company a loan of \$12,000.

The National Woolen Mills Co., Ltd., Streetsville, Ont., have been declared insolvent and ordered to be wound up by the court. E. R. C. Clarkson, Esq., has been appointed interim liquidator.

The Canadian Bank of Commerce will erect a branch building at the corner of Carlton and Parliament Streets, Toronto, at a cost of about \$6,200.

The Donnelly Wrecking Co., Kingston, Ont., have contracted with the town of Noru Bay, Ont., to put 1,300 feet of submerged sewer pipe into Lake Nipissing, and to lay 330 feet of intake pipe for the new waterworks system into Trout Lake, three miles from the town.

The ratepayers of Burk's Falls, Ont., have voted favorably on a by-law to raise \$7,000 to defray the additional cost of waterworks.

The Dain Mfg. Co., of Iowa, a company incorporated in the United States, to manufacture agricultural and other implements, have been granted a license to carry on business in Canada. F. R. Shantz, Preston, Ont., has been appointed attorney.

Work on the new mint at Ottawa will commence very shortly. Langdon & Sullivan, the contractors, have taken out a permit for a temporary workshop, and will proceed with the operations as soon as possible.

The plant of the New Century Refrigerator & Door Co., Dundas, Ont., was destroyed by fire February 24. Loss about \$10,000.

The Canadian Pacific Railway Co are building a new line from Toronto to Sudbury, a distance of about 300 miles.

The contract for the extension of the Collingwood, Ont., wharf, has been let to Edward Conroy, Petrolia, Ont. The price is about \$25,000.

The model and public school, Athens, Ont., was destroyed by fire February 25. Loss about \$9,060.

The Campbell Milling Co. have been granted a license to carry on business in Canada. D. A. Campbell, Toronto Junction, Ont., has been appointed attorney.

The Lumen Bearing Co., a company incorporated in New York, have been granted a license to carry on a business of manufacturing metals, alloys, castings, etc. N. K. B. Patch, Toronto, has been appointed attorney.

The East Templeton Lumber Co. have been granted a license to carry on business in Canada. W. C. McLaren, Brockville, Ont., has been appointed attorney.

The Keystone Engineering Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture building supplies and to carry on a business of contractors of construction and engineering works. The provisional directors include A. W. Kirvan, F. B. Johnston and Strachan Johnston, Toronto.

The Wolthausen Hat Corporation, Ltd., Brockville, Ont., have been incorporated with a capital of \$50,000 to manufacture hats, caps, hat blocks, flanges, etc. The provisional directors include Frederick Wolthausen, L. R. Bonton, and S. C. Horton, Brockville.

The Close Brick Co., Ltd., Stratford, Ont., have been incorporated with a capital of \$25,000 to manufacture brick and tile. The provisional directors include J. H. Keuner, J. E. Young and D. H. Farrow, Stratford.

The Canadian Dental Supply Co., Toronto, have been incorporated with a capital of \$100,000 to manufacture dental and surgical supplies. The provisional directors include W. F. N. Windeyer, R. C. Windeyer and J. W. Brent, Toronto.

The Thompson Stationery Co., Toronto, have been incorporated with a capital of \$40,000 to carry on a business of lithographers, printers, embossers, etc. The provisional directors include Henry Thompson, F. N. Raines and J. H. Rush, Toronto.

Messrs. John Hillock & Co., Ltd., Toronto, have been incorporated with a capital of \$40,000, to take over the business of John Hillock & Co., manufacturers of refrigerators, building material, etc. The provisional directors include Frank Hillock, J. F. Hillock and C. W. Hillock, Toronto.

Thompson & Livoch, Ltd., Ottawa, have been incorporated with a capital of \$40,000, to manufacture engines, machines, tools, implements, etc. The provisional directors include L. H. Thompson, James Livoch and F. X. Laderoute, Ottawa.

The corporate name of the Ayton Cordage Co., Ayton, Ont., has been changed to the Ayton Cordage & Power Co.

Thomas Lawson & Sons, Ltd., Ottawa, have been incorporated with a capital of \$50,000, to carry on a business of electroplaters, pattern makers, machinists, etc.

The provisional directors include Thomas Lawson, C. T. Lawson and A. T. Lawson, Ottawa.

The Blind River Light, Heat & Power Co., Blind River, Ont., have been incorporated with a capital of \$40,000, to construct and operate works for the production of electricity for the purposes of light, heat and power. The provisional directors include D. I. Millar, Sault Ste. Marie, Ont., D. S. Pindell, Sault Ste. Marie, Mich., and E. F. Bradley, Toronto.

C. Nosworthy & Co., St. Thomas, Ont., manufacturers of agricultural implements, will enlarge their foundry.

An addition of 60x40 feet will be added to the plant of the St. Thomas Brass Co., St. Thomas, Ont.

The Acme Mfg. Co., Ltd., King St. E. Toronto, have succeeded the Dominion Motor & Machine Co., which went out of business recently. The new company will engage in general machine shop work, and build some special tools and machinery. Mr. Geo. B. McClellan is manager of the new company.

The Ontario Bureau of Mines is forwarding a collection of corundum and corundum-bearing rock, as a permanent exhibition for the National Museum, Paris. The collection is composed largely of the well-known Craig Mine crystal corundum, mined by the Canada Corundum Co., Toronto, at their Craigmont mines.

The Mark Fisher & Sons Co., Montreal, will erect a warehouse in Toronto 115x35 feet, five stories, to cost \$30,000.

Eganville, Ont., will install a new dynamo in their electric lighting plant.

A large storage warehouse will be erected at London, Ont., by the Dominion Government, to cost about \$20,000.

Mr. Carson, Belleville, Ont., will erect a \$15,000 canning factory at Napanee, Ont.

Messrs. D. H. Burrell & Co., Little Falls, N.Y., will erect a factory at Brockville, Ont., for the manufacture of dairy supplies. The town council will grant the company an appropriation of \$1,000.

The Canadian Bank of Commerce will build a new branch bank at Port Arthur, Ont.

The Northern Iron & Steel Co. has purchased the Open Hearth Plant and Rolling Mills erected at Collingwood, Ont., by the Cramp Steel Co. The plant is capable of making one hundred tons of open hearth steel per day, and finishing the same into merchantable product, such as wire rods, bars, rounds, flats, skelp, tire steel, angles, bolt and nut material, fish plates, tie plates, angle bars, railroad spikes and material used in the construction of street and railway cars and locomotives; steel used in the construction of agricultural machinery and in the building of engines, bridges, etc.

The F. W. Bird & Sons Co., East Walpole, Mass., have made arrangements to establish their Canadian branch in Hamilton, Ont. The company makes all sorts of papers, including wall papers and

roofing papers. It has bought nine acres of land east of the Petrie Mfg. Co.'s plant in the annex district, and will at the outset spend about \$20,000 on buildings. It is said that at the start 200 men will be employed.

The ratepayers of Woodstock, Ont., will vote on a by-law to loan \$15,000 to the Woodstock Windmotor Co.

The directors of the Trader's Bank, Toronto, will erect a new office building, eight stories high, to occupy a ground space of 100 square feet.

The ratepayers of Brockville, Ont., will vote on a by-law to raise \$30,000 to help the Canada Carriage Co. to rebuild their factory, which was recently destroyed by fire.

A plant for the manufacture of sand lime brick will be erected at Peterborough, Ont., at a cost of about \$25,000.

A collegiate institute building to cost \$50,000 will be erected in Peterborough, Ont.

The American Horseshoe Co. is considering the erection of a plant at Hamilton, Ont.

The American Chicle Co., Toronto, will erect a factory at a cost of about \$30,000, to manufacture chewing gum.

The Canadian Otis Elevator Co., Hamilton, Ont., who recently purchased the plant of the Fensom Elevator Co., of Toronto, will sell the same. Plans have been prepared for important additions to the plant at Hamilton at a cost of about \$40,000. Another important change in the Canadian Otis Elevator Co., is the removal of their general sales offices to Toronto, where quarters have been secured in the Confederation Life Building. Private telephone and telegraph wires will connect the plant and the Toronto offices.

One of the latest scientific discoveries along the lines of a metal used for machinery bearings, has proven that a triple or quadruple alloy composed of certain percentages of pure virgin metals, properly mixed, and fluxed with a certain chloride, will produce astonishing results. One of the finest babbitt metals lately placed upon the market is the "Midland," manufactured by the Georgian Bay Engineering Works, Midland, Ont. This metal contains all the desirable features that users of bearing metal could wish for. To enumerate some of its good points, for instance, it contains a certain amount of graphite or plumbago, which makes it a self-lubricating babbitt. It possesses the quality of expanding on cooling thus filling up the box into which it is poured, and making a neat, clean, clear, sharp casting. Another point—Midland metal stands up under the heaviest as well as the lightest kind of work, and is especially compounded for high speed machinery, such as is used in planing mills, or heavy machinery of saw mills, in fact there is hardly a place that this metal cannot be used for the purpose for which it is designed. Further particulars will be given by the makers, who guarantee it to perform the work for which it is wanted, and to contain

nothing but the very purest of virgin metals obtainable.

There has been considerable renewal of activity in mining operations in central Ontario recently, and many of the companies have made large increases in their plants. The Kingston Felspar Mining Co., at Bedford, purchased from Allis-Chalmers-Bullock, Ltd., Montreal, a hoisting plant, including a 30 h. p. double cylinder Lidgerwood engine; James Richardson & Sons, zinc miners, Mountain Grove, purchased an Ingersoll-Sergeant air compressing plant; and the Madoc Mining Co., Tweed, Ont., purchased a complete mining plant, consisting of a horizontal return tubular boiler, Ingersoll-Sergeant air compressor, Lidgerwood hoisting engine, etc., both from Allis-Chalmers-Bullock, Ltd., Montreal.

The Crescent Contracting Co., Temple Building, Montreal, have been formed to engage in the general contracting business. Special attention will be given to industrial establishments. C. M. Gardiner is manager of the new company.

The Syracuse Smelting Works, Montreal, inform us that they are receiving some very large orders for their manganese anti-friction metal. The new United States battleship "Nebraska," lately launched at Seattle, Washington, has its bearings lined with the Syracuse babbitt, which was specified by the United States government. This manganese anti-friction metal has not been on the market very long, still the company are having a great sale for it. They are sending on application miniature bars of their metal, which can be used as a paper weight.

The Molsons Bank, will erect a branch bank at St. Henri, Que.

Tenders are being called for the large building to be erected at Point St. Charles, Que.—the Alexandra contagious diseases hospital.

R. C. Fisher, Montreal, has completed arrangements for the erection of a fire-proof five story and basement apartment house.

Messrs. Heury Morgan & Co., Montreal, owners of the Colonial House, a department store, have purchased property adjoining their present building, and will spend about \$1,000,000 in enlarging their premises.

The hardware store of C. A. Parent, Quebec City, Que., was destroyed by fire February 18. Loss about \$6,000.

The Bank of Hochelaga, will erect a branch bank in Montreal, 60x37 feet.

Through their Montreal representatives, T. A. Morrison & Co., the Roman Stone Co., Toronto, have secured the contract for the ornamental stonework for the modern apartment house to be erected on Sherbrooke St., in Montreal.

The Montreal establishment of the Cobban Mfg. Co., Toronto, was destroyed by fire February 22. Loss about \$25,000.

