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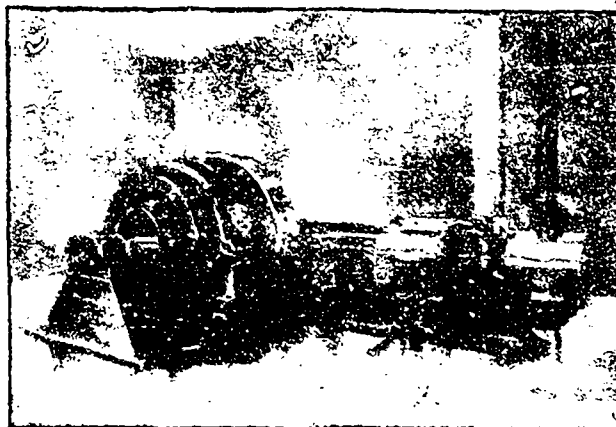
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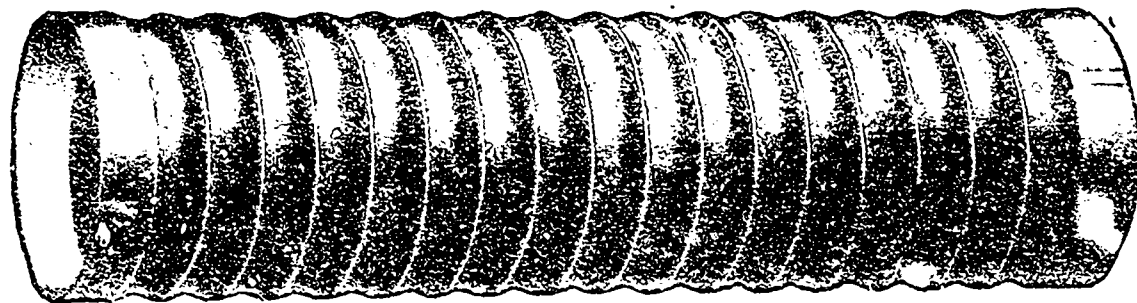
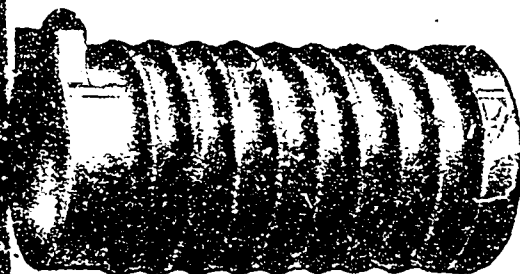
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With Plain Ends or Flanged to any required shape.

Uniform Thickness, Easily Cleaned, Unexcelled for Strength, Unsurpassed for Steaming Capacity.

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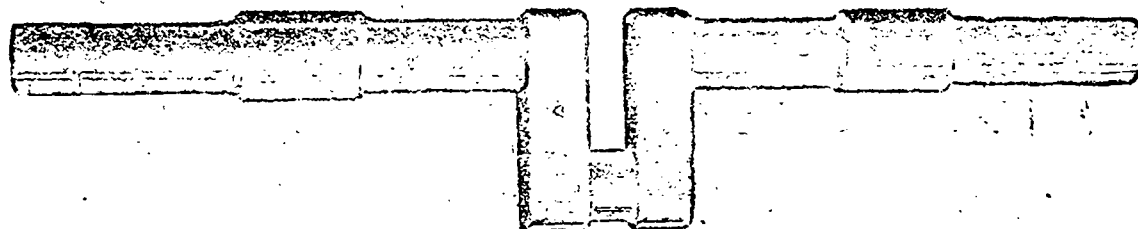
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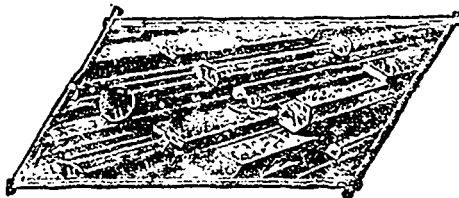
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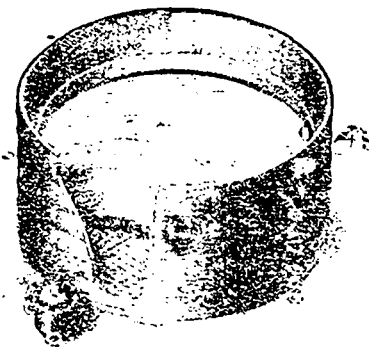
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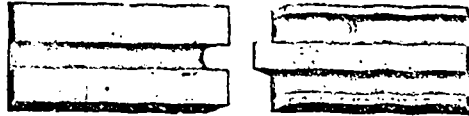
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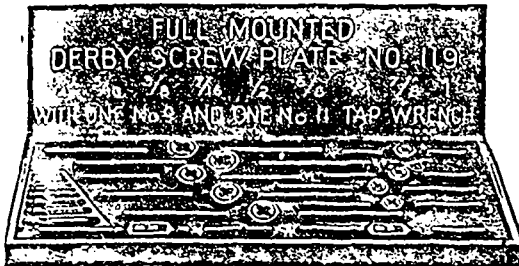
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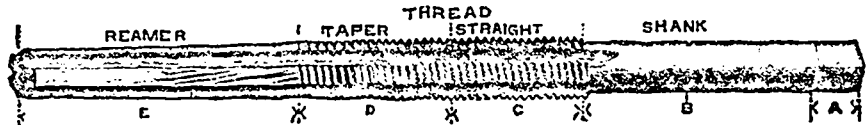
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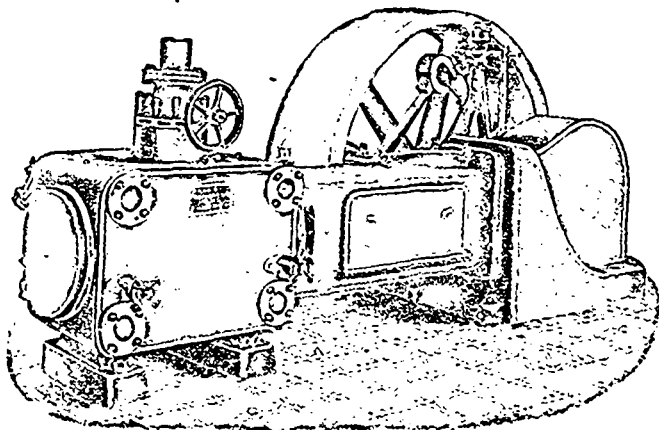
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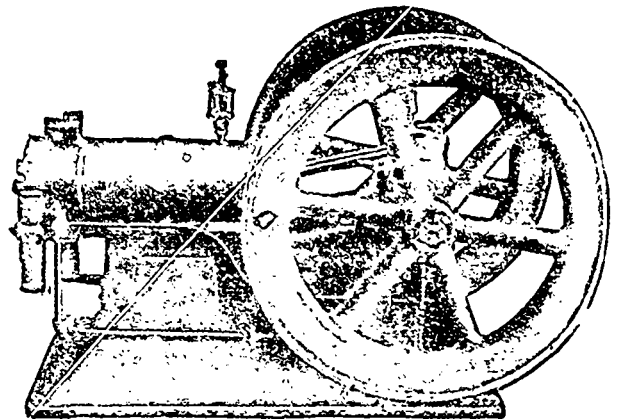
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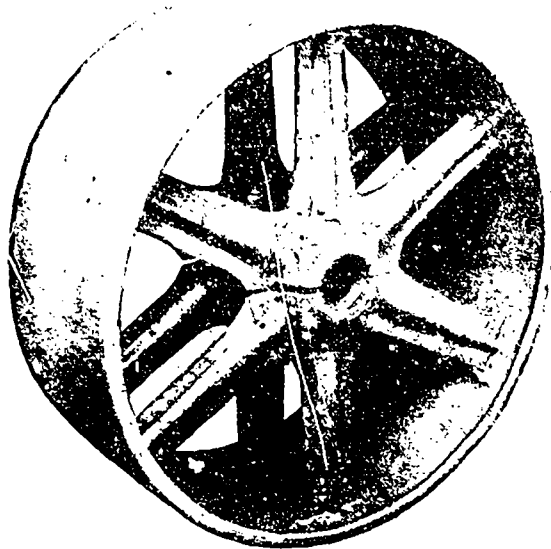
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We do not guarantee our engines to do "a little more than their rating," but we do guarantee them to work up to their full rating.

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Made entirely from pressed steel with single, double, triple or quadruple arms to suit width of belt, made in sizes up to 84 inches diameter

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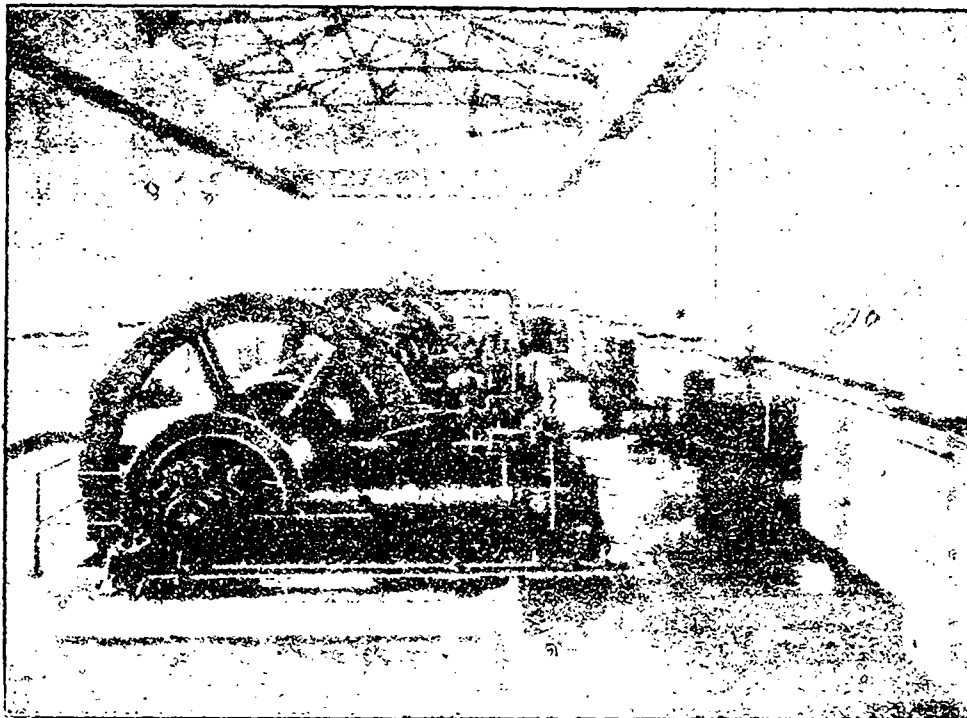
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Engines in sizes from 2 to 500 B.H.P.

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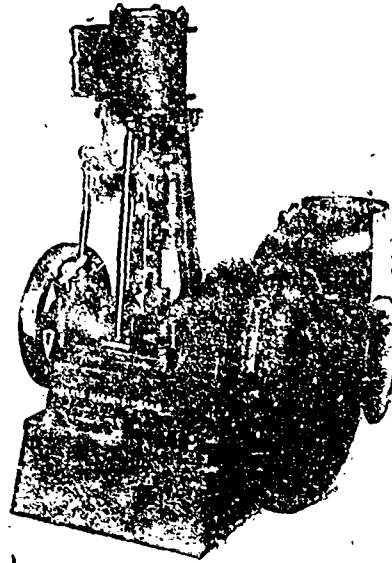
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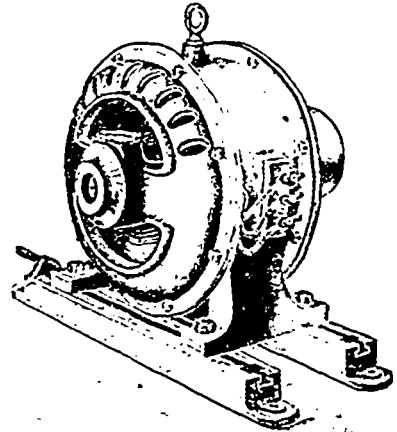
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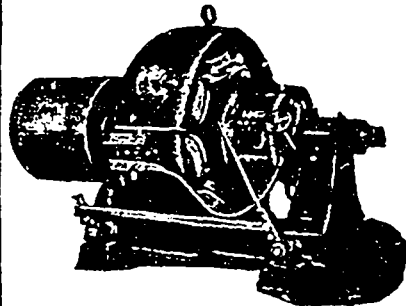
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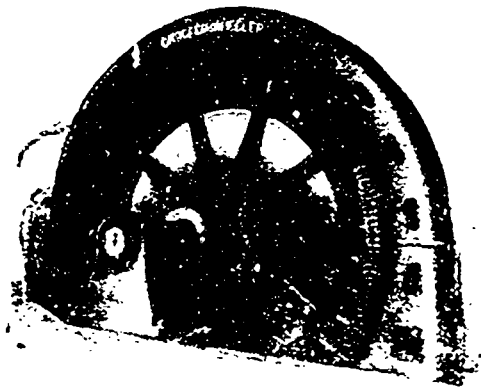


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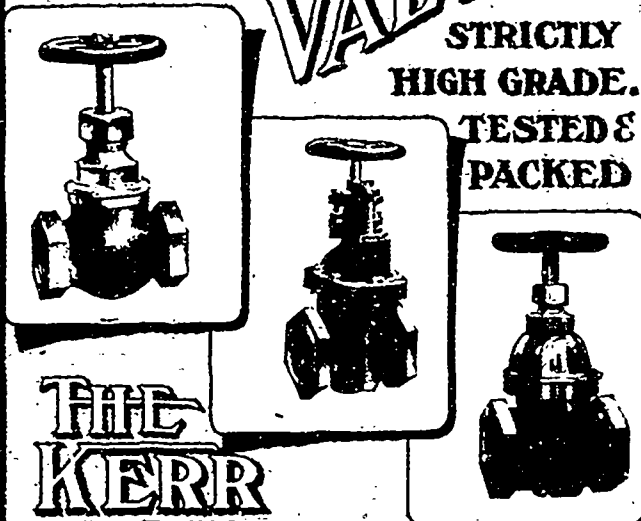
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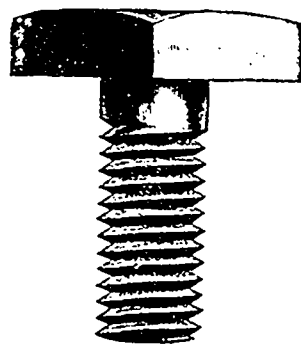
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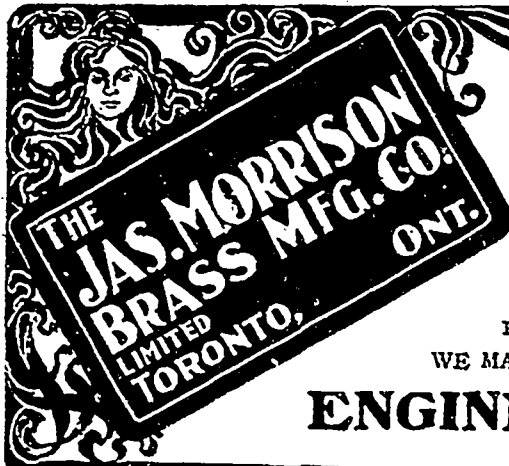
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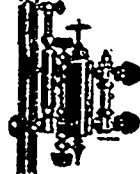

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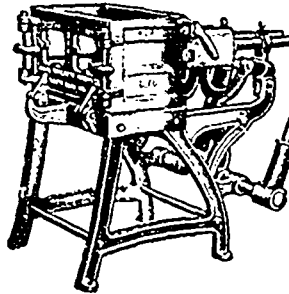
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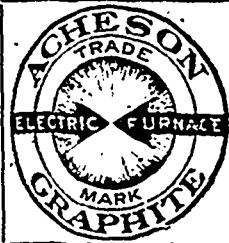
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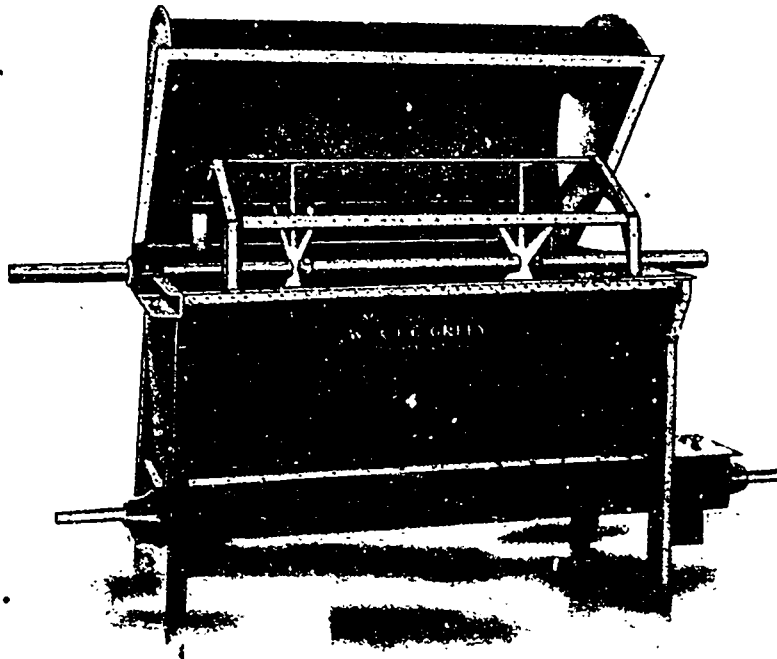
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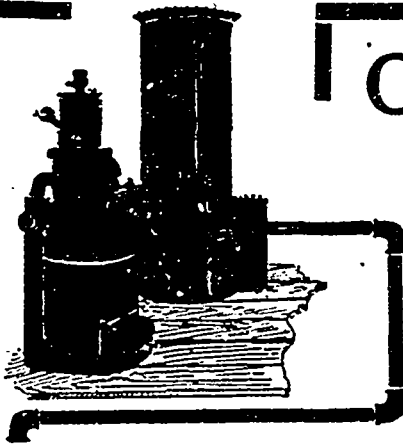


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H.P.	Hrs.	Days	lbs.	
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The Canadian Manufacturer Publishing Co., Limited.

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

J. J. CASSIDY, - - - Editor.  
D. O. McKINNON, - - - Business Manager.

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

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Canada and United States \$1.00 per year. All other Countries in Postal Union six shillings sterling, including postage.

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NEW ADVERTISERS THIS MONTH:

- G. Brandeis, C.E., Montreal
- DeLancey Mfg. & Supply Co., Toronto
- Electrical Inspection Bureau & Testing Laboratory, Montreal
- Hamilton Iron & Steel Co., Limited, Hamilton
- Laurie Engine & Machine Co., Montreal
- Chas. H. Mitchell, C.E., Toronto
- Monongahela River Consolidated Coal & Coke Co., Buffalo, N.Y.
- Ous-Fensom Elevator Co., Limited, Toronto
- Toronto Pottery Co., Toronto

AS TO NICKEL.

As is well known, the Sudbury region of Ontario contains a larger percentage of nickel ore than all other known deposits in the world. There are large deposits also in the island of New Caledonia, but the distance from market, the poverty of the ore and the difficulty of mining, causes the product to come as a far-behind second—as far as production and value is concerned. New Caledonia is a penal settlement belonging to France, and the nickel product is owned and controlled by the French government, and is used very largely in the manufacture of armour plate for French war vessels. There are also some small known deposits of nickel ore in the United States, from which the supply does not equal the demand for nickel for making the five cent nickel coin in use in that country, the deficiency being made good from the Sudbury sources. The export of nickel ore and matte in 1906, almost all to the United States, was valued at \$2,166,936. This article went into that country duty free, and was refined there, the United States duty on refined nickel being six cents per pound. In these days the armor plate used in all war vessels contains nickel, and in all the armor plates made for and used by the United States navy the nickel is drawn from Canada.

Strange to say, however, no refined nickel was ever pro-

duced in Canada. At the Sudbury mines the ore is subjected to processes by which it is reduced to matte, which contains perhaps about 15 per cent. of nickel, in which condition it is exported that going to the United States being refined in that country, the process giving employment to large capital and large numbers of skilled and other labor. A portion of this Sudbury nickel matte is exported chiefly to Wales, where other large capital and skilled labor is employed in the refining works there. But beyond the labor involved in raising the ore from the mines, and bringing it to the condition of matte, to save transportation charges Canadian capital and Canadian laws give no occupation whatever in preparing refined nickel for consumption in any industry.

The columns of THE CANADIAN MANUFACTURER has for years contained protests against this condition of affairs. It has shown that Canada possesses the largest and most valuable and most easily accessible, and most cheaply worked deposits of nickel ore in the known world; and it has shown that there is an exceedingly large and constant demand for nickel from every country that builds armor-clad war ships. France produces her own nickel used for that purpose, but the United States depends upon Canada. With a lack of manliness and independence, unfortunately, but too often exhibited in Canada, we submit to a gross imposition at the hands of the United States in this matter, with a total production of nickel quite insufficient to supply the demand for even coinage purposes—with no home-produced nickel for the manufacture of armor for their war ships. Just because Canada submits to the imposition they impose an import duty of 6 cents per pound on refined nickel, intentionally to prevent and discourage the refining industry in Canada, and to force the refining of Canadian nickel ores in that country. With an unlimited supply of nickel ore in our own country, not a pound of refined nickel has ever been produced in Canada; and while the United States is not a producer of nickel to any appreciable extent, all the nickel and manufactures thereof, to the value of hundreds of thousands of dollars, upon which heavy duties are laid, are brought from the United States. What chumps we are!

A remarkable feature of the situation is that even while Mr. Foster and the Conservative party was in power, a law was passed by the Dominion government authorizing a heavy export duty on nickel ore or matte, but not refined nickel, but it has never been put in force. If such an "order in council" had been passed under the regime of Mr. Foster, the United States would long before now have withdrawn their duty on refined nickel, and Canada would have been supplying the demands of that country. Canada would long before now have been adorned with tall and smoky chimneys indicating the localities of works for refining nickel, and hundreds of thousands of dollars would have been invested for that purpose, and thousands of skilled and highly paid artisans would have found employment in them; but, thanks to Canadian stupidity, all that sort of wealth is now employed in the United States.

