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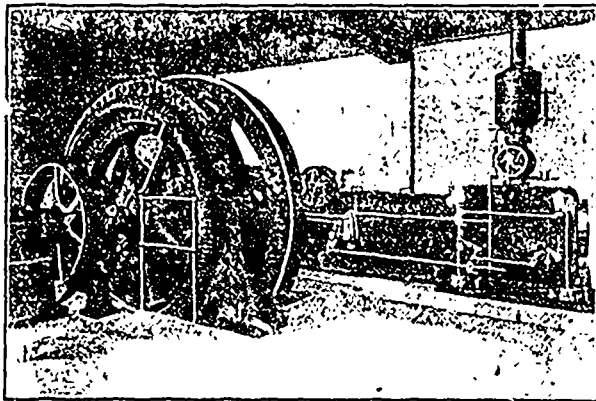
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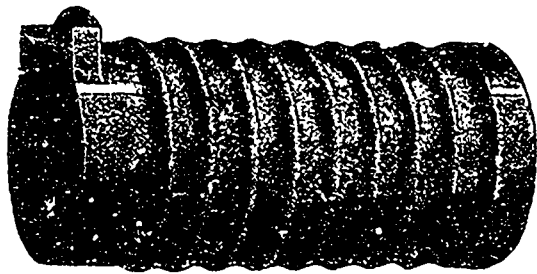
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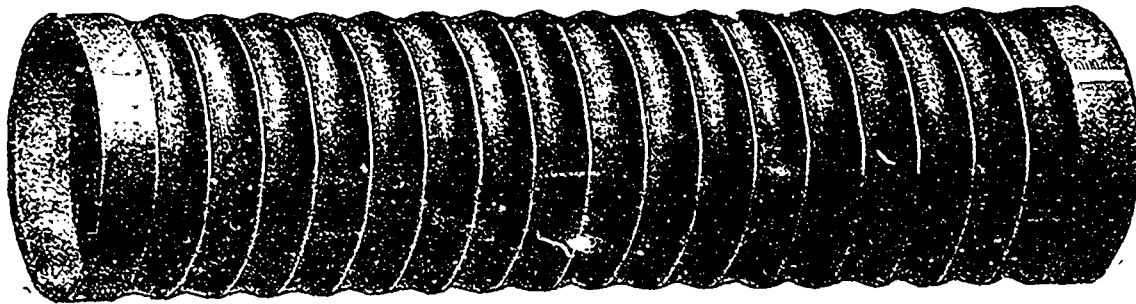


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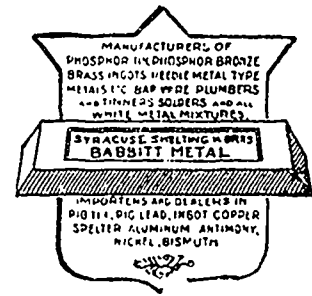
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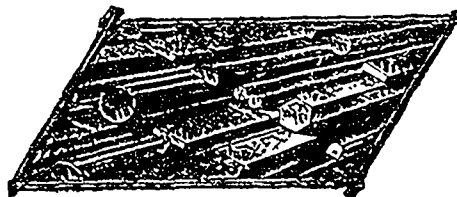
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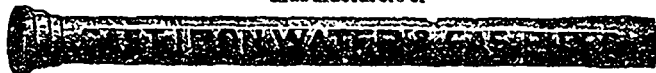
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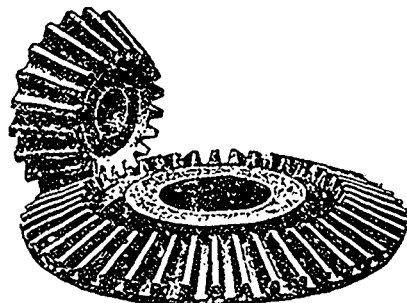
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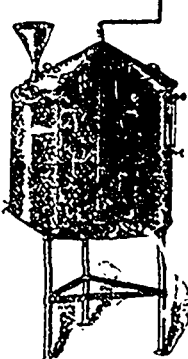
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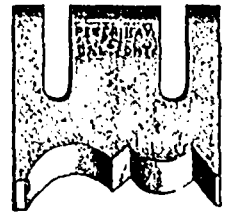
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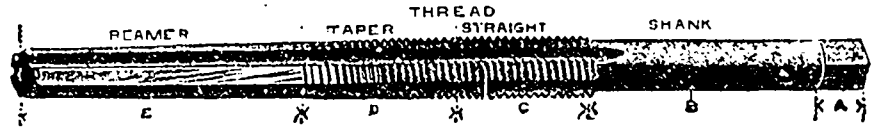
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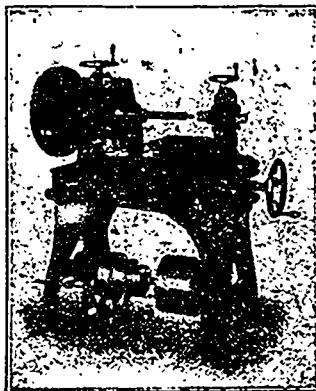
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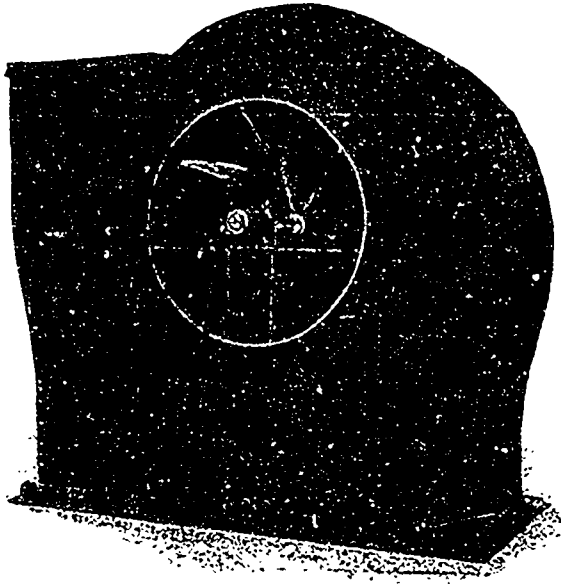
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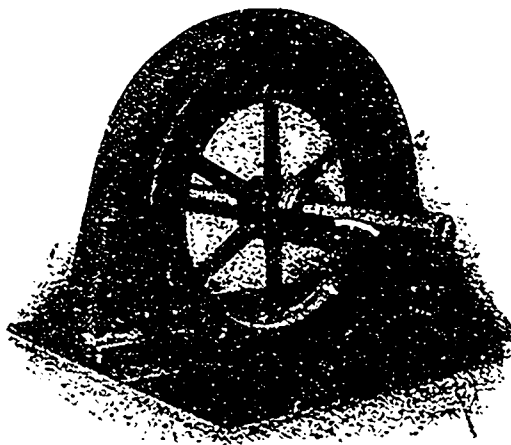
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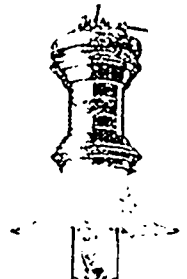
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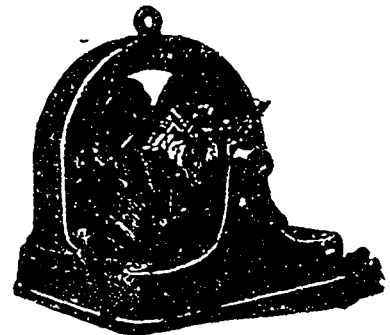
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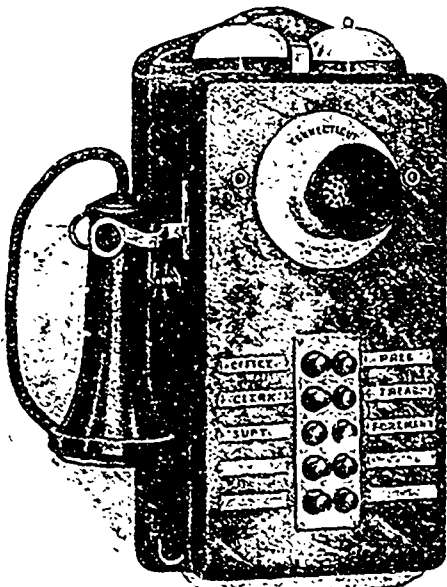


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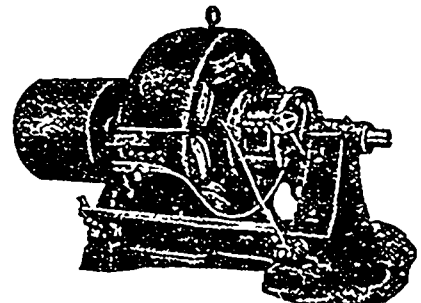
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Manufacturing Plant Number.	Total Horse Power.	Horse-Power to drive Shafting.	Per Cent. to Drive Shafting.	Manufacturing Plant Number.	Total Horse Power.	Horse Power to Drive Shafting.	Per Cent. to Drive Shafting.
1.....	400	157	39.2	7.....	40.4	20.7	51.2
2.....	74	57	77	8.....	74.3	40	53.8
3.....	38.6	25.3	65.6	9.....	47.2	24.5	51.8
4.....	59.2	47.9	80.7	10.....	190	108	56.9
5.....	112	64	57	11.....	107	74.5	69.7
6.....	168	91	54.2	12.....	241	114	47.3
Average, heavy machine work.	62.3	Average, light machine work.	55.1

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J. J. CASSIDY, Editor and Manager

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THE CUSTOMS ACT REGARDING COMBINES

Section 18 of the Customs Act reads as follows

"(1). Whenever the Governor in Council has reason to believe that, with regard to any article of commerce, there exists any trust, combination, association or agreement of any kind among manufacturers of such article, or dealers therein, to unduly enhance the price of such article or in any way to unduly promote the advantage of the manufacturers or dealers at the expense of the consumers, the Governor in Council may commission or empower any judge of the Supreme Court or Exchequer Court of Canada, or of any superior court in any Province of Canada to enquire in a summary way into and report to the Governor-in-Council whether such trust, combination, association or agreement exists.

"(2). The judge may compel the attendance of witnesses and examine them under oath and require the production of books and papers, and shall have such other necessary powers as are conferred upon him by the Governor-in-Council for the purposes of such enquiry.

"(3). If the judge reports that such trust, combination, association or agreement exists, and if it appears to the Governor-in-Council that such disadvantage to the consumers is facilitated by the duties of customs imposed on a like article, when imported, then the Governor-in-Council shall place such article on the free list, or so reduce the duty on it as to give the public the benefit of reasonable competition in such article."

IN RESTRAINT OF TRADE.

Coincident with the visit of the Tariff Commission to Toronto was the halting into the courts of what is better known as the plumbers' combine, including about all the plumbers, steam and gas fitters of Toronto and other places in Ontario; certain manufacturers of plumbers, steam and gas fitters' supplies, and the members of a labor union who work in the plumbing, steam and gas fitting business. For several days the gentlemen of the Tariff Commission were edified with scare head announcements in the newspapers in which many exaggerated statements were made. Since then other discoveries have been made in which it is claimed that manufacturers in other lines had combined in restraint of trade. The allegations in all these matters are being investigated

Another Tariff Edition.

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

in the courts, and no doubt British justice will be meted out to those who may deserve punishment.

A feature of the affair, and a noisy feature it is, is the cry that goes up from the unthinking ones, that the only cure for such combines is the lowering or entire abolition of the duties upon such lines of products as are made by the accused. It does not seem to them that there is any other mode of punishment for offenders against the law forbidding combines.

Suppose the demands of these unthinking people were acceded to, and the articles in question placed upon the free list? What then? Every manufacturer implicated would have to go out of business, and there are many of them in Canada, who are not implicated. Capital invested would be lost; factories and workshops would be closed, and thousands of workmen would be thrown out of employment. Is it desirable that such conditions prevail? The interdependence that prevails not only in communities, but in trades also would be most violently disturbed; the existing order of things would be disrupted, and a disastrous financial panic would certainly follow. Meantime the industries affected would be unable to meet the requirements of the country, and the deficiencies would be made good by imports of foreign goods.

There should be no panic. If vindictiveness must be shown—if punishment must be meted out—leave it to the law of the land to do what is right and proper. Punish those who violate the law, but do not punish every man, woman, and child in Canada. Hands off the tariff.

THE TARIFF COMMISSION.

At the annual meeting of the Canadian Manufacturers' Association held in the city of Quebec in September last, the tariff committee submitted a most interesting report, including the following:

"The most important event of the year for the manufacturing industries of Canada is the appointment of the Tariff Commission, which is now commencing its investigations. To the work of this commission the association

has looked forward for three years; and we believe that we may anticipate a revision, which will produce a favorable effect in the development of our industries.

"It is to be regretted that more tariff changes were not included in the last budget speech of the Minister of Finance, so as to afford an immediate measure of relief to those industries which are being seriously crippled under present conditions. In behalf of these we can only urge that the revised tariff be put into operation at as early a date as possible.

"Your committee is desirous that every reasonable effort shall be made by the members and sections of the association to assist the Tariff Commission in its work, particularly in supplying the fullest information, and in reconciling conflicting interests.

"In conclusion your committee desires to re-affirm the tariff resolution passed at the annual meeting of the association at Halifax in 1902."

The salient feature of that Halifax resolution was as follows:

"Resolved that in the opinion of this association the changed conditions which now obtain in Canada demand the immediate and thorough revision of the tariff upon lines which will more effectually transfer to the workshops of our Dominion the manufacture of many of the goods which we now import from other countries."

In the report of the proceedings of the convention, as published in *Industrial Canada*, regarding this matter, it is stated that

"The report of the tariff committee having been received in private session, the discussions which followed are not published with the other convention proceedings. It had been thought advisable, however, that for the benefit of those members who were unable to be present, a general outline should be given of the principal points covered in that discussion, in order that the feeling of the meeting might be distinctly understood.

"Perhaps the most important point arising out of the report was the appointment of the Tariff Commission. The association had been agitating for a commission for the past three years, and while the one the Government has appointed was not, perhaps, just what could have been desired, still its appointment was, nevertheless, a great concession to the views of the association, and an important event for the welfare of the whole Dominion. It was believed that the Government was prompted by an earnest and sincere desire to provide a better and a higher tariff for the protection of Canadian industries.

"In facilitating the work of the commission it was strongly urged that the association should endeavor to assist them in every way in its power. When placing any matter before the government the association had always claimed to represent the concrete views of its members. To arrive at those concrete views it was necessary that the various sections of the association should first get together and thresh out all the points connected with their several businesses, one by one. These reports, when thoroughly threshed out and approved by the tariff committee should be presented by representatives from each section, and, if possible, in one place only.

"This plan would result in harmonizing differences as far as possible, and in saving the time of the Commission.

"Nothing could be gained by asking too much. The feeling of the meeting was unanimous in the belief that the worst enemies the association had, the worst enemies the policy of protection had, were those manufacturers, whose requests were extreme, and those who took advantage of the protection accorded them to charge extravagant prices. The association's boast was, that

with a good protective policy competition within the country would in time bring prices down to the level of or even below foreign prices."

The report of the tariff committee and the entire discussion thereon, occupied less than one page of *Industrial Canada*.

As stated by the chairman of the committee, the Government Tariff Commission were then prosecuting their investigations with a view to making such changes in the tariff as to them might seem desirable. The association had been demanding the immediate and thorough revision of the tariff ever since the Halifax meeting three years before, reiterated in precise terms at Toronto in 1903, and at Montreal in 1904; and surely, in view of the conditions, the association should have been fully prepared and ready to meet the Commission at the first convenient occasion, to facilitate the work of the Commission and to assist them in every way in its power. Surely three years was a sufficiently long time for preparation to formulate a statement of the concrete views of the members. The appointment of the Commission was, we are told, a great concession to the views of the association, and surely the association should have been in readiness to advise and assist the Commission at the first opportunity offering.

The Commission were in session for several days in Montreal in November, but the association was not prepared to advise and assist them in their enquiries into tariff matters, leaving it to individual members to present their views as best they could. In the meantime, the tariff committee sent out a circular notifying the members of the association that the Commission would begin sittings in Toronto the next week; but members were requested to note that the Government Commission would sit later at other places—that members of certain sections should not present their views until their differences of opinion had been harmonized.

As advertised, the Commission were in session in Toronto for several days, but no official representatives of the association appeared before it, but there were many delegations of members whose ideas were to have their own axes ground without reference to the harmony that should exist in all well regulated associations. From Toronto the Commission went to London, Chatham, Hamilton, and other places, affording the association abundant opportunities to be heard, but no requests for hearings were made, but there were numerous delegations and individuals, members of the association, who only made suggestions from their own personal standpoints. At none of the sessions of the Commission were there any attempts made at any harmonizing of differences, nor efforts to save the time of the Commissioners.

