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Vol. 52.

TORONTO, MARCH 2, 1906.

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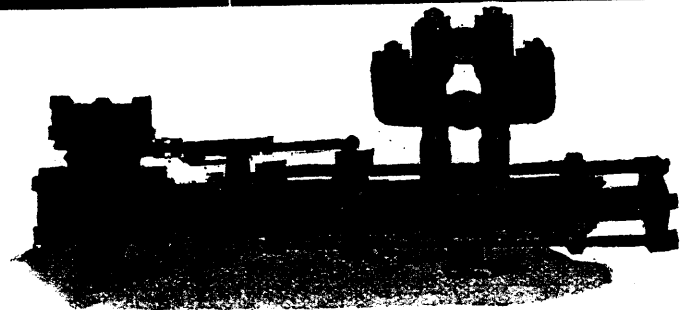
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Does not blow out and requires no following up.
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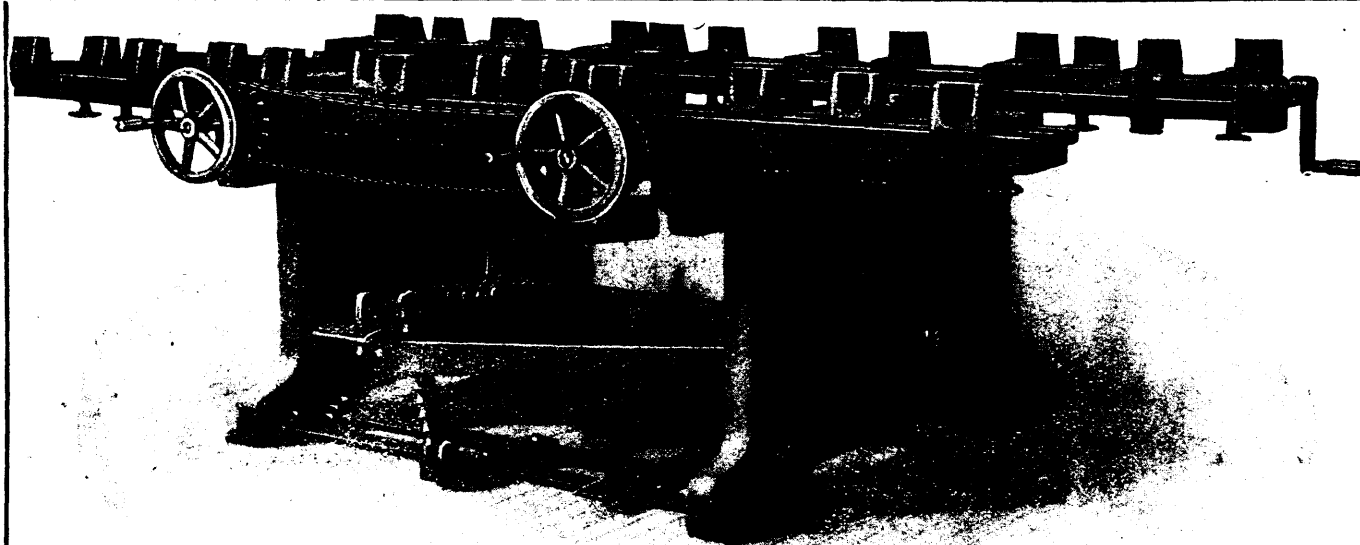
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THE HAMILTON TRADING CO., MANITOBA, Ceylon Plumbago SUPPLIES, also Extra Fine Quality
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The Classified Index
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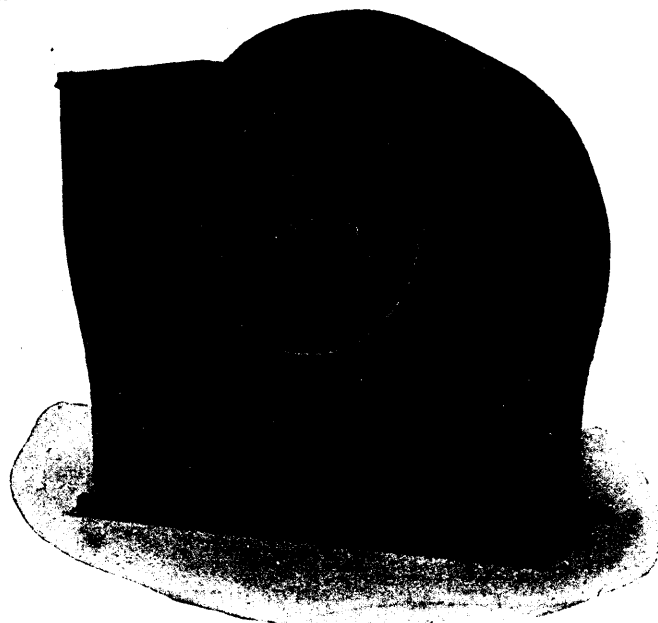
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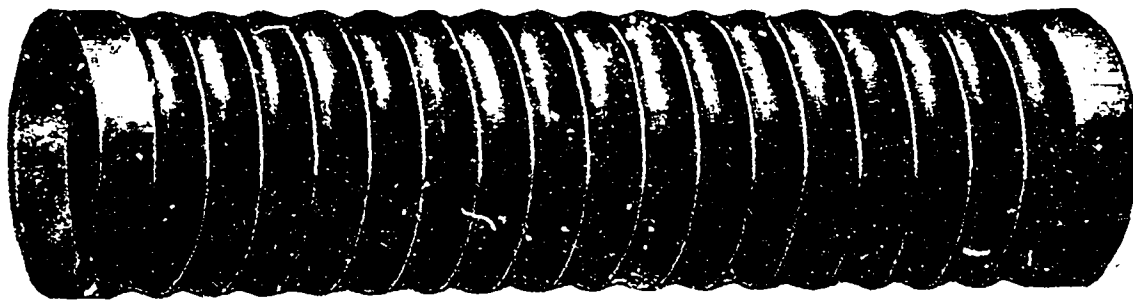


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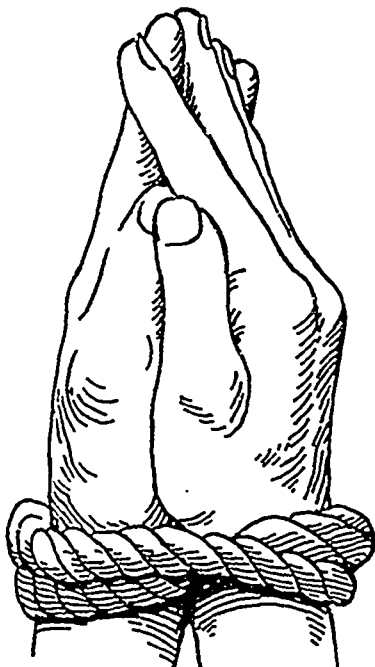
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Water apparently evaporated under actual conditions per pound of coal, 10 1/2 lbs. Equivalent evaporated from and at 212 degrees per pound of combustible pounds, 12:33.

