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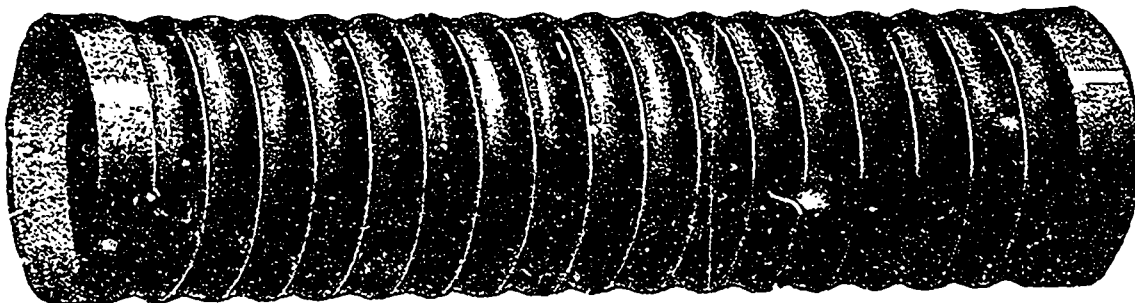
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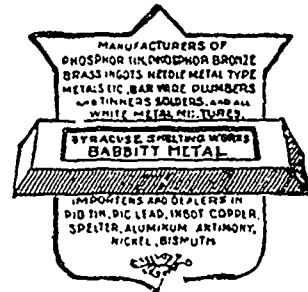
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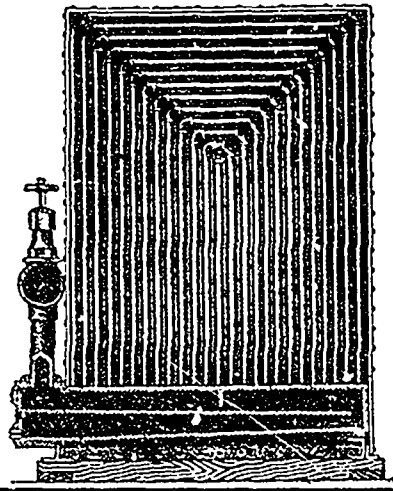
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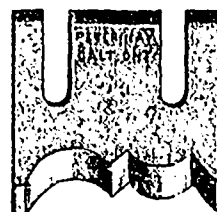
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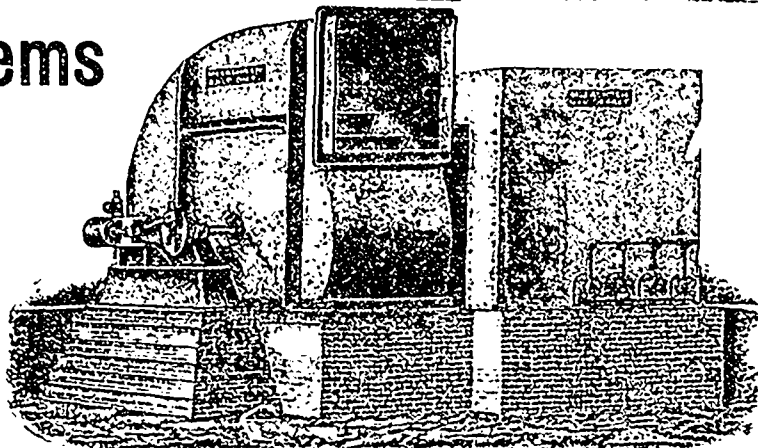
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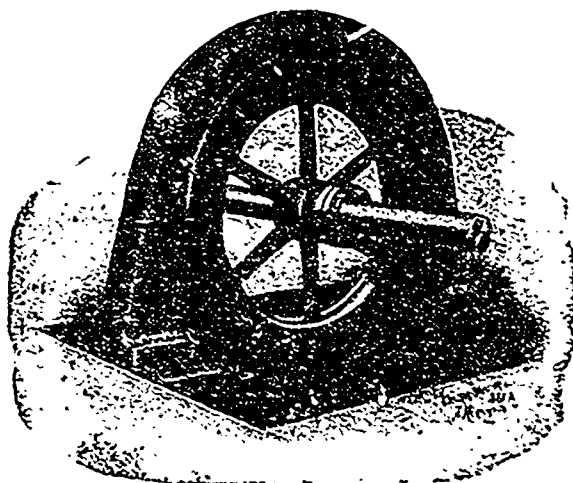
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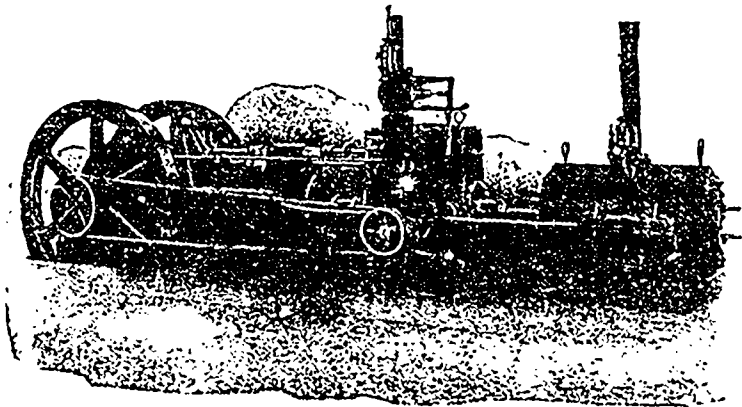
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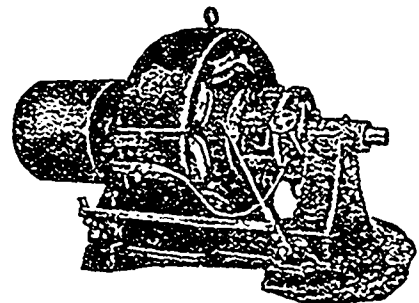
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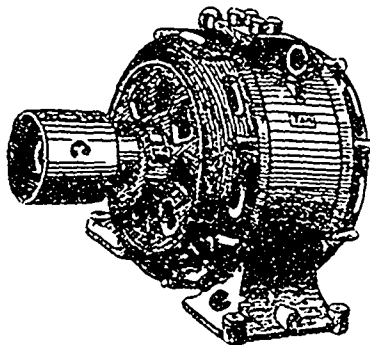
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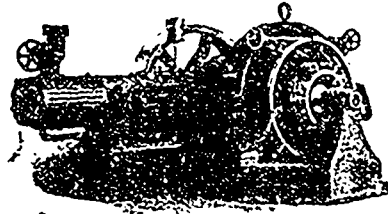
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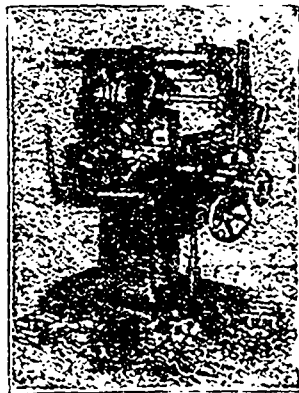
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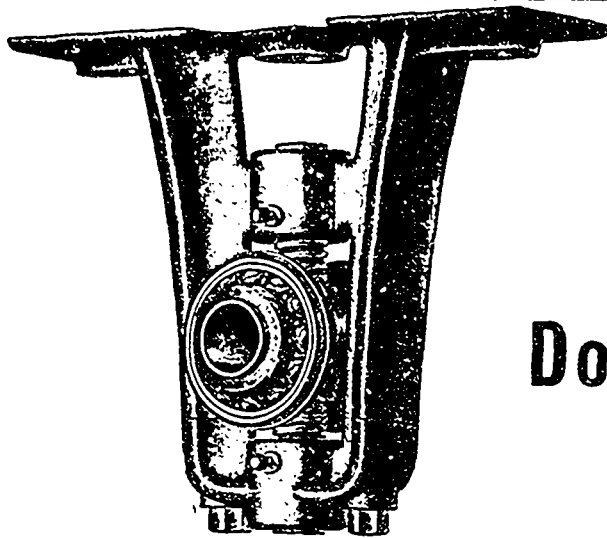
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J. J. CASSIDEY, Editor and Manager

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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.

MISAPPREHENSIONS.

In a recent issue of this journal mention was made of the fact that a Melbourne dispatch received in London stated that some antagonism had arisen between the Australian and Canadian governments as shown in a recent debate in the Australian House of Representatives in which the Minister of Trade and Commerce, referring to his reassessment of the value of Canadian harvesters imported into Australia, caused a sensation by producing a letter from the Dominion Customs Department in which the Department had refused to allow its officers to make inquiries enabling the Commonwealth to ascertain for purposes of taxation the real value of harvesters sent from Canada to Australia.

It was on the strength of this report that the Canadian Manufacturers' Association wired the following cable message to the government of the Australia Commonwealth:

The Canadian Manufacturers' Association regrets to learn, through the cables published in the press, that there should be any difficulty in arriving at the correct valuation of imports into Australia for the collection of duties. If your government should send an expert to this country to ascertain such values on exports from Canada, this Association will be glad to render him any assistance in its power.

Who the sender of the Melbourne dispatch was is not stated, but it is quite evident that it was conceived either in ignorance of the facts, or with an intention to rupture the most excellent relations existing between the Australian and the Canadian governments. The fact is, the matter in question in no way related to the Australian duty on harvesters, as the Manufacturers' Association supposed it did, but to the administration of the tariff law; and it is rather remarkable that the senders of the Association's cablegram did not comprehend that fact.

Appreciating the importance of the matter, and understanding that the misapprehension which the Manufacturers' Association labor under, and the action they took in offering their services when they could not pos-

sibly be required; and knowing that Mr. J. S. Larke, the most efficient Canadian commercial agent who has, for years, looked after Dominion interests in Australia, is now in Canada for the special purpose of giving our manufacturers and exporters accurate information in all such matters, THE CANADIAN MANUFACTURER requested, and is in receipt of a statement from him, respecting the alleged changes in the collection of duties on imports into Australia from Canada. Mr. Larke, referring to the Customs Act of the Commonwealth of Australia, passed October 3, 1901, section 154, states it to be as follows:

When any duty is imposed according to value:

(a) The value shall be taken to be the fair market value of the goods in the principal markets of the country whence the same were exported in the usual and ordinary commercial acceptance of the term and free on board at the port of export in such country, and a further addition of ten per cent. on such market value.

Mr. Larke says:

"Under this regulation Canadian goods shipped from Ontario and other points East, would be required to pay duty on the value at Vancouver when shipped by the Canadian Australian line, the only Canadian line by which goods could reach the Commonwealth. This would involve the payment of duty on the freight on the long overland haul. If these goods had been shipped from a United States port, say New York, they would have had to pay duty on freight only to the United States frontier. The consequence would be to differentiate in favor of United States ports of shipment, and almost to prohibit shipments by the way of Vancouver.

"This Act was passed without my having had the opportunity to see it; but immediately upon its going into effect, and my learning of it, I called the attention of the Hon. Mr. Kingston, who was the Australian Minister of Customs at the time, and pointed out to him that Canada was especially and almost alone, unfavorably effected by the provision. He was good enough, after some correspondence, to order that duty should be collected upon the fair value at the place of manufacture.

J. J. CASSIDEY, EDITOR

No duty was collected on inland freight, casing or packing under this order. The law, however, was not changed, but custom officials had at the time of my departure from Australia, acted upon this instruction of Mr. Kingston.

"It was alleged that exporters to Australia took advantage of these provisions to defraud the Commonwealth of fair duty in contracting to deliver goods at a certain price in Sydney or at New York. The goods would be invoiced at the amount agreed upon but there would be deducted from this sum the charges paid for freight, packing and casing. By unduly increasing the charge for packing, casing and internal carriage to the seaboard, the net value for duty would be materially reduced, the manufacturer making up for the low price of his goods by false charges upon the other two items of expenditure.

"I have never had any reason to believe that any Canadian firm had done this; but it was notorious that it had been frequently done from several countries; and some Canadian invoices did bear the appearance of such false charges having been made. The Canadian charges for packing, even where the duties were not effected thereby, have been high as compared with the charges by manufacturers of other countries, owing to the fact that Canadian exporters had not made a study of as economical packing as those of other countries, who have had a larger experience in the export trade, had done.

"This being continued under the new state of things, it had every appearance of an intentional attempt to defraud the customs, particularly if the Canadian invoice showed, as it sometimes did, that the charge for packing was two or even three times that charged by some exporters of other countries on the same class of goods. The same thing would apply in some degree to the charges for inland freight. These invoices naturally fell under suspicion. In many cases too, Canadian manufacturers were very careless in making their invoices, not understanding perfectly the consequence of the carelessness inflicted upon the consignee.

"The difficulty, which the customs authorities had in getting at a correct statement of the cost of inland carriage and packing has led Sir William Lyne, the present Minister of Customs, to revert to the provisions of the Customs Act in valuing goods for duty. This is not aimed specially at Canada, but it does, as stated, affect Canada when shipments are made, as many should be made, by the way of Vancouver.

"Canada became prominent in this discussion through a difficulty in arriving at the value of a machine, known as "The Harvester." This is an Australian invention. The first machines of this kind imported into Australia were made by the Massey-Harris Co. of Toronto, who entered them at a valuation to which no objection was taken, but when they were made by a manufacturer in the United States and entered at a lower valuation, the Australian manufacturers of these machines became alarmed at the invasion of their market and protested against the entry at what they termed a fraudulent figure.

"As the only machines known to the public, up to this date, were made in Toronto, the newspapers stated that they were Canadian machines, over which the difficulty arose. This was incorrect, but it attached the name of Canada to a dispute to which this country had nothing whatever to do.

"There is no ill feeling in Australia against Canadian products. From the Premier of the Commonwealth to the humblest citizen, there is a desire to cultivate trade within the Empire, and sentiment has led to Australians encouraging trade with Canada, even where it has not given them any pecuniary benefit thereby. I believe that the Australian Government when it realizes the effect of the duty upon exports by the way of Vancouver, will remove the disability, which is inflicted by the present custom law, as it did when I called attention to the Act three years ago."

TRADE IN NORTH-WEST CANADA.

As a matter of course wherever there is sweetness, thereabouts will the busy bee be found; and wherever there may be prospects for good and lucrative business, there will the diligent and energetic Yankee be on hand to supply the wants and fill the requirements of such trade. It is not questioned that at this time our great Canadian North-West offers the most alluring inducements for trade of any country in the world; and as a matter of course our American friends are spying out the land and sending home accounts of the possibilities of trade there. The intelligent manner in which this is being done is shown in the report of special agent Pepper, sent out by the Bureau of Manufactures of the United States Department of Commerce, who, under date of September 2, writing from Winnipeg, furnishes an interesting letter in regard to conditions in that section of Canada. Speaking of the work undertaken by the tariff commission, who began their sances in Winnipeg last week, Mr. Pepper attaches some significance to the fact that the commission began their work in Winnipeg, which, he says, is the gateway and distributing center of the North-West that is now being so rapidly settled. Geographically and through the rail way systems, Winnipeg controls the trade of that section of Canada. An indication of the volume and extent of this trade may be had from knowledge of the imports of merchandise from foreign countries. In 1903 the duties collected at the Winnipeg customs house amounted to \$2,252,000; in 1904 the total was \$2,725,000 and in 1905 they will probably exceed \$3,000,000. The total value of imports entered at Winnipeg in 1904 was \$14,300,000, and in 1905 it will probably exceed \$17,000,000. In addition to the customs collections at Winnipeg, the duties paid at Regina, Lethbridge and Calgary are in excess of \$600,000 annually; and the total imports are more than \$6,000,000. A large proportion of the entries at all these custom-houses is of goods from the United States; and of these imports farm machinery and agricultural implements of all sorts constitute the bulk. The Canadian market for farm machinery may be said to lie largely in Manitoba and the North-West, where the competition is between the manufacturers of the Mississippi

Valley and the States bordering the Dominion, and Canadian manufacturers, the majority of whose plants are in Ontario. As an illustration of the competition, Mr. Pepper states that there are in Winnipeg eight agents of threshing machines and similar articles made in the United States, and the same number representing Canadian concerns. The number of representatives of concerns manufacturing binders, reapers, plows, etc., in both cases is larger.

From this statement it may be seen that the announcement of the tariff-commission hearings in so far as relates to the North-West is of the greatest interest for manufacturers and buyers of agricultural implements. Under date of August 26 the Minister of Trade and Commerce in Ottawa addressed a circular letter inviting persons interested to appear before the commission and give their views, or to submit their opinions in writing. As an indication of the scope and range of the inquiry is subjoined the list of queries contained in the circular letter. They are as follows:

(a) The extent (approximately) to which cost of goods imported is increased to the ultimate consumer over and above the amount of the tax imposed, as far as you can ascertain. This, it is presumed, will depend largely on the number of hands through which goods pass before reaching consumer.

(b) Effect of heavy duties on quality of goods imported. How far do producers try to meet duties by reducing quality of goods?

(c) General effect of heavy duties on trade and commerce. How far is the total consumption of such goods likely to be diminished by the rise in price, including goods of same kind produced in Canada?

(d) Result in your judgment if duty was totally abolished on class of goods in which you chiefly deal?

(e) How far are the disadvantages of which Canadian manufacturers complain of a temporary or a permanent character?

(f) How do prices of goods imported by you at present compare with prices paid for articles of equal quality ten, fifteen, or twenty years ago, and to what causes do you attribute rise or fall in price, as case may be?

(g) To what extent, if any, do you find that goods now imported are being sold below cost of production? In what sorts of goods and from what countries have you found this to be the case?

Comment of a political nature has been made on the action of the tariff commission in selecting the present time for beginning the inquiry in the agricultural regions. The Manitoba Grain Growers' Association suggested that the commission should not sit in Manitoba before November 15, since during September and October the farmers of the West would be too busy getting in their crops to attend the sessions of the commission or to formulate their views. Representatives of Canadian manufacturers are taking lively interest in the sessions of the commission. The present tariff on steam engines, threshers, windmills, farm wagons and heavy machinery generally is 25 per cent., and on mowing machines, harvesters, binders, reapers, attachments, plows, etc., the duty is 20 per cent.