PROTECTION MUST BE PROTECTED.

Under the old regime, when the Canadian Manufacturers' Association was a living and active entity, its sole aim was to advocate tariff protection to Canadian manufacturing industries. In fact the objects of the Association were embodied in its constitution in two paragraphs as follows:

1. To secure by all legitimate means the aid of both public opinion and governmental policy in favor of home industries and the promotion of Canadian manufacturing enterprises.

2. To enable those engaged in all branches of Canadian manufacturing enterprises to act in concert as a united body wherever action in behalf of any particular industry or of the whole body becomes necessary.

The qualification for membership in the association was that any person directly interested in any Canadian manufacturing industry was eligible for membership.

From the time of its organization the growth of the association was slow, owing to the fact that there were then but comparatively few manufacturers in Canada. There were some manufacturing concerns, it was true, in Nova Scotia, New Brunswick, Quebec, and Ontario, but virtually none in any of the other parts of the country. They were widely scattered, and but few opportunities were afforded to the manufacturers to come together for consultation regarding the possibilities of united action, and the creation of a public sentiment looking to the adoption by the Dominion Government of tariff protection. The low rates of duty then imposed upon manufactured goods imported into Canada was a great obstacle to the success of the manufacturers of those days; and the idea of tariff protection first began to crystalize in Ontario, where a comparatively few of the pioneers foregathered and organized "The Manufacturers' Association of Ontario," of which James Watson, of Hamilton, was the first president. Mr. Watson was president of the Strathroy Knitting Co., and associated with him in this premier association were R. W. Elliot, of Toronto, a manufacturer of drugs, chemicals, etc.; Thomas Cowan, of Galt, builder of boilers, engines, wood-working machinery, etc.; W. H. Storey, of Acton, manufacturer of gloves, mitts, etc.; William Christie, of Toronto, manufacturer of biscuits, and Joseph Simpson, of Toronto, manufacturer of knit goods, all of whom have passed from this life; and there are yet remaining of that noble army of Captains of Industry, who were co-laborers with those whose names are mentioned, such men as Adam Warnock, of Galt, president of the Galt Knitting Co.; Bennett Rosamond, of Almonte, president of the Rosamond Woolen Co.; George Booth, of Toronto, president of the Booth Copper Co.; William Chaplin, of the Welland Vale Works, St. Catharines; James Goldie, flour miller, of Guelph; John Cowan, president of the Ontario Malleable Iron Works, Oshawa; Henry J. Bird, president of the Bracebridge, Ont., Woolen Mills; Edward Gurney, of the Gurney Foundry Co., Toronto, and many others.

It was during the incumbency of Mr. Watson that the name of the association that had come into existence under his leadership, and of which he was president for three years, was changed to "Ontario Manufacturers' Association," and it was of this organization that R. W. Elliot was president in 1884 and again in 1885; and it was at the annual meeting in this latter year that, at the suggestion of Mr. Elliot, the name was changed to "Canadian Manufacturers' Association." Mr. Elliot and his confreres had given their time unstintedly, and their best services to extend the influence the association

was fast acquiring, knowing that the co-operation of manufacturers throughout Canada was necessary to give it the weight without which it could do but little in shaping public opinion in favor of tariff protection.

It was through the efforts of R. W. Elliot and the "old guard" by whom he was surrounded that the scope of the association was extended, and many manufacturers from other provinces added to the membership; and it was in 1894 that George E. Drummond, representing the Canada Iron Furnace Co., of Montreal, was first vice-president of the association.

There were many other prominent Canadian manufacturers doing business elsewhere than in Ontario, who became members of the association, some of whom were the Dominion Bridge Co. Dominion Oil Cloth Co., Dominion Wire Manufacturing Co., Dominion Wire Rope Co., Robert Gardner & Son, Colin McArthur & Co., McArthur, Corneille & Co., The Robert Mitchell Co., Montreal Pipe Foundry Co., D. Morrice Sons & Co., G. W. Sadler, and the St. Lawrence Sugar Refining Co., all of Montreal; S. T. Will. R., Richelieu Woolen Mills, Chambly Canton, Que.; J. T. Goodhue & Co., Danville, Que.; Royal Pulp & Paper Co., East Angus, Que.; E. B. Eddy Co., Hull, Que.; Carrier, Laine & Co., Levis, Que.; Jencks Machine Co., and Paton Mfg. Co., Sherbrooke, Que.; F. D. Butterfield, Rock Island, Que.; J. A. Cote, St. Hyacinthe, Que.; Montreal Cotton Co., Valleyfield, Que.; Robb Engineering Co., Amherst, N.S.; Acadia Sugar Refining Co., Halifax, N.S.; Nova Scotia Steel & Coal Co., New Glasgow, N.S.; Albert Mfg. Co., Hillsborough, N.B., and others.

The objects these well-known and influential members of the Canadian Manufacturers' Association had in view were to secure by means of both public opinion and governmental policy the promotion of Canadian manufacturing enterprises through adequate tariff protection; and to be able, through the organization of the association to act in concert, as a united body whenever action in behalf of any particular industry or of the whole body might become necessary.

WHAT SHALL WE BUY FROM ENGLAND?

The Minister of Finance has been in many parts of Canada, making enquiries on the tariff question, and meeting the representatives of every interest. From all, except the agriculturists, he hears the same plea—they want more protection on all they manufacture, and less on their raw material. One man tells what his finished products are, and asks for more protection. Another describes these same articles as his raw materials, and asks that they go in the free list, or that the tariff on them be reduced.

The manufacturers ask that what they buy from the United States shall come in free, and that that which comes in from the United States for anybody but themselves shall be kept out by means of prohibitive duties.

Mr. Fielding and the other commissioners hear of many instances also where the tariff against articles that come from England should be increased for the protection of Canadian industries. All our manufacturers' requests are in the direction of narrowing our doorway to British goods. After all his enquiries it is doubtful if Mr. Fielding has a single hint from the manufacturers of Canada

as to what way our doors may be widened to imports from the mother land. Yesterday he put the straight question to some of them: "What are we to buy from England?" He got no answer. They attempt reply by saying that we can buy from England goods now bought from the United States. But what goods? The goods from the United States that they ask the Government to exclude by tariff are goods that they say should not be allowed to get in here, because they injure home industries. They do not want home industries injured even by British goods.

What shall we buy from England? Can one manufacturer offer an answer that another manufacturer will not at once object to? In short, is it not so, that British goods being out are to be kept out if the protectionists have a free rein, while American goods are to be shut out, except where their coming in will benefit the manufacturer?—Toronto News.

Mr. Fielding is easily answered—very easily. The manufacturers nor any other class of the community, desire to exclude British goods. There are many, however, who desire to exclude American goods. Canadian manufacturers, not being able to supply all the demands of Canada for manufactured products, Canadian consumers are quite ready to buy from those who are willing to supply their wants. They know what they want, and the seller, be he a Britisher or a Yankee, can get the trade if the goods are really what is wanted and can be bought at reasonable prices. The Britisher offers what he happens to have or make, which may be taken or not at the pleasure of the purchaser. On the other hand, the Yankee will alter styles and methods, and even machinery for production, to meet the views of purchasers, which his Britisher competitor will not do. And the Yankee seller is a liberal advertiser in Canadian journals, which the Britisher seller is not. See?

THE HOSPITAL FOR SICK CHILDREN.

The Hospital for Sick Children, Toronto, appeals to fathers and mothers for funds to maintain the thousand sick children that it nurses within its walls every year. The Hospital is not a local institution. The sick child from any place in Ontario, who can't afford to pay has the same privileges as the child living in Toronto and is treated free.

The Hospital had last year in its beds and cots 891 patients—316 of these were from 217 places outside of Toronto. The cost is 14 cents per patient per day, and there were 133 sick little ones a day in the Hospital.

Since its foundation the Hospital has treated 11,262 children. About 8,000 of these were unable to pay and were treated free.

Your money can put golden hinges on the door of the Hospital's mercy.

Everybody's dollar may be the Friend in Need to Somebody's child.

Your dollar may be a door of hope to somebody's child. The Hospital pays out dividends of health and happiness to suffering childhood on every dollar that is paid by friends of little children.

Money is the muscle in the arm of the Hospital's mercy,

and every dollar is the sinew in the outstretched hand of the Hospital help and mercy.

"Inasmuch as ye do it unto the least of these my little ones ye do it unto Me." Send your spare dollar or dollars to J. Ross Robertson, chairman of the Hospital Trust, Toronto.

EDITORIAL NOTES.

Something of an Imperial character has been given to the sessions of the Tariff Commission by the attendance of delegates from the British West India Islands. Some time ago the Jamaica Society of Agriculture intimated that a representative of that body would appear before the Commission. The preferential tariff applies to both Jamaica and Trinidad. Canada imports between \$3,000,000 and \$4,000,000 worth annually from the British West Indies, all of which come in under the preferential tariff.

The Imperial Board of Trade have taken up the cudgel on behalf of British business interests, and directed a despatch to the Canadian Government, voicing the strong protest of Old Country exporting houses against the Quebec commercial travelers' tax. In its communication it gives a list of the countries where taxes are imposed on commercial travelers. This goes to show that none of the more enlightened nations of Europe put any such restrictions on international trade. France, Germany, Italy, Spain, and Greece, welcome all the foreign commercial travelers who care to do business in their midst. Moreover, among those countries who do tax travelers, none demand any such figure as is exacted in Quebec. The figures are furnished to bear this statement out. The despatch in question came before the Dominion Cabinet at its last meeting and will be brought to the attention of the Quebec authorities.

The director of the United States Mint, has prepared a statement of the world's production of gold and silver for 1904, which shows total gold valued at \$347,150,700, an aggregate of \$168,493,538 fine ounces of silver, and a commercial value of silver totalling \$97,726,200, the coinage value of which is \$217,850,200. The United States produced:—Gold value, \$80,723,200; silver in fine ounces, \$57,786,100; silver in commercial value, \$33,516,000. Canada produced:—Gold value, \$16,400,000; silver in fine ounces, \$3,718,668; silver in commercial value \$2,156,800. Great Britain produced—Gold value, \$102,400; silver in fine ounces, \$174,517; silver in commercial value, \$101,200. Africa produced:—Gold value, \$85,913,900; silver in fine ounces, \$486,408; silver in commercial value, \$282,100. These figures show an increase of about \$22,000,000 in gold over the bureau's estimate for 1903. The United States shows a gain of about \$7,000,000, and South Africa of \$18,000,000. The director says that both of these countries are still upon a rising scale of production. The world's output in 1905 is expected to exceed that of 1904 by \$25,000,000, with an

other gain probable in 1906. The most important gold field in the world is that of the Transvaal.

The Dominion Department of Agriculture has accepted an official invitation to participate in the international exhibition to be opened at Christchurch, New Zealand, in November, 1908. It is not known yet whether there will be a Canadian pavilion, or whether an allotment of space will be reserved. The chances are that the latter policy will be adopted.

In the report of the Department of Trade and Commerce, Mr. D. H. Ross, Canadian commercial agent, gives the terms of the Canadian Government's invitation to Australia to enter into preferential trade relations. The invitation states that: "His Excellency was moved to enquire whether the Government of the Commonwealth of Australia would be willing to enter into negotiations with the Government of Canada with a view to establishing preferential trade relations between the two countries, and if so, whether the Australian Government would be prepared to offer stated tariff concessions to Canada, or would prefer to make the subject one for consideration at a conference between delegates representing the Canadian and Australian Governments."

The first work undertaken by the reorganized statistical branch of the Agriculture Department at Ottawa is the publication of a work showing the number of males and females engaged in the various departments of Canadian industry. This is based upon data collected in the 1901 census. As the tables will take up a great deal of space, it is possible that those dealing with the manufacturing industry may be brought out first. The work is now in progress, and will be ready early in the new year.

It is understood that the Provincial Treasurer of Quebec has given the Dominion Government assurances that the Commercial Travelers Act will be reconsidered and modified at the next sitting of the Legislature. The modification proposed will be of such a nature as to remove the discontent which the tax has caused in Great Britain.

Mr. D. H. Ross, Dominion commercial agent at Melbourne, Australia, reports that the S.S. Cupic, of the White Star Line, recently arrived at Melbourne with the largest cargo in quantity and value which ever left New York direct for Australia. The quantity was 12,000 tons of general freight, valued at over \$1,500,000. In view of recent advances on freight rates from New York to Australia, which was influencing the local makers in heavy and bulky lines, it was more than ever important that Canadian exporters should secure the lowest inland freight from the factory point upon shipments, to beat New York.

The trade and navigation returns, covering the fiscal year ending June 30, show the extent of the importa-

tion of small steel, which is brought in under a duty from \$7 to \$10 per ton. The imports for the year of bar iron and steel, comprising only rounds, squares, and flats, amounted to 32,375 tons, valued at \$1,024,256, on which duties amounting to \$202,634 were exacted. Fish plates were brought in to the extent of nearly 7,000 tons under a duty of \$8 per ton, the value of the goods being \$208,246. There are several small plate mills in Canada manufacturing butt-welded pipe up to two inches in diameter. All the skelp for this industry is imported to the amount of 19,147 tons, valued at \$557,944. Railroad spikes pay a duty of \$10 per ton, and nearly 25,000 tons came from abroad, costing \$97,221, with duties amounting to \$24,839. Canada has no tin plate industry and no duty is charged on tin plate. Last year the importations in this line, including block plate, amounted to 250,000 boxes, valued at \$2,878,600. Approximately 25 per cent. of this amount came from the United States.

There was once a loud-mouthed British fish-dealer who proclaimed free-trade for everything but herring, which reminds us that there are some Canadians who are much like the Billingsgate fisherman, judging from the requests that have been poured into the ears of the Tariff Commissioners. These requests are not only from free traders but protectionists also, hence the similarity.

And now that eminent protectionist, A. E. Kemp, M.P., appears before the Tariff Commission to plead for free trade—in other people's products, of course—because they are his own raw materials. Protection on tin plate in the United States did not begin till there were sixty millions to serve. Some bold iconoclast may apply the argument to graniteware.—*Toronto Globe.*

For the information of the *Globe* it may be stated that the manufacture of tin plate in the United States is now in condition not only to supply the home market but also to do a large export business. More than that—heretofore Canada's chief source of supply of tin plate was Great Britain, but that trade is decreasing every year and the purchases from the United States are increasing. There is no Canadian duty on tin plate, therefore Canada has no tin plate industry.

There has recently been a change in the Australian duty on motor cars and parts, by which parts are subject to 20 per cent. duty when shipped with the car to which they belong and to 12.5 per cent. duty when shipped separately as machinery or appliances. Rubber tires accompanying the car are assessed at 20 per cent., and the duty on storage batteries shipped as integral parts of motor cars, is 12.5 per cent.

At a recent meeting held in Ottawa the Dominion Cabinet approved the contract with the Bucknall steamship lines, London, England, for a two-monthly cargo service between Canada and New Zealand. The contract is for three years, and Canada grants a subsidy of £10,000 per annum. New Zealand is expected to be a party to the arrangement on the same terms. The steamers employed will have a speed of ten knots.

MACHINERY AND ENGINEERING.

UNIVERSAL MILLING MACHINE.

The accompanying illustration is of the No. 14 Universal Milling Machine made by the Becker-Brainard Milling Machine Co., Hyde Park, Mass.

This machine embodies a number of new and important improvements which will be much appreciated by users of universal milling machines. Special attention is called to the positive gear feed drive, and the change feed mechanism, by which twenty changes of

The arm is made of steel, is designed for horizontal adjustment and has an arbor support which may be removed, so that any of the attachments can be placed in position without the necessity of removing the arm.