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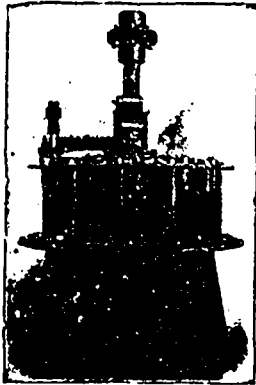
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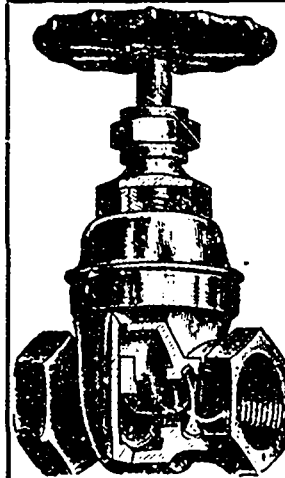
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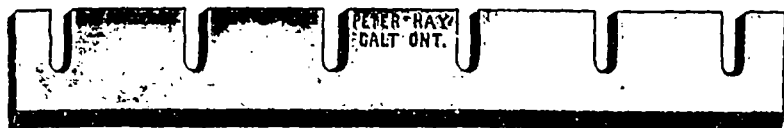
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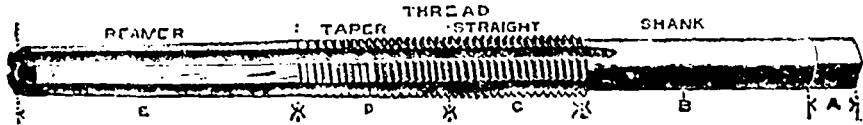
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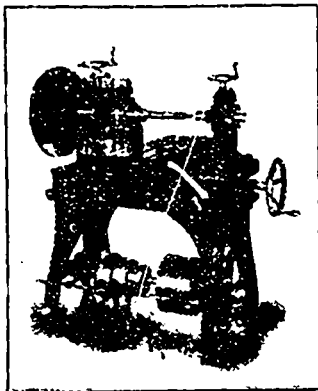
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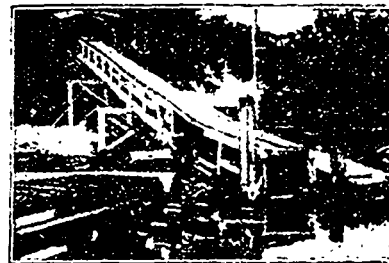
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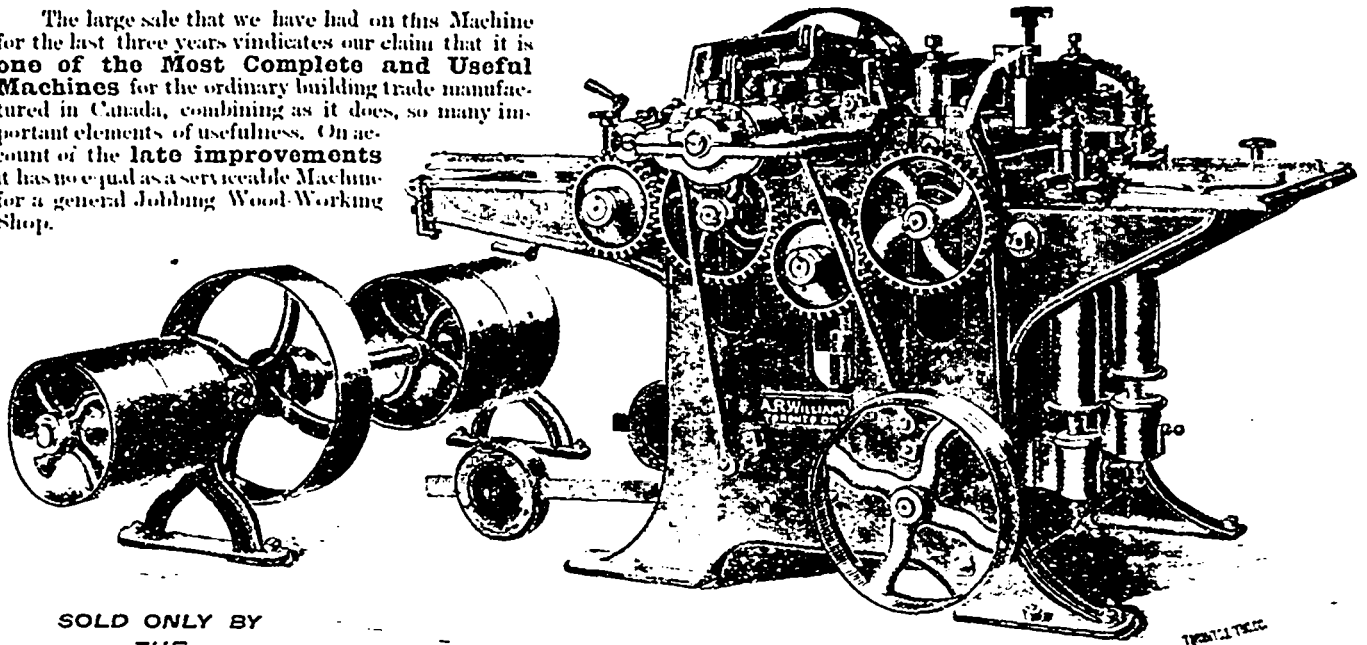
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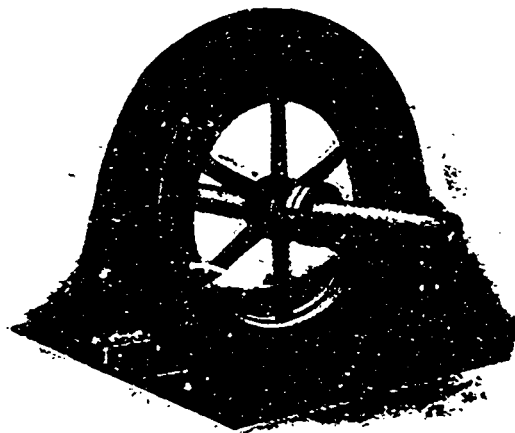
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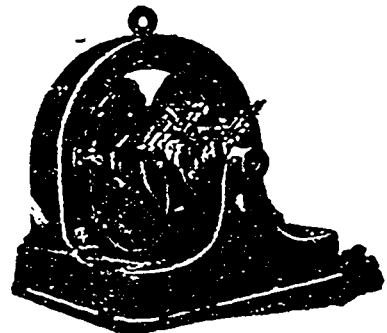
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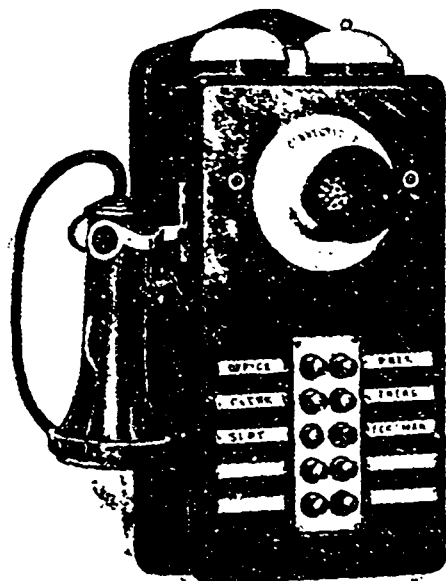
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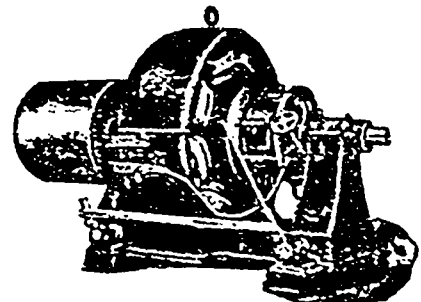
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TABLES

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

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Index to AdvertisersPage 45

OUR SYMPOSIUM—WHAT IT SHOWS.

The invitation recently extended by THE CANADIAN MANUFACTURER to a number of manufacturers residing in various parts of the country, and engaged in many different industries, was confined chiefly to present and past officers of the Canadian Manufacturers' Association, members of the executive council, members of standing committees, and officers of the several branches, from Halifax to Vancouver. They were representative men in their various industries, selected for the different positions assigned them because of their intelligent zeal in behalf of the association. The question upon which their opinions were requested was "The Need of the Iron Industry," the general opinion of the entire country, and of all thinking men in it being that no industry or interest in the country equalled that of the production of home made iron and steel.

The association had at the Halifax convention in 1902, at the suggestion of its tariff committee, passed a resolution disapproving of the bounty system as observed by the Dominion Government as a substitute for tariff protection, and this anti-bonus resolution had been affirmed and reaffirmed at every convention of the association ever since, and had thus become unchangeably committed to it. The Government had adopted a system, on a downward sliding scale, under which the manufacturer of pig and other crude forms of iron and steel would be fostered, the hope being that by the time of the extinction of the bonus the industry would be so well established as to no longer require it. A tariff duty of \$2.50 per ton was laid on imports of pig iron, but the view of the Government was that that protection was not sufficient to afford due justice to the industry, hence the bonus. The bonus was to be paid out of the general fund of the country, and could not be a tax upon such industries as required these cruder forms of iron and steel as their raw materials. Under the sliding scale the bonus paid by the government is fast reaching the period of extinction, leaving the industry such small and insuffi-

cient protection as to threaten its existence and the loss of the large capital invested in it. It does not seem to be the policy of the government to increase the tariff duty; and the only hope that seems left is for a return to the higher bonus of a few years ago, and an enlargement of it to include some additional forms of iron and steel to which it is not now extended.

As shown in the symposium, many manufacturers consider that an increase of duty would be much against their interests, tending as it would to increase the cost of their raw materials, which would not be the case if the makers of this raw material were assisted by a bonus, and would be both willing and glad to have the Government bestow it. The sentiment in favor of bonusing the industry is crystalized by Mr. Gurney when he says, "I have been astonished at the general attitude of the Government to this pig iron proposition, which is recognized to be the one thing more than any other which stands at the base of manufacturing industries of any country."

In view of the extreme importance of the iron industry, and the necessity for perpetuating it by any and all proper means, it is to be noticed that in the memorial of the association presented to the Government by President Ballantyne, not one word was mentioned regarding it, either in protest against a bonus, as mentioned in the oft repeated tariff resolutions, or in favor of a bonus as advocated by Mr. McNaught in his symposium letter.

The views of members of the association, as expressed in the iron question, are worth reading and preserving.

