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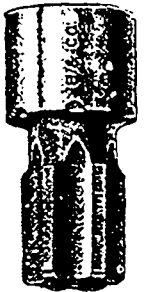
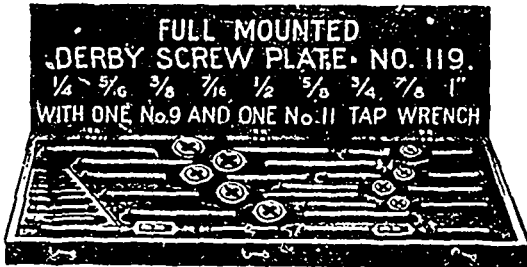
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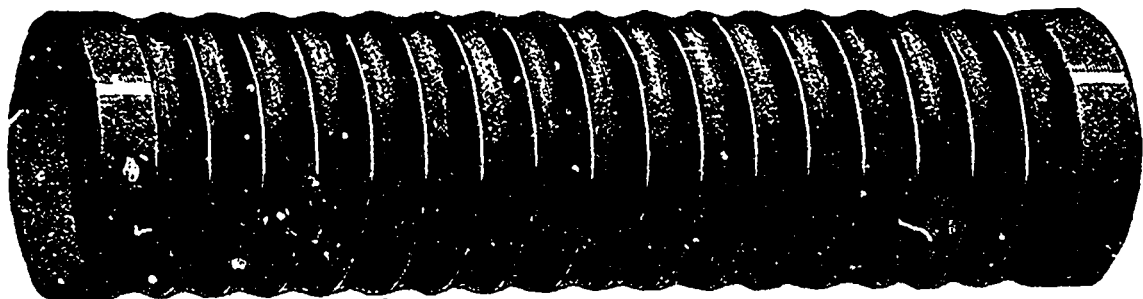
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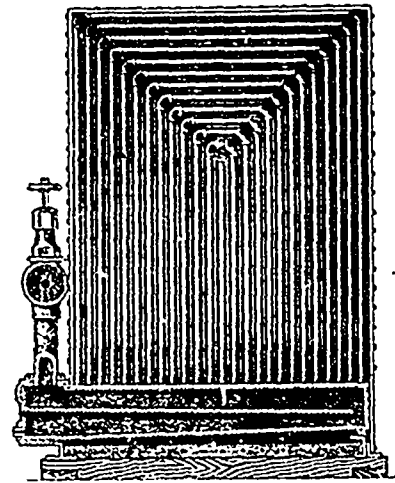
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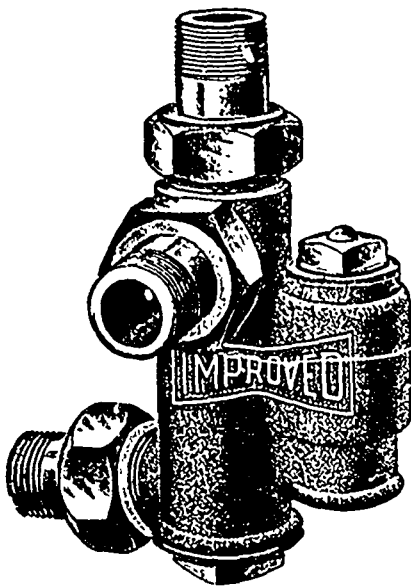
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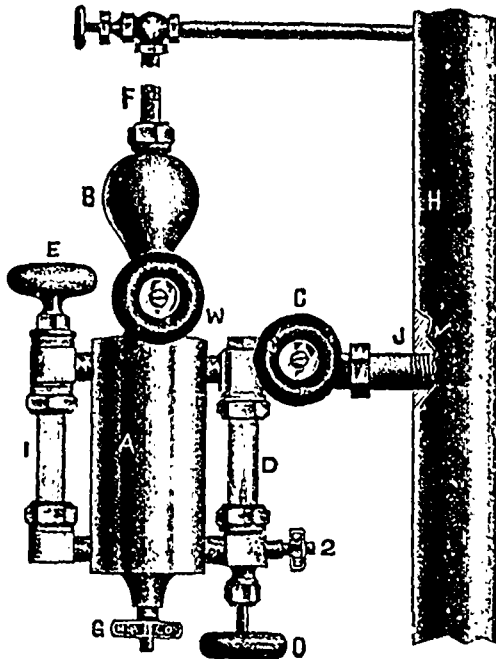
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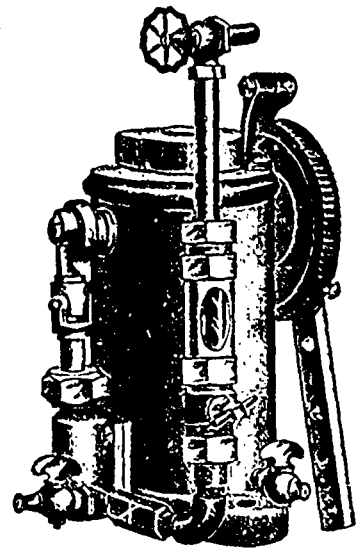
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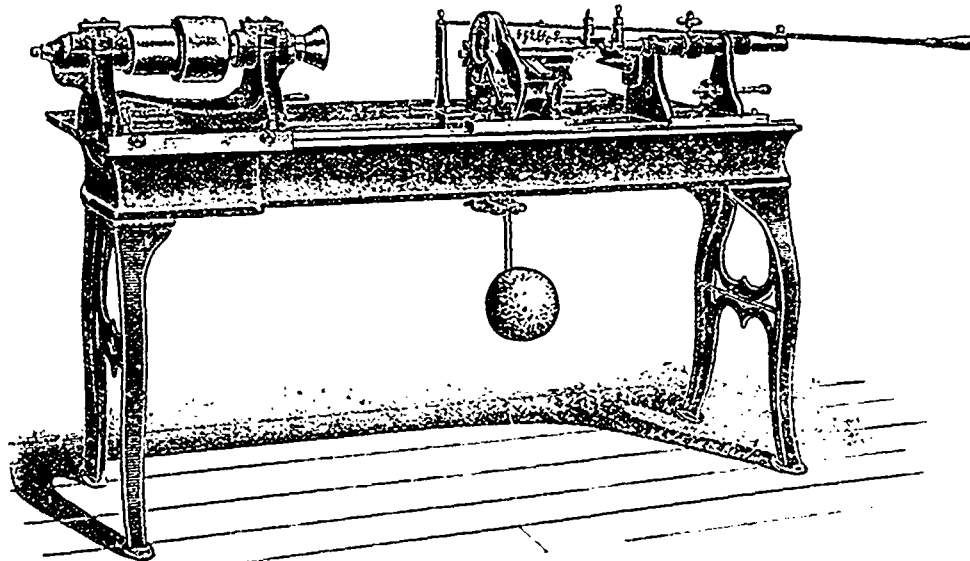
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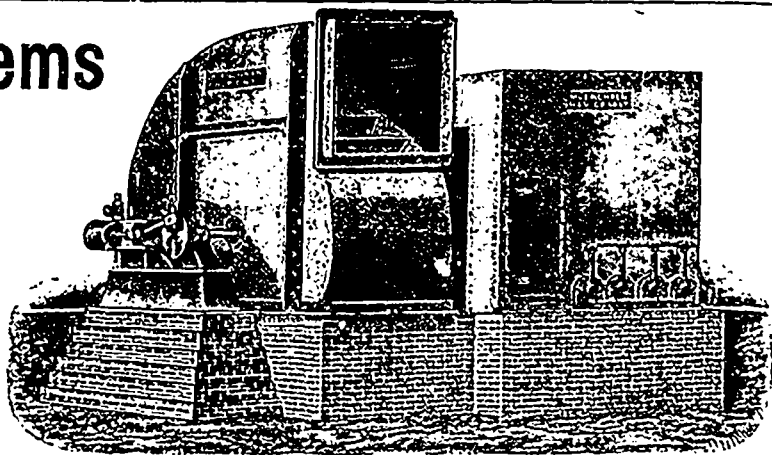
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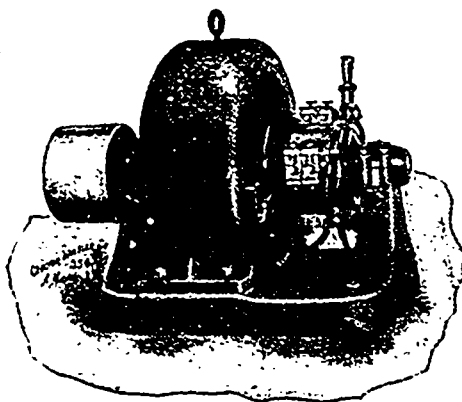
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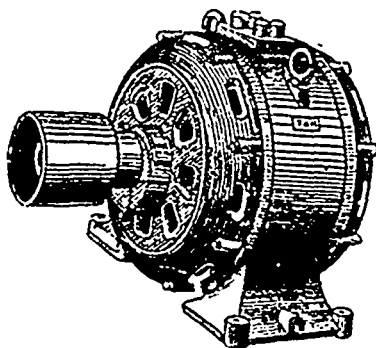
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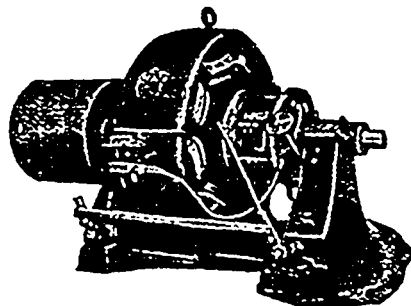
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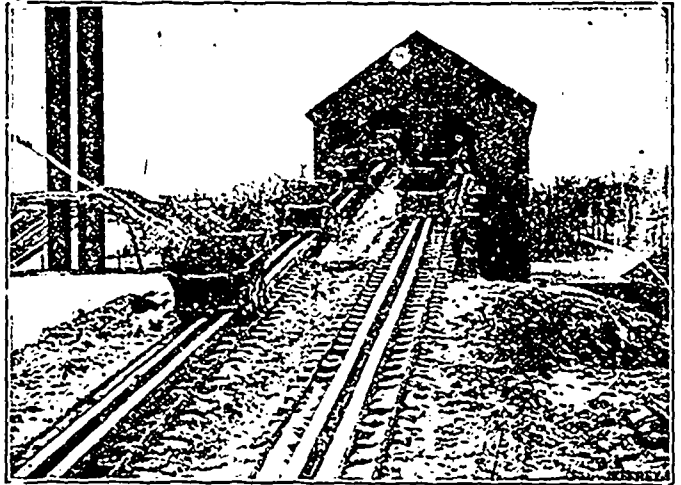
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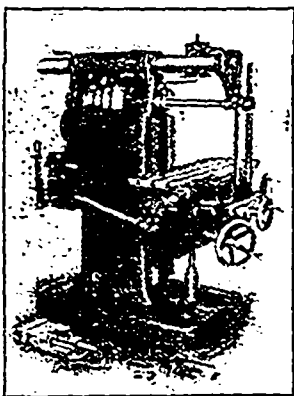
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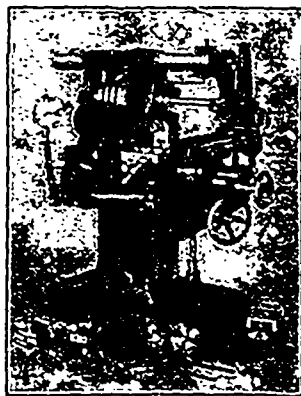
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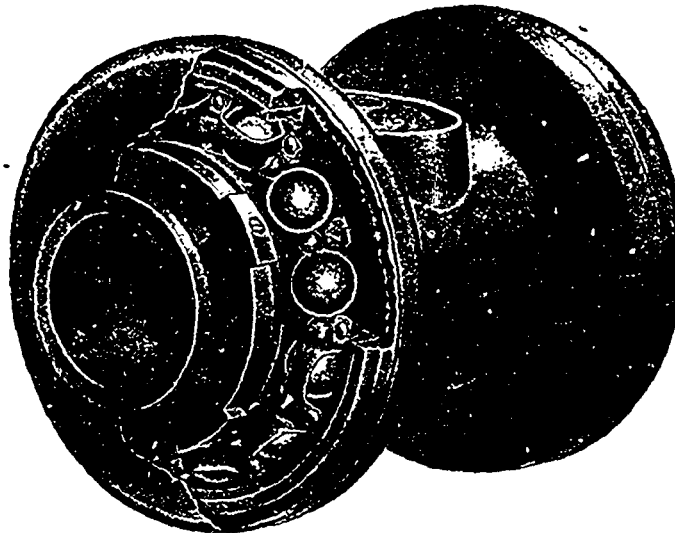
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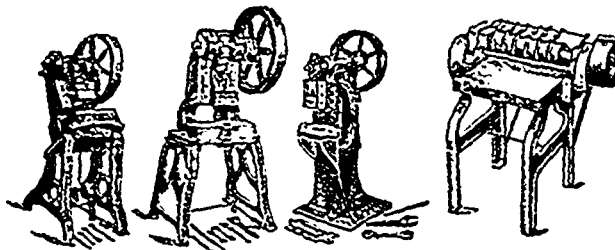
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SUBSCRIPTIONS:

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

J. J. CASSIDY, Editor and Manager

Classified IndexPage 42

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NOVA SCOTIA COAL FOR ONTARIO.

Mr. W. C. Milner, who seems to be exceedingly well acquainted with the subject he discusses in *The Maritime Merchant*, of Halifax, N.S., bases his remarks upon the peculiar position taken by Mr. Griffin, editor of *Industrial Canada*, the organ of the Canadian Manufacturers' Association. Mr. Griffin had taken the position that Canada should be made independent of the United States for her coal supply, for two reasons:

1st. Because in time of war our supplies of fuel would be cut off, reducing Ontario to a terrible plight.

2nd. A prolonged strike or a revolutionary outbreak would place Ontario in a very unenviable position.

Mr. Griffin had previously, in expounding the protective doctrine of the association, showed that American coal should, as far as possible, and by any available means, be excluded from Canada, particularly from Ontario, Manitoba and the North-West, which are the almost exclusive sections of this country dependent upon the United States for their coal supplies, one of the propositions being that the duties derived from imports of coal be diverted from the general purposes of the Government and paid out in bounties to steamers which might engage in freighting Nova Scotia coal to Ontario ports. Mr. Milner, as will be observed, makes the arguments of the editor of *Industrial Canada* appear to be of less value than one cent. Mr. Milner says:

From the absence of any statement from Mr. Griffin as to the commercial side of the question, it may be fairly assumed that he considers his proposition has no commercial merit whatever and that it rests altogether on precautionary grounds—upon the desirability of guarding Ontario against the contingencies of war, revolution and strikes across the border. Thus the issue is reduced to a very simple one, and the question is narrowed to, (1st). How much of this insurance of Ontario's fuel supply against the contingency of wars, revolutions and strikes in the United States is to cost? (2nd). Who is to pay it?

Ontario imports about four millions of tons of coal and pays a duty of about \$2,000,000. Mr. Griffin proposes that this payment should be continued and be appropriated for ten years in paying bounties to steamboats carrying Nova Scotia coal to Ontario.

This method of solving the difficulty is somewhat archaic, has the merit of simplicity itself. Suppose the government adopted this plan and it proved completely successful and Nova Scotia supplanted American coal in the markets of

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Ontario—where is the money to come from to pay the bounties? The bounties are to be paid out of the duties, and if no coal were imported, no duties would be collected. This contingency appears to have been overlooked by Mr. Griffin. Perhaps, however, Mr. Griffin was figuring on his remedy as being a partial cure—say half way successful. That is, one half of the people of Ontario should purchase Nova Scotia coal, and the other half continue to purchase American coal. On this basis the other half would still be subject to the possibilities of wars, strikes and revolutions across the border, while at the same time they are paying (in the way of duties) the freight on Nova Scotia coal that their more fortunate neighbors are using. If this is not a legitimate deduction from Mr. Griffin's proposition, he can re-state his case. Any argument, based on the continuance of the coal duty, which Ontario of all provinces alone pays, involves either sectional or class taxation. This is the most unfair, unjust and odious form of taxation that was ever contrived. Ontario is not an independent nationality, and if it be a judicious and right act for the government to specially protect her interests (coal or otherwise) against war, strikes or revolutions from across the border, the expenses, like those of all other defensive operations incurred by the government, ought to be paid out of the general revenues of the country to which Ontario pays her full quota.

I will not say that Mr. Griffin has created huge bug-bears to sustain an unjustifiable tax, and that the dangers from war, strikes and revolutions are not real, pressing and imminent; but it will soon be a century since the two countries have been at war. Intercommunication, trade and the strengthening of the ties of commerce are a thousand times more powerful in making for peace, than tariff walls erected to dam back the flow of trade.

Mr. Griffin offers no solution to the problem of making Ontario independent of war, strikes or revolution during the four or five months when navigation in the great lakes is closed. Would Mr. Griffin ship the coal west by rail at a cost, at normal rates, from \$5 to \$10 per ton, according to distance? Or would he form great depots of coal at the lakes during the summer months? The latter plan would involve loss by deterioration, danger of fire, erection of expensive loading and unloading plants, rail freights to local points and interest on the large dead capital employed. No business man would for a moment consider either plan practicable from a commercial standpoint or invest money in it. It will never be adopted except at the expense of the taxpayers.

The American coal mines are in the interior, from 300 to 400 miles from Atlantic ports, and the lowest freight rate (\$1.35) is equal to that much protection to Nova Scotia coal landed on territory common to both, namely, New England; and Canadian duty is therefore not required to shut American coal out of the Maritime markets.

The American coal miners are 600 miles from Montreal by

rail, water carriage not being available. The freight is over \$3.00 per ton. In the Montreal market, Nova Scotia coal, therefore, enjoys a protection of freight rates of over \$2.00 per ton. The 600 miles of land carriage serve as a barrier against any encroachments of American coal irrespective of the duty.

American coal is delivered in Ontario at prices that would defy competition from Nova Scotia even if the duty were doubled. It has been selling the past year as far east as Toronto, freight and duty paid, at a dollar per ton less than Sydney coal in Halifax.