The manufacturers who desire increased duties do so with the purpose of securing the trade of the settlers who have poured into the North-West from the United States in such large numbers in the last few years. These sett-

lers naturally and quite generally prefer the farm machinery to which they have been accustomed in their previous homes; and usually they insist on having it, even in the case of concerns which have branch works in Canada, and which offer the output of these subsidiary plants. The opinion prevails that under the rates of the existing tariff Canadian manufacturers may look for an enlarged market in the North-West for wagons, reapers, binders and similar implements. In threshers the large American concerns can hold their own, but the smaller ones are at a disadvantage with their Canadian competitors.

The large amount of railway construction now under way, and which is likely to continue for several years, also offers encouragement to the manufacturers of the United States. Grading machinery, steam plows, and steam shovels will be in steady demand, and the Canadian factories have not yet been able to drive out their American competitors. A question has been raised whether the freight rates from the United States is not one means of compensating American manufacturers for the tariff duties, but this does not appear to be the case. The freight charges from St. Paul are alleged to be too high, but from more distant points they are declared to be reasonable. However, whatever rate is made is usually met by the Canadian roads, though the haul is longer.

Concerning the buying capacity of the new North-West, with its steady agricultural development and regardless of prospective tariff changes, the situation is admittedly encouraging for the manufacturers of agricultural implements in the United States as well as in Canada.

ALBERTA AND ATHABASCA.

By the completion of the formalities at Edmonton for the admission of the newly created Province of Alberta, there was added to the regular organized, self-governing states of the Dominion of Canada an area equal to the whole of the New England states, with Pennsylvania, New York and the British Isles thrown in to make up the tale, says the Philadelphia Ledger. Alberta is but one of the two provinces created by the rearrangement of the boundary lines of the old territories of Athabasca, Alberta, Saskatchewan and Assiniboia. When Saskatchewan shall also be added to the galaxy of stars which form the crown of our neighboring commonwealth to the north, another 275,000 square miles will be added to the total.

These two Canadian states—for they hold much the same relation to the confederation as do the constituent members of the American Union to the Washington government—will enter into the full possession of their rights as provinces with advantages quite unique. Both are rapidly growing in population and commercial and industrial strength, but unlike most new commonwealths they begin with an assured income of really generous proportions.

In Canada the theory of taxation differs radically from that of the United States. The Dominion does much more for the provinces than the Federal government does for the states, and the revenue of the Dominion

comes in large measure from Federal indirect taxes. As the people of the provinces pay these taxes, the Dominion returns a portion to the provinces in proportion to the population and to the amount of unused public land therein. The new provinces in theory surrender their lands to the Dominion, which administers them for the benefit of the provinces in accord with the national policy as to immigration, etc.

Again, the Dominion refunds to the new provinces an amount representing what their people pay toward the interest on the debts of the old provinces which the Dominion assumed at the time of the Confederation. As a matter of fact, the two new provinces have no debts at all, but the Dominion pays to each five per cent. on \$8,107,000, which amount is assumed as the sum that will compensate the Albertans and Saskatchewanians for their share of the burden of the general debt.

These various items, together with an annual allowance for the support of the government and Legislature, an annual per capita subsidy, and allowance for five years for public buildings, etc., work out so that these new states start with an assured revenue amounting to \$1,112,875 for the first year, and increasing with the growth of population until it shall reach the total of \$2,300,575 when the people number 800,000. The effect of this system is that the provinces rarely care to exercise their power to impose direct taxes, and the cost of government is but lightly felt by the emigrants who are flocking in yearly increasing numbers to the farm lands of the Canadian North-West.

THE TORONTO EXHIBITION.

Like an iridescent dream, the 1905 seances of the Canadian National Exhibition materialized as announced, dazzled the eyes of all beholders during its allotted term of existence, and is now no more, leaving behind it pleasing memories of the most interesting and attractive event of the kind that ever delighted the community. It had outgrown its previous characteristics, and is no longer known as the Toronto Fair, or the Toronto Industrial Exhibition, but the Canadian National Exhibition, which is much more in accordance with the size and dignity to which it has attained.

Of late years each "Toronto Fair" has always been of greater importance and of more attractive character than any that preceded it, and with the passing away of the old management and the demolition of the old buildings, and the coming in of new men and the construction of new and more modern buildings, the scope and character of it has experienced corresponding change, and it is not now like what it used to be. The city of Toronto and the country adjacent thereto are not depended upon as of yore to supply the attractions and the sight-seers also, for now not only Toronto, but Ontario, and not only Ontario but all Canada, from ocean to ocean, are drawn upon to supply exhibits; and the treasures of the whole world, even unto the uttermost parts thereof, send their riches to add to the attractions, and as to the visitors—they congregate from all lands, including details from the great British navy, and the soldiers of the

King and the boys in blue, regiments of them, go shoulder to shoulder before the grand stand, all anxious to contribute to the festivities of the occasion. Masterpieces in many domains of art, with numerous historic treasures, were secured from British and European galleries, museums and universities, while private collections also contributed. Some of the best work of Canadian artists were also on exhibition, and the whole made a collection of great educational value and worthy the highest appreciation. The general round of gaiety and entertainment surpassed all previous shows. The acrobats, the trained animals, the clowns, and all the "circus" accompaniments were there in varied and exciting combination, and humanity should fervently strive to postpone the day when the circus will lose its charm, or the glowing kaleidoscopic outbursts and jarring noises of the fireworks cease to fascinate.

The displays of machines, machinery and manufactures were creditable—they always are—and while the department in which was shown the processes of manufacture was at times crowded almost to suffocation, it was apparent that the buildings devoted to this feature of the Exhibition were entirely too small and inconveniently arranged to afford the exhibitors the accommodation they desired and should have; and it was also apparent that other interests were more highly favored in the matter of suitable buildings and the locations of them. But all things come to those who wait; and as but little more in that direction for these other interests will be necessary for some time to come, no doubt the management of the Exhibition will in the near future provide more suitable accommodations for the manufacturers.

The president, Mr. McNaught, and the manager, Dr. Orr, deserve the highest praise for what they are doing and have done to advance the interests and importance of the Exhibition.

EDITORIAL NOTES.

Mr. J. S. Jeans, secretary of the British Iron Trade Association, in his recently published report for 1904 speaking of the competition of the United States with Great Britain, for Canadian trade says that the "competition of the United States has been increasingly felt in many markets, but most of all, perhaps, in that of the Dominion of Canada, to which that country in 1904 supplied 216,800 tons of rails, against only 39,739 tons supplied by the Mother Country. This is on the whole the most notable case of the kind, but an examination of the figures shows that the United States had been working the Canadian markets in 1904 for all they were worth in every possible direction."

The Island of Sakhalin, or Saghalien, or, its native name, Taraika, is a long, narrow strip of land that extends almost due north and south a few miles off the coast of Asiatic Russia, or what was once Asiatic Russia. It lies in the southwest part of the Sea of Okhotsk, in latitude 52 degrees. It is separated from the mainland only by the six-mile wide Mamia strait. Unfertile, mountainous and

cold, it offers little encouragement to agriculture, but is extremely rich in coal and is said to possess great deposits of gold and other precious metals. Its coast line is bleak and uninviting. On the western shore lofty cliffs rise sheer out of the sea, unbroken by bays or any indentations of land whatsoever, while the eastern coast is little better, although here and there narrow inlets and lagoons pierce the barren rocks. Huge forests, however, abound, and will be a source of fabulous income to the island's future owner. But its chief value lies in its fisheries. Its waters are said to be the finest fishing ground in the world. The population of Sakhalin is insignificant. In 1872 there were 13,000 inhabitants, counting all sorts and conditions, and to-day there are about 36,000, or a little more than one person to the square mile.

The following decisions by the board of customs relating to the tariff have been published :

Iron rowlocks, galvanized, for equipment of fishing boats—dutiabie.

Colliery "tipple" or "bankhead"—dutiabie.

Monitor well augur, for boring wells—dutiabie.

Well-drilling machinery, operated on the "rotary flush system," the "jetting flush system," or the "hydraulic system," and in which the chisel-shaped drill is not used, not to include motive power—free.

Paper cylinders, to be manufactured into paper bags—35 per cent.

Cloth double texture, india-rubbered—30 per cent.

Stereotypes, for illustrating serial and other stories and in reading matter, not advertising, in newspapers— $\frac{1}{4}$ cent per square inch.

Stereotypes for newspaper advertisements— $1\frac{1}{2}$ cents per square inch.

It is reported from St. John, N.B., that most of the large wholesale drug houses in Canada are to be combined in one company with a capital stock of \$6,000,000 and headquarters in Montreal. It is expected that the project will be completed by the first of next year. This is announced as resulting from the formation of the Wholesale Druggists' Association, with the idea of economy in carrying on the business. In places like St. John, where there are several wholesale drug houses, one will gradually absorb the others.

The Trade and Commerce Department have commenced publication of comparisons of tariffs of the different countries. The principal articles of export from Canada will be grouped and published in series from week to week, together with the duties they would meet in foreign countries. At the end of the year the weekly issues will be published in one volume.

An interesting development has taken place in connection with the question as to whether or not the bounty of \$3 per ton voted by the Dominion Parliament for the manufacture of steel was properly payable on account of steel rails. The intention of Parliament was to encourage the manufacture in Canada of structural steel for bridge-making and other purposes, but the statute was some-

what ambiguously worded. The phraseology was such that the interests at Sault Ste. Marie, who are now engaged in the production of steel rails, thought they could collect the bounty for rails as well as for other kinds of steel, and accordingly put in a claim for \$61,000. The Department of Justice reported against the claim, but Mr. A. B. Aylesworth, in a carefully reasoned opinion, held that it was a good one. Fortified by this authority, Mr. McDougall, the late Auditor-General, permitted the account to be paid. The present Auditor-General, Mr. Fraser, thinks that there should be a judicial interpretation of the act in order to decide whether payment of the \$61,000 was proper. Accordingly he has held back from payment a sum equal in amount which is due and properly payable to the Soo concern on account of other kinds of steel than rails. If the courts hold that the payment of \$61,000 was improper, the amount withheld will be turned into the treasury and the country will not lose the amount. Should the decision be rendered that the payment was legal, the country will have the satisfaction of knowing that it was in accordance with the law. The Soo company's claim led the Government to pass an order in-Council specifically excluding steel rails from the articles entitled to the bounty as was announced a short time ago.

Speaking of the menace to the manufacturing of automobiles, the Iron Age says:—"It is not to be wondered at that manufacturers of automobiles should express themselves as a number of them have done of late concerning automobile track racing. Nothing but harm can come to the automobile industry from having its product classed among implements of destruction, for such the modern racing machines certainly are. The track events in which automobiles are driven by professional racers bear about the same relation to sport as a Spanish bull fight. Two of these races last week resulted in terrible injuries to two drivers, and there is not an event of this sort that does not put in jeopardy the lives of scores of spectators. The record of the long runs across country is likewise one of fatality and maiming. As with every other mechanical invention the place of the motor vehicle is to be made by its service to mankind. High speeds in competitive driving determine nothing that has a legitimate bearing on the efficiency of these machines under conditions of actual service. Moreover, by advertising the automobile as in practically the category of war munitions, track racing only retards its advance to a permanent place in urban transportation. Since some of them have gone on record as in favor of an agreement to abolish racing as a means of advertising their machines, it might be in order for the manufacturers of automobiles to consider whether the factor of speed has not been altogether overworked in the competition of the various forms of motors. In spite of the confident assertions that the motor vehicle has come to stay, it is evident that the many accidents attending its employment in travel for pleasure have caused an accumulation of sentiment that must be reckoned with. Inevitably some phases of the present vogue of the auto car will pass away. When cheaper machines come and buyers multiply, the second stage in the movement will have arrived. After that the solution of the problem of greater safety will determine whether the industry shall continue on its present lines or whether it shall eventually find its chief development in the field of heavy haulage, with the motor displacing the truck horse of to-day.

EXHIBITORS AT THE FAIR.

It is well within the bounds to say that the number of exhibitors at the Canadian National Exhibition which last week closed a most successful season was greater than ever before, and the number and variety of exhibits was correspondingly greater. There were not buildings enough on the grounds to accommodate them, and the overflow covered every available outside space, valuable sections of the lawns being utilized for the excess.

Seventeen hundred and seventy-one exhibitors, some of whom had five or more entries of goods, or prize animals, were officially recognized by the Exhibition.

The following is the classification of the industrial exhibits: Manufacturers and liberal arts, 116; transportation, 36; implements, 50; stoves, 16; machinery, 31; women's work, 8; manufacturers' annex, 22; dairy building, 8; automobiles, 6; and on the grounds, outside of buildings, 120.

Following is a partial list of names of some of the more important exhibitors, it being impossible at this time to give even brief descriptions of their exhibits:

MACHINERY HALL.

H. W. Petrie, machinery, Toronto.
 Goldie & McCulloch Co., machinery, Galt, Ont.
 Jones & Moore Electric Co., Toronto.
 D. K. McLaren, belting, Montreal.
 Chapman Double Ball Bearing Co., Toronto.
 A. R. Williams Machinery Co., Toronto.
 Dominion Belting Co., Hamilton, Ont.
 United Electric Co., Toronto.
 T. & H. Electric Co., Hamilton, Ont.
 Wm. R. Perrin & Co., machinery, Toronto.
 Bakecock & Wilcox, boilers, etc., Montreal.
 Canadian General Electric Co., Toronto.
 Queen City Cycle Works, Toronto.
 A. D. Fisher Co., skates, etc., Toronto.
 H. H. Watts & Co., electrical supplies, etc., Toronto.
 S. F. Bowser & Co., tanks, pumps, etc., Toronto.
 Central Electric & School Supply Co., Toronto.
 Borden Co., machinery, Warren, Ohio.
 Garlock Packing Co., Hamilton, Ont.
 Eureka Mineral Wool & Asbestos Co., Toronto.
 Consolidated Electric Co., Toronto.
 Goold, Shapley & Muir Co., machinery, Brantford, Ont.
 C. Wilson & Son, scales, tools, etc., Toronto.
 Georgian Bay Engineering Works, Midland, Ont.
 Simplex Engine Co., Toronto.
 S. Vessot & Co., machinery, Toronto.
 E. Long Mfg. Co., machinery, Orillia, Ont.
 Henderson Roller Bearing Mfg Co., Toronto.
 Canadian Fairbanks Co., machinery, Montreal.
 Canadian Bearings, Limited, Hamilton, Ont.
 Canada Metal Co., Toronto.
 Dodge Mfg. Co., pulleys, etc., Toronto.
 Philip Carey Mfg. Co., asbestos material, Toronto.
 James Morrison Brass Mfg. Co., Toronto.
 Underfeed Stoker Co., Toronto.

MANUFACTURERS' BUILDING.

Metallic Roofing Co., Toronto.

Gutta Percha & Rubber Mfg. Co., Toronto.
 United Typewriter Co., Toronto.
 Capewell Horse Nail Co., Toronto.
 McGregor Harris Co., mfrs. confectionery, Toronto.
 E. C. Hill Mfg. Co., bicycles, Toronto.
 Eureka Refrigerator Co., Toronto.
 A. H. Whitely, stoves, machines, etc., Toronto.
 Devonshire Cream Chocolate Mfg. Co., Toronto.
 Ontario Rubber Co., Toronto.
 C. W. Mack, mfr. rubber stamps, Toronto.
 Canadian Gelatine Co., Toronto.
 Computing Scale Co., Toronto.
 Blue Ribbon Tea Co., Toronto.
 Durham Rubber Co., Bowmanville, Ont.
 Dominion Camister Co., Dundas, Ont.
 L. H. Packard & Co., mfrs. shoe dressing, Montreal.
 International Gas Appliance Co., Toronto.
 Toronto Brass Mfg. Co., Toronto.
 Berlin Robe & Clothing Co., Berlin, Ont.
 Canadian Time Recording Co., Toronto.
 Scott Knitting Co., Toronto.
 B. Cairns, mfr. rubber stamps, Toronto.
 Defender Photo Supply Co., Toronto.
 W. H. Dunne, bicycles, Toronto.
 Marshall Sanitary Mattress Co., Toronto.
 Merchants' Rubber Co., Berlin, Ont.
 J. S. Fry & Sons, mfrs. cocoa, chocolate, etc., Toronto.
 Walter M. Lowney & Co., mfr. confectionery, Montreal.
 Macdonald Mfg. Co., tinware, etc., Toronto.
 Dalton Bros., mfrs. soaps, spices, etc., Toronto.
 Sovereign Mfg. Co., mfrs. perfumes, Toronto.
 Red Feather Tea Co., Toronto.
 Bates Mfg. Co., mfrs. wines, etc., Toronto.
 A. D. Fisher Co., mfrs. skates, etc., Toronto.
 Dunlop Tire Co., Toronto.
 Bordens Condensed Milk Co., Montreal.
 Harry H. Love & Co., mfrs. sporting goods, Toronto.
 Sherlock-Manning Organ Co., London, Ont.
 Heintzman & Co., mfrs. pianos, etc., Toronto.
 John Taylor & Co., mfrs. soaps, etc., Toronto.
 Kemp Mfg. Co., mfrs. tinware, etc., Toronto.
 Singer Sewing Machine Co., Toronto.
 Office Specialty Mfg. Co., Toronto.
 J. W. T. Fairweather, mfrs. hats, furs, etc., Toronto.
 H. J. Heintz Co., mfrs. pickes, etc., Pittsburgh, Pa.
 Robert Simpson Co., Toronto.
 Irving Umbrella Co., Toronto.
 Canada Cream Cheese Co., Toronto.
 T. Upton Co., mfrs. jellies, preserves, etc., Hamilton, Ont.
 East & Co., mfrs. umbrellas, trunks, etc., Toronto.
 American Cereal Co., Chicago, Ill.
 Penman Mfg. Co., mfrs. knitted goods, Paris, Ont.
 Canadian Shredded Wheat Co., Toronto.
 Nasmith Co., mfrs. confectionery, Toronto.
 National Cash Register Co., Toronto.
 Edwardsburgh Starch Co., Toronto.
 Ingersoll Packing Co., Ingersoll, Ont.
 Canadian Oil Co., Toronto.
 Imperial Varnish & Color Co., Toronto.
 John Kay Son & Co., carpets, etc., Toronto.
 Stan. Walker, mfr. furs, etc., Toronto.
 Toronto Carpet Mfg. Co., Toronto.