R. L. Innes, manager the Canadian Cannery, Hamilton, Ont.

J. J. Cassidey, Esq., Editor THE CANADIAN MANUFACTURER:

Dear Sir:—I do not feel competent to write an article on "The Need of the Iron Industry," being too little acquainted with that branch of business. I can only say in a general way that Canada requires to foster, to the greatest possible extent, every industry that it can develop. It has been clearly proven that a protecting tariff or a bounty to a new concern, invariably assists in building up an industry that in the course of time is generally able to take care of itself in the open market.

P. H. Burton, president the Merchants Dyeing & Finishing Co., Toronto.

J. J. Cassidey, Esq., Editor THE CANADIAN MANUFACTURER:

Dear Sir:—I think that the bonus system is wrong in principle, as it takes money collected from one industry to support another, whereas a tariff for each industry adapted to its special needs is much more desirable.

A. S. Rogers, general manager the Queen City Oil Co., Limited, Toronto.

J. J. Cassidey, Esq., Editor THE CANADIAN MANUFACTURER:

Dear Sir:—I quite agree with you that the iron industry is of very great importance to this country; in fact, it cannot be overestimated, but I am not sufficiently familiar with the conditions which affect its manufacture to give any expert opinion as to what are its requirements in the way of assistance, etc.

Alexander Saunders, manager the Goderich Organ Co., Goderich, Ont.

J. J. Cassidey, Esq., Editor THE CANADIAN MANUFACTURER:

Dear Sir.—I have read with a great deal of interest your article entitled "The Need of the Iron Industry." I fully realize the necessity of adequate protection to the industries of Canada, in order to place them upon a stable basis, in competition with older and highly protected industries of other countries.

The products of iron enter so largely into all lines of manufacture, that the Government adopted a wise policy in granting a bounty to the producers, thus shifting the burden from the manufacturers to whom pig iron and steel are the raw materials, to the general public, who should rightly bear the cost of encouragement of this industry in particular. The iron industry is only yet in its experimental stages, and I think the Government should give such assistance as will bring it to a successful issue. Once the industry is on a par with that of other nations in cost of production, a nominal tariff would be sufficient.

All credit to the men who have the courage, in the face of almost insurmountable difficulties, to put their energy and capital into such a national enterprise.

James Maxwell, manager David Maxwell & Sons, manufacturers of farm implements, etc., St. Mary's, Ont.

J. J. Cassidey, Esq., Editor THE CANADIAN MANUFACTURER:

Dear Sir:—While we fully recognize that protection to the Canadian iron industry is absolutely necessary for the successful development of it, we think that any additional protection should be in the form of a renewal of the bounties instead of increasing the duty on pig iron or bars. In many lines of iron and steel products used as raw material by the implement manufacturers the present rate of duty is considerably in advance of our present protection on the manufactured article, and any addition to the present tariff would of necessity increase the cost of manufacture and result in the consumer having to pay considerably in advance of present prices.

James P. Murray, the Toronto Carpet Manufacturing Co., Toronto.

J. J. Cassidey, Esq., Editor THE CANADIAN MANUFACTURER:

Dear Sir:—I am opposed to the bounty system, but I am strongly in favor of the protection to the iron industry being high enough to encourage and maintain the thorough establishment and existence of it.

We are frequently called to consider the consumer. In Ontario we are paying a tax on every ton of soft coal we use, to encourage the Nova Scotia mining industry. We live under laws which affect us sometimes very inconveniently, but it is for the good of the whole community. All our industries are in need of protection, and by securing to them our home market we have no reason to assume we will not be able to supply our wants.

President Lincoln told the people to dig the iron ore out of the ground and themselves make it into anything they wanted, and they would then have not only the article, but the money spent to produce it in their own community and be so much the richer.

F. J. Campbell, general manager the Canada Paper Co., Windsor Mills, Que.

J. J. Cassidey, Esq., Editor THE CANADIAN MANUFACTURER:

Dear Sir:—My opinion is that to obtain the establish-

ment of plants for the manufacture of structural steel in Canada is worth a very considerable effort.

Geo. F. Haworth, of Sadler & Haworth, manufacturers of leather belting, Toronto.

J. J. Cassidey, Esq., Editor THE CANADIAN MANUFACTURER:

Dear Sir:—In reply to your enquiry asking my opinion regarding "The Need of the Iron Industry," would say that the Government should give it every possible encouragement. As a basic industry the manufacture of iron and steel in Canada, particularly in their cruder forms, should receive every attention that can reasonably be bestowed upon them.

R. L. Torrance, manager The J. B. Armstrong Mfg Co., manufacturers of fine finished carriages, sleighs etc., Guelph, Ont.

J. J. Cassidey, Esq., Editor THE CANADIAN MANUFACTURER:

Dear Sir:—I have always been in favor of every reasonable step being taken to encourage the iron industry in Canada, and believe it has a great future before it. I think, at the same time, that they have had every thing that they could expect, when you take into account bounties granted, the protective tariff, and the operation of the dumping clause. They certainly should not expect anything more.

I also find that although this has been in operation for a long time, it is still necessary to import certain lines of steel which should be produced in this country. Accordingly, in my opinion, the time has arrived for a reconsideration of the lines which should be added to those already on the free list for manufacturers of certain goods unable to purchase steel for their requirements from Canadian mills.

Geo. A. Walkem, manager Vancouver Engineering Works, Vancouver, B.C.

J. J. Cassidey, Esq., Editor THE CANADIAN MANUFACTURER:

Dear Sir:—I have read your article, re "The Need of the Iron Industry," with a great deal of interest. There is no doubt that no industry contributes more to the prosperity of any nation than the iron industry, and I would be strongly in favor of such protection to it by bounty or otherwise as would ensure the iron smelting and rolling industry when properly managed and paying a fair return on the money invested.

The returns are not all direct and the indirect returns will go some way towards repaying the moneys expended in bounties. I think that this would be the opinion of all the consumers of iron.

Chilion Jones, manager The D. F. Jones Manufacturing Co., manufacturers of shovels, spades, scoops, draining tools, etc., Gananoque, Ont.

J. J. Cassidey, Esq., Editor THE CANADIAN MANUFACTURER:

Dear Sir:—Replying to your letter, re "The Need of the Iron Industry," would say, that I am strongly in favor of building up that industry as well as every other. In order to accomplish this it is absolutely necessary that all articles made from iron should have a sufficient duty imposed upon them to insure the manufacture of them in Canada. If this is not done, I cannot see how any

great increase of output can be expected, as there will be no market for them, even if the country doubles in population in the next ten years. The 33½ per cent. preference given to Great Britain induces the importation of such goods, consequently preventing the consumption of Canadian made articles, and therefore reduces the market for iron, steel and other materials; and as England will give Canada no advantage in her markets, I do not see why the industries of Canada should be injured by the preference.

If a maximum and minimum tariff is adopted, the tariff as now in force should be the minimum and an increased duty imposed as the maximum.

William Smaill, secretary-treasurer the Canada Horse Nail Co., Montreal.

J. J. Cassidey, Esq., Editor THE CANADIAN MANUFACTURER:

Dear Sir:—The development of our natural resources namely, mines, fisheries, forests and agriculture, is of paramount interest to every Canadian who wishes his country to prosper. These resources may be potentially all that they are admitted to be, but unless they are developed, they remain dormant. The possibilities are there, but the full realization has not yet come.

We know that we have large deposits of iron and coal, and other basic materials necessary for the development of an iron and steel industry; then why should it not be developed? We have arrived at that stage in our development when the demand for products requiring large quantities of articles produced from iron and steel is large and imperative, and likely to increase in a ratio corresponding to the increase of our population.

We have railroads to build, and renewals to be made; therefore rails to provide. We require bridges to traverse the streams and rivers innumerable in our land. We require structural material for the erection of the many buildings and structures going up on every hand. Our rolling mills require billets for the production of merchant bars; nail rods for the production of wire, etc. We have the demand already, and increasing; the supply must be provided, either as the production of our own Canadian works, or imported from abroad. Which shall it be? Which do we as Canadians prefer it shall be? Surely, that it shall be "Made in Canada."

The development of the iron and steel industry to the point it has now reached, is directly as the result of the fostering aid and protection afforded it by duties and bounties, sufficient to encourage investors to enter upon the erection of large and suitable works required, and incur the large outlays necessary for the initiation and development of such enterprises. Whatever may be our differences regarding the question of protection and bounties, from a theoretical point of view the number of persons in Canada who would now acquiesce in seeing these industries destroyed, or their facilities lessened by the withdrawal of government support, must be a very small minority indeed.

I have not sufficient technical acquaintance with the subject, to give an opinion that is worth considering, as

to whether the iron and steel industries established under such auspices, have arrived at that point where they can be left to take care of themselves, without the assistance referred to, but, if it can be established through impartial examination and expert inquiry, that they do need a continuance of such aid, we should all rally to their support by asking the government to help such a good cause.