The table has an automatic longitudinal and cross feed in either direction and being centrally driven, feeds freely at any angle to 45 degrees right or left hand. It is provided with 3/8 inch T slots and with oil pans

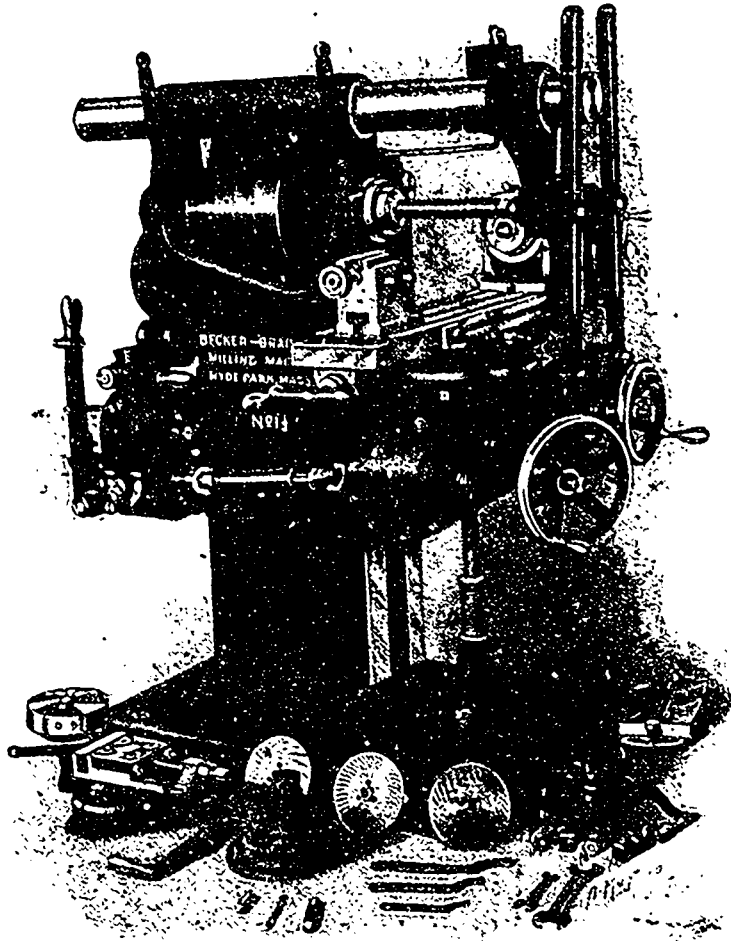
Dials are adjustable and graduated to read to thousandths of an inch, to indicate the vertical, transverse and longitudinal movements of platen, and are set at any position with set screw.

The patented change feed mechanism is conveniently arranged on the back of column and is capable of obtaining instantly, twenty changes of feed, slow or fast, by a simple movement of the lever, without stopping the machine.

The spiral dividing head and back center. The dividing head can be set at any angle from 10 degrees below the horizontal, to five degrees beyond the perpendicular. The front end of the spindle is threaded to the same size as the machine spindle, and also fitted with the same taper. By means of the raising block, the head can be set at any angle for taper work. Head is arranged for plan and differential indexing, dividing all numbers to 360. The ten change gears, which are sent with the machine, make a combination which will cut nearly any spiral from 1.25 to 68.57 inch pitch to one turn.

The machine is of unusually heavy design for this type and the metal is so distributed as to take care of all strains and permit of the production of high grade work at the highest possible speed, and the machine is amply powerful to drive high speed steel cutters at the very highest limit of speed. The table feeds are positive gear driven through spur gearing, and have a range of speeds to cover every requirement. This method of driving the table consumes the least possible amount of power, thereby permitting the spindle to drive large cutters with heavy cut. The machine is also provided with a number of special features to aid the operator in quickly adjusting the work on the table, and also obtain proper speed of spindle and feed of table for each individual operation.

For further information write the Becker-Brainard Milling Machine Co., Hyde Park, Mass.



No. 14 UNIVERSAL MILLING MACHINE. GEAR FEED. RANGE 24x8x17 1/2

feed can be made without stopping the machine; the new clutch mechanism in connection with the hand wheels, also the box type of knee and telescopic elevating screw.

The spindle has a No. 10 B. & S. taper hole in front end, is made of hammered crucible steel, has a 1/2 inch hole through its entire length and runs in self-centering bronze boxes arranged to compensate for wear. It has slot across end to engage clutch collar for arbor, is threaded to take a chuck, and a threaded collar covers the screw when not in use. It is connected with the change feed mechanism by three spur gears, making a positive drive. The spindle is fully back-gear, and gears are protected by guards.

at each end. Feed is reversed in front of machine.

The knee is of the box type and is supported by a telescopic elevating screw, so that no holes are necessary in the floor.

Hand wheels are provided with clutch arrangement enclosed in hub which operate the vertical movement of the knee and cross movements of the carriage. When either the knee or carriage have been set to the required position, the clutch may be instantly disengaged by pressing in the knob on the front of the hand wheel, thereby preventing any accidental change from their fixed position and also preventing them from revolving when the automatic feeds are thrown in.

4,500 H.P. GAS POWER PLANT IN CEMENT WORKS.

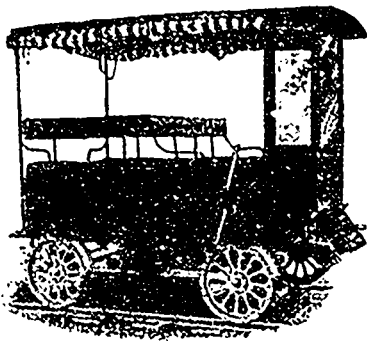
The Iola Portland Cement Co., Iola, Kansas, have recently placed an order with the Westinghouse Machine Co., East Pittsburg, Pa., for three 500 h.p. horizontal double acting gas engines and one 125 h.p. vertical single acting gas engine to increase the capacity of their already large gas power plant. The three horizontal gas engines now on order will be the first of this type to be installed in the power house, the remainder being of the vertical type. After the installation of the engines now on order, the power equipment will comprise 15 engines of the Westinghouse vertical single acting type and three of the horizontal double acting type, aggregating about 4,500 h.p. The company operates its plant upon Kansas natural gas fuel and is one of the largest users of gas power in the cement manufacturing field. The engines are used to operate various classes of machinery, such as rock crusher, rotary kilns, lime shafting and generators for supplying power and light throughout the works. The machinery is in general arranged in

groups upon sections of counter shafting driven by a single engine either direct connected or rope driven. In point of size this installation has few precedents and its successful operation under such severe conditions demonstrates the many advantages of gas power in industrial establishments of all kinds.

NEW GASOLINE MOTOR CAR.

The accompanying cut shows a No. 16 gasoline motor car manufactured by Fairbanks, Morse & Co., Chicago, Ill., and is one of several different styles of cars of this class which they are at present building.

Early in the summer of this year Mr. Geo. H. Webb, Chief Engineer of the Michigan Central Railroad, made an inspection trip over that system with one of these cars, and below is some data which is of special



No. 16 GASOLINE MOTOR CAR.

interest, showing as it does, what has been actually accomplished with this gasoline motor.

Total distance traveled by the car was 1347 miles and the total amount of gasoline used was 231 gallons or an average of 19.7 miles per gallon of gasoline. The records show that on the run from Jackson to Allegan a distance of 175 miles round trip only 74 gallons of gasoline were used, or 23.3 miles per gallon. The total cost per mile including lubricating oil, battery cells and everything excepting wages of man in charge was 9-10ths of a cent. Most any railroad

man can figure out that this is quite a saving as compared with a steam locomotive pulling a private car.

This gasoline car has its advantages also because of its ability to attain a high rate of speed and maintain it on a long run. From Marshall to Allegan, 66.4 miles distance was made in one hour and forty minutes, or at the rate of 40 miles per hour, and they report they never stopped the engine once. The distance from Tekonsha to Harris-29 miles was made in 45 minutes, and the best run of the entire trip was made from South Haven to Kalamazoo, a distance of 39.6 miles in 45 minutes, or at the rate of 52.94 miles per hour.

The manufacturers report that there is a large demand for cars of this class now that they have demonstrated that they are a complete success, and their factory with the present facilities is not able to keep up with the orders which are received from all sections of the country.

THE INTERNATIONAL WATERWAYS COMMISSION.

Mgr. Laflamme, of Laval University, who was commissioned by the International Waterways Commission to report upon the erosion of the rock at Niagara Falls, and the possibility of its diverting the main flow of water from the Canadian to the United States side of the stream, has given his opinion that 50 or 60 years' continuance of the process of erosion now in progress at the Horseshoe Fall will not deprive Canadians of the proportion of the water they now enjoy. In fact the very reverse is probably going to be the case; that is to say, the flow toward the Canadian shore at this point will be increased rather than diminished.

At the last meeting the United States Commissioners made an unsuccessful attempt to secure from the Canadian representatives an understanding for an equal division between the two countries of powers available on all waters along the international boundary. At present the American Commission's scope is limited to the St. Lawrence and great lakes, and if the proposed equal division applied only to the power available at Niagara and the Soo, it would be an extremely poor

bargain from our point of view. On the other hand, if the United States Commissioners are successful in getting Congress to extend their authority to the regulation of questions anywhere along the water boundary, it would be hard to tell offhand how our interests would be affected by sharing alike in all these. At Niagara nature has given us nine-tenths of the flow that represents 222,000 cubic feet per second. At the Soo, where the Americans are entitled to between two-thirds and three-quarters of the flow, there is not more than 60,000 cubic feet per second to be had.

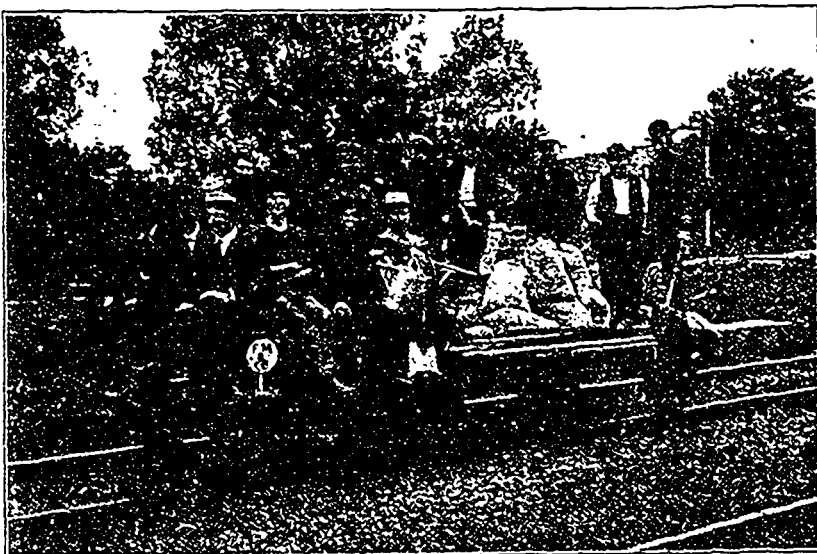
The present disposition of the authorities on both sides means that the use of the Niagara River for power purposes will not be permitted to spoil the scenic grandeur of the Falls.

Owing to some alterations that have been made by one of the United States Commissioners in the proposed regulations to govern the users of water privileges at the Soo, there will have to be another meeting of the whole Commission before the report is signed and laid before the respective governments at Ottawa and Washington. The proposals of the Commission are of a most drastic character; nevertheless, it is said that their acceptance by the two governments is assured. They provide that all water privileges on both sides of the St. Mary's River shall be subject to the control of the Waterways Commission, which would mean the conversion of the latter body into a permanent institution between the two countries. Another rule is designed to ensure that the level of the water in Lake Superior shall never fall lower than 601.5 to 603 feet above mean tide at New York. If such fall does take place, the Commission have power to curtail the quantity of water taken for power purposes. In the event of the level remaining below the specified minimum for six months, the commissioners may prohibit the taking of water for power purposes altogether until the normal level of Lake Superior is restored. On the other hand, should the lake level exceed 603 feet above mean tide at New York the lessees of water privileges must assist in drawing off as much as the Commission directs.

Whatever works are needed in the St. Mary's River to regulate the level of Lake Superior must be performed by the power companies at their own expense. Instead of their enjoying the perpetual right to water privileges, all leases must have a twenty-year limit, and shall lapse unless renewed by the respective governments. Neither government shall be liable for damages through any work it may call upon the power companies to perform. The two existing power companies on the United States side and the one at the Canadian Soo are brought fully under the control of the Waterways Commission as well as any that may hereafter be chartered. Finally the Commission has authority to change these rules from time to time as conditions may warrant.

Later on no doubt similar restrictions will be laid upon the users of water privileges at Niagara Falls.

The B. F. Sturtevant Co., Hyde Park, Mass. have the contract to furnish fans for ventilation of portions of the Capitol at Washington, D.C., which is now undergoing repairs.



SHEFFIELD MOTOR CAR.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER

CAPTAINS OF INDUSTRY.

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

The Kingston Locomotive Works, Kingston, Ont., have received a contract from the Canadian Northern Railway Co. for ten locomotives.

Building to the amount of about \$400,000 has been done in Walkerville, Ont., this year. Included in this are E. C. Walker's new residence, \$125,000, King Edward school, \$50,000, Walker's rack house and new cooper shop, \$40,000 each, Globe Furniture Co.'s works, \$40,000.

Two additional metallic circuits between Toronto and Hamilton Ont., have just been completed by the Bell Telephone Co. Long distance communication between the two cities should be greatly facilitated by this additional service, and any congestion of traffic which may have existed, relieved.

The automobile department of the Packard Electric Co., St. Catharines, Ont., has been taxed to its limit during the recent season to fill the orders for Canadian built cars although the factory has a capacity of five cars per day. Three new models will be included in their next season's catalogue, namely, Model B, 8 h.p. runabout seated for two persons, Model S, a luxurious touring car, with 20 to 24 h.p. four cylinder motor and bevel gear drive and Model L, a light and speedy road racer with 16 to 20 h.p. motor this last is classed as the sportsman's car.

The property owners of Cornwall, Ont., have voted favorably on a by-law to grant a loan of \$20,000 to Thomas McGill and a company to be formed by him for the manufacture of chairs.

R. W. Leonard, Esq., engineer in charge of the installation of an electric plant at Kakabeka Falls, near Fort William, Ont., says when the plant is in operation it will revolutionize the commercial life of Fort William and Port Arthur. The plant will have a capacity of 28,000 h.p. and it is intended to transmit the electric energy to Fort William along a copper wire at a pressure of 25,000 volts to the sub-station now being erected. From the river above the Ecarte Rapids, a gigantic circular flume or aqueduct is being laid at an elevation which will add forty feet to the height of the falls, which is 120 feet. An additional twenty feet will be obtained from the lower rapids where the turbines are being placed, making a total head of 180 feet. The reservoir into which the flume, which will require 3,500 yards of concrete and the removal of 35,000 yards of rock, discharges is a massive structure of concrete and steel, from which two penstocks leading direct to the turbine wheels, 181 feet below, are fed.

The Hanrahan Building & Contracting Co., Toronto, have been incorporated with a capital of \$40,000, to carry on a general building, constructing and contracting business. The provisional directors include Charles Hanrahan and W. T. Kernahan, Toronto.

The Letter-Envelope Co., Toronto, have been incorporated with a capital of \$50,000, to carry on a business of bookbinders, printers, etc., and to manufacture stationery. The

provisional directors include C. L. Benedict, A. H. S. Van Koughnet and George Ritchie, Toronto.

The Riordan Paper Mills Co., Merriton, Ont., have increased their capital stock from the sum of \$1,000,000 to the sum of \$2,000,000.

Messrs. Penman & Sprang, Limited, Toronto, have been incorporated with a capital of \$40,000, to manufacture stationery, office furniture, etc. The provisional directors include R. S. Rider, Hamilton, Ont.; J. H. Speers and C. M. Wright, Toronto.

Wholesale Jewelers, Limited, Toronto, have been incorporated with a capital of \$200,000, to manufacture jewelry, silverware, watches, clocks, etc. The provisional directors include Strachan Johnston, R. H. Parmenter and A. J. Thomson, Toronto.

The Cambrian Mineral Co., Sudbury, Ont., have been incorporated with a capital of \$100,000, to carry on a mining, milling and reduction business. The provisional directors include R. G. Leckie, J. E. Leckie and W. J. Montgomery, Sudbury.

The Annabella Mining Co., Toronto, have been incorporated with a capital of \$40,000, to carry on a mining, milling and reduction business. The provisional directors include H. M. Chance, Philadelphia, Pa., Alexander Fasken and Harper Armstrong, Toronto.

The Packard Electric Co., St. Catharines, Ont., report that the sales of their type G. meter have increased so rapidly during the last year that it has become necessary to further increase the capacity of this department of their factory.

The Louise Mining Co., Toronto, have been incorporated with a capital of \$40,000, to carry on a mining, milling and reduction business. The provisional directors include H. M. Chance, Philadelphia, Pa.; Alexander Fasken and Harper Armstrong, Toronto.

The Annie Mining Co., Toronto, have been incorporated with a capital of \$40,000, to carry on a mining, milling and reduction business. The provisional directors include H. M. Chance, Philadelphia, Pa.; Alexander Fasken and Harper Armstrong, Toronto.