**WHERE, OH! WHERE WERE THEY?**

One of the most remarkable discussions that ever occurred in the Dominion House of Commons was had there a few days ago. The new tariff being under discussion, Mr. Schaffner, a Conservative member from Manitoba, moved an amendment reducing the duty on reapers, binders and mowers, from 17½ to 10 per cent. Mr. Staples (Con., Man.), supporting the amendment.

Dr. R. N. Walsh (Con., Que.) said that he spoke for Eastern Canada. His constituents and farmers generally demanded relief. He preferred to go further than the amendment and to reduce the duty upon all agricultural implements.

Mr. Lake (Con., Man.) pointed out that farming implements were appraised so much higher by the customs than formerly, that, as a matter of fact, the custom duties increased, instead of decreased, although the rate of duty was lowered. He denounced the dumping clause. It bore with especial severity upon the farmer who had to buy agricultural implements.

Mr. Henderson (Con., Ont.) pointed out that more agricultural implements were exported than imported. This showed how strong was this industry. Did it need an excessive protective duty? Statistics showed that our Canadian manufacturers had almost a complete monopoly of the home market.

Mr. Knowles (Lib., Assiniboia) preferred the high tariff on farming implements. He thought that the Conservatives were not sincere in supporting the amendment.

Mr. R. L. Borden (Con. Leader) said the farmers of Canada were complaining that it cost no more to manufacture these implements in Canada than it does in the United States. Why, then, were the retail prices so much higher in this country? In the absence of information as to the cost of production, the prices charged abroad and at home, etc., he could not support the amendment.

The amendment (to still further reduce the duty on agricultural implements) was defeated by a large government majority, 36 Conservatives voting in favor of it. To their credit, he it said, that Messrs. Borden, Foster, Sproule and Taylor, prominent Conservatives voted with the government. There was no discussion whatever on the part of any of the Conservatives, on the merits of tariff protection to the Canadian industry, although it was an opportunity seldom occurring, and more seldom made use of, to urge the necessity of protection. There are quite a number of members of the House of Commons who obtained their seats there through their proclamations on the hustings to their constituents their undying fealty to the policy of tariff protection, some of them being manufacturers—some of them very closely identified with the Manufacturers' Association.

Where, oh! where were the Toronto members?

**BE CAREFUL WHAT YOU DO.**

The Right Honorable James Bryce, the British Ambassador to the United States was in Ottawa a few days ago in an endeavor, it is said, to better the relations between the United States and Canada. He was equipped with instructions from the British Government, and a satchel

full of suggestions from President Roosevelt and Secretary Root in the matters to be discussed, and Mr. Bryce and the British Government, and President Roosevelt and Secretary Root no doubt hope and expect that Canada will place no stumbling block in the way of the happy arrangements hoped for by the diplomats. It will be remembered that Secretary Root was in Ottawa quite recently in conference with our Governor General Lord Grey, and the consent of Canada to the arrangements proposed, which will be of a prefatory character, of course, will quickly be given—so some hope.

According to Ambassador Bryce and Secretary Root, there are some fifteen points of interest in which Canada is supposed to be interested, to be settled by them. They may be enumerated as follows:

1. Tariff Reciprocity between Canada and the United States.
2. Preservation of Niagara Falls and determination of the right and extent of American and Canadian concerns to take water from international lakes and rivers.
3. Preservation of the seals in Behring Sea.
4. Regulations of fisheries in the Great Lakes and off the Atlantic and Pacific Coasts.
5. Revision of the agreement of 1817 respecting naval vessels on the Great Lakes.
6. Definition and marking of parts of the international boundary line now insufficiently defined and open to dispute.
- 7, 8. Relating to intransit trade.
9. Relating to alien labor laws.
10. Relating to reciprocal mining rights.
11. Relating to the conveyance of prisoners through the respective countries.
12. Relating to reciprocity in wrecking and salvage rights.
- 13, 14. Relating to logging on the St. John River.
15. Relating to the head tax imposed by the United States on Canadians entering that country.

Some of these points are capable of easy and satisfactory adjustment by the countries interested, and will be thus adjusted quite independently of any officious intermeddling on the part of Great Britain; and the less that country concerns itself in these matters the better for all concerned. Perhaps the most important of these is the first named, which has reference to tariff reciprocity between Canada and the United States. Canada does not thank Ambassador Bryce in even offering suggestions in the matter; and Secretary Root may be assured that his wishes regarding it had better die a bornin'.

**NEW POSTAL RATES FOR SECOND-CLASS MATTER.**

At a conference between Postmaster-General Lemieux, of Canada, and officials of his department, and Postmaster-General Meyer, of the United States, and a number of his assistants, held in Washington, April 1, an agreement was reached to amend the postal convention existing between the two countries in so far as it affects the transmission of newspapers and periodicals, known as second-class matter, between the two countries. Canada accepts the tentative proposal of the United States that second-class

matter mailed in one country and addressed to the other might each four ounces or fraction thereof on be subject to a rate of one cent for each bulk package, prepaid by stamps affixed.

Under the arrangement which heretofore existed mail matter has been transmitted to its destination in either country on payment of the regular second-class rate, and no fiscal settlement has been made on account of the difference in volume of the mail received by one country over that received by the other. On account of the very large preponderance of mail matter going from the United States to Canada over that received from that country the agreement has operated very materially to the advantage of the United States.

The Canadian postal administration last November gave notice that after May 7 next the paragraph of the existing convention relating to the admission of newspapers and periodicals from the United States to the Canadian mails on payment of the one cent per pound rate at the office of origin would be abrogated, but afterward it offered compromises. It proposed that the rate upon newspapers and periodicals sent from the office of publication in one country to subscribers and newsdealers in the other be either two cents per pound, each packet bearing a separate stamp, or four cents per pound bulk rate, the sender to have the right to elect whether he would send his mail in bulk or in separately addressed packages at the optional rates named. This proposal appeared to be complicated and difficult of application, and it was therefore rejected by the United States postal authorities. But they submitted the tentative proposal which was accepted to-day by the Canadian officials. The rate agreed upon is substantially the transient second-class rate which the individual citizen of the United States now enjoys, the exception being that publishers of the United States have an additional privilege of mailing in bulk packages at the rate named, separately addressed newspapers and periodicals intended for delivery to subscribers at one postoffice. The cost also to publishers in the United States will be at least 50 per cent. less than if the postal union rate should be applied.

Postmaster-General Meyer endeavored to obtain a continuance of the old agreement until Congress shall have had opportunity to legislate upon the question of second-class postage, but it did not appear thus to maintain the status quo, and the new agreement was, therefore, entered into for the protection of American publishers.

#### RIGHT ABOUT FACE.

At a recent meeting of the Young Men's Liberal Club, in Toronto, one of the prominent speakers made the following announcement:

Our condition will continue to be hopeless as long as we persist in the old ways. Labor questions are engaging attention to a large extent, and they are truly reform questions. Until we win the labor vote we will be in the soup, as we have been on many occasions before. You will never win this Conservative city till you have the labor party.

Another prominent speaker was Mr. J. F. M. Stewart,

B.A., recently secretary of the Canadian Manufacturers' Association, which position he resigned to become chief organizer of the Liberal party for Ontario. Organizer Stewart made a strong speech in favor of his party, speaking encouragingly of the prospects of its success over the Conservative party in Toronto.

It is said that the Manufacturers' Association is not particularly identified with any political party in Canada; and it is quite certain that ever since the birth of the Association many years ago until the reorganization within the past decade, the slogan that was always effective in bringing Canadian manufacturers to its councils was the suggestion that the national policy was in danger. That would always rally the Old Guard. At the Winnipeg convention of the Association in September last, Mr. Stewart, who was then secretary, in his report called attention to the fact that "the association had become a large organization—that it was one thing to say the membership exceeded 2,100, and quite another to appreciate what it means to have that number of factories represented in the association with their business interests centred in 246 Canadian towns and cities, and their workshops scattered from the Atlantic to the Pacific."

It would occupy too much time and space to enumerate at this time all of the aims and objects of the association, for they are many, but before the reorganization they were included in the following:

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

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

It would naturally be supposed that every person in any way connected with the association would not only subscribe to these simple rules of faith, but also be a sincere believer in them; but it is to be observed that, notwithstanding votes of thanks for faithful services rendered, the secretary lays down his trust as the confidential mouthpiece of an association whose shibboleth is "tariff protection to Canadian manufacturing industries" to become organizer, manager and chief cook and bottle washer for a party that never entertained any kindness for manufacturers, and is now using his best efforts to win the labor vote in the struggle to politically capture this Conservative city of Toronto.

Of course Mr. Stewart had a right to lay down one job for another, and he has a right to advocate the union of forces of the labor party and the opponents of tariff protection to defeat protection. Under the reorganization it is not necessary that the secretary of the association shall be a member of it; and it is presumed that no pledge of fealty to its principles is ever required.

#### THE NEW LABOR PARTY.

The Canadian Labor Party, as a distinct political organization was brought into existence at a convention held in Toronto on March 29. The proceedings of the convention were commenced by P. M. Draper, of Ottawa, moving the following resolutions:

"Resolved, that this convention of workmen, from all parts of the Province of Ontario, representing toilers in every department of industrial life, do heartily approve of independent political action upon the part of Canadian workmen. Be it further

"Resolved, that we hereby constitute this convention of the Ontario branch of the Canadian labor party for the purpose of safeguarding the interests of the workmen of this province by nominating candidates for municipal councils, the provincial legislature, and also for the Dominion Parliament."

Secretary Draper said there were too many lawyers and manufacturers at Ottawa, and too few representatives of the working man.

"The workingman," he said, "must let the governing representatives at Ottawa know that if they do not represent the sentiments of the working class, the working people of the country will elect members from among themselves to be their representatives.

"That is the object of the Trades and Labor Congress, and the object of the present meeting.

"There are 40 councils chartered by the Trades and Labor Council, stretching from the Atlantic to the Pacific.

"The battlefield for the labor party is now removed to the legislature and parliament.

"We have the stuff and we have the intelligence—more of it than most of the stool-pigeons at Ottawa."

A strong socialistic element included among the delegates offered and attempted to force through substitute resolutions which were, after heated discussions, rejected, and Mr. Draper's resolutions were adopted. A platform was adopted advocating the underlying principles of the party as follows:

1. Free compulsory education.
2. Legal working day of eight hours, with a week of six days.
3. Government inspection of all industries.
4. The abolition of the contract system on all public works.
5. Minimum living wages, based on local conditions.
6. Public ownership of all franchises, such as railways, telegraphs, waterworks, lighting, etc.
7. Tax reform, by lessening taxation on industry and increasing it on land values.
8. Abolition of the Dominion Senate.
9. Exclusion of Chinese.
10. The union label to be placed on all manufactured goods, where practicable, and on all government and municipal supplies.
11. Abolition of child labor by children under 14 years of age, and of female labor in all branches of industrial life, such as mines, workshops, factories, etc.
12. Abolition of property qualification for all public offices.
13. Voluntary arbitration of all labor disputes.
14. Proportional representation in grouped constituencies, and abolition of municipal wards.
15. Direct legislation through the initiative and referendum.
16. Prohibition of prison labor in competition with free labor.

Some of the planks of this platform are of good and serviceable timber, others being rotten and can never be used, but there is none of them favorable or otherwise to tariff protection upon which the greater prosperity of the laboring classes in Canada depend.

#### AMERICAN ENTERPRISE IN BRITISH COLUMBIA.

United States Consul Dudley, of Vancouver, reports to his government that an agency has been established in his district by which a large part of the adjacent districts of British Columbia are being supplied with American products. He writes:

"In 1897 I observed that a large proportion of the tools and machinery, and much of the food supply consumed in this province, came from the United States. However, I felt that the best way to introduce American manufactures would be to canvas the country by means of expert agents, though in many cases the prospective sales would not be sufficient to warrant this expense on the part of individual concerns. I then endeavored to induce some business men to establish a manufacturers' agency here, said agency to carry a line of samples of many different lines, and to employ one or more agents to visit all portions of the country, inviting the attention of prospective buyers to the opportunity afforded to see samples, and to secure prices and full information regarding duties, best methods of shipping, etc.

"Two attempts were made to establish an agency here, but in both cases the persons undertaking to do this had too little capital, and therefore, failed to accomplish the results desired. Recently a gentleman came here from the United States with considerable capital, associated himself with local capitalists and organized the "American Manufacturers' Agency," which seems to be in a fair way to becoming a successful business establishment. I shall be glad to place all American manufacturers, who so desire, in communication with this new agency.

"It is impossible to ascertain just what proportion of manufactured articles sold in this market comes from the United States. Certain it is that the proportion is very large. As I go about from store to store I see American manufactured goods on every hand. Much of this supply comes to British Columbia through Montreal, Toronto, and other points in Eastern Canada.

"Among the long list of manufactured articles, imported into British Columbia may be mentioned: Mining tools and machinery of all kinds, agricultural tools and machinery, saw mill tools and machinery, donkey engines and other machinery, as well as tools of various kinds used in the logging industry, all kinds of tools used in the building trades, together with supplies of asphaltum, cement, pressed bricks, etc. One flour mill has recently been constructed and put in operation here; it is said that several other mills will be in operation in time for this year's wheat crop, and it is presumed that most of the machinery for these mills will come from the United States. Silver hollow ware is brought to Eastern Canada in blank, and finished there to supply this and other markets in Canada. Railway building is being rushed in all portions of this province, and large quantities of tools and machinery will be in demand for this class of work. Automobiles and all kinds of motor vehicles and motor boats are in demand.

"Should this manufacturers' agency succeed in carrying out its plans upon anything like the scale proposed, it will prove a very important agency in introducing the products of American manufacturers into this country. This is a time for American manufacturers to canvas this

market thoroughly. Those who are unable to send their representatives here may secure proper representation through the local agency, and thereby establish a good trade."

#### IMPRISONMENT FOR DEBT vs. CONTEMPT OF COURT.

A press telegram from London states that the Attorney-General, Sir John Lawson Walton, had repeated in the House of Commons the statement he made in November last that the Lord Chancellor had under consideration the question of abolishing imprisonment for debt, and that he contemplated introducing legislation on the subject. The Attorney-General, however, could not state the date.

Mr. Donald Maclean, who drew this intimation from the Attorney-General, says that within the last ten years 82,590 persons have been imprisoned for non-compliance with the court orders for payment of debts.

"The present system, according to the testimony of nearly all the county court judges," he says, "is the chief weapon in the hands of firms and persons who foster among the working classes a pernicious system of false credit, and whose main business is to tempt people of small means to borrow money at ruinous rates of interest, or to purchase articles they cannot afford."

This condition in England is of long standing, and has been incorporated in the laws in Canada,—certainly in Ontario, and it is no unusual thing that a debtor unable to meet the demands of an impatient creditor, has recourse usually to the police court with the result that the debtor is commanded to liquidate the indebtedness within a certain time, perhaps in instalments, the alternative being that the debtor will go to jail for "contempt of court" if he does not do so.

In some enlightened countries imprisonment for debt is only inflicted in case of fraud, or for fraudulent concealment of assets, but in such cases the creditor must prove the fraud and show where the assets are before the court will issue a commitment.

Imprisonment for debt in England, as described by Dickens, has long been abolished; but a number of people—and possibly debtors of small sums—have been committed to prison, not for debt exactly, but for contempt of court in not obeying the court's order to pay the debts within a given time. After a creditor has obtained a verdict in his favor, and the debtor does not pay, he takes out a judgment summons, and, after strictly proving to the judge the means of the debtor, obtains an order for payment by instalments on certain days, or in the alternative committal to prison. In Canada as in England, this order is very difficult to obtain, as it must be proved that the debtor can pay but won't.

#### EDITORIAL NOTES.

THE CANADIAN MANUFACTURER, while advocating high protection for manufacturers, has no use for protection in some other respects. It seems that a bill has been introduced into the Ontario Legislature which if passed will make the Ontario Association of Architects a very close corporation indeed. THE MANUFACTURER states that if the bill were passed it would prevent many who now earn their living by making plans from doing so in future, and would mean that one could not erect a coal

shed even without employing an architect of the association. This THE MANUFACTURER deprecates, and says that "this thing of making close corporations is in restraint of trade." Of course it is, and THE MANUFACTURER does right to condemn it; but it is inconsistent in approving protection the very purpose and principle of which is to restrain trade.—Montreal Witness.

No inconsistency at all. This journal wants the freest kind of free trade in Canada for Canadians, including Canadian architects. But it wants adequate protection in Canada against the rest of the world, particularly for Canadian manufacturing industries. There is a great deal of difference between Canadian architects in Canada and the cheap labor of foreign countries. The very purpose and principle of tariff protection is to protect Canadian industries, not to discriminate between Canadians.

On account of the cancellation of the contract with the North Atlantic Trading Co., an order-in-council has been passed by the Dominion government under which bonuses will be paid to European booking agents for farmers, farm laborers, railway laborers, miners and female domestics, who are sent out as immigrants. It has been decided to pay a bonus of \$2.50 for adults and \$1.25 each for children. Strange as it is no inducements are offered for skilled mechanics. There is a strong demand in Canada for thousands of such, but, at the demand of the labor unions, the government place obstacles in the way of skilled mechanics who might desire to become Canadian citizens.

The nine months' fiscal period of the Dominion closed March 30. For this term of nine months the customs revenue amounted to \$39,653,898, compared with \$34,946,930 for the same nine months of last year, an increase of \$5,697,868. The collections for March, 1907, were \$5,101,537, an increase of \$678,870 over March, 1906. This remarkable and unnecessary growth of revenue results from lack of adequate tariff protection. The increase indicated, if contained for the twelve months would be more than \$7,100,000 more than the revenue from that source for the previous year. The value of exports of the country fall far short of the imports, and the shortage must be made good by exports of gold with which to maintain the equilibrium. Why not, by judicious increases in the tariff force the needs of the country to be manufactured at home, and thereby keep the gold in Canada.

Mr. A. McGowan, a lawyer of Montreal, is organizing a political party in that city to promulgate free trade within the Empire. He claims to have a number of university students with him in the promulgating business. Why don't manufacturers and other protectionists organize and promulgate the principles of tariff protection to Canadian manufacturing industries to the university men? They need instruction.

At the recent annual meeting of the British Empire League the chief item of business was the consideration of the report of the executive. In that part of the re-

port relating to the preferential tariff it is stated that if the Imperial government is still unprepared to do anything in this matter, your committee would urge upon our representatives at the forthcoming London Conference to use every effort to secure an agreement for a system of mutual preferential tariffs among all the colonies—leaving Great Britain out of the arrangement, until she expresses a willingness to unite with the outer empire in such a policy. This would be the most dignified course for the colonies to adopt, in view of the fact that 274 members of the House of Commons have petitioned Australia not to give any preference in her tariff to the Mother Country."

This journal is not particular as to how little or how much preference may be offered, provided that the minimum duties to be imposed are sufficiently high to afford adequate protection to all Canadian industries.

It has more than once been demonstrated, says the New York Commercial, that Congress did a prudent thing when it clothed President Roosevelt with practically absolute control of all administrative matters in connection with the construction of the Panama Canal. This gets a fresh illustration in the recent announcement from the President serving notice that the open-shop principle must prevail in the work on the isthmus. Agitators have been constantly turning up there among the men and endeavoring to unionize them and get things into such a condition that they can enforce the closed-shop rule. The President has made no effort to stop this process of unionizing the men but has issued notice in the most determined manner that there will be no recognition of the unions, all employment being strictly under the open-shop rule—for non-union and union men alike as the fitness of each shall determine.

There were in the continental United States last year 83,941,510 people, according to a special report just issued by the Census Bureau. The figures given represent an increase of 7,946,935 over those for the year 1900. The increase from 1905 to 1906 was 1,367,315. If Alaska and the insular possessions be included, a total of 93,182,240 inhabitants is attained. That the population is growing in density is, of course, to be expected; there were twenty-eight persons to the square mile of the continental United States in 1906, as compared with twenty-six in 1900. New York retains its position as the most populous American city. It is credited with a population of 4,113,043 in 1906. Chicago had a population of a little less than half that of New York, namely, 2,049,135. The gain in the former case was a little above, in the latter case a little below 20 per cent. Philadelphia's population was 1,441,735 and that of St. Louis 649,320, while Boston had 602,278 and Baltimore 553,669 inhabitants. These figures represent substantial increases, though not so large as in the case of the two cities first mentioned. The drift of the population toward the cities is indicated by the fact that the increase in the population of incorporated places having 8,000 or more inhabitants, exclusive of San Francisco and Los Angeles, from 1900 to 1906,

was 15.9 per cent., while the increase for the United States, exclusive of those cities, was only 8.8 per cent.

Perhaps the most significant vote taken in the House of Commons for a long time was that of Tuesday on Mr. Schaffner's proposed amendment to the tariff, to reduce the general duty on agricultural implements from 17 1/2 to 10 per cent. Mr. Schaffner is a Conservative from the West, as is also Mr. Staples, who seconded the amendment. In a rather slim house they had the support of all but five of the Conservatives present. . . . It is at least curious that, in face of such a situation, the original protectionist party should, by the active majority of its representatives, reverse alike its position and its tactics and adopt the plan of assailing piecemeal the provisions of what may still be called a protectionist tariff. Evidently the currents of thought that have been not carefully noted have been at work, and are showing their effect in expressions of opinion that may have unexpected consequences on the political situation.—Montreal Gazette.

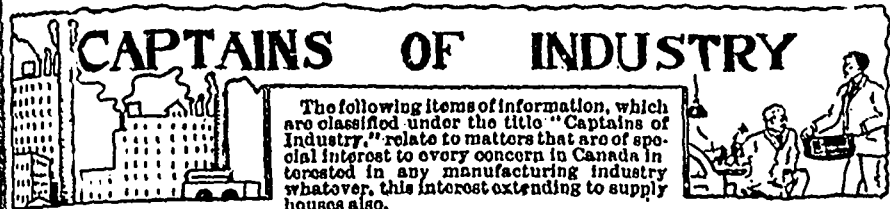
At the December meeting of the executive council of the Canadian Manufacturers' Association, the finance committee submitted the following resolution which was unanimously passed:

"That the resignation of Mr. J. F. M. Stewart, as Secretary of the Association be accepted, and that the finance committee be authorized to procure a suitable souvenir in recognition of his valuable services to the Association."

Mr. Stewart, it is understood, resigned the secretaryship of the Manufacturers' Association to become organizer of the Liberal party in Toronto, which position he now occupies.