PRODUCTION OF PIG IRON IN CANADA IN 1905.

The American Iron and Steel Association has received direct from the manufacturers the statistics of the production of all kinds of pig iron in Canada in the calendar year 1905. Full and complete reports have been received from every pig iron maker in the Dominion.

According to Mr. Swank's Bulletin, the total production of all kinds of pig iron in Canada in 1905 amounted to 468,003 gross tons, against 270,942 tons in 1904, an increase of 197,061 tons, or over 72 per cent. The production in 1905 was much the largest in the history of the Dominion and exceeded that of 1902, the year of next largest production, by 148,446 tons, or over 46 per cent.

In the first half of 1905 the pig iron production of Canada amounted to 210,206 tons and in the second half to 257,797 tons, an increase of 47,591 tons. Of the total production in 1905, 432,870 tons were made with coke; 4,836 tons with charcoal and coke mixed, and 30,297 tons with charcoal.

The production of basic pig iron in Canada in 1905 amounted to 172,102 tons, against 70,133 tons in 1904, and the production of Bessemer pig iron to 149,203 tons, against 26,016 tons in 1904. Basic pig iron was made in 1905 by three companies owning six furnaces, and Bessemer pig iron by two companies owning three furnaces. The basic pig iron was all made with coke for fuel, but the Bessemer pig iron was made with coke alone, charcoal alone, and charcoal and coke mixed. Canada has not made spiegeleisen or ferro-manganese since 1899, when small quantities of both metals were produced at Bridgeville, Nova Scotia, by a furnace which has since been abandoned.

The production of malleable Bessemer pig iron in Canada in 1905 amounted to 3,300 tons; foundry pig iron, 139,528 tons; forge pig iron, 3,500 tons; and white and mottled and miscellaneous grades of pig iron, including castings made direct from the furnace, 370 tons. Neither ferro-silicon nor ferro-phosphorus was made. The quantity of limestone consumed for fluxing purposes by blast furnaces in Canada in 1905 amounted to 290,310 tons.

The following table gives the total production of all kinds of pig iron (including spiegeleisen and ferro-manganese) in Canada from 1894 to 1905. Prior to 1894 the pig iron production of Canada was not ascertained by the American Iron and Steel Association.

Years.	Gross tons.	Years.	Gross tons.	Years.	Gross tons.
1894	44,791	1898	68,755	1902	319,557
1895	37,829	1899	94,077	1903	265,418
1896	60,030	1900	86,090	1904	270,942
1897	53,796	1901	244,976	1905	468,003

On December 31, 1905, Canada had 14 completed blast furnaces, of which nine were in blast and five were idle. Of the total ten usually use coke for fuel and four use charcoal. In addition one furnace, to use coke, was being built and three coke furnaces were partly erected on December 31. Work on the partly erected furnaces was, however, suspended some time ago.

During the first half of 1905 Canada had 13 of its completed furnaces in blast, and during the last half it had 12 furnaces in blast. In the first half of 1904 it had 10 furnaces in blast, and during the last half of the year 10 furnaces were also running.

THE METRIC SYSTEM.—I.

On April 12, of last year, Professor J. C. Maclellan, B.A., professor of physics at the University of Toronto, addressed the Committee on Agriculture of the Dominion House of Commons upon the metric system of weights and measures. The lecturer strongly advocated the adoption of the system as simpler and more advantageous from a commercial and economic standpoint than the duodecimo or British system. He pointed out that the transition from one system to another could be accomplished quite easily and without any disturbance in the nomenclature. All the nations of Europe and the American continent have adopted the system, save England and the United States, and the manufacturers of those countries, which have large interchange of trade with Germany, for instance, have now to maintain the two standards in their patterns and machinery in order to meet the needs of their internal and external trade.

Hon. Mr. Brodeur, Minister of Inland Revenue, informed the committee that he has been considering the advisability of securing the services of an expert to travel throughout the whole Dominion and lecture upon the subject for the purpose of educating the public in the principles upon which the system is based.

In order to prepare the public for the introduction of the system, should such a step be decided upon, the Dominion Government has engaged Professor Maclellan to deliver a series of lectures in every part of Canada, upon which service he has already begun.

The object of these lectures is to describe the metric system thoroughly, and to show its advantages over the system, or rather variety of systems of measurement, at present in use in Canada.

Professor Maclellan's addresses are of a similar character to the one he delivered before the committee in Ottawa. After reviewing the interesting history of the metric system which was introduced into France at the time of the Revolution, and has since been adopted by most of the countries of Europe, he illustrates the extreme simplicity of this method of calculation on account of its decimal character.

He points out that we have still in Canada a variety of weights and measures which are very confusing. For instance, the ounce avoirdupois is 437.5 grains, and the ounce Troy, or apothecaries, 480 grains. We have the dram avoirdupois weighing 27.344 grains, and the dram

apothecaries weighing 60 grains. The mile, according to land measure, is 5,280 feet, while the nautical mile is 6,000 feet. The surveyor's chain is 66 feet, and the engineer's chain 100 feet. The same variety of measurements prevail in every part of the British Empire and in the United States.

The metric system, he points out, has already been adopted by France, Germany, Austria-Hungary, Holland, Belgium, Norway, Sweden, Italy, Spain, Portugal, Greece and half a dozen smaller European states, by Egypt, Japan, parts of China, Mexico and nearly all the South American states.

Dr. Maclellan points out that if the British Empire and the United States would adopt the metric system there would be a uniform system throughout practically the entire civilized world. The advantages to trade and commerce are obvious. In fact he claims the countries which adhere to the old varieties of measurement are laboring under disadvantages in trade on that account, and shows how the industrial conditions in Canada and every part of the Empire would be improved by adopting the scale of measurement which prevails in the countries whose markets we are competing for.

At the coronation conference of colonial premiers held in London in 1902 a resolution was adopted to the effect that it would be advisable to adopt the metric system of weights and measures for use within the Empire, and that the prime ministers urge their governments to consider its adoption.

The metric system is now legalized in Great Britain, in Canada, and in most of the colonies, but nowhere yet is it made compulsory. New Zealand enacted a bill in 1903 by which the system will be made compulsory in that colony during the present year.

In 1904 a bill making the proposed system compulsory in Great Britain and Ireland after April 5, 1906, was introduced in the House of Lords and received its third reading, but sentiment in the House of Commons was against it, and the bill was dropped there.

There is now a bill for its introduction in all government works before the United States Congress. In Canada nothing definite has yet been done towards making the system compulsory.

Whether the metric system would be a good thing for Canada, and whether the people of Canada could be brought to favor it, is open for discussion. It is true that, as Professor Maclellan says, a bill was before the British Parliament proposing to make the system compulsory, but on April 15 last, when under consideration in the House of Commons, was withdrawn, and if it should ever be brought up again it will have to be de novo.

A strong argument in favor of the adoption of the metric system, as pointed out by Professor Maclellan, is that there are but few non-metric countries, including the British Empire, and the United States, with both of which Canada is so intimately connected, while about all the other countries of the world have adopted the system, and if Canada is to keep up with the procession of nations,

we must also adopt it. As shown by Mr. W. M. McFarland, in Cassier's Magazine, there are 36 countries using the French metric system, the aggregate population of which is 445,296,003, while there are but three important countries which do not use the system. These are the British Empire with 356,000,000 population, United States, 76,000,000 and the Russian Empire with 135,000,000, a grand total of 567,000,000. The population of each country, mentioned by Mr. McFarland, is given, and a study of the figures shows that none of the first four named are equal to the population of Liverpool; Lancashire has more inhabitants than any of the first 13; the total population of the first 24 is about equal to that of the United States; none of the first 25 equal the population within 50 miles of Manchester; the total population of the first 28 is equal to that of the Russian Empire, and the British Empire alone has 4,000,000 more people than the whole of the first 34. Professor MacLennan does not mention that the population of the three empires which do not use the metric system—Great Britain, United States and Russia, exceed by more than 120,000,000 inhabitants the population of the combined 36 other countries. So much for the argument that this portion of the British Empire at least should adopt the system because some other countries have done so.

Canada has too much at stake to enter upon such a chimerical scheme. It has been shown by some of the best engineers and machinists in the United States that to make absolutely necessary changes in the mechanical industries in that country, incident upon the compulsory adoption of the metric system, would cost not less than one thousand million dollars. Does Professor MacLennan comprehend what that means? Yet that is only one of the many reasons why the United States, nor Great Britain, nor Canada has not adopted it, and will not.

THE MANUFACTURERS' MEMORIAL.

At the Quebec convention of the Canadian Manufacturers' Association, held in September last, the report of the tariff committee received considerable attention. The report was read in open meeting and has been published, but the discussion of it was behind closed doors, and the public are not supposed to know what was said on the subject, nor who said it. The report was contained in less than one page of Industrial Canada.