The Isa Mining Co., Toronto, have been incorporated with a capital of \$40,000, to carry on a mining, milling and reduction business. The provisional directors include H. M. Chance, Philadelphia, Pa.; Alexander Fasken and Harper Armstrong, Toronto.

The Cobalt-Merchants Mining Co., Toronto, have been incorporated with a capital of \$200,000, to carry on a mining, milling and reduction business. The provisional directors include H. B. Wills, Whitford Vandusen and W. D. Scott, Toronto.

The Margaret Mining Co., Toronto, have been incorporated with a capital of \$40,000, to carry on a mining, milling and reduction business. The provisional directors include H. M. Chance, Philadelphia, Pa.; Alexander Fasken and Harper Armstrong, Toronto.

The Silver Gulch Mining & Prospecting Co., Cobalt, Ont., have been incorporated

with a capital of \$75,000, to carry on a mining, milling and reduction business. The provisional directors include T. J. Harwood, Mattawa, Ont.; R. A. Cartwright, Belleville, Ont., and W. C. Le Henp, Cobalt.

The Shirreff Mfg. Co., Brockville, Ont., have been incorporated with a capital of \$50,000, to manufacture carpet sweepers, etc. The provisional directors include W. M. Osborne, B. R. Shirreff, Brockville, and G. A. Shirreff, New York City.

The Jenekes Machine Co., Sherbrooke, Que., are furnishing the Standard Chemical Co., Toronto, two 100 h.p. 66-inch diameter by 16 feet long horizontal tubular boilers and five wood alcohol storage tanks 17 feet in diameter by 16 feet high.

The Big Dipper Mining & Milling Co., Peterborough, Ont., have been incorporated with a capital of \$2,500,000, to carry on a mining, milling and reduction business. The provisional directors include Sidmoor Sager, J. S. Waldron, Peterborough, and J. M. Fletcher, Buffalo, N.Y.

The London Stockyards Abattoir Co., London, Ont., have been incorporated with a capital of \$300,000, to construct and operate abattoirs, cold storage plants, packing establishments, etc. The provisional directors include G. F. Morris, Finley Marshall and M. I. Leitch, London.

The Canadian Co-operative Concern, Limited, Hamilton, Ont., have been incorporated with a capital of \$50,000, to manufacture machinery and farm stock of all kinds. The provisional directors include J. P. Whelan, Hamilton; Thomas McFadden and George Binnie, Township of Glenelg, Ont.

The Orchard Point Co., Orillia, Ont., have been incorporated with a capital of \$50,000, to carry on a hotel business, etc. The provisional directors include N. S. Farr, C. H. Dale and R. H. Jupp, Orillia.

The A. Meyer Co., St. Catharines, Ont., have been incorporated with a capital of \$400,000, to manufacture bread, confectionery, etc. The provisional directors include Anthony Meyer, F. T. Garner and G. H. Garner, St. Catharines.

The McClellan Try-On Clothing Co., Stratford, Ont., have been incorporated with a capital of \$40,000, to manufacture clothing. The provisional directors include J. A. McClellan, J. A. Duggan, Stratford, and L. A. Murch, Goderich, Ont.

The Byrnes Construction Co., Hamilton, Ont., have been incorporated with a capital of \$40,000, to carry on a business of contractors, etc. The provisional directors include J. W. Nesbitt, J. G. Gauld and James Dickson, Hamilton.

The flour and grist mills of P. R. Hoover & Sons, Green River, Ont., were destroyed by fire November 22. Loss about \$12,000.

The Canadian Shipbuilding Co., Toronto, have secured the contract for a new passenger steamer for the Muskoka Navigation Co., and a car ferry for the Grand Trunk Railway Co. with a capacity of 28 loaded cars.

The announcement was made at the meeting of the Canadian section of the Society of Chemical Industry held in Toronto last week that in the coming spring a company would invest \$1,500,000 in a plant to utilize the silver ores of Hastings County, Ont., and to extract sulphuric acid by the contact

process. Mr. Nieghorn, manager of the Canada Chemical Mfg. Co., London, Ont., made the statement. The construction of such a plant, which, it is understood, will be located near Tweed, Ont., will greatly stimulate the mining interests in Eastern Ontario, as it is expected to render available commercially large bodies of ore which are not now worked.

The Keystone Sugar Co., Whitby, Ont., have let the contract for their buildings, which will cost about \$150,000. The storage capacity of the five sheds will be 12,000 tons. Portland cement will be used largely in the construction of the buildings.

John Macdonald & Co., Limited, Toronto, have been incorporated with a capital of \$1,000,000, to manufacture dry goods, carpets, etc. The provisional directors include John Macdonald, J. F. Macdonald and D. M. Macdonald, Toronto.

The Packard Electric Co., St. Catharines, Ont., have secured the contract for electrical apparatus for Westmount municipal electric lighting plant; the contract includes two 200 k.w. and one 50 k.w. Crocker-Wheeler generators.

The R. E. Kinsman Lumber Co., Hamilton, Ont., have been incorporated with a capital of \$50,000, to carry on a sawmill and timber business. The provisional directors include R. E. Kinsman, W. M. McClelland and J. W. Bell, Hamilton.

The Tamagami Mining & Milling Co., Toronto, have been incorporated with a capital of \$40,000, to carry on a mining, milling and reduction business. The provisional directors include W. E. Thatcher, L. O. Hedden, East Orange, N.J., and F. F. Guild, Newark, N.J.

The Silver Five Mining Co., New Liskeard, Ont., have been incorporated with a capital of \$40,000, to carry on a mining, milling and reduction business. The provisional directors include James Matthews, Donald Stewart and D. T. K. McEwen, New Liskeard.

The Mount Forest Carriage Co., Mount Forest, Ont., have increased their capital from \$50,000 to \$100,000.

The Hastings Milling Co., Hastings, Ont., have been incorporated with a capital of \$75,000, to manufacture wheat, flour, cereals, etc. The provisional directors include J. J. English, Hastings, and H. A. Mulhern, Peterborough, Ont.

The Worth-Martin Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture machinery. The provisional directors include Robert Worth, L. L. Martin and Joseph Oliver, Toronto.

The Standard Tin Works, Toronto, have been incorporated with a capital of \$40,000, to manufacture tin, iron, copper, brass, etc. The provisional directors include T. H. Cook, Sarnia, Ont.; J. A. McGolpin and H. F. Budd, Toronto.

East & Co., Limited, Toronto, have been incorporated with a capital of \$100,000, to manufacture umbrellas, trunks, valises, suit cases, etc. The provisional directors include William East, Charles Adams, and Thomas Bell, Toronto.

The Temiscamingue Reduction Works, Cobalt, Ont., have been incorporated with a capital of \$166,000, to carry on a mining, milling and reduction business. The provisional directors include Peter Kirkegaard,

Delora, Ont.; H. C. Hammond and C. L. Benedict, Toronto.

The Holstein Farmers Mfg. & Supply Co., Holstein, Ont., have been incorporated with a capital of \$80,000, to manufacture farm machinery, tools, implements, etc. The provisional directors include G. T. Calder, T. J. Jordan, and S. T. Orchard, Holstein.

The Window Glass Machine Co. of Canada, Cayuga, Ont., have been incorporated with a capital of \$40,000, to manufacture glass-ware, etc. The provisional directors include J. W. Sheppard, A. K. Goodman, Cayuga, and S. L. Bodine, Pittsburg, Pa.

The Plymouth Cordage Co., Plymouth, Mass., have been granted a license to do business in Canada. W. M. German, Wexford, Ont., is the attorney.

Messrs. West, Taylor, Bickle & Co., Toronto, have been incorporated with a capital of \$20,000, to manufacture brooms, baskets, enamelled ware, cordage, paper bags, etc. The provisional directors include George West, E. J. Taylor and W. J. Bickle, Toronto.

The factory of the Hamilton Facing Mill Co., Hamilton, Ont., was destroyed by fire November 27. Loss about \$20,000.

The Berry Lubricator & Machine Co., Ottawa, have been incorporated with a capital of \$250,000, to manufacture machinery, boilers, heaters, furnaces, etc. The incorporators include James Walker, Montreal; E. A. Bleakney and F. A. Heney, Ottawa.

The Carcross Syndicate, Limited, Toronto, have been incorporated with a capital of \$150,000, to manufacture mining machinery, implements, etc. The incorporators include J. C. Grace, C. W. Mitchell and W. F. McRae, Toronto.

The roundhouse of the Grand Trunk Railway Co., Toronto, was damaged by fire November 26. Loss about \$20,000.

The Grand Trunk Pacific Railway Co. will spend about \$2,000,000 in the erection of a new station and hotel and the providing of terminal facilities in Ottawa. The company will also erect hotels at Quebec City, Montreal, Winnipeg, Man., Edmonton, Alta., and their proposed Pacific terminus.

Messrs. F. W. Bird & Co., Hamilton, Ont., will erect a factory building in that place, at a cost of about \$4,000.

The Westinghouse Electric & Mfg. Co., Pittsburg, Pa., have recently placed on the market a storage battery charging receptacle having many advantageous features, among the more important being a swivel attachment which conforms the receptacle to standard steam railway practice, and allows the car or vehicle to start and pull out the cables without danger of breaking them, or the contacts. The apparatus is adapted to both railway and automobile service, and has been adopted by the Pennsylvania Railroad for charging the batteries on their cars.

The city of Chatham claims the distinction of being the first city in Canada to install a public heating plant. The corporation which has constructed and is operating the plant is known as the Chatham Steam Heating Co., and may be called an offshoot of the Chatham, Wallaceburg & Lake Erie Railroad Co. The exhaust steam from the railroad company's power house is used by the heating company. About a mile of mains has been laid, and several churches, schools,

hotels, office buildings, as well as business houses and private residences, are connected with the mains. The main pipe through which the steam passes is an iron one. It is wrapped in asbestos, and this again is enclosed in a tin tube. Outside the tin tube there is an air cushion, and outside of that again is a wooden covering, which is bound with wire, and the whole treated with creosote and other materials. In this way a durable and cold proof tube is secured. At short intervals there are condensing valves which make up in themselves the bulk of the cost of laying the pipes, which amounts to \$8 per foot. The pipes are laid in a rather peculiar manner, the depth varying from 4 to 6 feet, in order to allow a sufficient slant for drainage, for a little water is sure to condense in the tubes. This runs off into the sewers. The steam has just been turned into the mains, but whether the rates fixed will lower the heating expenses of the users has not yet been demonstrated. They will, however, be saved the trouble of paying men to look after their furnaces or of doing it themselves. It is expected however, that there will also be a considerable reduction in insurance rates, because of the absence of fire in the buildings. The rates are made up in two ways. On the flat rate the charge is based on the number of cubic feet in the building to be heated, and varies from \$3 to \$5 per hundred feet, according as there are one or more sides exposed to the weather. On the meter system the charge is at the rate of 50 cents per thousand pounds of water condensation.

Because of the fact that the Westinghouse Electric & Mfg. Co. make the largest units required for the production and transmission of electricity, comparatively few people know that in the same works at East Pittsburg, Pa., are manufactured also the smallest units to meet the demands of printing establishments and similar lines of industry. It is a matter of considerable gratification to the company to see the favor with which their motors for the printing industry have been received. There have very recently been closed three contracts aggregating in the neighborhood of 400 motors, and the company are in position to undertake the equipment of printing establishments from the smallest to the largest machines required in this industry.

It is stated that the Public Works Department, Ottawa, is rather concerned over the fact that the pneumatic tube systems in Toronto and Montreal will cost about \$500,000 each, or \$1,000,000 in all. This includes, of course, the cost of land, the erection of suitable buildings and the installation of the system.

The ratepayers of Aylmer, Ont., have voted favorably on a by-law granting a loan of \$20,000 to the Aylmer Iron Works Co.

Bickford & Mackay will erect a knitting mill at Dundas, Ont.

The Empire Lumber Co. will build a large sawmill at Latchford, Ont.

President C. D. Warren, of the Lake Superior Corporation, Sault Ste. Marie, Ont., states that the company have made a contract with the Canadian Pacific Railway Co. for 50,000 tons of steel rails. The Corporation also have large orders for 100-pound rails from the Michigan Central, for use on their lines in Canada, and from the Great

Northern, who are building branch lines into British Columbia. The product of the steel rail mill has been sold up to July 1, 1906.

The Canadian Locomotive Co. and the Kingston Hosiery Co., Kingston, Ont., ask that a by-law be submitted to the ratepayers granting their concerns exemption for 20 years, both in view of big improvements to be made. The request will likely be complied with. The locomotive company say they will spend \$50,000 each in 1906 and 1907 and \$100,000 in 1908, and will increase their space by 70 per cent. The Hosiery Co., not in the Canadian syndicate of mills, will spend \$100,000 to keep up with business demands.

The Westinghouse Electric & Mfg. Co., Pittsburg, Pa., have perfected a new line of three-phase core type transformers for 60-cycle circuits. One of these transformers may be used where three-phase transformation is to be made, instead of two or three of the single-phase type. They are self contained units of compact construction, and are generally easier to install, and reduce the complexity of wiring between the transformer and the apparatus which it is to supply.

Henry Disston & Sons, Philadelphia, Pa., will enlarge their Canadian plant at Toronto, and will manufacture for the present such goods as are termed mill goods, comprising circular saws, band saws, etc. This product will be developed in the future as the trade increases.

The works of the Hamilton City Steam Laundry Co., Hamilton, Ont., were damaged by fire November 29. Loss about \$6,000.

The City Council of Stratford, Ont., will submit a by-law for ratification of the taxpayers for endorsement of the bonds of a company for the manufacture of wooden boxes, to the extent of \$20,000. The company is being formed by David Gilchrist, Toronto, and will have a capital stock of \$100,000. The company agree to erect a stone and brick building two and one-half stories high, 240x67 feet, the plant and land to cost not less than \$30,000.

The Jenckes Machine Co., Sherbrooke, Que., recently shipped to the Haskell Lumber Co., Montebello, Que., who are building a large new sawmill, three 150 h.p. 72-inch diameter by 18 feet long high pressure tubular boilers, and a large bill of transmission machinery.

The Chimalpa Land Co. have decided to build a large modern band mill in Montreal equipped with the latest improved machinery for the manufacture of lumber from the company's property in Mexico. This mill is to be operated by the Montreal firm of Shearer, Brown & Wills, who have acquired a large interest in the company, and have undertaken to introduce the company's valuable woods to the Canadian trade.

The factory of the Stark Cooperage Co., Montreal, was destroyed by fire November 16. Loss about \$30,000.

The Montreal Street Railway Co., Montreal, will expend about \$1,000,000 during the coming year in securing additional rolling stock, constructing new feeder lines and installing additional machinery in the main power house.

The John McDougall Caledonian Iron Works Co., Montreal, have been appointed

sole manufacturers in Canada of the Blaisdell cyanide excavating machinery, under the various patents owned and controlled by the Blaisdell Co., Los Angeles, Cal. This machinery was invented by Mr. H. W. Blaisdell, who has had an active experience in mining and milling gold ores extending over twenty-five years. After a series of experiments, this machinery, consisting of excavators, distributors, tailings stackers, aerators and mixers, was produced, and thus abolishing unskilled labor from cyanide plants and providing the final link for a complete mechanical method of handling ore between the mine and the dump was successful.

St. Anne's convent orphanage and agricultural college, St. Damien de Buckland, Que., was destroyed by fire November 28. Loss about \$50,000.

The premises of the Montreal Hat & Cap Mfg. Co., Montreal, were destroyed by fire November 23. Loss about \$8,000.

Another important concern has been added to the list of asbestos mining companies. This is the Asbestos Mining & Mfg. Co., which was formed by Providence, R.I., capitalists, and which will operate at Wolfstown in the Thetford, Que., district, the centre of the asbestos industry. The capacity of the plant at the start will be 150 tons of ore per day, but it is the intention to increase this subsequently to 300 tons. The buildings are being erected at the present time, and the plant, which is being furnished throughout by the Jenckes Machine Co., Sherbrooke, Que., comprises one 30x15 and two 20x6 style "B" Farrel bacon rock crushers, one set 36x17 geared crushing rolls, two heavy pattern cyclone pulverizers, one conveying and picking table 32-inch belt 40-foot centres, one steel revolving ore dryer 48-inch diameter, 30 feet long; several revolving sizing screens, together with bucket elevators; all the transmission machinery required, also a pit plant consisting of vertical boilers, derricks, hoisting engine, etc., and a very fine steam plant made up of a 14 and 36x26 Jenckes-Corliss engine; two 150 h.p. 72-inch diameter by 18 feet long, high pressure tubular boilers, condenser, boiler feed pump and feed water heater, all complete.

The Haskell Lumber Co., Montebello, Que., are erecting a large sawmill at that place.