The Syracuse Smelting Works, Montreal, inform us that they have been appointed sole agents in Canada and the United States for the Montreal Cop-

per Co., that city. The Montreal Copper Co., is, we are informed, the only concern in Canada producing refined ingot copper, and have lately received some very large orders for export. They are just in receipt of an order for shipment to Germany of 200,000 pounds. The plant is working to its fullest capacity, and the company expect shortly to enlarge it.

Messrs. H. Finberg & Co., Montreal, manufacturers of clothing, will erect a new factory at a cost of \$75,000.

The D. B. Martin Co., Philadelphia, Pa., have purchased the Eastern Abattoir at Montreal, and will spend \$150,000 in improvements.

The Canadian Pacific Railway Telegraph Co., Montreal, will erect 1,000 miles of copper wire, and 800 miles of ordinary wire, during the coming season. Most of the lines will be on new railway branches in the West, including an additional line from Winnipeg, Man., to Revelstoke, B.C., making the fourth line from Winnipeg to Vancouver, B.C.

Hamelin & Ayers Co., Ltd., Lachute Mills, Que., have been authorized to extend their powers to guarantee bonds, debentures, or other securities, and endorse the bills and papers of the Chatham Pulp & Paper Co., and the Lachute Shuttle Co., or to take over or amalgamate with any other company.

The James Williamson Warehousing Co., Montreal, have been incorporated with a capital of \$50,000, to carry on a business of warehousemen, etc. The incorporators include J. T. McCall, T. F. How, and James Williamson, Montreal.

Wm. Muir & Son, Ltd., Montreal, have been incorporated with a capital of \$45,000, to carry on a business of importing, exporting, freighting, etc., coal and other fuel. The incorporators include John Ryan, R. C. McMichael, and F. G. Bush, Montreal.

The contract has just been awarded by the city of Winnipeg, Man., to Babcock & Wilcox, Ltd., Montreal, for the installation of two of their 250 h.p. forged steel patent water-tube boilers, fitted with B. & W. patent steam superheaters and chain grate automatic stokers. This is an addition to the power plant of the City water-works system, in which five of the same type of boiler were installed some five years ago, and it speaks well for the general satisfaction they have given.

The foundry of Pascal Amesse, Montreal, was destroyed by fire February 24. Loss about \$1,500.

The John McDougall Caledonian Iron Works Co., Montreal, had a test made of their new Worthington turbine fire pump at the Canada Sugar Refining Co.'s works, Montreal, recently, in the presence of a number of members of the Society of Civil Engineers. The pump, which was driven by a Bullock direct-connected motor, has a capacity of 1,600 gallons per minute, against a pressure of 130 pounds.

W. J. McGuire & Co., Ltd., Montreal, have been incorporated with a capital of \$50,000, to manufacture automatic sprinklers, and other fire extinguishing appar-

atus, etc. The incorporators include W. J. McGuire, H. F. McGuire, Toronto, and W. L. Horn, Montreal.

It is reported that an American syndicate is negotiating for the purchase of a controlling interest in the E. B. Eddy Co., Hull, Que. The purchase price to be \$4,000,000.

The Dominion Coal Co., are increasing their lighting plant at International Pier, and will install two 60 h.p. Robb-Mumford boilers, and a 75 h.p. Robb-Armstrong engine.

Messrs. H. & A. Allan, Montreal, have signed a contract with the Dominion Government for a steamship service to France. The contract is for three years, and four steamships are to be employed.

Shurtleff's opera house, Coaticook, Que., was destroyed by fire February 24. Loss about \$4,000.

The Maskinonge Chair Co., Maskinonge, Que., have been incorporated with a capital of \$5,000, to manufacture chairs. The charter members include L. E. G. Dugas, Alphonse Lafreniere & H. Brousseau, St. Joseph of Maskinonge, Que.

The La Prairie Brick Co., La Prairie, Que., are installing a Premier brick machine, and an Imperial machine and automatic side-cutting table, purchased from J. D. Fate & Co., Plymouth, Ohio.

The Cape Breton Electric Co., has ordered a 150 h.p. engine from the Robb Engineering Co., Amherst, N.S., to increase the capacity of their North Sydney power station.

The McDonald block, North Sydney, N.S., was destroyed by fire February 17. Loss about \$10,000.

The Robb Engineering Co., have received an order from Laval Seminary, Quebec, for three 90 h.p. Robb-Mumford boilers, to replace the return tubular boilers at present in use.

Sydney N.S., will own their own electric light plant.

The Rosebank Lumber Co., have ordered two 100 h.p. return tubular boilers, to be fitted with Dutch ovens for their saw-mill at Douglastown, N.B., from the Robb Engineering Co., Amherst, N.S.

The A. C. Thompson Co., will erect a wire nail factory at North Sydney, N.S., to cost about \$50,000.

The Shipbuilding & Investment Co., Halifax, N.S., have been organized and a favorable site on the water front of that place has been secured on which a steel shipbuilding industry will be established.

B. E. Kingman, New York City, and F. Sayles, Providence, R. I., are interested in a project to develop the water power of Grand Falls, N.B., which includes the manufacture of ferro manganese at the Falls, and the operation of pulp, paper and saw-mills, the operation of international railway by electricity and the transmission of electric power between the St. John River Valley, to be sold for use in lighting and manufacturing as far as St. John. The project will involve from \$3,000,000 to \$4,000,000 outlay.

The Canada Woodenware Co., Hamp-

ton, N.B., will apply for incorporation with a capital of \$24,000 to manufacture tubs, pails, sashes, blinds, etc. The applicants include A. L. Brown, Winchendon, Mass., Wm. Barnes, Hampton, N.B., and G. C. Weldon, St. John, N.B.

The Paul Lea Co., Moncton, N.B., will apply for incorporation with a capital of \$60,000, to manufacture sashes, doors, furniture, etc. The applicants include Paul Lea, John A. Lea, Moncton, N.B., and M. M. Churchill, Yarmouth, N.S.

Vroom Bros., Ltd., St. Stephen, N.B., have applied for incorporation, with a capital of \$24,000, to manufacture furniture, carpets, window shades, etc. The applicants include E. G. Vroom, G. W. Ganong, and James Vroom, St. Stephen.

The Richibucto-Rexton Telephone Co., Richibucto, N.B., have been incorporated with a capital of \$20,000. The incorporators include W. J. Brait, Rexton, N.B., W. D. Carter, Richibucto, N.B., and W. J. D. Leary, Montreal.

The New Brunswick Iron Co., Fred ericton, N.B., have been incorporated with a capital of \$1,000,000, to develop mining properties at Musquash, N.B. The provisional directors include J. S. McLennan, Sydney, N.S., L. B. Knight, St. John, N.B., and A. D. Wetmore, Truro, N.S.

The Winding Ledges Power & Boom Co., St. Francis, N.B., have applied for incorporation to dig canals, construct booms, wharves, etc., and to establish mills and manufactories of all kinds.

Messrs. Donald Fraser & Sons, Fredericton, N.B., will erect two shingle mills, one at Cabineau, N.B., to have fourteen shingle machines, and the other at Baker Brook, N.B., to have ten shingle machines.

The ratepayers of Charlottetown, P.E.I. have voted in favor of municipal ownership of the electric light plant.

Winnipeg, Man., will extend the water-works system to give a capacity of 18,000,000 gallons daily, at an estimated cost of \$1,500,000.

The Ontario Wind Engine & Pump Co., Toronto and Winnipeg, Man., are erecting an elevated tank for water supplies, at St. Boniface, Man. It is a steel structure, 160 feet high, with tank capacity of 106,000 gallons.

The Empire Sash & Door Co., Winnipeg, Man., have been incorporated with a capital of \$100,000, to manufacture window sashes, doors, etc. The incorporators include W. H. McWilliams, Winnipeg, Man., G. F. Piper, Minneapolis, Minn.

The cigar factory of L. E. Nauer, at Portage la Prairie, Man., was destroyed by fire recently. Loss about \$1,500.

Hensal, Wood, Benedickson & Co.'s general store, Glenboro, Man., was destroyed by fire February 18. Loss about \$15,000.

The implement warehouse of W. G. Simmons, Glenboro, Man., was destroyed by fire February 18. Loss about \$20,000.

Messrs. Munro Bros., New Glasgow, N.S., will establish a wire manufacturing plant in Winnipeg, Man. This company now operate a plant at New Glasgow.

The Canada Malting Co., Toronto, will erect an elevator with a capacity of 150,000 bushels at Winnipeg, Man.

The Clare Mfg. Co., Preston, Ont., will erect a large foundry at Winnipeg, Man.

The clock to be placed in the tower of the new Canadian Pacific Railway hotel, Winnipeg, Man., will be one of the largest pieces of time-keeping machinery in Canada. It is to be on a substantial iron base within the tower, being fitted with fine steel arbors and pinions and hammered bronze wheels. The pendulum will be fitted with fine adjustments to compensate for heat and cold. Electric energy will be supplied by enormous batteries capable of running 100 secondary clocks if necessary.

The Canadian Northern Railway Co., are erecting a bridge over the south branch of the Saskatchewan river, near Prince Albert, N.W.T., which will consist of nine spans, the track being 100 feet above low water. The piers of the bridge are to be built of concrete, and the trusses of steel.

The Bank of Montreal, Regina, N.W.T. was destroyed by fire February 26. Loss about \$50,000.

The Alberta Telephone Co., Alberta, N.W.T. will install a complete telephone system throughout the Crow's Nest Pass district.

The Canadian Chilled Meat Co., Calgary, N.W.T., have been incorporated with a capital of \$500,000. The incorporators include H. E. G. Cooke, Cochran, N.W.T., and A. C. Sparrow, and W. H. Manarey, Calgary, N.W.T.

The Red Deer Lumber & Brick Co., Red Deer, N.W.T., have sold out to Dushing Bros., Ltd., of the same place.

The Methodists of Regina, N.W.T., have purchased a \$4,000 site on which they will erect a new church building.

Edmonton, N.W.T., will construct a new city hall, at a cost of about \$60,000.

It is reported that the T. Eaton Co., Toronto, have purchased a business lot in Calgary, N.W.T.

The ratepayers of Regina, N.W.T., will vote on a by-law to build a city hall at a cost of about \$60,000.

Lewis Bros. & Co., wholesale hardware merchant, with headquarters in Montreal, have opened a new branch at Calgary, N.W.T.

The Baptist congregation of Calgary, N.W.T. will rebuild their church, which was recently destroyed by fire, at a cost of about \$20,000.

The Lac Beau Valley Mines, Ltd., will erect a mill and concentrator near Blair, B.C.

The Port Nelson Canning & Salting Co., Victoria, B.C., have been incorporated with a capital of \$30,000.

The Enderby Coal Mines, Ltd., Victoria, B.C., have been incorporated with a capital of \$250,000.

The B. C. Wire & Nail Co., Victoria, B.C., have been incorporated with a capital of \$50,000, to manufacture nails, wire, wire rope, wire cable, etc.

The Dease Creek Hydraulic & Development Co., Victoria, B.C., have been incorporated with a capital of \$50,000.

The Ford Motor Works, Detroit, Mich. will establish an automobile factory in New Westminster, B.C. The company will also manufacture all classes of gas-line motors for launches.

The Canadian Pacific Railway Co., have purchased the Esquimalt & Nanaimo Railway. The price is reported to be \$1,250,000.

The Brooklyn and Phoenix hotels, Phoenix, B.C., were destroyed by fire February 14. Loss about \$15,000.