Perhaps the most important point discussed arising out of the report was the appointment of the tariff commission, whose investigations have since been concluded. The association has been agitating for a commission for the past three years, and while the one which the Government had appointed was not, we were told, just what could have been desired, still its appointment was a great concession to the views of the association. It was believed that the Government was prompted by an earnest and sincere desire to provide a better and a higher tariff for the protection of Canadian industries. In facilitating the work of the commission it was strongly urged that the association should assist them in every way in its power. When placing any matter before the

Government, the association had always claimed to represent the concrete views of the members. To arrive at these views it was necessary that the various sections of the association should first get together and thrash out all the points connected with their industries, and when thus thrashed out and approved by the tariff committee, should be presented to the Government. This would result in harmonizing differences and save the time of the commission. Nothing could be gained by asking too much, the feeling of the association being that the worst enemies it had, and that the policy of protection had, were those manufacturers whose requests were extreme. The boast of the association was that with a good protective policy competition would bring prices to the level of or below foreign prices. If, the committee said, the tariff is revised primarily for the benefit of Canadian interests, and "with a view to diverting surplus trade to British sources," it would meet the requirements of the country. The convention re-affirmed the tariff resolutions passed at the Halifax meeting in 1902, in Toronto in 1903 and in Montreal in 1904. One of these was for a preferential tariff in favor of the Mother Country and other parts of the British Empire, always under such conditions that the minimum tariff must afford adequate protection to Canadian interests; another was a re-affirmation of opposition to any arrangement for reciprocal trade with the United States, and another was a declaration of disapproval of the bounty system as a substitute for the policy of tariff protection.

It might readily have been imagined that under the circumstances, after the Government had been induced by the association, as we are told, to appoint the tariff commission; after telling the commission that the association would give them their best counsel and advice in arriving at proper conclusions regarding such changes in the tariff as should be made; after telling them that the association would assist them in every way in its power; after telling them that the concrete views of the different sections of the association should be presented; after all this voluminous say-so, the commission consumed several months in travelling over Canada without even so much as a whisper from the association until the very last day of their sessions in Ottawa, when the president of the association and the chairman of the tariff committee waited upon them, pro forma and with much form and presented a memorial. And such a memorial! It told about the large membership of the association and the large capital the members had invested in their different industries; the exceeding prosperity which pervaded the country; of how only within the last few years the manufacturers of Canada had awakened to the great possibilities which lie before them, which years have been years of progress and prosperity, suggesting that the fact should so scare the Government that, without pessimism they should say "Now, while we are prosperous, now is the time to safeguard our country against the coming times of depression." There was a dissertation, too, very carefully collated from the blue books, but which the Government evidently were

not familiar regarding the vast imports from the United States, how it happened and how it could be avoided; how we wish always to be on friendly terms with that country, and there were kind words said in behalf of the farmer, extracted from some of the addresses to the farmers prepared by one of the young men hired by the association for the purpose of enlightening the people in that direction; something about the value of the home market, and there were many other platitudinous expressions, all of which indicated that the whole memorial was written—not by business men who understood just what they were talking about, and knew just what the welfare of the country required—but rather by the B.A. contingent drawn from some of the colleges. There was not one word in it indicating that the association had any specific reasons for asking for the tariff revision that had been clamored for ever since the Halifax convention in 1902. Tariff revision was necessary for every Canadian industry represented in the association, and it was promised that when the time came to inform the Government the particulars of the revision required, it would be done concisely and in detail, but the opportunity was lost, and the public are left to wonder why.

Time was when the Canadian Manufacturers' Association entertained well defined ideas regarding the tariff as affecting all the different industries represented in it, and expressed them to the Government, but the present is not like the old days under the prestige of the Old Guard.

RECIPROCITY.

At a meeting of the Merchants and Manufacturers Association in Pittsburg, a few days ago, Hon. E. N. Foss, of Boston, spoke in favor of the "reasonable conservative application of a moderate protective policy."

"I believe," said Mr. Foss, "in a truly protective and not a restrictive and reactionary policy. I believe in a tariff that will overcome the difference in the cost of production here and abroad, and give our workmen a reasonable advantage in our markets; that will protect him in whatever sphere he is found, instead of discriminating against him as our present tariff does in many particulars.

"I also believe in reciprocity. I believe in it as a complement and counterbalance of the policy of protection. I believe that all protective tariffs ought to be formulated with regard to the principles of reciprocity as an integral part of protection; that by some fundamental feature, like the maximum and minimum principle, such as Germany and other foreign countries are developing with such care and discrimination, we can do justice to ourselves, and at the same time recognize the value to us of our best and most liberal customers.

"I believe in a tariff which recognizes the special relation to us of contiguous and other countries on this continent; a tariff that does not ignore the desirability of commerce and maritime enterprise the world over; that does not prevent or prohibit the access of our people to the necessities of life and industry, a tariff that does

not permit the mass of our citizens to be exploited for the pecuniary benefit of a few greedy institutions."

"It was not too much to say," said Mr. Foss, "that the United States had made a relative failure of their foreign trade. In 1904 South America spent \$7 in Europe for every \$1 in the United States. Asia, Africa, and Oceania were still less encouraging." There was also a steady decrease in the proportion of agricultural products. These exports had shrunk from 83 per cent to 55 per cent. The phenomenal volume of exports for 1904 and 1905 Mr. Foss attributed in part to increased prices, particularly in raw cotton, which represented 25 per cent. of the total.

Mr. Foss attacked the policy of excluding by duties of 100 to 150 per cent., imports like wool, hides and skins, lumber and sugar, of which the domestic supply, compared with the demand, was constantly lessening. Very many of the tariff schedules had no economic excuse for existence. "They restrict consumption, force inferior articles on our people, encourage adulteration and substitution, and invite hostile tariffs and other trade restrictions. The effect was already apparent in Canada and Germany."

The only excuse for the blanket scheme of protecting everything in sight was political, not economic. It was a log-rolling scheme for fortifying the whole system by multiplying its supposed beneficiaries.

Mr. Foss charged the stand-pat policy with the retaliation measures adopted abroad. Had Canada been treated in a half-decent manner, he thought the Canadian preferential tariff would have been extended to the United States. Count Goluchowski's utterance in 1897, after the adoption of the Dingley tariff, was smiled at, but Germany had fulfilled the threat. The new German tariff, which comes in force on March 1, discriminated against the imports from hostile tariff nations with surtaxes of 50 and 100 per cent. on free and dutiable goods.

As a general result, Mr. Foss found the immense trade areas of the world indisposed to friendly commerce, while European rivals possessed greater influence there than did the United States.

"Canada, our greatest customer on this continent, and our largest in the world for manufactured goods, is straining every nerve to divert the bulk of her foreign trade from the United States to Great Britain. The sole reason for this phenomenal condition is our own stupid and selfish treatment of the question of trade relations with the Dominion."

Nor did Mr. Foss think, judging from past experience, that Canada was concerned about threats of retaliation. The question of a tariff war with Canada or Germany was not one of patriotism, but of ordinary business judgment. The perils involved in the McCleary program was very serious, no less, possibly, than those of actual war. Germany would not stand to see her great steamship lines put out of business. In conclusion, he denounced the stand-pat policy as a repudiation of the principle of reciprocity, which alone made the Dingley act tolerable.

Instead of doing missionary work in Canada, looking

to the revival of a sentiment that has long since died out, owing to an effort on the part of the United States to coerce Canada into a connection derogatory to her, Mr. Foss is putting in his work where and with people where it will do the most good. He knows how it is in Canada. We wish him all possible success in his endeavors. He knows that there is more probability of Canada going in for reciprocity of tariffs with the United States than reciprocity in trade matters. He knows that if any meliorating conditions are to prevail, it must be begun in the American tariff.

EDITORIAL NOTES.

The imports of Portland cement into Canada in the fiscal year 1905, and sources of supply were:

	Hundred Weight.	Value
Great Britain.....	475,506	\$162,402
Belguim.....	360,882	103,438
France.....	2,046	600
Germany.....	17,295	6,961
Holland.....	2,979	897
Japan.....	64,444	27,083
United States.....	2,305,242	933,268
	<hr/>	<hr/>
	3,228,394	\$1,234,649

"The Executive Council of the Canadian Manufacturers' Association, desirous of building up Canadian ports, unanimously favor the application of the Canadian preference only to goods entering Canada directly from the country of their origin." Such is the memorial which has been adopted by the Executive of the association and which has been forwarded to Hon. Mr. Fielding, Minister of Finance. The object is to divert to Canadian ports the heavy importations from Great Britain that now come in via New York, Boston and Portland. The Canadian Manufacturers' Association, not being importers of merchandise, desire to burden the importers of Ontario with a handicap that would be almost unbearable. In most instances the difference in freight charges on goods imported from Great Britain to Toronto via Halifax or via New York would quite wipe out the tariff preference on British goods. In many lines of imports, the preference is the inducement in favor of British goods, and the proposition of the Association, if carried into effect, would mean the imports of German and French and American goods in preference to British goods. Ontario importers are not in accord with the association in this matter.