The Anglo-American Varnish Co., Montreal, have been incorporated with a capital of \$20,000, to manufacture varnishes, oils, colors, pigments, etc. The charter members include G. M. Ballard, Newark, N.J.; Peers Davidson and Arnold Wainwright, Montreal.

The Miramichi Quarry Co., Montreal, have been incorporated with a capital of \$90,000, to do a general quarry and contracting business. The charter members include R. A. E. Greenshields, A. W. G. Macalister and W. D. Garland, Montreal.

The crushing plant of the American Asbestos Co., Black Lake, Que., has been increased recently by the addition of two 40x6 Farrel bacon style "B" duplex crushers of which the Jenckes Machine Co., Sherbrooke, Que., are sole builders in Canada.

The Corrugated Steel Bar Co. of Canada, Montreal, have been incorporated with a capital of \$50,000, to carry on a business of mechanical engineers, metal workers, etc. The charter members include G. E. Drum-

mond, T. J. Drummond and J. T. McCall, Montreal.

The Renaud Interlocking & Block System Co., Montreal, have been incorporated with a capital of \$250,000, to manufacture automatic brakes and signals to stop railway coaches, etc. The charter members include L. A. Derome, Ernest Renaud and L. A. Davis, Montreal.

The Beach Calculating Machine Co. of Canada, Montreal, have been incorporated with a capital of \$50,000, to manufacture office supplies and specialties, etc. The charter members include J. A. Laurin, Oscar Herbert and P. E. Lamarche, Montreal.

The Intercolonial Railway Co. are preparing plans for new locomotive shops at Moncton, N.B. The cost of the new buildings alone, it is estimated, will be upward of \$500,000. In addition to the Moncton shops other repair shops are located at various points on the line, between Montreal and Halifax, Truro to the Sydneys, and Moncton to St. John, as well as one on Prince Edward Island.

The Dominion Iron & Steel Co., Sydney, N.S., have received an order from the Boston Elevated Railway Co., Boston, Mass., for a sample shipment of rails to be used on the curves of that line.

Two steamers having a tonnage of 7,000 each, to be launched next spring, are to be built in England to the order of a Norwegian firm this winter for the St. Lawrence coal carrying trade of the Dominion Coal Co., Sydney, N.S.

The Dominion Coal Co., Sydney, N.S., announce that the output for St. Lawrence ports this year was 4,000 tons in excess of last year.

A company have been formed at Truro, N.S., with a capital of £40,000, to construct lines of railway from Truro to Parrsboro, N.S., and from Parrsboro to Maccan, N.S. W. H. Magee, Truro, is interested.

The Dominion Iron & Steel Co. have made a large addition to their coal-washing plant at Sydney, N.S., including a trestle, pockets and conveyors to provide for the storage of 15,000 tons of coal. The company recently made a shipment of 39 carloads, aggregating 2,000 tons of their output, principally steel rails, by the Intercolonial railway.

The moulding and pattern shops of the A. C. Thompson Co., Lunenburg, N.S., were destroyed by fire November 24. Loss about \$20,000.

The Eureka Mfg. Co., Sussex, N.B., have been incorporated with a capital of \$24,000, to manufacture acetylene gas and appliances, etc. The incorporators include G. W. Fowler, M. W. Carrier and W. J. Jonah, Sussex.

The Thomas W. Flett Lumber Co., Nelson, N.B., have been incorporated with a capital of \$35,000, to manufacture lumber, etc. The incorporators include T. W. Flett, Nelson, N.B.; C. F. Flett, Melrose, Mass., and W. J. Flett, Boston, Mass.

The Jacquet River Lumber Co., Calhoun, N.B., will apply for incorporation with a capital of \$45,000, to manufacture lumber, etc. The applicants include W. M. Calhoun, Albert, N.B.; T. B. Calhoun, and H. F. Calhoun, Calhoun, N.B.

The new machinery for the power house of the electric light system for Glace Bay, N.S., is being installed. The power house is 75x42 feet, the contract price being \$8,000. Along the Brook a retaining wall of solid concrete has been built, and inside this wall stands a steel concrete smokestack, 105 feet in height. The power house is divided into two departments, the boiler room and the engine and condenser room, with a neat little office in the latter. A representative of the Robb Engineering Co., Amherst, N.S., is now engaged in setting up and installing a 375 h.p. Robb-Armstrong, horizontal, tandem compound, Corliss engine, arranged for a direct connection with a 250 k.w. generator, and a 150 h.p. Robb-Mumford boiler, with a steel case. A representative of the Canadian General Electric Co., Toronto, is also engaged in installing machinery supplied by that company. This new machinery, which is up-to-date in every respect, consists of an alternating current revolving field generator, a 12 k.w. exciter mounting an engine shaft operated at a speed of 150 revolutions per minute, and a beautiful blue Vermont marble panel switchboard. This machinery will be supplemented by the large engine and dynamo, and the switchboard now in use, and two of the boilers used in the old building have been moved to the new boiler room. The system now supplies in the vicinity of 6,000 lights. The new system will have a capacity of about 12,000 lights.

The Dominion Iron & Steel Co., Sydney, N.S., have commenced work on an order for 5,000 tons of steel rails for the Temiskaming & Northern Ontario Railway Co. and are also filling the order of the Intercolonial Railway Co. for 25,000 tons. The company have in contemplation the addition of more modern machinery to their open hearth plant in order to enlarge the output. C. H. MacMillan, late superintendent of the open hearth plant at Ensley, Alabama, where a similar class of ore is used, has been making a preliminary inspection of the plant in view of the change. Arrangements are being effected with the Nova Scotia Steel & Coal Co. for the exploration of submarine ore areas at Wabana, N.S., further out than those of the Dominion Co.

Swift & Co., Chicago, Ill., intend establishing a factory in Winnipeg, Man.

The Grand Trunk Pacific Co. are in the market for 30,000 telegraph poles, with which to build their first line west of Winnipeg, Man.

The Manitoba Iron Works, Winnipeg, Man., have completed their contract for a water-tower for the town of Portage la Prairie, Man., the most extensive work of the kind so far undertaken in the Canadian West. They have been awarded the contract for the steel legs and machinery for the Anchor Cereal Co.'s elevator, Winnipeg.

The Western Canada Flour Mills Co., Winnipeg, Man., will erect a 4,000 barrel mill. They will take over the business of A. Kelly Milling Co., Brandon, Man., and the Lake Huron & Manitoba Milling Co., Goderich, Ont.

Mr. Philip Moon, a mechanic, of Brandon, Man., has perfected and patented a fanning mill for separating wild oats from wheat. Simplicity of construction, ease of operation, and great speed, are the principal features claimed for this new machine. It is said to

be capable of thoroughly cleaning from 30 to 60 bushels of wheat per hour, and it is understood Mr. Moon intends to have a number manufactured for spring seed cleaning.

The Manitou Gas Co., Manitou, Man., have been incorporated with a capital of \$7,500, to manufacture gas for light, heat and power purposes. The charter members include D. D. McTavish, St. Catharines, Ont.; R. A. Wyllie, Winnipeg, Man., and R. J. Chalmers, Manitou, Man.

The Lake of the Woods Milling Co. at Portage la Prairie, Man., are preparing a large shipment of flour for Japan. This order, which comprises 2,000 bags, leaves Vancouver on December 16 for Kobe, Japan. Another order has also been received for a considerable quantity, which will leave the coast in January.

The Alberta Flour Milling Co., Edmonton, Alta., are erecting a second elevator there.

The Alberta Grain Co., Edmonton, Alta., are building a 50,000 bushel elevator at that place.

J. J. Slater will erect a grist mill at Lloydminster, Sask.

Weibe & Rompel, Laugham, Sask., are erecting a flour mill at that place, which will have a capacity of 125 barrels per day.

The Methodist congregation of Moose Jaw, Sask., will erect a church building at a cost of about \$30,000.

A new bridge will be built over the Bow river at Calgary, Alta., at a cost of about \$50,000.

Messrs. J. Y. Griffin & Co., Winnipeg, Man., are making extensive alterations and additions to their warehouse and plant in Vancouver, B.C., at a cost of about \$25,000.

The Granby Consolidated Mining, Smelting & Power Co., Phoenix, B.C., have placed an order with the Jenckes Machine Co., Sherbrooke, Que., for another mammoth crusher of the Farrel bacon style "B" pattern. The receiving opening of this crusher is 42x30 inches. Its capacity per day of 10 hours is 1,400 tons of ore to 8 inch cube, and the shipping weight is 120,000 pounds, the heaviest single piece weighing about 75,000 pounds. The Granby Co. already have two crushers of this same size in operation.

At a meeting of the Canadian Section of Chemical Industry, held in Toronto last week, Prof. W. R. Lang, of the Toronto University, read an instructive paper upon the development of the chemical industries of British Columbia. Among other interesting features which Prof. Lang noted was the satisfaction of the management at Victoria with the experiments for preparing sulphur trioxide by the contact process, which he expects to be a success commercially. The fact that it was cheaper to import sulphur from the Pacific Islands than to use Canadian sulphur was a matter of surprise. British Columbia having practically the only iron ores along the northern Pacific coast, and the supply of coal being abundant, and the limestone associated with the iron being exceptionally pure, British Columbia is eminently fitted to become a large iron producer. Little has yet been done to save the platinum and osmiridium found in small quantities, and mercury in the form of cinnabar has been found at Kamloops Lake, and there is a strong probability of mercury ores being at

no distant date profitably treated. As a chemist Prof. Lang was much impressed with the Trail smelter, of which he spoke as a really fine chemical industry.

The Jenckes Machine Co., Sherbrooke, Que., have received an order from the Granby Consolidated Mining, Smelting & Power Co., Phoenix, B.C., for a 150 h.p. double drum electric hoist. The dimensions of the drum, which will be conical in shape, are 7 feet diameter at the larger end, 5 feet at the smaller end and 5 feet long. By means of friction clutches each drum can be operated independently of the other, and both drums are also controlled by powerful brakes. The capacity of this hoist is a load of 10,000 pounds, raised at a rate of 700 feet a minute, and the shipping weight is in excess of 50,000 pounds.

The British Columbia Telephone Co., Vancouver, B.C., will erect a new exchange building, which will be three stories high. The company will also install a new switchboard at a cost of about \$100,000. Other improvements to be made by the company will amount to about \$150,000.

The Oriental Power & Pulp Co. are about to utilize the pulp-wood resources on the timber areas they have recently leased from the British Columbia Government. These areas are at Graham Beach and Gardiner's Channel, and are 84,180 acres in extent. Yale Lake is to be the source of the power, 15,000 to 16,000 h.p. being alleged to be obtainable from that source. About the proposed site of the pulp mill the company have a number of buildings already erected, and are preparing for the erection of others. Sulphite fibre will be made, the spruce, hemlock and balsam on the company's limits being reported to be especially abundant and suitable for the purpose. The output is to be from 35 to 40 tons a day. Japan is the market the company depends on to take their product. It is understood that the Canadian Finance Syndicate Co., of London, England, will float the company.

NEW ROUTE TO SOUTHERN CALIFORNIA.

The opening to traffic of the San Pedro, Los Angeles & Salt Lake Railroad, known as the Salt Lake Route, between Salt Lake City and Los Angeles, makes available a most desirable short line to Southern California. This will doubtless be of great interest to the ever-increasing number of people who journey each winter to this sunny clime.

In anticipation of a large volume of this class of traffic a handsome equipment of modern vestibuled trains has been placed in service in connection with the Overland Limited train of the Chicago, Union Pacific & North-Western Line, the most luxurious train in the world. This forms a new and interesting route by which first-class tourist travel can reach the sunshine and flowers of Southern California, traveling on fast schedules and in luxurious comfort. Rates, folders and full information can be obtained from B. H. Bennett, general agent, 2 East King St., Toronto, Ont.

Buffalo Public School No. 7, Buffalo, N.Y., is being equipped with a complete heating and ventilating system consisting of engine driven fan heater, galvanized iron piping, etc., furnished by the B. F. Sturtevant Co., Boston, Mass.

ELECTRICITY.

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

The executive of the Canadian Electrical Association, of which A. A. Wright, Esq., M.P., of Renfrow, Ont., is president, have arranged to hold the next annual convention of the Association at Niagara Falls, Ont., the date to be announced later. An invitation has been extended to the Association from the Electrical Association of Great Britain to attend their annual meeting in 1906. The electrical associations of the United States, France, Germany, and Switzerland are also receiving invitations to be present. The secretary of the Canadian Association will communicate with its members, and also with the American Association, to see what arrangements can be made.

The York Radial Railway Co., Toronto, have decided that they will not approach the city again with reference to the entrance of radial roads into Toronto. Future negotiations, the company say, must begin with the city, and all offers must contain some plan for a renewal of the franchise for a period after the expiry of the Toronto Railway's agreement with the city. The Radial Co. have perfected their arrangements for the collection and delivery of goods for and from their various lines. The power on the Metropolitan road is to be increased from 1,500 to 3,000 h.p. The transmitting station of the Niagara Power Development Co. is nearing completion, and as soon as Niagara power is ready, the Metropolitan sub-station at Bond Lake will be greatly enlarged. All this work, with power from Niagara, will be ready for the company's extension to Lake Simcoe, which is to open early in the new year. Two new double trolley 60-foot cars are being built in the Toronto car workshops for the Mimico line, which will open its Port Credit extension in a few days. The farther extension to Oakville will be rushed as long as the weather permits, and early in the spring the extension will be completed, and thus a junction with the Hamilton radial roads secured.

A press despatch says: "The Pope has adopted the telephone habit. The Vatican is now as elaborately wired as any great financial institution or hotel in the United States—house, local, and long-distance telephone in every room. The long-distance telephone most often used by the Pope is the wire connection with Venice, his old place of residence and useful activity. From Venice come stories of all sorts of people who are occasionally called up by Pius for a moment's chat or some personal instruction. The Pope himself selected the telephone apparatus used in the Vatican."

A newly patented fire-alarm box that handcuffs tricksters is described in Popular Mechanics. When this is installed, it says, fire companies will no longer be called out by false alarms—or, if they are the miscreant will receive his due. The box has a small door in front, and as soon as this is opened a large gong in the box begins sounding, attracting attention to that place. On the inside are two small doors having a slot through which the hand must be thrust to send in an alarm. As the party sounds the alarm a rubber-lined aluminum handcuff

snaps around his wrist, the slotted doors fly open, releasing the handcuff and three feet of chain, and the party is a prisoner until the fire company arrives to find out where the fire is and release him. He can, however, close the large doors of the box and cause the large gong to cease ringing.

"Many explorers have commented on the speed with which news travels among savage tribes," says Amateur work. "A curious observation as to a possible solution of the problem of their methods has been made by the Rev. A. Rideout, who, as a missionary among the Basutos, has noticed their method of sending messages from village to village by means of a signal drum or gourd. This gourd, covered with the dried and stretched skin of a kid gives out a sound which travels and can be heard at distances of from five to eight miles. The transmission and reception of messages on these drums is entrusted to special corps of signallers, some one of whom is always on duty, and who beat on the message in what is practically a Morse alphabet. 'On hearing the message,' says Mr. Rideout, 'the signaller can always tell whether it is for his chief or for some distant village, and delivers it verbally or sends it on accordingly, and it is thus carried on with surprising rapidity from one village to another till it reaches its destination. King Lerothodi granted me the privilege of sending messages to our missionary workers by his great telegraph system, and never have I known a message sent by it to fail to reach the person for whom it was intended in its proper form. All that took place in the Boer War, victories and reverses in the Transvaal and Orange Free State were known to us by gourd-line messages hours before the news ever reached us by field telegraph. The natives guarded the secret of their code carefully. To my knowledge, messages have been sent a thousand miles by means of it.' This is probably one of the earliest forms of wireless telegraphy."

WIRELESS TELEGRAPHY.

United States Consul Diederich of Breir en, Germany, furnishes a brief description of a new wireless telegraph station to be erected at Norddeich:

"The general postoffice department of the German Imperial Government is now building a wireless telegraph station of monstrous height at Norddeich, which probably will be for the time being the most efficient in the world. It is expected to cover a circuit of not less than 932 miles. This station will convey not only messages to and from Germany, Switzerland, France, Great Britain and Denmark, but also the larger part of Italy, Sweden and Norway, and even portions of Spain, the Balkan peninsula and Russia; to the south-east it will operate as far as Saragossa, in the south it will almost reach Naples and Cetinje, in the east get close to St. Petersburg, and in the north it will talk to the people at Drontheim and about half-way up to Narvik.