It is therefore fair to assume that the duty on coal has no protective value whatever either in Ontario, Montreal or along the St. Lawrence, or in the Maritime provinces. If repealed it would be no disadvantage to Nova Scotia, but if its repeal were coupled with the repeal of the American duty, opening the large New England market to the energy, skill and enterprise of Nova Scotia operators, it would give what is so much needed, viz., an outlet for Nova Scotia coal in a nearby market of almost unbounded possibilities, and on a commercial basis, independent of subsidies, bonuses, bounties or any other government aid or political pull.

If Industrial Canada and its editor, and its compiler of political statistics, and its manufacturer of untenable arguments have nothing better to offer why the Ontario members of the Manufacturers' Association, and other manufacturers and industrial interests in this province should be taxed more than \$2,000,000 a year upon their fuel, the discussion had better be abandoned. But unfortunately grafts abound in Canada, and those who draw sustenance from Industrial Canada must be supported regardless of cost.

POSTAL RATES.

The effect of British postal charges on Canadian readers was discussed in the Dominion Senate a few days ago arising from a resolution moved by Senator Drummond, which was adopted. The resolution was as follows:

That the attention of the Government be directed to the local, foreign and Imperial postal charges, with a view of remedying certain inequalities therein, and the Senate affirms the principle that the conveyance of letters, newspapers, books, periodicals, etc., should be at a lower scale of charges within the Empire than at the time ruling with any foreign country.

Senator Drummond pointed out that the supply of light literature in Canada was almost entirely American. When English magazines were obtained, they were usually filled with advertisements of American wares. A Canadian magazine was almost an impossibility, whilst the Canadian post-office distributed them for nothing. It seemed fair for the United States to say to Canada, if you will carry our magazines, etc., for nothing, we will carry yours for nothing also. In working it out there was a great discrepancy. The returns showed that there were 22,072 American publications, of which some 300 were magazines, against 1,227 Canadian publications. The arrangement was, therefore, very lopsided. One American magazine contained 162 pages of reading matter, 1,059 advertisements, and weighed 17 ounces.

It seemed to him that the Canadian manufacturers had great room to complain. He thought that strong representations made to Great Britain, backed by the Senate, would have great weight. At the same time, he did not complain of the representations which had been made. In regard to the latter portion of his resolution, he did not think much agreement was needed. Canada had preferential trade, which he had always considered rather crude. What the people wanted was inter-imperial preferential trade. He did not care to exaggerate sentiment as a factor, but it was the most potent factor in original negotiations.

Senator R. W. Scott, discussing the matter, said that Senator Drummond had placed the senate and the people

under an obligation by drawing attention to the unwise and unpatriotic course of the British postoffice. The matter had been discussed at the colonial conference, when the imperial postmaster-general refused any concessions, and even objected to Canada reducing her rates. Sir William Mulock, the postmaster-general, however, very strongly and persistently pressed for leave to reduce our rates as an influence on the British public. Had Canada not been so deeply attached to the motherland, said Mr. Scott, she would long ago have become imbued with American sentiment. He hoped Sir George Drummond's speech would be widely read, and he would gladly post a copy to the imperial postmaster-general. Mr. Scott read a memorandum from the postoffice department as to the efforts made, including the resolution moved by Sir William Mulock at the colonial conference. Since that time the motherland had not made any reduction. The circulation of American advertisements was of great detriment to the English manufacturer.

Sir Mackenzie Bowell said that when the first steps to lower the rates were taken by Canada it was found to be a contravention of the postal convention. That had been removed. He thought Sir George entitled to the gratitude of the country for having brought up this matter. Sir Mackenzie reminded the house that the tariff act contained a clause providing for the taxation of advertising literature, which might be applied to the magazines Sir George had mentioned. In revising the tariff this should be provided for at any rate. He thought it high time the senate and house of commons should express themselves plainly on these matters affecting our commerce. He thought it regrettable that there were statesmen in England who take the course they do. If these drawbacks were not removed, it would not be the fault of Canada.

Sir Richard Cartwright stated that he had noted frequently that there was a disposition in Great Britain to ignore the just claims of Canada upon various points. He had hoped that the generous treatment given Great Britain by Canada would have altered this. He would have great pleasure in calling the attention of his colleagues, and especially the finance minister, to the importation of magazines which are really advertising mediums. He thought that Sir George had made out a very clear case. His officers had already drawn attention to many of these facts. The discussion would not be thrown away, especially as the postmaster-general would hail it as strengthening his hands. He hoped ere long an alteration would take place.

This discussion is exceedingly timely, and it is to be hoped that it may lead to the correction of some objectionable features in our postal regulations that will result in some good to Canadian publishers. It is a laudable effort on the part of Senator Drummond to induce the British Postmaster-General to reduce the postal charges on British magazines coming to Canada, the probability being that the labor will be lost. On the other hand, as shown in the discussion, Canada is being swamped with similar literature from the United States, with glaring injustice to Canadian publishers. There seems to be no restrictions whatever upon the distribution throughout Canada of American publications, at a large cost to the Canadian postoffice department, while Canadian publishers are required to pay full rates upon every pound of their literature committed to the mails. With a laudable desire to keep the expenses of his department as low as possible, Postmaster-General Mulock finds himself constantly confronting a deficiency, the inevitable expense arising largely from the carrying of second-class matter originating in the United States, upon which no postage is paid to Canada, rather than

from the carrying of similar matter of Canadian origin upon which postage is paid.

The opinion prevails among many Canadian publishers that it would be well were reasonable postage imposed upon all publications going through the Canadian mails, both foreign and domestic. Canadian publishers are not paupers, and all they ask is fair play and equal justice.

RAILWAYS OF CANADA.

The report of the Canadian Department of Railways and Canals gives some very interesting statistics concerning Canadian railways. During the fiscal year 1903-04 there was spent on the government railways \$12,351,259, of which \$2,619,059 was chargeable to capital account, \$2,132,231 to income and \$7,599,958 to revenue. There was paid out in subsidies to other than government railways a total of \$2,046,878. There was spent on canals \$2,890,558, of which \$1,880,787 was chargeable to capital, \$302,409 to income and to revenue, \$436,034 for staff and \$361,327 for repairs. The total departmental expenditure for railways and canals for the past fiscal year amounted to \$15,368,071.25.

The total revenue derived from the government works for the past fiscal year was as follows: From railways, \$6,627,255, and from canals, \$79,536, of which the sum of \$72,701 was derived from hydraulic rents. The total government expenditure on railway construction prior to and since confederation (July 1, 1867), up to July 1, 1904, amounts, on capital account, to \$142,648,039, which includes the sum of \$25,000,000 granted (from capital) to the Canadian Pacific Railway for its main line. In addition, there has been expended from the consolidated fund a total of \$139,556,724, including \$31,341,933 paid as subsidies to railways other than the Canadian Pacific Railway, and \$107,110,755 for working expenses of the government railways, making a total expenditure of \$282,204,763.

The total number of controlling railway companies in Canada is eighty-five, not including the government railways. Fifty-four companies were absorbed by amalgamation, and there were thirty-eight leased lines. Completed railways amount to 19,611 miles, an increase of 534 miles, besides 3,327 miles of sidings; laid with steel rails, 19,545 miles, of which 763 miles was double track; in operation, 19,431 miles; paid-up capital amounts to \$1,186,546,918, an increase of \$39,996,149; gross earnings of the year, \$100,219,436, an increase of \$1,154,909; working expenses, \$74,563,162, an increase of \$7,081,638; net earnings, \$25,656,274, a decrease of \$2,926,729; number of passengers carried, 23,640,765, an increase of 92,023; freight traffic, 48,097,519 tons, an increase of 724,102 tons.

At the close of the fiscal year ended June 30, 1904, the jointed statistics of steam and electric roads (including street railways) show the following results: The number of companies was 240; there were 20,378 miles of railway completed, 20,176 miles being in operation; the paid-up capital amounted to \$1,236,946,106; the gross earnings were \$108,673,045, and the total working expenses, \$79,889,679, making the net earnings \$28,783,366. There were 205,330,763 passengers and 48,497,680 tons of freight carried.

The returns of electric railways in Canada show that there are 767 miles of such in operation, the capital invested in them, including Dominion, Provincial and Municipal subsidies, being \$30,453,609, being an increase of \$1,219,982 over last year. Working expenses were represented by the sum of \$5,326,517, an increase of \$853,659, when compared with the previous year. Net earnings were \$3,125,092, or an increase

of \$366,273. There were 181,687,992 passengers carried, as against 155,662,812 for the previous year. These railways, it will be seen, are capitalized at over \$100,000 per mile. In the United States, taking the whole country, the capitalization is \$90,000 a mile, and in Massachusetts, which is said to have the finest street railways in the world, the capitalization is only \$38,500. The steam railroads of the United States are capitalized at \$60,000 per mile, and they probably average a considerably higher cost than street railways.

Capitalization, however, is not based on investment, but on earning power; the net income for street railways in the United States averages \$3,300 per mile of track, and only \$2,050 per mile for steam railroads. The net earnings of the Massachusetts Street Railway last year were over \$7,000 per mile of track, and it paid in dividends over \$5,300 per mile of track. In Canada as a whole the net income was over \$4,000 per mile. The promoters of Canadian street railways have evidently little to learn from the votaries of high finance across the line.

MOTIVE POWER PROBLEM TO BE SOLVED.

When the Eastern division of the Grand Trunk Pacific is ready for operation it must solve a fuel problem. At Quebec it will leave tide-water and will take to the back country, heading straight for Winnipeg, 1,400 miles away, and for the prairies still further to the west. Coal can come from Nova Scotia and New Brunswick to Quebec, and there are mines at Edmonton and in the Rocky Mountains; but to what extent can it be carried from these two ends to supply the middle stretches? The Canadian Pacific draws its fuel from the Maritime provinces for its eastern stretches, and for those portions of its line adjacent to and west of the Great Lakes it relies on Pennsylvania coal, carried by water. It has great coal piles at Fort William, and from them the line is supplied westward until it meets the coal from its Rocky Mountain mines. For adopting this policy the railway has two good reasons. The first, and in itself sufficient reason, of course, is the cheapness of water transportation. This is reinforced by the heavy grades and awkward curves of the Canadian Pacific Line on the north shore.

The Eastern division of the Grand Trunk Pacific will traverse the back country many miles away from the lakes. It will, of course, have a branch to Lake Superior. Will it get its coal for its central stretches by this route? First, its main line will be far away from water transportation. Secondly, always presuming that the very low grades necessary to the success of the project are attained—the task of hauling the coal westward from Quebec will be immensely lighter than it is on the earlier transcontinental road. The engineers of the Construction Commission hope to see trains of 1,500 tons hauled westward by great Mogul locomotives. The coal can be laid down in Quebec for \$3.50 a ton, and carried in such loads, on a first-class line, they hope to see the railway able to ship it as far as Winnipeg for \$1.50 a ton. Coal at \$5.00 a ton is cheap fuel as railway practice goes. This calculation throws light on the numerous incidental advantages enjoyed by a road which has a first-class equipment. Its cars can have larger capacity, its trains can carry a greater tonnage, its engines can be stronger, its fuel will be cheaper.

Coal, however, is not necessarily the only fuel of the future. Electricity has to be considered. If electric traction on trunk lines ever becomes practicable, the Eastern division should possess great advantages. So far as we know the geography of the little-known region beyond the height of land, there is a fairly level plain extending a long distance to the north.

At a certain distance from James Bay this plain drops rather suddenly into a low-lying coastal region, largely made up of peat-bog. Plain and coastal region are seamed by numerous large rivers, all flowing northward. On many of them, at the point where they leave the plain, the "clay-belt," water falls, i.e., water-powers, occur.

For traffic reasons, the commissioners intend to keep the railway as close to the northern edge of this plain as the grades will permit. As the country opens up each river will be a highway for development work. Lumbering, for instance, may be expected to become active. If the railway is down stream from the lumber camps, the logs can be floated down to it. Other development work may be expected to follow, and every river valley will gain by being able to send its products down stream to the main line of the railway.

Thus the railway will virtually run along the line of northern water powers. Details as to these powers are lacking; one considerable fall, near Abitibi, is able to develop a large amount of power, and others are known to exist. The railway, it may further be noted, will run very close to enormous peat deposits. The construction commissioners have issued directions to their locating engineers to examine and report fully upon all available water powers, and also to note available peat deposits. They hope that the march of invention may enable electricity or peat, or both, to become serious motive powers, and in such an event the Grand Trunk Pacific would occupy a most advantageous position. The problem of utilizing peat as an industrial fuel has exercised men's brains for a very long time, and new devices are constantly being produced—so far with discouraging results. Neither is the outlook promising, for it must be remembered that peat, as found in bogs, is about 90 per cent. water, and the problem of eliminating that enormous proportion of water is exceedingly difficult.

The prospects of electric traction are better. Trolley locomotives have been manufactured which undoubtedly possess great speed and considerable hauling power. Not long ago, for example, on an American railway, one of these locomotives drew a train weighing 400 tons at a speed rapid enough to beat a light locomotive of standard type. For dense and continuous traffic the electric locomotive offers remarkable advantages. So far, however, electricity does not seem a practical motive power for the operation of an ordinary freight railway. With coal, the motive power is used only as it is needed. When there is no train to haul no coal is consumed. With electricity so far, the power must be available, whether the track is idle or is crowded with trains. The invention of a suitable storage battery locomotive may solve the difficulty. That improvement is in the future, but who can prophecy that it will not come. Should electric traction prove practicable, the Eastern division will be in the extraordinary favorable position of having been located with an express eye to the situation of the best water powers along the route.

One contingent advantage is almost certain to be reaped. If the hopes of the Construction Commission are realized, and if a line of good water powers are found, the incidental power needed by the railway can be derived from electricity. Machine shops can be run by electric energy, which for such a purpose is ideal. Stations can be lighted and heated by electricity. Switches and other apparatus can be worked with electric power. The saving to the railway, alike in the superiority of the power used, and in the lessened hauling of coal, should amount to millions of dollars. Thus the railway will start with an electric equipment which should insure

an economy of management unequalled elsewhere, and with a location which will enable it to take full advantage of every advance in the adaptation of electric locomotive to ordinary railway traffic.

MINERAL PRODUCTION OF CANADA IN 1904.

The Dominion Geological Survey Department has published the annual preliminary statistical statement of the mineral production of Canada for 1904. The value of the mineral products of Canada last year aggregated more than \$60,000,000, which is a falling off of \$2,500,000 in the grand total, but this does not necessarily indicate a general slackening in the permanent industries of the country. It is rather a gradual return to the natural conditions after the abnormal inflation due to rapid exploitation of the richer and easily accessible portions of the Yukon placers. To this cause can be attributed nearly \$2,000,000 of the decrease shown. Taking the different classes, comparison with the totals for 1903 shows that the structural material and clay products class remained practically stationary as far as their aggregate value is concerned. Practically every province in Canada shows a falling off. Nova Scotia, which ordinarily has an output of about half a million dollars, shows a decrease of nearly half its production. Several reasons are given for this, among which may be mentioned the extreme drought during the past season, the closing down, owing to financial difficulties, of a number of the best producing mines, and the cessation of production at the Richardson mine owing to the destruction of the shaft and workings by an extensive crush.

In Ontario, although a considerable amount of prospecting and development work has been done, most of the mines that were formerly important producers, were not operated during the year.

In British Columbia, an increased output from placer mines is indicated, while a smaller production was obtained from the lode mines. The ore shipments from Rossland and vicinity, the chief gold producing district, were less in 1903 by about 20,000 tons.

The Yukon output for the year, \$10,000,000, is based on the receipts of Canadian Yukon gold at the United States mint at San Francisco, and other receiving offices.

Although over twice as much lead was produced in 1904 as in 1903, the output is still far from its former maximum, viz., 31,584 tons in 1900. The production in 1904 was about 19,000 tons as compared with 9,070 tons in 1902.

The exports of lead from Canada in 1904 were 12,918 tons of lead in ore, etc., and about 21 tons of pig lead. Exports of iron ore were 168,828 tons, valued at \$401,738. In addition to the ore exported, about 180,932 tons of ore, worth about \$489,687, were mined in Canada and charged to Canadian blast furnaces.

CUSTOMS DECISIONS.

The Department of Customs has decided that the following articles are subject to the special or dumping duty if sold at a reduced price for export:—Photo library paste, paper patterns, silver stampings and castings, dental chairs, lumber, combs, corn cutters, for canning purposes; "wood" screws, wind mills, sewing machines, harness snaps, stove-pipe registers, wire rope, spring steel, 2½ to 5-inch, from ¼ to ½-inch thick, for railroad springs; axes, iron pipe fittings, roasting or dripping pans (sheet iron), safety pins, scale-tanged table cutlery, pumps and valves (invoice), lawn mowers, saddlery hardware (invoice), cameras, antimonial lead, milk food, veneer butter dishes, rubber balls, watches, box carts, shoe

polish and dressings, lace collars, hosiery, core compound for foundry purposes, rubber boots and shoes, Portland cement, roasted coffee, illuminating oil, sardines, enameled bath tubs, porcelain sinks, dry colors, red, cocoa butter, hops, gas burners, cast-iron tinned hollow-ware, cast-iron maslins, candied peel, jams, golden syrup, door checks and springs, rock drills.

The following articles are declared to be exempt from special duty:—Waterproof drawing ink, anvils, razors, "Universal" bread mixers, differential pulley blocks, hemp fuse, dried currants, olives in brine, common window glass, children's water colors, sewer pipe, 30 inches in diameter; ribbon gold leaf, cane molasses, dressed skins of animals such as are not produced in Canada.

By regulations under the provisions of section 19 of the Customs tariff amendment of 1904, books such as are not copyrighted or purchased in Canada are exempt from special duty temporarily until otherwise ordered.

Steel angles 2 by 2 inches up to 5 by 5 inches or from four to 10 united inches wide, and not less than 55 feet long, are exempt from special duty under temporary regulations when imported by bridge builders upon declaration on the face of the entry that the angles are for use in the construction of bridges and are not to be used in lengths under 55 feet.