The condemnation of the engineering staff found in the report of Mr. H. Holgate, C.E., of Montreal, to the Minister of Railways upon the leaks in the lift locks at Peterboro' and Kirkfield, and the negligence shown by the investigating engineer to have taken place, point to a demand for the resignation of Messrs. R. B. Rogers, superintendent and engineer of the Trent Canal; R. A. Davey, resident engineer on the Kirkfield lift lock; his assistant, Augustus Sawers, jr., and Messrs. D. E. Bethune and Spence, inspectors at Kirkfield and Peterboro', respectively. The belief entertained is that Mr. Emmerston, the Minister of Railways and Canals, will forward

a copy of Mr. Holgate's report to each of the gentlemen who have incurred criticism, together with a polite intimation that his resignation would be acceptable.

There are many Ontario members of the Canadian Manufacturers' Association, particularly in Toronto, Hamilton, Galt, London and other manufacturing centres to whom many forms of iron and steel are raw materials, and who take advantage of the cheaper charges for transportation to import their supplies from Great Britain, the tariff preference in favor of British goods being the inducement to trade with the Mother Country. But now the executive of the Association are asking the Government to refuse the benefit of the preference except where the imports are through Atlantic Canadian ports. The suggestion, if carried out, would be to still further divert an already waning trade with Great Britain to the United States.

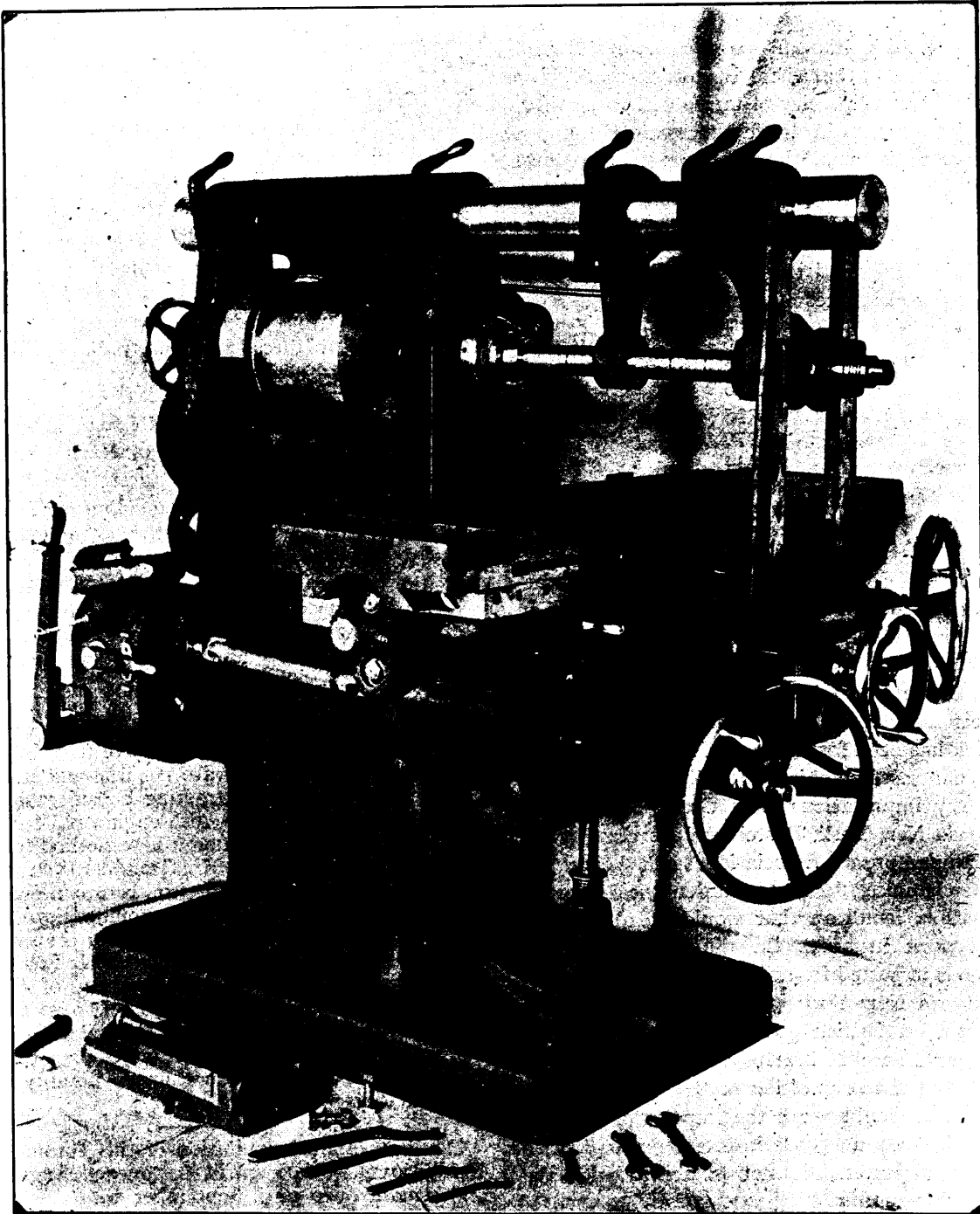
Speaking at a meeting in Montreal a few days ago, Hon. L. P. Brodeur, Minister of Marine and Fisheries, said the work that had been undertaken by his predecessor, the late Hon. Raymond Prefontaine, would be vigorously carried to completion. Particular attention would be given to deepening the St. Lawrence channel, and the Minister was able to promise that by next November a depth of thirty feet would be obtained as far as Batiscan, 57 miles above Quebec. Improvements to the river route between Quebec and the Straits of Belle Isle would also be carried out.

Mr. Sontum, commercial agent for Canada in Sweden and Norway, reports the discovery of two very important inventions in connection with the iron and steel industry, which are at present attracting considerable attention. The inventors are two Swedish engineers, Messrs. Grondil and Kjellin, who have found a new method for producing iron from the ore. By Mr. Grondil's system the ore is crushed to fine dust and the iron is drawn out by the aid of strong magnets. It is then moulded into the form of bricks. Mr. Kjellin uses electricity for the same purpose. The patentee has closed contracts with French, German and Italian firms for the employment of Mr. Kjellin's method in the production of from two to three million tons of iron and steel per year. Similar agreements for the production of iron and steel under the Grondil method have been made with other firms, notably the Krupp works at Essen, Germany.

The 27th annual exhibition of the Toronto Industrial Exhibition Association will be opened August 27 next and remain open until September 10.

At the recent meeting of the tariff commission in Ottawa a gentleman representing the Atikokan Iron Co., of Port Arthur, Ont., asked for a fixed bounty on pig iron for a term of five years, after which to be decreased by a sliding scale. He also asked that the bounty on pig iron made from foreign ore be allowed to lapse as provided under the existing Act; and also that the duty on coal for coking purposes be abolished. The bounty business is all right enough, and the request for free coal for coking purposes is all right, but if the Atikokan people think that they can successfully make good commercial iron with Atikokan ore, without an admixture of foreign ores, they are mistaken. No coke iron is made in Canada that does not contain a foreign element in it. Does he want all the furnaces in Canada closed?

MACHINERY AND ENGINEERING.



NO. 4 PLAIN MILLING MACHINE.

NO. 4 PLAIN MILLING MACHINE.

The accompanying illustration is of the No. 4 plain milling machine, gear feed, made by the Becker-Brainard Milling Machine Co., Hyde Park, Mass.

This machine embodies a number of new and important improvements which will be much appreciated by all users of milling machines. Special attention is called to the positive gear-feed drive and change-feed mechanism, by which 20 changes of feed can be made without stopping the ma-

chine; the new clutch mechanism in connection with the hand wheels; also the box type of knee and telescopic elevating screw.

The spindle has a No. 12 B. & S. taper hole in front end, is made from hammered crucible steel, has a $\frac{3}{4}$ -inch hole through its entire length, and runs in self-centering bronze boxes arranged to compensate for wear. It has a slot across end to engage clutch on arbor, is threaded to take a chuck, and a threaded collar covers the screw when not in use. It is connected with the change-feed mechanism by three spur gears, making a positive-driven feed. The spindle is

double back geared, and gears are protected with guards.

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

The platen has automatic longitudinal, cross and vertical feeds. It is provided with three $\frac{3}{4}$ -inch T slots with oil pans at each end. Feed is reversed in front of machine.

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

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER

provided with automatic vertical feed and knock-off.