THE CANADIAN MANUFACTURER, once the official organ of the Canadian Manufacturers' Association, and still an insistent pleader for "adequate" protection for "Canadian industries," is in despair and in a rage. It raves in choice alliteration at the "fool fury of free trade fanaticism." It sees free trade is coming with no laggard steps. It says that a ready and willing ear is given to farming and agricultural associations when they visit Ottawa, but, alas, the poor protectionists! If this be true, perhaps it may be accounted for by the fact that ministers have tired of the importunities and unreason of some of the already highly-protected manufacturers, and are, for a change, giving a little hearing to the ordinary producing and consuming Canadian. THE CANADIAN MANUFACTURER says further: "We observe the pernicious doctrine of free trade flowing in every direction, but nothing for protection." We are bound to believe such an authority, and our belief is the stronger and deeper because THE CANADIAN MANUFACTURER loses its temper and calls names. Hitherto, we have been used to hear manufacturers describe free trade as a beautiful theory or doctrine, but one which is impracticable in a commercially cutthroat world. The case for the protectionists must therefore be very serious indeed when their newspaper spokesman damns free trade as not only in practice but in theory a pernicious doctrine.—Montreal Witness.





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

A large building on Wellington Street, Toronto, occupied by the D. McCall Millinery Co.; A. Chapman, glove manufacturer; Arthur & Co., wholesale dry goods merchants, Fairbank Limited, ladies' neckwear; A. W. Holtby, manufacturers; the agent of the Warwick Chambers, and the London & Lancashire Life Assurance Co., was destroyed by fire recently. Loss about \$75,000.

The Public Works Department, Ottawa, invite tenders up to April 24 for the construction of a drill hall at Belleville, Ont.

The Gutta Percha & Rubber Mfg. Co., Toronto, have been awarded the contract by the Ottawa Fire & Light Committee for the supply of 1,000 feet of fire hose.

The Canadian Pacific Railway Co. will build a branch line from Peterborough to Victoria Harbor, Ont., a distance of about 100 miles.

A sewerage system will be installed at Aylmer, Ont., at a cost of about \$60,000.

The Canadian Pacific Railway Co. will erect new roundhouses and machine shops at Smith's Falls and Muskoka, Ont.

The Park & River Railway Co., Niagara Falls, Ont., have commenced work on the ornamental bridge over the intake of the city waterworks. The bridge will be of concrete and iron and will cost in the neighborhood of \$3,000.

During the coming summer the Grand Trunk Railway Co. will erect 20 new stations throughout Ontario, not including the union depots at Toronto and Ottawa.

Messrs. Alexander & Miller, Peterborough, Ont., have been awarded the contract to install an electric lighting plant in the mills of the Cavandish Lumber Co., Lakefield, Ont.

An addition will be erected to the Royal College of Dental Surgeons, Toronto, at a cost of about \$25,000.

The Agricultural College, Guelph, Ont., will be enlarged at a cost of \$75,000.

The premises of the Royal Hotel, Lion's Head, Ont., were destroyed by fire April 6.

The Grand Trunk Pacific will erect two million bushel elevators, one at Tiffin, and the other at Fort William, Ont.

The Canadian Pacific Railway will considerably improve their line between Toronto Junction and Bolton Junction, Ont., a distance of 23 miles. The cost of the work will be about \$175,000.

The premises of the Dominion Paving & Constructing Co., Toronto, were destroyed by fire recently. Loss about \$10,000.

The Sherlock-Manning Organ Co., London, Ont., have plans out for a two story brick addition to their organ factory.

The premises of the Paisley Street Methodist church, Guelph, Ont., were destroyed by fire April 6. Loss about \$5,000.

The big car ferry "Ontario No. 1" built by

the Canadian Shipbuilding Co., Toronto, for the Grand Trunk Railway Co. was launched a few days ago. The new boat is 315 feet long, beam 54 feet depth of hold 20 feet, and height between decks 17 feet. Twenty-eight loaded coal cars can be carried at once while the vessel has been built so as to run both winter and summer. The total cost is about \$375,000.

The Public Works Department, Ottawa, will build a new wharf at Peterborough, Ont.

The Ottawa Electric Railway Co., Ottawa, will erect a new pavilion at Roccliffe Park.

The McLaughlin Carriage Co., Oshawa, Ont., will erect a new factory for the manufacture of automobiles.

The Hamilton Terminal Station Co., Hamilton, Ont., will erect a vaudeville theatre at a cost of about \$60,000.

The Northern Gold & Silver Mining Co., Ottawa, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include H. G. Ketchum, W. Foran and J. A. Clayton, Ottawa.

The Mutual Steamship Co., Port Colborne, Ont., have been incorporated with a capital of \$99,000, to manufacture steamships, vessels, barges, tugs, etc. The provisional directors include D. McGillivray, F. K. Brown and L. Kinnear, Port Colborne, Ont.

The Lemcke Tug Co., Lion's Head, Ont., have been incorporated with a capital of \$20,000, to manufacture ships, vessels, barges, scows, machinery, boilers, etc. The provisional directors include C. Pedwell, C. Lemcke, and J. Waugh, Lion's Head, Ont.

The Labatt Mfg. Co., London, Ont., have been incorporated with a capital of \$200,000, to manufacture plumbers' supplies, brass, iron, copper, gasoline engines, etc. The provisional directors include J. Labatt, H. F. Labatt, London, Ont., and S. C. Mewburn, Hamilton, Ont.

Cochrane Cobalt Mining Co., Toronto, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include H. M. Martin, W. A. Sadler, and D. H. Glanville, Cobalt, Ont.

Cobalt Magnet Mines, Toronto, have been incorporated with a capital of \$600,000, to carry on a mining, milling and reduction business. The provisional directors include J. F. Boland, H. J. Macdonald, and C. L. Bray, Toronto.

The Flexlume Sign Co., St. Catharines, Ont., have been incorporated with a capital of \$40,000, to manufacture electrical illuminated signs, etc. The provisional directors include R. R. Wiley, W. S. Hough, and A. W. Marquis, St. Catharines, Ont.

Rabbit Mountain Mines, Limited, Toronto, have been incorporated with a capital of \$3,000,000, to carry on a mining, milling and reduction business. The provisional directors

include J. C. Wilgar, R. H. Culbert and J. F. Hollis, Toronto.

Messrs. D. H. Howden & Co., London, Ont., have been incorporated with a capital of \$250,000 to manufacture hardware, etc. The provisional directors include D. H. Howden, L. C. Johnston, and J. V. Givins, London, Ont.

The Barton Netting Co., Windsor, Ont., have been incorporated with a capital of \$40,000, to manufacture tiling, mantels, grates, gas and electric lighting fixtures, etc. The provisional directors include C. J. Netting, T. R. Barnett, and G. F. Trunk, Detroit, Mich.

Confederation Mines, Limited, Hamilton, Ont., have been incorporated with a capital of \$250,000, to carry on a mining, milling and reduction business. The provisional directors include J. Thomson, W. Marshall and W. Barr, Hamilton, Ont.

The Farming World, Limited, Toronto, have been incorporated with a capital of \$50,000, to carry on a printing and publishing business. The provisional directors include F. W. Hodson, J. W. Wheaton and W. P. Bull, Toronto.

The Vandorf Telephone Co., Vandorf, Ont., have been incorporated with a capital of \$10,000, to carry on the business of a telephone company. The provisional directors include G. J. VanNostrand, H. Powell and A. J. VanNostrand, Toronto.

The Dominion Warehousing Co., Ottawa, have been incorporated with a capital of \$150,000, to carry on a warehousing and cold storage business. The provisional directors include A. F. Leggatt, H. H. Williams and H. S. Harrison, Ottawa.

The Perfect Brick & Tile Co., Ottawa, have been incorporated with a capital of \$100,000, to manufacture bricks, tiles, cement, etc. The provisional directors include A. M. Chisholm, J. H. Birkett and R. F. Rowan, Kingston, Ont.

The Erie Portland Cement Co., Toronto, have been incorporated with a capital of \$1,000,000, to manufacture cement, brick, stone, etc. The provisional directors include D. Forrester, R. D. Moorhead and C. J. Foster, Toronto.

The Iroquois Mfg. Co., Iroquois, Ont., have been incorporated with a capital of \$40,000, to manufacture machines, tools, utensils, etc. The provisional directors include R. S. Smart, J. Moffatt, and T. R. E. MacInnes, Ottawa.

The Bracebridge & Muskoka Lakes Telephone Co., Bracebridge, Ont., have been incorporated with a capital of \$10,000, to carry on the business of a telephone company. The provisional directors include P. A. Smith, P. Hutchison and J. Thomson, Bracebridge, Ont.

Zone Consolidated Oil Co., Thamesville, Ont., have been incorporated with a capital of \$40,000, to carry on a mining, milling and reduction business. The provisional directors include J. Dean, J. W. Baxter, and J. H. Thomas, Pittsburg, Pa.

The Eclipse Safety Paper Co., Ottawa, have been incorporated with a capital of \$50,000, to carry on a printing and publishing business. The provisional directors include E. Seybold, J. Davidson and A. E. Mortimer, Ottawa.

The Elk Lake Prospecting & Development Co., Toronto, have been incorporated with a capital of \$250,000, to carry on a mining, milling and reduction business. The provisional directors include C. D. Scott, J. P. McGregor and R. E. Alexander, Toronto.

Commercial Travellers Larder Lake Gold Mining Co., New Liskeard, Ont., have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business. The provisional directors include S. M. Herron, S. Read and J. Matthews, New Liskeard, Ont.

Red Rose Mining Co., Toronto, have been incorporated with a capital of \$600,000, to carry on a mining, milling and reduction business. The provisional directors include P. H. Kane, F. W. Maclean and S. J. Arnott, Toronto.

Ramsay Sinclair Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture drugs, surgical instruments, etc. The provisional directors include R. E. Sinclair, F. E. Whitehead and T. J. Lannen, Toronto.

The Asbestos Mfg. Co., London, Ont., have been incorporated with a capital of \$25,000, to manufacture asbestos, etc. The provisional directors include E. W. Phillip, H. V. Everham, and R. V. Z. Mattison, Ambler, Pa.

Elk Lake Cobalt Silver Mining Co., North Bay, Ont., have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include N. B. Strong, H. D. Graham and G. C. Legge, Haileybury, Ont.

Milburn Cobalt Silver Mines, Peterborough, Ont., have been incorporated with a capital of \$200,000, to carry on a mining, milling and reduction business. The provisional directors include S. T. Medd, W. S. Davidson and E. B. Fowler, Peterborough, Ont.

The Strathcona Silver Mining Co., of Cobalt, Toronto, have been incorporated with a capital of \$800,000, to carry on a mining, milling and reduction business. The provisional directors include R. T. Mullin, J. P. Beaudoin and C. I. Giroux, Montreal.

The George Kelly Co., London, Ont., have been incorporated with a capital of \$40,000, to manufacture cigars, tobaccos, etc. The provisional directors include G. Kelly, J. E. Saunders and T. W. Stewart, London, Ont.

Cobalt Blue Silver Mining Co., Toronto, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. G. Shaw, J. Montgomery and G. F. Thompson, Toronto.

Messrs. Nisbet & Auld, Toronto, have been incorporated with a capital of \$250,000, to manufacture goods, wares and merchandise. The provisional directors include R. A. Nisbet, A. R. Auld and D. Gray, Toronto.

Shamrock Silver Co., Toronto, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. G. Shaw, G. F. Thompson and W. R. Williams, Toronto.

The Cleopatra Mining Co., Ottawa, have been incorporated with a capital of \$2,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. B. Bedard, J. S. Virtue and G. R. Lipsy, Ottawa.

The Sudbury Brewing & Malting Co., Toronto, have been incorporated with a capital of \$75,000, to carry on a brewing and malting business. The provisional directors include P. McCabe, A. R. Bickerstaff and J. M. Wallace, Toronto.

Manchester Cobalt Mines, Toronto, have been incorporated with a capital of \$450,000, to carry on a mining, milling and reduction business. The provisional directors include F. B. Allen, A. Cohen, and M. Bray, Toronto.

Batts, Limited, Toronto Junction, Ont., have been incorporated with a capital of \$100,000, to manufacture lumber, timber, etc. The provisional directors include R. J. Batt, C. W. Batt, and T. W. Batt, Toronto Junction, Ont.

The Dominion Lumber Co., Webbwood, Ont., have been incorporated with a capital of \$350,000, to manufacture lumber, timber, shingles, ties, posts, poles, etc. The provisional directors include E. B. Ryckman, C. S. MacInnes, C. C. Robinson, Toronto.

The St. Thomas Automobile & Garage Co., St. Thomas, Ont., have been incorporated with a capital of \$25,000, to manufacture automobiles, bicycles, etc. The provisional directors include G. M. Baldwin, A. E. Thomas and T. Hall, St. Thomas, Ont.

The Ontario Silver Co., Niagara Falls, Ont., are adding new equipment, including new presses costing about \$3,000.

The new plant of M. Beatty & Sons, Welland, Ont., is complete, all but a storehouse, of which the foundations are laid. The office will be moved about the middle of May.

The works of the Canadian Ramapo Iron Works, Niagara Falls, Ont., are expected to commence operation in June. The office will be moved to the works in May.

Messrs. Taylor & Bate, St. Catharines, Ont., are building a new brewing and racking house. The building is up-to-date. The walls are brick, and lined with cork; floors are reinforced concrete; stairs are iron. The machinery will soon be installed.

Messrs. Gray & Reardon, St. Catharines, Ont., bottlers of aerated waters, have sold out to McNulty & King. Gray & Reardon moved to St. Catharines from Niagara about two months ago.

Mr. R. Nadell has purchased the soda water works of Charles Lobb & Co., St. Catharines, Ont. The building is being improved, and new and modern machinery installed.

The Geo. Wilson Building & Contracting Co., Limited, St. Catharines, Ont., are building a sash and door department to replace that destroyed by fire two months ago. The new building is one story, 80x66 feet, with concrete foundations, and wooden walls protected with concrete on expanded metal. The planing mill will be enlarged to 144x64 feet, with similar construction.

Mr. John McIntyre, late manager of the Toronto branch of the J. I. Case Threshing Machine Co., has gone to Winnipeg. His successor is Mr. G. B. Voorheis.

The Imperial Plaster Co., Toronto, manufacturers of Imperial white rock hydrated lime, plaster paris, etc., are commencing to handle all lines of builders' supplies.

The Canada Wheel Works, Limited, Merriton, Ont., are building a one story brick 50x50 feet addition to relieve the crowding

in their factory. It will be completed about May 1.

F. C. McCordick, tanners, St. Catharines, Ont., are installing new fleshing and skinning out machines. They expect to double last year's output this year.

The Montrose Paper Mills, Limited, Thorold, Ont., are installing a filtering plant at a cost of about \$5,000.

Work has commenced on the plant of the North American Cobalt Refining Co. at Thorold, Ont. The contracts have been let, and the plant is to be completed by October 1.

James Davy, Thorold, Ont., is installing new machinery in his pulp mill, at a cost of about \$10,000. The output will be increased about 50 per cent.

The Penman Mfg. Co., Thorold, Ont., have enlarged their capacity about 20 per cent this year.

Messrs. Paxton & Bray, St. Catharines, Ont., are enlarging their pit and brick yard to give an increased capacity of about 50 per cent this year.

McGlashan, Clarke Co., Limited, manufacturers of cutlery, electroplate and nickel silver flat ware, have commenced the manufacture of celluloid handled table knives. They expect to install a celluloid planer before long.

The Dominion Suspender Co., Niagara Falls, Ont., will build a shirt and collar factory this summer. Plans are being prepared.

Sheldons, Limited, Galt, Ont., have installed an exhaust fan for the Ontario Silver Co. Niagara Falls, Ont.

The Niagara Heating & Supply Co., Niagara Falls, Ont., will enlarge their foundry this spring, doubling its capacity.

The Macdonald Mfg. Co., Toronto, have just completed a five story addition to their manufacturing plant, 100x70 feet, and are equipping it with up-to-date machinery for the manufacture of lithographed tinware.

The Canada Cloak Co., Toronto, manufacturers of coats, suits and skirts, will move to 63-71 Wellington Street West, in June or July. During the past six months they have doubled their selling staff, and require large factory premises. When completed the new premises will be 203x81 feet in size and thoroughly modern in every respect.

The Marshall Sanitary Mattress Co., Toronto, have moved to 140-141 Spadina Avenue. The capacity of the plant will be doubled. Active offices are being built. A feature will be a 140 foot sign, with six large letters advertising Marshall mattresses.

The Polson Iron Works, Toronto, are installing a generating set from the B. F. Sturtevant Co., Boston, Mass.

The Deloro Mining & Reduction Co., Deloro, Ont., have purchased a 150 H.P. triple cylinder vertical Weber engine, a producer, to be installed about May 1.

A. Berg & Sons, Toronto, are installing a sand-lime brick plant of 20,000 capacity for Schultz Bros. Co., Brantford, Ont.

A despatch from Collingwood, Ont., states that the Collingwood Shipbuilding Co. have decided to double the capacity of the plant. President McDougall states that the desire is to put the shipyard in a position to build or repair vessels of all classes, from the

steam tug to the modern freighters 600 feet in length. At present the company have a splendidly equipped drydock, 500 feet in length, and capable of docking two ordinary lake freighters, 500 feet in length.

The enlargement to the lighting plant of the town of Barrie, commenced last May, has been completed, and the new equipment is now running in service. K. L. Aitken, the consulting engineer, made an extensive series of tests and all the apparatus has since been accepted.

The Atikokan Iron Co., Port Arthur, Ont., have built blast furnaces for roasting ore, and a large dock, at a cost of about \$1,300,000.

Messrs. Baines & Peckover, 126 Bay Street, Toronto, are moving to 98 Esplanade East where they will have larger premises.

The Canadian General Electric Co., Toronto, will erect a five story office building at the corner of King and Simcoe Streets at a cost of about \$400,000.

The Mutual Life Insurance Co., New York city, will erect large offices in Toronto at a cost of about \$1,500,000.

The Seamans-Kent Co., Meaford, Ont., will erect a wood-working plant at Fort William, Ont., at a cost of about \$100,000.

The Georgian Bay plant of the Canada Iron Furnace Co., Midland, Ont., was destroyed by fire recently.

The Anchor Wire Fence Co., Stratford, Ont., will erect a new factory.

The McKinnon Dash & Metal Works Co., St. Catharines, Ont., will erect a new chain factory.

The Carriage Mounting Co., Toronto, will erect a factory at St. Catharines, Ont.

The Welland Vale Mfg. Co., Welland, Ont., will build a central establishment in St. Catharines, Ont.

The Wabasso Cotton Co., Montreal, have been incorporated with a capital of \$750,000, to manufacture cotton, woolens, yarn, etc. The charter members include J. M. Greenfields, W. J. Henderson, J. Jenkins, Montreal.

The Imperial Breweries, Montreal, have been incorporated with a capital of \$400,000, to carry on a brewing and malting business. The charter members include E. M. Lanctot, E. Belanger and F. X. Roy, Montreal.

The Canada Carboy Co., Montreal, have been incorporated with a capital of \$1,000,000, to manufacture iron, steel, coke, peat, etc. The charter members include P. J. Hubert, L. E. Martel and L. O. Boisvert, Montreal.

A new Anglican Church will be erected in Ganby, Que., at a cost of about \$30,000.

The sash and door factory of Messrs. Bevil & Sons, Montreal, was damaged by fire recently. Loss about \$7,000.

Messrs. McRae & Allan, jewelry manufacturers, Attleboro, Vt., have decided to establish a plant in Sherbrooke, Que.

The engineering building of McGill University, Montreal, was destroyed by fire, April 5. Loss about \$750,000.

A new power house will be erected in connection with the Montreal General Hospital, Montreal, at a cost of about \$80,000.

Mark Workman, Montreal, will erect a new theatre costing about \$250,000.

The Miramichi Lumber Co., Boiestown, N.B., will erect a new mill for the manufacture of shingles at a cost of about \$75,000.

The Department of Public Works, Ottawa, are endeavoring to secure a dredge for St. John, N.B., harbor.

The congregation of the Methodist church, Springfield, N.B., will erect a new edifice at a cost of about \$9,000.

An addition, 83x45 feet, will be erected to the Good Shepherd Monastery building, Halifax, N.S.

The Dominion Coal Co., Glace Bay, N.S., are preparing plans for extensive alterations and additions to their plant.

The Sydney Cement Co., Sydney, N.S., are installing another mill which will bring their output up to 80,000 barrels.

Messrs. Ham & Motherwell, Winnipeg, Man., have been incorporated with a capital of \$50,000, to manufacture goods, wares, merchandise, etc. The provisional directors include G. V. Motherwell, J. Scott, and D. W. McKerchar, Winnipeg, Man.

Messrs. Richardson & Bishop, Winnipeg, Man., have been incorporated with a capital of \$100,000, to carry on a printing, publishing and engraving business. The provisional directors include R. D. Richardson, W. A. Bishop and D. B. Horn, Winnipeg, Man.

Messrs. H. P. Pennock & Co., Winnipeg, Man., have been incorporated with a capital of \$20,000, to manufacture goods, wares, merchandise, etc. The provisional directors include H. P. Pennock, W. R. Allan, and R. A. Gilbert, Winnipeg, Man.

The hardware warehouse of Messrs. James Robinson & Co., Winnipeg, Man., was destroyed by fire April 6. Loss about \$40,000.

A large grand stand club house will be erected for the New Kirkfield racing track, Winnipeg, Man., at a cost of about \$250,000.

M. Peterson, Winnipeg, Man., invites tenders up to April 30 for the supply of pipe and junctions for the Winnipeg sewerage system.

Portage la Prairie, Man., invites tenders up to April 30 for laying sewer connections from the street sewer to the street line.

Brandon, Man., invites tenders up to May 6 for the supply of 85 tons of 6 and 8 inch cast iron pipe and specials.

The Commissioners of the Transcontinental Railway invite tenders up to May 1 for the construction of six steel bridges at the following points: Wabigoon and Winnipeg Rivers, Crossing, White-mouth River and east and west branches of Brokenhead River, Man.

The Canadian Pacific Railway Co. are erecting a new station at Souris, Man., at a cost of about \$20,000.

The council, Neepawa, Man., are calling for tenders for work in connection with an extensive fire protection system.

The Board of Control, Winnipeg, Man., are considering the erection of a new fire hall at cost \$18,000.