Ambrose Kent & Sons, mfrs. jewelry, Toronto.
 Whaley Royce Co., mfrs. musical instruments, Toronto.
 Black Bros. & Co., mfrs. hardware, etc., Halifax, N.S.
 Lever Bros., mfrs. soap, etc., Toronto.
 C. Rogers & Sons Co., mfrs. furniture, etc., Toronto.
 Standard Silver Co., Toronto.
 Crown Mfg. Co., mfrs. confectionery, etc., Toronto.
 Christie, Brown & Co., mfrs. biscuits, etc., Toronto.
 Berliner Gramophone Co., Montreal.
 International Stock Food Co., Toronto.
 Malta-Vita Pure Food Co., Toronto.
 Gold Medal Furniture Mfg. Co., Toronto.
 Leeming, Miles Co., mfrs. druggists' sundries, etc., Montreal.
 E. W. Gillett Co., mfrs. yeast, lye, etc., Toronto.
 Globe-Wernicke Co., mfrs. office specialties, Stratford, Ont.
 Pure Gold Mfg. Co., mfrs. spices, baking powder, etc., Toronto.
 Brunswick-Balke-Collender Co., mfrs. billiard tables, Toronto.
 Ontario Lead & Wire Co., Toronto.
 Harry Webb Co., mfrs. confectionery, Toronto.
 T. Eaton Co., Toronto.
 J. J. McLaughlin, mfg. chemist, Toronto.
 Samuel May & Co., mfrs. billiard tables, etc., Toronto.
 Armour, Limited, Toronto.
 Frank Stanley, mfr. pianos, etc., Toronto.
 Uxbridge Piano & Organ Co., Uxbridge, Ont.
 Gerhard Heintzman, Ltd., mfrs. pianos, Toronto.
 Williams Piano Co., Oshawa, Ont.
 Newcombe Piano Co., Toronto.
 Mendelssohn Piano Co., Toronto.
 D. W. Karn Co., mfrs. organs, pianos, etc., Woodstock, Ont.
 Nordheimer Piano & Music Co., Toronto.
 Dominion Organ & Piano Co., Bowmanville, Ont.
 Mason & Risch Co., mfrs. pianos, Toronto.
 Martin-Orme Piano Co., Ottawa.
 W. Doherty & Co., mfrs. organs, Clinton, Ont.
 Luxfer Prism Co., Toronto.
 Mela Gama Tea Co., Toronto.
 Ryrie Bros., mfrs. jewelry, Toronto.
 Berlin Rubber Mfg. Co., Berlin, Ont.
 Cowan Co., mfrs. cocoa, chocolate, etc., Toronto.
 Ontario Grape Growing & Wine Co. St. Catharines, Ont.
 Gowans, Kent & Co., crockery, glassware, etc., Toronto.
 Getty & Scott, mfrs. boots, shoes, etc., Galt, Ont.
 Walker, Parker Co., mfrs. boots, shoes, etc., Toronto.
 Oxford Woolen Mills, Oxford, N.S.
 Cohen Bros., mfrs. optical goods, Toronto.
 Sherlock-Manning Organ Co., London, Ont.
 Morris Piano Co., Listowel, Ont.
 H. W. Burnett Co., mfrs. pianos, organs, etc., Toronto.

TRANSPORTATION BUILDING.

Matthew Guy, carriage maker, Toronto.
 Blackwell Varnish Co., Whichwood Park, Ont.
 Unique Umbrella Co., Toronto.
 D. Conboy, mfr. carriage tops, etc., Toronto.
 Imperial Varnish & Color Co., Toronto.
 Hydraulic Navigation Co., Hamilton.
 Samuel Trees & Co., saddlery, etc., mfrs., Toronto.
 Lyon Mfg. Co., Toronto.
 Depew Carbon Paint Co., Chicago, Ill.
 I. Simpson Mfg. Co., mfrs. carriages, Brantford, Ont.
 Barrie Carriage Co., Barrie, Ont.
 Mitchell & Co., mfrs. hearses, etc., Ingersoll, Ont.
 E. N. Heney Co., mfrs. carriages, saddlery, etc., Montreal.
 William Gray & Sons Co., mfrs. carriages, etc., Chatham, Ont.
 Tudhope Carriage Co., Orillia, Ont.
 J. B. Armstrong Mfg. Co., mfrs. carriages, Toronto.
 Canada Carriage Co., Brockville, Ont.
 A. B. Greer, mfr. carriages, London, Ont.
 Palmerston Carriage Co., Mount Forest, Ont.
 R. McKie Buggy Co., Hamilton, Ont.
 Brantford Carriage Co., Brantford, Ont.
 Munro & McIntosh Carriage Co., Alexandria, Ont.
 James Lochrie, mfr. bicycles, etc., Toronto.
 John Campbell & Son, mfr. carriages, etc., London, Ont.
 S. G. Saywell & Sons, mfrs. harness, etc., Toronto.
 Toronto Welsbach Light Co., Toronto.
 T. Eaton Co., Toronto.
 Dunlop Tire Co., Toronto.
 Toronto Pole & Shaft Co., Toronto.
 Canada Saddlery & Harness mfg. Co., Oshawa, Ont.
 Tisdale Iron Stable Fittings Co., Toronto.
 George A. Rudd & Co., mfrs. harness, etc., Toronto.
 Guelph Carriage Top Co., Guelph, Ont.
 C. Kloepfer, mfrs. carriage goods, etc., Toronto.
 Ben Hur Mfg. Co., Hamilton, Ont.
 Hamilton Tool & Optical Mfg. Co., Hamilton, Ont.
 A. K. Melbourne Co., mfrs. carriages, hardware, etc., Hamilton, Ont.
 Gilmore Door Co., Trenton, Ont.

IMPLEMENT BUILDING.

Ontario Wind Engine & Pump Co., Toronto.
 Julius F. House, mfrs. blacksmiths' supplies, Toronto.
 Walter Dean, boats, etc., Toronto.
 Canadian Ladder Co., Toronto.
 Johnston Oil Engine Co., Toronto.
 McKeough & Trotter, foundry, Chatham, Ont.
 Monteith, Nixon & Co., mfrs. trucks, etc., Toronto.
 Gavin Shaw & Sons, mfrs. troughs, Lindenwood, Ont.
 Hamburg American Wagon Co., New Hamburg, Ont.
 Toronto Welsbach Light Co., Toronto.
 R. Fleming, mfr. aerial ladders, etc., Toronto.
 London Cement Brick Machine Co., London, Ont.
 Clydesdale Stock Food Co., Toronto.
 Speight Wagon Co., Markham, Ont.
 Imperial Artistic Wood Turning Co., Thorold, Ont.

J. A. Ewart, carriage and wagon works, Toronto.
 T. E. Bissell, mfr. harrows, Elora, Ont.
 Paris Plow Co., Paris, Ont.
 Steel Trough & Machine Co., Tweed, Ont.
 Berlin Woodenware Co., Berlin, Ont.
 Davis Acetylene Gas Co., Toronto.
 International Carriage Co., Brighton, Ont.
 Farmers' Coöperative Harvesting Machine Co., Toronto.
 St. Thomas Acetylene Mfg. Co., St. Thomas, Ont.
 R. Chestnut & Sons, mfrs. canoes, etc., Fredericton, N.B.
 Jackson Wagon Co., St. George, Ont.
 Chatham Wagon Co., Chatham, Ont.
 Adams Wagon Co., Brantford, Ont.
 Brantford Cordage Co., Brantford, Ont.
 Grimm Mfg. Co., evaporators, etc., Montreal.
 Erie Iron Works Co., St. Thomas, Ont.
 Ontario Spring Bed & Mattress Co., London, Ont.
 Robt. A. Gardiner, carriage maker, Toronto.
 Dominion Wrought Iron Wheel Co., Orillia, Ont.
 Lowden Machinery Co., Guelph, Ont.
 Manson Campbell Co., fanning mills, etc., Chatham, Ont.
 De Laval Separator Co., Toronto.
 American Seeding Machine Co., Toronto.
 Defiance Iron Works Co., Chatham, Ont.
 Walter Nicholls Motor Boat Co., Toronto.
 Dain Mfg. Co., mfrs. hay rakes, etc., Preston, Ont.
 Toronto Gas & Gasoline Engine Co., Toronto Junction, Ont.
 Canada Launch & Engine Works, Toronto.
 J. I. Case Threshing Machine Co., Toronto.
 Spramotor Co., London, Ont.
 Bach Specialty Co., household supplies, etc., Toronto.

MANUFACTURERS' ANNEX.

Monarch Typewriter Co., Toronto.
 Sun Typewriter Co., New York, N.Y.
 Collins Mfg. Co., wire and sheet metal goods, Toronto.
 W. G. Patrick & Co., Cerebros salt, Toronto.
 The Anglo-Canadian Supply Co., mfrs. metal polish, Toronto.
 The Royal Crown, mfrs. soaps, etc., Winnipeg, Man.
 The Canada Last Co., Toronto.
 W. E. McGregor & Co., mfrs. burnt wood and leather, Toronto.
 Penman & Sprang, mfrs. duplicator machines, Toronto.
 Pulvo Mfg. Co., brass polish, etc., Toronto.
 Johnson's, Limited, mfrs. Zon-o-phones, Toronto.
 W. H. Burton, band instruments, Toronto.
 White Sewing Machine Co., Cleveland, Ohio.
 Nugget Polish Co., London, Eng.
 Metal Polish Co., Toronto.
 Canada Maple Exchange, Montreal.
 Diamond Dry Powder Fire Extinguisher Co., Toronto.
 Chas. E. Stacey, mfr. tube skates, Toronto.
 C. C. Huffman, mfrs. polish, etc., Toronto.
 R. Stewart Muir Agency, adding machines, Winnipeg, Man.
 Domestic Specialty Co., dyes, etc., Hamilton, Ont.
 Northrop Mfg. Co., potato peeler machines, Toronto.
 Siche Gas Co., Toronto.
 ARCHER LIGHT, HEAT & POWER CO., Toronto.
 Clare Bros. & Co., stoves, etc., Preston, Ont.

STOVE BUILDING.

Charles F. Rees & Co., mfrs. stoves, etc., Toronto.
 Walker Steel Range Co., Grimsby, Ont.
 Canada Malleable & Steel Range Mfg. Co., Toronto.
 George Sparrow & Co., hotel and kitchen outfits, Toronto.
 Wrought Iron Range Co., Toronto.
 Grundy Stove Co., Guelph, Ont.
 Western Foundry Co., Wingham, Ont.
 Adams Furniture Co., Toronto.
 Burrow, Stewart & Milne, stoves, scales, etc., Hamilton, Ont.
 A. Welch & Son, furniture, etc., Toronto.
 Guelph Stove Co., Guelph, Ont.
 Gurney Foundry Co., Toronto.
 Telephone City Stoves, Brantford, Ont.
 Doherty Mfg. Co., stoves, Sarnia, Ont.
 Pease Foundry Co., Toronto.
 Moffat Stove Co., Weston, Ont.

AUTOMOBILE BUILDING.

The Ford Motor Co., Walkerville, Ont.
 Canada Cycle & Motor Co., Toronto.
 Dunlop Tire Co., Toronto.
 Hyslop Bros., mfrs. bicycles, etc., Toronto.
 Durant-Dort Carriage Co., Sarnia, Ont.

DAIRY BUILDING.

Petrie Mfg. Co., cream separators, etc., Hamilton, Ont.
 Empire Cream Separator Co., of Canada, Toronto.
 Vermont Farm Machine Co., Bellows Falls, Vt.
 Farmers' Mfg. & Supply Co., Durham, Ont.
 Henry Trull, agricultural implements, Oshawa, Ont.
 Raymond Mfg. Co., machinery, Guelph, Ont.
 R. A. Lister & Co., dairy supplies, Montreal.

ON GROUNDS.

Page Wire Fence Co., Walkerville, Ont.
 McGregor-Banwell Fence Co., Walkerville, Ont.
 Pittsburg Perfect Fence Co., Hamilton, Ont.
 H. R. Lamb Fence Co., London, Ont.
 London Fence Machine Co., London, Ont.
 Frost Wire Fence Co., Hamilton, Ont.
 Canadian Portable Fence Co., Toronto.
 Canadian Steel & Wire Co., Toronto.
 Owen Sound Wire Fence Co., Owen Sound, Ont.
 A. Lemire, mfr. stone machines, etc., Wotton, Que.
 The Brintnell Adjustable Roller Bearing Co., Toronto.
 The D. Pike Co., mfrs. tents, awnings, etc., Toronto.

The magnitude of the heating proposition in a large railroad shop is well exemplified in the case of the new shops of the Southern Railway Co., at Spencer, N.C. The machine shop alone contains 4,500,000 cubic feet, and requires for its heating two special steel plate fans, 9½ feet in diameter, driven by 10x10 horizontal engines and installed in connection with a total of about 21,000 feet of 1-inch pipe massed in individual heaters. The entire equipment was furnished by the B. F. Sturtevant Co., Boston, Mass., and is designed to maintain a temperature of 60° when the outdoor temperature is 10° F. Distribution is made through a system of overhead piping with discharge pipes leading down to within about 10 feet of the floor.

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 Sheerin Rubber Co., 20 Wellington Street West, Toronto, inform us that they are the selling agents for the Durham Rubber Co., of Bowmanville, Ont. Mr. P. C. Haggarty, who has been "on the road" for a number of years for the Durham Co. is manager of the Sheerin Rubber Co. The Durham Rubber Co. are building a very fine new factory at Bowmanville.

The Atikokan Iron Co. are rapidly putting in the foundations for their coal docks, blast furnace and other works on the harbor front at Port Arthur, Ont. The location of the works is about half way between Port Arthur and Fort William, on the shore of Thunder Bay, and pile driving has been carried out in the harbor for a distance of half a mile. It is at the outer end of this work that the company will erect their plants. It is still hoped that the coal docks will be ready to receive some coal this fall, but it will be very late before they can be far enough along for that. The furnace can scarcely be ready before late next year. Coke ovens of the beehive type will be built, but no steps have yet been taken toward construction. To facilitate the smelting of the magnetic sulphuric ores of the Atikokan, a large crushing plant and roasting beds will be established at the furnace, waste gases of the stack being expected to do what roasting is needed. At the mine, 130 miles west of Port Arthur, the Canadian Northern has built a spur to the property now under development, and tunnels are being driven into the ore formation, exposing a large quantity of high grade ores. Diamond drilling at depth will determine the extent of the ore bodies, which are now known to be important. While nothing more than a blast furnace and fuel plants are now planned, the company contemplate increasing the extent of their works as soon as they are assured of success, and intend in time to become a large factor in the iron and steel development of Western Canada.

The Thornton & Douglas Co., manufacturers of clothing, etc., Stratford, Ont., have purchased a large site in Hamilton, Ont., upon which they will erect a three story factory building 110x60 feet.

St. Leon Waters, Limited, Toronto, have been incorporated with a capital of \$100,000, to acquire the St. Leon Springs in Quebec and to manufacture mineral and distilled waters, etc. The provisional directors include W. H. Moore, C. G. Ruel and F. C. Annesley, Toronto.

The Sun Printing Co., Toronto, have increased their capital from \$20,000 to \$100,000.

The Walter Nicholls Motor Boat Co., Toronto, have changed their name to Nicholls Bros., Limited.

The Canada Brass Rolling Mills Co., Toronto, will increase their capital from \$150,000 to \$500,000.

The Fulton Lumber Co., Toronto, have been incorporated with a capital of \$25,000, to manufacture lumber, timber, etc. The provisional directors include Elliott Fulton,

Walter Fulton, Fulton's Mills, Ont., and C. A. Barclay, Brougham, Ont.

The Cleveland Michipicoten Mining Co., Michipicoten River, Ont., have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include C. F. Roth, J. Fonerstein, and Adolph Droege, Cleveland, Ohio.

The Vermont Farm Machine Co., a United States incorporation, have been licensed to manufacture mowing machines, agricultural implements, etc., in Ontario with a capital of \$25,000. F. H. Kilbourn, Owen Sound, Ont., is their attorney.

Nasmiths' Limited, Toronto, have been incorporated with a capital of \$1,000,000, to acquire the business of the Nasmith Co., and to manufacture bread, confectionery, etc. The provisional directors include J. S. Lovell, Robert Gowans and S. G. Crowell, Toronto.

The Hedley Shaw Milling Co., of Thorold, and St. Catharines, Ont., have completed arrangements for taking over and operating the mill of the Frontenac Cereal Co., at Kingston, Ont.

The Savage Cobalt Silver Mining Co., Toronto, have been incorporated with a capital of \$250,000, to carry on a mining, milling and reduction business. The provisional directors include C. A. Masten, J. R. L. Starr and J. H. Spence, Toronto.

Charles H. Davies, Limited, Stratford, Ont., have been incorporated with a capital of \$40,000, to manufacture men's and boys' wearing apparel, etc., and to acquire the business of C. H. Davies. The provisional directors include C. H. Davies, G. H. Langan, and Johnson Harris, Stratford.

Ontario Smelters, Limited, Toronto, have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business, etc. The provisional directors include T. H. Smallman, London, Ont.; S. F. Kirkpatrick, Kingston, Ont., and G. E. Drummond, Montreal.

A company has been formed at Maxville, Ont., for the purpose of rebuilding the flour mill recently destroyed by fire at that place. For further particulars apply to J. P. McDougall of Maxville.