Messrs. McClure Bros., Vancouver, B.C., have discovered and acquired another large area of blue clay near their first find at Matsqui, B.C. Experiments are being made to determine its endurance against fire. The tests have been most satisfactory. The Matsqui brick was put alongside the the best imported fire brick in a chemical furnace. The greatest heat that could be obtained was 3,600 degrees. At that temperature the English brick showed signs of vitrification, but the British Columbia brick was still as solid as when put into the furnace.

The Postmaster-General, according to a notice which appears in The Canada Gazette, has had under consideration the liability of articles of celluloid to explode or catch fire under certain conditions, cases having occurred that strongly pointed to mails being injured from this cause. It has been decided that such articles may in future only be mailed if packed in tin boxes with close fitting lids. Notice is, therefore, given that from the standpoint of mailable matter celluloid is regarded as of the nature of an explosive, and the mailing of such articles, except as prescribed, is prohibited, and renders the sender liable to prosecution, under the section of the Post-Office Act relating to the sending of explosives, matches, etc., in the mails.

The Robb Engineering Co., Amherst, N.S., have recently completed a new machine shop building which is perhaps the largest shop in the province. It was designed by Mr. A. G. Robb, and is 250 feet long by 100 feet wide. The walls are brick and the roof of mill construction, consisting of southern pine trusses spaced eight feet centres. The interior of the building is coated with a special permanent whitewash which does not rub; it is heated by the fan system which utilize exhaust steam from the main engine to heat the air before it is distributed through the shop. One-half of the width of the building forms an erecting floor clear from floor to roof and served by an electric crane with a lifting capacity of twenty-five tons. The machinery of the shop is driven by electricity generated from a C. G. E. dynamo driven by a Robb-Armstrong engine; the motors for the separate machines are of both the Westinghouse and Bullock types.

## ELECTRICITY.

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

The Montreal Terminal Railway Co., Montreal, will make application for an act to issue preferential shares to increase its bonding power to construct branch or circuit lines to be operated by electricity in the counties of Hochelaga, Maisonneuve, Jacques Cartier, Chambly, Vercheres, Laprairie, St. Johns, Iberville, Rouville and St. Hyacinthe; to acquire, generate, distribute, sell and dispose of electric power for lighting, heating, power and other purposes.

Construction work on the Windsor & Tecumseh Street Railway Co., Windsor, Ont., line is progressing rapidly. The officials hope to have the road in operation in the spring. The grading from Windsor to Tecumseh, a distance of 12 miles, has been completed. The officers of the company are: C. E. Walker, Walkerville, Ont., president; Frank M. Ohl, Toledo, Ohio, vice-president; E. Ledore, Tecumseh, Ont., secretary-treasurer; Willis F. Brown, Toledo, Ohio, general manager.

The Southwestern Traction Co., which is building a line between London and Port Stanley, is negotiating with the St. Thomas Council for the purchase or leasing of the city's street railway.

The annual report of the Electrical Development Co., of Ontario, shows that up to the present time the company has paid out for plant \$1,737,267.76, has \$974,693.77 on deposit, and has still to come in on bonds, \$1,249,650. The directors state that the progress of the works under construction has been more rapid than expected, and that every engineering difficulty has been overcome. Vice-president Nichols giving details of the work done announced that there was at present nothing to indicate that the work would not be completed and in operation by the summer of 1906. He reported satisfactory progress by the Toronto & Niagara Power Co., which will distribute the power generated by the Electrical Development Co., and added: "The outlook for the sale of power improves as time goes by, and we already have to consider provision for a larger initial output than at first contemplated."

Cecil Smith, the promoter of the Grand River & Western Power Co., which seeks a Dominion charter, states that his company will develop power at Jordan, near St. Catharines, Ont., and will run a line west as far as London. Brantford will be on the direct route and the main line of transmission will be through that city. There is an abundance of power for use, according to the testimony of experts, and a large share of it would be utilized at very low rates in the various manufacturing industries of the city.

Messrs. Hon. L. J. Forget, H. S. Holt, Hon. Robert Mackay, Dennis Murphy, of Ottawa; Aldred Melville, H. B. Rainville, W. McLea Walbank, J. N. Greenshields, K.C., M. Noseworthy, Chief Engineer



Tye, of the Canadian Pacific; Rodolphe Forget, M.P., journeyed to Shawinigan Falls, Que., a few days ago, the purpose being to formally celebrate the addition of 10,500 h.p. to the plant of the Shawinigan Heat & Power Co. This makes a total development of 28,800 h.p., and the Montreal Light, Heat & Power Co., will utilize the whole of it. Hon. Robert Mackay, president of the Shawinigan Co., started the machinery which gives Montreal the benefit of ten thousand additional horse power.

The new telephone line between Vancouver and Victoria, Vancouver Island, is open for business. Its length is 100 miles of land lines and 144 miles of cable. The cable was supplied by the Wire & Cable Co., Montreal, of which contract mention was made some months ago in these columns.

The Maine & New Brunswick Electrical Power Co., recently formed for the purpose of harnessing the Aroostook Falls, will develop 4,000 h.p. at that point. It will be used for manufacturing purposes, and to operate an electric railway and lighting plant.

The Pocock Power Co., Dominion City, Man., have submitted a proposition to the council to light the municipality from a power plant to be installed on the Rosseau river.

The Commissioner of Public Works at Ottawa, has approved of the plans of Backus & Co., for building the dam and developing water power on the Rainy River at Fort Frances, Ont. The plans provide for the development of 20,000 h.p.

John Galt, C.E., Toronto, has examined the Rosseau river, near Emerson, Man., and has reported favorably on it as a source for economical development of water power in combination with long distance electrical transmission.

## FUEL.

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

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

The F. P. Weaver Coal Co. have engaged L. C. Mickles as its Canadian sales agent and have opened an office in the Confederation Life Building, Toronto.

The annual report of the Crow's Nest Pass Coal Co. shows that the output of the company's mines at Fernie, Michel and Morrissey, B.C., during the last calendar year was 742,210 tons, an increase of about 81,000 tons over the 1903 production. The amount of coke made in 1904 was some 78,000 tons in excess of the preceding year's tonnage.

Secretary W. A. Martin of the Western Ontario Coal Association, London, Ont., reports that the Association is growing rapidly.

It is reported that the Shawmut Coal & Coke Co. is preparing to extend its operations to Rochester, N. Y., the coming

season, though the Buffalo office is not informed of anything new in regard to it. There has been a plan for some time of getting to Lake Ontario as soon as practicable, and this will no doubt be held till it is accomplished.

The Pittsburg & Buffalo Co., through their Buffalo office have made a number of important coal contracts in Canada lately.

The Canadian Pacific will soon begin the work of developing the coal measures which it owns at Hosmer, seven miles from Fernie, B.C. Under an agreement between the Crow's Nest Coal Co., the latter cannot produce coal from this property for two years yet, but as it will take two years to properly bring them up to a productive stage, the work is now to be inaugurated, so that the shipment can be made just as soon as the time specified has expired. It is anticipated at Fernie that the work of putting these coal measures on a productive basis will give employment to a large force of men.

The Dominion Coal Co.'s 1904 report shows that the net earnings for the year ended December 31 were \$1,620,475.33, as compared with \$1,756,023.68 for the year 1903. The output of 1904 was 3,023,522 tons, as compared with 3,147,766 tons for 1903. The reduction is ascribed to the Dominion steel strike, and the report explains that at the commencement of the season care was taken not to take orders up to the full estimated capacity. The falling off of receipts is further explained by the reimposition of import duty on the New England Gas & Coke Co.'s shipments, and by increased cost of production due to severe weather in the early part of the year. The balance sheet exhibits an allowance of \$130,569.81 for depreciation, making a total property account of \$22,970,516. This is raised by the addition of cash accounts receivable, coal, supplies, and various credits on payments made in advance for 1905, to \$25,403,548.40. The stock and debenture liabilities, including the accrued preferred dividends which have been paid since the striking of the balance, are \$23,699,981.05. Other liabilities are unpaid royalty \$84,056.62, accounts and notes payable \$271,937.56, bond interest accrued \$58,250, contingent fund \$54,915.66, sinking fund, accrued, \$117,157.10. This leaves a total balance to surplus account of \$1,117,250.41, as against \$226,912.13 a year ago—an increase of \$890,338.28. The improvement in the financial position of the company consists in an addition to the surplus account of \$890,338.28, consisting as follows: Retirement of first mortgage loans, \$116,500; reduction of floating debt, \$469,118.07; increase in value of assets, \$503,766.90; the whole less additional debenture debt which after payments made during year amounts to an increase in liability of \$198,546.69.

The Eco Magneto Watchman's Clock is being installed in a number of manufacturing establishments in Canada by Eco Magneto Clock Co., Boston, Mass. This clock possesses a number of exclusive merits aside from its cheapness, being operated by magneto generation instead of chemical battery.

## OPPORTUNITIES.

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

The Department of Public Works, Ottawa, are asking for tenders until March 7, for the Quebec wharf extension.

The Department of Public Works, Ottawa, are inviting tenders for alterations and additions to the post office at London, Ont., which will be received until March 9.

Messrs. James Ross, president of the Mexican Light, Heat & Power Co., R. B. Angus, J. R. Wilson and A. W. Hooper, recently returned to Montreal from the city of Mexico, give a very favorable report of outlook of the company.

Chairman of the Board of Control, Toronto, will receive tenders until March 21, for the erection of a six million imperial gallon, triple expansion, fly-wheel pumping engine.

THE CANADIAN MANUFACTURER is in receipt of a request from an important mercantile concern in Australia for name and address of Canadian maker of paper siding and ceiling squares. The article is described as being made by paper mill-board glued and pressed to wood backing, giving strength and evenness of surface. Who makes the article?

We are in receipt of a request from the agents in Copenhagen, Denmark, of an important trading company, whose head offices are at Durban and Lorenzo Marques, South Africa, for names and addresses of Canadian shippers of white pine and poplar lumber who might be interested in that trade. For further information address this office.

The Department of Railways and Canals, Ottawa, are inviting tenders for the building and equipping with machinery of a steel gate lifter for the Williamsburg canals.

A. E. McKenzie, secretary of the Y.M.C.A., Brandon, Man., will receive tenders until March 20, for the erection and completion of a four story brick building for the Association.

Tenders will be received until March 13, by John Galt, C.E., Toronto, for providing the materials and labor required for the erection of a reinforced concrete pumping station at East Toronto, Ont.

Tenders will be received until March 6, by C. W. Postlethwaite, Toronto, for dredging required in the harbor this season.

The town clerk, Lunenburg, N.S. is inviting tenders for the construction of a sewerage system in that town.

The city council, Ottawa, will issue debentures to the extent of \$500,000 to purchase water power to be used in connection with the street lighting plant.

The Island Revenue Department, Ottawa, invite tenders for the supply of wood naphtha for the manufacture of methylated spirits.

The city engineer, Calgary, N.W.T., is asking for tenders until March 16, for installation of a complete electric light plant at that place.

The Department of Public Works, Fredericton, N.B., will receive tenders until March 13, for rebuilding Red Bank Bridge.

**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 Electrical Magazine, London, England, of which Mr. Theo. Feilden is editor, celebrates in its issue of January 31, its first anniversary, in which is told the story of the American tour last year of members of the British Institution of Electrical Engineers, headed by the president, R. K. Gray, of the Associazione Elettrotecnica Italiana, headed by Prof. Mosie Ascoli, the president, and other eminent British and Continental electrical scientists. This tour embraced quite a number of industrial centres in the United States and Canada, involving from start to finish, some ten thousand miles of travel. As its name indicates, The Electrical Magazine is an exponent of all that is modern and up-to-date in electrical progress in Great Britain.