D. Auckland & Sons, Winnipeg, Man., will erect a new warehouse, 124x62 feet.

Oil boring operations are to be commenced shortly in the Egg Lake District, about 25 miles north-west of Edmonton, near Morinville, Alta. Seven carloads of oil boring machinery, including 12,000 feet of tubular casing, will be installed immediately.

The premises of J. F. Barker & Co., Daysland, Alta., were destroyed by fire April 7. Loss about \$20,000.

A street railway system will be installed in Calgary, Alta., at a cost of about \$250,000.

The Ellison Mill & Elevator Co. will erect a mill and elevator at Lethbridge, Alta., at a cost of about \$75,000.

W. P. Hanson, Lethbridge, Alta., will erect a saw mill at a cost of about \$40,000.

The council of Prince Albert, Sask., have decided to develop the water power on the Shell River at a cost of about \$250,000.

The Lethbridge Electric Light Co., Lethbridge, Alta., will improve their plant at a cost of about \$25,000.

The Canadian Pacific Railway Co. will erect a 20-stall roundhouse at Strathcona, Alta.

New sidewalks and pavements will be laid in Prince Albert, Sask., at a cost of about \$500,000.

A waterworks and sewerage system will be installed at Wetaskiwin, Alta., at a cost of \$150,000.

The Alberta Government has passed estimates for steel bridges to be erected as follows:—Medicine Hat, \$82,000; Old Man River, north of Pincher, \$20,000; Bow River, Calgary, \$25,000; Bow River, Gleichen, \$35,000; Old Man River, Kipp, \$15,000; Red Deer River, Red Deer, \$25,000; Sheep Creek, \$20,000 and \$8,000; and Rosebud, \$30,000.

The ratepayers of Craik, Ont., are negotiating for a telephone system.

The council, Prince Albert, Sask., have placed orders with the Goldie & McCulloch Co., Galt, Ont., Allis-Chalmers-Bullock, Limited, Montreal, and the Canada Foundry Co., Toronto, for improvements and extensions to the electric lighting plant, at a cost of about \$26,237.

A new town hall will be erected at Rosethorn, Sask., at a cost of about \$15,000.

The Canadian Pacific Railway Co. will erect a large hotel at Moose Jaw, Sask., at a cost of about \$75,000.

The Dallas Hotel, Lethbridge, Alta., will be enlarged at a cost of about \$6,000.

The North Star elevator, Abernethy, Sask., was destroyed by fire recently.

The Peterborough Cement Roofing Co., Peterborough, Ont., purpose erecting a branch plant in Regina, Sask.

The American Steel Wire Co., Cleveland, Ohio, will erect a branch factory at Lethbridge, Alta., at a cost of about \$2,000,000.

J. W. Nunn, Fernie, B.C., will receive tenders up to April 30 for the construction of a sewerage and waterworks system.

The Pacific Coast Mills & Timber Co. will erect large sawmills at New Westminster, B.C.

W. V. Hunt, of the British Columbia Electric Railway Co., Vancouver, B.C., has been appointed engineer in charge of the work of installing new water power units at Lake Buntington. Three units of 10,000 h.p. each will be installed at a cost of about \$250,000.

The Crow's Nest Pass Electric Light & Power Co., Fernie, B.C., are preparing to build long distance lines to Elkmouth and Rosmer, B.C.

Messrs. Macdonell, Gzowski & Co., Vancouver, B.C., have been awarded the contract for the construction of the masonry wharf for the Canadian Pacific Railway Co. there. The cost of the structure will be about \$250,000.

The Yale Columbia Lumber Co., Nelson, B.C., expect to cut 40,000,000 feet of lumber this season.

#### FORTY YEARS' RECORD.

The history of the firm of A. C. Leslie & Co., Limited, Montreal, is outlined in a very attractive souvenir booklet lately issued by them, showing forty years of development in the iron, steel and metal business. The frontispiece is a full page likeness of the late Mr. A. C. Leslie, founder of the firm, which he established in 1866.

Mention is made of the fact that few of the houses of those early days are now in existence, among the few being Crathern & Caverhill (the parent firm of Caverhill, Learmont & Co.), Frothingham & Workman, J. N. Hall & Co. (now Seybold & Sons Co.), J. T. Letourneux & Fils (now Letourneux Fils & Cie., Limited), O. Faucher (now Faucher & Fils), and J. H. Wilson, among the wholesale hardware firms, James Robertson (now the Jas. Robertson Co., Limited), Winn & Holland, W. and F. P. Currie & Co., and Thos. Robertson & Co., among the heavy metal merchants in Montreal. In Ontario, Wood & Leggat (now Wood, Vallance & Co.), Adam Hope & Co., and D. Moore & Co. (now the D. Moore Co., Limited), of Hamilton; Rice Lewis & Son, Ridout, Aikenhead & Co. (now Aikenhead Hardware Co.), and M. & L. Samuel (now M. & L. Samuel, Benjamin & Co., of Toronto), are among the few remaining.

Among the many who have retired are: Moreland, Watson & Co., Ireland, Gay & Co., Ferrier & Co., Delisle Bros. & McGill, Leitch, McLean & Co., Wm. Darling & Co., Benny, Macpherson & Co., Thos. Wilson & Co., W. & B. Francis, C. C. Snowdon & Co., Thompson, Whitehead & Co., Hall, Kay & Co., Hamilton & Massey, of Montreal; A. K. Boomer & Co., T. H. Ryan & Co., and John Harrington, of Toronto; Daniel MacNab & Co., Wm. Bellhouse & Co., and Buchanan, Harris & Co., of Hamilton; T. & I. Thompson, of London, Ont.

Old-timers in the trade talk of the change in conditions of business now. Then, nearly everything was imported from Great Britain, and invariably by steamers direct to Montreal, inland points being reached by the Grand Trunk or Great Western Railways, or by steamers on the St. Lawrence and Ottawa Rivers and on Lakes Ontario, Erie and Huron. From these ports, or from the nearest railway stations, freight was hauled great distances, and it was nothing unusual for goods to be teamed from Montreal to Ottawa and even farther. The competition in rates between steamers and railways was often very keen, pig iron having been taken from Montreal to Toronto as low as 80 cents per ton, while immediately after the close of navigation the rate was raised to \$6.00 per ton. Naturally there was a great rush to receive and ship all goods before the close of navigation, and then a long, lazy winter.

The boom of '73 is still spoken of, when the price of pig iron went to \$45 per ton and collapsed the next spring, other commodities

following suit, and the result was widespread disaster, involving many prominent hardware firms, but A. C. Leslie & Co., though heavy losers, weathered the storm. One old-time merchant speaks of having bought iron during the winter for spring delivery at \$45, which was only worth \$28 on arrival.

In 1887 an office was opened in Toronto in charge of William S. Leslie, the eldest son of the founder, who returned to Montreal in 1895. On the death of Mr. Leslie in 1896 the business was continued under the same name by his son, who associated with him Albert H. Campbell, for fourteen years in the

increased during the past few years, and there has been room for all.

Last year after the death of Mr. E. H. Copland, the business of Copland & Co. was purchased, by which was added a considerable connection in fire bricks and clay, ganister and other lines for the foundry trade as well as in standard lines of chemicals.

#### WHERE THE WORLD'S NICKEL COMES FROM.

One of the most valuable metals of commerce is nickel. Gold is where you find it—



OFFICERS OF A. C. LESLIE & CO., MONTREAL.

WM. S. LESLIE, President.

E. H. COPLAND, Secretary.

A. H. CAMPBELL, Vice-President.

F. H. FOSTER, Treasurer.

employ of Frothingham & Workman. This partnership continued until dissolved by the incorporation in December, 1906, under the style of A. C. Leslie & Co., Limited, with an authorized capital of \$250,000 with the following officers:—William S. Leslie, president; Albert H. Campbell, vice-president; Thomas H. Jordan, director; Edward H. Copland, secretary; Frederick H. Foster, treasurer.

This will make no change in the management or the nature of the business but will provide for further expansion, and the officers believe there is room for a large development, having full faith in the future of Canada. The pleasantest feature of the past growth is that it has not been at the expense of competitors, the number of whom have largely

and so is nickel. Up to the present time nickel is found only in two places—Australia and in the region of Sudbury, Ont. These Canadian nickel mines were discovered by accident, and for years went unrecognized—no one seemed to know the metal had any value.

When the Canadian Pacific Railway was building its main line through Western Ontario, a rock formation carrying copper and iron was cut through. This was a part north of Georgian Bay, now known on the map as Sudbury.

The copper in the rock was estimated from 2 to 3 per cent., but it was so rich that it warranted an attempt at extraction. The Canadian Copper Co. was organized, and

# Canadian Bounties.

## CHANGES IN PIG IRON AND CORDAGE.

the Copper Cliff mines opened up. The ore was shipped, some to Wales, and some to the copper reducing works in New Jersey.

Combined with the copper was another metal besides iron. No one seemed to know what it was. It was new to the experts. So the New Jersey smelter allowed it to run off with the slag. Not so with the Welshmen—they know the metal, and also knew its value. Like good business men they kept their secret and bought all of this particular copper ore they could get—the nickel was worth more than the copper—and it was clear profit. But the secret at last came out, and the Sudbury copper mines became the greatest nickel mines in the world.

The mines at Copper Cliff resemble the ordinary copper mines, and the nickel-copper bearing vein shows no sign of exhaustion.

The ore is partially reduced at the mines. It is crushed and screened, then spread out over vast beds of cordwood—acres in extent. Fire is applied, and the ore roasts for 48 days. This process drives out most of the sulphur, leaving the metals in a form called matte. This matte is shipped to the refining works in Constable, N.J., where the nickel of commerce is made.—Ironmonger's Chronicle, London, England.

### FINANCIAL.

The Royal Bank of Canada will erect a seven-story building on King Street, Toronto, at a cost of about \$200,000.

The Canadian Bank of Commerce have awarded the contract to the Canadian White Co., Montreal, for the construction of a large bank building on St. James Street, Montreal.

The Home Bank of Canada will open a new branch in Toronto at the corner of Bloor and Bathurst Streets.

The Canadian Bank of Commerce have opened a branch at Atlin, B.C.

The Quebec Bank have opened a branch at Inverness, Que., and a sub-agency at Sturgeon Falls and Cache Bay, Ont.

### PERSONALS.

Mr. Ernest Marriage, whose discussion of the Niagara power question appears elsewhere in this issue is at present in Toronto where he represents several English firms, among them being, Davey, Paxman & Co., manufacturers of steam and gas engines, Colchester; Francis Berry & Sons, machine tools, Sowerky Bridge; Christy & Co., disintegrator manufacturers, Chelmsford and Pullin and Mann, brick and pipe machinery, Leeds.

Mr. K. L. Atken, consulting engineer, of Toronto, presented a paper entitled "Synchronous Converters vs. Motor Generator Sets" by Mr. Paul M. Lincoln, at the April meeting of the Toronto Branch of the American Institute of Electrical Engineers.

Many members of THE CANADIAN MANUFACTURER mourn with sorrow of the death of Mr. William D. Watson, of the John Deere Mfg. Co. Limited, Ayr, Ont., who died at his home in Ayr on Monday, April 15, at his 54th year.

Changes affecting the bounties on binder twine and pig iron have been recommended by Mr. Fielding. In the case of binder twine he has moved to amend the statute of 1903 to provide:

1a. That the Governor in Council may authorize the payment of a bounty to any corporation, firm or person, manufacturing cordage in Canada from manilla fibre, such bounty to be equal to the amount paid as export duty in the Philippine Islands on manilla fibre produced on those islands and used in the manufacture of cordage in Canada—the said bounty to be payable only in respect of manilla cordage manufactured in Canada on and after the first day of January, 1907. Provided, however, that the bounty shall not exceed three-eighths of one cent per pound on the manilla fibre as and in the manufacture of cordage.

It is recommended that bounties be paid on the undermentioned articles manufactured in Canada for consumption therein.

(a) In respect of pig iron manufactured from ore, on the proportion from Canadian ore produced during the calendar years,

1907..	\$2 10 per ton;
1908.....	2.10 per ton;
1909.....	1.70 per ton; and
1910.....	0.90 per ton.

(b) In respect of pig iron manufactured from ore, on the proportion from foreign ore produced during the calendar years,

1907.....	\$1.10 per ton;
1908.....	1.10 per ton;
1909.....	0.70 per ton; and
1910.....	0.40 per ton.

(c) On puddled iron bars manufactured from pig iron made in Canada during the calendar years,

1907.....	\$1.65 per ton;
1908.....	1.65 per ton;
1909.....	1.05 per ton; and
1910.....	0.60 per ton.

(d) In respect of rolled, round wire rods not over three-eighths of an inch in diameter, manufactured in Canada from steel produced in Canada from ingredients of which not less than 50 per cent. of the weight thereof consists of pig iron made in Canada, when sold to wire manufacturers for use or when used in making wire in their own factories in Canada, on such wire rods, made after December 31, 1906, six dollars per ton.

(e) In respect of steel ingots manufactured from ingredients of which not less than 50 per cent. of the weight thereof consists of pig iron made in Canada, on such ingots made during the calendar years.

1907.....	\$1.65 per ton;
1908.....	1.65 per ton;
1909.....	1.05 per ton; and
1910.....	0.60 per ton.

#### ELECTRICALLY SMELTED ORE.

That it is expedient to provide that no bounty shall be paid under the foregoing provisions in respect of iron or steel made in Canada by the electric process after December 31, 1908.

That with a view to the encouragement of the smelting of Canadian iron ore by electric-

ity it is expedient to provide that the Governor in Council may authorize the payment out of the Consolidated Revenue fund of the following bounties on pig-iron and steel ingots manufactured in Canada, for consumption therein, when such pig-iron and steel is the product of Canadian iron ores smelted in Canada by electricity, viz.:

(f) On pig-iron manufactured from Canadian ore by the process of electricity smelting during the calendar years,

1909..	\$2 10 per ton;
1910.....	2 10 per ton;
1911.....	1 70 per ton; and
1912.....	0 90 per ton.

(g) On steel ingots manufactured by electric process direct from Canadian ore, and on steel ingots manufactured by electric process from pig-iron smelted in Canada by electricity from Canadian ore during the calendar years,

1909.....	\$1.65 per ton;
1910.....	1 65 per ton;
1911.....	1.05 per ton; and
1912.....	0.60 per ton.

It is provided that bounty shall not be paid on steel ingots from which steel blooms and billets for exportation from Canada are manufactured.

### BOOK REVIEWS.

#### MODERN STEAM ENGINEERING IN THEORY AND PRACTICE.

BY GARDNER H. HISCOX, M.E.

Fully illustrated by four hundred and fifty specially made engravings and diagrams, four hundred and eighty-seven pages, price \$3.00, New York, the Norman W. Henley Publishing Co.

This book is designed for the engineer, fireman, electrician and every one interested in steam practice. It contains simple instructive information dealing with the most recent practice. It deals with the care and management of boilers, engines, refrigeration machinery, dynamos, motors, elevators, air compressors and all other branches with which the modern engineer must be familiar. It describes and illustrates the properties and use of same for the generation of power in the various types of engines in use. Slide valve, high speed, Corliss, compound, multi-expansion engines, and other valve gear, and DeLaval, Parsons, Curtis and other turbines are included and fully described and illustrated. Discussion of the cost of steam power in its application and operation is included.

A very valuable feature of this book which commends itself at once in looking through it is the large number of questions relating directly to the work taken up in the book. Their answers are given and are such that the engineer and student will find very valuable and instructive. The book is not only a guide but a teacher and as a text book should meet with considerable favor.

# Industries Wanted in Canada.

## GREAT VARIETY OF OPENINGS.

In the seventh report of the Bureau of Labor of the Province of Ontario is given a list of the industrial openings in the province as received from the town clerks and secretaries of Boards of Trade of the various municipalities. These cover the widest possible range and serve somewhat of an index to the yet unexploited manufacturing possibilities of the province.

It is a significant fact that many towns and cities are wakening to the possibilities of development by becoming more important industrial centres. Places where departments of publicity have been established and where an appropriation has been granted for advertising have found the investment to pay handsomely. Of these Welland, Toronto, Hamilton and Winnipeg are striking examples.

## WESTERN AMBITION.

That the West is alert to the possibilities of manufacturing is shown by a recent address by Industrial Commissioner Rowland, of Winnipeg, in which he pointed out that throughout the Canadian West to-day, it is an established fact that the growth of towns and cities has reached such a point of competition that from the head of the great lakes to the Pacific coast, there is not a single community of any size that is not making strenuous endeavors to persuade manufacturers and business men to locate at these points. Starting from Port Arthur and Fort William we might mention among others, Kenora, Portage la Prairie, Brandon, Regina, Moose Jaw, Saskatoon, Prince Albert, Medicine Hat, Calgary, Strathcona, Edmonton, Vancouver and Victoria, each and all advancing their claims for recognition, and spending large sums of money, either in bonusing industrial enterprises or conducting advertising campaigns.

It therefore behooves Winnipeg and her public-spirited men to enact a policy of progression, and by every possible means to place before the world the advantages and opportunities of this centre over all other points in the West, and unless the business men of the city become stimulated into united action and become enthused with the laudable work of building up a greater Winnipeg, this enterprise which has been so well begun, will not become the great movement, nor have the same results as we originally intended it should have.

And there are reasons too—reasons affecting the financial side of every business man and investor in our city—why he should lend his aid in this publicity. Not only does realty value increase tremendously as the industrial enterprises come in, but the rapid growth of the city's population, brought about by filling these factories with workmen cannot fail to stimulate trade in all its branches.

## OFFSETS BONUSING IDEA.

And further too, one must not forget that the work of the bureau is instrumental in offsetting the Santa Claus idea of granting bonuses to manufacturing concerns, thereby saving thousands of dollars to Winnipeg citi-

zens, that would otherwise be expended on increased taxation.

Only a week of two ago a town within 500 miles of Winnipeg signed an agreement at their council meeting giving to a concern a two per cent. guarantee for twenty years on a bond issue of a million dollars, and a free site of ten acres of land with a water frontage to another company. Compared to deals of this kind, in a town of less than 10,000 population, the cost of operating a thoroughly up-to-date publicity bureau in Winnipeg, that will induce manufacturers to come here without the granting of such enormous concessions is a small item indeed.

It is an acknowledged fact that the present prosperity of Winnipeg's citizens has been brought about by the rapid development of the city, and to increase the prosperity to the fullest extent, it is essential, as every business man will agree, to inaugurate a persistent campaign, embracing all legitimate methods to induce capital to come to Winnipeg.

One of the most significant movements of modern times is the effort of communities all over North America, particularly its Western part, to bring before general notice their advantages and opportunities. Large numbers of cities and communities have raised thousands of dollars for this purpose, and committees of energetic and wide-awake citizens have been appointed to promote this work.

In Western Canada, Brandon, Regina, Medicine Hat, Edmonton, Calgary, and Strathcona have appointed publicity men to take charge of the work, large sums of money being raised by public subscription and the town councils contributing liberally towards the fund. Out in the old city of Victoria, B.C., the Victoria Development and Tourist Association was formed by the leading citizens. The city council has just made a grant of \$7,500 to the enterprise.

## OPENINGS IN ONTARIO.

Remarks from various clerks in Ontario towns will serve to show where industries are wanted, although the towns in most instances have not yet become alive to the value of publicity:

Alvinston.—Good opening for the manufacture of vitrified brick; felt factory and wagon factory.

Alliston.—An implement factory has been established. Good opening for boot and shoe factory, woolen mill and sugar beet factory; also good opening for woodenware industry or any other industry to which the forest and farm are contributory. For instance, a factory for plows, harrows, wagons, etc.

Arnprior.—Good opening for a foundry. Large quantities of building sheathing paper is used throughout this section. A concrete dam is about to be built on the Masawaska river, and will supply electric power to manufacturers. A large factory has been built for the manufacture of shirts, etc., and also a factory for bottling and aerating Sanitaris mineral water. The Montreal Suspender Co. have built a large factory here and expect to employ 150 hands. The Campbell & Tough Scale Co., Limited, of

Arnprior, started business here last year to manufacture scales for weighing live stock. Good opening for a machine shop and foundry.

Alfred.—The Ottawa Peat Co. have started pressing black muck into small rolls for fuel. Good opening for flour mill.

Antrim.—Splendid opening in the village of Galetta (this township) for flour mill and woolen factory. It is situated on the Mississippi River and the Grand Trunk Railway runs through it. Fine water power, and an industry requiring such would find here a desirable location.

Almonte.—Good opening for a foundry, furniture factory and also a carriage factory. Ameliasburg.—Good opening for a cannery factory.

Acton.—Shoe factory might do well, as all kinds of leather are prepared here by a manufacturer.

Aylmer.—Good opening for a pork factory. Barrie.—Good opening for carpenter and planing shop.

Brighton.—Good opening for a boat building concern.

Bath.—Good opening for cannery factory. Bancroft.—Good opening for mining industries, as there are large quantities of minerals and granite, marble and mica. A rolling mill would do well here.

Brigden.—There has been established a stove and heading mill. Good opening for brick and tile yards.

Bruce Mines.—Opening for a chair factory, saw mill, basket and veneer mill, and cheese and butter factories would do well here.

Brussels.—Good opening for furniture factory, cannery factory and condensed milk factory.

Byng.—Good opening for a brick kiln.

Buxton.—Opening for sugar beet factory.

Baden.—A foundry should do well here.

Beeton.—Good opening for carriage factory and boot and shoe factory.

Burk's Falls.—Good opening for chemical works and also a tannery, as there is abundance of hemlock bark.

Blezzard Valley.—Good opening for a butter factory, as one would be of great benefit to the locality.

Brudenell.—Good opening for a grist mill, also blacksmith shop.

Blind River.—There has been established a machine shop and foundry. Splendid opening here for tannery, as there is abundance of tan bark in vicinity and communication excellent. A furniture factory would also do well here.

Bothwell.—Good opening for a cannery factory.

Blyth.—A foundry, a furniture factory, and an industry and a cannery factory would all find good openings here.

Bridgeburg.—A planing mill would do well here.

Beamsville.—A basket factory, a fruit evaporator factory and cannery factory would do well here.

Bowmanville.—There has been a large addition built to the Bowmanville Foundry Co., also a new industry, known as the Deham Rubber Co.

**Blair.**—There is a good opening for any industry requiring cheap power, as there are two good water powers lying idle here close to Grand Trunk Railway station, and one mile from the Canadian Pacific Railway station.