Isham Randolph, the eminent hydraulic engineer of Chicago, Ill., has designed a wonderful scheme for the building of the wing dam, which the Queen Victoria park commissioners at Niagara Falls, Ont., will construct to raise the level of water in the city waterworks intake. A concrete tower seven feet square and fifty-eight feet high will be erected on the shore and upset into the shallow water near shore, where it will lie on the bottom, forming a submerged dam. The tower will be built in sections connected with heavy chains. When it falls into the river the sections will break apart so that the dam will conform to the river bed, while the chains will hold them in place. The tower is now in course of erection.

The Grand Trunk Railway Co. are considering the erection of a large depot, a new freight house and an overhead bridge in London, Ont., to cost about \$2,000,000.

The City Dairy Co., Toronto, have secured a permit for the erection of a three story concrete stable 112x85 feet, to cost about \$25,000.

The Adams Furniture Co., Toronto, have purchased the Russell House property in this city at a cost of \$135,000.

The ratepayers of Arnprior, Ont., have voted favorably on a by-law granting a loan of \$35,000 to the Montreal Suspender & Umbrella Mfg. Co., in consideration for which the company will erect a large factory there. The manufactures now carried on in Montreal, Ottawa, and Sorel, Que., will be removed to Arnprior.

The County Council of Hurdman's Bridge, Ont., have decided to rebuild the bridge at that place at an estimated cost of \$15,000. It will have concrete piers, steel superstructure and concrete floor.

Messrs. Little Bros' sawmill at Haileybury, Ont., was destroyed by fire August 28. Loss about \$5,000.

The Kinnmount Creamery at Peterborough, Ont., owned by Messrs. Graham Bros. & Co., was destroyed by fire September 5. Loss about \$7,000.

Messrs. E. C. Atkins & Co., a United States incorporation, have been licensed to manufacture repair saws, tools, machinery, etc., in Ontario with a capital of \$40,000. C. D. Ten Eyck, Toronto, is their attorney.

The Hough Lithographing Co., Toronto, have been incorporated with a capital of \$40,000, to carry on a lithographing and engraving business, etc. The provisional directors include James Miln, Henry Hough and Robert Miln, Toronto.

The Trent Valley Sugar, Provision & Cold Storage Co., Peterborough, Ont., have been incorporated with a capital of \$400,000, to manufacture and refine sugar, syrups, etc. The provisional directors include A. E. Dixon, Peterborough; A. C. Dean, Township of Smith, Ont.; and Frederick Cochrane, Baltimore, Ont.

The Hayne Milling Co., Brigiden, Ont., have been incorporated with a capital of \$40,000, to manufacture flour, cereals, etc. The provisional directors include J. J. Hayne, John Wheeler, Brigiden, and Thos. Hayne, Sarnia, Ont.

The Regal Incubator Co., Toronto Junction, Ont., have been incorporated with a capital of \$80,000, to manufacture incubators, etc. The provisional directors include E. R. Rogers Toronto Junction; J. A. Pascoe, York, Ont., and W. D. Sharpe, Brampton, Ont.

The Imperial Steel & Wire Co., Collingwood, Ont., will erect additions to their factory to cost about \$100,000. The buildings will consist of a fence mill, 200x60 feet, two stories; galvanizing building, 250x10 feet and warehouse, 200x100 feet. The additional machines to be installed will consist of a 250 h.p. water tube boiler and a compound condensing engine of 150 h.p. to drive a 100 k.w. generator. This generator will be used to drive the nail mill, with 40 tons daily capacity; wire fence mill, with 10 tons daily capacity, and galvanizing plant, 10 tons daily capacity. The company will install

the very latest devices in motors and silent chain drive in the transmission of their power and the operation of machinery.

Mr. H. C. Boulton, Toronto, will erect a six story office building at a cost of \$33,000.

The keel of the new steamer which is being built for the Niagara River Line has been laid in the shipyards of the Canadian Ship-building Co., Toronto.

Permits have been issued in Toronto between August 29 and September 8 for buildings aggregating in value \$363,850. The list includes 104 residences, several stores and a large scale factory to cost \$60,000.

Messrs. Gunn Bros. Co. have commenced the erection at Toronto Junction, Ont., of their main abattoir building, four stories and basement, in the construction of which 1,500,000 bricks will be used. The total cost will be \$100,000.

The Southwestern Traction Co. will extend their line from Hamilton, Ont., to London, Ont. The company are now building a line to Port Stanley, Ont.

Plans have been prepared for the construction of a breakwater at Port Arthur, Ont., at a cost of \$250,000.

Messrs. Furney & Oliver, Flesherton, Ont., will operate the grain elevator of F. A. Metcalf at Burford, Ont.

A company has been formed to build a large flour mill at Galetta, Ont., on the site of the mill which was burned some years ago.

The Manitoba Peat Co., Winnipeg, Man., have commenced operations at their plant at Fort Frances, Ont. The plant is electrically equipped throughout. The main building contains an engine, two boilers, a large electrical generator, dryers, compressors and all the necessary machinery. There are in addition large storage sheds. The company own about twenty square miles of peat bogs in that vicinity. Mr. Wilson Irwin, manager of the company states, that in the work of excavating and preparing the peat, the land is first cleared of all underbrush and moss, then electrically driven appliances excavate the peat, pulverize it and scatter it over the earth, where it is allowed to lie for some time, until the moisture is reduced by evaporation. There are then appliances for gathering the peat where it is taken to the plant on the electric motors. The officers of the company are: R. J. Whitla, president; R. J. Woodward, secretary-treasurer; directors, Dr. C. W. Carr and T. A. Irwin, Winnipeg.

The York Radial Railway Co.'s car barns and contents, which included five cars, machinery and tools, on the Lake Shore Road near Swansea, Ont., were destroyed by fire September 12. Loss about \$20,000.

The old Kingston & Pembroke car shops at Kingston, Ont., owned by the Canadian Pacific Railway Co., were destroyed by fire September 12. The carshops contained a lot of valuable machinery, a number of cars, a snow plow and flanger, all of which were destroyed. Loss about \$50,000.

The Toronto Railway carried 4,201,880 passengers during the two weeks of the Exhibition ending on September 9. This does not include those who traveled on transfers. During the same period the company's earnings amounted to \$173,940.57, against \$151,371.65 for the same period of 1904,

thus showing an increase of \$22,569.92 for this year's Fair traffic receipts.

Sir Wilfrid Laurier turned the first sod in the construction of the Grand Trunk Pacific Railway, on September 11, at Fort William, Ont.

The South African Republics are apparently beginning to open out and Canada is beginning to reap the benefit of the South African war by the way of trade extension. The Ontario Wind Engine & Pump Co., Toronto, have just received an order from Pretoria for three complete outfits of their well-known Canadian Airmotor. There is a great field in South Africa for Canadian enterprise and we are pleased to notice that the above firm are pushing their goods into all parts of the world.

J. R. Booth is pushing ahead the work on his new pulp and paper mill at the Chaudiere, at Ottawa. The outlay involved in connection with this undertaking will be about \$1,000,000. Concrete foundations are being laid and the structure, when completed, will be one of the best equipped in the country.

It is reported that the receiver of the Central Ontario Railway Co. has obtained leave to spend \$25,000 on construction work to effect a junction with the Canada Atlantic Railway at Whitney, Ont.

The Canada Machinery Co., Sarnia, Ont., whose plant was recently destroyed by fire, will probably rebuild, but not on the present site. The management of the company was recently changed, and is now in the hands of W. F. McGuire and C. B. Richards, formerly of Cleveland, Ohio. The output of the company comprises can making machinery, lathes, shapers, planers, drills and presses of all kinds.

A large lift lock, with a lift of 48½ feet, will be constructed at Kirkfield, on the Trent Canal, Ont. The chambers will be 140 feet long, 33 feet wide, and will have eight feet of water over the gate sills. The main cylinders will be of cast steel, with rams 90 inches in diameter and 57 feet long. The total weight on each ram will be about 1,700 tons and the working pressure in the cylinders will be about 600 pounds per square inch. The towers, about 100 feet high, will be of structural steel, and the upper approach will be a steel aqueduct with a length of 35 feet. This use of steel throughout instead of concrete will give the lock a considerably different appearance from the similar lock on this same canal at Trent, Ont.

Brophy Cains, Limited, Montreal, have been incorporated with a capital of \$500,000, to acquire the business of Brophy Cains, and to manufacture dry goods, etc. The provisional directors include Thomas Brophy, F. L. Cains and G. L. Cains, Montreal.

The Quebec Harness Mfg. Co., Quebec City, have been incorporated with a capital of \$20,000, to manufacture harness, saddlery, etc. The provisional directors include N. G. Kirouac, Notre Dame de Quebec, G. Darveau, and W. F. Terry, Quebec City.

The North River Power Co., Montreal, have been incorporated with a capital of \$90,000, to manufacture electrical and mechanical apparatus, tools, fixtures, etc., and to acquire the business of the Shelby Co. The provisional directors include Robert Bickerdike, Albert Fogarty, and J. A. Mann, Montreal.

The Improved Match Co., Montreal, have been incorporated with a capital of \$75,000, to manufacture matches, sashes, doors, packing boxes, etc. The provisional directors include H. D. Metcalfe, Westmount, Que.; C. P. Metcalfe, and C. J. Anderson, Montreal.

The E. Guillet & Sons Co., Limited, Marieville, Que., have been incorporated with a capital of \$150,000, to manufacture hats, etc., and to acquire the business of E. Guillet & Co. and E. Guillet & Sons. The provisional directors include Edmond Guillet, H. D. Guillet and H. W. Jewett, Marieville.

It is reported that the Baylis' Pulp & Paper Co., of Binghamton, N.Y., have purchased three hundred miles of spruce timber on the River Ste. Anne, thirty miles from Quebec City, at a cost of about \$1,000,000. The company will establish pulp and paper mills in that vicinity to cost \$700,000.

The St. Eustache Canning Co's. factory at St. Eustache, Que., was destroyed by fire September 4. Loss about \$50,000.

The Department of Marine and Fisheries at Ottawa, have been notified of the destruction by fire of the lighthouse at Macquereau Point, on Bay Chaleurs. Loss about \$6,000. Plans will be prepared a once for the construction of a new station.

The Keewatin Flour Milling Co. have closed a contract for the machinery of one of the largest flour mills on the continent. The equipment will be equal to 40,000 barrels a day and provision has been made for a further output of 20,000 barrels. The successful tenderers were the Allis-Chalmers Co., of Milwaukee, Wis., who have built all the large flour mills in the United States. The amount involved will be about \$225,000. A considerable portion of the machinery will be constructed at the works of Allis-Chalmers-Bullock, Limited, Montreal. The contract calls for the installation of the Universal Bolter system throughout. The power is derived from the Lake of the Woods, and wherever possible electricity will be used in the operation of the plant. A separate waterwheel will be installed to generate the current, and the elevator of 500,000 bushels capacity, the car pullers, the wheat shovels, the passenger and freight elevators, the cooper shops, etc., will be run by electricity. The mill building and elevator, now under construction by the Macdonald Engineering Co., Chicago, Ill., will be completed by January 1. Mr. John Mather of Ottawa is president, and a number of Ottawa capitalists are interested. They are determined to have a mill equal to anything on the continent in operation at an early date.

One of the largest of pulp mergers in the history of Canada was recently perfected at Montreal, whereby a number of companies operating in Newfoundland, having an aggregate area of a million and a half acres of pulp lands, surrendered their interests to a company in which the controlling interests are held by a group of British publishers, capitalized at £1,000,000. The companies affected are the Reid Newfoundland Co., the Exploit Lumber Co., the Newfoundland Timber Estates Co., and the Newfoundland Lumber & Pulp Co.

The Imperial Cement Co., Montreal, are equipping their plant with a Sturtevant

pulverized coal burning apparatus, supplied by the B. F. Sturtevant Co., Boston, Mass.

The municipal council of Notre Dame des Neiges, Que., are considering the installation of a new waterworks system in that town.

It is reported that the Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio, who recently sent a complete wire mill to Japan, are at the present time very busy constructing several improved wire mills, one of which will be located in Atlanta, Ga., one in Peoria, Ill., and one in St. John, N.B., also the Montreal Rolling Mill Co., Montreal, who are enlarging their outfit with some new machinery. Various orders for part equipments are being filled, together with a line of sewer pipe machinery of its special style.

The James Robertson Co., Limited, of Montreal, have been licensed to do business in New Brunswick and have established a branch works at St. John with a capital of \$5,000. They will manufacture saws, barbed wire, lead pipe, etc. The provisional directors include J. M. H. Robertson, C. M. Robertson and A. A. McMichael, Montreal.

A. A. Tuttle's sash and door factory at Moncton, N.B., was destroyed by fire September 9. Loss about \$3,000.

The Thomas W. Flett Lumber Co., Nelson, N.B., have been incorporated with a capital of \$35,000, to acquire the business of T. W. Flett and to manufacture lumber, etc. The provisional directors include T. W. Flett, J. A. Flett and M. J. Flett, Nelson.

The Sayer Co., Limited, Sussex, N.B., have been incorporated with a capital of \$9,000, to manufacture hardware, furniture, etc. The provisional directors include John Sayer, Sussex; Jacob Sayer, Amherst, N.S., and P. G. Sayer, Cocagne, N.B.

Mr. G. S. Mayes, St. John, N.B., has been awarded the contract for dredging the St. John harbor.

It is reported that a new flour mill will be built at the old Morrison place at Clark's Cove, about a mile above Chatham, N.B.

The Salvation Army will erect a large new building in Yarmouth, N.S.

The Western Lighting Co., Rosser, Man., have been incorporated with a capital of \$20,000, to manufacture illuminating supplies, machinery, etc. The provisional directors include E. E. Price, Rosser; W. P. Rogers and W. F. Farrow, Winnipeg, Man.

Messrs. P. Burns & Co., Calgary, Alta., have been incorporated with a capital of \$2,000,000, to manufacture cereals, dairy produce, and to erect grain elevators, mills, etc. The provisional directors include J. S. Lovell, Robert Gowans, and E. W. McNeill, Toronto.

The Pipestone Hotel Co., Pipestone, Man., have been incorporated with a capital of \$5,000, to erect a hotel building, etc. The provisional directors include J. W. Crawford, J. G. Rattray, and E. J. Parker, Pipestone.

Messrs. Stobart Sons & Co., Winnipeg, Man., will increase their capital from \$500,000 to \$600,000.

The Royal Four Mills Co. have commenced work on the construction of their large flour mill at River la Seine, St. Boniface, Man.

The Builders' Equipment Co., Winnipeg, Man., have been incorporated with a capital

of \$120,000, to manufacture machinery, cement, lime, brick, etc. The provisional directors include Arthur Macaw, A. R. Bredin and L. C. Hazlett, Winnipeg.

The Myres Iron Fence Co., Limited, Winnipeg, Man., have been incorporated with a capital of \$35,000, to acquire the business of the Myers Fence Co., and to manufacture agricultural machinery, etc. The provisional directors include R. L. Myers, P. C. Young, and W. F. Salter, Winnipeg.

The Metcalfe Milling Co., Limited, Portage la Prairie, Man., have been incorporated with a capital of \$100,000, to acquire the business of Metcalfe & Son, and to carry on a general milling business, erect elevators, mills, etc. The provisional directors include T. H. Metcalfe, Chas. Metcalfe, Portage la Prairie, and G. A. Metcalfe, Winnipeg, Man.

The Western School Journal Publishing Co., Winnipeg, Man., have been incorporated with a capital of \$5,000, to carry on a printing and publishing business. The provisional directors include A. S. Rose, Brandon, Man.; Edgar Burgess, Manitow, Man., and D. J. Wright, Deloraine, Man.

S. P. Hodgson, of Swan Lake, Man., has placed a contract with the Willford Mfg. Co. for a 100-barrel flour mill and 30,000 bushel grain elevator.

R. P. Butchart, managing director of the Vancouver Portland Cement Co., Victoria, B.C., with works located at Tod Creek, B.C., has decided to begin the manufacture of cement at Calgary, N.W.T., and is now preparing plans for the works. At that centre, deposits of lime, rock and clay very similar to that found at Tod Creek have been located, and with these ingredients a high class of Portland cement will be manufactured in order to meet the demands of the prairie provinces. The Calgary concern will have an initial capacity of 600 barrels a day. While the machinery installed will have this capacity the works will be such as to lend itself to a very large increase, the building to be sufficient to accommodate machinery to manufacture 2,000 barrels daily.

The Western Milling Co. will erect a 20,000 bushel elevator at Macleod, N.W.T.

The Melita Roller Mills Co., Melita, Man., are overhauling their mill and adding a new bolting system.

A new flour mill and grain elevator will be built at Vonda, N.W.T., by James Mack of Prince Albert, N.W.T.

The Hall-McNabb Co. will erect a flour mill at Red Deer, Alta., at a cost of \$40,000.

The ratepayers of St. Boniface, Man., have voted favorably on a by-law to raise \$100,000 by the issue of debentures for local improvements.

A new town hall will be erected in Qu'Appelle, Sask. Mr. W. M. Dodd, of Regina, is the architect.

Messrs. Wm. Gray & Sons, carriage manufacturers, Chatham, Ont., will erect a branch factory in Winnipeg, Man.

The smelter plant of the Canadian Metals Co., at Frank, Alta., presents a busy scene, more than 100 workmen being busy rapidly rushing to completion the extensive buildings. The boilers and most of the machinery for the power house have arrived, and will be placed in position at once, in order to

have them running when the plant is completed.

Mr. E. A. Bradley, Revelstoke, B.C., superintendent of the Marshall-Schelling property on French Creek and for the American Mining Co., states that improvements are to be made on the Marshall-Schelling property, and an incline tunnel is to be run 160 feet to bedrock, and an air compressor and hoist installed for the work. A dynamo will also be put in to light the mine by electricity.