The Canadian Westinghouse Co., Hamilton, Ont., manufacturers of electrical apparatus, air brakes, etc., have sent us their very artistic calendar for 1905.

The National Electric Co., Milwaukee, Wis., have sent us circulars illustrating the direct current generators, and the Christensen air brake equipment manufactured by them.

The Westinghouse Electric & Mfg. Co., Pittsburg, Pa., have sent us circulars descriptive of their Westinghouse type K motors, and also of their bi-polar motors—type R for direct current circuits.

"Watt Meters and How to Read Them" is the title of a little booklet issued by the Canadian Westinghouse Co., Hamilton, Ont. It will be found instructive to all users of electric light and power.

The Westcott Chuck Co., Oneida, N.Y., have issued a new illustrated catalogue and price list.

The Sirocca Engineering Works, Belfast, Ireland, have issued an attractive and interesting catalogue on Davidson centrifugal fans which are built in Canada by the Robb Engineering Co., Amherst, N.S.

Messrs Baines & Peckover, Toronto, have issued literature calling attention to various tool steel and other iron and steel products for which they are Canadian agents.

"Economic Gas and its Application to

Lighting" is the title of an interesting pamphlet issued in English and French by J. DeClerey, Montreal.

The B. F. Barnes Co., Rockford, Ill., represented in Canada by H. W. Petrie, Toronto, have just issued a complete catalogue on twentieth century machine tools which they manufacture, which includes gang drills, lathes, grinders, automatic chucks and other machinery.

Alexander Gibb, Montreal, Canadian representative of Beardshaw's profile tool steel, is sending out illustrated catalogues showing the advantages of this material.

The Hobbs Mfg. Co., London, Ont., have issued a new illustrated catalogue on "Maximum Light" glass, for which they are Canadian agents.

The American Steam Pump Co., Battle Creek, Mich., represented in Canada by the A. R. Williams Machinery Co., Toronto, have just issued a new illustrated catalogue on Marsh boiler feed pumps.

Earnshaw Bradley, C.E., Montreal, who is in charge of the Canadian work of the Armbrusen Hydraulic Construction Co., has issued an attractive leaflet illustrating the construction of the dam built for the town of Fenelon Falls, Ont.

An article in a recent number of the India Rubber World describes the plant, and sketches the history of the Canadian Rubber Co., Montreal and Toronto, which has just completed, its fiftieth year, though, if it be considered the successor of an older concern which operated the first rubber industry in Canada, it has several years more to its credit.

A new trade journal, The Trade Gazette, has been established at Calgary, N.W.T. It is said to be the only trade journal between Winnipeg, Man., and the Pacific coast. G. C. Young, Esq., is editor.

"Something Pneumatic" published by the Chicago Pneumatic Tool Co., Chicago, Ill., will hereafter be known as "Ideal Power," the current issue of which is just to hand. It contains much of interest to manufacturers and others interested in this line of work.

The value of having at hand a selected list of shippers, manufacturers and agents, arranged alphabetically under their different towns in Great Britain, must be apparent to every business concern in Canada; and this is embodied in the 1905 edition of the Export Merchants Shippers' Directory of Great Britain and Ireland, a copy of which has reached us from the publishers, whose office is at 160a Fleet Street, London, England. The general arrangement of this volume—now in its 40th year—remains unaltered, the present form having been found most convenient for ready reference, but every portion of the book has received thorough revision, several new sections have been added, and special attention has been paid to the "Index to Class of Goods Shipped," to make it even more useful than before to Colonial buyers, etc., by adding the specialty of each shipper in brackets where necessary by the side of the name of the firm appearing under a general or composite heading.

We are indebted to Mr. W. A. S. Hewins, secretary, for a copy of the report

of the Tariff Commission some months since called together by Mr. Joseph Chamberlain to examine the fiscal proposals which he had submitted to the electors of Great Britain. The report under consideration, Vol. I, has reference to the iron and steel trades in a popular and abridged form. The Commission, will, we are informed, shortly issue their report upon the various textile trades of Great Britain; reports on other trades will follow, and in this way the whole British industry will be brought under detailed and expert examination. The full report, with appendix and index, may be obtained from the publishers, Messrs. P. S. King & Son, 2 Great Smith street, Westminster, S. W. London, England.

The C. Regenhardt's Agency, 11 Broadway, New York, have sent us their 1905 edition of their International Guide for merchants, manufacturers and exporters, which contains the addresses wanted every day by firms engaged in foreign business. However remote a place may be, if business of any importance is transacted there, the book, we are told, gives all the particulars that are of service to the merchant: data re shipping intercourse, consular and customs service, number of inhabitants; the leading banks and law firms, commission and forwarding agents, etc. Any special information, such as reliable reports on business concerns, trade lists, etc., may be obtained from any town direct through the Regenhardt correspondents. The contents and its arrangement and the mass of data it contains is so classified and indexed that it is readily accessible. Price \$1.50.

The Jeffrey Mfg. Co., Columbus, Ohio, have purchased and will operate the plant of the Ohio Malleable Iron Co., of that place.

**PERSONALS.**

The thirteenth annual convention of the Dominion Grange & Patrons of Husbandry, met in Toronto recently. Officers for 1905 were elected as follows:—Master, Henry Grose, Lefroy, Ont.; overseer, Thomas McMurchy, Loree, Ont.; secretary, William Fisher, Burlington, Ont.; treasurer, James Fallis, Newbridge, Ont.; chaplain, F. Goodfellow, Duncan, Ont.; lecturer, James Glenn, Glanworth, Ont.; steward, Albert Carruthers, Whitby, Ont.; assistant steward, J. G. Lethbridge, Strathburn, Ont.; gatekeeper, W. A. Coulter, Painswick, Ont.

At the thirty-eighth annual meeting of the Montreal Rolling Mills Co., Montreal, held a few days ago in the company's office, the following directors were named for the ensuing year. Messrs. E. S. Clouston, James Ross, Wm. McMaster, Sir George Drummond, Sir Montague Allen, Bartlett McLeunan, Hon. Senator Mackay and James I. Waldie.

The Gutta Percha & Rubber Mfg. Co., Ltd., Toronto, have opened warehouse premises at Vancouver, B.C., and will carry there a large and complete stock of their manufactures, including rubber boots and shoes and mechanical goods. The

establishment will be run as a branch of the company, and will be under the management of Mr. A. G. McKenney, who has been in the employ of the company for twelve or fifteen years, and who for the past five or six years has spent most of his time in British Columbia looking after the interests of the company in that territory. Mr. McKenney is therefore well known to the rubber purchasing trade in British Columbia, and well posted in its requirements.

Messrs. Wm. Jessop & Sons have just reoccupied their old quarters on Bay Street, a fine new building having been erected on the site of the one destroyed a year ago. Mr. C. L. Bailey is manager of the Toronto office of the company.

The Hoffman Corr Mfg. Co., have removed their Toronto offices from 118 to 101 Bay Street.

Discussions on the following subjects will be held before the Engineers Club of Toronto during the month of March, introduced as follows:—March 2, "Expert Witnesses" by Frank Arnoldi, Esq., K.C. March 9, "The Maximum Distance to which Power can be Economically Transmitted," by H. A. Moore. This will be a joint meeting with the Toronto branch of the American Institute of Electrical Engineers. March 16, Discussions re Amalgamation with Toronto Branch of Canadian Society of Civil Engineers. March 23, "Relation between High Tension Lines and Other Lines," by K. L. Aitken. March 30, "Repairs to a Stand Pipe," by M. N. McLeod. A

proposition is before the Engineers Club from the Canadian Society of Civil Engineers, that a Toronto branch of the Canadian Society be organized in Toronto, and the Engineer's Club be amalgamated therewith.

Attention is called to the full page advertisement in another page of Messrs. F. Reddaway & Co., Manchester, England, manufacturers of the "Camel" brand hair belting, canvas hose, cotton belting, Indian rubber goods, etc. Heretofore these goods were handled in Canada by Messrs. W. A. Fleming & Co., Montreal, but Mr. Fleming, who is now in ill health, is surrendering that agency, and Messrs. Reddaway & Co., are now completing other arrangements for the handling of their goods in this country, the result of which will be duly announced in this journal.

Fetherstonhaugh & Dennison is the name of a new Toronto patent firm which recently opened offices in 9 Toronto Street, Toronto. The new firm is handling the Ontario business of Messrs. E. J. Fetherstonhaugh & Co., with Mr. Herbert Dennison, C.E., in charge of the new office.

A large and influential deputation waited upon the Dominion Government a few days ago to ask that a duty be imposed upon lumber and shingles coming into Canada equal to that imposed by the United States upon Canadian lumber. At the head of the deputation were J. B. Miller, Parry Sound Lumber Co., president; W. D. Lummis of Sarnia, ex-presi-

dent, and the executive, composed of Jas. Playfair of Midland, W. P. Brill, of the Nipissing Lumber Co., Toronto, D. L. White of Midland, Boyd & Furrier of South River, W. J. Shepherd and Wm. Lovering of Waubaushon. Among others present were J. R. Booth and Dennis Murphy of Ottawa, George Gordon of Sturgeon Falls, R. H. Roy of Windsor, Wm. Scott of Port Arthur, J. C. Spook of Peterboro', W. B. McLean of Toronto, George Thomson of Goderich, J. E. Keenan of Owen Sound, J. P. Newman of Wurlton, J. Harrison of Owen Sound, H. E. Craig of Toronto, E. H. Heaps and F. Patterson of Vancouver, Hon. W. C. Wells Leach of Vancouver, Messrs Hendrie and Jardine of New Westminster, D. C. Cameron of Rat Portage, Mr. Jones of Revelstoke, Messrs. MacLennan and Stone of the Vancouver Board of Trade, and C. C. Ballantine, vice-president of the Canadian Manufacturers' Association.

Hon. N. P. Otis, chairman of the Board of Directors of the Otis Elevator Co., died at his residence at Yonkers, N. Y., a few days ago, aged 65 years.

Mr. Wm. Laidlaw, K.C., and Mr. E. H. Keating, C.E., formerly manager of Toronto Railway, both of Toronto, have again left for Mexico in the interests of Messrs. Mackenzie & Mann, who are negotiating for some extensive concessions in that country. It is understood that an extensive electric power, light and heat franchise, as well as electric and steam railways and iron works, are all included in the concession. In addition to Messrs.

## TO THE VARNISH BUYER

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Write for our 100 page illustrated catalogue. Every dealer should have a copy for reference.



Mackenzie & Mann, capitalists in New York and Montreal are understood to be interested in the undertaking.

Charles D. Edwards, for many years prominently identified with the business of Montreal, died in January at Stoughton, Mass., in his 64th year, and his remains were brought to Montreal for interment. Mr. Edwards was the pioneer safe manufacturer of Canada, having started in Montreal under the style of Kershaw & Edwards, both members of the firm being sons of the heads of the firm of Kershaw & Edwards, of Boston, one of the best known of the early safe-makers of the United States. After a few years Mr. Kershaw retired, and Mr. Edwards carried on the business alone. The first factory was started in 1857, and Mr. Edwards took over the business in 1859. The Edwards safes were noted for strength and durability, all the iron used in making them came from the Old Country, and cement was used for filling instead of plaster of paris. The deceased was the

father of Mr. H. O. Edwards, advertising manager of the Canadian General Electric Co. and of the Canada Foundry Co., Toronto.