Hand wheels for operating the feeds are provided with clutch arrangement enclosed in hub. When the table has been set to required position, the clutch may be instantly disengaged by pressing in the knob on the front of the hand wheels, thereby preventing any accidental change from their fixed position, and also preventing them from revolving when the automatic feeds are thrown in.

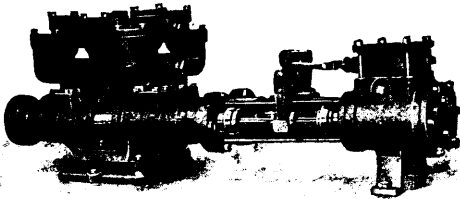
Dials are adjustable and graduated to read to thousands of an inch, to indicate the vertical, transverse, and longitudinal movements of platen, and are set at any position with set screw.

The patented change-feed mechanism is conveniently arranged on the back of column, and is capable of obtaining instantly 20 changes of feed, slow or fast, by a simple movement of the lever without stopping the machine.

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

DUPLEX OUTSIDE PACKED PUMP.

The accompanying illustration shows a Duplex Outside Packed Pump, provided with pot valves, as recently designed by the Smart-Turner Machine Co., Limited, Hamilton, Ont. It is particularly adapted to marine service, and as is seen while the pump is outside packed, the plungers do not project outside the cylinders, thus avoiding any chance of the engineer being struck on



DUPLEX OUTSIDE PACKED PUMP.

the leg by a projecting plunger. Each valve is in its own pot so that any one may be taken out by removing only two nuts. Any drip from the plunger glands is caught in a pan, so arranged that it may be carried away in a pipe. The steam end of the pump is of the Standard Duplex pattern. The whole pump takes up less floor space than the end outside packed pattern, which is so well known.

After a hearing had on February 21, in the Superior Court at Boston, Mass., between the Lowell Crayon Co., plaintiff, and Howe Lowell Crayon Co., defendant, the following decree was made by Judge Richardson, who heard the cause:—"It is hereby ordered, adjudged and decreed as follows: That the defendant Howe Lowell Crayon Co., its officers, servants, agents and attorneys, be and they hereby are enjoined from using in any way, by card or label or stamping, stencilling or marking, or otherwise, upon their packages of manufactures for the trade, or in advertising the same in any way to the public, the combined words "Lowell Crayon" or "Lowell Crayons," whether in combination with any other words or otherwise, until the further order of the Court."

CAPTAINS OF INDUSTRY.

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

The Canadian General Electric Co., Toronto, are sales agents of the "Blue Gloss" commutator compound, manufactured by the Blue Gloss Lubricant Co., Toronto Junction, Ont. The article eliminates the wear on the brushes and commutator, prevents sparking and reduces the temperature.

P.P.P. means "Purchase Packard Products" and save money as indicated in a desk blotter sent us by the Packard Electric Co., St. Catharines, Ont.

The report of the Directors of the Toronto Industrial Exhibition Association states that of the sum of \$300,000 voted by the citizens of Toronto last year for the erection of new buildings, only \$36,000 has been so far expended, this amount being utilized in the erection of the new fireproof Art Gallery. In this connection, plans have been prepared and contracts let for the erection of a building for the exhibit of agricultural implements and process of manufacture, at a cost of \$81,000. The building is contracted to be completed on July 15 next. Plans have also been prepared for a steel and brick building for the accommodation of agricultural products, to be erected at a cost of \$70,000.

The Canadian Portland Cement Co. have ordered from the Robb Engineering Co., Amherst, N.S., two 150 h.p. boilers for their plant at Marlbank, Ont.

The Ontario Board of Health, Toronto, have approved of a septic tank system for disposal of Toronto's sewage, the estimated cost of which is about \$2,385,000, and the annual cost is estimated at \$76,000.

The flour and grist mill of Messrs. Morrison Bros., Sombra, Ont., was destroyed by fire February 20.

The Adjustable Axle Nut Co., London, Ont., with a capital of \$40,000, have secured the London Tool Co's premises and will begin operations at once.

The three Canadian sugar factories at Raymond, Alta., Berlin and Wallaceburg, Ont., produced 25,000,000 pounds of sugar last year. This is valued at four cents a pound, and the maintenance and encouragement of these factories will cost \$1,000,000 per annum.

Messrs. T. Long & Bro., Collingwood, Ont., will erect a large elevator, warehouse and cold storage plant.

Toronto Junction, Ont., has asked Toronto to assume a debt of \$1,000,000 and continue the exemption of factories in the suburban town as terms of annexation.

The coal elevator of the Grand Trunk Railway Co., Barrie, Ont., was destroyed by fire February 15.

The Mathews Steel Shipping Co., Toronto, have purchased a steamship in England to trade in the lakes and to carry freight from Montreal to Fort William, Ont.

The Smart-Turner Machine Co., Hamilton, Ont., have installed an automatic feed pump and receiver in the factory of the Wilson Scale Works, Toronto.

A surveyor who has been at work on the Transcontinental, reports that there are indications of silver, gold, copper, iron, etc., in the Spout Lake region, in the district of Lake Abitibi.

St. Joseph's Roman Catholic church, Toronto, was damaged by fire February 12, to the extent of about \$600.

The construction work of the Electrical Development Co. and the Toronto & Niagara Power Co. is now approaching completion, and it has been considered necessary to appoint a general manager, who will give undivided attention to the operation of the companies. Mr. Frederic Nicholls, Toronto, has therefore retired from that position, and is now first vice-president and managing director. Mr. Hubert H. Macrae, solicitor for the two companies, has been appointed general manager, and will assume the duties as soon as the necessary arrangements can be completed.

The Hamilton Cataract Power, Light & Traction Co., Hamilton, Ont., have recently ordered a duplex power pump from the Smart-Turner Machine Co., Hamilton, Ont.

A Deaconess Home and Training School will be erected in Toronto at a cost of about \$100,000, to accommodate 75 pupils and 25 deaconesses.

The Pembroke Electric Light Co., Pembroke, Ont., have awarded the contract for the installation of their plant at Black River to the Canadian Westinghouse Co., Hamilton, Ont.

The Molsons Bank will erect a new bank building in Toronto to be 100x50 feet and will be ready for business May, 1907.

The Ontario Power Co., Niagara Falls, Ont., are installing the fourth section of their power house equipment, which will be the largest unit for the generating of electricity in the world. Their capacity will be 12,500 h.p. They will be ready for operation in March and a fifth unit of equal size will be ready during April. The record-breaking generators of the Canadian Niagara Power Co. are of but 10,000 h.p. capacity, and those to be installed by the Electrical Development Co. will be of 12,000 h.p.

Messrs. E. Leonard & Sons, London, Ont., have placed an order with the Smart-Turner Machine Co., Hamilton, Ont., for one of their 5-ton hand power traveling cranes.

The saw, shingle and chopping mills of Messrs. Bull & Curtis, Skibbereen, near Coburg, Ont., were destroyed by fire February 15.

Hon. Mr. Matheson, Toronto, received a cablegram from the manager of the London branch of the Bank of Montreal recently saying that the experiments by the great Rothschilds' financial firm in the smelting of Cobalt ores are being carried on with pronounced success.

The Niagara Frontier Bridge Co. have applied for incorporation to erect a bridge over the Niagara River from a point in the

state mile reservation to the Canadian side. The location is to be left to a commission including W. E. Birleson, E. H. Taylor, G. W. Knox, Burt Van Horn, C. Hilton Scribner and W. C. Edwards of New York; F. A. Hilton, J. P. Murray and A. E. Osler, Toronto, and Willard P. Whitlock of New Jersey.

The Smart-Turner Machine Co., Hamilton, Ont., are building a wire crimping machine for the B. Greening wire Co., that city.

The hardware store of Messrs. Stevely & Sons, London, Ont., was destroyed by fire February 20. Loss about \$15,000.

A deputation representing the University of Toronto, consisting of President Loudon and Mr. John Hoskin, K.C., waited on Hon. Dr. Reaume a few days ago to suggest the desirability of coöperation in the electric lighting plant which has been proposed for the Legislative buildings. The university authorities have for some time past been anxious to have an independent plant for their needs, and the opportunity to build a joint plant seemed to them a favorable one. The plan would involve a much larger installation than had been contemplated at first.

The Board of Education, Peterborough, Ont., have decided to ask the city council for \$30,000, to build a new school building.

The Frank H. Fleece Co., Philadelphia, Pa., manufacturers of chewing gum, will establish a branch of their works in Toronto.

The Hawkesbury Lumber Co., and Senator W. C. Edwards recently purchased a timber limit containing 225 square miles on Lake Temiskaming, for \$200,000.

The Canadian White Co., Montreal, have commenced the work of erecting the structural iron on the new Federal Life Building, Hamilton, Ont. The Hamilton Bridge Works Co. have the contract for the metal frame work.

The Belgo-Canadian Pulp & Paper Co. have recently installed three automatic feed pumps and receivers in their works, built by the Smart-Turner Machine Co., Hamilton, Ont.