The following decisions by the Board of Customs are announced:—Alvina table salts, 25 per cent., bells of all kinds, when imported for use in churches, free, chocolate paste color, 25 per cent.; creamania, per sample submitted, 50 per cent.

EDITORIAL NOTES.

The Dominion Government will remit the tolls on Canadian canals for another year. The experiment of permitting the free use of canals which was made last year at the instance of Canadian grain shippers had a beneficial effect upon transportation rates in both Canada and the United States. It also had the effect of diverting to Canadian channels and to the port of Montreal a large portion of the grain business which was previously done by the way of Buffalo to the ports of New York, Boston and Philadelphia.

A string is to be attached to the hospitality expected to be received by the excursionists who are to visit Great Britain the coming summer under the auspices of the Canadian Manufacturers' Association. At a recent meeting of the Leeds Chamber of Commerce it was suggested that a day be devoted by each of the cities to be visited by the excursionists. Alderman Matheson, one of the delegates from the Leeds Chamber to the recent Montreal conference, said he would be pleased to make the visit as enjoyable as possible, but some of those who visited Canada felt very strongly about the conduct of the Canadian manufacturers, many of whom were doing their best to promote prohibitive duties against English goods. He remembered that they received a petition from the woolen textile manufacturers of Toronto, imploring them not to attempt to reduce the duties as they had established industries of their own, and were contemplating increasing the duties. They had put high duties on iron and steel, and not content with that, the Canadian Government was actually giving a bonus on pig iron sent to England. These gentlemen might be very patriotic and very kindly disposed to us, and he would be very pleased to welcome them socially, but it must be remembered that they were coming here to ask us to injure ourselves by putting on prohibitive duties in their interest, while at the same time they were proposing to increase the

duties against us rather than diminish them. It was true they gave us a preference, but the initial duty was so high that the preference of 30 per cent. did not give us a look in. They put up a big wall, and then took off the copingstone so as to let us peep over. There was an enormous difficulty in getting goods into wherever they had started manufactures of their own. He would be very glad to propose that the Chamber entertain them, but hoped nothing would be said about the tariffs.

No manufacturer ever feared a competitor who did not advertise his business. Such competition is of the sort that does not hurt. It is the manufacturer who advertises more aggressively than the other who causes the anxiety that leads to insomnia.

Premier Murray of Nova Scotia, brought down the financial returns in the House of Assembly last week. The total revenue for the year was \$1,194,755. The royalties from coal amounted to \$585,252, half the entire revenue. Mr. G. E. Tanner, opposition leader, asked the Government to take energetic measures to enable Nova Scotia coal to reach the Ontario market. He urged on them that they press the Dominion Government to make better transportation facilities for coal shipment, to increase the duty, and the Provincial Government was recommended to remit the royalty of ten cents a ton for five years on coal going to Ontario, and to make a further remission of half the royalty for a further period of five years. Mr. Tanner said he did this on the ground that it was more important to cultivate inter-provincial than foreign trade.

The Dominion Government has announced that the duty on automobiles imported into Canada will hereafter be 35 per cent. instead of 25 per cent. as heretofore. According to the explanation of the Minister of Finance the 25 per cent. rate was adopted temporarily when automobiles began to be imported from the United States. The problem then arose how to classify them, the Minister holding that they should come under the head of vehicles, but it was finally decided to admit them for the time being as gasoline engines on which the duty is 25 per cent. In his late decision the Minister re-affirms his first view and classifies automobiles as vehicles at a 35 per cent. rate.

The great progress that has been made during the past ten years in the manufacture of cement pipes is in direct relationship with the development of the Portland cement industry. When we remember how serious were the misgivings, less than two decades ago, at the proposed use of cement pipes, and see their extensive use to-day, we must feel impressed by the triumphant success of this new industry. One of the difficulties in the way of introducing the cement pipes lay in the fact that the use of concrete had been forgotten for centuries; the other was that it is hard to get out of a rut, but the newer generation of technists were more free from prejudice and were readier to accept novelties, not only in building materials but in the machines for their production. The rapid acceptance of a good idea is desirable, though too much hurry invariably entails failures and disappointment. When people began to recognize the excellencies of cement pipes and their advantages, all kinds of compositions and mixtures were tried, as well as methods, for making and shapes for the pipes. The result was a number of costly failures. The ease with which the material can be worked has enabled shapes of all kinds to be produced, and sizes of pipes up to seven feet in diameter are made. These large pipes are reinforced with iron rods in the concrete, or what is known as armored concrete.

A NEW CURTIS MACHINE.

The Curtis & Curtis Co., Bridgeport, Conn., are just bringing out a new pipe cutting and threading machine, which they feel to be the crowning effort of their 23 years of study and effort on the subject pipe cutting and threading machinery.

This machine is one which they call No. 116 and is to have range for all sizes of standard pipe between 4 inches and 14 inches inside measurement, 15 inches outside.

In appearance and operation it resembles the other sizes of machines made by this company which are so well known to the trade. It consists of a die-carrying gear, supported and surrounded by a

and not only draw back when the thread is cut thus avoiding running back over the thread but they will cut either over or under standard size to allow for any variation in the fittings.

These dies are so made by a special process that they can be ground when dull on an ordinary grind stone and in case one of them is lost or broken, a new die can be supplied to travel with the remainder of the set without supplying an entire new set as is generally necessary, hence a great saving to the operator.

These machines are supplied with an oil tank and pump which feeds oil to the work in a steady stream and when used

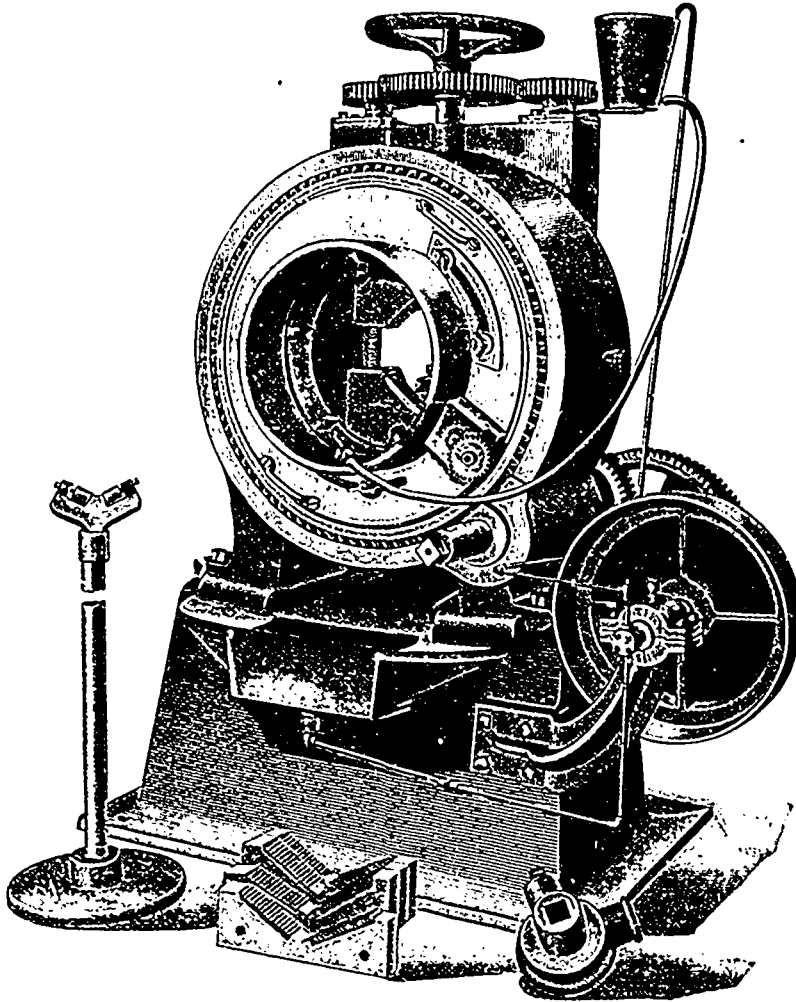
pipe is the delay and the inconvenience of having to remove pipe from its position and send it where a power machine can be found. By the use of these machines all this expense can be saved and the helpers do the threading of the pipe while the more experienced men are putting it up.

These machines are also supplied with a cut-off device with an automatic feed operated by a worm and worm wheel which leaves the end of the pipe absolutely square and without a burr.

The construction of this machine also saves greatly over other makes of machines on account of the small floor space required which is only about 3x4 feet. This is of great importance in crowded factories where rents are high.

It is arranged for four speeds forward and back and when desired it can be supplied with direct connected electric motor or engine.

Only the very best material and workmanship is used in the construction of the machine and it is already meeting with a very large sale.



THE CURTIS NEW PIPE CUTTING AND THREADING MACHINE No. 116.

casting or shell and an actuated pinion embedded in the side of it with a self-centering vise attached to the back of the shell, also many new features not heretofore used.

In operating, the pipe is put through the self centering vise so that the end to be threaded goes into the lead of the dies and the pipe gripped by turning the hand wheel as shown on the machine, and as the die-carrying gear revolves it recedes into the shell and the dies are brought onto the pipe. The gear is supplied with a lead screw on the back which engages with lead blocks and thus the feed of the gear is made positive.

The dies are opening and adjustable

returns it to the tank to be used over again.

The machine as shown in our illustration is a power machine but by removing four bolts the head can be taken from the base and carried out of the works and used as a hand machine. When used as a hand machine, one man will, with ease, cut off and thread 14 inches pipe and the work can be done on the spot without delay and expense of carting heavy work to the machine. Even if the pipe is in the ground at the bottom of a trench and only one end exposed, the machine can be slipped on the pipe without removing the pipe from the ground. A great part of the expense in threading

PRODUCTION OF PIG IRON IN CANADA IN 1904.

The American Iron and Steel Association has received direct from the manufacturers the statistics of the production of all kinds of pig iron in Canada in the calendar year 1904. They show an increase of 5,524 gross tons, or a little over 2 per cent., as compared with 1903, but a decrease of 48,615 tons as compared with 1902.

The total production in 1904 amounted to 270,942 gross tons, against 265,418 tons in 1903, 319,557 tons in 1902, 244,976 tons in 1901, and 86,090 tons in 1900. In the first half of 1904 the production was 120,643 tons, and in the second half it was 150,299 tons, an increase of 29,656 tons. Of the total production in 1904, 251,671 tons were made with coke, and 19,271 tons with charcoal. About one-fourth of the total production was basic pig iron, namely, 70,133 tons. The production of Bessemer pig iron, all made in the last half of the year was 26,016 tons. Spiegeleisen and ferromanganese have not been made since 1899.

The following table gives the total production of all kinds of pig iron (including spiegeleisen and ferromanganese) in Canada from 1894 to 1904. Prior to 1894 the statistics of pig iron production in Canada were not collected by this Association.

Years	Gross Tons.	Years	Gross Tons.	Years	Gross Tons.
1894	44,791	1898	68,755	1902	319,557
1895	37,829	1899	94,077	1903	265,418
1896	60,030	1900	86,090	1904	270,942
1897	53,796	1901	244,976		

The unsold stocks of pig iron in Canada on December 31, 1904, amounted to \$5,119 tons.

On December 31, 1904, Canada had 15 completed blast furnaces, of which 8 were in blast and 7 were idle. Of this total 10 were equipped to use coke for fuel and 5 to use charcoal. In addition 3 coke furnaces were partly erected on December 31, but work on the furnaces had been suspended some time ago.—The Bulletin.

CAPTAINS OF INDUSTRY.

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

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

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

The Stratford Mill Building Co., have received the contract to erect a flour mill for W. F. Forrest, Atwood, Ont., at a cost of about \$11,000.

The Maple Leaf Flour Mills Co., Ottawa, will erect a large flour mill at Rat Portage, Ont.

P. W. Gaddiner, Galt, Ont., will erect a mill for the manufacture of sashes, doors, etc.

The Royal Canadian Yacht Club, Toronto, will erect a new club house at Centre Island, at a cost of about \$24,000.

Edward Ramage, Toronto, shipbuilder, has secured a lease of the dock at foot of Berkeley Street, and has erected buildings and installed machinery (using gas power) suitable for building and repairing steel and composite tugs and vessels.

The Canadian Bond Co., Toronto, have been incorporated with a capital of \$250,000, to deal in bonds, debentures, etc. The provisional directors include J. S. Lovell, W. W. McNeil, and Richard Richardson, Toronto.

The Massey-Harris Co., Toronto, have embarked on the manufacture of hand cream separators in addition to their other lines of farm machines. They have purchased the patents for Canada, and all other countries, except the United States, of the Iowa Cream Separator Co., Waterloo, Iowa, on which patterns their machines will be made, but they will be known as the "Massey-Harris" separator. Besides attending to the Canadian trade through their present selling organization, the company hope to do a large foreign business in such countries as Australia and New Zealand, where dairying is a prominent industry. They have installed extensive machinery for the purpose, and are now turning out machines for this season's trade.

The Presbyterians of Kilmartin, Ont., will erect a church building, 65x50 feet, at a cost of about \$5,000.

The Simpson Ave. Methodist Church, Toronto, will erect a new building at a cost of about \$25,000.

The Niagara, St. Catharines & Toronto Navigation Co., have purchased the club house of the Royal Canadian Yacht Club, Toronto, at a cost of \$25,000. The club house will be used in connection with the new steamship line, and also in connection with the Electrical Development

Co., in the transmission of power from Niagara to Toronto.

The sixty-seven building permits issued last month in Toronto, represent an expenditure of \$305,295 on seventy-nine new buildings, principally residences. The total for February, 1904, was \$154,380, the estimated value of forty-two buildings.

The screen cloth painting tower of the B. Greening Wire Co., Hamilton, Ont., was destroyed by fire March 3. Loss about \$15,000.

The moulding shop of J. Fleury's Sons, Aurora, Ont., was destroyed by fire recently. Loss about \$1,000.

The flour and chopping mill of J. M. Morden, Greenville, Ont., was destroyed by fire March 1. Loss about \$9,000.

The ratepayers of Fort Frances, Ont., have voted favorably on a by-law to raise \$20,000 for fire apparatus and municipal buildings.

It is stated that the Canadian Pacific Railway Co., will construct a branch line from London, Ont., to Sarnia, Ont., passing through the important oil-bearing fields surrounding Petrolia, Ont.

The Property Committee, Toronto, have asked the Board of Control to appropriate \$340,000 to improve the public schools, collegiate institutes and technical school.

The clam-shell dredge Islander, for the work of laying the six-foot conduit across the Toronto bay, was launched recently at the Polson Iron Works Co.'s wharf, Toronto. The hull of the dredge is 87 feet long, 35 feet wide and 7 feet deep. The boom is 90 feet long, and will use a Hayward type of clam-shell of the two yards capacity. It is expected that this dredge will be able to excavate at least 100 cubic yards per hour.

The Galt Building, Constructing & Real Estate Co., Galt, Ont., have been incorporated with a capital of \$40,000. The provisional directors include F. E. Brown, T. A. Norris, and W. C. Marriott, Galt.

The Leamington Light & Heat Co., Leamington, Ont., have been incorporated with a capital of \$40,000, to manufacture electricity and gas for light, heat and power purposes. The provi-

sional directors include Walter Stares, Leamington, and J. W. Post, Chatham, Ont.

General Leather Goods, Ltd., Toronto, have been incorporated with a capital of \$40,000, to manufacture leather, etc. The provisional directors include Joseph Kilgour, R. H. Cameron, and M. A. Cameron, Toronto.

Newsome & Gilbert, Ltd., Toronto, have been incorporated with a capital of \$100,000, to manufacture stationery, etc. The provisional directors include A. T. Gilbert, J. J. Sutcliffe, and W. J. McWhinney, Toronto.

The Fountain Condenser Co., Ltd., Petrolia, Ont., have been incorporated with a capital of \$40,000, to manufacture steam condensers, etc. The provisional directors include J. C. Fountain, Parkhill, Ont., D. S. Robb, London, Ont., and J. C. Winters, Mount Morris, N. Y.

The Canadian Drawn Steel Co., Hamilton, Ont., have been incorporated with a capital of \$100,000, to manufacture iron and steel, etc. The provisional directors include W. A. McCool, Beaver Falls, Pa., H. J. Waddie and D. R. C. Martin, Hamilton.

The Cataract Wine & Canning Co., Niagara Falls, Ont., have been incorporated with a capital of \$100,000, to manufacture native wines, vinegar, canned fruits, etc. The provisional directors include E. R. Lundy, W. W. Thompson, and D. D. Glasgow, Niagara Falls.

The McIntosh-Gullett Co., Ltd., Toronto, have been incorporated with a capital of \$75,000, to acquire the business of McIntosh, Granite & Marble Co. The provisional directors include H. R. Playtner, J. R. Macdonald and W. D. McIntosh, Toronto.

The Clark-Demill Co., Ltd., Hespeler, Ont., have been incorporated with a capital of \$100,000, to manufacture woodworking machinery and tools, engines, boilers, pumps, etc. The provisional directors include G. D. Forbes, J. R. Phin and Anthony Ochs, Hespeler, Ont.

The National Supply Co., Windsor, Ont., have been incorporated with a capital of \$400,000, to manufacture any article of trade or commerce. The provisional directors include C. R. Clapp, Toledo, Ohio, J. H. Rodd, and Wm. Horne, Windsor.

The North Bay Light, Heat & Power Co., North Bay, Ont., have been incorporated with a capital of \$50,000, to manufacture electricity and gas, for light, heat and power. The provisional directors include Thomas Wallace, J. T. Lovell, North Bay, and A. H. Leggatt, Ottawa.

The Boileau Reduction Co., Toronto, have been incorporated with a capital of \$1,200,000, to carry on a business of a milling, mining, and reduction company. The provisional directors include Frederick Plumb, F. V. Philpott, and J. L. Ross, Toronto.

The Canadian Northern Coal & Ore Dock Co., Toronto, have been incorpor-

ated with a capital of \$500,000, to construct docks, wharves, elevators, etc. The provisional directors include J. S. Lovell, Wm. Bain, and E. W. McNeill, Toronto.

Crushed Stone, Ltd., Toronto, have been incorporated with a capital of \$40,000, to manufacture crushed stone, lime, etc. The provisional directors include W. H. Essery, W. H. Adamson, and G. W. Essery, Toronto.