**Beaverton.**—Good opening for furniture factory. Good shipping point from two railways and from Trent Canal.

**Bohwaygeon.**—Good opening for boat and canoe factory, have Canadian Pacific Railway connection and municipal electric power plant.

**Br. Lin.**—Good opening for a grist mill, have Grand Trunk Railway, Canadian Pacific Railway and James Bay Railway connections.

**Bellville.**—There are many good sites here at moderate figures for industries. The shipping facilities are excellent.

**Bracebridge.**—Any woodenware industry would do well here.

**Berlin.**—Good opening for any iron industry.

**Brockville.**—New industries established are St. Lawrence Engine Works, for manufacturing motor boats and engines; The Shirreff Mfg. Co., manufacture wringers, etc.; Gilbert Boat Co.; The Brockville Mining Co., for preparing mica.

**Bayfield.**—Good opening for flax mill and cement and tile works.

**Caladonia.**—Good opening for almost any industry, as the Niagara power will be available shortly. There is also good water power.

**Chesterville.**—Good opening for sash and door factory.

**Carleton Place.**—New industries established are General Electric Co., and Mica Splitting Co.

**Calabogie.**—Good opening for a grist mill, woolen mill, cheese and butter factory; also for stove or tub factory; have the best water power in the county of Renfrew and excellent railway facilities.

**Cumberland.**—Good opening for a grist mill and saw mill.

**Casselman.**—Good opening for brick yard.

**Chatsworth.**—Good opening for agricultural implement factory, furniture factory, cooperative, brick and cement yard.

**Cockburn Island.**—A saw mill has been established.

**Catarqui.**—Good opening for a canning factory.

**Chapleau.**—An electric light plant for lighting the streets and houses has been established.

**Cherry Valley.**—Good opening for an industry for manufacture of apple barrels and cheese boxes.

**Clifford.**—Good opening for planing mill.

**Clidsey.**—Good opening for a chair factory.

**Colden.**—Good opening for a machinery repair shop, woolen mill; also for the manufacture of tile.

**Cayuga.**—Good opening for a creamery; also a harness shop.

**Casterton.**—Two saw mills have been established here. Good opening for creamery and cheese factory; also a furniture factory.

**Castleton.**—Good opening for a canning factory.

**Camilla.**—Saw mill and grain grinder established.

**Dublin.**—Excellent opening here for a creamery and cheese factory, as there is none within a radius of ten miles square.

**D'Arey.**—A canning factory would do well here.

**Dryden.**—Any industry requiring strong power would find here a suitable location, such as a pulp mill or grist mill.

**Dunchurch.**—As the James Bay passes through here, any industry which could use our forest resources would do well.

**Dorehester Station.**—A peat manufactory started. Good opening for a canning factory, also beet sugar factory.

**Deux Riveriers.**—A saw mill has been started. Good opening for another saw mill in the neighborhood.

**Denbigh.**—A cheese factory has been established. Good opening for a shoemaker.

**Delaware.**—Good opening for a fruit and vegetable canning factory.

**Dorland.**—A canning factory would find here a good opening.

**Delta.**—Good opening for a tub manufacturing business and canning factory.

**Dunnville.**—Good opening for brick and tile factory, apple evaporator and vinegar works. There is an abundant supply of natural gas to provide heat for this purpose, and the shipping facilities are good. A basket factory would also do well.

**Devlin.**—A small portable saw mill here. Good opening for a barrel, stave and heading factory; also a pump factory. Good shipping facilities to Winnipeg and Kenora.

**Elmvale.**—Good opening for a foundry, and also woolen mill.

**Evanturel.**—Good opening for a furniture factory, saw mill and handle factory, and woodenware factory.

**Emo.**—Excellent opening for a live newspaper.

**Emberson.**—Saw mill started.

**Flinton.**—A door, sash and blind factory would find here a good opening.

**Fort Stewart.**—Good opening for flour and saw mills.

**Gordon.**—Good opening for a cheese or creamery factory.

**Glen Elbe.**—Good opening for a grinding mill and a factory for cheese boxes.

**Glenmeyer.**—Good opening for brick, tile and cement works. Any industry for the manufacture of woodenware would do well, as there is abundance of timber here.

**Green Bay.**—A butter factory or creamery would find here a good opening.

**Griffith.**—Good opening for cheese factory.

**Greenville.**—A quarry has been opened for quarrying and crushing stone for roads and for shipping to smelting works in Hamilton.

**Glenalda.**—Two saw mills have been established. Any woodenware industry or a woolen mill would find good water power here.

**Gooderham.**—Good opening for a carding and woolen mill.

**Haileybury.**—Lumber mill, electric light plant, and several mining companies have been established. Any industry using spruce, cedar, etc., would find a good opening here, such as sash and door factory or furniture.

**Hayburn.**—A canning factory for canning corn, tomatoes, fruit, etc., might pay here, as there is good shipping facilities by water.

**Hespeler.**—Iron working industries are wanted. Good sites and good terms. Grand Trunk and Canadian Pacific Railway connections at the door.

**Hamilton.**—Almost any industry requiring

good facilities, low taxes and cheap land would find it to their advantage to look over the north-eastern part of Barton township.

**Harrowsmith.**—Canning factory would do well, also a brick and tile industry.

**Highgate.**—A canning factory will doubtless prove a paying industry, and it is probable the township would give free taxes for ten years to any thriving industry.

**Hastings.**—Good opening for boot and shoe factory, furniture factory, carriage factory and woolen mills. In fact anything needing good water power.

**Huntsville.**—Good opening for cheese factory, and poultry farm on a large scale. This is a centre for tourists during the summer months and the demand for eggs and poultry is large.

**Hawkesbury.**—Good opening for foundry, also any wood-working industry that could use the cuttings from logs into boards. This material is now shipped to the United States.

**Hensall.**—Good opening for knitting factory and carriage factory.

**Hillier.**—Good opening for barrel factory; also canning factory.

**Hagersville.**—Saw mill and planing mill started. Good opening for lumber yard and sash and door factory.

**Holland Landing.**—Splendid opening for manufacturing of any kind. Free sites and exemption from taxes.

**Harrow.**—Good opening for canning factory.

**Havelock.**—Good mining country.

**Hintonburg.**—This village has excellent railway facilities, a number of suitable building sites and an A1 water supply. Any industry using steam or electric power should find here a desirable location.

**Kingston.**—Kingston is unsurpassed as a locality for industries on account of its splendid rail and water shipping facilities; lead smelting plant should flourish here, and when these are established industries requiring iron and lead as their raw material, would find here a desirable location.

**Katrine.**—Good opening for grist mill.

**Kingsville.**—Good opening for a canning and tobacco factory.

**Kagawong.**—Good opening for a creamery and cheese factory, woolen mills, grist mill, cement and brick industries and pulp mill.

**Keewatin.**—Opening for almost any industry as there is here one of the best water powers in Canada.

**Lansdowne.**—Provender mills started. A brick and tile yard would find here a good opening.

**Lancaster.**—Good opening for a foundry. There is a large brick building suitable for a machine shop.

**London.**—Good openings for canned goods factory, cold storage, agricultural implement industry, machine tool shop, glue factory, etc.

**L'Orignal.**—Good opening for saw mills or any industry for handling hard and soft woods.

**Markdale.**—There is a good water power in this vicinity and any wood-working concern would do well; also a foundry and repair shop.

**Mildmay.**—Good facilities for making brick and tile. Good water power.

**Maxville.**—Good opening for grist mill.

**Maynooth.**—Good openings for woolen mill, roller mill and mining industry.

**Marmora.**—Good opening for any industry

connected with lumbering, also for the manufacture of articles requiring hardwood.

Midlothian.—Good opening for a saw mill.

Millbrook.—A canning factory would do well here.

Morrison.—Good opening for carriage factory and blacksmith shop.

Moonstone.—Good openings for saw mill, cheese factory and brick yard.

Mt. Irwin.—Good opening for a cheese factory.

Minden.—Good opening for furniture factory.

Milverton.—Good opening for foundry, woolen mill, sash and door factory. Good shipping facilities on the main line of the Canadian Pacific Railway, Grand Trunk Railway, and Guelph and Goderich line.

Madoc.—Cheese box factory, barrel factory and canning factory would find here good openings.

Murillo.—Power company established for transmitting power to Port Arthur and Fort William.

Mt. Brydges.—Canning factory would do well here.

Napanee.—A canning factory has been established. There is room for other canning factories as there is a large district here suitable for raising small fruits, etc. The present factory cannot put up all the fruit delivered.

Norwood.—Good opening for a broom factory, or any woodenware industry.

Norwich.—A manufacturing business of any kind using hardwood would find suitable conditions here.

North Gower.—Good opening for a sash and door factory. An electric railway between here and Ottawa would be a great success.

New Dublin.—There is a good opening here for the manufacture of drain tile and brick.

North Bay.—Good opening for flour and pulp mills, tannery and furniture factory. Any industry established here would command the markets of New Ontario.

Omence.—An industry for the making of cement blocks for building purposes and tile for culverts and drains has been started. Good opening for saw mill and shingle mill.

Orangeville.—Good opening for a boot and shoe factory.

Orville.—Good opening for woodworking machinery industry.

Ottawa East.—The Ottawa Lumber Co. have established a planing mill. Water power excellent, and any industry might do well here.

Plantaganet.—Good opening for lime kiln, grist mill and canning factory.

Port Dover.—Good opening for brick yard, planing mill, sash and door factory, smelting works, glass factory and moulding factory. Good shipping facilities by rail and water.

Port Rowan.—Good opening for a canning factory.

Parham.—Good opening for a shoemaker.

Port Elgin.—Good opening for sash and door factory, box factory and a pail and tub factory.

Pinkerton.—Good opening for the manufacture of woodenware, such as tool handles, etc.

Picton.—Good opening for a pickle factory, fruit evaporating and canning factory.

Pelee Island.—Good opening for tobacco canning and starch factories.

Powassan.—Good openings for woolen

factory, furniture factory, tanner and chemical works.

Pembroke.—Machine shop and sawmill started. Good opening for a boot and shoe industry and woodenware factory.

Port Arthur.—Good opening for a match factory, woodenware industry, woolen mills and washing machine manufactory.

Petrolia.—Good opening for planing mill, machine shop and canning factory.

Palmerston.—Good opening for a grist mill.

Rockwood.—Good location for a lumber and planing mill. Excellent water power.

Ripley.—Good opening for the manufacture of cement blocks, tile, etc., also for the manufacture of farm implements; carriage factory. Excellent shipping facilities by rail or water.

Rainy River.—Good opening for sash and door factory.

Sundridge.—Good opening for any woodenware manufactory.

Stayner.—Good opening for canning factory.

Sharbot Lake.—Good opening for flour mill.

Sandwich.—Good opening for any industry which requires water frontage. Best shipping facilities in Ontario.

Sutton, West.—Good opening for a woolen mill or cement block factory.

Simcoe.—Good opening for the manufacture of tin cans for canning industry and wood-working industry. Good opening for beet sugar factory, broom factory, flax mill and cement, tile and brick factory.

Salem.—Good water power lying idle.

Sydenham.—Good opening for a brick-making industry.

Sault Ste. Marie.—Good opening for a chair factory and any industry using wood, both hard and soft.

Stokes' Bay.—Good opening for any woodenware industry or furniture factory.

South Zorra.—Good opening for a foundry and machine shop.

Sudbury.—Good opening for a wood-working industry, foundry, and the manufacture of farm implements.

Stouffville.—Good opening for canning factory or pickle factory.

Southampton.—Good opening for grist mill and saw mill.

Tweed.—The American Madoc Mining Co. established. Good opening for canning factory.

Tara.—Good opening for a woolen mill, as there is good water power with mill partly idle. Good local trade, as well as the manufacture of domestic goods. Splendid farming section, with abundance of wool marketed here.

Tory Hill.—Saw mill started. Minerals found.

Theford.—A cheese factory might do well here.

Tottenham.—A cement block industry has been established. Now that the Canadian Pacific and the Grand Trunk Railways are completed there will be openings for almost any industry.

Thessalon.—Good opening for a tannery, also a veneer, chair and general furniture factory, including boxes, tool handles, etc.

Thamesville.—Good opening here for a pork-packing industry, a flax mill, cannery, or any wood manufacturing industry.

Tilbury.—Good opening for butter and

cheese factory, pork-packing industry, soap factory and broom factory.

Toronto (East).—The East Toronto Cement Co., also planing mill have been established.

Uxbridge.—This town is well situated to supply a cannery, as the best of small fruits and vegetables are produced; could also support a good butter and cheese factory. Good situation for another tannery.

Uffington.—Two good water powers that could be utilized.

Vankleek Hill.—Any industry where water power is not required will find here a good opening.

Virgil.—Good opening for a fruit canning industry.

Virginia.—Splendid water power in the neighborhood. Good opening for laundry, woolen or woodenware factory. The James Bay Railway, which is just building, runs through the place. Splendid facilities for shipping.

Vittoria.—Planing mill established. Good opening in this locality for canning factory or evaporator.

Verner.—A good opening for butter factory.

Vankoughnet.—There is abundant iron in this section which might be worked profitably.

Victoria Road.—New creamery established; also an industry for the manufacture of cement, situated at Raven Lake, about two miles from here. A good bakery would do well here.

Wyoming.—Good opening for canning factory and evaporator; also a flax mill.

Wellington.—A canning factory has been established, and brick works for the manufacture of bricks out of sand and cement.

Welland.—The following industries have been established: The Plymouth Cordage Co., Ontario Iron & Steel Co., Falls Power Co., and the Erie & Ontario Drilling Co. Best opening on earth for anything requiring every railroad in Canada, deep water connection, cheap electric power, natural gas, low taxes and cheap land. Iron industries especially attracted.

Whitevale.—Good opening for a wood-turning establishment to take the place of one destroyed by fire three years ago. Water power available.

Whitby.—Splendid opening for any kind of manufactories, owing to good railway and water communication. Small industries preferred, employing 50 hands or under. A woodworking industry could not find a better situation. No better location in Canada for a sugar beet factory. Electric light and water power operated by town.

Wheatley.—Butter factory established. Good opening for cheese factory, also sash and door factory.

Walkerton.—Good opening for confectionery business, brush factory, canning factory, foundry and machine shop. There is a reasonable amount of water power developed.

Westport.—A mica mine is being developed. There is a building in the town for malleable iron works, which has been idle for nearly two years owing to lack of money to carry on the business. This building could easily be converted into a woolen mill. Good water power available.

Woodville.—An industry for the manufacture of farm implements is much needed.



Warton.—Good opening for a wood-working industry; also Portland cement industry.

Woodstock.—Industries established: Standard Fence Co., Eureka Plant Co., Canadian Fence Mfg. Co., and two cement block manufacturing companies. From the location, the railway facilities and the city owning the works and the electric light power plant, this town affords the very best position for almost any manufacturing industry, large or small.

Walkerville.—The Imperial Rattan Co., for the manufacture of chairs, etc., also a plumbing business have been established. Good facilities here for the establishment of car works.

Woodsee.—Brick yard started. Good opening for a creamery; a tile plant is also needed, as farmers are beginning to tile their land, and as freight rates are high tile should be manufactured at home. There is an abundance of good clay for the purpose.

Waterdown.—Good opening for a creamery or cheese factory: could be built near a

permanent creek with plenty of spring water. There is also the frame of an old saw mill which could be easily fitted up for the purpose. Eight miles from Hamilton on main road.

Webbwood.—The White Pine Lumber Co. has been established, operating about six miles from the town. A splendid water power about two miles out could easily be utilized for saw mill, planing or veneer mill, or other industry.

Waterford.—Good opening for machine and repair shop or for almost any industry. Good shipping facilities by rail.

York.—There is a great quantity of stone that has been tested and pronounced superior for the manufacture of the finest glass. There is also a splendid gas field, judging from wells drilled on the border of the township; also from two in the township.

Zurich.—A planing mill and sash and door factory would find here a good opening, also canning factory.

anthracite coal, for every horse power actually given out by the engine for one hour at full load.

It is therefore a very simple calculation to find what such a plant would cost per year, working for 300 days and 10 hours per day. As it is 20 pounds multiplied by 10 and by 300, which comes to 60,000 pounds or 30 tons, at \$5 per ton. This is \$150. The proposed charge for the same power by Hydro Electric Commission, is, including the meter, \$27.50 per h.p., per annum, which multiplied by 20 comes to \$550, or about 360 per cent. greater if cost of fuel only is considered. It would be as well to bear in mind that this proposed charge for power is for that delivered at consumer's premises, and not the price as in the gas engine of that actually delivered to the shafting in the factory. A 20 h.p. induction motor would probably not have an efficiency of more than 85 per cent. It will be seen that our 20 h.p. that has to be paid for, will be diminished to 17 h.p. before it can be used, and it will then cost us \$32.36 per h.p. per annum, which multiplied by 20, will give \$647.20 as the total cost of 20 h.p. as supplied to customer's shafting in his factory, or nearly 450 per cent. over the cost of fuel in a 20 h.p. suction gas plant for one year. Now it would be extremely foolish for me or any one else to tell a purchaser of such a plant that \$150 would be all that it would cost him, as there is the greater first cost of the gas plant over the electric motor to be taken into consideration, on which interest has to be charged, there would also be depreciation and repairs to be allowed for, and cost of labor to look after the plant, (which latter I may state is very small—about once in three hours a fresh supply of fuel to the gas producer is necessary, and then the engine looks after itself, and makes its gas as it requires it, according to the amount of power that is called for).

There were two or three such plants as I have mentioned working at the Toronto exhibition last year, and the price of a 20 h.p. plant I was informed was about \$1,500 in Toronto, allowing on this 10 per cent. for depreciation and repairs which comes to \$150, and 6 per cent. for interest on capital, \$90, and allowing \$1 per day for attendance (which never ought on such a plant to exceed two hours per day), would come to \$300 per year. These amounts with the \$150 for fuel already mentioned make a total of \$590 for a gas plant as the cost of one year's work. A 20 h.p. induction motor and starter, etc., would cost, say \$500. Interest on this at 6 per cent. and depreciation only 7 per cent., makes a further charge of \$65 per year, to be added to the \$647, or a total charge of \$712 per year for 20 h.p. from Niagara for 300 days and 10 hours per day, against \$590 per year to obtain the same result by means of a gas plant, or a saving by using the latter of 17 per cent. on the cost of the year's work.

I have worked out charges on similar lines for 50 h.p. and 150 h.p., and in both cases find it possible to supply gas power cheaper than Niagara power, but I think enough has been said to show that this Niagara power is not quite such a great catch as it is supposed to be for the Toronto manufacturer. No doubt when dealing with large amounts of 10,000 or 15,000 h.p. for a railway company, Niagara power is the right thing, and when

## Niagara Power in Toronto.

DISCUSSED FROM AN ENGLISH ENGINEER'S VIEWPOINT.

BY ERNEST MARRIAGE, MECHANICAL ENGINEER.

On the above well known subject it might appear difficult to say anything fresh after the floods of literature and eloquence that have been poured forth on this question, but there is one aspect of it that is the most important of all that does not seem to have much attention paid to it and that is:—When will Niagara power be available for general use in Toronto at a reasonable price, and how can it be got here at the earliest possible date, without saddling the general tax paye. with a heavy liability?

Now speaking as an English engineer with 25 years' varied experience in the Old Country, and who represents among other English firms in Canada, one that builds gas engines, and also large steam engines up to 3,000 h.p., I do not hesitate to say, that the present policy that it is proposed to follow in connection with above question, is one that is most unlikely to accomplish the object set forth.

The only way to overcome any difficulty in this world is to look it squarely in the face, and to acknowledge facts, and the principal fact in this question for the people of Toronto to face, is that at the present time, the Toronto Electric Light Co. and the powers behind them are the masters of the situation, and not only have they the means of transmission and distribution of Niagara power in their hands, but also they have many of the best customers, and they can afford to sell them Niagara power as cheap as any one, and the question therefore for the people of Toronto is.—How to make them do this to everybody, and that at the very earliest opportunity.

### POSITION OF HYDRO ELECTRIC COMMISSION.

Now it is as well to bear in mind that at the present time there are other methods of providing cheap power for Toronto than by Niagara Falls—but while there is any prospect of a fight between the Electric Light and Power companies, and the Hydro Electric Commission, the unfortunate Toronto manufacturer will simply have to stand by and

whistle for his cheap power, as owing to the uncertainty that exists at present time, engineers that are willing to supply power in competition with both the above, are prevented from doing so. I am not a betting man, but if it comes to a fight between the Electric Light Co., etc., and the Hydro Electric Commission, I should be strongly inclined to place my money on the former, as likely to come out of the scrumage with the spoils of war. The only weapon the Hydro Electric Commission can use if the powers of expropriation given them by Parliament do not accomplish their object, (owing to the high price that would have to be paid for the vested interests of the Electric Light Co.), is to build an independent transmission line of their own, and supply Toronto customers with power direct, with the result, that there would probably be a considerable loss to the general taxpayer in the ruinous competition that would follow.

I have gone carefully into the proposed prices of Niagara power for Toronto given out by the Hydro Electric Commission, and I say, unhesitatingly, that unless they can improve on these prices in favor of the power user, whoever supplies power at these rates, will be faced with very formidable competition from the modern methods of generating power, that are now in successful use in various parts of the world.

### PRICES COMPARED.

It is a well known fact among engineers that up to about three years ago it was thought to be quite impossible to generate motive power in small quantities at the extraordinary low price that it can be produced for to-day.

This has been accomplished by means of what is known as the suction gas producer combined with an ordinary gas engine, and there are in Toronto to-day agents of various engineering firms who make these engines, and who will guarantee that on a size so small as a 20 h.p. plant the amount of fuel used in same shall not exceed one pound

these companies have been supplied and not till then, will the manufacturer who wants from 20 to 200 h.p. get much attention.

#### POSITION OF MANUFACTURER.

Reverting to the question I placed at the head of this article, it appears I think there is only one course to pursue in the interest of the manufacturer, who at the present time does not know where he is, and also in the interest of the taxpayer, who will probably have to pay the whole bill after the fight is over, and that is for the Hydro Electric Commission to clear right out of the way so far as Toronto is concerned, and instead of their fighting the Toronto Electric Light and Railway companies, etc., with the taxpayers' money, to allow the various engineering firms do it, who are ready and willing to take this business off their hands at any time if they will clear out of the way.