"German vessels homeward bound from America will be able to communicate with the German station at Norddeich when they are still on the Atlantic far beyond Land's End, 12 degrees west of Greenwich. The installation at the station will be set up by a Berlin firm supplying machinery, apparatus, and accessories for wireless telegraphy, according to the system called 'telefunken.'

"At first it was proposed to erect this gigantic telegraph station on the island of Borkum, but finally Norddeich at Norden was chosen as the northwesternmost corner of the German Empire. Norddeich is also the terminus of the Prussian railway system in the extreme northwest, and a small sea-port for the Frisian Islands.

"The towers for the station are to be 213.25 feet high. The foundations have already been laid and the work of erecting the iron superstructure will soon begin."

THE LIGHTNING ROD

For four years past a lightning research committee, organized by the Royal Institute of British Architects and the Surveyors' Institution of London, have been conducting a series of investigations into the use and value of lightning rods. The recently published report sums up and recapitulates the results of much new study on this important subject, the practical suggestions of which are as follows:

First.—Two main lightning rods, one on each side, should be provided, extending from the top of each tower, spire or high chimney stack by the most direct course to the earth.

Second.—Horizontal conductors should connect all the vertical rods (a), along the ridge, or any other suitable position on the roof; (b) at or near the ground line.

Third.—The upper horizontal conductor should be fitted with aigrettes or points at intervals of 20 or 30 feet.

Fourth.—Short vertical rods should be erected along minor pinnacles and connecting with the upper horizontal conductor.

Fifth.—All roof metals, such as finials, ridging, rain water and ventilating pipes, metal cowls, lead-flashing gutters, etc., should be connected to the horizontal conductors.

Sixth.—All large masses of metal in the building should be connected to earth either directly or by means of the lower horizontal conductor.

Seventh.—Where roofs are partially or wholly metal-lined they should be connected to earth by means of vertical rods at several points.

Eighth.—Gas pipes should be kept as far away as possible from the positions occupied by lightning conductors and as an additional protection the service mains to the gas meter should be metallically connected with house services leading from the meter.

According to the statement of Mr. Killingworth Hedges, the honorary secretary of the Committee, a single lightning conductor, or even a group of independent conductors attached to various parts of a building, does not afford complete protection. The Committee investigated 115 cases of lightning strokes throughout Great Britain, and while 75 took place in unprotected buildings, no less than 40 buildings were struck, notwithstanding the fact that they were "protected" by conductors.

A point which will surprise many is that copper wire is not the ideal medium for conducting electricity to earth. Iron, it is claimed, has many advantages over it. Copper being highly conductive, the liability of side flashes is increased. In other words, the flash travels far too readily over it and is likely to get out of hand.

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 Dominion Coal Co., Sydney, N.S., announce that next season there will be a move to greatly augment their carrying capacity by the introduction of three new colliers of the largest and most improved type, now building in Europe. They will also introduce a new steamer in the passenger trade between Montreal and Gulf ports, the business having outgrown the vessel now in this trade. During the season now closing the Dominion Coal Co. shipped up the St. Lawrence 1,120,000 tons, as compared with 1,116,000 tons last year.

When the Canadian Pacific Railroad acquired the Tilsonburg, Lake Erie & Pacific Railroad in November it was generally believed that the officials had in view the use of Port Burwell, Ont., as a coal-receiving port for the western Ontario service; not only for coal for transportation and manufacturing uses, but for the domestic supply of anthracite as well. This presumption has been borne out by the laying of the keel for a large railroad ferry in one of the shipyards in Cleveland, Ohio. It is being constructed at a cost of \$300,000 on the joint order of the Canadian Pacific Railroad, the Ellsworth Coal Co., and one other interest believed to be the Lake Erie & Western Railroad. The steamer will be very strongly constructed, with ice-crushing appliance, as it is the intention to run her winter and summer. Her capacity will be 28 cars per trip. She will be provided with water bulkheads, which will be flooded for ballasting purposes when necessary. The United States terminal has not yet been decided upon, but it will be either Conneaut or Ashtabula, Ohio. The Port Burwell ferry route will be used extensively by the Canadian Pacific Railroad for the importation of steel rails as well as coal. The vessel will, it is expected, be ready to go on the route about next May.

The coal docks of the Canadian Pacific Railway Co. at Fort William, Ont., are very handsomely illustrated in the Cleveland Marine Review included in which are the steamers Philip Murich and Anna C. Mich, which were discharging coal at the docks. The two steamers, says the Review, had cargoes representing 15,300 tons, which was transferred from the boats to storage on the dock in the actual working time of 43 hours with one-ton Macbeth rigs. This coal dock is one of the most complete on the lakes, and has established several records for fast handling of coal. The yard is 1,100 feet along the front of the Kaministiquia river, 275 feet back, and 30 feet deep from the top of the car loading bins. The storage capacity is about 200,000 tons. For distributing coal in the storage, the dock is equipped with two traveling bridges, and with cable cars which have a capacity of about 600 tons an hour, that is from the towers on the face of the dock to the yard. The bridges are also fitted out with pick-up machines with a capacity of about 1,800 tons in ten hours,

taking coal from storage, putting it into pockets from which the coal is loaded into cars. The hard coal storage shed has a capacity of 50,000 tons and a pick-up machine with a capacity of 65 to 70 tons an hour. The dock is one of the most modern on the lakes, and is equipped with the cable system for shifting cars in front of and away from the chutes and also for moving the towers into which the unloading rigs operate into a pocket, and then into cars for distribution over the storage pile. During the past season this dock handled approximately 800,000 tons of coal. N. N. Jockeland is superintendent of the dock, which is situated very conveniently near the mouth of the piers leading into Fort William, and vessels consigned to it can go directly to the dock from Thunder Bay without making a turn.

It is stated that an option has been taken on the Cassiar Coal Co.'s big coal measures in British Columbia by a wealthy syndicate of colliery owners in England. The transaction is said to involve several hundred thousand dollars, the negotiations having been conducted by Mr. Walter R. Nursey, Toronto.

WELSH COAL IN FOREIGN MARKETS.

According to the London Times, Welsh steam coal is in great demand both at home and abroad. The Times says:

Welsh coal is used principally for naval and manufacturing purposes. Its superior calorific power, combined with its weathering capabilities, have given it a peculiar advantage over other coals for the use of mercantile steamships, and it is mainly in virtue of this advantage that the steam coal of South Wales has now for about 25 years occupied its unique position at the various coaling depots along the trade routes of the world. Last year the quantity of coal exported from Cardiff was 14,920,610 tons, and from all the South Wales ports over 21,000,000 tons, or just half the total coal export trade of the whole of the country. In France and Italy the railways as well as the steamship lines are large consumers, but the following figures will give an idea of the extent to which Cardiff coal is shipped to the depots where mercantile steamships and war ships call in order to refill their bunkers.

The nearest and by far the greatest market is in the Mediterranean, and the following were the exports from Cardiff in 1904 to some of the ports on the French, Italian and Egyptian coasts: Alexandria, 503,000 tons; Bordeaux, 285,000 tons; Constantinople 136,000 tons; Genoa, 970,000 tons; Gibraltar 189,826 tons; Marseilles, 331,157 tons; Malta 342,106 tons, and Port Said, 1,114,086 tons. To Madeira and the Canary Islands the exports amounted to over 600,000 tons; to Aden, 167,000; to Cape Town, 317,000 tons; to Colombo, 280,000 tons; to the Philippines, 57,000 tons; to Hongkong 582,596 tons; to Singapore, 113,030 tons; to Shanghai 141,000 tons; and over 1,200,000 tons went to Uruguay and the Argentine Republic. Other depots might have been mentioned, but these figures, though in a few cases of an exceptional character, suffice to show how largely supplied is the world's mercantile marine with the "black diamonds" of the South Wales coal field, and incidentally to explain how it is that Cardiff clears more tonnage for foreign trade than any other port in the world.

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.

We are in receipt of an enquiry from a Canadian manufacturing concern for name and address of makers of machinery for making skewers, Canadian or American. Write CANADIAN MANUFACTURER.

Parties who may be interested in purchasing produce from the West Indies at first hands and in supplying goods, materials and equipments to land owners are requested to address the secretary of the Peasant Proprietors Cooperative Association of the Grand Roy-Concord District, Grenada, British West Indies. It is stated that this association is composed of a considerable number of prosperous but small land-owners who have added to their success by forming an association which enables them to buy on a cooperative basis, and gives them the means of uniting their products to provide a volume of sufficient magnitude to warrant shipments for their own account without the intervention of local merchants. Advices state that they are seeking to form a connection in New York, and they urgently request catalogues and correspondence.

Pumps of a large capacity for low lifts, say under 30 feet, but chiefly 10 feet, and requiring low power for run, especially those for kerosene engines, will, in the near future, find a market for irrigation purposes in Formosa. They should, however, be simple in construction and easily handled. The extensive cultivation of rice and the great increase in the planting of the Lahanna sugar cane (i.e. rose bamboo, a Hawaiian cane introduced by the Formosan Government some years ago), both of which require abundant supplies of water, will probably tend to increase the demand for irrigation pumps. The contemplated establishment of a government rice inspection office will also later on cause a demand for machinery to rake out dirt and paddy from the rice paddy sifting machinery. British Consul at Tainan.

The Australian Department of Trade and Customs has issued instructions that the provisions of sections 151 (a) of the customs act in regard to the assessment of goods for duty are to be strictly complied with. The following charges are to be included in arriving at the free-on-board value. Cost of labor and materials (except outside packages) used in packing, and all costs of conveying the goods from the place of sale and placing them on board the exporting ship. The following charges are to be excluded: Stamp duty including bills of lading, buying commission and brokerage. The instructions apply to goods imported from all countries.

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.

Mr. Samuel S. Dale has sent us a copy of "The Metric Fallacy and Failure," a paper read by him before the Canadian Section of the Society of Chemical Industry, at Toronto, on November 23. The last sentence in the brochure says: "When South America becomes a German province; when the Monroe Doctrine is a dead letter; when the Imperial flag of the Hohenzollerns floats over Westminster and Washington, then and not till then will the metric system be forced on the Anglo-Saxon people, no longer free."

"Protection and Prices," is the title of a cloth bound copy of third edition of a brochure just received from Watson Griffin, manager of "Made in Canada" educational campaign, conducted by the Canadian Industrial League, a branch of the Canadian Manufacturers' Association. Most of the articles bound up in the volume were published in *Industrial Canada* during the years 1903 and 1904, and refer to the industrial conditions existing in Canada during that period.

The Joseph Dixon Crucible Co., Jersey City, N.J., have sent us a beautiful photograph representing the United States Express building as it will be when completed, the steel work of which, now in course of erection, is being protected with Dixon's Silica-Graphite paint, made by them. The immense building will be one of the most conspicuous of the kind in New York.

The Maryland Casualty Co., Baltimore, Md., publish a monthly budget concerning the operations of the company, the current number of which is devoted to an illustrated description of their new office building in that city. The appointments and various offices in the building appear to be appropriate and complete in all respects, and the list of officers, directors and official staff include the names of some of the best known managers in the business. The financial statement of the company show that they have at their credit with the Treasury Board of Canada, at Ottawa, the sum of \$93,705.66 for the protection of its Canadian patrons.

Messrs. Fairbanks, Morse & Co., Chicago, Ill., have sent us a brochure just published by them—their catalogue No. 101A relating to Sheffield motor cars manufactured by them. These cars are specially adapted for inspection use on railroads; are built in great variety of styles, open and covered, with which officials can make very quick and frequent inspections with comfort, and at a less cost than it would be to fire up a locomotive or inspection engine.

The Westinghouse Machine Co., Pittsburg, Pa., have sent us an advance copy of their new standard engine catalogue. The Westinghouse standard engine has now behind it a history of more than a quarter of a century of the most remarkable success, fully demonstrating the correctness of the principles on which it was designed. The field of application of this engine embraces every location in which the use of a simple non-

condensing engine is consistent with the principles of sound engineering and commercial economy. This engine by reason of its peculiar construction, lends itself to use in locations exposed to the weather, to dust and grit, and to corrosive fumes; as, for example, in rock-crushing plants, brick works, cement works, gas works, chemical works, foundries, etc., where the normal conditions of operation would prove rapidly destructive to the working parts of the ordinary engine of open construction.

The Crocker-Wheeler Co., Ampere, N.J., have issued Bulletin No. 61 to describe the belt-type direct-current machines for general power purposes and small lighting plants. The Form D machines described are the highest development of the open-belt motors and generators, having all the improvements in design and construction that practical experience has demonstrated are necessary or desirable.

The Armstrong Mfg. Co., Bridgeport, Conn., have issued a catalogue describing the Armstrong stocks and dies. The catalogue shows a complete line of hand tools and also a number of pipe machines, pipe fitters' vises and other tools.

The Berger Mfg. Co., Canton, Ohio, have issued a catalogue describing their Spanish tile roofing. This tile is made of pressed steel in various sizes and shapes and presents a handsome appearance. It is being largely used on public buildings and residences.

The Dayton Pneumatic Tool Co., Dayton, Ohio, have issued an illustrated catalogue describing their line of "Green" pneumatic hammers. Chipping, caulking and riveting hammers of two classes are shown, together with illustrations showing the work done by them. The use and care of the hammer, together with the descriptions of the chisels and rivet sets, and descriptions for assembling and taking apart the hammers are also given.

The American Blower Co., Detroit, Mich., have issued a catalogue describing the "A.B.C." heater for use in heating and ventilating systems. The catalogue shows a number of views of the heater with and without casings, and also erected in conjunction with fans and blowers for forcing the air through the buildings, together with tables of dimensions and price list.

The Bourne-Fuller Co., Cleveland, Ohio, have sent us a pamphlet having reference to Scott's Crucible Tool Steels, the handling of which they control. The Scott brands of tool steel are made in six tempers, thus being suitable for all mechanical purposes. The company inform us that owing to the increased volume of their tool steel trade, they have found it necessary to establish a tool steel department, of which Mr. J. C. Scott will have charge, assisted by a corps of experienced tool steel salesmen. To properly supplement their mill deliveries, the company will at all times carry in stock a full assortment of all grades of tool steels.

The Jeffrey Mfg. Co., Cleveland, Ohio, have sent us their catalogue No. 20, illustrating machinery manufactured by them specially designed for handling coal at the mines. The catalogue is issued for the purpose of showing some Jeffrey work in the line mentioned, and also for the benefit of those specially interested in coal handling, with whom the company would be glad to correspond with a view to demonstrating how per-

fectly equipped they are to handle both special and ordinary problems. The book in its 142 pages gives illustrations, diagrams and descriptions of about every conceivable apparatus, machinery, plant, etc., used in coal mining under about every variety of conditions.

The National Electric Co., Milwaukee, Wis., have sent us a pamphlet illustrating their stationary and portable motor-driven air compressors, for continuous and intermittent service.

The Canadian Westinghouse Co., Hamilton, Ont., have sent us an illustrated pamphlet of motor generators, manufactured by them.

The Rolla L. Crain Co., Ottawa, are sending out circulars relating to the loose-leaf continuous ledger and loose-leaf systems manufactured by them.

The Dominion Geographer, Mr. White, is getting out an atlas of Canada which will furnish considerable information which is not at present available in any other. It contains 39 maps and 44 sheets of diagrams. Among the features shown will be the territorial divisions of the country, maps showing the physical features, the geology, the minerals, the forest resources, telegraphs, telephones, railways, canals, lighthouses, sailing distances, routes and depths, isotherms for the various months, density of population, international and inter-provincial boundaries, routes taken by the early explorers, drainage basins, distribution of the Indian tribes, maps of the ten chief cities, together with statistical diagrams of area, population, agriculture, finance, trade and commerce, mineral products, education, immigration, vital statistics and altitudes.

The machine shop and spring shop of the Page Woven Wire Fence Co., Monessen, Pa., are to be equipped throughout with hot blast heating system, furnished by the B. F. Sturtevant Co., Boston, Mass. These two buildings combined contain nearly one million cubic feet of space.

The Westinghouse Machine Co., East Pittsburg, Pa., who have built some of the largest steam engines in the country, have within the last few weeks booked orders for more than 75 steam engines, aggregating 10,764 h.p. Of the different types of steam engines manufactured by this company 5,010 h.p. of Marine type were sold, 2,740 h.p. of Compound steam engines, 1,823 of Standard, 801 of Junior and the remainder of Corliss. The largest single order during this time was received from the Tehuantepec Railway of Mexico for four 16 inch and 34x15 inch Marine type engines and two 84x8 inch Standard engines for equipping their Salina-Cruz and Coatzacoalcos power houses.