The Boyd, Brumell Co., Toronto, will increase their capital stock from \$25,000 to \$75,000.

The Hawkesbury Electric Light & Power Co., Hawkesbury, Ont., have been granted a license to carry on business in Canada. Thomas Ross, Hawkesbury, has been appointed attorney.

The Adams Bros. Harness Mfg. Co., Toronto, have been granted a license to carry on business in Canada. J. H. Adams, and Charles Adams have been appointed attorneys.

The Canada Launch Works, Toronto, will change the corporate name of the company to the Canada Launch & Engine Works, Ltd.

The Guelph Foundry Co., Guelph, Ont., will increase their capital from \$40,000 to \$200,000.

The capital stock of the Reed Feather-bone Mfg. Co., Toronto, will be increased from \$20,000 to \$60,000.

The Union Drawn Steel Co., Beaver Falls, Pa., will establish a branch of their works at Hamilton, Ont. A Canadian company will be incorporated with a capital of \$150,000, to manufacture polished steel shafting, shapes of all kinds, forgings, castings, etc. The first building to be erected will be 300x60 feet.

The Canada Iron & Foundry Co., St. Thomas, Ont., have erected a main foundry building 800x76 feet, warehouse 130x40 feet, shipping room, 70x32 feet, besides a machine shop, power house and office building.

The Gutta Percha & Rubber Mfg. Co., Toronto, have removed their offices and sample rooms to their building at the south-east corner of Yonge and Wellington streets. The interior has been entirely remodelled and two stories added to it.

The city engineer, Toronto, has made a report to the Board of Control that the estimated cost of installing a municipal electric lighting plant, with an alternating current sufficient to keep up 1,500 arc lights, would be \$638,000.

The Prekard Electric Co., St. Catharines, Ont., have established a factory for the manufacture of automobiles.

The Lake Superior Corporation, Sault Ste. Marie, Ont., are shipping steel rails at the rate of ten to fifteen carloads daily, and distributed along the branch line under construction from Sudbury, Ont., to Toronto.

The Lake of the Woods Milling Co., are installing an electric plant at their Keewatin, Ont., mill.

The Canadian Corundum Wheel Co., Hamilton, Ont., are going into an en-

tirely new industry in Canada, and for that purpose are now doubling the size of their buildings and plant. The new industry is the vitrifying of emery wheels. This company have undergone a most remarkable growth since their formation several years ago, having in this time built one of the most modern factories in Canada, devoted to grinding machines and materials and introduced their products throughout the Dominion.

W. T. Sampson, Gananoque, Ont., will establish bolt works at that place at a cost of about \$30,000.

The brush and hat factory of Meakins & Sons, Hamilton, Ont., was destroyed by fire March 8. Loss about \$55,000.

The station of the Grand Trunk Railway Co., at Millbrook, Ont., was destroyed by fire March 7.

The Canadian Niagara Power Co., have opened their new power house and started operating two 10,000 h.p. units of their first installation of 50,000 electrical units. The company are the pioneers in development of Niagara power on the Canadian side for commercial purposes.

The Hamilton Bridge Co., Hamilton, Ont., have lately secured a number of important structural steel orders and bridge contracts.

Plans have been prepared for a modern factory for the manufacture of electrical supplies to be erected in Hamilton, by Chadwick Bros., of that city.

The Hamilton Stamp & Stencil Co., Hamilton, Ont., have recently increased their plant, and showrooms, and installed considerable improved machinery.

Warwick Bros. & Rutter, Ltd., wholesale stationers, printers, and bookbinders, Toronto, who, since the big fire of April last, have occupied temporary premises in various parts of the city, took possession of their new factory building on February 19. Their new warehouse building will be ready for occupation in May. The two buildings forming an L at the corner of King Street and Spadina Avenue, have been constructed entirely of brick, concrete and cement and steel, and are as nearly fireproof as architectural skill can suggest. The factory building is unique in construction, being all on one floor, and covering an area of more than 20,000 square feet. The Employing Printers' Association paid a visit to the new factory some days ago, as the guests of the Toronto Type Foundry.

The Keystone Engineering Co., recently formed in Toronto, to engage in all lines of electrical contracting and engineering work, have opened offices at 94 Adelaide Street West. They have heavy financial backing, and have engaged an expert staff of engineers, familiar with all lines of electrical work. Their line of work covers the entire electrical field, not only the electric wiring, but also engines, generators, motors, switch boards that are called for in main building installations. In addition to this the company shall ex-

cute for owners, as well as architects, drawings, and specifications on electrical works, where such is required. They are also agents in Toronto for the Crocker-Wheeler Co., Ampere, N. J., manufacturers of direct and alternating current apparatus, and will give special attention to specifications dealing with lighting and power machinery, as well as motors for machine tools, machine and line shaft drives. Mr. J. C. Keenan, president of the company, has for many years engaged in construction work for the Bell Telephone Co. of Canada, latterly in similar work in Pittsburg, Pa., and Baltimore, Md.

The King Cleaning Elevator Co., Fort William, Ont., will make extensive additions to the tank section of their plant.

John McKay & Co., Bowmanville, Ont., will build a large grist mill at that place.

Lumsden Bros., Hamilton, Ont., wholesale grocers and canners, will open a branch canning factory in Brantford, Ont., under the name of the Standard Canning Co.

Peterborough, Ont., will have a new wharf, which will be 300x60 feet. It will cost about \$10,000, and will be of a massive and solid character.

The Bertram Engine Works Co., Toronto, have been awarded a contract by the Dominion Government for the construction of a quarantine steamer to cost about \$85,000.

The Canadian Otis Elevator Co., Hamilton, Ont., which recently took over the Fensom Elevator Co., Toronto, have decided to close the works of the latter company. The new firm will be The Otis Fensom Co., with offices in Toronto, and works in Hamilton. The present capacity of the works will be doubled at a cost of about \$40,000.

It is estimated that the Grand Trunk Railway Co., will spend about \$3,000,000 on the contemplated improvements on the Esplanade, Toronto.

The Board of Control, Toronto, have awarded the contracts for the new art gallery to be erected on the Exhibition grounds, at a cost of \$32,175, to be completed August 1.

The Canada Glue Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture glue stock, gelatine, etc. The provisional directors include O. C. Butz, Paul Kreisemann, and C. C. Johnston, Chicago, Ill.

The Montreal & Lake Erie Steamship Co., Toronto, have been incorporated with a capital of \$180,000, to build and operate passenger, freight and other steamboats, etc. The provisional directors include C. A. Jaques, Montreal, J. Hob, Ottawa, and W. D. Matthews, Toronto.

The Ottawa Pilot Printing & Publishing Co., Ottawa, have been incorporated with a capital of \$50,000, to carry on a printing, engraving, and lithographing business. The provisional directors include F. W. Bambrick, F. B. Rankin, and Wm. Johnston, Ottawa.

The Bell Telephone Co., will erect a new telephone exchange at Kingston, Ont., at a cost of about \$30,000.

The Imperial Comout Co., Owen Sound, Ont., will increase the output of their factory at a cost of about \$35,000.

A new five-stamp mill will be installed at the Shakespeare Mine of the Webbwood Gold Mining property at Sault Ste. Marie, Ont.

The Standard Windmill & Mfg. Co., of Michigan, will establish a factory at Whitby, Ont.

A building will be erected in Woodstock, Ont., for the Trader's Bank.

The People's Telegraph & Telephone Co., Maynook, Ont., have been incorporated with a capital of \$40,000, to carry on a telegraph and telephone business. The provisional directors include W. J. Sergeant, Bancroft, Ont., W. J. Fitzgerald and E. P. Netterville, Maynooth, Ont.

The Essex Canning & Preserving Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture, can and preserve vegetables, fruits, meats, etc. The provisional directors include R. W. Ball, L. H. Barton and F. D. Byers, Toronto.

The J. L. Thompson Co., St. Catharines, Ont., have been incorporated with a capital of \$50,000, to manufacture tinware, etc. The provisional directors include J. L. Thompson, Hamilton, Ont., W. B. Smith, Port Rowan, Ont., and H. W. Fairlie, St. Davids, Ont.

The Foster Co. of Richards Landing, Richard Landing, Ont., have been incorporated with a capital of \$25,000, to carry on a mercantile business. The provisional directors include C. J. Foster, W. H. Crawford and J. A. Montgomery, Richards Landing.

The Meaford Wheelbarrow Co., Meaford, Ont., have been incorporated with a capital of \$90,000, to manufacture wheelbarrows, scrapers, etc. The provisional directors include J. H. Cleland, Wm. Butchart, Meaford, and Alexander Gibb, Montreal.

Dominion de Forest Wireless Telegraph Co., Ottawa, have been incorporated with a capital of \$1,200,000, to erect stations for sending and receiving messages by wireless telegraphy. The provisional directors include L. J. Lemieux, F. J. Humphrey and E. Brassard, Montreal.

The Ontario & Quebec Navigation Co., Picton, Ont., have been incorporated with a capital of \$50,000, to carry on a general transportation business. The provisional directors include B. R. Hepburn, J. de C. Hepburn and R. G. K. Hepburn, Picton, Ont.

The Peninsular Tool & Specialty Co., Windsor, Ont., have been incorporated with a capital of \$22,000, to manufacture moulders and masons tools, etc. The provisional directors include George Thompson, J. E. Wright, Windsor, and C. C. Stewart, Detroit, Mich.

The E. F. Mason Co., Peterborough, Ont., have been incorporated with a capital stock of \$40,000. The provisional directors include E. F. Mason, W. H.

Dayman and J. M. Fanning, Peterborough.

The Detroit & Leamington Oil Co., have been granted a license to do business in Canada. A. R. Bartlet, Windsor, Ont., has been appointed attorney.

The ratepayers of Grimsby, Ont., will grant a loan of \$15,000 to the Walker Steel Range Co., Windsor, Ont., which have secured the Grout foundry and will shortly increase the plant.

The Niagara Navigation Co., Toronto, have awarded the Canadian Shipbuilding Co., Toronto, the contract for a twin screw steel passenger steamer with quadruple expansion engines for the Lewiston-Toronto route. The new boat will be the length of the steamer Chippewa, the largest ship at present in the company's fleet, and the contract will provide for a guaranteed speed of 22½ miles per hour. The work will be commenced at once in order that the steamer may be ready for service for the season of 1905.

The Tessenden Wireless Telegraphic Co., Ottawa, are applying for incorporation. The company are seeking to get the Government to install a wireless telegraphy station on Sable Island.

The ratepayers of Bowmanville, Ont., have granted a bonus of \$15,000 to the Durham Rubber Co., of that place.

The Lake Superior Corporation will extend the Algoma Central road to a connection with the Canadian Pacific Railway Co.'s line. One hundred miles of the road have been graded and railed, 125 miles are graded and ready for the rails, and twenty-five miles remain to be both graded and railed. The company have recently completed the installation of a large building paper machine at their pulp mill.

The Cataract Power Co., Hamilton, Ont., have already had nine bridges constructed for the extension of the Hamilton Radial Electric Railway from Burlington to Oakville, Ont., besides having purchased the poles, ties and ballast. The cars will likely be Canadian built. Mr. J. B. Griffith will go to Europe to buy the rails. The bridges will be double-track, in anticipation of a possible double track between Hamilton and Oakville. Work on the extension will be begun as early as possible.

The Swift Co Chicago, Ill., which control the Fowler's Canadian Co.'s business in Hamilton, Ont., will double their capacity in the near future, and will kill 6,000 hogs a week. In addition, sheep and cattle will be slaughtered and put up for market.

Since the purchase of the New York & Ottawa Railroad by the New York Central Railroad Co., the latter have determined to rebuild the road between Cornwall, Ont., and Tupper Lake, which will be operated under the Vanderbilt system. The change is necessary to make the New York and Ottawa tracks suitable to the heavy rolling stock of the New York Central. The roadbed of the New York and Ottawa is in good condition for the small engines in use, but the change contemplated will make the bed suitable for the largest class of engines. This road

and the Rutland will insure to the Central an immense trade from Ontario and it will also place Cornwall in advance as an export town.

The Gulf Whaling Co., Montreal, have been incorporated with a capital of \$295,000, to manufacture, cure and pack whales, seals, etc. The provisional directors include Paul Galibert, Rolland Prefontaine, Montreal, and B. Sawyer, Westmount, Que.

Lewis Bros., Limited, Montreal, have been incorporated with a capital of \$1,000,000, to manufacture hardware, paints, oils, etc. The provisional directors include L. J. Lewis, J. G. Lewis and Wm. Lewis, Montreal.

The Imperial Hotel Co., Montreal, will erect a modern hotel at Lachine, Que., at a cost of about \$60,000.

The Dominion Bridge Co., Montreal, have been awarded the contract for the steel work for the turbine power plant to be erected in that city, requiring 3,000 tons of steel, and Messrs Babcock & Wilcox have received the contract for the boilers.

The Fairbanks Co., manufacturers of scales, mill supplies, etc., and heretofore owned by the United States concern of the same name, have been reorganized as the Canadian Fairbanks Co., Limited, Montreal, with Mr. H. J. Fuller, president and treasurer. Up to the present, the Fairbanks Co. have imported all their supplies from the United States, but it is now announced that the Canadian Fairbanks Co. will erect a factory and manufacture in Montreal. Mr. Fuller states that the site for the factory has not yet been decided upon, but it will be erected and will give employment to three hundred hands.

Messrs Lymburner & Matthews, Montreal, will erect a large machine shop and factory in that city, at a cost of about \$20,000.

The premises of the Montreal Watch Case Co., Montreal, were destroyed by fire March 1. Loss about \$20,000.

Smith, Carter & Smith, Limited, Montreal, have been incorporated for the manufacture of shade cloth and window shades.

The inspector of mines for Quebec has reported an important new district for mining investigation and development, situated 200 miles northwest of Lake St. John and within 100 miles of the probable route of the Trans-Continental Railway. The discoveries include copper ore, magnetic iron ore, gold, and asbestos, the deposits of asbestos being reported as particularly extensive.

The Crown Hotel, Hull, Que., was destroyed by fire March 7. Loss about \$3,000.

The factory of the Imperial Furniture & Mattress Co., Hull, Que., was destroyed by fire March 8. Loss about \$2,000.

The Northern Development Co., Montreal, have been incorporated with a capital of \$40,000, to carry on a mining, milling and smelting business, etc. The provisional directors include C. H. Archer, J. L. Perron and N. E. Brais, Montreal.

The planing mills of Alex. Baptist, Three Rivers, Que., were destroyed by fire March 6. Loss about \$5,000.

The Mount Royal Club, Montreal, will erect a large new building 114 x 110 feet, to cost about \$250,000.

The Dorchester Apartment House Co., Montreal, are applying for incorporation with a capital of \$250,000, to erect an apartment house 125 x 78 feet, in that city. J. A. Jacobs, of the Canadian Underwear Co., Montreal, will be one of the directors.

The city council of Montreal, is planning to increase the present water supply at a cost of about \$2,250,000.

The carriage factory of A. Pare & Co., Montreal, was destroyed by fire March 8. Loss about \$16,000.

The Canadian-American Linotype Co., Montreal, have placed on the market a new linotype machine which is similar to the old style linotype in that any face from agate to small pica can be used, and it avoids the necessity for purchasing sets for special work. The machine is distinct, in that it is compact and can be operated by one person from his seat at the key board without moving therefrom. The "Style B" linotype machine has a capacity of 5,000 ems of matter per hour. The whole of the faces that have been made for the standard linotype machine can be used in it. This applies to English, American or German made matrices. The firm have agents in South America, Mexico, and are establishing one in Germany.

James Wilson & Co., Limited, Montreal, have been incorporated with a capital of \$100,000, to manufacture oils, cotton waste, railway and mill supplies, etc. The provisional directors include W. C. McIntyre, C. C. McIntyre and D. J. Dickson, Montreal.

The Bellhouse, Dillon Co., Montreal, have been incorporated with a capital of \$45,000, to manufacture chemicals, dyes, varnishes, cements, fire bricks, clays, etc. The provisional directors include E. F. Surveyer, A. C. Casgrain and K. J. Beardwood, Montreal.

The Canadian Fairbanks Co., Montreal, have been incorporated with a capital of \$500,000, to manufacture scales, weighing instruments and other manufactures made from iron, brass, etc. The provisional directors include H. J. Fuller, C. M. Rudel and F. A. Pownall, Montreal.

The E. Cavanagh Co., Montreal, have been incorporated with a capital of \$100,000, to carry on a general mercantile business. The provisional directors include W. J. Henderson, A. W. G. Macalister, and A. C. Calder, Montreal.

The Chandler & Mills Co., Montreal, have been incorporated with a capital of \$60,000, to manufacture druggists supplies and to acquire business of Chandler & Masey, Toronto, in Quebec. The charter members include Wm. Lunny, J. H. Mills and F. M. Markey, Montreal.

The McPhee Bros. & Bayley Co., Montreal, have been incorporated with a capital of \$20,000, to manufacture advertising novelties and designs. The

charter members include C. C. McPhee, A. C. McPhee and Henry Bayley, Montreal.

The Universal Spring Motor Co., Montreal, have applied for incorporation with a capital of \$500,000, to manufacture the universal spring motor, also electric, water and steam motors.

Daly & Morin, Montreal, have erected a factory 100 x 25 feet at Lachine, Que., for the manufacture of window shades, etc.

The Canadian Pacific Railway Co., have placed an order with the Locomotive & Machine Co., Montreal, for thirty simple ten-wheel locomotives, and with the Canadian Locomotive Works, Kingston, Ont., for ten of the same class.

The Canadian Rubber Co., Montreal, will extend their present large plant by erecting a number of additional buildings.

D. K. McLaren, Montreal, manufacturer of leather belting, has opened a branch, in St. John, N.B.

Messrs. Emerson & Fisher, St. John, N.B., have been incorporated with a capital of \$150,000, to carry on a general manufacturing business. The provisional directors include R. B. Emerson, W. S. Fisher and F. B. Murray, St. John, N.B.