At the Granby Co.'s smelter, Grand Forks, B.C., all the blast furnaces were blown out recently to admit of the necessary blast pipe and other connections being made to the two large furnaces the erection of which has just been completed. Since then the six 44x160-inch furnaces have been blown in, and the two 48x210-inch furnaces will shortly be operated for the first time. The treatment capacity of the smelter will now be 2,700 to 2,800 tons of ore per diem.

The Mainland Linotype Co. have been incorporated at Victoria, B.C., with a capital of \$25,000, to carry on a printing, lithographing and engraving business, etc.

The Wallace Shipyards, Limited, Vancouver, B.C., have been incorporated with a capital of \$20,000, to construct drydocks, steamers, tugs, etc.

The Southern Okanagan Power Co. have been incorporated at Victoria, B.C., with a capital of \$50,000, to develop water powers, and operate power houses, etc.

The Elk Lumber & Mfg. Co.'s mill and power house at Fernie, B.C., were destroyed by fire September 7. Loss about \$100,000.

The American Mill Co. are erecting a large cedar mill at Mosquito Bay, Vancouver Island. Mr. W. C. Schultheis, of Seattle, Wash., is in charge of the work. The mill will operate six band saws, and will have a capacity of 200,000 feet of lumber per day. The company own vast areas of cedar lands in that vicinity.

The Colonial Portable House Co., Vancouver, B.C., have been incorporated with a capital of \$10,000, to erect houses, buildings, etc. A. Rowan, Vancouver, is interested.

The Ark Group Mining & Milling Co. have been incorporated at Victoria, B.C., with a capital of \$100,000, to carry on a mining, milling and refining business.

The Wellington Coal & Wharfage Co., Vancouver, B.C., have been incorporated with a capital of \$100,000, to acquire the business of Macdonald, Marpole & Co., and to carry on a shipbuilding and forwarding business.

The Vancouver Timber & Trading Co. have been incorporated at Victoria, B.C., with a capital of \$100,000, to manufacture lumber, timber, etc.

Ald. Edward Cook, Vancouver, B.C., will erect a warehouse 112x66 feet, three stories high, in that city, at a cost of \$30,000.

The British Columbia Government has entered into an arrangement with the Grand Trunk Pacific Railway Co. to establish their terminus at Kaien Island, on the tract of 10,000 acres which the officials purchased some time ago. The company agree, subject to the approval of the Governor-General in Council to construct thereon, of a substantial and permanent character, wharves, docks, stations, yards, round-houses, and

other facilities, on or before June 30, 1906, and thereafter actively prosecute to completion. Should the company fail to carry out the provisions of the agreement the Government has the right to cancel it and to resume possession of the land.

The B. F. Sturtevant Co., Boston, Mass., will equip the New York Fire Department repair shops with a complete outfit of forges, blowers and a smoke exhauster.

The Albion Stove Works, Limited, Victoria, B.C., have been incorporated with a capital of \$30,000, to acquire the business of the Albion Iron Works and to manufacture stoves, etc.

A new school building will be erected at Port Moody, B.C. For further particulars address J. A. Cato, that place.

The San Juan Mining & Mfg. Co. have been incorporated at Victoria, B.C., with a capital of \$1,000,000, to carry on a mining, milling and reduction business.

The Columbia Wine & Spirit Co. have been incorporated at Victoria, B.C., with a capital of \$50,000, to manufacture wines, aerated and mineral waters, etc.

The new lathe shop of the Latrobe Steel Co., Latrobe, Pa., containing nearly three-quarters of a million cubic feet of space, is to be heated by Sturtevant hot blast system, installed by the B. F. Sturtevant Co., Boston, Mass.

REDUCTION OF COBALT ORE.

The Canadian Copper Co., who have within the past two years spent \$2,000,000 on plant and betterments in connection with their nickel mines near Sudbury, Ont., have, it is reported, about completed arrangements for the sampling and purchase of the refractory and valuable ores of the Cobalt district. A crusher is being erected at Copper Cliff, the smelter town of the company, a skilled chemist from New York is to be engaged, and the cobalt ores will be purchased on the plan in vogue at Denver, Omaha and other mining centres in the west. An umpire will be chosen in case the chemists for buyers and sellers differ as to value, and on the certificate of this umpire payment will be made.

As a preliminary to proper sampling of the ore, it will have to be crushed. After purchasing, it will be roasted in chambers to get rid of the arsenic. The ore will then be smelted in the ordinary way, though the metallurgy of the complex ores at Cobalt is by no means clear.

Copper Cliff is 83 miles west of North Bay, and the latter point is in the vicinity of 100 miles from Cobalt. It is very important for the miners to be able to market their product so near home, and on Canadian soil. They can, no doubt, join in appointing a chemist to check the determinations of the buying company, and a regular umpire can be chosen who will be acceptable to both parties.

It is urged that there would be great difficulty in refining nickel-copper matte in Canada because it is claimed the necessary chemical would have to be freighted here from New York at extra expense. The refining of the ore from Cobalt will, it is thought, probably continue to be done in New York.

It is believed that for the present, at least the difficulty as to proper reduction works for Cobalt ores has been solved.

ELECTRICITY.

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

The Jones & Moore Electric Co. of Manitoba, Winnipeg, Man., have been incorporated with a capital of \$75,000, to manufacture electrical machinery, supplies and appliances, and to carry on the business of mechanical and electrical engineers. The provisional directors include J. W. Jones, Toronto; G. J. Hicks and L. M. Delbridge, Winnipeg.

A despatch from San Francisco says:—Francis J. McCarty, a seventeen-year-old boy, seems to have demonstrated the application of wireless telegraphy to the telephone on home-made instruments. He is able to carry the words of a song for one mile, so they can be heard distinctly at the other end of his circuit. For several months the lad has been working on his invention, on which he hopes to get a patent. In front of his apparatus he sang a half dozen songs, which listeners at the receiving station, a full mile away, heard as distinctly as if they came over an ordinary telephone wire.

The Canadian Westinghouse Co., Hamilton, Ont., have been awarded the contract for the installation of a 1,500 k.w. steam turbine for the Ottawa Electric Co. Work of installation will be carried on during November. The steam turbine is known as the Westinghouse-Parsons' type and is manufactured at Pittsburg, Pa.

The Bell Telephone Co. are now installing their new central energy switch board at Peterborough, Ont.

The Ontario Legislature are considering a report on electrifying the line of the Temiskaming & Northern Ontario Railway between New Liskeard and North Bay, Ont., a distance of 112 miles.

The Calgary Street Railway Co., Calgary, N.W.T., have asked for permission to proceed with the construction of an electric street railway.

The electric lighting plant at Chatham Ont., will be enlarged at a cost of \$35,000.

The Westinghouse Electric & Mfg. Co., Pittsburg, Pa., have received contracts for the equipment of about 12 different electric railway lines with their single phase alternating current system, said to be the latest development of electric traction. The best evidence of the success of the new system lies in the fact that most of the early roads have ordered additional equipment from the Westinghouse Co. The demand for electric railway motors and generators has never been larger than at present, and the railway department of the Westinghouse works at East Pittsburg is kept busy night and day filling orders.

The work of developing power at the Kamistiquia Falls, near Port Arthur, Ont., will be proceeded with as rapidly as possible. The company who are about to undertake the development have let contracts to the Canadian General Electric Co., Toronto, for the generators, exciters, switchboards, etc., the total cost being about \$200,000.

An enterprise of much importance to the mining interests of Kamloops, B.C., is about to be started by Mr. John Shields, who has

staked off a location on the Adams River where 20,000 h.p. of electricity can be generated. This power, it is understood, will be available for the Iron Mask and other mining properties in the vicinity of Kamloops.

The electric light plant now under construction at Frank, Alta., will be ready in a few days for the installation of the dynamos. The plant will cost \$8,000 when completed.

COST OF ELECTRICITY FROM NIAGARA'S PLANT.

Now that Niagara Falls has for some years been in the business of manufacturing electricity for use in more or less long-distance use, it is possible to get the basis of prices upon which it is found feasible to conduct its business. Third Vice-President Rankin has been interviewed by the Toronto Globe on the subject, and we glean the following:

In regard to the company's prices for horsepower delivered at Buffalo, which is between 22 and 23 miles away, the power is carried to the limits of that city on the company's own right of way, and it is sold where used for a limited number of hours a day on the kilowatt hour principle. The latter is equivalent to 1 1/2 h.p. hour, or, to be more matter of fact still, to 1 1/4 h.p. used for one hour. There is a monthly service charge for the maximum service called for in the contract of \$1 per kilowatt hour, of 75 cents per h.p. hour. This is due to the fact that the company on making a contract with a user of its power must be ready to supply him with it to the maximum amount called for at all times. It cannot sell that power elsewhere during the temporary non-use by the particular customer hence this fixed charge. The meter charge is on a scale based on a price of two cents per unit, or kilowatt hour, for 1,000 units or less per month. This scale insures to larger users—as is the case in the purchase of other commodities of industrial life—cheaper power proportionately than that obtained by the smaller users. Here are the details of the scale up to 80,000 units:

		PER UNIT
For 1,000 units or less per month.....		\$.02
Excess over	Up to	
1,000	2,000	.105
2,000	3,000	.012
3,000	5,000	.01
5,000	10,000	.008
10,000	20,000	.0075
20,000	40,000	.007
40,000	80,000	.0066
80,000		.0064

As an example, the case of an 80 h.p. motor running 10 hours a day at its maximum power at times, but averaging through out the day 60 h.p. would, running 25 working days, use the equivalent of 15,000 h.p. hours or reduced to the unit of the kilowatt hour 11,200 units. The charge per month by the company's scale would work out like this: For service demand 80 h.p. at 75 cents per h.p., \$60; for 10,000 units at 008 \$80; and for 1,200 units in excess over 10,000 at .0075 \$9.—a total for the month of \$149. Users of power of any kind usually calculate their total operating expenses by their rated h.p., and following that

rule in this instance the result shows a charge equivalent to \$22.35 per h.p. per annum.

Mr. Rankin said that in the case of people desiring 200 h.p. or more, it was usually found that they preferred a yearly contract at a fixed price per h.p. hour for 24 hours in the day. For 200 h.p. under the conditions mentioned the company sold at \$35 per h.p. per year. Naturally prices were proportionately less as the quantity of power consumed increased, units of 5,000 to 10,000 h.p. for 24 hours a day being sold at from \$25 to \$27 per h.p. per year.

The company carries its power over its own right of way to the city line of Buffalo at a voltage of 22,000. At the time it is "stepped down," in the phraseology of electricity, to 11,000 volts, and is sent through large underground distributing cables to the four substations, where it is reduced to 2,200 volts, which is the commercial voltage delivered to customers. Mr. Rankin was asked if the prices mentioned were profitable to his company, and he promptly answered: "I think the rates would be changed if they were not profitable." He was not in a position to enter upon a discussion as to the price power developed at the Falls could be sold at with fair profit in Toronto, not being sufficiently well acquainted with conditions in that city as to enable him to speak of the cost of distribution and other important factors.

One result of the development of this power in Buffalo is the growing use of electricity for domestic purposes. An official of the Buffalo & Niagara Falls Electric Light Co., of Buffalo, which buys its power from the Niagara Falls Power Co. and resells, talked interestingly on this point. "In this neighborhood," he said, "the use of electricity for sewing machines, ironing, lighting and other household purposes is steadily increasing. The average cost of running a sewing machine by electricity is one-half cent an hour. The cost of a motor for that purpose would be from \$12 to \$15. But the motor may be expected to outlast the machine. For ironing the cost runs to about three cents an hour, with a proportionately smaller charge to tailors, who of course use larger irons and use them constantly. Reports show that the use of electricity for ironing in the home is rapidly increasing. Then in regard to lighting, the charge amounts to about one-third of a cent an hour for a 16 candle-power lamp. Wherever electric lighting is used in houses attachments for the other purposes named can be made to the wiring already in, and are quite easily handled by the householders themselves." The amount of power used is of course gauged by meters.

The company also furnishes power for the cash systems of stores. It has been found that about one h.p. is sufficient for the purposes of stores of three floors. The charge for such a service averages about \$3 per month, the stores remaining open during the usual hours, and on two nights a week until 10 o'clock.

A GREAT TUNNEL NEAR VANCOUVER

The great engineering enterprise undertaken by the British Columbia Electric Railway Co. to furnish electric power is now approaching completion. About sixteen miles from Vancouver there is a small lake covering about 300 acres. This is called

Trout Lake, or Lake Beautiful, and lies about 400 feet above the high water mark. A power plant has been established at the foot of the mountain, and water is brought down in large pipes, having a fall of 390 feet in 1,600 feet. But this lake does not contain sufficient water to meet the demands in the dry season, and therefore it was decided to bring down the water of Lake Coquitlam, which lies about 35 feet higher than Lake Beautiful, and has an area of about 2,000 acres. Between the two lakes there is a range of mountains rising to a height of about 4,000 feet, and to bring the water from Lake Coquitlam to Lake Beautiful required the construction of a tunnel almost the entire distance, some two and a half miles, through solid rock.

Work was begun about two and a half years ago at both ends, and has continued until a few days since, when the two gangs of men met in the middle of the tunnel and found that the borings met each other without the variation of an inch.

Sufficient water has thus been secured to produce all the electrical power that is likely to be needed in that vicinity for many years.

The tunnel is regarded as one of the largest and most successful engineering enterprises yet undertaken in that province, and the following are facts concerning it: Cost, \$320,000; total length, 2½ miles; size, 3x9 feet, with rounded corners, area of normal cross section, 73 square feet; number of men employed on construction, 100 to 175; time required for drilling, two years, two months and three weeks; average rate of progress per day, between 15 and 16 feet; average rate of progress per week, 120 feet; greatest distance driven on either side in one week, 80 feet, at the Lake Beautiful end, in week ending October 30, 1904; explosives required, over 200 tons of dynamite, gelignite and blasting gelatine; fuse used in blasting, 500,000 feet, or nearly 100 miles; candle power required to light the work, 175,000.

TELEPHONE PARTY LINE.

Wonderful advance in the technique of the telephone may be confidently predicted before the general advent of the automatic telephone or of the wireless telephone, predicted years ago by the brilliant over-sanguine, but far-seeing Tesla. Very shortly one may look for great improvements in the party line service, says the Philadelphia Record.

One of the largest telephone supply houses is bringing out what is known as selective party line signal, by which it is possible to ring any particular bell on a four-party line without ringing the others, and thus do away with one of the greatest annoyances of the cheaper forms of telephone service.

The selective bell is based on the harmonic principle, which is simply an application of a well-known property of vibrating reeds. Every reed has a natural period or rate of vibration, and by applying small impulses of force to this reed it can be made to take up that particular vibration. In practice each bell on a four-party circuit is attuned differently, and when a subscriber is wanted suitable exciting impulses are sent into the line from a ringing machine at central which causes the reel, or clapper of his bell to vibrate, but does not affect any other clapper

on the circuit. The machine ringer at central is an innovation, the result of a large number of experiments along this particular line.

From the practical point of view the new selective harmonic ringing system has many advantages, chief among which is that every telephone on the system may be connected in a similar manner, the only difference being in the bell, or "harmonic ringer." Moreover, the selective feature of any bell may be changed at will by substituting another clapper, these being adjustable and removable for that purpose.

Among the other advantages, from the station man's point of view, is that the new ringer can be placed on any common battery telephone to take the place of an ordinary single-party polarized ringer, that present equipment can be changed over to the new system without the expense of new 'phones. In general appearance there is no difference between the party line 'phone thus equipped and the single-line telephone.

THE COST OF POWER IN HAMILTON

Mr. William C. Hawkins, the secretary and general manager of the Hamilton Ont. Cataract Power, Light & Traction Co. explains that the company's charges for power are based on the "horsepower hour" principle, that has been shown, by experience to be the best from the standpoint of the two interests, viz., the consumer and the supplier of power. The base rate of the company is three cents per h.p. hour, that is three cents per hour for every h.p. used. As a net charge this would, of course, be decidedly costly to the consumer, but the company grants a liberal discount on every contract for over 100 h.p. hours per month. Thus in the case of establishments where only 100 h.p. hours per month are required there would be a flat charge of \$3 but in the case of 200 h.p. hours per month a discount of 7 per cent is allowed. The discounts are larger as the rate of h.p. hours increases, reaching 66½ per cent in the case of 2,000 h.p. hours per month. These figures apply to establishments equipped with motors up to 30 h.p. A 10 h.p. motor, working ten hours a day, at all times at full load, would be equivalent to 100 h.p. hours per day, and counting 25 working days to the month, it would equal 2,500 h.p. hours for the latter period. At three cents per h.p. hour there would be a charge on the base rate of \$75 a month, but the company gives on this aggregate of h.p. hours a 66½ per cent discount, and the charge is thus reduced to \$27. In practice, however, a motor seldom averages more than 60 per cent of the above, and the figures would in the average case be modified accordingly.

For 30 h.p. and upwards one cent per h.p. hour is charged. For 50 h.p. and over the rate is three-quarters of a cent net per h.p. hour, if the contract contains the restricted period clause, limiting the consumer not to use power between the hours of 5 and 6.10 p.m. from October 1 to March 1. These figures are clearly set forth in the company's printed schedule of prices. There is also a stipulation that a minimum charge of \$1.20 per month per h.p. of motors installed will be made. This if in the example quoted in the foregoing the

10 h.p. motor should be idle for a month through no fault of the company, \$12 per month would be charged against the consumer. The fact of his motor being idle would not, of course, alter the fact that the Cataract Co. would not be absolved from its obligation to have ready for him on demand the power his contract called for.

In cases where particularly large supplies of power are called for, say 5,000 up, special contracts are made, but the principle of charging by hundreds of h.p. hours is maintained. It is worthy of mention that the company are supplying 10,000 h.p. to one single establishment in Hamilton alone. The company bring their power to Hamilton from DeCew Falls, a distance of 35 miles. In all contracts the Cataract Co. bring the power to the door of the consumer, the latter, of course, bearing the cost of his interior plant.