Toronto will then be able to get Niagara power at the lowest price that it can be supplied at, and also at an early date, without one cent being risked by the taxpayer.

It is also as well to bear in mind the present situation in Toronto in reference to Niagara power. The street car system is now operated by Niagara, but the Electric Light Co. is still largely operated by steam power, yet even under these conditions the largest consumers are, I understand, able to purchase power at about two cents per kilowatt, or 1½ cents per h.p. per hour, at which price it is certain there cannot be a large profit left

for the Electric Light Co. The lowest proposed price for Niagara power is about 1 cent per h.p. per hour, and with a 150 h.p. gas plant the cost would be about 8-10 of a cent per h.p. per hour, including all charges for fuel, labor, depreciation, interest, etc., as in above illustration of 20 h.p. gas plant.

Manufacturers and engineers are thankful for the figures of Hydro Electric Commission, and for the valuable information they have given, as to the cost of Niagara power in Toronto independent of the Electric Light Co., etc., and if it is really desired to obtain cheap power in Toronto at an early date, the sooner there is free competition between the Electric Light Co., and the various engineers who will be prepared to supply power by other means the better.

The manufacturer will then be thrown on his own resources, and will be able at once to bargain direct with the Electric Light Co., knowing very well that if they will not bring their charges down to those given by Hydro Electric Commission, he can do better elsewhere, but while cheap power is dangled before him at some unknown date without any effort on his part, he probably won't do anything for himself at all, with the result that the Electric Light Co. will be placed in a stronger position than ever, whereas if a few more gas power plants were put to work in Toronto, their present charges for light and power would have to be cut in half or they will lose their customers.

try and exhaust port. These ports are annular each being on alternate sides. The dividing walls are supported on both sides to their whole length by the grooves in the cylinder heads and also by the whole width of the pockets, one-third of the length of the slides always remaining within the pockets. A rocking shoe is provided at the inner end of each slide, which maintains a steam tight joint between the circumference of the rolling piston and the inner end of its division wall. A balance plate of ordinary construction is used on the steam side of the division walls to maintain tight pockets for the slide. The outer ends of pockets are cored to form automatic chambers to receive and return the divisions, the pressure of air being calculated to receive and overcome the momentum of the slides and return them without undue force.

The piston is a disc of cast iron bored to receive the crank pin and covered by two thin annular shells serrated in the centre of their circumference so as to move out against the cylinder heads without allowing steam to leak under the ends of the division walls or slides. They are turned down over the sides of the piston, so as to carry the grooves for the shoes of the slides, and are fastened to the piston by flat annular rings of copper, the outer circumference of the rings being anchored to the inside of the movable shells and the inner circumference clamped to the piston by clamping rings and screws. This gives a steam tight joint of great flexibility and allows the sides of the shells to be held against the cylinder heads by the steam pressure in the chamber. As the steam and friction may be readily proportioned to each other on the principle of a balanced valve, it will be seen that the packings on all points of wear are steam-controlled and that they will remain tight to the limits of wear; also that these limits are much greater than in the ordinary engine. The motion of the rolling piston is epicycloidal in all its parts, so that there is no wear on the cylinder wall, very little on the crank pin, which is fitted either plain or with roller bearings, and the motion of the shells rubbing on the cylinder heads will keep

## New Rotary Engine.

J. M. EVANS, THE INVENTOR HAS HAD THE ENGINE IN ACTUAL OPERATION FOR SOME TIME.

A Canadian company has been organized to manufacture and place on the market a new rotary engine, upon the development of which the inventor, Mr. J. M. Evans, of Toronto, has spent fifteen years of continuous study and work. A paper describing this engine was recently given before the Engineer's Club of Toronto.

Its design and construction are such that it is steam tight under every possible condition. Its mechanism for steam taking, cut off, expansion and exhaust works with absolute and unvarying precision.

Fig. 3 is an external view of a 100 h.p. engine, showing the central cylinder, with steam chests bolted to it on either side, so that the engine may run either way, taking steam from one side and exhausting on the other, the necessary difference in size of steam valve openings being easily and simply adjusted when changing from one to the other.

The steam valve consists of two parts, the disc and a sliding annular plate containing the same number of openings as the disc upon which it is carried, and adapted to be automatically rotated by a governor, or to remain constantly at a predetermined angle of cut-off as desired. In the latter case the cut-off may be varied while the engine is in motion ranging from the full opening of 120°, to a point where all but two of the openings are closed.

The working parts within the cylinder consist of the crank shaft which is built up, to allow of easily removing the working parts;

the rolling piston journaled upon the crank pin and revolving upon the pin, with the outer circumference rolling in contact with the wall of the cylinder. Three division walls separate the cylinder into three 120° compartments, each of which has a separate steam en-

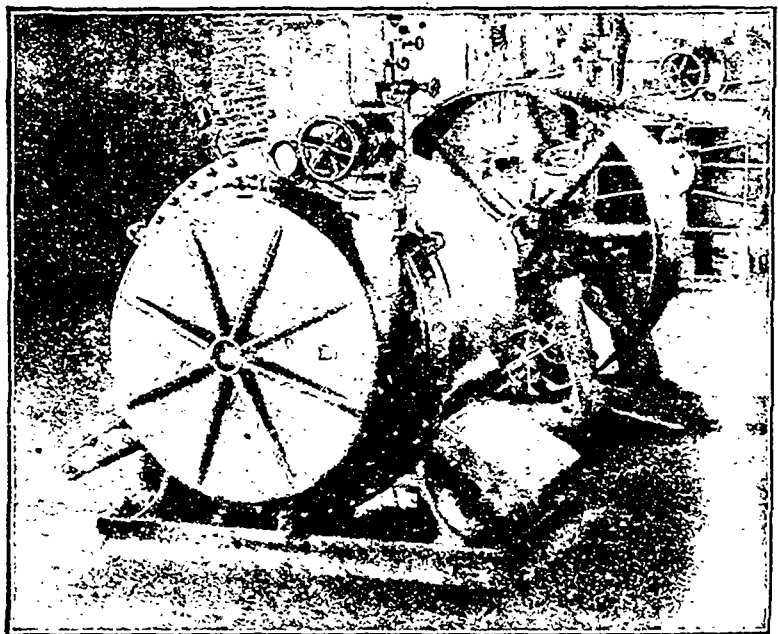


FIG. 1.—500 H.P. EVANS ROTARY ENGINE.  
Floor space 60"x60". Height 5 feet, weight 7,600 lbs.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

both shells and heads flat to the limits of wear. The shoes on the ends of the slides rub against the circumference of the piston shells, but owing to the shape of the shoe, it is

ing is simple and is accomplished by placing the additional cylinders side by side with the high pressure, with steam chests between them.

cylinder engine, one compartment constantly taking steam at boiler pressure, one using it expansively, and the third exhausting. Hence as the area exposed to boiler pressure increases in one chamber, the preceding one decreases its pressure by expansion, thus maintaining a nearly constant pressure on the crank shaft.

The engine will start with full boiler pressure on two chambers and cut off as speed is attained: this gives by actual test, when starting, a pull of about four times the power used when running regularly. This is a particularly valuable feature of reversing engines.

The exhaust valve gives ample time to allow of the escape of steam and thus all liability of back pressure is avoided, as the steam has twice as long a time in which to escape as in the ordinary engine.

**THE DARLING BUILDING.**

What will be, when completed, one of the finest warehouse and factory buildings in Canada, is being built at the corner of Spadina Avenue and Adelaide Street, Toronto, by the Andrew Darling Co.

Having suffered heavy losses from the great fire in the wholesale district of Toronto, three years ago, the company is sparing no pains to insure against a repetition of the disaster. The new building will be isolated

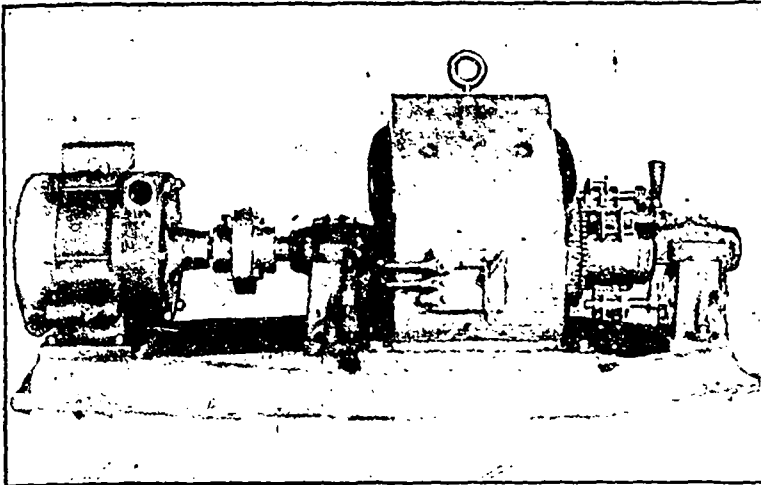


FIG. II.—25 H.P. DIRECT CONNECTED TO GENERATOR. Floor space 14'x18", height 16", weight 350 lbs.

steam controlled, and the great latitude of motion in the pocket will keep it tight until worn to the point where renewal is necessary. New shoes are cheap and easily inserted. All curves are circular and all planes flat and right-angled, making them easy of renewal with limited facilities, as would be the case on shipboard, or in small ports with poor machine shops.

In starting, the engine takes steam at boiler pressure in two of the compartments at once, but as it gathers speed the cut-off reduces the angular opening of the steam admission valve until the cut-off attained is sufficient to carry the load at a given speed, after which the steam is used expansively, the reduced valve opening admitting steam to the various chambers in rotation. The shape of the chambers is such as to obtain the full pressure upon the surface of the piston with a very thin layer of steam, and there being no clearance, the economy in this direction is marked. The condensation is also very small, as the steam is filling the live, and exhaust sides of the cylinder heads, and the periphery is of such shape as to be easily jacketed. Compound-

The simple engine, as shown, can be used condensing, and when so used the entire surface of the rolling piston exerts power

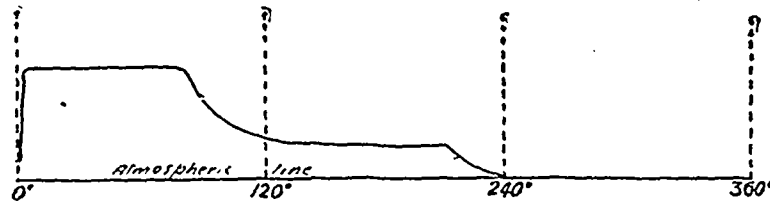


FIG. IV.—IDEAL INDICATOR CARD.

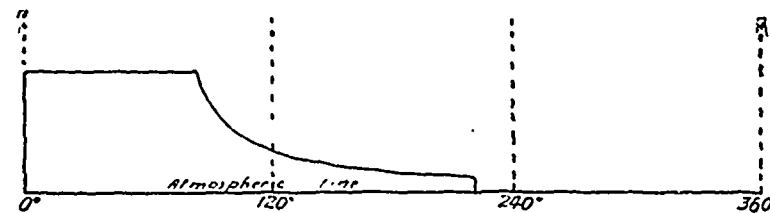


FIG. V.—ACTUAL INDICATOR CARD.

to operate the crank shaft. The surface upon which steam pressure is exerted is equal to a plane whose length is the sum of the chords of the arcs of steam area, multiplied by the width of the cylinder, which gives a very large pressure surface to be acted on by a very thin layer of steam. The steam exerts a very gradual increase of pressure upon the piston, as the steam entry ports are close to the division walls, and as the point of contact rolls past the port the surface exposed to boiler pressure increases steadily until the point of cut-off is reached, when the pressure gradually decreases until the exhaust ports open, obviating the heavy blows caused by the steam striking the full surface of the piston of the ordinary reciprocating engine. The epicycloidal motion of the piston allows the chamber to enlarge considerably after the angle of one-third revolution has been passed, hence steam may be admitted at boiler pressure for one-third of a revolution, and then be used expansively for another third of a revolution. This is true of each of the three compartments in each revolution, so that we have a similarity to the triple

on all sides, built of reinforced concrete, and equipped with a sprinkler system of fire protection. The staircases and elevators will be encased, and the heating system will be outside the building altogether under the sidewalk.

The building is to be nine stories in height, and the roof is to be on by August 1. As this is the first of its kind in Canada, its progress will be watched with considerable interest. The work is under the direction of engineers experienced in this style of construction in United States. The Provincial Construction Co. are the contractors.

The larger part of the building will be occupied by the Andrew Darling Co., for the manufacture of men's ready-to-wear clothing. A part of the lower floor will be leased for banking purposes; and some of the upper floors for warehouse or factory purposes.

The Packard Electric Co., St. Catharines, Ont., have ordered an 8 1/2 ton travelling crane from the Smart-Turner Machine Co., Limited, Hamilton, Ont.

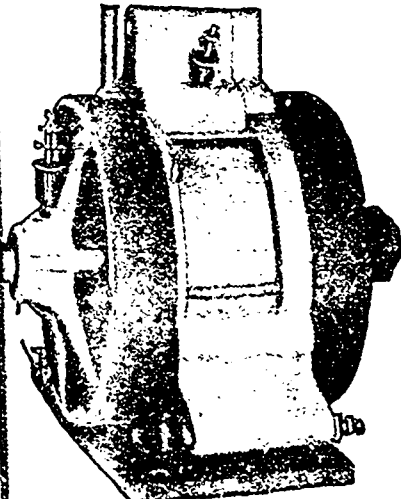


FIG. III.—100 H.P. Floor space 24'x30", height 24", weight 1,500 lbs.



## Office Methods and Appliances

A Review of the Latest Suggestions in Office Systems and Supplies for Manufacturers.



### A Lecture on Book-Keeping.

THEORY, HISTORY AND PRINCIPLES.

BY F. L. S. TURNER, L.A.\*

Book-keeping is the art of recording business transactions with the view of having a permanent record of them and of showing their effect upon wealth.

Book-keeping is, then, the result of business, which may be briefly defined as the exchange of values. The desire to exchange or barter has existed since the earliest ages and is found among the most primitive people, and the desire to secure the necessities and even the luxuries of life is recognized as a law of nature.

In every business transaction there is an exchange, present or deferred, of property, service, or other representative of value; and this fact has become the fundamental principle of double entry book-keeping, which must record each transaction and its effect on two or more interests. For instance if a sale is made for cash, we have decreased our stock of goods and received its equivalent in cash. Should we sell on time, we receive nothing tangible, but our customer is said to owe us, that is we charge or debit him.

#### RECORDS UNDER SEPARATE HEADINGS.

The simple rule sometimes given with regard to debit and credit is to debit what comes in or whatever costs you, and to credit what goes out. In case we sell goods for cash, therefore, we debit or charge cash and credit merchandise. If we sell for time, we debit the buyer and credit merchandise. Similarly when we pay for some expense, or service, we credit cash which goes out and debit what costs us.

It will quite easily be seen, therefore, that we must keep records under separate headings, of not only the commodities we handle such as cash, merchandise, etc., but of our transactions with people with whom we do business, and also of our expenses.

Such records are called accounts and kept in a book called the ledger. Hence we can see that the ledger is the most important of the books with which we have to deal—all other books being primarily to prepare records for entering the ledger, which operation is called posting. Since for every debit we have a corresponding credit of the same amount, when all entries have been properly posted to the ledger, the ledger should balance, that is the total debits will be equal to the total credits, in other words the total of all the accounts showing debit balances will equal to the total of the accounts showing credit balances.

#### ITALIAN ORIGIN.

The principles we have described were

\* Before the Chartered Accountants' Students' Association of Manitoba.

first incorporated into a methodical system by the merchants and bankers of Venice and Genoa, in the 14th century, and the history of book-keeping proper may be said to date from this time, although many very interesting records have come down to us from the ancient dynasties of Babylon and Egypt.

These records relate largely to the levying and collecting of taxes in the form of grain, cattle, fabrics, etc., which were in turn used to defray expenses of government.

The Babylonian book-keeper engrossed his records with a stylus upon tablets of clay, which were then baked so as to preserve them.

The Egyptians used rolls of papyrus, a kind of parchment.

Ancient Greece possessed a highly developed system of accounting for public moneys, but an historian says that "If the state entrusted to any one only a talent, and if it had ten checking clerks, and as many seals, and twice as many witnesses, it could not insure his honesty." Public officials were sometimes required to have their accounts engraved in stone and exposed to the public.

Ancient Rome had also elaborate methods of checking tax collections and disbursements, but their records, and indeed all others up to 1200 A.D., are not strictly accounts, but merely memoranda of receipts and disbursements.

#### THREE BOOKS.

In the 15th century, about 1494, Luca Paciolo, a Venetian monk, wrote the first known work on double entry book-keeping.

In this work Paciolo says that three books are necessary:

- A day book—called the memorial.
- A journal.
- A ledger.

Every transaction was entered as it occurred, in the day book, then journalized, that is arranged for posting in the accounts affected, and then posted. Paciolo stated that the object of book-keeping is to give the trader, without delay, information as to his assets and liabilities.

It is remarkable that so many centuries passed without further general improvement, even as late as 1796 we find that an English writer recommends the same procedure, discountenancing even the use of a separate cash book.

In modern double entry books many improvements have been made in methods, mainly along the line of shortening the clerical work and thereby ensuring greater accuracy.

It is no longer considered necessary to make all entries first in a day book and then in a journal.

#### TRANSACTIONS CLASSIFIED.

We now classify our transaction, and all entries affecting one account we place as far as possible together. For example we now use a cash book in which is recorded all cash received and all cash paid out. Direct from this book, without further journalization we post to the ledger.

Making an entry on the debit side of the cash book at once debits the cash account, and records the proper account to be credited. The cash account is thus taken out of the ledger, and our cash book becomes the cash account.

It is also customary to pass all charged sales through one book, which is periodically added. The total is manifestly the total sales and is passed to the credit of the merchandise, or sales account in the ledger, while the individual customers are debited in the ordinary way. An immense number of postings is thus saved. Purchases may be handled in a similar way, also notes or bills receivable and payable.

#### DEVELOPMENT OF COLUMNS.

The first journal had only one money column. It has now become general in journals, cash books, etc., to enter of extended items affecting the same account in special columns, as a further means of shortening work. Instead of posting the items individually the total only requires to be considered.

To sum up, the improvements which modern practice has developed along the following lines:

1. The use of original entries as posting media.
2. The classification of original entries under separate covers, such as cash book, sales book, invoice book, bill book etc.
3. The introduction of special columns into all books, minimizing the labor of posting and facilitating the gathering of statistics and information.
4. Better ledger rulings and classification of accounts.
5. Loose leaf systems.

We have now considered the principles of double entry book-keeping and the methods of preparing entries for the ledger and have stated that we must provide in the ledger suitable accounts exhibiting all transactions as they occur. We have seen further that the ledger should always be in balance when all entries have been made.

#### TWO DISTINCT INTERESTS.

We have now to consider something further in the theory of book-keeping. There are two distinct interests in any business:

1. That of the proprietor who owns the business, and his investment.
2. That of the business, and the application of the proprietor's investment.

When a business is commenced an investment is made, that is the proprietor sets aside a sum of money or other asset which he wishes to employ in the venture. The

# CONVENIENCE, ACCURACY, ECONOMY

Are three strong arguments in favor of Loose Leaf Systems of Book-keeping which should enlist you among the thousands of users of

## The Crain Continuous Systems

Did you ever lose time and patience hunting through a card index drawer for an important record that has been taken out and put back in the wrong place?

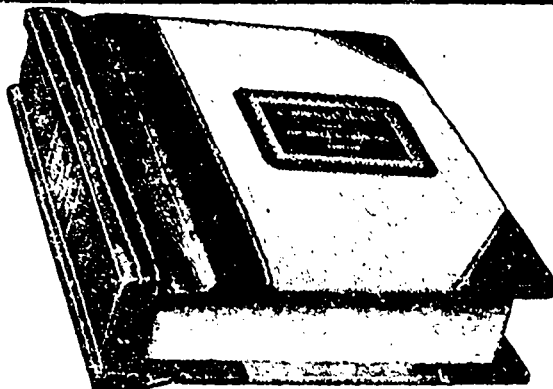
In the Crain Continuous Systems every record is in its proper place. Entries can be made without removing the sheets in half the time. It is absolutely safe, and from an economical standpoint it is without a rival.

The Crain Monthly Account System for the retail trade will pay for itself in a very short time.

Write for Catalogue H, which will give you full information.



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## Are You Right on The Firing Line?



Could your book-keeper tell you fifteen minutes from the time you read this, exactly what each detail of your business costs you?

Do you know where the leaks are through which your money dribbles.

Balance sheets once a month won't do; you want detailed facts right now of what is happening at your lathes, your counter and your shipping room.

You must know all the details without having to look them up.

When the little things keep you busy and the big things are put off until to-morrow there is something wrong with your system of accounts.

Lay down a half finished job and the loose ends tangle before you can pick it up.

Business Systems leave petty routine where it belongs—with your book-keeper.

Business Systems get the work done but leave you time to think and plan.

Business Systems give the best of your brain to your whole business.

Your request will bring detailed information by return mail.

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assets he invests are, therefore, debited, his own account, which may be called proprietor's account, investment account, capital account, etc., is credited, that is, the business owes him the amount of his investment, and as far as the business is concerned the capital account is a liability or debt.

#### OBJECT IN VIEW.

The object of business is to make profit and the object of book-keeping is to disclose whether or not profits have been made, and the manner in which they have been made.

Let us see what information can be gained from our ledger, which we have seen consists of a number of accounts showing debit and credit balances.

Those accounts showing debit balances represent what we have received, or what has cost us, such of them, therefore, as are real or tangible are known as assets, the others are losses.

Those accounts showing a credit balance either represent what we have given, or what has produced value. The former are liabilities or debts, the latter are profits.

There are some accounts which cannot come under any of these heads, for instance statistical accounts such as purchase accounts and sales accounts. These accounts, as their names indicate, represent one, the total purchases, the other the total sales. These accounts in a mercantile business together help to form the account to which we must look for our main profit, and this account may be called the trading or merchandising account.

The trading account starts off debited with the goods on hand, if any. We next transfer thereto the debit balance of our purchases account. If we have a freight and duty account, we transfer it also. We have now the total cost of all the goods we have handled. We next transfer to the credit side of this account the credit balance on the sales account. But we have yet another item to consider. All of our goods have not been sold. We inventory or take stock of them, pricing goods at cost (including freight). We next enter this on the Credit side of the Trading Account, which, of course, has just the same effect as deducting it from the Debit side, which is really what we want to do in order to arrive at the cost of goods sold. If we find the Credit side of our Trading Account the larger, we have made a profit to that extent and this profit is known as the Gross Profit.