The firm of A. B. Kirschbaum & Co., have established a system of scholarships in the Philadelphia Textile School, to be known by their name, a scholarship to be awarded at the close of each school-year to that member of the Freshman Class who has made the best record in the year's work, the scholarship to be good, if properly renewed, and if the student's record remains satisfactory, for the remaining two years of the regular course. Not only is the establishment of these scholarships of importance in itself, but it is, moreover, especially significant implying, as it does, a warm recognition of the value of this school on the part of one of the largest and most important firms in the clothing business in the country. This is but the most recent recognition of the service that this institution is performing for the textile indus-

tries of America that has come from practical business men, a sort of recognition which is the most gratifying and authoritative that could be received.

The Michigan Central Railway Co., Wabash, Grand Trunk and Pere Marquette Railway, have agreed upon plans for the tunnel under the Detroit River.

Some interesting facts regarding the endurance of a centrifugal fan blower were brought out in the discussion at the last meeting of the Pittsburgh Foundrymen's Association, regarding the relative merits of the positive blower and the fan. It was stated by a representative of the Westinghouse Air Brake Co., that they installed six positive blowers in their foundry and after six months replaced them with fans. At this plant the iron is melted continuously and the blowers were compelled to operate 23 hours daily. The blowers were operated at a pressure of 16 ounces and at the beginning of a heat would run up to 20 ounces. Regard-

A thorough-annealed crucible—you know what it's worth. Every McCullough-Dalzell crucible is perfect in this as in other desirable qualities. Write for prices.

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the greatest paying investment you ever made. We guarantee that it

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Also supplied by Oil Companies, Dealers and Power Contractors.

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INCREASES BOILER CAPACITY**

*Our Specialties Mechanical Draft*

**B. I. STURTEVANT CO. BOSTON**  
NEW YORK PHILADELPHIA CHICAGO LONDON

ing the life of fans, he said that they have used a No. 9 fan for fifteen years, and during that period it was operated 23 hours every day except Sunday and required no repairs whatever.

The Lake Ontario Steamship Co., Montreal, have purchased the steamer China, which will be placed on the route between Montreal and Fort William, Ont. Stops will be made at Toronto, Cleveland, Ohio, and Detroit, Mich., on the trip to Lake Superior.

The Canadian Railways Finance Co., with a capital of \$16,000, have acquired a charter to connect Hudson's Bay with the Pacific by rail. It is un-

derstood the company will undertake Canadian railway business on a large scale.

**CALIFORNIA EXCURSIONS.**

The Chicago, Union Pacific and North Western Line runs through first-class Pullman and Tourist sleeping cars to points in California and Oregon. Personally conducted excursions from Chicago every week. Lowest rates. Choice of routes. Finest scenery. Special attention given to family parties. For maps, illustrated folders and rates, address, B. H. Bennet, General Agent, 2 East King Street, Toronto, Ont.,

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- Brantford, Ont.
- Fort William, Ont.
- Halifax, N.S.
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- Lindsay, Ont.
- Orillia, Ont.
- Peterborough, Ont.
- Regina, N.W.T.
- Sherbrooke, Que.
- Toronto, Ont.



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CANADIAN CORUNDUM WHEEL CO., - Hamilton, Ont.

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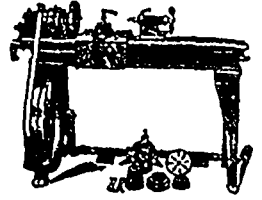


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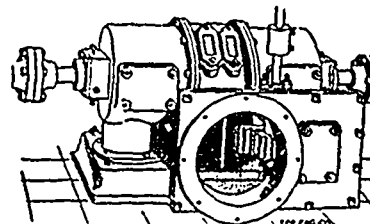
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CAMEL BRAND BELTING  
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ADDRESSES of AGENCIES will be published as soon as possible.

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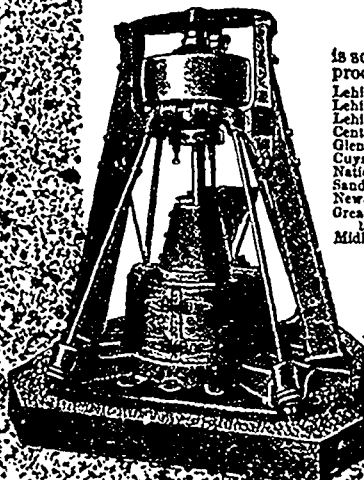
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is sold more largely to Portland Cement Works than any other make. Here's the proof conclusive: 579 Mills sold in the past two years to following works:

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| Cuyaga Lake Cement Co., Ithaca, N. Y.                       | Alma Cement Co., Wellston, Ohio.                           |
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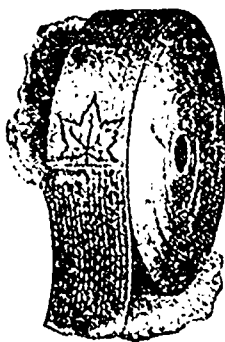
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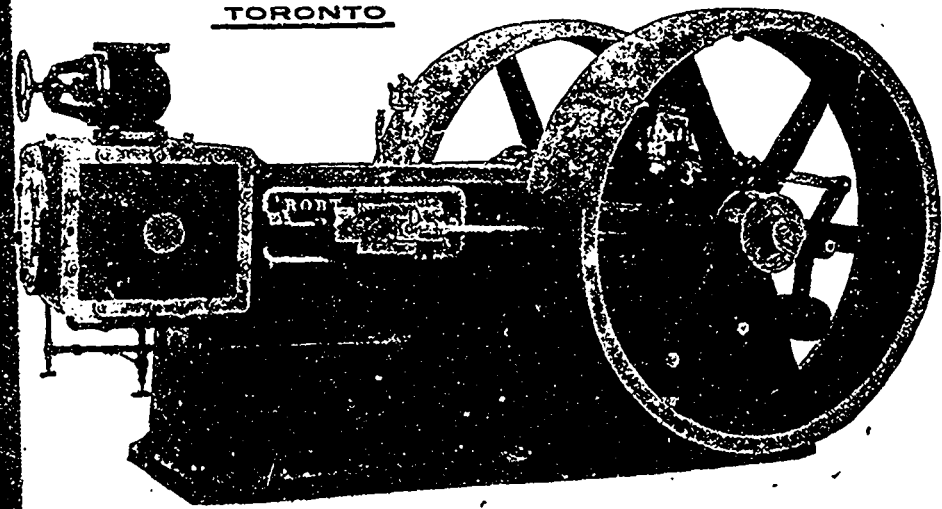


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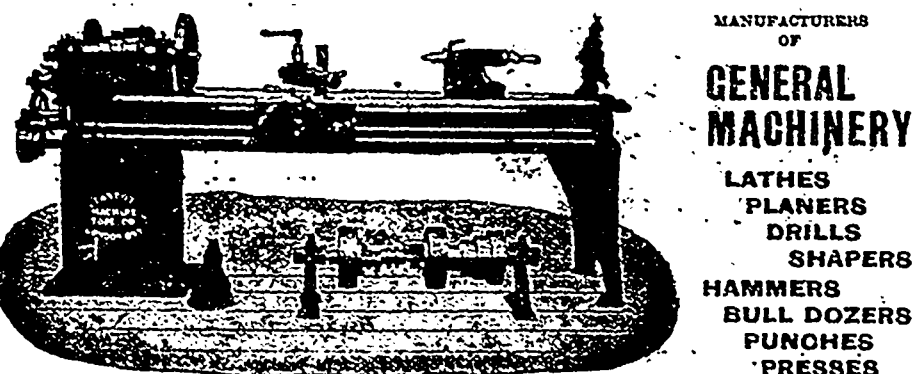
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Exclusive in industrials.



SEALED TENDERS addressed to the undersigned, and endorsed "Tender for alterations and additions to Post Office, London, Ont." will be received at this office until Thursday, March 1905, inclusively, for certain alterations and additions to Post Office building, London, Ont.

Plans and specification can be seen and tenders obtained at this Department and at the office of H. C. McBride, Esq., Architect, London, Ont.

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 10 per cent. (10 p.c.) of the amount of the tender, which will be forfeited if the party tendering declines to enter into a contract when called upon to do so, or if he fails to complete the work contracted for. If the tender is not accepted the cheque will be returned. The Department does not bind itself to accept the lowest or any tender.

By order.

**FRED. GELINAS,**  
Secretary

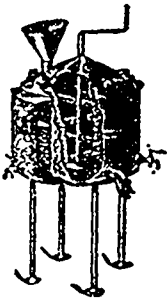
Department of Public Works,  
Ottawa, February 20, 1905.

Newspapers inserting this advertisement without authority from the Department, will be paid for it.



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WINDSOR.

Sold by  
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MACHINERY  
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MODEL "A"

on 30 days' trial under a guarantee of  
saving its cost in one year.

Over 3,000 of them now in use.  
Let us tell you about it.

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## Dewar Detective Agency

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We are in the strike breaking business  
and can furnish non-union skilled labor of  
all kinds to break strikes in any quantity  
needed. Special Watchmen, with or with-  
out uniform, furnished to guard property.

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Manufacturers of **FINE GLOVES and MITTS**  
In every variety and style. **Moccasins**

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## DISC VALVES

ARE THE BEST  
FOR HIGH STEAM.

Ask Your Dealer  
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Catalogues Sent on  
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Limited

WALKERVILLE, - ONT.



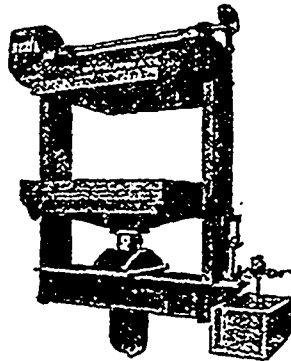
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has helped to solve the most difficult problems  
in lubrication. Write for a free copy of

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a new booklet full of interesting information.  
Samples free.

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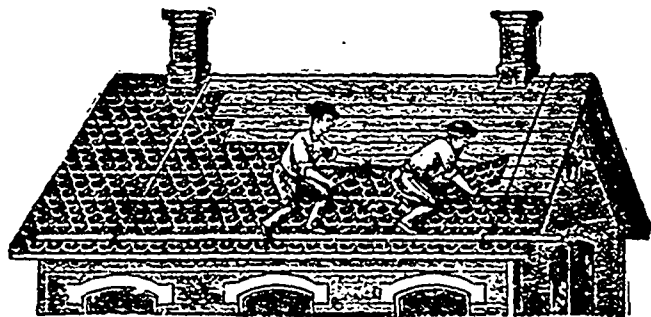
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## ..Filter Presses..

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**At \$2.00 per 100 Square Feet.**

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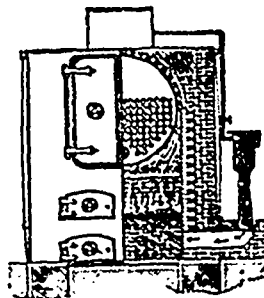
Can be actuated  
by steam  
or water jets.

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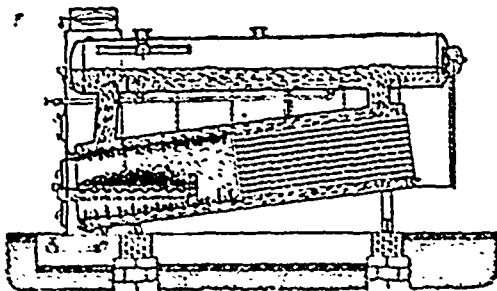
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Regulate blast with side handle.

Start and stop by opening and closing a valve in steam pipe—full.

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# CLASSIFIED INDEX.