American capitalists have recently bought pulp mills in Canada that have been inactive. One of these new concerns which has recently been organized is the Miramichi Pulp & Paper Co., with a capital of \$300,000. The incorporators are George T. Keys, of Pepperill, Mass., and his two brothers; Charles A. Haight, a Boston capitalist, and James Beveridge, late manager of the pulp mill at St. John, N.B. They have bought the Chatham, N.B. pulp mill, which has been closed for some years, and will commence active operations at once.

The general traffic manager of the Intercolonial Railway at Moncton, N.B., has received official notification from the President of the Superior Jury of Awards of the Louisiana Purchase Exposition, to the effect that a gold medal and diploma had been awarded the railway for the handsome display made at St. Louis last season. The railway display was one of the leading features in the Forestry, Fish and Game Building, where it was viewed with great interest by thousands of people and made a place of assembly by many sportsmen. The gold medal is awarded for the best collection of mounted animals and mounted fish, in which department the railway had certainly the best variety and finest specimens. The diploma is for the general excellence of the exhibit. Both are prizes that were most coveted by exhibitors at the Fair, and are consequently greatly appreciated.

The York & Sunbury Milling Co., Gibson, N.B., have been incorporated with a capital of \$320,000, to manufacture lumber, etc. The provisional directors include W. H. Murray, St. John, N.B., Frederick Pond, Gibson, N.B., and A. J. Gregory, Fredericton, N.B.

The Skif Lake Mfg. Co., Canterbury, N.B., have been incorporated with a capital of \$25,000, to manufacture lumber, etc. The provisional directors include

H. W. Shaw, Hawkshaw, N.B., G. S. Ingraham, Southampton, N.B., and A. I. Fox, Canterbury Station, N.B.

H. Horton & Son, Limited, Fredericton, N.B., have been incorporated with a capital of \$40,000, to manufacture harness, collars, horse-clothing, etc. The provisional directors include G. A. Horton, J. J. Walsh, St. John, N.B., John Leck, Truro, N.S.

Messrs. Timothy Lynch & Co., Fredericton, N.B., have been incorporated with a capital of \$200,000, to manufacture lumber, etc. The provisional directors include Timothy Lynch, T. L. Lynch, Fredericton and P. B. Millie, Glassville, N.B.

James Ready, Limited, Lancaster, N.B., have been incorporated with a capital of \$50,000, to carry on a business of brewers, malsters, etc. The provisional directors include James Ready and T. L. Ready, Lancaster.

The Fairville Electric Light Co., Lancaster, N.B., have been incorporated with a capital of \$2,500, to manufacture electricity for lighting, heating and power purposes. The provisional directors include James Ready and T. L. Ready, Lancaster.

The Sydney Cement Co., Sydney, N.S., have been incorporated with a capital of \$500,000, to manufacture cement from slag. The plant is to be of steel, with a capacity of 500 barrels a day, and a coöperation with a capacity of 50,000 barrels a year will be erected. The city council will grant a bonus of \$10,000.

G. E. Boak, Halifax, N.S., stated that the Halifax Steel Shipbuilding Co. will commence operations very shortly. The location of the site will be at Dartmouth, N.S., where the erection of the plant and ships will be commenced immediately. It is possible that the Dominion Government may give the first order for a Canadian cruiser to be built at the new works.

E. S. Blackie, chemist, Halifax, N.S., is negotiating with the Standard Chemical Co., Toronto, who have plants in Ontario and Quebec, to establish a plant in Halifax, for the manufacture of wood alcohol, acetate of lime, acetic acid, cresote and other bye-products.

A. S. Reudall, St. John's, Nfld., in connection with several parties from North Sydney, N.S., has purchased the marine railway at the latter place. A new plant will be installed.

The Strathern Shipping Co., Halifax, N.S., have been incorporated with a capital of \$16,000, to carry on a business of warehousemen, etc. The provisional directors include W. H. Fulton, J. B. Kenny and Hector McInnes, Halifax, N.S.

Cunningham's sawmill near Lisdale, N.W.T., was destroyed by fire recently. Loss about \$1,500.

It is stated that Sir Sanford Fleming will establish a cement plant at Rawanaskis Falls, N.W.T. A fine deposit of cement of unlimited quantity has been located near the scene of the proposed industry.

The Canadian American Oil Co., have been incorporated with a capital of \$1,000,000, to develop the Egg Lake oil field near Edmonton, N.W.T. The provisional directors include R. Secord, L. A. Stephens and K. A. McLeod.

H. A. Richardson will establish a peat manufacturing industry at Winnipeg, Man., having purchased from W. J. Griffin, patents for a peat excavating and compressing machine. Mr. Richardson estimates that peat-fuel produced by his process can be supplied to Winnipeg consumers at \$5.50 per ton, and will compare favorably with anthracite. The unique feature of the process is that the expense to which peat companies have hitherto been put, in draining the bog before operating on it, is avoided. The machine is built entirely on a scow and peat taken at one end from the bog, by a series of buckets on endless chains, is dumped into a hopper, and in from 28 to 45 minutes comes out at the other end in the form of perfected briquettes. It is claimed that by avoiding the air-drying process, some of the best elements, usually lost, are retained in the peat. Each machine can take 500 tons of peat from the bog daily, and turn it into 100 tons of briquettes.

A permit has been issued for an eight story modern office building to be erected in Winnipeg, Man. For further information apply to the mayor of that city.

The ratepayers of Treherne, Man., will vote on a by-law to grant a loan of \$5,000 to C. Wickham to rebuild his flour mill, which was recently destroyed by fire.

Messrs. Foley, Lock & Larson, Winnipeg, Man., will erect an addition to their building 116 x 116 feet, to be used for manufacturing biscuits and confectionery.

A new rectory will be built for the Holy Trinity Parish, Winnipeg, Man., to cost about \$10,000.

The Anghia Land & Lumber Co., Winnipeg, Man., will erect a sawmill at Manitoba Falls.

An important order has just been placed by the Winnipeg, Man., Electric Street Railway with Messrs. Babcock & Wilcox, Montreal, for three of their large forged steel patent water-tube boilers, aggregating 2,000 h.p. The fact of this order being placed so soon after the contract for the boilers ordered by the Winnipeg city water-works from the same firm, a week or two ago, is a significant sign of the times, and illustrates the progress our Western Metropolis is making. The street railway installed two boilers of the same type about two years ago, and the repeat order would indicate that they have given good service.

The Merchants Bank will erect a large bank building at Edmonton, N.W.T.

St. Albans' Parish, Prince Albert, N.W.T., will have a new church building.

The Gas Equipment Co., Brandon, Man., have been incorporated with a capital of \$40,000, to establish gas, water and electric plants. The provisional directors include D. A. Hopper, J. W. Thompson and R. M. Matheson, Brandon.

It is stated the Dominion Government will erect a new post office and customs house at Medicine Hat, N.W.T.

The Western Mfg. Co., will erect a factory at Regina, N.W.T.

The Ogilvie Flour Mills Co., Winnipeg, Man., have just compiled a careful estimate of wheat remaining in farmers' hands in the country tributary to their 95 elevators situated all over the wheat belt. After making allowances for seed requirements, the percentage is less than 6 per cent. of the whole crop, or equivalent to reserves of under three and a half million bushels, which is considerably lower than expected.

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

The Canadian Iron Wool Co., Winnipeg, Man., have been incorporated with a capital of \$10,000. The provisional directors include E. C. Foley, Montreal, E. C. Colby and T. A. Irvine, Winnipeg.

Garson Quarries, Limited, Winnipeg, Man., have been incorporated with a capital of \$200,000. The incorporators include Peter Lyall, Montreal, Wm. Garson and J. M. Aikins, Winnipeg.

The B. R. Hamilton Hardware Co., Neepawa, Man., have been incorporated with a capital of \$50,000. The provisional directors include B. R. Hamilton, J. H. Hamilton and A. H. Hunter, Neepawa.

The Winnipeg & Port Arthur Investment Co., Winnipeg, Man., have been incorporated with a capital of \$250,000. The provisional directors include J. J. Carrick, Port Arthur, Ont., Wm. Pearson and Harry Pollard, Winnipeg.

The Leighton Farmer's Elevator Co., Deloraine, Man., have been incorporated with a capital of \$10,000. The provisional directors include T. J. Freeland, J. C. Barrett and James Innes, Deloraine.

The Canadian Pacific Pulp & Paper Co., Swanson Bay, B.C., have erected a saw mill with a capacity of 40,000 feet of lumber per day, and a sulphite plant capable of producing about forty tons of sulphite pulp daily. A paper mill will be erected shortly.

The Maple Ridge Creamery & Fruit Canning Co., Port Hammond, B.C., will erect a factory at that place.

English and Canadian capitalists are interested in the project of erecting a large sawmill to supply the foreign market and iron works at Esquimaux, B.C.

Many of the leading shippers in the mining district of British Columbia are increasing their plants. New machinery to the value of over half a million dollars has been ordered and will be installed during the next few months in a number of mines in the Rossland and Slocan districts. The Velvet mine at Rossland is putting in new concentrators and stamps that will cost \$45,000. At the Cliffo mine in Rossland about \$30,000 is to be expended in a thirty-stamp mill to in-

crease the output; \$12,000 is being expended by the Spitzee mine at Rossland in compressors and machine drills, while a new tramway is being put in at the Jumbo mine which will greatly facilitate the shipment of ore.

The Canada Zinc Co., Victoria, B.C., have been incorporated with a capital of \$200,000, to carry on a business of a mining, smelting and refining company.

The Cowichan Water Works Co., North Cowichan, B.C., have been incorporated with a capital of \$10,000, to construct and operate a water works system.

The Whatshan Lake Power Co., Victoria, B.C., have been incorporated with a capital of \$250,000, to generate electricity for light, heat and power purposes.

The Small & Bucklin Co., New Westminster, B.C., will erect a sawmill on the Fraser River, and will also build a tannery.

The Esquimaux & Nanaimo Railway Co., will build foundry and machine shops at Haslam Flat, near Ladysmith, B.C.

The Capital City Packing & Canning Co., Victoria, B.C., will erect a canning factory at Esquimaux, B.C.

The British Columbia Electric Railway Co., which have been operating electric systems of street railways in Victoria, Vancouver and New Westminster, have taken over the branch line of the Canadian Pacific Railway Co., between Vancouver and Steveston, and will operate it as an electric railway.

The Vancouver Lumber Co., Vancouver, B.C., will extend their buildings and plant to double their capacity.

Fire in the Coal Creek Mines, Fernio, B.C., March 11, destroyed both tipples and power house. Loss about \$200,000.

A furnace will be installed and other extensive improvements made at the Atikokan mines on the Canadian end of Lake Superior near Fort William, Ont.

The United Supply & Contracting Co., have been incorporated at Victoria, B.C., with a capital of \$100,000, to carry on a business of electric light, heat and power supply company.

The Burt Mfg. Co., Akron, Ohio, manufacturers of Cross oil filters, recently made a shipment of five oil filters to their agency in Pelsingfors, Finland; three large shipments to their representative in Havana, Cuba, and four filters to customers at Valparaiso, Chile.

The Westinghouse Electric & Mfg. Co., Pittsburg, Pa., have just sold to the La Belle Iron Works, Stubeville, Ohio, a direct current engine-type generator, to be rated at 1,000 k.w., the voltage to be 250. The contract includes also a switchboard of blue Vermont marble. The Westinghouse apparatus already installed in this plant includes alternating and direct current generators with a total rated capacity of 1,250 k.w., a 300 k.w. rotary converter and over 200 motors, not including those used on the cranes, ranging in size from 1 to 200 h.p. About two-thirds of these are Westinghouse type alternating current motors.

ELECTRICITY.

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

The Keystone Engineering Co., Toronto, are engaged on electrical work in connection with the Gale Mfg. Co.'s new factory in Toronto.

HYDRO-ELECTRIC DEVELOPMENTS AT NIAGARA FALLS.

That great power plants are being constructed on the Canadian side of Niagara Falls is well known, but probably not many recognize the stupendous character of the work now going on, nor appreciate the relation of the new plants to the total hydro-electric development of the world, says the Electrical Review. The three great power stations now being built will have an aggregate output of 285,000 h.p., distributed as follows:—The Canadian Niagara Power Co., 110,000; the Toronto & Niagara Power Co., 115,000, and the Ontario Power Co., 60,000. The last-named company intend increasing their stations ultimately to 180,000. Comparing the total for the present plans of 285,000 with the grand total for the world, which is given by the Engineer (London) as 1,483,000, shows what an important addition to the world's water power the Canadian plants will form. But this is not the whole story, for adding in the additional 120,000 planned for by the Ontario Power Co. gives a total of 405,000 h.p. for the new Canadian stations, more than 27 per cent. of the world's present hydro-electric power.

It is interesting to sum up the total power development of the Niagara Falls district, in use and prospective. On the American side there is about 150,000 h.p. in the three stations. On the Canadian side, along the Welland canal, there are two stations with a present output of 26,000 h.p., and a total planned for of 52,000. Right at the Falls is the small plant of the International Railway Co., which has an output of 1,500 h.p. The total is about 625,000 h.p.

"In an excellent description of the work going on now at Niagara Falls, which is contributed to the Engineering Magazine, Mr. C. B. Smith says that for a generation at least the Niagara Falls district is not likely to make use of more than 400,000 h.p. This allows for the large factories now being built there, and for the probable development of the district. Should Mr. Smith's estimate prove correct—and he has had excellent opportunities to study the situation, as he was, until recently, engineer for the Ontario Power Co.—there will be a number of generators idle or long-distance transmission will have to be resorted to to dispose of the available surplus. Mr. Smith thinks the railroads will avail themselves of the opportunity as soon as they are convinced that they can rely upon the supply."

It is worth while looking at the present state of hydro-electric development for those countries where this has been carried well forward. The following are

the figures given in the Engineer (London):—The United States leads with 527,467 h.p. Canada comes next with 228,225 h.p. When the new Canadian plants have been put into service she will push this country closely for first place. Third on the list of countries is Italy with 210,000 h.p.; next comes France with 161,343, and then Switzerland with 133,202 h.p. Germany has 81,077, and Sweden has 71,000 h.p. In all other countries the hydro-electric development is small, being only a few thousand horse power for each.

The Keystone Engineering Co., Toronto, are installing an annunciator system in H. S. Howland Sons Co.'s warehouse, this city.

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.

Mr. F. L. Wanklyn, vice-president of the Dominion Coal Co., at Montreal, is credited with the statement that should the present strike of the German coal miners continue, it will probably have the effect of increasing prices of coal in Canada. The strike has already raised the price of British coal considerably, and if the strike continues the result will be that British ships which carry cargoes of coal as ballast to Canadian ports at a low rate, which on account of the preference, can be landed here with profit, competing successfully with the Canadian article, will be unable to obtain their coal at a cheap enough rate to render it profitable to export hither. Last year he said out of 1,450,000 tons of coal brought into the St. Lawrence, 47,000 tons came from Great Britain. The preceding year for a number of extraordinary causes the imported coal was in a far greater proportion, namely, 134,000 tons out of a total of 1,248,000 tons brought into the St. Lawrence. If on account of the coal strike in Germany the demand for the British article increases, this source of import will be blocked.

The areas at Little Bras d'Or acquired by the St. Lawrence Coal Co., are four miles from North Sydney, N.S., and adjoin the areas of the Nova Scotia Steel & Coal Co. There is stated to be three seams opened on the property ranging from 3 to 6 feet in thickness and it is estimated that these are capable of producing over 5,000,000 tons. It is claimed that other seams will bring the total available coal up to 20,000,000 tons. The colliery to be opened up will have a capacity of 500 to 1,000 tons a day. A slope has been sunk near the outcrop of the Collins seam, and extends to a point close to the southern limits of the area. It only remains for the company to run levels on the seam and raise coal for the market. The Edwards and No. 3 seams have been opened up near the surface by several pits and shafts.

The Rogers Coal Co., Hamilton, Ont., have been sold to Samuel Gilles of that city. Mr. Alfred S. Rogers, who managed the business, will enter the wholesale coal business representing some important coal mining concerns.

Messrs. Thos. Myles & Sons, Hamilton, Ont., report a good demand for all kinds of coal and coke, their business showing a steady increase.

The largest coal carrying fleet that has yet sailed out of Sydney, N.S., will be employed by the Dominion Coal Co. during the coming season in the St. Lawrence river trade. The fleet will comprise the following chartered boats Catalone, Mystic, Dominion, Torduenjold, Tancred, Britannic, Harrod, Ovidia, Symra and the James Ross, besides the company's own steamers, namely the Cobban, Louisburg, Cape Breton, Bonavista and Cacouna. They will also have the steamer, Turpin, chartered for the coaster trade alone. The James Ross, called after the president of the company, is a new steamer, now in course of construction at Middlesboro, England. She is being built specially for the coal trade and will have a carrying capacity of 7,000 tons. Apart from this regular fleet there will be boats chartered from time to time as opportunity presents itself. The company will exert every effort to get the largest quantity of coal possible up the St. Lawrence this season.

There is one peculiarity about stored coal for railway use, when it does get on fire, that it is not very generally known. Coal stored in great heaps deteriorates in quality as time goes on; this deterioration is slow oxidation, and oxidation, slow or fast, is always accompanied by the generation of heat. There is no way of preventing this action, but there is a way of avoiding serious results, and that is to provide means for rapidly carrying off the heat, and that is best accomplished by the free circulation of air through and around the pile. The peculiarity about the fire in the interior of a pile of coal is that it cokes a layer of coal all around the fire, and this coked layer will not readily let water through, so that drenching the pile from the outside and expecting the water to soak in and put out the fire is an expectation which is not likely to be realized. The way to put out a fire in the center of a coal pile is to push a sharp pointed piece of perforated pipe into the burning mass, couple the piece of pipe to the shop hose and turn on the water.

The property of the Canada Coal & Railway Co., Joggins, N.S., was sold recently to Stuart Jenks, Amherst, N.S., who was acting for outside capitalists. The purchase price was \$50,500 for the mining property, which includes the line of railway from MacCan to Joggins, and large coal mines in splendid working condition at the latter place. Timber lands embracing 1,900 acres were sold for \$5,500.