#### OTHER PROFIT AND LOSS ACCOUNTS.

But we have other accounts which represent Profits and Losses, such as Interest, Salaries, General Expenses, etc., so we next proceed to collect them under one heading, —Profit and Loss Account. The losses, of course, on the Debit side—the gains on the Credit. The net differences, if a credit, is the Net Profit, which belongs to the proprietor, and is a proprietary account. He has now in his business, not only his investment, but also his profit, and the business is worth just as much more to him.

Let us now look at the accounts we have kept—they are all either assets or liabilities. When arranged in groups the statement resulting is called a Balance Sheet. The difference between the Assets and Liabilities outside of investments, will show us the net worth of the business, which exactly corresponds with the Proprietary Accounts, again

showing that the Balance Sheets, representing the business, and the Profit and Loss Account of the Proprietor, are complementary to each other.

If a clear and concise view of the principles, practice, and results of Double Entry Book-keeping can once be gained by the student he has made a great deal of progress in the study of accountancy.

#### SINGLE ENTRY.

When books are kept in an incomplete manner, they are said to be kept by Single Entry. The simple law of Debit and Credit holds good, but accounts are kept for persons only. Occasionally other accounts are kept, but usually only as memoranda. Day Book and Cash Book are usually the books of original entry.

The objections to Single Entry are as follows:

1. The record or Ledger is incomplete. It does not contain the necessary information for the preparation of a detailed Profit and Loss Account.

2. There is no check against errors and commissions of posting such as the Trial Balance of Double Entry provides. Post a Debit as Credit, or neglect to post a Debit, and loss results.

To ascertain the profit or loss arising from the transaction of any period:

1. Prepare a statement of Assets and Liabilities. The difference between Assets and Liabilities is, of course, the Net Worth or Net Insolvency of the business.

2. Find the difference between the present Net Worth and the worth at commencement of the period and you have the net Profit or Loss for the time under consideration.

As stated above, any incomplete system of book-keeping is single entry, and I think it safe to say that 50 per cent. of the systems of the west come under this head. It is therefore, extremely important that the book-keeper should clearly see what is required to transform a single ledger into a well rounded, symmetrical Double Entry Ledger, and those steps we will briefly consider.

1. Take stock and prepare a list of Assets and Liabilities, of which the difference is, of course, the net worth or capital.

2. Prepare a Journal entry, Debiting Asset accounts and Crediting Liability accounts, crediting a Capital account with the Net Worth which balances the entry.

3. Open the necessary new accounts which do not already appear. Also open such accounts for expense, interest, etc., as may be subsequently required.

#### THE NATURAL LAW OF CONSEQUENCE.

Moral honesty is largely a matter of understanding.

A man without an understanding of moral honesty is ignorant of the natural law of consequence. He may immediately profit by a dishonest act, but in his dull sense of justice, in his general attitude of mind he will in other acts, individually or collectively, bring eventual retribution in the ill will of his fellows. They will exert a moral force of mind against him. He will sooner or later be out of harmony with his environs.

It is just simply the natural law of consequence.

Thoughts, you know, are things.

Supposing we quote a price on something

that's never been made before—to a farmer or country tinker or to anyone ignorant of material or machine-shop practices. Supposing we make a mistake and name a price of \$25 instead of \$50. Even though the error is a clerical one on our part, the farmer or tinker has accepted it in good faith, and is under no moral or legal obligation to pay more than our proposition. Ignorance excuses him.

But—

Here is a case of a neighbor of ours who made figures on a special machine from a set of drawings that had been used by other concerns for producing the same thing. The patron had many of these machines on his floors built by different concerns at different times—the patron knew what they were worth.

Our neighbor made a price of \$300.

On completing their contract the cost each for the material alone equalled the amount of their proposition. Their bid should have been \$650, which they afterward learned their patron had been paying for this same work. The patron had this price in mind when he accepted the one of \$300, and allowed our neighbor to proceed with it in the knowledge that he was going to get something for nothing.

He took advantage of the secretary's signature at the bottom of the letter of quotation to legally obtain some of our neighbor's money.

He was not doing unto others as if he were the others—he was legally doing others.

He was ignorant of the natural law of consequence.

We once did some special work on a lot of castings furnished by the patron. Our estimator made up his figures of \$5.00 each from quarter-scale drawings. When the castings arrived they were much larger than the estimator read. The work was worth \$25 a casting.

Our policy is to forget the quoted price when a job enters our shop for execution—we do everything as well as we can in spite of the price.

We rendered a statement mildly calling attention to the error on our part, and to the fact that they had had this work done before in other shops and knew approximately its worth. They answered and quieted their conscience with the statement that they thought we had a way of doing it for our price.

Yes, and they even massaged us by requesting a two per cent. discount for cash.

They got something for nothing—in this instance.

They were ignorant of the natural law of consequence.

Several years ago a former superintendent took an easy look at a set of drawings and quoted a price of \$175. We heard nothing from the quotation and kept hammering away with follow-up letters. One day the man to whom the quotation had been made called on other business, and we asked about his tool job. "Oh, you were too low on that," he replied. "I didn't know you as I do now and gave it to another concern on a material and time basis. It cost \$650."

Here's a man who didn't want something for nothing.

He knew that eventually you get nothing for nothing. He was aware of the natural law of consequence.

He has our good will, and in his spirit

## The Reliance Numbering Machine

(Six Wheels) Numbers from 1 to 1,000,000.

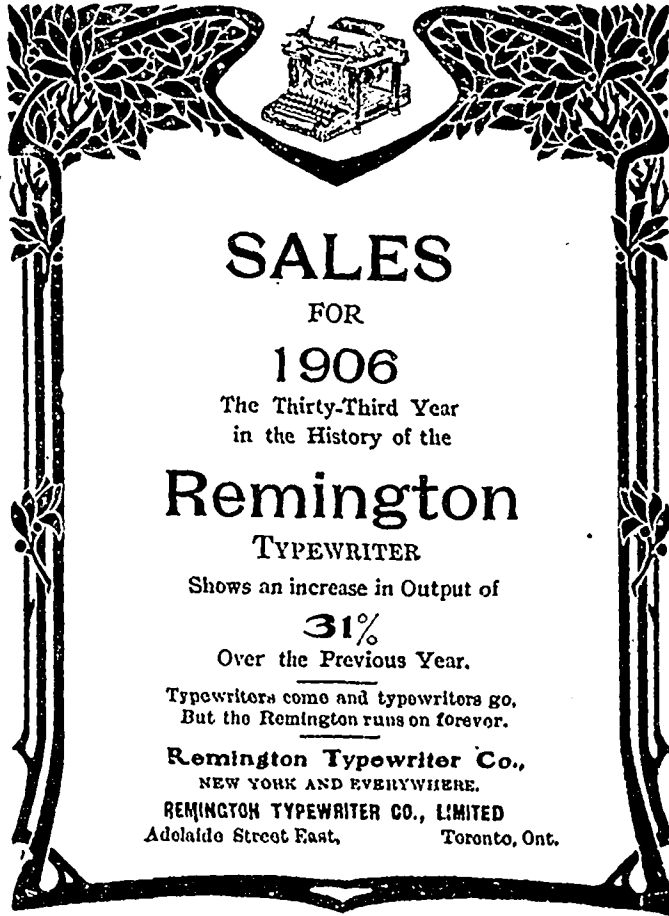
The machine is **AUTOMATIC** throughout. It can be set to print numbers consecutively, print in duplicate, or repeat any number indefinitely.

The number is like this **123456**

Each machine is sold with our guarantee. This machine is exceptional value at

**\$4.50**

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## Remington

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Shows an increase in Output of  
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Typewriters come and typewriters go,  
But the Remington runs on forever.

**Remington Typewriter Co.,**  
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**P**RETTY nearly every Modern Business Man is willing to admit that the conducting of accounting by Bound Book Methods is a thing of the past.

We introduced the Perpetual System in Canada, and alone, opposed at every step, we conducted a campaign that eventually revolutionized the system of accountancy.

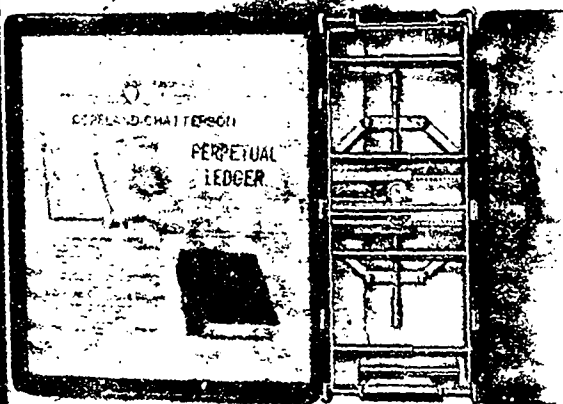
Our ledgers are as far ahead to-day, as much in the to-morrow class as, when we placed the system before a world of bound book methods.

Copeland-Chatterson Perpetual Ledgers save you money and facilitate business. They lessen the possibility of error and assist in the transacting of business by making it easy for you to know at once the condition of your outstanding accounts, and in helping you to find the particular account wanted, quickly.

The Copeland-Chatterson Perpetual Ledgers can be adapted to meet any changes in any business at a moment's notice. New accounts may be added and old ones given more space if desired.

The inactive accounts may be filed away in the Transfer Ledger—active accounts only remaining in Current Ledger—never ceasing.

The alphabetical arrangement of the Copeland-Chatterson Ledger makes the Ledger an Index itself.



## The Copeland-Chatterson Co., Limited

Works: BRAMPTON, ONT.

General Offices: TORONTO, ONT.

moral understanding he will incur the good will of others—all along the line of life.

Men who have the conscience to take something for nothing usually have a rat-hole in their money-bin which they do not see.—The Silent Partner.

#### CEDAR WOOD FOR LEAD PENCILS.

The lead pencil is one of the most common articles in everyday use, and, according to calculations made by the Forest Service of the Department of Agriculture, nearly 320,000,000 pencils are manufactured in this country every year. To manufacture these millions of pencils there are required 110,000 tons, or 7,300,000 cubic feet, of wood, so that each day in the year 300 tons, or 20,000 cubic feet, of wood are used for pencils. Since practically all of the wood is red cedar, and since the pencil industry is steadily growing, the supply of red cedar is greatly depleted; yet no substitute has been found for it. Leaving out of consideration the imported pencils, the average educated American over ten years of age uses six pencils of home manufacture each year. Ten years ago he used less than five. Red cedar has a soft, straight grain, and when grown under best conditions is very free from defects. Because of its peculiar qualities no equally good substitute for it has ever been found, and it is doubtful if any other wood-using industry is so dependent upon a single species as the pencil industry is dependent upon red cedar. In fact, red cedar suitable for pencil manufacture is the only wood the price of which is always quoted by the pound. Strange as it may seem, no steps have heretofore been taken to provide for a future supply of red cedar. This has been largely due to a lack of information on the rate of growth and the habits of the tree, and to the widespread belief that second-growth red cedar never reaches merchantable size. In accordance with its policy toward the conservation and economic use of commercial woods, the Forest Service has made a careful study of red cedar and has come to the conclusion that it can profitably be grown in regions of its development. Several changes are recommended in present forest management in order to secure the desired growth. In the southern forests the cedar will have to be given a better chance instead of being considered, as now, a negligible quantity in its younger stages, and many of the forest-grown trees which are now cut for fence posts can profitably be left to attain their full development and thus become available for pencil wood.

#### THE SOUTHERN CALIFORNIA NEW TRAIN.—BEST ROUTE.

The Los Angeles Limited, electric lighted, new from the Pullman shops, with all latest innovations for travel comfort, leaves Chicago 10.05 p.m. daily, arrives Los Angeles 4.45 p.m. third day via Chicago, Union Pacific & North-Western Line and the Salt Lake Route. Pullman drawing room and tourist sleeping cars, composite observation car, dining cars, a la carte service. For rates, sleeping car reservations and full particulars, apply to your nearest agent or address B. H. Bennett, 2 East King St., Toronto.

### PUBLICATIONS.

**Steel Goods.** A 60 page illustrated price list covering the lines of Crescent brand hardware manufactured by Canada Steel Goods Co., Hamilton, Ont. These lines include wrought steel hinges, butts, shelf brackets, shovels, steel whiffletrees, etc. All lines are illustrated and described.

**For the Power Plant.** A classified index of power plant equipment including everything needed in engine and boiler rooms, power transmission systems and supplies with addresses of manufacturers issued by Power, New York. This list covers the power field in the United States in the same authoritative manner as does the classified index of CANADIAN MANUFACTURER in Canada.

**Vertical Engines.** Second edition of Bulletin No. 125 issued by B. F. Sturtevant Co., Hyde Park, Mass., describing Class VS 5 vertical engines manufactured by them. This engine is a high speed automatic provided with a system of forced lubrication. Parts of the engine are illustrated and described together with sectional views and dimensions. Interesting tables are also given.

**Evans Rotary Engine.** Some facts about the Evans rotary engine are given in a 14 page illustrated catalogue. A comparison is made of this type of prime mover with the reciprocating engine. The wide application of this engine is also shown. Anyone may procure a copy of this interesting catalogue by addressing a card to The Evans Rotary Engine Co., Manning Arcade, Toronto.

**Conveying Machinery.** An illustrated supplement of conveying machinery for saw mills, lumber mills and wood working industries showing some of the lines manufactured by the Jeffrey Mfg. Co., Columbus, Ohio. The catalogue consisting of 72 pages is made up almost entirely of illustrations showing Jeffrey conveyers of various types in actual operation.

**Contractors' Machinery.** The Niagara Falls Machine & Foundry Co., Niagara Falls, Ont., have issued their 1907 catalogue of contractors' machinery and supplies. It contains about 100 pages of illustrated and descriptive matter referring to the different lines manufactured.

**Annual Report.** The twenty-fifth annual report of the Toronto General Trusts Corporation gives interesting information regarding that institution and its business transacted during the past year.

**Mine Cages, Skips and Ore Cars.** The Wellman-Seaver-Morgan Co., Cleveland, Ohio, are sending out an interesting circular describing the above lines. These are but a few of the many kinds of power and mining machinery manufactured by them.

**High Speed Twist Drills.** A bulletin issued by William Abbott, 334 St. James Street, Montreal, giving directions for using Novo high speed twist drills in order to obtain the best results.

**India Rubber Machinery.** A line of high class India rubber and gutta-percha machinery manufactured by David Bridge & Co., Castleton, Manchester, England, is described in a 23 page catalogue in which the different designs are well illustrated.

**Marino Engines.** Fairbanks-Morse marine engines is the title of the latest catalogue issued by the Canadian Fairbank Co. Engines of various styles and capacities are described in detail. Illustrations are given of the important features as well as of the engines. Anyone interested in this class of engine would do well to send to the Advt. Dept. Canadian Fairbanks Co., Montreal, for a copy, mentioning CANADIAN MANUFACTURER.

**Four-Way Hydraulic Valve.** David Bridge & Co., Castleton, Manchester, make the only valve of its kind actuated by one hand wheel, a full description of which is given in this catalogue.

**Cranes.** One of the most complete crane catalogues issued has been received from the office of the Whiting Foundry Equipment Co., Harvey, Ill., devoted to electric travellers and other cranes for foundries, machine shops, rolling mills, steel plants, power stations, yards, docks, and railroad service. It comprises over 150 pages and illustrates the Whiting travelling crane in actual operation in some of the largest industrial plants in Canada and the United States.

**Storage Batteries.** The Westinghouse Co. Publishing Department have issued a new catalogue on the Westinghouse storage battery for stationary use, manufactured in the storage battery department of the Westinghouse Machine Co., Pittsburg, Pa. It outlines the advantages of this type of battery and gives data regarding the different elements.

**Axles.** A neatly designed catalogue is being sent out by Canadian Bearings Limited, Hamilton, Ont., entitled "Axles and Economy Effectuated" calling attention to the merits of the Wright taper roller bearing applied to axles for different services.

**Dye Stuffs.** The monthly bulletin for March published by the Cassella Color Co., New York and Montreal, contains an interesting article on the dyeing of artificial silk as well as other articles on coloring fabrics. This bulletin will be sent to those interested by addressing the above firm at their Montreal office, 86 Youville Sq.

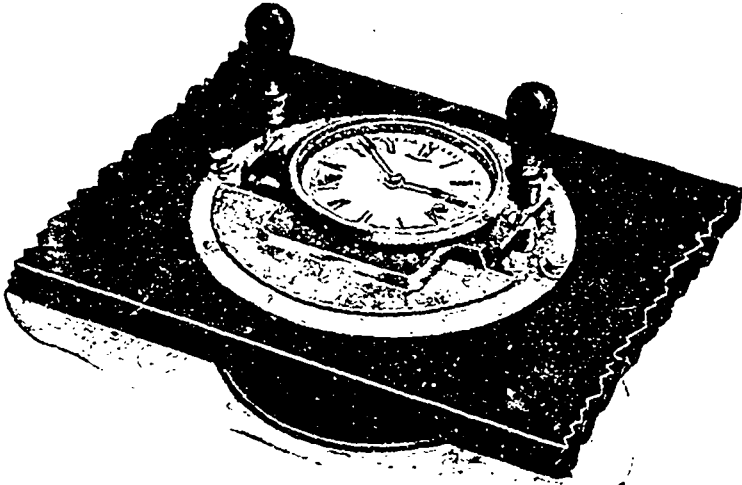
**Paint Machinery.** A catalogue relating credit to the printer, the designer, and the firm itself has just been issued by Wm. J. G. Gray, 2 Church Street, Toronto, describing power machinery, color ink and printers' roller making appliances. It is attractive in appearance and well arranged, having a two color cover design being printed on heavy coated paper and a superior quality of illustrations used. It contains 70 pages and is fully illustrated with some of the numerous lines manufactured by this firm. Besides those already referred to are mentioned and illustrated some lines of flour machinery, grain choppers, sprayers and other machinery, chilled iron roller power transmission apparatus, etc. This catalogue should be in the hands of all interested in these lines and will be sent to any one desiring a copy.

The Saskatoon Construction Engineering Co., Saskatoon, Sask., have been awarded the contract for the building of a sewer and water pipe in Saskatoon, at a cost of about \$71,747.



# YOUR FACTORY COST SYSTEM.

## What Is Its Basis?



### THE CALCULAGRAPH

DOES NOT GUESS  
DOES NOT FORGET

DOES NOT ESTIMATE  
DOES NOT MAKE CLERICAL ERRORS

As the stability of a building depends on the soundness of its foundation, so a factory cost system depends on the accuracy of the records on which it is based.

If you depend on your workmen for these records they must be full of errors—not necessarily intentional.

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is a machine which makes original records of working time with absolute mechanical accuracy.

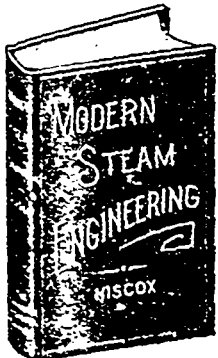
Such records make a reliable foundation for, and are adaptable for use in connection with, any system of finding costs of factory products.

The **CALCULAGRAPH** is the only machine in the world which mechanically subtracts the time of day a workman begins from the time of day he stops and prints his actual working time.

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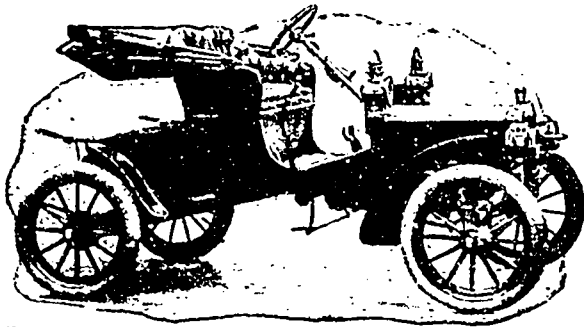
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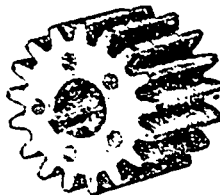
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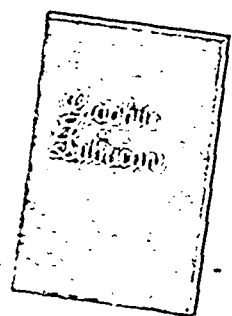
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Syracuse Smelting Works, Montreal.

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

**Cranes (Electric and Hand Power)**  
Babcock & Wilcox, Montreal.  
Smart-Turner Machine Co., Hamilton, Ont.

**Cranks shafts**  
Canada Forge Co., Welland, Ont.

**Crayons**  
Lowell Crayon Co., Lowell, Mass.

**Crucibles**  
Dixon, Joseph, Crucible Co., Jersey City, N.J.  
Hamilton Facing Mill Co., Hamilton, Ont.  
McCullough-Dalzell Crucible Co., Pittsburg, Pa.  
Syracuse Smelting Works, Montreal.

**Crucible Caps**  
Hamilton Facing Mill Co., Hamilton, Ont.  
McCullough-Dalzell Crucible Co., Pittsburg, Pa.

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

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

**Dashes**  
McKinnon Dash & Metal Works Co., St. Catharines, Ont.

**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.

**Dredges**  
Allis-Chalmers-Bullock, Limited, Montreal.

**Drill Chucks**  
Krug & Crosby, Hamilton, Ont.

**Drills**  
Allis-Chalmers-Bullock, Limited, Montreal.  
Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
Petrie, H. W., Toronto.

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

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

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

**Dry Battery Filler**  
International-Acheson-Graphite Co., Niagara Falls, N.Y.

**Dry Kiln Apparatus**  
Sheldons, Limited, Galt, Ont.  
Sturtevant, B. F. Co., Boston, Mass.

**Dust and Shavings Separators**  
Greay, Wm. & J. G., Toronto.  
Sheldons, Limited, Galt, Ont.  
Sturtevant, B. F. Co., Boston Mass.

**Dye Stuffs and Chemicals**  
Benson, W. T. & Co., Montreal.  
Brunner, Mond & Co., Northwich, England.  
Canada Chemical Mfg. Co., London, Ont.  
Cassella Color Co., New York City.  
Leslie, A. C. & Co., Montreal.  
McArthur, Cornelle & Co., Montreal.  
Nichols Chemical Co. of Canada, Montreal.  
Winn & Holland, Montreal.