Mr Hawkins stated that the cost of the company's power to the consumer was cheaper by from 40 to 50 per cent. than the cost of a similar amount of energy developed by steam, in addition to the other advantages of cleanliness, safety and the saving of space. Some 18,000 h.p. of the amount developed by the company is now being used in Hamilton, Dundas, Burlington, St Catharines, Grimsby, Beamsville and Oakville, Ont.

INTERNATIONAL WATERWAYS.

Mr Thos. Cote, secretary of the Canadian section of the International Waterways Commission, returned a few days ago to Ottawa from the Soo, Port Arthur, Fort William, Fort Frances, Duluth and Chicago, where he went in connection with the investigation which is being made into the effect upon navigation on the upper lakes of power development and other enterprises. The commission are ascertaining the effect upon navigation of the works of the power companies operating at the Soo, and will recommend such regulations as may be necessary to effectively control them. Mr. Cote reports that practically all the industries at the Soo are in active operation, and doing better than before. The contention has been made that the international boundary line in the Mary's River has not been located by exact measurements, and that a new survey should be instituted by the two governments. The engineers on the commission, Messrs Wisner and Coste, will ascertain if there is any ground for the contention. The commission in the neighborhood of Fort William and Port Arthur. At Duluth Messrs. Cote and Wisner personally examined the proposed diversion of waters of White Lake and White Iron Lake in St. Louis and Lake counties by the Minnesota & Power Co. The diversion would not comprehend the lakes named, but all streams running out of them and the watershed extending northward and passing ultimately into Rainy Lake, River and Lake of the Woods. The navigation and navigation interests claim that the reduction in the flow of water northward

would destroy the navigation of the Rainy River, which is already difficult during intervals in summer. Power development at Fort Frances would also be injured. The power company state that the maximum flow northward is about one thousand cubic feet per second and at low water 200 cubic feet. They propose to take 600 cubic feet of the maximum flow. The visit of the commission to Chicago had reference to the effect of the Chicago drainage canal upon the upper lakes.

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 Maritime Coal & Railway Co., Amherst, N.S., have located a new seam of coal on their property, which is claimed to be the Lawson seam. This seam was worked many years ago on the Joggins property and contains the best quality of coal in Cumberland County.

A report from Victoria B.C. states that Mr. W. F. Borland, representing Montreal and New York capital, has completed the purchase of 30,000 acres of coal lands on Queen Charlotte Island from a syndicate for \$700,000.

The Nova Scotia Steel & Coal Co., North Sydney, N.S. have made a contract with the Montreal Sugar Refinery for 2,500 tons of picked coal as a first installment. The company expect to be raising coal at their new colliery in a few weeks.

The Armstrong, B.C., Advertiser reports that Mr. A. W. McVittie has discovered a seam of bituminous coal seven miles from the west shore of Okanagan Lake, B.C.

Mr. T. H. Crowley, Sault Ste. Marie, Ont., discovered a deposit of bituminous coal on Mr. Win Croughs farm near Peterborough, Ont.

A scientific discovery has recently been made which may have an important influence on the future of southern British Columbia. An English company has apparently solved the problem of manufacturing coke from a non-coking coal. It has supplied the natural deficiency artificially, and the result is said to be perfectly successful. The process is not unlike the "briquetting" which has been resorted to for nearly half a century to produce domestic and steam coal from coal dust. The home of the latter industry is Swansea and later other South Wales ports. The fine coal from the screenings is collected, ten per cent. of pitch added, the mixture superheated in a huge revolving cylinder until it becomes a semi-plastic mass. It is then expelled in the same way in which clay is forced from pug mill, moulded into briquettes, and after drying and cooling, becomes a marketable and profitable fuel. So prosperous has the industry become, and so well adapted is the fuel, especially for hot countries, that it is a matter of wonder that it has not extended to Canada.

The Murphy Iron Works manufacturers of the Murphy automatic smokeless furnace, whose works and main office are in Detroit,

Mich., with Canadian branch at Walkerville, Ont., with branch office in Board of Trade Building, Toronto, inform us that they have just closed a contract with the Buffalo and Susquehanna Coal & Coke Co., at Punxsatawney, Pa., and will install for them ten Murphy automatic smokeless furnaces for boilers aggregating 3,500 h.p. These furnaces are to be used for furnishing power for coal mining operations, the coal being delivered direct from the mine into the furnaces, by which, the cost per ton will be only the labor cost for mining, probably 75 cents per ton or less. If this coal company find it to their interest to install Murphy furnaces, considering the low cost of their fuel, it must be a much better proposition for Canadian manufacturers with coal costing from \$3 to \$5 per ton. Where the coal company in Pennsylvania effect an economy of one dollar by this method, the Canadian manufacturer would save perhaps \$6. In other words the earning power on investment in Canada would be five or six times greater than in Pennsylvania.

The West Canadian Collieries are steadily enlarging their operations at their Lille colliery, five miles from Frank, Alta. The coal measures there being developed are those of the eastern portion of the extensive Crow's Nest Pass coal fields. A tippie has recently been completed, with a capacity of 2,000 tons per day. A coal washer is being erected near the coke ovens, of which there are 54. These are Belgian ovens, of the Bernard type, and have a producing capacity of about 175 tons of coke per diem. The coke is of an average good quality, though a little higher in ash than that made at the Crow's Nest Pass Coal Co.'s beehive ovens at Michel and Fernie, B.C., in the western part of the Crow's Nest coal fields.

The International Coal & Coke Co.'s mine at Coleman, Alta. is now sufficiently opened and equipped to produce between 2,000 and 3,000 tons daily. In addition to a large seam of steam coal, there is a seam of coking coal now being opened. This will warrant the company in increasing the number of coke ovens to 200, which it is planned to do.

The Edmonton, Alta. Bulletin says the coal areas in the vicinity of Edmonton are gradually showing up in larger quantity and better quality. One of the new mines being developed is in the vicinity of Big Island, some five miles up the river, where Messrs. Leddy, Collausion, Mulligan and Cahill have a seam of hard coal 15 feet in thickness adjoining the river, making the transportation of it very easy. It is also above high water mark and sufficiently high for them to put in a double track, making the loaded cars return the empties.

The Arbutnot Fuel Co. has been organized and will establish offices and yards at Fort Rouge Man. Mr. John Arbutnot and C. A. Hutchinson, Winnipeg, Man., are interested.

The Link-Belt Engineering Co., Philadelphia, Pa., have taken a number of orders for coal handling machinery during the last few weeks, for use with both anthracite and bituminous coal. A large boiler-house equipment, including coal handling and storage machinery, will be installed for the Latrobe & Connelville Coal & Coke Co., at Latrobe, Pa.; also a coal elevating apparatus for handling coal from boats for the American Ice Co., Philadelphia.

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.

James Chisholm, architect, Winnipeg, Man., is inviting tenders for the erection of an addition to the John Marrin Co.'s warehouse in that city.

The Department of Public Works, Ottawa, will receive tenders for the construction of a detention building in Quebec City.

The Department of Railways and Canals, Ottawa, will receive tenders for the construction of a nine-stall engine house at Pietou, N.S.

Mr. W. A. MacKinnon, Canadian commercial agent in Bristol, England, calls the attention of Canadian architects to be programme of the competition for the plans for the Palace of Peace to be erected at The Hague, Holland. Full instructions to competitors have been forwarded to the Department of Trade and Commerce at Ottawa.

J. J. Murison, secretary-treasurer Arcola, N.W.T., will receive tenders for the erection of a town hall there.

J. H. Garnett, Warrenburg, Mo., has purchased the La Giralda and Santa Maria gold and silver mines in the Vallecillo district near Monterey, Mexico. He plans to extend developments, building a modern concentrating plant, and make other improvements and installations of improved machinery for mining and milling.

Dispatches state that the Mexican Government will arrange for extensive improvements to the port and harbor of Mazatlan, Jalisco, estimates putting the cost of the contemplated work at \$7,000,000.

It is stated that the plans of Nelson Rhoads, Jr., have been approved for the construction of the water-works for city of Juarez, Mexico, source of supply, 120-foot well which has been tested to a 24-hour capacity of 2,000,000 gallons; pumping plant to be operated by gasoline engine of 500,000 gallons capacity daily; water to be elevated into tank on steel tower 40 feet high; tank's capacity 300,000 gallons; pipe line to be of cast iron nearly six miles long. For further particulars address Board of Public Works, Juarez, Chihuahua, Mexico.

C. J. Brown, city clerk, Winnipeg, Man., will receive tenders for the supply of two city hook and ladder trucks. The trucks shall have each one 50 foot extension ladder, one 40 foot, one 30 foot, one 28 foot, one 26 foot, one 24 foot, one 20 foot, one 14 foot, one 12 foot, and one 9x9 foot extension ladder, equipment to be complete.

O. J. Godfrey, town clerk, Indian Head, Sask., will receive tenders for the erection of an electric light power house there.

J. H. Agnew, Provincial Treasurer, Winnipeg, Man., will receive tenders for the purchase of \$150,000 of drainage debentures.

PUBLICATIONS.

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

The Joseph Dixon Crucible Co., Jersey City, N.J., have issued a circular setting forth the protective and wearing qualities of Dixon's silica graphite paint, for all classes of steel work, roofs, fences and bridges.

The Garvin Machine Co., New York City, have sent us a folder describing and illustrating the Garvin direct constant feed milling machines manufactured by them.

The Link-Belt Engineering Co., Philadelphia, Pa., have sent us booklets No. 55 and No. 56 relating to their "Trump" measuring and mixing machine and their "Trump" concrete measuring and mixing machine.

The Pennsylvania Fire Brick Co., manufacturers of Beech Creek fire brick, roof, bung, portland cement, etc., at Beech Creek, Pa., have sent us the usual handy desk pad for the last four months of the current year.

The Canadian Westinghouse Co., Hamilton, Ont., have sent us Circular No. 1108, describing their regulating and reversing controllers.

The Murphy Iron Works, manufacturers of Murphy automatic smokeless furnaces, whose Canadian branch factory is at Walkerville, Ont., with offices in Toronto, have sent us a handsome catalogue entitled "Economy in cost for power and smoke prevention," which contains several illustrations of installations of their furnaces also valuable information regarding same.

THE HONORABLE PETER WHITE.

Under the title of "The Honorable Peter White" the Penton Publishing Co. of Cleveland, Ohio, recently issued a volume by Ralph D. Williams, editor of the Marine Review, which deals with the development of the Lake Superior iron ore region and the growth of its iron ore trade during the past fifty years. The volume, which is profusely illustrated, is a distinct contribution to the literature of the iron industry of the United States, although it relates to the human and personal side rather than to the technical side of the industry.

Mr. Williams says that his book was largely prepared from data obtained from an examination of the manuscripts of the original iron ore mining companies of the region. In telling the story of the beginning of the Lake Superior iron ore industry it was eminently proper to honor a man who has been closely identified with the history of the region from early boyhood to old age. Hence the above title. Peter White, who is now one of the oldest as well as one of the most respected citizens of the Upper Peninsula of Michigan, assisted as a boy in stripping the ground for the first iron ore mined in the Lake Superior country. He also wrote the bill of lading of one of the earliest shipments of iron ore made from the region. This shipment amounted to only six barrels. Although over fifty years

have passed since this event Peter White, a resident of Marquette, is still an active, strong, and vigorous man at the age of 77 years.

Mr. Williams is to be congratulated upon writing such an interesting and valuable work. The volume is in reality an industrial romance, undertaken to preserve the history of the greatest iron ore region in the world while it was yet possible to secure the facts from the lips of the men who were actually connected with its development. The book contains over 200 pages and is tastefully bound and handsomely printed. Its price is \$1.50 per copy net; postage 15 cents extra. Every iron and steel manufacturer should have a copy.

THE ADVANTAGES OF MECHANICAL DRAFT.

The B. F. Sturtevant Co., Boston, Mass., in their exhaustive treatise entitled "Mechanical Draft," point out that to a great extent the advantages of this method of draft production are inter-dependent, and that the possession of one advantage is evidence of the possession of others of similar character. "Thus the very adaptability of mechanical draft is indicative of the fact that it is more flexible than that produced by the chimney is more readily controlled, and less influenced by climatic changes; while the apparatus for its production is more readily transported and has a higher potential value than a chimney. To a considerable extent they stand out as the conveniences of this method regardless of their economies. When it is shown that increased efficiency can be secured by a method that is more convenient the advantage of mechanical draft is established.

"The actual omission of the chimney is sometimes of far greater importance than would at first appear, while the results with which the rate of combustion may be increased is doubly appreciated when it is shown that under proper conditions the efficiency of combustion may be increased thereby. The economy in the quantity of fuel consumed has, in its relation to the advantage of mechanical draft on shipboard, a value which is closely allied to that resulting from the decreased space occupied.

"The economic results which may be secured through the introduction of mechanical stokers and devices for utilizing the heat of the gases are rendered most evident under the conditions of mechanical draft production, as are also the great advantages of preventing smoke and the blessing of good ventilation as they are exemplified on shipboard. The facts that the size of a boiler plant required for a given output is reduced when a fan is substituted for a chimney, that the cost of the mechanical draft plant, is usually far less than that of the chimney draft plant, and that its operating expense is likewise less under the conditions, all point most conclusively to the purely economic advantages of the method which is the purpose of this book at present."

The B. F. Sturtevant Co., Boston, Mass., have secured the contract for the furnaces and equipment of the Springfield Technical School, Springfield, Mass., which will consist of over 20 forges, with blower for furnace blast and exhauster for removing the

PERSONALS.

Mr. H. F. Stratton, who has been connected with the principal office of the Electric Controller & Supply Co., at Cleveland, Ohio, has accepted the position of New York representative of the same company, with offices at 136 Liberty St., New York City.

At the annual meeting of the Dominion Miller's Association, held in Toronto August 21, the following officers were elected for the ensuing year—President George Goldie, Arr. Ont.; first vice-president, W. Vogan, Walkerton, Ont.; second vice-president, J. Munro, Thorold, Ont.; secretary-treasurer, C. B. Watts, Toronto.

The National Retail Furniture Dealers' Association held its annual meeting in Toronto, September 6 and was largely attended by members from all parts of Canada. After the president's address, delivered by Mr. John Hoodless, of Hamilton, Ont., the secretary and treasurer, Messrs. J. M. Mathers and W. B. Rogers presented their reports, which proved highly satisfactory. It was decided to empower the executive to discuss amalgamation with the Retail Merchants' Association of Canada. The result of such advances will be reported later. The election of officers resulted as follows—President, John Hoodless, Hamilton; vice-presidents, N. G. Valleequette, Montreal; John White, St. John, N.B.; A. Campbell, Brandon, Man.; C. S. Coryell, Toronto; F. E. Walker, Hamilton.

Mr. Hugh Calderwood, formerly of the Ellingwood Shipbuilding Co., has been appointed surveyor for the Bureau Brevet at Toronto.

Mr. E. Von der Osten, C.E., Toronto, who has been ill at his home for the past eight weeks, has suffered a relapse and has been removed to the Toronto General Hospital.

On the invitation of a number of representative Canadian implement and vehicle manufacturers and others, the members of the National Association of Agricultural Implement and Vehicle Manufacturers of the United States, a body representing four hundred million dollars of capital, will pay special visit to Toronto on September 29, at the conclusion of their annual convention at Niagara Falls, N.Y. A special train will take the party to Toronto by way of St. Catharines and Hamilton. At Hamilton they will inspect the works of the International Harvester Co. of Canada. In Toronto they will be given a street car ride around the city, and in the evening will be entertained at a banquet in the King Edward Hotel. The occasion is one of the most influential commercial organizations in the United States. Its annual deliberations are always of much importance to the trade. The trip to Canada is unique in that it is the first to be made by a large association of American captains of industry.

The New Orleans Railway Co., New Orleans, La., have through their engineers, Messrs. Sanderson, & Porter, New York, recently purchased from B. F. Sturtevant Co., Boston, Mass., six large economizers which will be unique in that they are being put to withstand the highest pressure to which any economizer is known to have been subjected. All pipes are being tested at 300 pounds pressure before they leave the

works; and each section is tested to 500 pounds after the pipes are inserted. There is but a single gasket joint running through the machine, this joint being made by two very heavy flanges with a special gasket which has 2 1/2 inch plane surface through the entire circle.

THE WORLD'S PIG-IRON PRODUCTION.

Substantially accurate statistics of pig-iron production in 1901 are now available for countries which in 1903 produced about 95 per cent. of the total. The table given below presents the actual returns for all countries in 1903, the actual returns for 1901 which are available, and assumes in the case of countries which in 1903 made about five per cent. of the total that their production in 1901 did not vary from that in 1903. All the figures in the table are taken from the Iron Age and refer to tons of 2,240 pounds:

Country	1903	1901	Change
United States	18,009,232	16,497,053	+1,512,219
Germany and Luxembourg	9,926,251	9,944,294	*18,010
United Kingdom	8,811,201	8,562,658	+248,546
France	2,795,627	2,952,377	*156,750
Russia	2,415,173	2,839,800	+424,627
Belgium	1,197,275	1,262,566	*65,291
Canada	265,418	270,942	*5,524
Austria-Hungary	1,395,588
Sweden	481,961
Spain	297,874
Italy	74,090
Other Countries	225,000	42,474,313
Total	45,894,713	44,804,150	+1,090,563

The world's production of pig iron has been approximately as follows, in tons of 2,240 pounds.