## Abrasives

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

## Air Compressors

Allis-Chalmers-Hullock, Limited, Montreal.  
American Steam Pump Co., Battle Creek Mich.  
Canada Foundry Co., Toronto.  
Canadian Rand Drill Co., Sherbrooke, Que.  
Corbett R. B., Brooklyn, N.Y.  
Durling Bros., Montreal.  
Schutte & Koerting Co., Philadelphia, Pa.

## Aluminum

Northern Aluminum Co., Pittsburg, Pa.  
Syracuse Smelting Works, Montreal.

## Angles, Beams and Girders

Bourne-Fuller Co., Cleveland, Ohio.  
Canada Foundry Co., Toronto.  
Hopkins, F. H. & Co., Montreal.  
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

## Aniline Colors and Dyewood Extracts

Bellhouse, Dillon & Co., Montreal.  
Benson, W. T. & Co., Montreal.  
Brunner, Mond & Co., Northwich, England.  
Canada Chemical Mfg. Co., London, Ont.  
Casella Color Co., New York City.  
Geigy Aniline & Extract Co., New York City.  
McArthur, Cornello & Co., Montreal.  
Nicholls Chemical Co., Montreal.  
Winn & Holland, Montreal.

## Annealing Muffles and Furnaces (Wire)

Leslie, A. C. & Co., Montreal.  
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

## Antimony

Syracuse Smelting Works, Montreal.

## Anvils and Vises

Hopkins, F. H. & Co., Montreal.  
Leslie, A. C. & Co., Montreal.  
Rice Lewis & Son, Toronto.

## Architects

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

## Automatic Gear Cutting Machines

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

## Axles

Hopkins, F. H. & Co., Montreal.  
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

## Babbitt Metal

Petrie, H. W., Toronto.  
Pittsburgh Shafting Co., Detroit, Mich.  
Syracuse Smelting Works, Montreal.

## Banks

Bank of Hamilton, Hamilton, Ont.  
Bar Iron and Steel  
Bourne-Fuller Co., Cleveland, Ohio.  
Hopkins, F. H. & Co., Montreal.  
Leslie, A. C. & Co., Montreal.  
Rice Lewis & Son, Toronto.

## Belt Dressing

McLaren, J. C. Belting Co., Montreal and Toronto.  
Petrie, H. W., Toronto.  
Rossendale Belting Co., Toronto.  
Williams, A. R. Machinery Co., Toronto.

## Belt Fasteners

Bristol Co., Waterbury, Conn.  
McLaren, D. K., Montreal and Toronto.  
McLaren, J. C. Belting Co., Montreal and Toronto.  
Petrie, H. W., Toronto.  
Rossendale Belting Co., Toronto.  
Williams, A. R. Machinery Co., Toronto.

## Belting (Cotton)

Dominion Belting Co., Hamilton, Ont.  
Flaming, W. A. & Co., Montreal.  
Grey, Wm. & J. G., Toronto.  
McLaren, D. K., Montreal and Toronto.  
McLaren, J. C. Belting Co., Montreal and Toronto.  
Petrie, H. W., Toronto.  
Pittsburgh Shafting Co., Detroit, Mich.  
Reddaway, F. & Co., Manchester, England.  
Rossendale Belting Co., Toronto.

## Belting (Leather)

Flaming, W. A. & Co., Montreal.  
Grey, Wm. & J. G., Toronto.  
McLaren, D. K., Montreal and Toronto.  
McLaren, J. C. Belting Co., Montreal and Toronto.  
Petrie, H. W., Toronto.  
Pittsburgh Shafting Co., Detroit, Mich.  
Reddaway, F. & Co., Manchester, England.  
Rice Lewis & Son, Toronto.  
Sadler & Haworth, Montreal and Toronto.  
Williams, A. R. Machinery Co., Toronto.

## Belting (Rubber)

Grey Wm. & J. G., Toronto.  
Gutta Percha & Hubber Mfg. Co., Toronto.  
McLaren, D. K., Montreal and Toronto.  
Petrie, H. W., Toronto.  
Pittsburgh Shafting Co., Detroit, Mich.

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## Belting and Supplies

Bristol Co., Waterbury, Conn.  
 Dominion Belting Co., Hamilton, Ont.  
 Fleming, W. A. & Co., Montreal.  
 Greer, Wm. & J. G., Toronto.  
 Gutta Percha & Rubber Mfg. Co., Toronto.  
 Jeffrey Mfg. Co., Columbus, Ohio.  
 McLaren, D. K., Montreal and Toronto.  
 McLaren, J. O. Belting Co., Montreal and Toronto.  
 Petrie, H. W., Toronto.  
 Pittsburgh Shafting Co., Detroit, Mich.  
 Reddaway, F. & Co., Manchester, England.  
 Rice Lewis & Son, Toronto.  
 Rosendale Belting Co., Toronto.  
 Williams, A. R. Machinery Co., Toronto.

## Blast Furnace Brick

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

## Blowers

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

## Boiler Compounds

Canada Chemical Mfg. Co., London, Ont.  
 Lord, Geo. W. Co., Philadelphia, Pa.  
 Sleeth, D., Montreal.

## Boiler Inspection

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

## BOILERS (See Engines and Boilers)

## Brass Founders

Hamilton Brass Mfg. Co., Hamilton, Ont.  
 Meadows, Geo. B. Wire, Iron & Brass Works Co., Toronto.  
 Penberthy Injector Co., Windsor, Ont.

## Brick and Bricklaying Machinery

Allis-Chalmers-Bullock, Limited, Montreal.

## Building and Paving Brick

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

## Building Iron and Steel

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

## Builders' Materials

Albert Mfg. Co., Hillsboro, Ont.  
 Canada Foundry Co., Toronto.  
 Canadian Otis Elevator Co., Toronto.  
 Expanded Metal & Fireproofing Co., Toronto.  
 Gartschore, John J., Toronto.  
 Hopkins, F. H. & Co., Montreal.  
 Meadows, Geo. B. Wire, Iron & Brass Works, Toronto.  
 Metallic Roofing Co., Toronto.  
 Owen Sound Portland Cement Co., Owen Sound, Ont.  
 Pittsburgh Shafting Co., Detroit, Mich.  
 Rice Lewis & Son, Toronto.  
 Sheldon & Sheldon, Galt, Ont.

## Cables

Dominion Wire Rope Co., Montreal.  
 Greening, B. Wire Co., Hamilton, Ont.  
 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-Dalsell Crucible Co., Pittsburg, Pa.

## Card Clothing

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

## Cast Iron Pipe

Canada Foundry Co., Toronto.  
 Gartschore-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)

Greer, Wm. & J. G., Toronto.  
 Kerr Engine Co., Walkerville, Ont.  
 McDougall, John, Caledonian Iron Works Co., Montreal.

## Cement Machinery

Allis-Chalmers-Bullock, Limited, Montreal.  
 Bradley Pulverizer Co., Boston, Mass.  
 Greer, Wm. & J. G., Toronto.  
 McDougall, John, Caledonian Iron Works Co., Montreal.

## 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, Thomas & Son, Toronto.

## Clay Working Machinery

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

## Coal and Coke

Bourne-Fuller Co., Cleveland, Ohio.  
 Bynnton, F. M., Inc., Buffalo, N.Y. and Pittsburg, Pa.  
 Brownlee, J., Galt, Ont.  
 Burton, Beldler & Phillips Co., Cleveland, Ohio.  
 Ferguson, J. D., Hamilton, Ont.  
 Hoffman, Jules G., Detroit, Mich.  
 Milnes, James H. & Co., Toronto.  
 Nyles' Thos. Sons, Hamilton, Ont.  
 Pittsburgh Coal Co., Pittsburg, Pa.  
 Rochester & Pittsburg Coal & Iron Co., Buffalo, N.Y.  
 Shawmut Coal & Coke Co., St. Mary's, Pa.  
 Shepard, Charles G., Buffalo, N.Y.  
 Shipman, O. W. Co., Detroit, Mich.  
 Wick, H. K. & Co., Buffalo, N.Y.  
 Wilson H. T. Coal Co., Detroit, Mich.

## Coal Cutting Machines

Allis-Chalmers-Bullock, Limited, Montreal.  
 Canadian Rand 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

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

## Collection Agency

Petrie, H. D., Hamilton, Ont.

## Concrete Mixers

Hopkins, F. H. & Co., Montreal

## Contractors' Machinery

Allis-Chalmers-Bullock, Limited, Montreal.  
 Gartschore, John J., Toronto.  
 Hopkins, F. H. & Co., Montreal.  
 McDougall, John, Caledonian Iron Works Co., Montreal.  
 Schutte & Koerting Co., Philadelphia, Pa.

## Contractor's Plants

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

## Conveying Machinery

Allis-Chalmers-Bullock, Limited, Montreal.  
 Babcock & Wilcox, Limited, Montreal.  
 Borden & Selleck Co., Chicago, Ill.  
 Canada Foundry Co., Toronto.  
 Greer, Wm. & J. G., Toronto.  
 Jeffrey Mfg. Co., Columbus, Ohio.  
 Link-Belt Engineering Co., Philadelphia, Pa.  
 McDougall, John, Caledonian Iron Works Co., Montreal.  
 Ferris, William R. & Co., Limited, Toronto.  
 Pittsburgh Shafting Co., Detroit, Mich.  
 Rosendale Belting Co., Toronto.

## Copper Materials

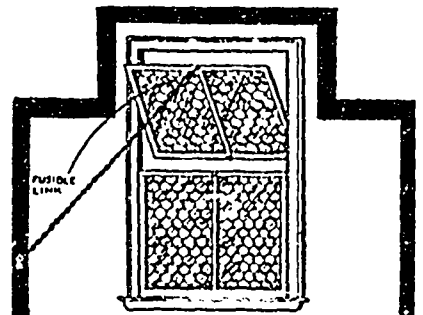
Greening, B. Wire Co., Hamilton, Ont.  
 Phillips, Eugene F. Electrical Works, Montreal.  
 Syracuse Smelting Works, Montreal.  
 Wire & Cable Co., Montreal.

## Corundum

Canada Corundum Co., Toronto.

## Corundum Wheels

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



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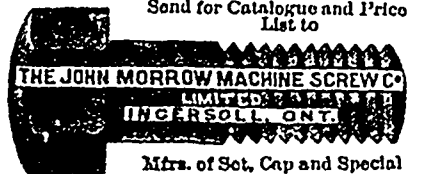
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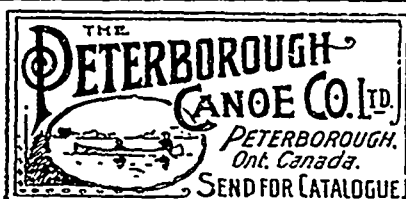
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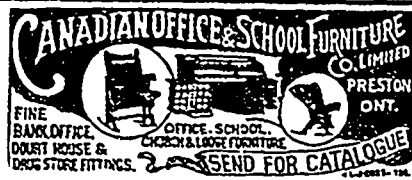
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 Lowell Crayon Co., Lowell, Mass.

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 McCullough-Dalsell Crucible Co., Pittsburg, Pa.  
 Pittsburg Crucible Works, Pittsburg, Pa.  
 Syracuse Smelting Works, Montreal.

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 Pittsburg Crucible Works, Pittsburg, Pa.

**Crucible Covers**  
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**Decalcomania**  
 Meyerscord Co., Chicago, Ill.

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 Dewar Detective Agency, St. Louis, Mo.

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

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 Kelly's Directories, Limited, Toronto.