The growth of the motor commercial vehicle is only second to that of the pleasure automobile. In one year the output of this type of motor car has increased 70 per cent and the future gives promise of even a more remarkable increase. A year ago there were only two makes of commercial cars regularly placed on the market, and this number has now been increased to eight. The electrically propelled machine was the first to gain in favor, but now the commercial vehicle driven by a gasoline motor seems to be in the lead.

PERSONALS.

Graham Fraser, Esq., and J. Dix Fraser, Esq., director of works and assistant director of works respectively of the Dominion Coal & Iron Co., Sydney, N.S., gave a dinner to a number of their business associates recently preliminary to their leaving the company. During the course of an address, Mr. Graham Fraser called attention to three new records set by the Dominion company in October. The open hearth output was 18,915 tons an increase of 3,837 over June, 1903, which had held the record, the blooming mill turned out 15,262 tons, 1,246 more than in October 1902, and the blast furnaces added 565 tons to the 8,124 of June, 1902, which was the largest preceding output.

Mr. Arthur D. Fiske, formerly Pennsylvania representative of Harbison-Walker Refractories Co., Pittsburg, Pa., has severed his connection with that company and has accepted position of general sales manager of the Pennsylvania Fire Brick Co., Beech Creek, Pa., and will be closely identified with the management.

Mr. C. S. Powell, general agent of the Westinghouse Electric & Mfg. Co., who has for some time occupied offices at 11 Pine Street, New York, has removed to the offices of the company on the 19th floor of the Trinity Building, 111 Broadway. The Westinghouse Electric & Mfg. Co., in addition to their offices in the Hanover Building at 11 Pine Street, occupy the entire 19th floor of the Trinity Building.

CONVENTION OF CANADIAN CLAY-WORKERS.

The annual convention of the Ontario Clayworkers' Association will be held in Hamilton, Ont., December 13 and 14 instant, headquarters being at the Hotel Royal.

Following subjects will be discussed: Watersmoking and burning of clay wares, Mr. Miller, superintendent Don Valley Pressed Brick Co., Toronto.

Economical generation and use of power on clay-working plants. B. E. Bechtel, Waterloo, Ont.

Testing of clays. O. Bard, Parkhill, Ont. Lecture by Prof. Baker, Ontario Bureau of Mines.

Manufacture of dry press brick. J. McCannell, managing director, Milton Pressed Brick Co., Milton, Ont.

Local Association for Brickmakers, and how to run them. L. New, Hamilton, Ont. Tidiness and cleanliness of a brick plant. Wm. Hancock, Hamilton, Ont.

Best methods of preparing clay for machines. Wm. McCredy, Lyons, Ont.

How to interest the farmers in drainage. J. M. Carter, St. Catharines, Ont.; Jno. Jarvis, Dorchester, Ont.

PATENTS

Messrs. Marion & Marion, patent attorneys, Montreal and Washington, D.C., have obtained the following Canadian patents:

J. A. Godin, Montreal, building construction; Joseph Thompson, Grand Bay, Westfield, N.B., air cushion spring; Messrs. A. Coulombe & E. Lacroix, Woonsocket,

R.I., vinegar generator; Henri Ragot, Notre Dame de Lourdes, Man., shocking machine; Francois Mouterde, Montreal, storage battery; Oscar Brunler, Leipzig, Germany, steam generators, Philippe D. Dupont, St. Johnsbury, Vt., coil spring power hammer; Matthew Steel, Gosforth, England, carbureting apparatus; Charles Duncan, Montreal, baskets for incandescent electric light bulbs; Charles E. Hibberd, Auckland, New Zealand, coin freed machines; Fredrik A. Kjellin, Stockholm, Sweden, electric furnaces.

Messrs. Fetherstonhaugh & Co., patent solicitors, Toronto, Ottawa and Washington, D.C., send us the following list of patents recently granted Canadian inventors:

E. C. Crompton, Brantford, Ont., collapsible boxes, D. Ewart, Ottawa, the construction of walls of buildings; J. A. Beam, Baden, Ont., threshing machines; W. H. Freemantle, Smith's Falls, Ont., nut locking devices, R. Sylvester, Lindsay, Ont., threshing machines, E. J. Eastwood, Arnprior, Ont., nut locks; W. H. Brown, Hampton, N.B., stave jointing machines; F. J. Gilman, Montreal, mechanical furnaces; M. L. Dohan, Richmond, Que., vending machines; T. A. Blakeley, Flesherton, Ont., anti-friction bearings; C. D. McPhee, Arnprior, Ont., electric hot bearing indicators; M. D. Prendergast, Sarnia, Ont., wire fence fabrics; D. McMillan, Montreal, rope clutches; A. Hatton, Kingston, Ont., buoys for locating sunken ships; F. Huber, Montreal, wrenches; J. M. Fleming, Ottawa, trolley pole heads; C. E. Shedrick, Sherbrooke, Que., electric controllers; D. Hastings, Galt, Ont., end matching machines; H. Truesdell, Toronto, grate bars; J. A. Godin, Montreal, building construction;

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A. Vandervoort, Belleville, Ont., tires, pneumatic tire construction; F. Cowden, Montreal, process for moulding and apparatus for carrying same; A. Warfield, Toronto, metal railway ties and means for fastening rails to same; W. Bernard, Smith's Falls, Ont., freezing hydrants; J. T. Leehonby, Hamilton, Ont., machine for trimming the corners of boxes; H. R. Lockhart, Montreal, trolley bases; C. G. Draeseke, Dundas, Ont., clutch devices for the driving mechanisms of lathes; G. Hill, Ottawa, feed water heaters for locomotives.

AN IMPORTANT ORE DEAL.

The Moose Mountain iron ore properties, lying about 18 miles north of Sudbury, Ont., were recently the scene of an important deal. A two-tenths interest was sold to Mackenzie & Mann, of the Canadian Northern Railroad, for \$500,000. The interests sold were those of Chase S. Osborne of Sault Ste. Marie and John C. Spry of Chicago. The Canadian Northern Railroad is building from Toronto westerly toward a connection with its present lines running from the north shore of Lake Superior into the north-western wheat districts of Canada and headed for the Pacific. A slight deflection of the main line will pass it across the Moose Mountain properties, and a line of about 70 miles in length will connect the ore with deep water on the north shore of Georgian Bay. The railroad has agreed with the remaining owners of the Moose Mountain district that it will make a low rate to the lake, a rate that will give a gross freight from the mines to lower lake receiving ports of about \$1 a ton. It is from this fact that the great importance of the purchase by Mackenzie & Mann arises.

These properties were discovered some three years ago by a prospector who reported his finds to Mr. Osborne. The latter interested Joseph Sellwood of Duhith, who made an examination. Two years ago last April Mr. Sellwood, John W. Gates, John Lambert and a few associates, including Blair & Co., New York bankers, and John J. Mitchell, president of the Illinois Trust & Savings Bank, Chicago, bought the lands, paying therefor about \$10,000. Sufficient exploration has been made to show a very great value, and there are many millions of tons of excellent magnetic ore exposed above water level. This ore is partly Bessemer, with a large portion running from 0.06 to 0.07 per cent. in phosphorus, while the bulk of the ore so far as determined carries above 61 per cent. of iron.

These deposits are located along the west branch of the Vermillion River, in Nipissing district, and extend for 30 to 40 miles, much of it in an unsurveyed district of Algoma. The company, an interest in which has just been sold to Mackenzie & Mann, controls the most pronounced part of the formation, extending for several miles along the trend of the range, and there are great outcrops of iron in a bluff-like situation. At least five of these outcrops can be made into shipping mines as soon as transportation is furnished. The nearest railroad line to these properties now is the main line of the Canadian Pacific, which passes 18 miles to the south. The distance to the village of Killarney, on the north shore of Georgian Bay, is about 70 miles. Ore shipping piers will be built near Killarney and work begins this winter.

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CANADA'S MARBLE CAVES.

W. S. Ayres, the eminent mining and consulting engineer of Banff, B.C., was in Revelstoke, B.C., recently, having just returned from an inspection and survey on behalf of the Dominion Government of the famous marble caves discovered by Charles Deutschman, and which bid fair to become the greatest wonder and attraction on the American continent. With the assistance of the discoverer Mr. Ayres surveyed in three days 3,225 feet, of which 1,084 feet were in absolutely new channels which were never before entered by any man. Mr. Ayres was much impressed with these latter passages and he considers they have as yet only been touched upon, for their end was nowhere in sight. This was Mr. Ayres' second visit to the famous Cougar Basin in which the caves are located, his first trip being made about the end of last May, when he ventured the opinion that other caves, possibly of greater extent and beauty would yet be found in the vicinity. The recent discovery of the big caves, to the east of the original discovery, fully bears out Mr. Ayres' opinion.

Mr. Ayres stated that the caves were exceedingly grand, there being nothing just like them known in the whole world. Unlike the mammoth caves of Kentucky and others of lesser renown, the Deutschman caves have a very marked and different formation, being constructed of marble by the force of water action. For centuries past underground streams have been carving out these immense caverns and channels until now they are unequalled in magnificence of grandeur and beauty.

Mr. Ayres has had large experience in the pursuit of his profession in underground work, and his opinion of the Deutschman caves will be of immense value to the government as well as of great interest to the people of Canada. The most skeptical now admit that these wonderful caves will in the near future be the attraction of the continent

and the means of drawing thousands of tourists from all points in Canada, the United States and Europe, to this district.

ZINC IN CANADA.

Mr. Alfred C. Garde, M.E., Nelson, B.C. one of the members of the Commission recently appointed to inquire into the zinc resources of British Columbia, states that the report of the Commission is in course of preparation. Prof. W. R. Inglis, New York, was chairman of the Commission, and the third member was Mr. Philip Argall M.E., Denver, Colorado. The Commission had been appointed by Dr. Haanel, the head of the Department of Mining, at Ottawa, and was under his supervision. The Commission have been at work for the last three months investigating the zinc deposits, the quality of the ore, method of treatment, etc. Their work has been so satisfactory that it will be continued by the Department next spring. The price of zinc has greatly increased of late years owing to its much wider use in the various arts and for electrical and other purposes.

There are deposits in Ontario which will probably be investigated later. In British Columbia large shipments have been made, but the producers suffer a loss, through having to ship the ore to the United States or to Europe for treatment. It is hoped that soon this can be done in Canada.

Speaking of the general mining outlook in British Columbia, Mr. Garde said the copper industry was steadily going ahead. The boundary country was producing largely and profitably. The Granby Co., which had the biggest plant, was one of the most encouraging industries of the province.

100,000 tons of apples are grown on British soil yearly.

THE BERTRAM PLANT AT DUNDAS, ONT

Extensive additions and improvements are being made to the plant of the John Bertram & Sons Co., Dundas, Ont. A new foundry building, which will embody the most modern ideas in construction and appointments, is already well under way. The structure will be 209 feet long, with provision for extending to 500 feet. The centre bay is 50 feet and the side bays 32 feet wide, making a total width of 114 feet and providing 32,600 square feet of floor space. The west bay will have a gallery, with reinforced concrete flooring its entire length. This will be used as a charging floor and for sand and coke storage. The storage bins will be served by a system of chutes whereby the coke and sand will be received directly from cars.

Ample light enabling the men to work in the deepest hole, will be provided by skylights and two rows of side windows. Provision is made for ventilation by the swinging of the upper row of side lights. The crane equipment will include one 10 and one 25-ton traveling crane for the centre bay, 5-ton cranes for the side bays and a 5-ton crane over the core room. The yard between the foundry and extended machine shops will be covered by a large traveling crane

with 60-foot span. Transportation facilities will include railroad service for the yard and tracks running into the foundry.

The old foundry building, after the completion of the new foundry, will be converted into a machine and erecting shop, served by a 30-ton traveling crane, under which all the heavy class of tools will be built. The building will be extended to 280x50 feet, and when completed will give three erecting shops suitable for various classes of work and served by 10, 15 and 30-ton cranes, respectively. The present No. 1 shop will remain a two-story manufacturing shop for small parts. With these extensions over 55,000 feet of machine and erecting shop floor space will be given.

The works will be operated by electric power and an air plant for the new foundry will be installed.

T. A. Somerville, formerly with the Canadian Pacific Railway's Angus shops and the Canada Car Co. Montreal, has charge of the construction and improvements. The Phoenix Iron Works Montreal, have the contract for the steel work. M. J. Haney and Roger Miller, Toronto, are contractors for the balance of the work.

For the manufacture of its full line of small tools, including taps, dies, reamers, milling cutters, punches, etc., a plant has been pur-

chased in Dundas, near the Bertram works, and will be used by the Pratt & Whitney Co. The building is a modern structure and will afford at present 12,000 feet of floor space. Machinery for the plant is being shipped from Hartford and work will commence shortly. A twist drill department will also be included in the plant. An elaborate equipment of special machinery for this department is ready for installation. This small tool plant, which will soon be enlarged will be operated as one of the departments of the Bertram works.

The Jencks Machine Co., Sherbrooke, Que., are in receipt of an order from the Granby Copper Co., of New York, whose mines and works are at Phoenix, B.C. for an ore crusher which will have a capacity of working 150 tons of ore per hour, or 3,600 tons per day. This will be the third large crusher supplied by the Sherbrooke concern to the Granby Copper Co.

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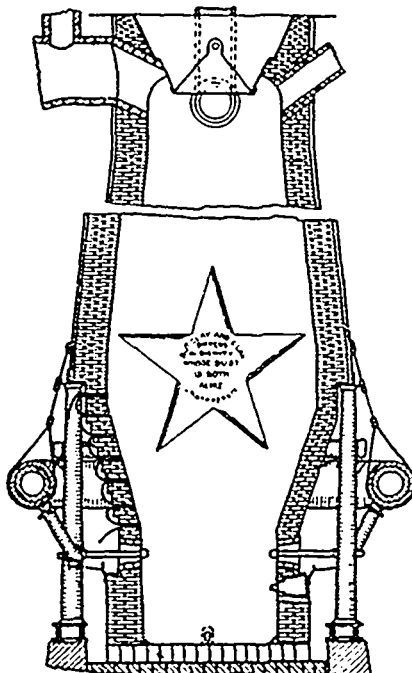
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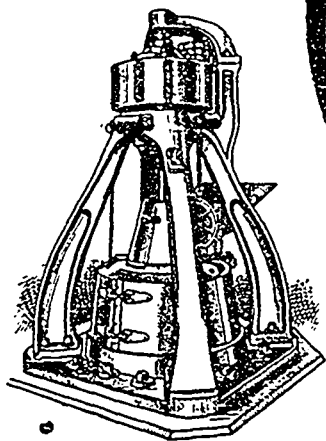
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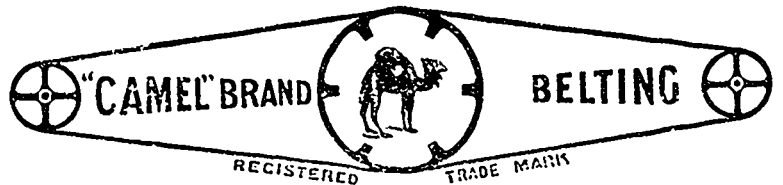
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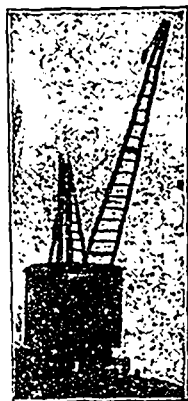
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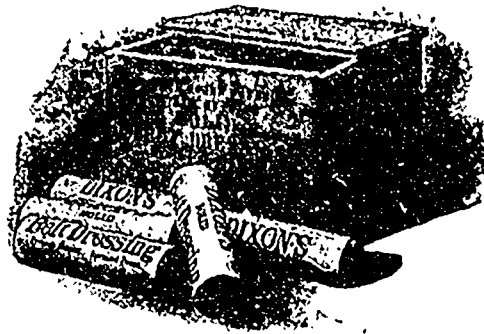
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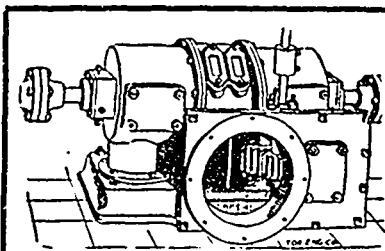
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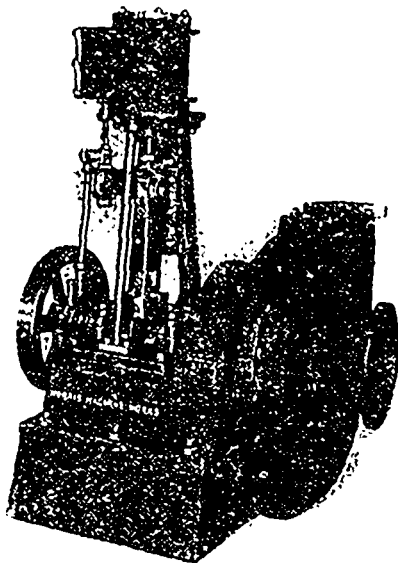
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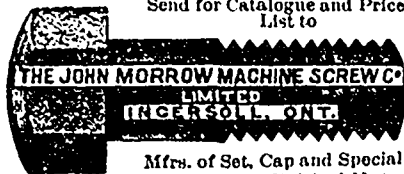
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Syrause Smelting Works, Montreal.