1855	6,150,000
1860	7,400,000
1865	9,250,000
1870	11,900,000
1875	13,675,000
1880	17,950,000
1885	19,100,000
1890	27,157,000
1895	28,571,000
1900	40,087,616
1901	40,100,000
1902	43,324,068
1903	45,891,713
1904	*41,801,150

The tendency of production in the United States towards wide variations is well shown in the first table. While the average production in the United States in the two years constituted but 38 per cent. of the total, there was a large decrease from 1903 to 1901, while other leading countries showed a net increase, this decrease being more than

three times the net increase; so that the net decrease of all countries is only about two-thirds the decrease shown by the United States alone. In the current year the United States is likely to swing as far in the opposite direction from the world's average change. Statistics of production in the first half of this year by various countries outside of the United States, and aggregating between 5,000,000 and 6,000,000 tons, show an increase of between three and four per cent. from production in the similar period of last year. The United States, on the other hand, has shown the remarkable increase of 39 per cent., comparing the first seven months of this year with the same period last year, this increase being at the rate of over 6,000,000 tons a year. It is reasonably certain that this country will in 1905 show an increase over 1904 of something more than 5,000,000 tons, while the rest of the world may perhaps show no increase, and in no event is likely to show an increase half as great as this.

PATENTS.

Messrs. Marion & Marion, patent attorneys, Montreal and Washington, D.C., have obtained Canadian patents for the following: David Begnoche, Lacolle, St. John's Co., Que., hay press; J. G. Gascon, St. Francois de Sales, Que., gang plow; Messrs. Dickie & Brown, Wellington, New Zealand, machine for vending stamps, tickets, etc.; E. G. Fadden, Noyan, Que., suspender buckle; Nikolai Perzoff, St. Petersburg, Russia, couplings for internally and externally armored hose; A. Wardroper, Long Acre, England, stocking suspenders; E. H. Cuddy, Fort William, Ont., vehicle attachment; Arthur Beauvais, Laprairie, Que., plow; H. V. Hillcoat, Amherst, N.S., bearings; Henri Harnnet, Paris, France, electric furnaces for the electro-metallurgy of iron and its combinations; J. J. Kirk, Maplewood, Ont., threshing machine; R. L. Ellery, Portsmouth, N.H., centre bearing for cars; L. A. Leon, Maisonneuve, Que., door securing means; Napoleon Niverville, Montreal, loose leaf file; W. K. Bryce, Sanikar Centre, Mich.; switch rod; and J. C. Anderson, Victoria, B.C., jars.

Messrs. Fetherstonhaugh & Co., patent barristers, Toronto, Montreal, Ottawa and Washington, D.C., have recently obtained Canadian patents for the following:

P. Perdue, Clinton, Ont., seeding drills and cultivators; L. H. Morgan, Brampton, Ont., protective shields for water pneumatic tires; W. S. Cooper, Galt, Ont., ignition operating devices for reversing gas or gasoline engines; C. Dandelin, Montreal, apparatus for use in cleaning buildings; V. Filtreau, Montreal, rotary engines; G. S. Cushing, St. John, N.B., process for making wood pulp; W. J. Hastings, Watford, Ont., acetylene gas machines; H. Shipping, Tavistock, Ont., dumping vehicles; A. Jobbern, Hamilton, Ont., scales; E. Large, Calgary, Alta., pneumatic tires; J. M. Bryant, Windsor, Ont., typograph machines; W. R. Wilson, Toronto, coal mine tippie and screen plants; G. E. Gilbert, Peterborough, Ont., letter and document files and binder spindles; G. Spearman, Winnipeg, Man., combined traction wheels and water tanks; J. A. Whyte, Toronto, electric signalling and electric pneumatic train control systems; H. Balm, Toronto, paper boxes; R. H. Beal, Lindsay,

Ont., process of manufacturing moccasins; T Bennett, Toronto, temporary grates; C. S. Botsford, Peterborough, Ont.; cloth measuring machines; W. J. Clokey, Toronto, harvesters; H. W. Dorken, Montreal skates; J. Metivier, Quebec, boots, G. P. Eastman, Toronto, cloth cutters; W. H. Scharf, Montreal, linotype machines; and J. E. Keenan, Owen Sound, Ont., pail graining machines

CANADA TO LEAD THE WORLD

Dr. Heroult, the great French metallurgical expert in electric smelting and refining of iron, now in Ottawa, in an interview regarding Canada's great possibilities in this respect, is reported as follows:

"In ten years Canada will have become a great metallurgical country. You will see an iron industry in this Dominion larger than in any other country in the world. Canada will yet furnish to the world its iron supply. It will be just the same with iron as with wheat. A decade from now Canada will outstrip all other countries in wheat-growing. The production of iron at a cheaper rate than it can be made elsewhere will cause Canada to take a similar position as far as iron is concerned." The foregoing prophecy was made, not by a Canadian, but by a visitor from France, Dr. P. L. T. Heroult, technical director of the French Electro-Metallurgical Society, who has immense works at La Praz, France, where aluminum and steel are produced.

Dr. Heroult is perhaps the best living authority on the smelting of iron ores and the manufacture of steel by the electric method. He has invented the process which is named after him. Two great plants for the refining of steel by the Heroult process are in course of construction, one in Germany and the other at Syracuse, N.Y. The latter is being erected by the Holcomb Steel Co., who have obtained a license from Dr. Heroult to use his invention. The cost of the works will be one million dollars, and the output will be from 80 to 100 tons daily. The company propose to manufacture tool steel and also high class steel billets, the latter being used for piano, rod and other purposes. The Holcomb Co. will be the first concern on the American continent to use electricity in connection with the making of steel. It will be produced by the ordinary method, and the electricity will be applied to a purifying or refining process. Thus by the expenditure of about one dollar per ton, steel worth \$20 a ton will be converted into a product worth \$200 a ton. Dr. Heroult has come to America with his wife and four high salaried engineers. The party will spend twelve months on this side, and the cost to Dr. Heroult will not be much less than \$20,000.

The great metallurgical expert will not give all his time to the Syracuse enterprise. He has undertaken to superintend experiments in the making of pig iron and steel at a plant which is now in course of construction at Sault Ste. Marie, and for which Parliament, on Hon. Frank Oliver's recommendation, voted \$15,000. Associated with him will be Dr. Haanel, Superintendent of Mines. It was on Dr. Haanel's advice that Hon. Clifford Sifton, when Minister of the Interior, despatched a commission to Europe to study and report upon the electric process of smelting ores and making steel. Dr. Haanel

personally conducted the commission, which was fraught with great consequences to Canada.

When the commission reported upon the feasibility of the electric method there was a universal demand from all parts of the world for the report, which received the highest commendation from scientific authorities. From that date public interest in electric smelting became intensely keen, and plants for the utilization of the new method were started in various countries. In Europe and in the United States, where fuel is cheap, the ordinary processes can be employed and electricity need only be utilized for refining. In the extreme East and extreme West of Canada fuel does not cost much, but in the interior the price is prohibitive. This is especially true of Ontario and Quebec where there are immense deposits of magnetite. These ore bodies have long remained undeveloped because they could not be economically treated. But in their vicinity is waterpower in abundance, and that means cheap fuel. Dr. Heroult has smelted magnetite by electricity, and it is a success. He is reasonably sure we can produce pig iron and a high-grade steel here. But to make certain beyond all peradventure and to ascertain all the facts that can be learned in connection with electric smelting, experiments for six months will be conducted at the "Soo" in a plant of special design and construction. Dr. Heroult thinks that under favorable conditions pig iron can be made for \$10 per ton, while steel will cost only about \$4 per ton more to produce. This means a saving of several dollars as compared with the cost of producing pig iron and steel elsewhere. But even if the cost were the same as in other countries it would mean great things for Canada.

When asked what the successful smelting of iron ores would mean to Canada, Dr. Heroult said: "Pig iron is the basis for structural and other steels. At present Canada expends fifty and sixty millions of dollars in buying steel abroad. The idea ought to be to make that steel in this country out of Canadian material by the aid of Canadian water-power and Canadian labor. Even if the cost of making iron and steel here should only equal the cost elsewhere you would keep in Canada the money you now send abroad. But we expect the cost of manufacture will be less here. Think of what it means. The retention in Canada of sixty millions of dollars now yearly spent abroad, the supplying of the new demand for steel rails, structural steel and other classes of the product which has arisen in consequence of the country's development, the profitable sale of your surplus product in foreign markets, and the creation in this country of numerous other industries more or less dependent upon iron and steel. As to the iron resources of this country, from all that I can learn they are vast indeed. In Sweden the quantity of ore in sight is sufficient to supply the markets of the world for one hundred years. If we were to compare the quantity in Canada with that in Sweden I should say Canada has three times as much."

Dr. Haanel, who was present at the interview, pointed out that in the United States some anxiety is beginning to be manifested about the iron supply. Formerly they would not look at ore containing only 55 per cent. of iron, but now they were very glad to get

it. Very soon they would be willing to take ore with much less content of iron. In the United States also much less discrimination is being shown with respect to the sulphur content of ore.

In these remarks by Dr. Haanel the French expert concurred. Dr. Heroult thinks the Canadian Government have behaved with great enterprise and generosity in sending a commission abroad and providing money for experimental purposes. No other government, he says, has behaved in such a public-spirited manner. Dr. Heroult has undertaken to repay the Canadian Government for the \$15,000 voted for experiments at the Soo out of the proceeds of sale of licenses in Canada for the use of his process.

THE SMALL CONVERTER IN STEEL FOUNDRIES.

A recent article in these columns related to the development of the steel casting industry in the United States in the past few years, as gauged both by the increasing use of steel to the displacement of gray iron castings and by the new plants erected in recent years of prosperity, with their year additions both of acid and basic steel. The statistical exhibit contained in the reports of the American Iron and Steel Association. A noteworthy development, to which attention is called in the last directory of American iron and steel works published under the above association's auspices, is the increase in the number of small Bessemer plants installed for the manufacture of steel castings.

Since the introduction of the Tropenas process in the United States a few years ago, 17 plants with 23 converters have been erected and one plant with one converter has been built in Canada. This movement has gone on, in the face of the prejudice against the small converter arising from the failure of a number of processes employing the small vessel, to make good the same made for them. In Europe 40 Tropenas plants with 60 converters are in operation, one of the most noteworthy being the plant of Edgar Allen & Co., at Sheffield, England, where three two-ton converters are in operation, producing 7,000 tons of castings a year. While generally employed in the manufacture of medium and small castings, free from blowholes, the Tropenas process is adapted also to the production of castings up to 6½ tons in weight. It is stated that a casting of this weight can be made when using one 2-ton converter, that by using two 2-ton converters a casting can be made of a weight of 13½ tons.

Castings of Tropenas steel have been used in some cases recently as substitutes for drop and hand forgings, and the process has been employed for machinery, structural and railway castings, as well as hammers, picks, wrenches, anvils, gears, crank shafts, and automobile parts. The use of Tropenas steel of practically the same composition as wrought iron has led to the use of the Tropenas process in the manufacture of castings for electrical purposes. Government works which have Tropenas converters in use are the United States Naval Gun Factory at Washington, D. C., the United States Arsenal at Springfield, Mass., and the Bureau of Construction and Repair, Brooklyn Navy Yard.

SMALL ELECTRIC MOTORS.

Twenty years ago the electric motor was hardly more than a toy, or at best a bit of laboratory apparatus. Since then, and especially in the past ten years, it has almost revolutionized methods of producing, transmitting, and distributing power. Some interesting facts are given in an article on the subject contributed to The Engineering Magazine by F. M. Kimball. An attempt to indicate all the principal lines of industry in which small motors are now successfully employed, says Mr. Kimball, would require volumes. He continues:

"As motors have improved in quality and have been purchasable at lower prices, and central stations have multiplied over the country, distribution systems have been extended, and the cost of operating motors lessened, until they have come into such common use that the small steam-engine is seriously threatened, and various oil and gas engines as well.

"When one considers the enormous amount of power generated and distributed for manufacturing purposes in the United States, and then remembers that probably less than seven per cent. of all this power is distributed electrically, he can begin to form some idea of the vast possibilities yet unrealized in the use of electrical motors. It is estimated that there are at the present time not less than 60,000 motors in daily operation in America, exclusive of those used for railways, automobiles, fans, and elevators, and these 60,000 motors—which represent an investment of about \$12,000,000—are supplying something like 1,000,000

h.p. Among the more urgent reasons for the adoption of electrical distribution of power and motor drive are. Increased production due to possibility of almost perfect maintenance and regulation of speed; saving in power supply; saving in floor space required for producing a given output; flexibility of machine location with regard to light, sequence of operations carried on, and ease of supplying the raw material and removing the finished product, elimination of dust and dirt; safety to operatives, ease and facility of adding to the existing equipment, ability to work individual machines overtime without wasting more power in operating line shafts than is consumed by the machine operated; independence of operation in each machine, i.e. freedom from a complete shut-down if a main shaft or belt gives out; possibility of lighter roof structures—no heavy shafts and belts having to be supported—and consequent decrease in cost of building . . .

"There is no problem of more vital interest to the small manufacturer, repair-shop man, or user of light machinery, than that of obtaining a cheap, reliable, simple, and continuous source of power. This question is often the dominating factor in determining the location of a shop or manufactory. Nearly everything else is subservient to it. There are throughout the United States thousands of mechanics and manufacturers using light machinery, who are quartered in out-of-the-way, low-studded, badly ventilated and badly lighted shops, for the reason that it is only in such locations that they can find shafting to which they can attach

their machines and from which they can obtain the necessary power to operate them at a reasonable cost.

"Aside from the prejudicial effects to health and eyesight arising from working in such unhygienic surroundings, they are a positive and serious detriment to a man's business success. People do not like to enter gloomy, out-of-the-way, ill-ventilated, and dirty shops to place their orders or to look for such articles as they may be in search of. A pleasant, well-lighted, and well-ventilated, easily accessible store or factory is an absolute necessity to any man desirous of making the most of his business. Even if a room be clean, light, and well ventilated at the start, it soon becomes gloomy and dirty if power is supplied to its occupant from the time-honored line shaft with its attendant heavy belts, frictional electricity, constant dust, and dropping oil."

With the advent of the electric motor, the writer reminds us, the necessity of putting up with these conditions is largely eliminated. In most towns there are stations from which a supply of electricity may be obtained, and also attractive and accessible locations for small shops or factories which want only power-supply to make them available. The electric motor is the connecting link between these two, and the user has at once at his disposal a wonderfully flexible supply of power at a reasonable price. Says Mr. Kimball in closing:

"The flexibility of a motor system is of the greatest advantage. There is hardly a shop where frequent changes are not made either by putting in additional machinery, or

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changing the location of the existing machines. When such machines are driven by motors, it is far easier to change the wire circuits supplying them than to change a line of shafting with its attendant pulleys and belts. Furthermore, in engine-driven factories the entire location and layout has to be dependent upon the relative accessibility to, and location of, the driving-shafting. This often results in the necessity of arranging the machines most disadvantageously, so far as strict regard to the sequence of operations to be carried on is concerned. Motor-driven machines, on the contrary, may be located to the utmost advantage in relation to the general layout of the factory and without regard to a line shaft. As motors may be attached to the wall or ceiling, the belts may be short and the pulleys light, causing a material saving in floor and ceiling space.

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The Joseph Dixon Crucible Co., Jersey City, N.J., manufacture as a lubricant for wire rope Dixon's Ticonderoga flake graphite. This, the company state, has the endorsement of many leading manufacturers as well as the approval of those experienced in its use, because of the well recognized fact that flake graphite prevents the abrasion and wear of all parts coated with it. For this purpose graphite must be combined with suitable greases to make it adhere, but there has always been considerable danger and difficulty in applying grease to moving cables. Elevator and other cables used for hoisting purposes, are subject to both internal and external wear; the former is caused by the rubbing of the wires and strands upon one another under pressure in bending over the sheaves, the latter by rubbing and wedging in the grooves of the pulleys. Unless the cables are kept well lubricated they wear and deteriorate rapidly. Flake graphite as a wire rope lubricant is supplied in such a form as to make it thoroughly acceptable to practical men who have used it. It is put up in the form of a package which is of about the size and shape of an ordinary

book and contains nearly three pounds of graphite lubricant. It is easily applied by holding the open edge of the package against the cable while in motion. The combination is known as Dixon's Handy Graphite Rope Dressing.

THE CONSULTING ENGINEER.

There is a certain class of people which looks upon the engineer as a great scientific expert—a man who has devoted years of study and hard work to learning thoroughly his profession, and whose services are indispensable when important work is to be done. But, to them, the engineer is a man of such importance that he will not stoop to small work. He perhaps would be out of his element if he did, and when a small job is to be done, there is little to be gained by employing expert advice.

Upon the other hand, says the Electrical Review, there is another class of people—men who probably call themselves practical—who have done a good deal of work, who have learned what they know in the hard school of experience, and who think that they know all that is necessary for carrying out a small undertaking, and therefore do not need the services of a consulting engineer. There are many men in this class who have done a lot of work. For carrying out certain kinds of work, better men cannot be found, but, in the broader sense of the word, they are not engineers. But few of them are capable of grasping the larger features even of a small undertaking, and for this reason they do not build wisely, although they build well. As a rule, they install a plant which will be reliable, but it is apt not to be efficient.

Of course, both of these classes are in the wrong. There are many engineers who are not only competent, but who would gladly do the consulting work for small plants, and whose advice and instructions would save, many times over, the fee charged. It must be a small job indeed, and a very unimportant one which is not worth doing right. If it is to be done right, it must be done by a man who knows how to do it. The man who has learned his trade merely by doing what others have told him to do is very apt to follow precedent although conditions may call for something entirely new. If he has learned to raise poles by means of pikes, he will probably go on putting in poles in the same way until someone makes him do it in a different way. Until he has been shown that there are better ways than the one which he practises, he naturally thinks he knows the best way, and that he knows all there is to be known about raising poles. Only recently we were shown a letter received by an electrical engineer, which said that a certain electrical plant had no need of his abilities, because the writer, who was also the engineer of the plant, had done all the work himself, from the designing and laying out of the plans

to installing the motors, putting in the poles, and hanging the wire.