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

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 Canada Machinery Co., Sarnia, Ont.  
 Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
 London Machine Tool Co., London, Ont.  
 Petrie, H. W., Toronto.  
 Pittsburgh Shafting Co., Detroit, Mich.

**Drills (Pneumatic and Rock)**  
 Allis-Chalmers-Bullock, Limited, Montreal.  
 Canadian Rand Drill Co., Sherbrooke, Que.  
 Jeffrey Mfg. Co., Columbus, Ohio.

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 Globe Machine & Stamping Co., Cleveland, Ohio.

**Drop Forging Dies**  
 Globe Machine & Stamping Co., Cleveland, Ohio.

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 Sturtevant, B. F. Co., Boston, Mass.

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

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 Berson, W. T. & Co., Montreal.  
 Brunner, Mond & Co., Northwich, England.  
 Canada Chemical Mfg. Co., London, Ont.  
 Casella Color Co., New York City.  
 Geary Anilins & Extract Co., New York City.  
 McArthur, Cornille & Co., Montreal.  
 Nicholls Chemical Co., Montreal.  
 Winn & Holland, Montreal.

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**Electric Motors and Transformers**  
 Allis-Chalmers-Bullock, Limited, Montreal.  
 Packard Electric Co., St. Catharines, Ont.

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

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 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.

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 Canadian Otis Elevator Co., Toronto.

Darling Bros., Montreal.  
 Greey, Wm. & J. G., Toronto.  
 Jeffrey Mfg. Co., Columbus, Ohio.  
 Link-Belt Engineering Co., Philadelphia, Pa.

**Elevator Insurance**  
 Canadian Casualty & Boiler Insurance Co., Toronto

**Emery and Emery Wheels**  
 Canadian Corundum Wheel Co., Hamilton, Ont.  
 Forman, John, Montreal.  
 Petrie, H. W., Toronto.

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

**Engineers (Civil)**  
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 Parke, R. J., Toronto.  
 Vogel, C. H., Ottawa.

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 Electrical Construction Co., London, Ont.  
 Hunt, Robert W. & Co., Chicago, Ill.  
 Marion & Marion, Montreal.  
 Parke, R. J., Toronto.  
 Perrin, William R. & Co., Limited, Toronto.  
 Simpson, T. T., Deschenes, Que.  
 Vogel, C. H., Ottawa.  
 Volta Electric Repair Works, Toronto.  
 Von der Osten, E. & Co., Toronto.

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 Canada Foundry Co., Toronto.  
 Darling Bros., Montreal.  
 Electrical Construction Co., London, Ont.  
 McDougall, John, Caledonian Iron Works Co., Montreal.  
 Robb Engineering Co., Amherst, N.S.

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 Allis-Chalmers-Bullock, Limited, Montreal.  
 Canadian General Electric Co., Toronto.  
 Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
 Crocker-Wheeler Co., St. Catharines, Ont.  
 DeLano-Osborn Engineering Co., Toronto.  
 Electric Engineering & Supply Co., Montreal.  
 Electrical Construction Co., London, Ont.  
 Jones & Moore Electric Co., Toronto.  
 Marion & Marion, Montreal.  
 Toronto & Hamilton Electric Co., Hamilton, Ont.  
 United Electric Co., Toronto.  
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 Worth & Martin, Toronto.

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 Darling Bros., Montreal.  
 DeLano-Osborn Engineering Co., Toronto.  
 Electrical Construction Co., London, Ont.  
 Greey, Wm. & J. G., Toronto.  
 McDougall, John, Caledonian Iron Works Co., Montreal.  
 Hunt, Robert W. & Co., Chicago, Ill.  
 Kerr Engine Co., Wakeville, Ont.  
 Marion & Marion, Montreal.  
 Robb Engineering Co., Amherst, N.S.  
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 Mills, S. D., Toronto.

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 Canada Foundry Co., Toronto.  
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 Goldie & McCulloch Co., Galt, Ont.  
 Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
 Hopkins, F. H. & Co., Montreal.  
 McDougall, John, Caledonian Iron Works Co., Montreal.

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 Pittsburgh Shafting Co., Detroit, Mich.  
 Robb Engineering Co., Amherst, N.S.  
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 Williams, A. R. Machinery Co., Toronto.

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

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

# CLASSIFIED INDEX.

(CONTINUED).

## Exhaust Heads

Burt Mfg. Co., Akron, Ohio.  
Darling Bros., Montreal.  
Sueddon & Sheldon, Galt, Ont.

## Exhausters

Schutte & Koerting Co., Philadelphia, Pa.

## Explorer and Geologist

Erans, Horace F., Ashcroft, B.C.

## Factory Sites

(See Factory Locations, page 35).  
Central Ontario Power Co., Peterboro, Ont.  
Hutchison, S. M., Paisley, Ont.  
Roland, Chas. F., St. Catharines, Ont.

## Feed Water Heaters

Babcock & Wilcox, Limited, Montreal.  
Larling Bros., Montreal.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Schutte & Koerting Co., Philadelphia, Pa.

## Fires

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

## Financial

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

## Filters (Oil)

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

## Filters and Filtering Systems (Water)

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

## Fire Brick and Clay

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

## Fire Escapes

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

## Flour Mill Machinery

Goddie & McCulloch Co., Galt, Ont.  
Grey, Wm. & J. G., Toronto

## Forges and Blowers

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

## Founders

Canada Foundry Co., Toronto.  
Cowan & Co., Galt, Ont.  
Guthrie-Thomson Pipe & Foundry Co., Hamilton, Ont.  
Goddie & McCulloch Co., Galt, Ont.  
Grey, Wm. & J. G., Toronto.  
Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.

## Foundry Facings and Supplies

Hamilton Facing Mill Co., Hamilton, Ont.

## Fuel Economizers

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

## Furniture (Lodge, Opera and School)

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

## Galvanizing

Ontario Wind Engine & Pump Co., Toronto.

## Galvanizing and Tinning Machinery and Furnaces (Wire)

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

## Gas and Gasoline Engines

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

## Gauges (Recording Pressure)

Bristol Co., Waterbury, Conn.

## Gauges (Steam)

Penberthy Injector Co., Windsor, Ont.  
Petrie, H. W., Toronto.  
Williams, A. R. Machinery Co., Toronto.

## Gauges (Water)

Babcock & Wilcox, Limited, Montreal.  
Penberthy Injector Co., Windsor, Ont.

## Generators

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

## Gloves, Mittens and Moccasins

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

## Glue Heaters

Advance Machinery Co., Toledo, Ohio.  
Grey, Wm. & J. G., Toronto.

## 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.  
Grey, Wm. & J. G., Toronto.

## Hardware

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

## Heating and Ventilating Apparatus

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

## Hoisting Engines

Bertram Engine Works Co., Toronto.

## Hoists (Chain and Pneumatic)

Allis-Chalmers-Bullock, Limited, Montreal.  
Canadian Rand Drill Co., Sherbrooke, Que.  
Hopkins, F. H. & Co., Montreal.

## Hose (Fire and Pneumatic)

Gutta Percha & Rubber Mfg. Co., Toronto.  
McLaren, J. C., Belting Co., Montreal and Toronto.

## Hydrants

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

## Hydraulic Accumulators

McDougall, John, Caledonian Iron Works Co., Montreal.

## Hydraulic Machinery

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

## Industrial Plants

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

## Insulated Wires and Cables

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

## Iron and Steel Specialties

Armstrong Mfg. Co., Bridgeport, Conn.  
Bourne-Fuller Co., Cleveland, Ohio.  
Brown & Co., Paris, Ont.  
Canada Foundry Co., Toronto.  
Leslie, A. C. & Co., Montreal.  
London Rolling Mill Co., London, Ont.  
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.  
Pittsburgh Shafting Co., Detroit, Mich.  
Rice Lewis & Son, Toronto.  
Rochester & Pittsburg Coal & Iron Co., Buffalo, N.Y.  
Ryall Machine Screw Co., Montreal.

## Injectors

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

## Iron and Steel Inspection

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

# Dominion Oil Cloth Co.

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Manufacturers of

**Oilcloths** of Every Description.

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Oil-Cloth, Stair Oil-Cloth, etc.

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MONTREAL, Que.

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J. TURNBULL, General Manager.

HEAD OFFICE, HAMILTON, ONT.

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Vancouver, B.C.	Winnipeg, Man.

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 Wrenches,

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 Plate Tubes.

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 Then why not  
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The best advertisers in the  
 country—and they are all  
 thinkers—tell you how to  
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 The Retailer and Advertiser

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 world are presented weekly.

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 BRAINS you miss the benefit  
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 who have given years to the  
 study of advertising.

Five dollars a year is all it costs, and  
 its worth it. Sample copy 15 cents.

**JAMES KNAPP REEVE**  
 PUBLISHER  
 DEPOSIT, N. Y.

**CLASSIFIED INDEX.**

(CONTINUED).

**Lamps—Electric**

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

**Lathes**

Barnes, B. F. Co., Rockford, Ill.  
 Canada Machinery Co., Sarnia, Ont.  
 Cowdry, C. H. Machine Works, Fitchburg, Mass.  
 London Machine Tool Co., London, Ont.  
 Petrie, H. W., Toronto.  
 Williams, A. R. & Co., Toronto.

**Lathes (Wood-working)**

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

**Lubricators**

Penberthy Injector Co., Windsor, Ont.

**Machinists**

Bertram Engine Works Co., Toronto.  
 Goldie & McCulloch Co., Galt, Ont.  
 Greay, Wm. & J. G., Toronto.  
 London Machine Tool Co., London, Ont.  
 Worth & Martin Toronto.

**Machinists' Supplies**

Armstrong Mfg. Co., Bridgeport, Conn.  
 Butterfield & Co., Rock Island, Que.  
 Canada Machinery Co., Sarnia, Ont.  
 Goldie & McCulloch Co., Galt, Ont.  
 Gutta Percha & Rubber Mfg. Co., Toronto.  
 Hopkins, F. H. & Co., Montreal.  
 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.  
 Worth & Martin, Toronto.

**Machine Tools**

Barnes, B. F. Co., Rockford, Ill.  
 Becker-Brainard Milling Machine Co., Hyde Park,  
 Mass.  
 Canada Machinery Co., Sarnia, Ont.  
 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  
 Greay, Wm. & J. G., Toronto.

**Malleable Iron Castings**

Smith's Falls Malleable Castings Co., Smith's Falls,  
 Ont.

**Marine and Stationary Engines and  
 Boilers**

Allis-Chalmers-Bullock, Limited, Montreal.  
 Bertram Engine Works Co., Toronto.

**Mechanical Draft**

Babcock & Wilcox, Limited, Montreal.  
 McEachren Heating & Ventilating Co., Galt, Ont.  
 Sheldon & Sheldon, Galt, Ont.  
 Sturtevant, B. F. Co., Boston, Mass.

**Metal Gates**

Pago Wire Fence Co., Walkerville, Ont.

**Metal Stamping**

Globe Machine & Stamping Co., Cleveland, Ohio.

**Metallurgists**

Mills, S. D., Toronto.

**Mill Machinery and Supplies**

Allis-Chalmers-Bullock, Limited, Montreal.  
 Armstrong Mfg. Co., Bridgeport, Conn.  
 Becker-Brainard Milling Machine Co., Hyde Park,  
 Mass.