Mr. Tanner, the leader of the Opposition in Nova Scotia, proposes to the Government of that province a policy to increase the trade with Ontario. The Provincial Government collects a royalty

of 10c. a ton on all the coal raised in Nova Scotia. He suggests that shipments of coal to the Upper Provinces be exempt from this royalty for five years, and that for the following five years they be exempt from half of it. But Premier Murray has so far not shown a disposition to adopt the idea. It is very much like working at cross purposes for the Dominion Government to be maintaining an import duty to help the sale of domestic coal and for the Provincial Government to be laying a burden on the coal industry in the form of a royalty. —Mail and Empire.

Mr. W. E. Cooper, Canadian travelling representative for the W. A. Clarke Coal Co., Detroit, Mich., has lately been calling on Canadian coal consumers.

E J Conroy, Brantford, Ont., has been appointed Canadian representative of the Commercial Coal Co., Detroit, Mich.

It is stated that the Dominion Coal Co., Sydney, N.S., are looking for dockage in Toronto, the intention being to compete in the soft coal trade in Ontario.

The total coal production of the United States is now at the rate of 100,000,000 tons a day, and the consumption of coal by railroads is equal to 40 per cent. of this, or 40,000,000 tons a day. The fuel for a road in America contributes about 10 per cent. of the total expenses of operation, and 30 to 40 per cent. of the total cost of running the locomotives, each engine consuming on an average \$5,000 worth of coal per annum.

A direct saving to fuel may possibly be effected by the more general introduction of producer gas; at any rate, it seems to be an established fact that less fuel is required to produce a certain amount of steam if it is first converted into gas than if it is burnt direct in the boiler. This corroborates the conclusion, drawn from a large number of boiler trials, that the average waste of fuel in a boiler is very high, say 30 to 50 per cent. The cause of this waste is excessive air admission at the furnaces, which is necessary, partly on account of the smoke nuisance, partly on account of the wear and tear of the boiler. The maximum heat loss due to smoke is about 1 per cent. Most inventions for the removal of this smoke consist in arrangements for admitting air, resulting in further reductions of efficiency amounting to from 20 to 30 per cent. When smokeless coals are used, and as the conditions of firing are as perfect as can be, furnace temperatures approaching 5,000 Fabr., could be attained. Such excessive temperatures must produce very severe stresses, both in furnace plates and in water tubes, and such intense heats must increase the wear and tear of a boiler, and are, therefore, not desirable. A solution to the difficulty seems accidentally to have been found upon when, for totally different reasons, the Admiralty sub-divided their Belleville boiler by adding a so-called economizer. The essential point of the alteration is, however, not the economizer, but the addition of a second combustion chamber yet in spite of the principle of double combustion being but imperfectly

carried out. In that case the economic results are said to be exceedingly good.

OPPORTUNITIES.

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

The Ontario Bureau of Mines is in receipt of an inquiry from Charles E. Scholes Co., Manufacturers' agents, 164 Front Street, New York, who are desirous of procuring supplies of molybdenite to be manufactured into molybdenic acid. There are a number of molybdenite deposits in Ontario, but so far they have not been actively worked. The chief use of molybdenum is in the alloying of steel for special purposes.

The county clerk, Welland, Ont., is inviting tenders until March 28, for a bridge to be constructed over the Welland River, to be of steel, 100 feet in length, and a clear roadway of 16 foot width.

Tenders will be received for the erection of two offices for the Canadian Bank of Commerce by Darling & Pearson, architects, Toronto.

The time for receiving tenders for the erection of a six million imperial gallon, triple expansion, fly-wheel pumping engine for the water works department, Toronto, which was to expire March 21, has been extended to April 18.

The Department of Public Works, Ottawa, will receive tenders until March 22 for the construction of a wharf at Pleasant Bay, N.S.

The Department of Public Works, Ottawa, will receive tenders until April 3 for the construction of an extension to the breakwater at Richibucto, N.B.

The Ontario Bureau of Mines is in receipt of an inquiry from London, England, concerning Portland cement. The writer says a combine practically exists in Great Britain, and he asks if the Canadian material could not be shipped thence. It is thought at the bureau, however, that the price he mentions, 20 shillings a ton, would hardly pay Canadian manufacturers. In this connection it is stated that all Canadian plants until recently made cement from marl, but one recently erected at Hull, Que., and one now in course of erection at Belleville, Ont. will follow the United States method, which is not so costly, of using limestone. An American recently visited the bureau and asked for and obtained information regarding limestone deposits which would warrant the erection of a cement factory.

Tenders are being called by County Commissioner Talbot at London, Ont., for the new bridge to be built across the Thames near Ingersoll, Ont. It will be of steel and cement, and will cost about \$1,500.

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.

Beginning with the new year what was formerly the Hardware Dealer, published weekly in Montreal, became the Hardware Dealer's Monthly, which, as its name implies, is issued once a month. The publishers, the Canadian Trade Journals, Limited, Montreal, feel that the interests of their readers can be better served with a monthly than a weekly publication. The issue before us contains a variety of useful information in regard to general trade conditions in Canada, especially as they relate to hardware interests.

The Commoner and Glassworker, of Pittsburg, Pa., have just published a very complete edition of the Glass Trade Directory for 1905. It contains a correct list of all the glass plants in the United States and Canada, officers of the different companies, capacities of factories and the class of ware manufactured in each plant. It constitutes a valuable book for reference, and should be in the hands of every manufacturer and jobber.

The Westinghouse Electric & Mfg. Co., Pittsburg, Pa., have sent us pamphlets descriptive of their type of induction motors and direct current motors, type R.

The Packard Electric Co., St. Catharines, Ont., have sent us an illustrated pamphlet regarding their Jandus series alternating arc lighting system, the regulating apparatus of which is of the inductive type, and consists of an impedance coil, a laminated iron core and a mechanical device maintaining the two in such relative position that the inductive drop in the coil is inversely proportional to the number of lamps operating on the circuit. On an alternating current circuit of constant potential, it is possible in a properly designed machine, automatically to maintain a constant impedance in the circuit and therefore to obtain throughout the range from full load to no load, a current of constant value.

"Compressed Facts About Compressed Air" is the title of a booklet by the Clayton Air Compressor Works, New York City, giving a resume of the points to be considered in buying an air compressor of medium capacity.

"School and College Telephone Systems" is the title of a new catalogue issued by C. W. Bongard & Co., Toronto, and in which are fully described and illustrated the various instruments and equipment for sale. The system is adopted to the various warehouse and factory requirements.

The Hamilton Stamp & Stencil Co., Hamilton, Ont., have just issued an attractive catalogue on the Canada Stencil Cutting Machine which they are now manufacturing, an article which should be in use by every concern which does any shipping.

The Industrial Publication Co., 16 Thomas St. New York, have sent us a very handsomely bound volume entitled "How to mix Paints," by C. Godfrey, the price of which is fifty cents. This book is intended for those who have not had the benefit of a long training and experience in mixing colors. Simple and clear directions are given so that by a little practise the reader may be able to mix the various tints and shades of reds, blues, yellows, browns, greens, grays and colors made from blacks, japans, etc. Besides the directions for mixing paints, notes are given about tints and shades, use and care of brushes, hints on displaying colors to show customers, color harmony, etc. This book will be found an exceedingly handy companion for both amateur and practical painters.

The Wellman-Seaver-Morgan Co., Cleveland, Ohio, manufacturers of coke ovens, hoisting, cement works machinery, etc., gas engines, engines and cranes, have sent a circular illustrating the Johnson patent arch plate.

The Ogilvie Flour Mills Co., Montreal, have sent us a very pretty picture which is the reproduction of a painting designed especially for them, the work of which was done by the Toronto Lithographing Co. We have also received one of their 1905 calendars, which will be sent free to any address.

The American Steam Pump Co., Battle Creek, Mich., have sent us an illustrated booklet having reference to the Marsh boiler feed pumps, manufactured by them, regarding which they say:—They are entirely self-contained, and the construction admits of a ready interchange of cylinders on either side, so that combinations suitable for any required duty may be made, or any part easily removed for inspection or repair. They are self-governing and cannot run away, race or pound should suction be broken from any cause. They use steam most economically, and will handle either cold or hot water of any temperature equally well. The steam valve mechanism, the most important and usually complex part, has been simplified to a single piece, without auxiliary appendages; it not only accomplishes all that other valves of multiple parts do (actuation), but also possesses the function of regulation, both as to piston speed and steam consumption. In construction only the very best of material and workmanship are employed throughout, and each pump is carefully tested at their factory before sending out, and is properly packed, ready to connect up and operate at once. They furnish full set of wrenches, drip cocks, sight-feed lubricator, and extra packing for water piston.

Messrs. Wm. Barber & Bros., paper manufacturers, Georgetown, Ont., have sent us their artistic calendar for 1905 entitled "The Historian."

The Westinghouse Electric & Mfg. Co., Pittsburg, Pa., have closed a contract with the United Railways & Electric Co., Baltimore, Md., for an alternating current generator to be rated at 5,000 kilowatts. It will be of the flywheel type, with 32

poles, and will run at 94 r.p.m. The generator will be wound for 13,000 volts, three-phase, with a frequency of 25 cycles. The 5,000 k.w. generator now on order is to have the same characteristics and to run in parallel with the five 2,000 k.w. generators which the Westinghouse Co. just finished installing in the Pratt Street Station in Baltimore.

PERSONALS.

The Nova Scotia Oil & Gas Co., Halifax, N.S., held their annual meeting last month and re-elected the directors. It has been arranged to have Professor Shuler, of Harvard University, visit the Cheverie oil field and make a report on its oil-bearing possibilities.

C. O. Granberg has become one of the staff of engineers of the Canadian Casualty & Boiler Insurance Co., Toronto.

Messrs. F. B. Fetherstonhaugh and A. F. Nathan, attorneys at law and solicitors of patents, have opened an office at 132 Nassau St., New York city.

Eugene F. Phillips, Providence, R.I., president of the Washburn Wire Co., and general manager of the American Electrical Works, died February 22, at the age of 61 years.

It is announced from Washington city that president Roosevelt has nominated Mr. Robert S. Chilton, jr., of Washington, to be consul at Toronto, of Mr. Chilton will succeed Mr. E. N. Gunsaulus, who has been American Consul here for the past four years. Mr. Chilton has for the past few years been chief of the Consular Bureau at Washington. He formerly had a consulate in Canada, and has risen rapidly in the service. His appointment to Toronto shows how this city has risen in importance from a Washington standpoint. Mr. Gunsaulus gets a promotion. He will leave here for the exceedingly important post of Consul at Cork, Ireland, which also embraces Queenstown, the landing-place of Atlantic steamers bound for Liverpool.

S. H. Moore, who has been connected with the sales department of the Bourne-Fuller Co., Cleveland, Ohio, has resigned to become treasurer of the Bodfield Belting Co., Cleveland, Ohio.

The Hamilton Cataract Power, Light & Traction Co. held their annual meeting March 6, when these officers and directors were re-elected:—Hon. J. M. Gibson, president; James Dixon, vice-president; J. R. Moodie, treasurer; W. C. Hawkins, secretary and general manager; John Dickenson, ex-M.P.P., J. W. Sutherland and J. A. Kammerer.

Messrs. Thomas Carlin's Sons Co., Allegheny, Pa., have elected Mr. Thomas McBride to be secretary of the company, to occupy position previously held by Mr. W. C. Scott.

E. U. Dickson, office manager and general purchasing agent of the Allis-Chalmers Co., Milwaukee, Wis., has resigned from that company, and will be associated with the Milwaukee Coke & Gas Co.

The annual meeting of the management,

heads of departments, and travelling salesmen of the Ontario Wind Engine & Pump Co., took place on February 20 and 21 at their Toronto office, when representatives of the company from all parts of the Dominion were present and matters of general interest and importance were taken up and discussed, and a most gratifying report was brought by all concerning the business done during the past year and prospects for the present one. The report of the Winnipeg, Man., branch was especially encouraging, considering the fact that this branch had only been in existence for some eight months, and the company were more than ever convinced that they had made no mistake in building a warehouse and making full provision for taking care of their trade in the West. On the afternoon of the 21st a session was held at the King Edward Hotel with a banquet following, at the conclusion of which the retiring sales manager, Mr. F. W. Monteith, was presented with a gold chain and locket by the company, also a roll top desk and chair, and by his fellow employees he was presented with a gold watch suitably engraved. The presentation was made by Mr. S. H. Chapman on behalf of the company, and by Mr. H. Alms on behalf of the employees.

The adjourned meeting of the Collingwood Shipbuilding Co. was held in Collingwood, Ont., a few days ago. The following were appointed temporary directors: A. McDougall, C. Cameron, H. M. Campbell, H. B. Smith, Thomas Long, E. R. Carpenter, W. A. Copeland, J. M. Hopkins and N. Dymont. At a subsequent meeting the directors appointed J. M. Hopkins president, Mr. McDougall vice-president, and Thomas Long secretary-treasurer. These gentlemen will hold office until the charter is obtained for the new company, when permanent directors will be appointed. The company have, within the past few months, spent about \$50,000 in plant. Their foundry and machine shops are now nearly completed. They have just closed a contract for a 500 h.p. compound Corliss engine for the Chatham flour mills.

The Board of directors of the Industrial Exhibition Association, Toronto, elected the following officers: Mr. W. K. McNaught, president; Mr. R. J. Score, first vice-president; Lieut-Col. McGillivray, second vice-president, and Messrs. W. K. George and H. R. Frankland, members of the Executive.

The annual meeting of Rhodes, Curry & Co., Amherst, N.S., was held recently. The officers were elected as follows: N. Curry, president; N. A. Rhodes, vice-president; J. M. Curry, secretary and treasurer; E. N. Rhodes, solicitor. The vacancy on the board of directors caused by the death of the late J. M. Townshend was filled by the appointment of J. R. Douglas. In addition to this Senator Mitchell, of Drummondville, and B. F. Pearson, M.L.A., of Halifax, were added to the board.

The Association of Ontario Land Surveyors closed their thirteenth annual meeting in Toronto a few days ago. Officers elected for, the ensuing year

were: President, J. W. Tyrroll, Hamilton; vice-president, Dr. Otto J. Klotz, Ottawa; secretary-treasurer, Captain Killally Gamble, Toronto; auditors W. A. McLean and L. V. Rorke, Toronto.

Charles M. Kittson, formerly of Montreal, who for the last three years has represented the Lake of the Woods Milling Co., in South Africa, has been appointed Canadian commercial agent there, to succeed J. S. Jardine, who recently resigned.

The sixth annual convention of the Canadian Forestry Association convened in the city of Quebec, March 9, holding a two days session. There were some sixty delegates present, including the following:—Mr. Aubrey White, Assistant Commissioner of Crown Lands for Ontario, president; Mr. E. G. Jolly de Lotbiniere, Quebec, vice-president; E. Stewart, Dominion Superintendent of Forestry, Toronto; Norman M. Ross, treasurer; R. D. Craig; R. H. Campbell, secretary; H. Wallin, Ottawa; Dr. C. A. Schenek, manager Vanderbilt Forest, Baltimore, N.C.; Prof. Filibert Roth, Ann Arbor, Mich.; Cal. F. Fox, New York; A. Knechtel, Albany, N.Y.; James Lemay, New Westminster, B.C.; F. W. Jones, Golden, B.C.; T. G. Loggie, Fredericton, N.B.; E. S. Welgrus, Orillia, Ont.; Wm. Little, Westmount, Que.; A. E. Alexander, Moncton, N.B.; Thomas Conant, Oshawa, Ont.; Rev. Father Emery, president Ottawa University; Hon. W. A. Weir, Montreal, manager Laflamme, Quebec; and others. The officers for the ensuing year were elected as follows:—Patron, His Excellency the Earl of Grey; honorary president, Wm. Little, Montreal; president, E. G. Joly de Lotbiniere, Quebec; vice-president, E. Stewart, Ottawa; secretary-treasurer, R. H. Campbell, Ottawa.

The annual meeting of the Canadian Rubber Co., Montreal, was held March 9. The old board of directors was re-elected, and the same officers will serve again. The directorate is as follows:—Sir Montague Allan, president; J. B. Learmont, vice-president; C. F. Smith, Lt.-Col. Henshaw, H. Markland Molson, Lt.-Col. Prevost, Hugh Allan, Andrew A. Allan, and Alfred Piddington. Dr. D. Lorne McGibbon, general manager.

Mr. W. G. VanWinckel and Mr. W. J. Robertson, who have been connected with the Canadian Typewriter Co., ever since its inception, have disposed of their interests in that company, and have purchased the business of the National Typewriter Co., Ltd., general dealers for the Province of Ontario, for the Smith Premier Typewriter, with offices at 75 Victoria Street, Toronto.

At the annual meeting of the Canadian Mining Institute, which was held at Montreal, March 2 and 3, the following officers were chosen for the ensuing year:—President, George R. Smith, M. L. A., Bell Asbestos Co., Thetford Mines, Que.; vice-president, Thomas Cantley, Nova Scotia Steel & Coal Co., New Glasgow, N.S.; Dr. W. L. Goodwin, director school of Mining, Kingston, Ont.; Dr. Frank D. Adams, McGill University, Montreal; secretary, H. Morton Lamb,

Victoria, B.C.; treasurer, J. Stevenson Brown, Montreal; for council for Nova Scotia, W. B. Robb, Robb Engineering Co., Amherst, N.S.; Charles J. Coll, Acadia Coal Co., Stellarton, N.S.; C. A. Meissner, mining engineer, Sydney, N.S.; Quebec, J. Obalski, inspector of mines, Quebec city; H. T. Hopper, Montreal; Harry J. Williams, Asbestos & Asbestic Co., Danville, Que.; Ontario, Dr. A. E. Barlow, Geological Survey, Ottawa; A. B. Willmott, Algoma Commercial Co., Saulte Ste. Marie, Ont.; British Columbia, R. R. Hedley, Hall Mining & Smelting Co., Nelson, B.C.

THE TEMISKAMING COMMISSIONERS.