To strengthen his contention that the work was done as well as it could be, he told, somewhat in detail, how he had strung wire, planted poles and run dynamos in various parts of the world. He had been in the business for many years, and during that time had visited many countries. We are sorry to say that, with all his experience, his grammar seems to have stuck where it was when he left the primary school, leading one to infer that his engineering abilities had not been much developed. No doubt the plant erected by this man was thoroughly reliable. Probably it is giving satisfactory service; possibly it is paying well. But is it not more probable that a better plant could have been laid out by securing the services of a competent consulting engineer in the first case, or that much improvement might be effected both in the operation of the plant and in the service by calling in an expert to-day?

We have no doubt that there are many plants throughout the country where practically the same condition prevails. The owners of the plant may be satisfied because it pays dividends. The engineer may be satisfied because he built the plant. The consumers may be satisfied because they know no better. Yet, if a competent man were brought in to overhaul the plant and put it in first-class condition, eyes would be opened on all sides.

Exhaustive experiments with the use of oil as fuel on battleships have proved so satisfactory that the British Admiralty in London, England, has ordered the erection of a great oil-storing depot at Plymouth, with jetties at which tank steamers can moor. Stores of oil will be established at most of the home ports.

The Rose Brick Co. will have their new plant in Oakland, Cal., completed in about four weeks. The output of the plant will consist entirely of magnesite fire brick, for use in blast furnaces, smelters and other places where an intense heat must be withstood. The management states that the entire output, including the carbonic acid gas, which is driven off in the process of making, has been contracted for at least a year ahead. The plant is situated near the head waters of a navigable estuary of San Francisco Bay, and the shipments, which will be mostly to the east, will all be made by water, and in this way the freight rates are reduced to the minimum figure. As the brick makes excellent ballast, the cheapness of freight rates, the Rose Brick Co. state, together with the close proximity of the plant to the fields where the raw material is obtained, puts the price situation practically in their hands. The output of the plant will be for the present 16,000 brick, weighing 75 tons, daily.

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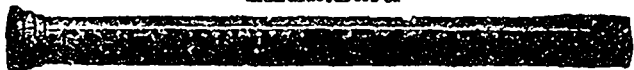
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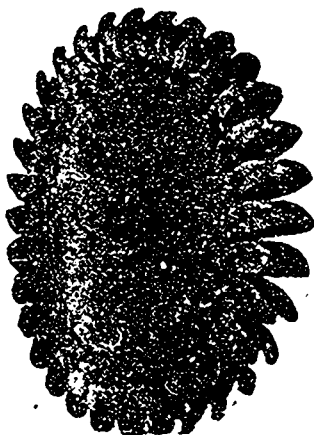
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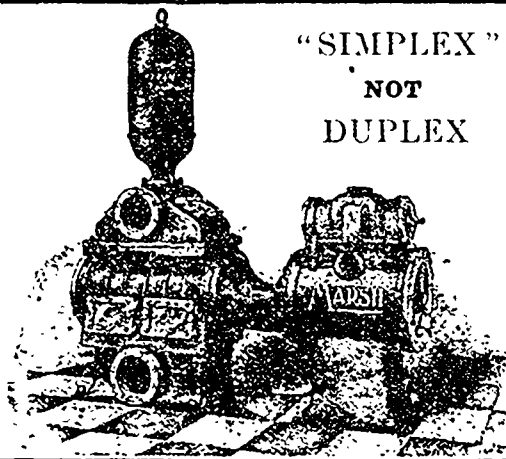
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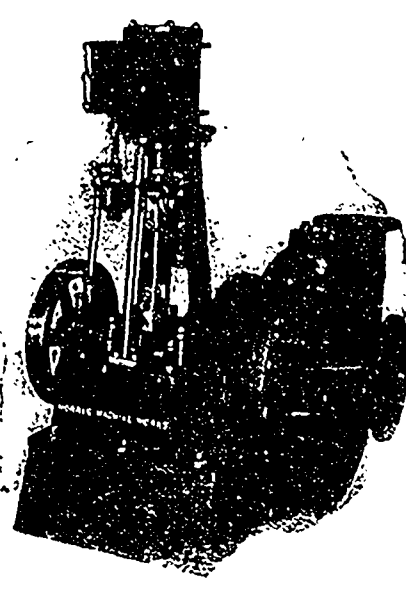
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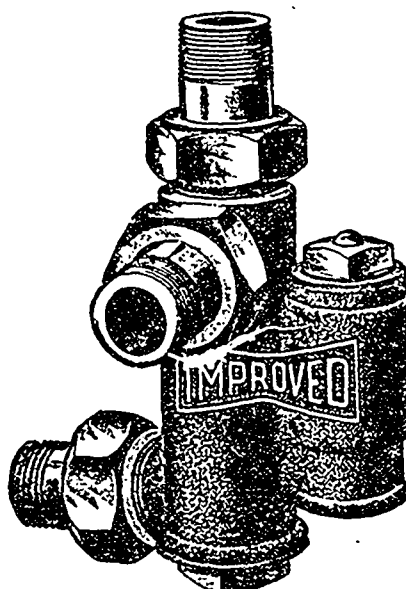
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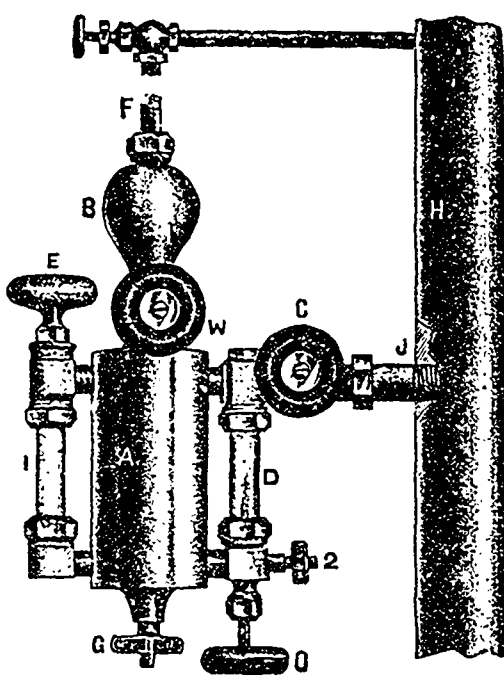
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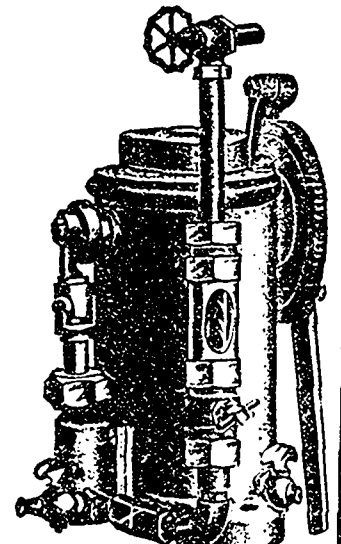
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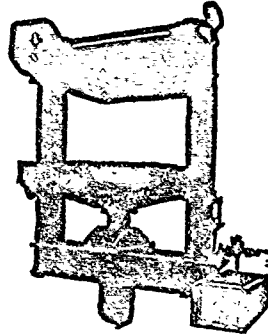
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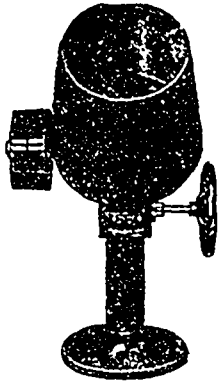
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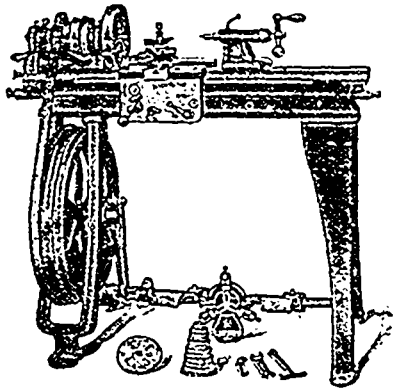
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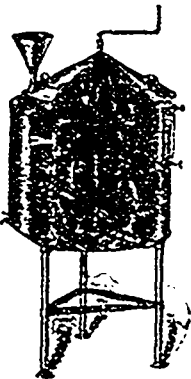
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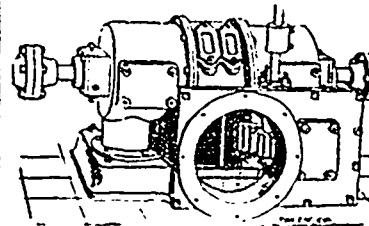


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Acids

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 Anglo-Chemical Co. of Canada, Montreal

Air Compressors

Chicago Compressor-Bullock, Limited, Montreal
 American Steam Pump Co., Battle Creek, Mich
 Canada Foundry Co., Toronto
 Canadian Road Drill Co., Sherbrooke, Que
 Consett B. W., Brooklyn, N. Y.
 Ingersoll Bros., Montreal
 Schutte & Koerting Co., Philadelphia, Pa

Alum

Anglo-Chemical Co. of Canada, Montreal

Aluminum

American Aluminum Co., Pittsburg, Pa
 Quebec Smelting Works, Montreal

Angles, Beams and Girders

Wabatts V R Machinery Co., Cleveland, Ohio
 Canada Foundry Co., Toronto
 McKays F. H. & Co., Montreal
 Nova Scotia Steel & Coal Co., New Glasgow, N.S.

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 Canada Chemical Mfg. Co., London, Ont
 Canada Color Co., New York City
 Canadian Aniline & Extract Co., New York City
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 Anglo-Chemical Co. of Canada, Montreal
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Quebec Smelting Works, Montreal

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

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 Quebec Smelting Works, Montreal

Banks

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 Messrs. H. W., Toronto
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 Wabatts V R Machinery Co., Montreal and Toronto
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 Messrs. H. W., Montreal and Toronto
 Wabatts V R Machinery Co., Toronto

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 Messrs. D. K., Montreal and Toronto
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 Wabatts V R Machinery Co., Montreal and Toronto
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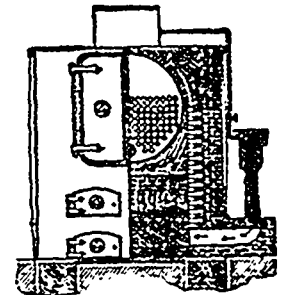
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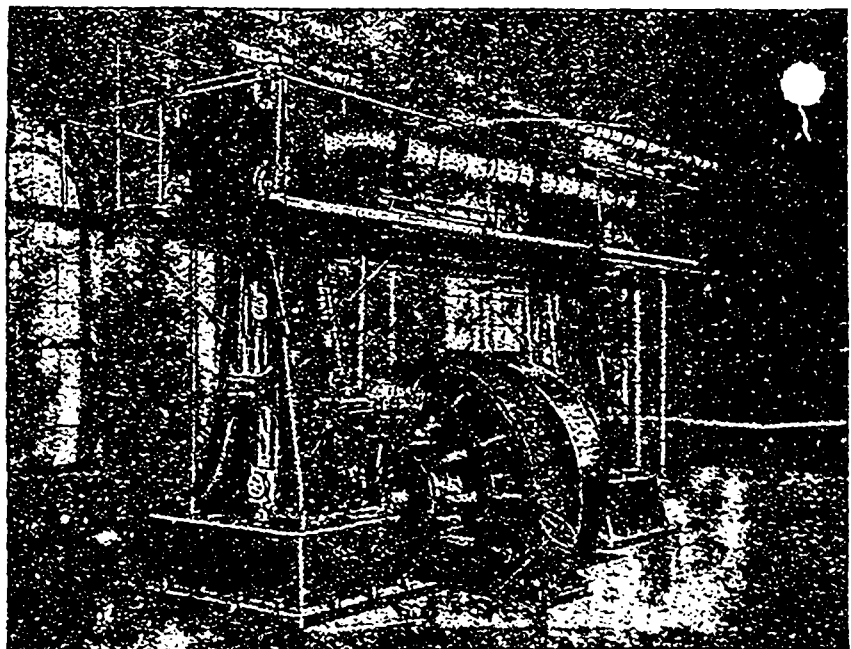
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McLaren, J. C. Belting Co., Montreal.

Covers

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

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

Crucibles

Inson, Joseph, Crucible Co., Jersey City, N. J.
McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa.
Synapse 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

Baker-Barnard Milling Machine Co., Hyde Park, Mass.

Deep Well Engines

American Steam Pump Co., Battle Creek, Mich.

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Pewar Detective Agency, St. Louis, Mo.

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

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Helly's Directories, Limited, Toronto.

Draw Benches (Wire)

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

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O'Neil Supply Co., Pittsburgh, Pa.

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National Supply Co., Leamington, Ont.
O'Neil Supply Co., Pittsburgh, Pa.

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Alis-Chalmers-Bullock, Limited, Montreal
Barnes B. F. Co., Rockford, Ill.
Canadian Westinghouse Co. Ltd. Hamilton, Ont.
Hess H. W. Toronto.

Drills (Pneumatic and Rock)

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

Drop Forgings

Alis Machine & Stamping Co., Cleveland, Ohio.

Drop Forging Dies

Alis Machine & Stamping Co., Cleveland, Ohio.

Dry Kiln Apparatus

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

Dust and Shavings Separators

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

Dye Stuffs and Chemicals

Bessemer, W. T. & Co., Montreal
Crompton Mond & Co., Northwich, England
Canada Chemical Mfg. Co., London, Ont.
Canada Color Co., New York City
Gerrard and Extract Co., New York City
McArthur, Cornelle & Co., Montreal
Noble Chemical Co. of Canada, Montreal.
Winn & Holland, 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

Byrnes Engineering Co., Toronto.

Electrical Supplies

Alis-Chalmers-Bullock, Limited, Montreal.
The I. G. Waterbury, Conn.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co. Ltd. Hamilton, Ont.
Electrical Construction Co., London, Ont.

Forman, Jean, Montreal.
Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto.
Packard Electric Co., St. Catharines, Ont.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.
Worth & Martin, Toronto.

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Alis-Chalmers-Bullock, Limited, Montreal.
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Otis-Fenson, Elevator Co., Toronto.

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

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

Engineers (Civil)

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

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

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

Engineers (Electrical)

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

Engineers (Mechanical)

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

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

Engineers (Mining)

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

Engineers (Municipal)

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

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Jenckes Machine Co., Sherbrooke, Que.
Morris Machine Works, Baldwinville, N. Y.
McDougall, John, Caledonian Iron Works Co., Montreal
McEachren Heating & Ventilating Co., Galt, Ont.
National Supply Co., Leamington, Ont.
Oil Well Supply Co., Pittsburgh, Pa.
Petrie, H. W., Toronto
Robb Engineering Co., Amherst, N.S.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.
Williams, A. R. Machinery Co., Toronto

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

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

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

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

Explorer and Geologist
Evans, Horace F., Ashcroft, B.C.
Factory Sites
(See Factory Locations, page 38.)
Board of Trade, Orillia, Ont.
Central Ontario Power Co., Peterboro, Ont.
Hutcheson, S. M., Paisley, Ont.

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

Files
Spence, R. & Co., Hamilton, Ont.
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Sadler & Haworth, Montreal and Toronto.

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Babecock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal
Perrin, William R. & Co., Limited, Toronto.
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Babecock & Wilcox, Limited, Montreal.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.

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

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

Fire Escapes
Darling Bros., Montreal.
Fire Insurance
Inter-Insurance of America, New York City.

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

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

Foundry Facings and Supplies
Hamilton Facing Mill Co., Hamilton, Ont.
Fuel Economizers
Babecock & Wilcox, Limited, Montreal.
Schutte & Koerting Co., Philadelphia, Pa.
Sturtevant, B. F. Co., Hyde Park, Mass.

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Canadian Office & School Furniture Co., Preston, Ont.
Galvanizing
Ontario Wind Engine & Pump Co., Toronto.
Galvanizing and Tinning Machinery and Furnaces (Wire)
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

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

Gauges (Recording Pressure)
Bristol Co., Waterbury, Conn.
Gauges (Steam)
Penberthy Injector Co., Windsor, Ont.
Petrie, H. W., Toronto.

Gauges (Water)
Williams, A. R. Machinery Co., Toronto

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

Generators
Allis-Chalmers-Bullock, Limited, Montreal
Canadian General Electric Co., Toronto
Canadian Westinghouse Co., Ltd., Hamilton, 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.

Glue Heaters
Advance Machinery Co., Toledo, Ohio.

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

Government Notices
Factory Inspectors.
Minister of Agriculture.

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

Grease Cups
Penberthy Injector Co., Windsor, Ont.

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

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

Hoisting Engines
Jenckes Machine Co., Sherbrooke, Que.

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

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

Hotel
Gallatin Hotel, New York City.

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

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

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

Hydraulic Machinery
Canada Foundry Co., Toronto.
Darling Bros., Montreal
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.

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

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 Hamilton, Wm. Mfg. Co., Peterborough, Ont.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Engineering Co., Amherst, N.S.

Solder
 Machine & Stamping Co., Cleveland, Ohio.
 Smelting Co., Montreal.

Special Machinery
 Chalmers-Bullock, Limited, Montreal.
 Machine & Stamping Co., Cleveland, Ohio.

Speed Recorders
 Co., Waterbury, Conn.

Sprinkler Insurance
 Canadian Casualty & Boiler Insurance Co., Toronto

Stamps and Stencils
 Machine & Stamping Co., Cleveland, Ohio.

Steam Pumps
 Chalmers-Bullock, Limited, Montreal.
 Steam Pump Co., Battle Creek, Mich.
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Architectural Review.....	London....	Monthly	4 00	4 25	Literary Digest.....	New York..	Weekly	3 00	3 25
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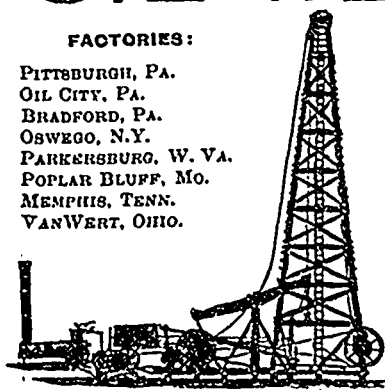
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