Darling Bros., Montreal.  
 Fleming, W. A. & Co., Montreal.  
 Gartshore, John J., Toronto.  
 Goldie & McCulloch Co., Galt, Ont.  
 Greay, Wm. & J. G., Toronto.  
 Gutta Percha & Rubber Mfg. Co., Toronto.  
 Hamilton Brass Mfg. Co., Hamilton, Ont.  
 Hamilton, Wm., Mfg. Co., Peterborough, Ont.  
 Hawksworth, Alfred, Montreal.  
 Hay, Peter Knife Co., Galt, Ont.  
 Hopkins, F. H. & Co., Montreal.  
 Jeffrey Mfg. Co., Columbus, Ohio.  
 London Machine Tool Co., London, Ont.  
 Morrow, John, Machine Screw Co., Ingersoll, Ont.  
 McDougall, John, Caledonian Iron Works Co., Mont-  
 real.  
 McLaren, D. K., Montreal and Toronto.  
 Penberthy Injector Co., Windsor, Ont.

Petrie, H. W., Toronto.  
 Pittsburgh Shafting Co., Detroit, Mich.  
 Reddaway, F. & Co., Manchester, England.  
 Rice Lewis & Son, Toronto.  
 Robb Engineering Co., Amherst, N.S.  
 Ryall Machine Screw Co., Montreal.  
 Spence, R. & Co., Hamilton, Ont.  
 Wilson, J. C. & Co., Glenora, Ont.

**Milling Cutters and Machines**

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

**Minors' Lamps**

Allis-Chalmers-Bullock, Limited, Montreal.  
 Anton, John & Son, Monongahela, Pa.

**Mining Machinery**

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

**Motors and Dynamos**

Allis-Chalmers-Bullock, Limited, Montreal.  
 Canadian General Electric Co., Toronto.  
 Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
 Corbett, R. B., Brooklyn, N.Y.  
 Electrical Construction Co., London, Ont.  
 Forman, John, Montreal.  
 Jeffrey Mfg. Co., Columbus, Ohio.  
 Jones & Moore Electric Co., Toronto.  
 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

**Nickel**

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

**Novelty Manufacturers**

Worth & Martin, Toronto.

**Nozzles**

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

**Office and Bank Fittings**

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

**Oils and Lubricants**

Dixon, Jas. Crucible Co., Jersey City, N.J.  
 Fleming, W. A. & Co., Montreal.  
 Imperial Oil Co., Petrols, 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.  
 Berry Bros., Walkerville, Ont.  
 Fleming, W. A. & Co., Montreal.  
 Geigy, Aniline & Extract Co., New York City.  
 McArthur, Cornelius & Co., Montreal.

**Paper Manufacturers**

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

**Patents**

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

**Perforated Metals**

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

**Personal Accident**

Canadian Casualty & Boiler Insurance Co., Toron-

**Phosphorizers**

McCullough-Dalsell 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, Mont-real.

**Pipe (Riveted, Iron and Steel)**

Babcock & Wilcox, Limited, Montreal.  
 McDougall, John, Caledonian Iron Works Co., Mont-  
 real.



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(CONTINUED).

## Pipe Threading Machines

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

## Pipes and Tubes

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

## Plaster

Albert Mfg. Co., Hillborough, N.B.

## Plates

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

## Plumbago

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

## Pneumatic Tools

Allis-Chalmers-Bullock, Limited, Montreal.  
Canadian Hand Drill Co., Sherbrooke, Que.

## Pointer Bolls (For Rods and Wire)

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

## Portland Cement

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

## Power Plants—Equipments

Allis-Chalmers-Bullock, Limited, Montreal.  
Babcock & Wilcox, Limited, Montreal.  
Canadian General Electric Co., Toronto.  
Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
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.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Marland Electric Co., St. Catharines, Ont.  
Petrie, William R. & Co., Limited, Toronto.  
Petrie, H. W., Toronto.  
Phillips, Eugene F., Electrical Works, Montreal.  
Pittsburgh Shafting Co., Detroit, Mich.  
Robb Engineering Co., Amherst, N.S.  
Sartrevaux, D. F. Co., Boston, Mass.  
Toronto & Hamilton Electric Co., Hamilton, Ont.  
United Electric Co., Toronto.  
Wilson, J. C. & Co., Glenora, Ont.

## Presses (Tire, Sewer Pipe, Nozzles and Sleeves)

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., Glenora, Ont.

## Pumps and Pumping Machinery

Allis-Chalmers-Bullock, Limited, Montreal.  
American Steam Pump Co., Battle Creek, Mich.  
Canada Foundry Co., Toronto.  
Corbett, R. B., Brooklyn, N.Y.  
Darling Bros., Montreal.  
Downie Pump Co., Downieville, Pa.  
Goldie & McCulloch Co., Galt, Ont.  
Jeffrey Mfg. Co., Walkerville, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Ontario Wind Engine & Pump Co., Toronto.  
Petrie, H. W., Toronto.  
Rohrer & Koerting Co., Philadelphia, Pa.

## Punches and Shears

Canada Machinery Co., Sarnia, Ont.  
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.

## Railway Supplies

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

## Reamers

Butterfield & Co., Rock Island, Que.

## Rivets

Bourne-Fuller Co., Cleveland, Ohio.

## Rock and Ore Crushers

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

## Roller Bearings

Pittsburg Shafting Co., Detroit, Mich.

## Bolling Mill Engineers

Bourne-Fuller Co., Cleveland, Ohio.

## Roofing

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

## 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 Co., 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.

## Shafting

Allis-Chalmers-Bullock, Limited, Montreal.  
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.

## Shapers and Carvers

Advance Machinery Co., Toledo, Ohio.

## Shear Knives

Hay, Peter Knife Co., Galt, Ont.

## Sheets (Iron and Steel)

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.  
Pedlar People, Oshawa, Ont.

## Sheet Metal Stamping

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

## Ship Builders

Bertram Engine Works Co., Toronto.

## Smoke Stacks

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

## Solder

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

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# CLASSIFIED INDEX.

(CONTINUED).

## Special Machinery

Allis-Chalmers-Bullock, Limited, Montreal.  
Globe Machine & Stamping Co., Cleveland, Ohio.

## Speed Recorders

Bristol Co., Waterbury, Conn.

## Sprinkler Insurance

Canadian Casualty & Boiler Insurance Co., Toronto.

## Stamps and Stencils

Globe Machine & Stamping Co., Cleveland, Ohio.

## Steam Pumps

Allis-Chalmers-Bullock, Limited, Montreal.  
American Steam Pump Co., Battle Creek, Mich.  
Canada Foundry Co., Toronto.  
Darling Bros., Montreal.  
Goldie & McCulloch Co., Galt, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Petrie, H. W., Toronto.  
Pittsburgh Shafting Co., Detroit, Mich.  
Williams, A. R. Machinery Co., Toronto.

## Steam Separators

Babcock & Wilcox, Limited, Montreal.  
Darling Bros., Montreal.  
McEachren Heating & Ventilating Co., Galt, Ont.  
Sheldon & Sheldon, Galt, Ont.

## Steam Specialties

Darling Bros., Montreal.  
McEachren Heating & Ventilating Co., Galt, Ont.  
Penberthy Injector Co., Windsor, Ont.  
Schutte & Koerting Co., Philadelphia, Pa.  
Sheldon & Sheldon, Galt, Ont.

## Steam Valves

American Steam Pump Co., Battle Creek, Mich.  
Babcock & 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 Balls

Algoma Steel Co., Sault Ste. Marie, Ont.  
Drummond, McCall & Co., Montreal and Toronto.  
Gartshore, John J., Toronto.  
Hopkins, F. H. & Co., Montreal.

## Steel Shafting

Darling Bros., Montreal.  
Goldie & McCulloch Co., Galt, Ont.  
Greay, Wm. & J. G., Toronto.  
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.  
Pittsburg 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-Daisell Crucible Co., Pittsburg, Pa.  
Pittsburg Crucible Works, Pittsburg, Pa.

## Structural Steel

Bourne-Fuller Co., Cleveland, Ohio.  
Janada Foundry Co., Toronto.  
Hopkins, F. H. & Co., Montreal.

## Sulphur Furnace

Schutte & Koerting Co., Philadelphia, Pa.

## Suspension Furnaces

Continental Iron Works Co., New York City.

## Tanks (Oil and Water)

Janada Foundry Co., Toronto.  
Jorbett, 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.

## Taps and Dies

Butterfield & Co., Rock Island, Que.  
Globe Machine & Stamping Co., Cleveland, Ohio.

## Tees

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

## Textile Manufacturers

Dominion Oil Cloth Co., Montreal.  
Smith Mfg. Co., Toronto.  
Storey, W. H. & Sons, Acton, Ont.

## Textile Supplies

Greay, Wm. & J. G., Toronto.  
McLaren, J. C. Bolting Co., Montreal and Toronto.

## Thermometers (Recording)

Bristol Co., Waterbury, Conn.

## Tin

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

## Tool Grinders

Barnes, B. F. Co., Rockford, Ill.

## Tool Steel

Bourne-Fuller Co., Cleveland, Ohio.  
Hopkins, F. H. & Co., Montreal.  
Leslie, A. C. & Co., Montreal.

## Transfer Ornaments

Meyercord Co., Chicago, Ill.

## Trucks

Corbett, R. B., Brooklyn, N.Y.  
Greay, Wm. & J. G., Toronto.  
Hopkins, F. H. & Co., Montreal.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Sheldon & Sheldon, Galt, Ont.

## Trucks (Railway)

Canada Foundry Co., Toronto.

## Trucks (Wire Mill Supplies)

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

## Tubs (Cleaning and Coating Wire)

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.  
Greay, Wm. & J. G., 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.  
Babcock & Wilcox, Limited, Montreal.  
Canada Foundry Co., Toronto.  
Hamilton Brass Mfg. Co., Hamilton, Ont.  
Kerr Engine Co., Walkerville, Ont.  
Petrie, H. W., Toronto.  
Schutte & Koerting Co., Philadelphia, Pa.  
Williams, A. R. Machinery Co., Toronto.

## Valves (Rubber)

Gutta Percha & Rubber Mfg. Co., Toronto.

## Varnishes

Berry Bros., Walkerville, Ont.

## Ventilators

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

## Wagon and Carriage Wood Work

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

## Washers or Rollers (Cleaning Rubber)

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

## Water Power Development

Vogel, C. H., Ottawa.

## Water Purifying Chemicals

Canada Chemical Mfg. Co., London, Ont.  
Lord, Geo. W. Co., Philadelphia, Pa.  
Sleeth, D., Montreal.

## Windmills

Ontario Wind Engine & Pump Co., Toronto.

## Wire Mill Supplies

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

## Wire and Wire Rope

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

## Wire Rope Fittings

Dominion Wire Rope Co., Montreal.

## Wire Cloth

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

## Wire Drawing Machinery

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

## Wire Fencing and Netting

Page Wire Fence Co., Walkerville, Ont.

## Wire Specialties

Meadows, Geo. B. Wire, Iron & Brass Works Co., Toronto.  
Page Wire Fence Co., Walkerville, Ont.

## Wood-Working Machinery

Advance Machinery Co., Toledo, Ohio.  
Canada Machinery Co., Sarnia, Ont.  
Cordrey, C. H., Machine Works, Fitchburg, Mass.  
Goldie & McCulloch Co., Galt, Ont.  
London Machine Tool Co., London, Ont.  
Petrie, H. W., Toronto.  
Sheldon & Sheldon, Galt, Ont.  
Smith, H. B., Machine Co., Smithville, N.J.  
Williams, A. R. Machinery Co., Toronto.

## Yachts

Bertram Engine Works Co., Toronto.

## Zinc

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