**DYNAMOS (See Motors and Dynamos)**  
**Electric Meters and Transformers**  
Packard Electric Co., St. Catharines, Ont.

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

**Electric Transformers**  
Allis-Chalmers-Bullock, Limited, Montreal.

**Electrical Supplies**  
Bristol Co., Waterbury, Conn.  
Canadian General Electric Co., Toronto.

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Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
Electrical Construction Co., London, Ont.  
Forman, John, Montreal.  
Jones & Moore Electric Co., Toronto.  
Morrison, Jas., Brass Mfg. Co., Toronto.  
Packard Electric Co., St. Catharines, Ont.  
Toronto & Hamilton Electric Co., Hamilton, Ont.

## Electrodes

International-Acheson-Graphite Co., Niagara Falls, N.Y.

## Elevators and Conveyors

Darling Bros., Montreal.  
Greay, Wm. & J. G., Toronto.  
Jeffrey Mfg. Co., Columbus, Ohio.

## Elevator Insurance

Canadian Casualty & Boiler Insurance Co., Toronto.

## Emery and Emery Wheels

Forman, John, Montreal.  
Hamilton Facing Mill Co., Hamilton, Ont.  
Petrie, H. W., Toronto.

## Engineers (Chemical)

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

## Engineers (Civil)

Mitchell, Charles H., C.E., Toronto.  
Parke, R. J., Toronto.

## Engineers (Consulting)

Aitken, K. L., Toronto.  
Electrical Construction Co., London, Ont.  
Fensom, O. J., Toronto.  
Hunt, Robert W. & Co., Chicago, Ill.  
Madon & Marion, Montreal.  
Mitchell, Charles H., C.E., Toronto.  
Parke, R. J., Toronto.  
Perrin William R. & Co., Limited, Toronto

## Engineers (Contracting)

Babcock & Wilcox, Limited, Montreal.  
Canada Foundry Co., Toronto.  
Darling Bros., Montreal.  
Electrical Construction Co., London Ont.  
Fensom, O. J., Toronto.  
Greay, Wm. & J. G., Toronto.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Robb Engineering Co., Amherst, N.S.

## Engineers (Electrical)

Aitken, K. L., Toronto.  
Allis-Chalmers-Bullock, Limited, Montreal.  
Canadian General Electric Co., Toronto.  
Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
Crooker-Wheeler Co., St. Catharines, Ont.  
Electrical Construction Co., London, Ont.  
Fensom, O. J., Toronto.  
Jones & Moore Electric Co., Toronto.  
Marion & Marion, Montreal.  
Toronto & Hamilton Electric Co., Hamilton, Ont.

## Engineers (Mechanical)

Allis-Chalmers-Bullock, Limited, Montreal.  
Babcock & Wilcox, Limited, Montreal.  
Darling Bros., Montreal.  
Electrical Construction Co., London, Ont.  
Fensom, O. J., Toronto.  
Greay, Wm. & J. G., Toronto.  
Hunt, Robert W. & Co., Chicago, Ill.  
Kerr Engine Co., Walkerville, Ont.  
Marion & Marion, Montreal.  
Mitchell, Charles H., C.E., Toronto.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Robb Engineering Co., Amherst, N.S.  
Sheldons, Limited, Galt, Ont.  
Smart-Turner Machine Co., Hamilton, Ont.

## Engineers (Mill and Hydraulic)

Fensom, O. J., Toronto.  
Greay, Wm. & J. G., Toronto.  
Smart-Turner Machine Co., Hamilton, Ont.

## Engineers (Mining)

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

## Engineers and Contractors

Greay, Wm. & J. G., Toronto.  
Jeffrey Mfg. Co., Columbus, Ohio.  
Smart-Turner Machine Co., Hamilton, Ont.

## Engineers' Supplies

Morrison, Jas., Brass Mfg. Co., Toronto.

## Engines and Boilers

Allis-Chalmers-Bullock, Limited, Montreal.  
Babcock & Wilcox, Limited, Montreal.  
Canada Foundry Co., Toronto.  
Goldie & McCulloch Co., Galt, Ont.  
Morris Machine Works, Baldwinsville, N.Y.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Petrie, H. W., Toronto.  
Robb Engineering Co., Amherst, N.S.  
Sheldons, Limited, Galt, Ont.  
Smart-Turner Machine Co., Hamilton, Ont.

Sturtevant, B. F. Co., Boston, Mass.  
Williams, A. R. Machinery Co., Toronto.

## Engravers

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

## Exhaust Fans

Greay, Wm. & J. G., Toronto.  
Hamilton Facing Mill Co., Hamilton, Ont.  
Sheldons, Limited, Galt, Ont.  
Sturtevant B. F. Co., Boston, Mass.

## Exhaust Heads

Darling Bros., Montreal.  
Sheldons, Limited, Galt, Ont.  
Sturtevant B. F. Co., Hyde Park, Mass.

## Exhausters

Sheldons, Limited, Galt, Ont.  
Sturtevant, B. F. Co., Hyde Park Mass.

## Factory Sites

(See Factory Locations.)

## Fans

Sheldons, Limited, Galt, Ont.  
Sturtevant, B. F. Co., Hyde Park, Mass.

## Feed Water Heaters

Babcock & Wilcox, Limited, Montreal.  
Darling Bros., Montreal.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Pittsburg Filter Mfg. Co., Pittsburg, Pa.  
Robb Engineering Co., Amherst, N.S.  
Smart-Turner Machine Co., Hamilton, Ont.

## Feed Water Purifiers

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

## Files

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

## Fillet (Pattern)

Hamilton Facing Mill Co., Hamilton, Ont.  
Sadler & Haworth, Montreal and Toronto.

## Filters (Oil)

Babcock & Wilcox, Limited, Montreal.  
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.  
Pittsburg Filter Mfg. Co., Pittsburg, Pa.

## Financial

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

## Fire Brick and Clay

Dunbar Fire Brick Co., Pittsburgh, Pa.  
Elk Fire Brick Co., St. Mary's, Pa.  
Hamilton Facing Mill Co., Hamilton, Ont.  
Harbison-Walker Refractories Co., Pittsburg, Pa.  
Leslie, A. C. & Co., Montreal.  
Ontario Lime Association, Toronto.  
Pennsylvania Fire Brick Co., Beech Creek, Pa.  
Stowe-Fuller Co., Cleveland, Ohio.

## Fire Escapes

Darling Bros., Montreal.

## Flour Mill Machinery

Allis-Chalmers-Bullock, Limited, Montreal.  
Goldie & McCulloch Co., Galt, Ont.  
Greay, Wm. & J. G., Toronto.

## Forges and Blowers

Canada Foundry Co., Toronto.  
Greay, Wm. & J. G., Toronto.  
Hamilton Facing Mill Co., Hamilton, Ont.  
Sheldons, Limited, Galt, Ont.  
Sturtevant, B. F. Co., Boston, Mass.

## Forgings

Canada Forge Co., Welland, Ont.

## Founders

Canada Foundry Co., Toronto.  
Goldie & McCulloch Co., Galt, Ont.  
Greay, Wm. & J. G., Toronto.  
Kerr Engine Co., Walkerville, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Robb Engineering Co., Amherst, N.S.  
Smart-Turner Machine Co., Hamilton, Ont.

## Foundry Facings and Supplies

Hamilton Facing Mill Co., Hamilton, Ont.  
International-Acheson-Graphite Co., Niagara Falls, N.Y.

## Fuel Economizers

Babcock & Wilcox, Limited, Montreal.  
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)

Greay, Wm. & J. G., Toronto.  
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

## Gas Blowers and Exhausters

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

## Gas and Gasoline Engines

Economic Power, Light & Heat Supply Co., Toronto.  
Morrison, T. A. & Co., Montreal.  
Smart-Turner Machine Co., Hamilton, Ont.

## Gauges (Recording Pressure)

Bristol Co., Waterbury, Conn.  
Morrison, Jas., Brass Mfg. Co., Toronto.

## Gauges (Steam)

Morrison, Jas., Brass Mfg. Co., Toronto.  
Petrie, H. W., Toronto.  
Williams, A. R. Machinery Co., Toronto.

## Gauges (Water)

Babcock & Wilcox, Limited, Montreal.  
Morrison, Jas., Brass Mfg. Co., Toronto.

## Generating Sets

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

## Generators

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

## Gloves, Mittens and Moccasins

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

## Glycerine

Winn & Holland, Montreal.

## Government Notices

Factory Inspectors.  
Minister of Agriculture.

## Graphite

Dixon, Jos. Crucible Co., Jersey City, N.J.  
Hamilton Facing Mill Co., Hamilton, Ont.  
International-Acheson-Graphite Co., Niagara Falls, N.Y.  
McCullough-Dalzell Crucible Co., Pittsburg, Pa.  
Morrison, Jas., Brass Mfg. Co., Toronto.

## Hack Saws

Krug & Crosby, Hamilton, Ont.

## Hames

McKinnon Dash & Metal Works Co., St. Catharines.

## Hardware

Butterfield & Co., Rock Island, Que.  
Gartshore, John J., Toronto.  
Globe Machine & Stamping Co., Cleveland, Ohio.  
Morrow, John, Screw, Limited, Ingersoll, Ont.

## Heating and Ventilating Apparatus

Darling Bros., Montreal.  
Sheldons, Limited, Galt, Ont.  
Sturtevant, B. F. Co., Boston, Mass.

## High Pressure Blowers

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

## Holsting Engines

Allis-Chalmers-Bullock, Limited, Montreal.

## Holsts (Chain and Pneumatic)

Canadian Rand Drill Co., Sherbrooke, Que.

## Hose (Fire and Pneumatic)

Gutta Percha & Rubber Mfg. Co., Toronto.

## Hydrants

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

## Hydraulic Accumulators

Canadian Boomer & Boschert Press Co., Montreal.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Perrin, Wm. R. & Co., Limited, Toronto.  
Smart-Turner Machine Co., Hamilton, Ont.

## Hydraulic Machinery

Allis-Chalmers-Bullock, Limited, Montreal.  
Canada Foundry Co., Toronto.  
Canadian Boomer & Boschert Press Co., Montreal.  
Darling Bros., Montreal.  
Greay, Wm. & J. G., Toronto.  
McDougall, John, Caledonian Iron Works Co., Montreal.

Perrin, William R. & Co., Limited, Toronto.  
Petrie, H. W., Toronto.  
Smart-Turner Machine Co., Hamilton, Ont.

## Hydro-Electric Plant

Allis-Chalmers-Bullock, Limited, Montreal.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER



# HARRISON WALKER REFRACTORIES CO

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Manufacturers of  
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Specialties for  
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Fire Clay, Silica  
Magnesia, Chrome

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Black Surface Linings  
Brick for Open Hearth, Furnace  
Brick for Copper, Nickel, Brass  
for Gas-turbine, Brick for Mill  
Brick and Heating Furnaces  
Brick for Copper, Nickel, Brass  
Lining, Brick for Gas-turbine

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THE money you waste every year in faulty crucibles, would pay for the McCullough-Dalzell kind—and leave a handsome profit besides.



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Our factories are the most complete in the country. Located in Pennsylvania, Ohio, and Kentucky—and controlling the largest known bodies of Refractory materials for different work. Operated by experienced managers. We manufacture material for all heat work—second to none. Capacity over 200,000 Brick and Special Shapes per day. Write for catalogue.

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is guaranteed to do any work that spirits of turpentine will do, and do that work better. So absolutely certain are we of this that we are willing to ship a test order to any address. When you are convinced of the merit of our Varnish Turpentine you can pay us—not until then. Can we give you greater evidence of the faith that is in us?

## THE DEFIANCE MFG. and SUPPLY CO.

Toronto = = = Ontario

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(CONTINUED).

**Injectors**  
Canada Foundry Co., Toronto.  
Morrison, Jas., Brass Mfg. Co., Toronto.  
Williams, A. R. Machinery Co., Toronto.

**Insulated Wires and Cables**  
Phillips, Eugene F., Electrical Works, Montreal.

**Insulation, Sound and Cold Storage**  
Mica Boiler Covering Co., Montreal.

**Iron and Steel Specialties**  
Armstrong Mfg. Co., Bridgeport, Conn.  
Bourne-Fuller Co., Cleveland, Ohio.  
Canada Foundry Co., Toronto.  
Leslie, A. C. & Co., Montreal.  
London Rolling Mill Co., London, Ont.  
Lysaght, John, Limited, Bristol, England and Montreal.  
Nova Scotia Steel & Coal Co., New Glasgow, N.S.  
Petrie, H. W., Toronto.  
Union Drawn Steel Co., Hamilton, Ont.

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

**Lamps—Electric**  
Allis-Chalmers-Bullock, Limited, Montreal.  
Canadian General Electric Co., Toronto.  
Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
Forman, John, Montreal.  
Packard Electric Co., St. Catharines, Ont.

**Lathes**  
Petrie, H. W., Toronto.  
Williams, A. R. Machinery Co., Toronto.

**Lathes (Wood-working)**  
Goldie & McCulloch Co., Galt, Ont.  
Petrie, H. W., Toronto.  
Williams, A. R. Machinery Co., Toronto.

**Linoleum**  
Dominion Oil Cloth Co., Montreal.

**Lubricators**  
Hamilton Facing Mill Co., Hamilton, Ont.  
Morrison, Jas., Brass Mfg. Co., Toronto.

**Machinists**  
Fisher Bros., Toronto.  
Goldie & McCulloch Co., Galt, Ont.  
Greedy, Wm. & J. G., Toronto.  
Hall, John B., Toronto.  
Kerr Engine Co., Walkerville, Ont.  
Krug & Crosby, Hamilton, Ont.  
Robb Engineering Co., Amherst, N.S.  
Smart-Turner Machine Co., Hamilton, Ont.

**Machinists' Supplies**  
Armstrong Mfg. Co., Bridgeport, Conn.  
Butterfield & Co., Rock Island, Que.  
Goldie & McCulloch Co., Galt, Ont.  
Gutta Percha & Rubber Mfg. Co., Toronto.  
Jeffrey Mfg. Co., Columbus, Ohio.  
Morrow, John, Serew, Limited, Ingersoll, Ont.  
Petrie, H. W., Toronto.

**Machine Tools**  
Becker-Brainard Milling Machine Co., Hyde Park, Mass.  
Darling Bros., Montreal.  
Petrie, H. W., Toronto.

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

**Marine and Stationary Engines and Boilers**  
Allis-Chalmers-Bullock, Limited, Montreal.  
Smart-Turner Machine Co., Hamilton, Ont.

**Mechanical Draft**  
Babeock & Wilcox, Limited, Montreal.  
Sheldons, Limited, Galt, Ont.  
Sturtevant, B. F. Co., Boston, Mass.

**Metal Stamping**  
Globe Machine & Stamping Co., Cleveland, Ohio

**Metallurgists**  
Mills, S. D., Toronto.

**Mica Coverings**  
Mica Boiler Covering Co., Montreal.

**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.  
Gartshore, John J., Toronto.  
Goldie & McCulloch Co., Galt, Ont.

Greedy, Wm. & J. G., Toronto.  
Gutta Percha & Rubber Mfg. Co., Toronto.  
Hay, Peter Knife Co., Galt, Ont.  
Jeffrey Mfg. Co., Columbus, Ohio.  
Morrow, John, Serew, Limited, Ingersoll, Ont.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
McLaren, D. K., Montreal and Toronto.  
Petrie, H. W., Toronto.  
Robb Engineering Co., Amherst, N.S.  
Sadler & Haworth, Montreal and Toronto.  
Smart-Turner Machine Co., Hamilton, Ont.  
Spence, R. & Co., Hamilton, Ont.

**Milling Cutters and Machines**  
Becker-Brainard Milling Machine Co., Hyde Park, Mass.

**Mining Machinery**  
Allis-Chalmers-Bullock, Limited, Montreal.  
Canadian Rand Drill Co., Sherbrooke, Que.  
Gartshore, John J., Toronto.  
Jeffrey Mfg. Co., Columbus, Ohio.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Perrin, William R. & Co., Limited, Toronto.  
Petrie, H. W., Toronto.  
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.  
Electrical Construction Co., London, Ont.  
Forman, John, Montreal.  
Jeffrey Mfg. Co., Columbus, Ohio.  
Jones & Moore Electric Co., Toronto.  
Petrie, H. W., Toronto.  
Sturtevant, B. F. Co., Hyde Park, Mass.  
Toronto & Hamilton Electric Co., Hamilton, Ont.

**Motors (Electric)**  
Sturtevant, B. F. Co., Hyde Park, Mass.

**Moulding Sand**  
Hamilton Facing Mills Co., Hamilton, Ont.

**Moulders Supplies.**  
Hamilton Facing Mill Co., Hamilton, Ont.

**Municipal Filtration Plants (Water)**  
Pittsburg Filter Mfg. Co., Pittsburg, Pa.

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

**Nozzles**  
McCullough-Dalzell Crucible Co., Pittsburg, Pa.  
Morrison, Jas., Brass Mfg. Co., Toronto.

**Office and Bank Fittings**  
Canadian Office & School Furniture Co., Preston, Ont.

**Oils and Lubricants**  
Dixon, Jos. Crucible Co., Jersey City, N.J.  
Hamilton Facing Mill Co., Hamilton, Ont.  
Imperial Oil Co., Petrolia, Ont.  
Queen City Oil Co., Toronto.

**Oil Cloth**  
Dominion Oil Cloth Co., Montreal.

**Paint Pigment**  
International-Acheson-Graphite Co., Niagara Falls, N.Y.

**Paints and Colors**  
Berry Bros., Walkerville, Ont.  
McArthur, Cornelle & Co., Montreal.

**Paint and Color Machinery.**  
Greedy, Wm. & J. G., Toronto.

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

**Patents**  
Budden, Hanbury A., Montreal.  
Fotherstonbaugh & 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-Dalzell Crucible Co., Pittsburg, Pa.

**Pig Iron**  
Bourne-Fuller Co., Cleveland, Ohio.  
Canada Iron Furnace Co., Montreal.  
Nova Scotia Steel & Coal Co., New Glasgow, N.S.  
Syrausac Smelting Works, Montreal.

**Pipe (Riveted, Iron and Steel)**  
Babeock & Wilcox, Limited, Montreal.  
McDougall, John, Caledonian Iron Works Co., Montreal.

**Pipe Threading Machines**  
Armstrong Mfg. Co., Bridgeport, Conn.  
Butterfield & Co., Rock Island, Que.  
Morrison, Jas., Brass Mfg. Co., Toronto.  
Petrie, H. W., Toronto.

**Pipe Coverings**  
Mica Boiler Covering Co., Montreal.

**Pipes and Tubes**  
Bourne-Fuller Co., Cleveland, Ohio.  
Canada Foundry Co., Toronto.  
Montreal Pipe Foundry Co., Montreal.

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

**Plates**  
Bourne-Fuller Co., Cleveland, Ohio.  
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

**Plumbago**  
Hamilton Facing Mills Co., Hamilton, Ont.  
International-Acheson-Graphite Co., Niagara Falls, N.Y.  
McCullough-Dalzell Crucible Co., Pittsburg, Pa.

**Pneumatic Separators**  
Sheldons, Limited, Galt, Ont.  
Sturtevant, B. F. Co., Hyde Park, Mass.

**Pneumatic Tools**  
Allis-Chalmers-Bullock, Limited, Montreal.  
Canadian Rand Drill Co., Sherbrooke, Que.  
Hamilton Facing Mill Co., Hamilton, Ont.

**Pointer Rolls (For Rods and Wire)**  
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

**Power Plants—Equipments**  
Allis-Chalmers-Bullock, Limited, Montreal.  
Babeock & Wilcox, Limited, Montreal.  
Canadian General Electric Co., Toronto.  
Canadian Westinghouse Co., Ltd., Hamilton, Ont.  
Darling Bros., Montreal.  
Economic Power, Light & Heat Supply Co., Toronto.  
Goldie & McCulloch Co., Galt, Ont.  
Gutta Percha & Rubber Mfg. Co., Toronto.  
Jeffrey Mfg. Co., Columbus, Ohio.  
Jones & Moore Electric Co., Toronto.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Packard Electric Co., St. Catharines, Ont.  
Perrin, Wm. R. & Co., Limited, Toronto.  
Petrie, H. W., Toronto.  
Phillips, Eugene F., Electrical Works, Montreal.  
Robb Engineering Co., Amherst, N.S.  
Sadler & Haworth, Montreal and Toronto.  
Smart-Turner Machine Co., Hamilton, Ont.  
Sturtevant, B. F. Co., Boston, Mass.  
Toronto & Hamilton Electric Co., Hamilton, Ont.

**Presses (Tie, Sower Pipe, Nozzles and Sleeves)**  
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

**Presses (Baling, Celluloid, Cider, Die, Vulcanizing)**  
Canadian Boomer & Boschert Press Co., Montreal.  
Perrin, Wm. R. & Co., Limited, Toronto.

**Presses (Hydraulic)**  
Canadian Boomer & Boschert Press Co., Montreal.  
Perrin, Wm. R. & Co., Limited, Toronto.

**Pulleys**  
Darling Bros., Montreal.  
Goldie & McCulloch Co., Galt, Ont.  
Greedy, Wm. & J. G., Toronto.  
Jeffrey Mfg. Co., Columbus, Ohio.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Petrie, H. W., Toronto.  
Smart-Turner Machine Co., Hamilton, Ont.

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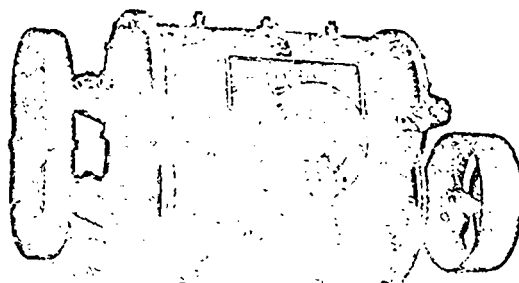
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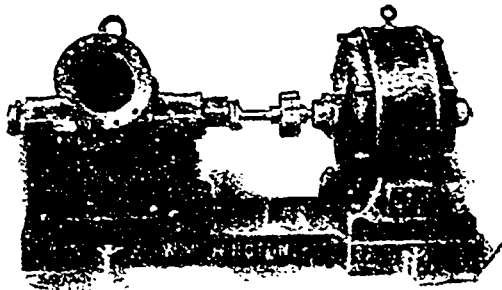
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