Three, instead of five gentlemen, now form the membership of the Temiskaming Railway Commission, as constituted under the Whitney Government. The names have been announced in The Ontario Gazette, and are as follows:

Cecil B. Smith, of the city of Toronto, in the room and stead of Robert Jaffray, resigned;

Dennis Murphy, of the city of Ottawa, in the room and stead of Edward Gurnoy, resigned;

Jacob L. Englehart, of the town of Petrolia, Ont., in the room and stead of F. S. Leonard, resigned.

Mr. Smith, who was selected primarily because of his professional knowledge of engineering, was formerly roadways engineer under the City Engineer, and left that post to accept full charge of the large contracting works of Mr. M. P. Davis, of Ottawa. He superintended all the masonry construction for the new Quebec bridge, and had charge of the contract for the works of the Canadian Niagara Power Co., at Niagara Falls. He is regarded as one of the most expert practical engineers in the profession, and his advice on the Commission will be of very great value.

Mr. Dennis Murphy is a prosperous business man of Ottawa, who was Conservative candidate in the recent Provincial contest, but met defeat.

Mr. Englehart, who is from Hon. Mr. Hanna's constituency, is a gentleman of large fortune, and has a wide experience in the conduct of affairs.

A CANADIAN CEMENT FACTORY.

The plant and surroundings of the International Portland Cement Co., at Hull, Que., is described as being one of the largest and most thoroughly complete establishments on this continent.

The location may be regarded as an ideal one for the manufacture and shipment of cement. The two raw materials—rock and clay—lie side by side upon the company's property, and the mill is located where they meet, so that the clay is brought into one side and the rock on the other.

Two lines of railway, the Canadian Pacific and the Ottawa Northern & Western, cross within a hundred yards of the mill. The plant has also the advantage of shipment by water, being located on the shore of Leamy Lake, from which a canal leads to the Gatineau river near its con-

fluence with the Ottawa. From the Ottawa, barges reach Montreal and Quebec via the Ottawa and St. Lawrence rivers, while the Rideau canal affords direct communication with Kingston and other lake ports.

The power for the operation of the plant is obtained from the Chaudiere Falls, and is transmitted to the factory as a three-phase alternating current at 10,000 volts, where step-down transformers reduce the pressure to 600 volts for the operation of induction motors. The plant comprises twenty buildings in all, covering about eleven acres, and has a capacity of over 2,000 barrels of cement per day.

The kiln building, the clinker storage, the clinker building, the cement warehouse and the coal-drying and grinding buildings are of steel, while the buildings for the preparation of the rock and clay are of wood. The walls of most of the buildings are of hollow cement blocks to a height of about eight feet, above which they are of cement plaster on expanded metal.

The machine shop, blacksmith shop, store-room, transformer house and the chemical laboratory are built entirely of hollow cement blocks; the clay storage, rock storage, air compressor house and clinker storage have heavy walls of stone, and the pumping station situated near the lake has walls of monolithic concrete. There are many ingenious and valuable devices introduced by the engineers who designed the plant to increase the economy and efficiency of the operation of manufacture to the highest degree. The coal, if brought in by rail, will be dumped directly into a large toothed-roll crusher under the track; if it is brought by canal boats it will be carried by a system of conveyors to the same point, and discharged into the crushers. From the crusher it drops into a bucket conveyor which deposits in the storage building, which has a capacity of 15,000 tons. From the storage the coal is carried to the dryers, which are similar in construction to those for rock, by a bucket conveyor running through a tunnel under the storage building.

A notable feature of this development is the utilization of waste heat from the clinker for drying the coal, a process that is usually an expensive one. Apparatus for regulating the amount of coal dust supplied and the blast of air according to the requirements of the kilns.

The plant is equipped with a complete fire protection system, having 700-gallon turbine pumps directly connected to induction motors which deliver water to an eight-inch main, which is supplied with twenty of the latest improved Fairbanks' hydrants. A branch from the main line supplies water to a 50,000-gallon tank elevated on a 77-foot tower. The power throughout the plant is supplied by induction motors, of which there are 57, ranging from five to one hundred and fifty horse-power. This large number of motors is due to the fact that all machines requiring large power and some of the smaller machines, when at a considerable distance from others, are provided with separate motor drives. Only groups of machines which must always be oper-

ated together (as a system of conveyers and elevators), are driven from one motor. This arrangement greatly simplifies the distribution of the power, and makes possible a more convenient and economical arrangement of the machinery than would be practicable if the driving were done from a few main lines of shafting. Perhaps the most notable feature of this fine mill, to one familiar with older types of cement factories is this convenience of arrangement with reference to the passage of the material through the different processes.

The valves, hydrants, cement testers and scales were furnished by the Fairbanks Co., Montreal, who also supplied much of the equipment for the machine shop and forges. The electrical equipment was by the Canadian General Electric Co., Toronto. The elevating and conveying machinery was purchased of the John A. Mead Mfg. Co., the Link Belt Engineering Co., Philadelphia, Pa., the Jeffrey Mfg. Co., Columbus, Ohio, and the Stevens & Adamson Co.

The engineers to whom the credit is given for the designing and construction of this magnificent and successful work, are Mr. Arthur C. Tagge, of Detroit, Mich., and Md. R. D. Hassan, of Cleveland, Ohio.

THE CANADIAN CANALS CORPORATION.

A deputation, consisting of Mr. J. D. Allan, president of the Toronto Board of Trade, Col. J. I. Davidson and Mr. R. C.

Steele, of Toronto, and Mr. H. C. Spalding of New York, have attended in Ottawa in connection with the third reading of the bill granting a charter to the "Canadian Canal Corporation," which proposes to build a ship canal from Georgian Bay to Toronto.

Mr. Spalding, the promoter of the company, who is an eminent engineer, having superintended the construction of large works, particularly in Russia, has prepared a statement regarding the engineering details of the scheme:

"The waterways will consist of two divisions.

"The first division will be sixteen miles long, and will extend from Matchedash Bay to Lake Couchiching, a northern extension of Lake Simcoe.

"This division will include a portage about five-sixths of a mile in length, whereon by means of a marine railway ships of the largest class can be raised or lowered by water power through a lift of 131 feet, the difference in level between the bay and lake. Thence the route would be through these two lakes for a distance of about twenty-five miles to the Holland River, which flows into the southern end of Lake Simcoe. By deepening and straightening this river for five miles we come to Oak Ridges, which is the divide between Lake Simcoe and Lake Ontario.

"The entire length of the southern division, including canal and river, will be about thirty-one miles, making the total length of the artificial railways about forty-two miles. Only twelve

miles of the whole will have to be cut in solid earth.

"The southern division will have two portages to make the descent from Lake Simcoe to Lake Ontario, each about 233 feet lift, and each about a mile long. These will be worked by water power.

"There will be nine tracks under each carriage on each of the three short portages upon this route, but there will be two sets of nine each, making eighteen tracks, for the support of the two carriages upon the single portage of the Nottawasaga route."

Mr. Spalding holds a number of patents for a sort of marine railway which he proposes to build on the southern division of the canal.

The authorities of the city of Toronto will probably oppose the passage of the bill for the incorporation of the company.

A new system of electric clocks has been installed in the university buildings, by which the visits of the night watchman are recorded. A regular patrol has been made previously, but by the new distribution of clocks the underwriters are assured that the buildings are being systematically visited at night. The circuit includes the main building, the gymnasium, library, and the medical, biological and chemical buildings.—Toronto Globe.

The clocks above referred to are manufactured by the Eco Magneto Clock Co., Boston, Mass.

TO THE VARNISH BUYER

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A GIANT MACHINE.

There has been put into successful operation at the sub-station of the Shawinigan Water & Power Co., in Maisonneuve, the largest machine of the kind ever built, says the Montreal Gazette. It is known as a "Frequency Changer," and was manufactured by the Bullock Electric Mfg. Co., of Cincinnati, Ohio. The current as it comes over the transmission line from Shawinigan Falls, is 30 cycles, and it is necessary to change this to 60 cycles, for the use of the city lighting and power mains. That is the work of this gigantic machinery.

The Frequency Changer consists of a synchronous motor, directly connected to a generator and a starting motor, all on the same shaft, and mounted on the same base. The starter is an induction motor, specially designed to give a heavy starting torque. As a general thing the rheostats are mounted on the switchboard, but in this case they are so large that this course was impossible, and they

have been placed in a separate room and are operated by a separate motor, and controlled from switchboards. The exciter set consists of a 200 k. w. 120 volt, direct current generator, which supplies direct current to the field of the frequency changer, directly connected to a 300 h.p. induction motor of 400 revolutions, the latter built by Allis-Chalmers-Bullock, Ltd., Montreal.

A few figures will show the enormous size of this machinery. The total length of the frequency changer is 30 feet, and the motor and the generator are each 15 feet high. The total weight is 500,000 lbs., or 250 tons. The middle pedestal alone weighs 34,000 lbs., or 17 tons. The motor has 10 poles, each weighing 2,200 lbs., and the generator 20 poles, each weighing 1,300 lbs. These poles aggregating 48,000 lbs., or 24 tons, revolve at 300 revolutions a minute. The motor rotar weighs 72,560 lbs., or over 36 tons, and the generator rotar 76,700 lbs., or over 33 tons. The section of the shaft between the two, weighs 12,000 lbs., or

6 tons. The bottom half of the motor stator weighs 54,000 lbs., or 27 tons, and the bottom half of the generator stator 42,000 lbs., or 21 tons. Nine railway cars were required to transfer the material. The set composed of a 7,500 h.p. motor driving a 5,300 k.w. generator, approximates 14,600 h.p. It is interesting to note that there are really two transformations in the work of the machine, namely—from electrical to mechanical energy, and back again to electrical energy suitable for the city. These two transformations are effected with a loss of less than 10 per cent. showing that the design was good, the construction adequate and the material of the best selection. There were already in the station five smaller 1,000 k.w. frequency changers so that the capacity of the station is now doubled.

The work of erecting this heavy machine, which was in charge of Mr. Thos. J. Mullen, superintendent of construction, of Allis-Chalmers-Bullock, Ltd., presented unusual difficulties. As the crane

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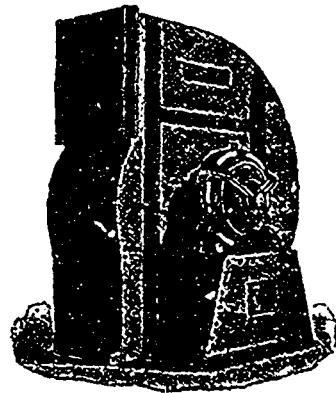
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in the station was only 15 tons capacity, the heavier parts were all raised and lowered by means of jack screws. Part of the end of the building was taken down, and a runaway was built from the railway to the foundation beds, and the machinery was brought in on rollers. The whole work was accomplished without mishap in 31 days.

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PATENTS GRANTED.

Below will be found a list of Canadian patents recently secured through the agency of Messrs. Marion & Marion, Patent Attorneys, Montreal, and Washington, D.C.

Information regarding any of the pat-

ents cited will be supplied free of charge by applying to the above named firm.

Henry Lambert, Inchbrook, England, self-locking nut; Nicholas A. Smallman, Fort Covington, N.Y., improvement in harness; Claude Boucher, Cognac, France, machine for making glass bottles; Joseph Antoine Gagnon, Chambly Basin, Que., heating apparatus; George A. McKay, Burnbank, Man., spring draft attachment for plows.

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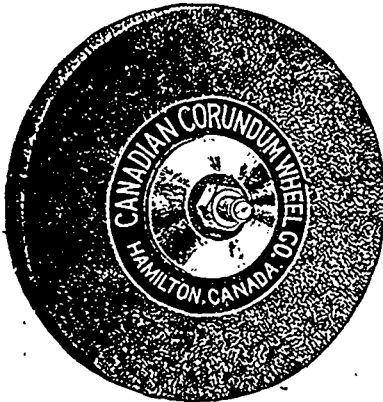
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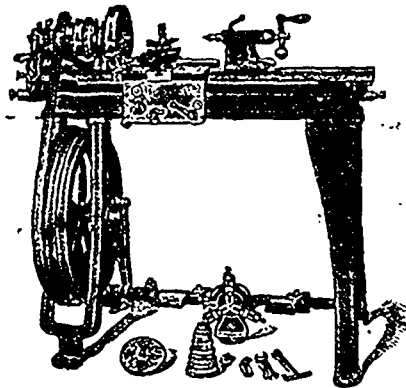
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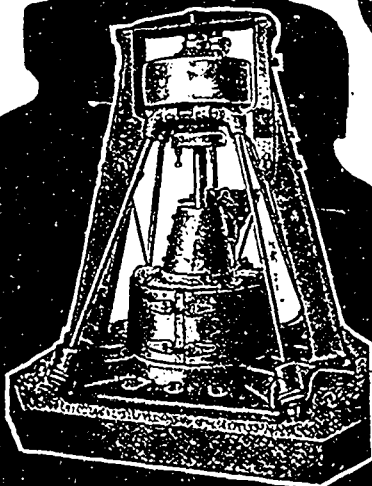
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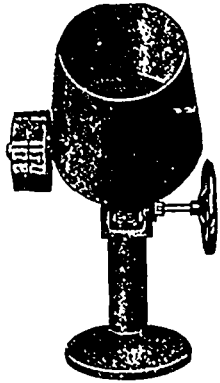
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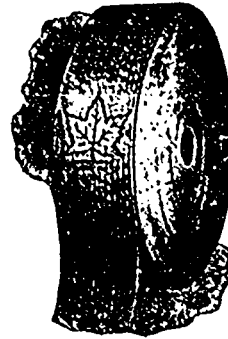


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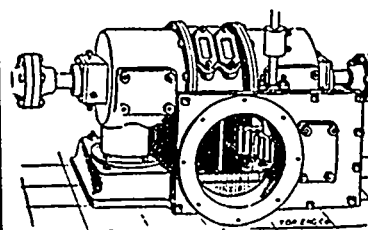
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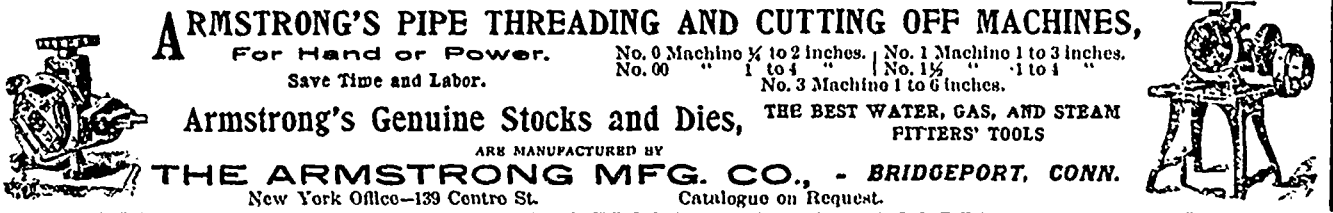
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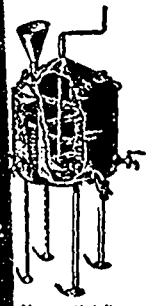
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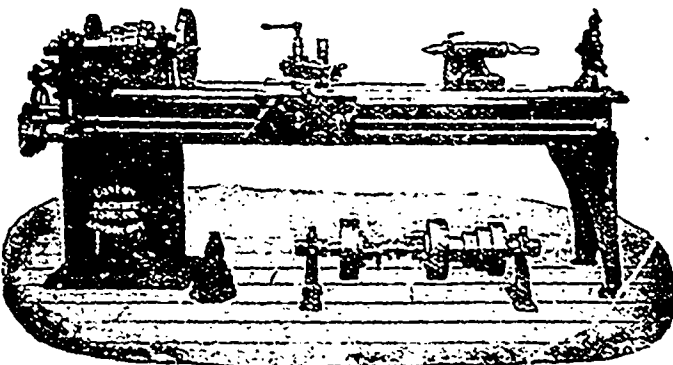
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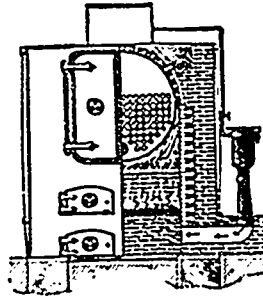
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3. Steam Boiler Furnaces.

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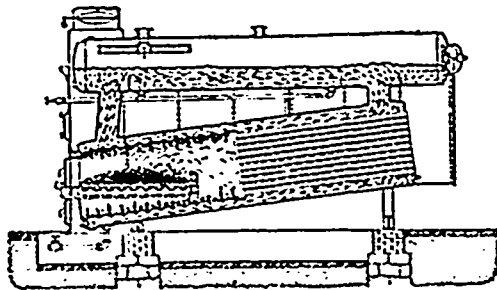
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WATSON JACK & COMPANY, Bell Telephone Bldg., Montreal
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CLASSIFIED INDEX.

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

Air Compressors

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

Aluminum

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

Angles, Beams and Girders

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

Aniline Colors and Dyewood Extracts

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

Annealing Muffles and Furnaces (Wire)

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

Antimony

Syracuse Smelting Works, Montreal.

Anvils and Vises

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

Architects

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

Automatic Gear Cutting Machines

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

Axles

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

Babbitt Metal

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

Banks

Bank of Hamilton, Hamilton, Ont.

Bar Iron and Steel

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

Belt Dressing

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

Belt Fasteners

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

Belting (Cotton)

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

Belting (Leather)

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

Belting (Rubber)

Greay Wm. & J. G., Toronto.
Gutta Percha & Rubber Mfg. Co., Toronto.
McLaren, D. K., Montreal and Toronto.
McLaren, J. C. Belting Co., Montreal.
Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.

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Belting and Supplies

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

Blas Furnace Brick

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

Blowers

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

Boiler Compounds

Canada Chemical Mfg. Co., London, Ont.

Boiler Inspection

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

BOILERS (See Engines and Boilers)

Brass Foundries

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

Brick and Bricklaying Machinery

Allis-Chalmers-Bullock, Limited, Montreal.

Building and Paving Brick

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

Building Iron and Steel

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

Builders' Materials

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

Cables

Dominion Wire Rope Co., Montreal.
 Greening, B. Wire Co., Hamilton, Ont.
 Phelps, Eugene F. Electrical Works, Montreal.
 Wire & Cable Co., Montreal.