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(CONTINUED).

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CoversMcCullough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.**Crayons**Lowell Crayon Co., Lowell, Mass.
McLaren, J. C. Belting Co., Montreal.**Crucibles**Dixon, Joseph, Crucible Co., Jersey City, N.J.
McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.
Syracuse Smelting Works, Montreal.**Crucible Caps**McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.**Crucible Covers**McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.**Cutter Grinding Machines**

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

Deep Well Engines

American Steam Pump Co., Battle Creek, Mich.

Detective Agency

Dewar Detective Agency, St. Louis, Mo.

Dies (Socket, Sewer Pipe and Tile)

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

Directories

Kelly's Directories, Limited, Toronto

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Dredges

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DrillsAllis-Chalmers-Bullock, Limited, Montreal.
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Petrie, H. W., Toronto.**Drills (Pneumatic and Rock)**Allis-Chalmers-Bullock, Limited, Montreal.
Canadian Rand Drill Co., Sherbrooke, Que.
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Globe Machine & Stamping Co., Cleveland, Ohio.

Drop Forging Dies

Globe Machine & Stamping Co., Cleveland, Ohio.

Dry Kilm Apparatus]Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.**Dust and Shavings Separators**Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.**Dye Stuffs and Chemicals**Benson, W. T. & Co., Montreal.
Brunner, Mond & Co., Northwich, England.
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Cassella Color Co., New York City.
Geigy Aniline & Extract Co., New York City.
McArthur, Cornicillo & Co., Montreal.
Nichols Chemical Co. of Canada, Montreal.
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Packard Electric Co., St. Catharines, Ont.**Electric Mine Locomotives**Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.**Electrical Repairs**

Keystone Engineering Co., Toronto.

Electrical SuppliesAllis-Chalmers-Bullock, Limited, Montreal.
Bristol Co., Waterbury, Conn.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Electrical Construction Co., London, Ont.

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Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto.
Packard Electric Co., St. Catharines, Ont.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.**Elevators and Conveyors**Allis-Chalmers-Bullock, Limited, Montreal.
Darling Bros., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jenokes Machine Co., Sherbrooke, Que.
Link-Belt Engineering Co., Philadelphia, Pa.**Elevator Insurance**

Canadian Casualty & Boiler Insurance Co., Toronto.

Emery and Emery WheelsForman, John, Montreal.
Petrie, H. W., Toronto.**Engineers (Chemical)**Heys, Thomas & Son, Toronto.
Hunt, Robert W. & Co., Chicago, Ill.**Engineers (Civil)**Parko, R. J., Toronto.
Vogel, C. H., Ottawa.**Engineers (Consulting)**Aitken, K. I., Toronto.
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Electrical Construction Co., London, Ont.
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Hunt, Robert W. & Co., Chicago, Ill.
Keystone Engineering Co., Toronto, Ont.
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Von der Osten, E. & Co., Toronto.**Engineers (Contracting)**Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
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Robb Engineering Co., Amherst, N.S.**Engineers (Electrical)**Aitken, K. I., Toronto.
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Jenckes Machine Co., Sherbrooke, Que.
Morris Machine Works, Baldwinville, N.Y.
McDougall, John, Caledonian Iron Works Co., Mont-
real.

Petrie, H. W., Toronto.
Robb Engineering Co., Amherst, N.S.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.
Williams, A. R. Machinery Co., Toronto.

Engravers

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

Exhaust Fans

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

Exhaust Heads

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

Exhausters

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

Explorer and Geologist

Evans, Horace F., Ashcroft, B.C.

Factory Sites

(See Factory Locations, page 31.)
Central Ontario Power Co., Peterboro, Ont.
Hutcheson, S. M., Paisley, Ont.

Feed Water Heaters

Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
McDougall, John, Caledonian Iron Works Co., Mont-
real.
Robb Engineering Co., Amherst, N.S.

Files

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Dun, R. G. & Co., Toronto.
Neff & Postlethwaite, Toronto.
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Hamilton Facing Mill Co., Hamilton, Ont.
Harbison-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-Fuller Co., Cleveland, Ohio.

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Darling Bros., Montreal.

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Sheldon & Sheldon, Galt, Ont.
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Canada Foundry Co., Toronto.
Goldie & McCulloch Co., Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Mont-
real.
Robb Engineering Co., Amherst, N.S.

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Hamilton Facing Mill Co., Hamilton, Ont.

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Babcock & Wilcox, Limited, Montreal.
Sturtevant, B. F. Co., Hyde Park, Mass.

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Ontario Wind Engine & Pump Co., Toronto

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Morrison, T. A. & Co., Montreal.

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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.

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

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.

Gloves, Mittens and Moccasins

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

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Advance Machinery Co., Toledo, Ohio.

Glue Room Equipment

Advance Machinery Co., Toledo, Ohio.

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Minister of Agriculture.

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

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Penberthy Injector Co., Windsor, Ont.

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Gartshore, John J., Toronto.
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Hopkins, F. H. & Co., Montreal.

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McLaren, J. C. Belting Co., Montreal and Toronto.
Reddaway, F. & Co., Montreal.
Sadler & Haworth, Montreal and Toronto.

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Gallatin Hotel, New York City.

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Kerr Engine Co., Walkerville, Ont.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Mont-
real.

Hydraulic Accumulators

Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Mont-
real.

Hydraulic Leather

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

Hydraulic Machinery

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

Industrial Plants

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

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Insulated Wires and Cables

Phillips, Eugene F., Electrical Works, Montreal.

Insurance

Inter-Insurers of America, New York City.

Iron and Steel Specialties

Armstrong Mfg. Co., Bridgeport, Conn.
 Bourne-Fuller Co., Cleveland, Ohio.
 Canada Foundry Co., Toronto.
 Leslie, A. C. & Co., Montreal.
 London Rolling Mill Co., London, Ont.
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 Nova Scotia Steel & Coal Co., New Glasgow, N.S.
 Payne H. W., Toronto
 Union Drawn Steel Co., Hamilton, Ont.

Injectors

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

Iron and Steel Inspection

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

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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.

Lathes

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

Lathes (Wood-working)

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

Loom Reeds

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

Lubricators

Penberthy Injector Co., Windsor, Ont.

Machinists

Edie & McCulloch Co., Galt, Ont.
 Robb Engineering Co., Amherst, N.S.

Machinists' Supplies

Armstrong Mfg. Co., Bridgeport, Conn.
 Butterfield & Co., Rock Island, Que.
 Edie & McCulloch Co., Galt, Ont.
 Gatta Percha & Rubber Mfg. Co., Toronto
 Hopkins, F. H. & Co., Montreal
 Jeffrey Mfg. Co., Columbus, Ohio.
 Morrow, John, Machine Screw Co., Ingersoll, Ont.
 Payne, H. W., Toronto.

Machine Tools

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

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

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

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Edie Machine & Stamping Co., Cleveland, Ohio.

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Mills, S. D., Toronto.

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 Armstrong Mfg. Co., Bridgeport, Conn.
 Becker-Brannard Milling Machine Co., Hyde Park, Mass.
 Darling Bros., Montreal.
 Gartshore, John J., Toronto.
 Galt & McCulloch Co., Galt, Ont.
 Gatta Percha & Rubber Mfg. Co., Toronto.
 Hamilton Brass Mfg. Co., Hamilton, Ont.
 Hamilton, Wm., Mfg. Co., Peterborough, Ont.
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 Hay, Peter Knife Co., Galt, Ont.
 Hopkins, F. H. & Co., Montreal.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Jenckes Machine Co., Sherbrooke, Que.
 Morrow, John, Machine Screw Co., Ingersoll, Ont.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 McLaren, D. K., Montreal and Toronto.
 McLaren, J. C., Belting Co., Montreal.
 Penberthy Injector Co., Windsor, Ont.
 Petrie, H. W., Toronto.
 Reddaway, F. & Co., Montreal
 Robb Engineering Co., Amherst, N.S.
 Snence, R. & Co., Hamilton Ont
 Wilson, J. C. & Co., Glenora Ont

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 Canadian Rand Drill Co., Sherbrooke, Que.
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 Gartshore, John J., Toronto.
 Hamilton, Wm. Mfg. Co., Peterborough, Ont.
 Hopkins, F. H. & Co., Montreal.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Jenckes Machine Co., Sherbrooke, Que.
 Link-Belt Engineering Co., Philadelphia, Pa.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Perrin, William R. & Co., Limited, Toronto.
 Petrie, H. W., Toronto.
 Williams, A. R. Machinery Co., Toronto.

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 Electrical Construction Co., London, Ont
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 Jeffrey Mfg. Co., Columbus, Ohio.
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 Keystone Engineering Co., Toronto
 Petrie, H. W., Toronto.
 Sturtevant, B. F. Co., Hyde Park, Mass.
 Toronto & Hamilton Electric Co., Hamilton, Ont.
 United Electric Co., Toronto.

Moulding Sand

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

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 Pittsburg Crucible Works, Pittsburg, Pa.

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

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Montreal Pipe Foundry Co., Montreal.

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

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

Plumbago

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

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Phillips, Eugene F., Electrical Works, Montreal.

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Jencks Machine Co., Sherbrooke, Que.
Kerr Engine Co., Walkerville, Ont.
Morris Machine Works, Baldwinville, N.Y.
McDougall, John, Caledonian Iron Works Co., Montreal.
Ontario Wind Engine & Pump Co., Toronto.
Petrie, H. W., Toronto.

Punches and Shears

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Petrie, H. W., Toronto.

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Goldie & McCulloch Co., Galt, Ont.
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Purifying and Softening Systems (Water)

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

Railroads

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

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Bourne-Fuller Co., Cleveland, Ohio.

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Lang Bros., Montreal.

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Sheldon & Sheldon, Galt, Ont.

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Butterfield & Co., Rock Island, Que.

Petrie, H. W., Toronto.

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Lang Crucible Works, Pittsburg, Pa.

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Fuller Co., Cleveland, Ohio.

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Ontario Wind Engine & Pump Co., Toronto.

Taps and Dies

Butterfield & Co., Rock Island, Que.

Globe Machine & Stamping Co., Cleveland, Ohio.

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Textile Manufacturers

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Smith Mfg. Co., Toronto.

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

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

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Syracuse Smelting Works, Montreal.

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Canada Foundry Co., Toronto.

Hamilton Brass Mfg. Co., Hamilton, Ont.

Kerr Engine Co., Walkerville, Ont.

Petrie, H. W., Toronto.

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

Valves (Rubber)

Gutta Percha & Rubber Mfg. Co., Toronto.

Varnishes

Berry Bros., Walkerville, Ont.

Ventilators

Darling Bros., Montreal.

Sheldon & Sheldon, Galt, Ont.

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

Wagon and Carriage Wood Work

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

Washers or Hollinders (Cleaning Rubber)

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Watchman's Clocks

Eco Magneto Clock Co., Boston, Mass.

Water Power Development

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Water Purifying Chemicals

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Ontario Wind Engine & Pump Co., Toronto.

Wire Mill Supplies

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

Phillips, Eugene F. Electrical Works, Montreal.

Wire Rope Fittings

Dominion Wire Rope Co., Montreal.

Wire Cloth

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Wire Drawing Machinery

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Wood-Working Machinery

Advance Machinery Co., Toledo, Ohio.

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Petrie, H. W., Toronto.

Sheldon & Sheldon, Galt, Ont.

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

Zinc

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Syracuse Smelting Works, Montreal.

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J. J. CASSIDY, Manager.

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American Architect	New York	Weekly	\$6 00	\$6 25
American Electrician	New York	Monthly	1 00	1 25
American Federationist	Washington	Monthly	1 00	1 25
American Inventor	New York	Monthly	1 50	1 75
Architect and Builders Magazine	New York	Monthly	2 00	2 25
Architectural Record	New York	Monthly	3 00	3 25
Architectural Review	London	Monthly	4 00	4 25
Atlantic Monthly	Boston	Monthly	4 00	4 25
Boys' Own Paper	London	Weekly	1 75	2 00
Brick-Bulder	Boston	Monthly	5 00	5 25
British Architect	London	Weekly	6 00	6 25
Buffalo Express, Illustrated	Buffalo	Weekly	2 00	2 25
Builders' Journal	London	Weekly	3 50	3 75
Camera	Philadelp. na.	Monthly	1 00	1 25
Canada First	Toronto	Monthly	1 00	1 25
Canadian Magazine	Toronto	Monthly	2 50	2 75
Cassiers' Magazine	New York	Monthly	3 00	3 25
Chemical News	London	Weekly	5 25	5 50
Colliers' Weekly	New York	Weekly	5 20	5 25
Commercial Intelligence	London	Weekly	5 00	5 25
Compressed Air	New York	Monthly	1 00	1 25
Cooking School Magazine	Boston	Monthly	1 00	1 25
Cornhill Magazine	London	Monthly	2 50	2 75
Delineator	New York	Monthly	1 00	1 25
Electrical Engineer	London	Weekly	4 50	4 75
Electrical Magazine	London	Monthly	2 25	2 50
Electrical Review	London	Weekly	5 75	6 00
Electrical World and Engineer	New York	Weekly	3 00	3 25
Electrician	London	Weekly	7 30	7 50
Electro-Chemical Industry	New York	Monthly	2 00	2 25
Engineering and Mining Journal	New York	Weekly	5 00	5 25
Engineering Review	New York	Monthly	1 00	1 25
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Everybody's Magazine	New York	Monthly	1 00	1 25
Field and Stream	New York	Monthly	1 50	1 75
Forest and Stream	New York	Weekly	4 00	4 25
Four Track News	New York	Monthly	1 00	1 25
Gentleman's Magazine	London	Monthly	4 00	4 25
Girl's Own Paper	London	Weekly	1 75	2 00
Good Housekeeping	Toronto	Monthly	1 00	1 25
Good Road's Magazine	New York	Monthly	1 00	1 25
Hardware Dealers' Magazine	New York	Monthly	1 00	1 25
Harpers' Magazine	New York	Monthly	4 00	4 25
Harpers' Weekly	New York	Weekly	4 00	4 25

NAMES	Place.	Fre- quency	Their Price.	Com- bina- tion
Illustrated London News	London	Weekly	\$6 00	\$6 25
Inter-Ocean	Chicago	Weekly	1 00	1 25
Iron Age	New York	Weekly	5 00	5 25
Ironmonger	London	Weekly	4 00	4 25
Ladies' Home Journal	Philadelphia	Monthly	1 25	1 50
Leshes' Monthly Magazine	New York	Monthly	1 00	1 25
Literary Digest	New York	Weekly	3 00	3 25
Machinery (Engineering Edition)	New York	Monthly	2 00	2 25
McClure's Magazine	New York	Monthly	1 00	1 25
Mines and Minerals	Scranton	Monthly	2 00	2 25
Modern Methods	Detroit	Monthly	50	1 50
Montreal Herald	Montreal	Daily	3 00	3 25
Montreal La Presse	Montreal	Daily	3 00	3 25
Montreal Witness	Montreal	Daily	3 00	3 25
Motor Age	Chicago	Weekly	2 00	2 25
Motoring, Illustrated	London	Weekly	2 25	2 50
Municipal Journal	New York	Monthly	3 00	3 25
National Builder	Chicago	Monthly	2 00	2 25
National Monthly	Toronto	Monthly	1 00	1 25
New York Clipper	New York	Weekly	4 00	4 25
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North American Review	New York	Monthly	5 00	5 25
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Outing	New York	Monthly	3 00	3 25
Ottawa Citizen	Ottawa	Daily	3 00	3 25
Ottawa Free Press	Ottawa	Daily	3 00	3 25
Pearson's Magazine	New York	Monthly	1 00	1 25
Photographic Journal	London	Monthly	2 00	2 25
Photographic Times	New York	Weekly	1 00	1 25
Photography	London	Weekly	2 25	2 50
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Power	New York	Monthly	1 00	1 25
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Review of Reviews	London	Monthly	2 00	2 25
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Youth's Companion	Boston	Weekly	1 75	2 00
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