Canada Plates

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

Canoes

Peterborough Canoe Co., Peterborough, Ont.

Caps

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Card Clothing

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

Cast Iron Pipe

Canada Foundry Co., Toronto.
 Rice Lewis & Son, Toronto.
 Montreal Pipe Foundry Co., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.

Castings (Iron and Brass)

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

Cement Machinery

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

Chain Making Machinery (Welded Coil Chain)

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

Channels

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

Charcoal Pig Iron

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

Chemists

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

Clay Working Machinery

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

Coal and Coke

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

Coal Cutting Machines

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

Coal Triples

Jeffrey Mfg. Co., Columbus, Ohio.

Coil Chains

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

Coke Oven Brick

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

Collection Agency

Petrie, H. D., Hamilton, Ont.

Concrete Mixers

Hopkins, F. H. & Co., Montreal.

Contractors' Machinery

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

Contractor's Plants

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

Conveying Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
 Babcock & Wilcox, Limited, Montreal.
 Borden & Selock Co., Chicago, Ill.
 Canada Foundry Co., Toronto.
 Greer, Wm. & J. G., Toronto.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Link-Belt Engineering Co., Philadelphia, Pa.
 McDougall, John, Caledonian Iron Works Co., Montreal.

Petrie, William R. & Co., Limited, Toronto.
 Pittsburgh Shafting Co., Detroit, Mich.
 Rosendale Belting Co., Toronto.

Copper Materials

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

Corundum Wheels

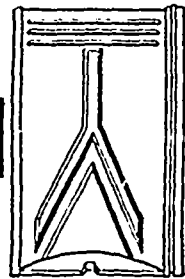
Canadian Corundum Wheel Co., Hamilton, Ont.
 Rice Lewis & Son, Toronto.

Cotton Banding and Rope

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

Covers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.
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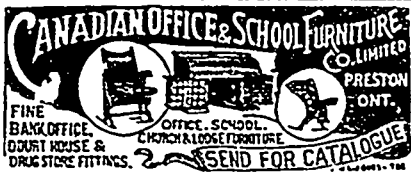
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 Lowell Crayon Co., Lowell, Mass.

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

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

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

Cutter Grinding Machines
 Becker-Brainard Milling Machine Co., Hyde Park, Mass.

Decalcomania
 Meyercood Co., Chicago, Ill.

Deep Well Engines
 American Steam Pump Co., Battle Creek, Mich.

Detective Agency
 Dewar Detective Agency, St. Louis, Mo.

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

Directories
 Kelly's Directories, Limited, Toronto.

Draw Benches (Wire)
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Drills
 Allis-Chalmers-Bullock, Limited, Montreal.
 Barnes, B. F. Co., Rockford, Ill.
 Canada Machinery Co., Sarnia, Ont.
 Canadian Westinghouse Co., Ltd., Hamilton, Ont.
 London Machine Tool Co., London, Ont.
 Petrie, H. W., Toronto.
 Pittsburgh Shafting Co., Detroit, Mich.

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

Drills (Twist)
 Pittsburgh Shafting Co., Detroit, Mich.

Drop Forgings
 Globe Machine & Stamping Co., Cleveland, Ohio.

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

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

Dust and Shavings Separators
 Sheldon & Sheldon, Galt, Ont.
 Sturtevant, B. F. Co., Boston, Mass.

Dye Stuffs and Chemicals
 Bellhouse, Dillon & Co., Montreal.
 Benson, W. T. & Co., Montreal.
 Brunner, Mond & Co., Northwich, England.
 Canada Chemical Mfg. Co., London, Ont.
 Cassella Color Co., New York City.
 Geigy Aniline & Extract Co., New York City.
 McArthur, Corneille & Co., Montreal.
 Nicholls Chemical Co., Montreal.
 Winn & Holland, Montreal.

DYNAMOS (See Motors and Dynamos)

Electric Meters and Transformers
 Allis-Chalmers-Bullock, Limited, Montreal.
 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
 Volta Electric Repair Works, Toronto.

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

Elevators and Conveyors
 Allis-Chalmers-Bullock, Limited, Montreal.
 Canadian Otis Elevator Co., Toronto.
 Darling Bros., Montreal.
 Greyc, Wm. & J. G., Toronto.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Link-Belt Engineering Co., Philadelphia, Pa.

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

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

Engineers (Chemical)
 Heys, Thomas & Son, Toronto.
 Hunt, Robert W. & Co., Chicago, Ill.

Engineers (Civil)
 DeLano-Osborn Engineering Co., Toronto.
 Parke, R. J., Toronto.
 Vogel, C. H., Ottawa.

Engineers (Consulting)
 Aitken, K. L., Toronto.
 DeLano-Osborn Engineering Co., Toronto.
 Electrical Construction Co., London, Ont.
 Hunt, Robert W. & Co., Chicago, Ill.
 Keystone Engineering Co., Toronto, Ont.
 Marion & Marion, Montreal.
 Parke, R. J., Toronto.
 Ferrin, William R. & Co., Limited, Toronto.
 Simpson, T. T., Deschenes, Que.
 Vogel, C. H., Ottawa.
 Volta Electric Repair Works, Toronto.
 Von der Osten, E. & Co., Toronto.

Engineers (Contracting)
 Babcock & Wilcox, Limited, Montreal.
 Canada Foundry Co., Toronto.
 Darling Bros., Montreal.
 Electrical Construction Co., London, Ont.
 Keystone Engineering Co., Toronto, Ont.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Robb Engineering Co., Amherst, N.S.

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

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 Allis-Chalmers-Bullock, Limited, Montreal.
 Babcock & Wilcox, Limited, Montreal.
 Borden & Selleck Co., Chicago, Ill.
 Darling Bros., Montreal.
 DeLano-Osborn Engineering Co., Toronto.
 Electrical Construction Co., London, Ont.
 Greyc, Wm. & J. G., Toronto.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Hunt, Robert W. & Co., Chicago, Ill.
 Kerr Engine Co., Waukeville, Ont.
 Marion & Marion, Montreal.
 Robb Engineering Co., Amherst, N.S.
 Sheldon & Sheldon, Galt, Ont.

Engineers (Mill and Hydraulic)
 DeLano-Osborn Engineering Co., Toronto.
 Hawksworth, Alfred, Montreal.
 Vogel, C. H., Ottawa.

Engineers (Mining)
 Heys, Thomas & Son, Toronto.
 Mills, S. D., Toronto.

Engineers (Municipal)
 Von der Osten, E. & Co., Toronto.

Engineers and Contractors
 Jeffrey Mfg. Co., Columbus, Ohio.

Engines and Boilers
 Allis-Chalmers-Bullock, Limited, Montreal.
 Babcock & Wilcox, Limited, Montreal.
 Bertram Engine Works Co., Toronto.
 Canada Foundry Co., Toronto.
 Canadian Heino Safety Boiler Co., Toronto.
 Corbett, R. B., Brooklyn, N.Y.
 Goldie & McCulloch Co., Galt, Ont.
 Hamilton, Wm. Mfg. Co., Peterborough, Ont.
 Hopkins, F. H. & Co., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.

McEachern Heating & Ventilating Co., Galt, Ont.
 Petrie, H. W., Toronto.
 Pittsburgh Shafting Co., Detroit, Mich.
 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. I., Engraving Co., Toronto.

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

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

Exhausters
Schutte & Koerting Co., Philadelphia, Pa.

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

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

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

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

Fillet (Pattern)
McLaren, J. C. Belting Co., Montreal.

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

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

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

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

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

Flour Mill Machinery
Goldie & McCulloch Co., Galt, Ont.
Grey, Wm. & J. G., Toronto

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

Founders
Canada Foundry Co., Toronto.
Cowan & Co., Galt, Ont.
Goldie & McCulloch Co., Galt, Ont.
Grey, Wm. & J. G., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.

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

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

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

Galvanizing
Ontario Wind Engine & Pump Co., Toronto.

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

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

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

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

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

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

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

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

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

Government Notices
Factory Inspectors.
Minister of Agriculture.

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

Grease Cups
Penberthy Injector Co., Windsor, Ont.

Grinding Machinery
Canadian Corundum Wheel Co., Hamilton, Ont.
Grey, Wm. & J. G., Toronto.

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

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

Holisting Engines
Bertram Engine Works Co., Toronto.

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

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

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

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

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

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

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

Insulated Wires and Cables
Phillips, Eugene F., Electrical Works, Montreal.
Wire & Cable Co., Montreal.

Iron and Steel Specialties
Armstrong Mfg. Co., Bridgeport, Conn.
Bourne-Fuller Co., Cleveland, Ohio.
Brown & Co., Paris, Ont.
Canada Foundry Co., Toronto.
Leslie, A. G. & Co., Montreal.
London Rolling Mill Co., London, Ont.
Lysaght, John, Limited, Bristol, England and Montreal.
Meadows, Geo. B., Wire, Iron & Brass Works Co., Toronto.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.
Rice Lewis & Son, Toronto.
Ryall Machine Screw Co., Montreal.

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

Iron and Steel Inspection
Hunt, R. W. & Co., Chicago, Ill.

Dominion Oil Cloth Co.

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Carriage Oil-Cloth, Enamelled
Oil-Cloth, Stair Oil-Cloth, etc.

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Vancouver, B.C.	Winnipeg, Man.

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the United States and Canada, and
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PUBLISHER
DEPOSIT, N. Y.**

CLASSIFIED INDEX.

(CONTINUED).

Lamps—Electric

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

Lathes

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

Lathes (Wood-working)

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

Loom Reeds.

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

Lubricators

Penberthy Injector Co., Windsor, Ont.

Machinists

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

Machinists' Supplies

Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Rock Island, Que.
Canada Machinery Co., Sarnia, Ont.
Goldie & McCulloch Co., Galt, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hopkins, F. H. & Co., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
London Machine Tool Co., London, Ont.
Morrow, John, Machine Screw Co., Ingersoll, Ont.
Petrie, H. W., Toronto.
Pittsburgh Shafting Co., Detroit, Mich.
Ryall Machine Screw Co., Montreal.
Worth & Martin, Toronto.

Machine Tools

Barnes, B. F. Co., Rockford, Ill.
Becker-Brainard Milling Machine Co., Hyde Park,
Mass.
Canada Machinery Co., Sarnia, Ont.
Cowdrey, C. H. Machine Works, Fitchburg, Mass.
Darling Bros., Montreal.
London Machine Tool Co., London, Ont.
Petrie, H. W., Toronto.

Machinery Repairs

Bertram Engine Works Co., Toronto
Greedy, Wm. & J. G., Toronto.

Malleable Iron Castings

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

**Marine and Stationary Engines and
Bollers**

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

Mechanical Draft

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

Metal Gates

Page Wire Fence Co., Walkerville, Ont.

Metal Stamping

Globe Machine & Stamping Co., Cleveland, Ohio.

Metallurgists

Mills, S. D., Toronto.

Mill Machinery and Supplies

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

Darling Bros., Montreal.

Fleming, W. A. & Co., Montreal.

Gartshore, John J., Toronto.

Goldie & McCulloch Co., Galt, Ont.

Greedy, Wm. & J. G., Toronto.

Gutta Percha & Rubber Mfg. Co., Toronto.

Hamilton Brass Mfg. Co., Hamilton, Ont.

Hamilton, Wm. Mfg. Co., Peterborough, Ont.

Hawksworth, Alfred, Montreal.

Hay, Peter Knife Co., Galt, Ont.

Hopkins, F. H. & Co., Montreal.

Jeffrey Mfg. Co., Columbus, Ohio.

London Machine Tool Co., London, Ont.

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

McDougall, John, Caledonian Iron Works Co., Mont-
real.

McLaren, D. K., Montreal and Toronto.

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

Milling Cutters and Machines

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

Miners' Lamps

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

Mining Machinery

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

Motors and Dynamos

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

Moulding Sand

Hamilton, Facing Mills Co., Hamilton, Ont.

Nickel

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

Novelty Manufacturers

Worth & Martin, Toronto.

Nozzles

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

Office and Bank Fittings

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

Oils and Lubricants

Dixon, Jos. Crucible Co., Jersey City, N.J.
Fleming, W. A. & Co., Montreal.
Imperial Oil Co., Petros, Ont.
Queen City Oil Co., Toronto.

Oil Cloth

Dominion Oil Cloth Co., Montreal.

Oil Cups

Penberthy Injector Co., Windsor, Ont.

Paints and Colors

Bellhouse, Dillon & Co., Montreal.
Berry Bros., Walkerville, Ont.
Fleming, W. A. & Co., Montreal.
Geigy, Aniline & Extract Co., New York City.
McArthur, Cornelle & Co., Montreal.

Paper Manufacturers

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

Patents

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

Perforated Metals

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

Personal Accident

Canadian Casualty & Boiler Insurance Co., Toronto

Phosphorizers

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

Pig Iron

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

Pipe (Riveted, Iron and Steel)

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

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(CONTINUED).

Pipe Threading Machines

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

Pipes and Tubes

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

Plaster

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

Plates

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

Plumbago

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

Pneumatic Tools

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

Pointer Rolls (For Rods and Wire)

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

Portland Cement

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

Power Plants—Equipments

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Corbett, R. B., Brooklyn, N.Y.
Darling Bros., Montreal.
DeLano-Osborn Engineering Co., Toronto.
Electrical Construction Co., London, Ont.
Goldie & McCulloch, Galt, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.

Pekard Electric Co., St. Catharines, Ont.
Permo, William R. & Co., Limited, Toronto.
Petric, H. W., Toronto.
Phillips, Eugene F., Electrical Works, Montreal.
Pittsburgh Shafting Co., Detroit, Mich.
Ebb Engineering Co., Amherst, N.S.
Sartreval, B. F. Co., Boston, Mass.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.
Wilson, J. C. & Co., Glencora, Ont.

Presses (Tire, Sewer Pipe, Nozzles and Sleeves)

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

Pulleys

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

Pumps and Pumping Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
American Steam Pump Co., Battle Creek, Mich.
Canada Foundry Co., Toronto.
Corbett, R. B., Brooklyn, N.Y.
Darling Bros., Montreal.
Downing Pump Co., Downsville, Pa.
Eddie & McCulloch Co., Galt, Ont.
Fair Engine Co., Walkerville, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
Ewart Wind Engine & Pump Co., Toronto.
Petric, H. W., Toronto.
Schutte & Koerting Co., Philadelphia, Pa.

Punches and Shears

Canada Machinery Co., Sarnia, Ont.
Ebb Machine & Stamping Co., Cleveland, Ohio.
Petric, H. W., Toronto.

Purifiers

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

Purifying and Softening Systems (Water)

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

Railroads

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

Railway Supplies

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

Reamers

Butterfield & Co., Rock Island, Que.

Rivets

Bourne-Fuller Co., Cleveland, Ohio.

Rock and Ore Crushers

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

Roller Bearings

Pittsburg Shafting Co., Detroit, Mich.

Rolling Mill Engineers

Bourne-Fuller Co., Cleveland, Ohio.

Roofing

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

Rubber Goods

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

Rubber Packing

Gutta Percha & Rubber Mfg. Co., Toronto.

Rubber Washing Tubs

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

Rural Mail Boxes

Globe Machine & Stamping Co., Cleveland, Ohio.

Safes and Vaults

Goldie & McCulloch Co., Galt, Ont.

Screws

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

Screw Plates

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

Shafting

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

Shapers and Carvers

Advance Machinery Co., Toledo, Ohio.

Shear Knives

Hay, Peter Knife Co., Galt, Ont.

Sheets (Iron and Steel)

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

Sheet Metal Goods

Globe Machine & Stamping Co., Cleveland, Ohio.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Sheet Metal Stamping

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

Ship Builders

Bertram Engine Works Co., Toronto.

Smoke Stacks

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

Solder

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

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CLASSIFIED INDEX.

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Special Machinery

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

Speed Recorders

Bristol Co., Waterbury, Conn.

Sprinkler Insurance

Canadian Casualty & Boiler Insurance Co., Toronto.

Stamps and Stencils

Globe Machine & Stamping Co., Cleveland, Ohio.

Steam Pumps

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

Steam Separators

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

Steam Specialties

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

Steam Valves

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

Steel and Composite Ships

Bertram Engine Works Co., Toronto.

Steel Rails

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

Steel Shafting

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

Stocks and Dies

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

Stoppers

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

Structural Steel

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

Sulphur Furnace

Schutte & Koerting Co., Philadelphia, Pa.

Suspension Furnaces

Continental Iron Works Co., New York City.

Tanks (Oil and Water)

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

Taps and Dies

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

Tees

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

Textile Manufacturers

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

Textile Supplies

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

Thermometers (Recording)

Bristol Co., Waterbury, Conn.

Tin

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

Tool Grinders

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

Tool Steel

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

Transfer Ornaments

Meyercord Co., Chicago, Ill.

Trucks

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

Trucks (Railway)

Canada Foundry Co., Toronto.

Trucks (Wire Mill Supplies)

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

Tubs (Cleaning and Coating Wire)

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

Tugs

Bertram Engine Works Co., Toronto.

Tumbling Barrels

Globe Machine & Stamping Co., Cleveland, Ohio.

Turbines

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

Typewriters and Supplies

United Typewriter Co., Toronto.

Valves

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

Valves (Rubber)

Gutta Percha & Rubber Mfg. Co. Toronto.

Varnishes

Berry Bros., Walkerville, Ont.

Ventilators

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

Wagon and Carriage Wood Work

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

Washers or Hollinders (Cleaning Rubber)

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

Water Power Development

Vogel, C. H., Ottawa.

Water Purifying Chemicals

Canada Chemical Mfg. Co., London, Ont.

Windmills

Ontario Wind Engine & Pump Co., Toronto.

Wire Mill Supplies

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

Wire and Wire Rope

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

Wire Rope Fittings

Dominion Wire Rope Co., Montreal.

Wire Cloth

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

Wire Drawing Machinery

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

Wire Fencing and Netting

Page Wire Fence Co., Walkerville, Ont.

Wire Specialties

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

Wood-Working Machinery

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

Yachts

Bertram Engine Works Co., Toronto.

Zinc

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

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