Peterborough, Ont., will have a new fire-hall at a cost of about \$9,500.

The Temiskaming Navigation Co., Mattawa, Ont., have been incorporated with a capital of \$90,000, to carry on a business of wharfingers, warehousemen, etc. The provisional directors include L. H. Timmins, J. A. Laroche, Mattawa, and G. H. Rochester, Ottawa.

The Moffat Fuel Saver, Limited, Ottawa, have been incorporated with a capital of \$100,000, to manufacture tools, machinery, etc. The provisional directors include E. Seybold, A. Fleck and R. C. Tate, Ottawa.

The B. F. Sturtevant Co., Boston, Mass., have received orders for the installation of standard economizers in the power plant of D. B. Martin, Limited, Toronto Junction, Ont.

The St. Lawrence Transportation Co., Toronto, have been incorporated with a capital of \$20,000, to carry on the business of an elevator, navigation and transportation company. The provisional directors include J. S. Lovell, W. Bain and R. Gowans, Toronto.

Sheldons, Limited, Galt, Ont., have been incorporated with a capital of \$200,000, to manufacture heaters, ventilators, etc. The provisional directors include W. D. Sheldon, S. R. Sheldon and J. R. Blake, Galt.

The Canadian Ramapo Iron Works, Niagara Falls, Ont., have been incorporated with a capital of \$300,000, to manufacture machinery, etc. The provisional directors include A. B. Mackay, R. O. Mackay and J. W. Nesbitt, Hamilton, Ont.

The Photo Engravers, Toronto, have been incorporated with a capital of \$40,000, to carry on the business of engravers, etc. The provisional directors include F. C. Hood, W. T. Northgrave and E. Potter, Toronto.

The Brampton Building & Improvement Co., Brampton, Ont., have been incorporated with a capital of \$40,000, to carry on the business of a land company. The provisional directors include R. J. Copeland, Toronto; J. H. Shields and W. C. Young, Brampton.

The Aylmer Cigar Co., Aylmer, Ont., have been incorporated with a capital of \$10,000, to manufacture tobacco, cigars, etc. The provisional directors include W. Warnock, W. J. Glen and H. B. Pollock, Aylmer.

The Ben Allen Portland Cement Co., Owen Sound, Ont., have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business. The provisional directors include C. Payton, Owen Sound; J. E. Day and J. M. Ferguson, Toronto.

The Foster 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 C. W. Kerr, C. S. MacInnis and J. H. Spencer, Toronto.

The Crescent Coal & Coke Co., Toronto, have been incorporated with a capital of \$20,000, to manufacture coal, coke, etc. The provisional directors include J. H. Duthie, R. A. Grant and W. H. Templeton, Toronto.

Messrs. Geo. Frid & Co. have recently ordered a standard duplex pump from the Smart-Turner Machine Co., Hamilton, Ont.

The Silver Star Mining Co., New Liskeard, Ont., have been incorporated with a capital of \$40,000, to carry a mining, milling and reduction business. The provisional directors include W. H. Rice, H. S. Hennessy, Haileybury, and W. J. Evans, New Liskeard.

The Standard Envelope Co., Perth, Ont., have been incorporated with a capital of \$100,000, to manufacture envelopes, stationery, etc. The provisional directors include G. H. Wheeler, Perth, Ont.; J. M. Lawson, Toronto, and E. Newell, New York.

The Oshawa Steam & Gas Fittings Co., Oshawa, Ont., have increased their capital from \$50,000 to \$100,000.

The Wainfleet Natural Gas Co., Port Colborne, Ont., have been incorporated with a capital of \$100,000, to carry on the business of a gas company. The provisional directors include D. W. Carter, J. H. Smith and G. H. Smith, Port Colborne.

The Frost Wire Fence Co., Welland, Ont., have recently placed an order with the Smart-Turner Machine Co., Hamilton, Ont., for an imbler wire fence loom.

The Nipissing Tribune Publishing Co.,

North Bay, Ont., have been incorporated with a capital of \$10,000, to carry on a printing and publishing business. The provisional directors include G. Gordon, Sturgeon Falls, Ont.; A. G. Davie and G. W. Leach, North Bay.

An interesting example of the general utility and adaptability of the Westinghouse air brake pump was given in connection with the raising of the lake steamer Corey exclusively by the use of 20 of these pumps. The Corey went aground on the shores of Gull Island, Lake Superior, during the severe gale of November 28 last. On December 1, men and pumps were sent by two of the prominent northern railroads to prosecute the work of raising this vessel. Ten 11-inch pumps and ten 9½-inch pumps were distributed along the deck of the steamer and arranged to force air into thirteen of the air-tight compartments in the vessel. This work was commenced on December 2, and while the air was forced into the compartments by the pumps, the leaks were repaired by boiler makers as fast as they were discovered, either by being patched or by the use of cement. To accomplish this preliminary work of stopping all leaks required until December 9, about 3 p.m. At this time all of the pumps were set to work forcing air into the compartments in order to displace the water and raise the vessel. On the following morning at 7.30 a.m., it was found that the boat had been raised four feet and sufficient water removed by the compressed air to allow the steamer Houghton to easily pull the Corey from the shore into deep water. In raising this vessel it is estimated that from 3 p.m. on December 9 until 7.30 a.m. December 10, about 6,000 tons of water were removed by the use of these 20 pumps.

The Smart-Turner Machine Co., Hamilton, Ont., have received an order from the London Fence Machine Co., London, Ont., for one of their standard duplex pumps.

The congregation of the Stewarton Presbyterian church, Ottawa, will erect a new church building at a cost of about \$27,000.

Anthony Blum, proprietor of the Laurentian Mine, at Dinorwic, Ont., has samples of the ore from that famous find, which indicate that the property is one of the richest strikes ever made in America. Mr. Blum states that the rich ore body which he has found is known in mining parlance as "chimney," or small deposit of extremely rich rock, lying in a large deposit of low-grade rock. This formation is common to all mining properties. The rich streak is two inches in width, and in places carries seams of solid gold three inches in thickness. It consists of a series of laminated plates separated by the pure metal. Next to it is a seam of quartz, 12 inches in thickness, which is equally rich in many places. Preparations are now being made to run a drift at the 200-foot level, in order to locate the "chimney" at this point, and also to furnish points of attack when stopping to take out the ore begins. Cross-cuts are also being run at this level in order to cut into five parallel veins which have been located by diamond drills at right angles from the drift. These cross-cuts are now in 125 and 80 feet respectively. When this prospecting work is completed, the taking out of the ore will be begun. The diamond drills were run in 470 feet in one direction and 43 in another,

and from the appearance of the cores secured, Mr. Blum is of the opinion that a huge body of low-grade ore will be delivered. A cyanide plant will be necessary to treat the mine.

The Crow's Nest Pass Coal Co. have recently ordered four smoke stacks from the Smart-Turner Machine Co., Hamilton, Ont.

Improvements are being made in the ventilation of the Dominion House of Commons Chamber, under the direction of Professor Durley, of McGill University. The fresh air is to be brought into the chamber by ducts in the ceiling, after it has been first purified by passing through a stream of running water. The foul air will be drawn out of the chamber by a series of apertures on the risers of the platforms on which the members' chairs and desks are placed. The system does not materially differ from that which has prevailed during the past few years, except that Professor Durley and Mr. Kimball, of Boston, the two investigating experts, discovered that the foul air exhaust was too small and that this militated against the successful ventilating of the chamber. Next year it is likely that a small refrigerating plant will be installed in the attic and that the fresh air will be passed over it after it is purified, and in this way the temperature of the House will be kept modified during the warmest days of the year.

The Smart-Turner Machine Co., Hamilton, Ont., have received an order for one of their duplex boiler feed pumps, from Messrs. E. Leonard & Sons, London, Ont.

By the beginning of next year, if present plans are carried out, iron ore from the Moose Mountain deposit in the township of Hutton, Ont., will be placed upon the market, and what is believed to be the largest and richest iron deposit in the world will have become an important factor in the supply of iron ore. Since Messrs. Mackenzie & Mann acquired an interest in the Moose Mountain Mining Co., which control the deposit, negotiations have been carried on with the object of securing the early development of the property. The main line of the James Bay Railway, as projected north of Sudbury, runs through the township of Hutton. A personal inspection convinced Mr. D. D. Mann of the importance of this deposit, and an agreement has been arrived at between the James Bay Railway Co. and the Moose Mountain Mining Co. by which the railway will construct the line to a point about 25 miles north of Sudbury, whence a short spur will give connection with the mine. The James Bay Railway Co. have also undertaken to build a short branch from a convenient point on their line near the crossing over the French River to a suitable harbor on Georgian Bay. A fleet of ore carriers will run in connection with the railway to carry the ore to the smelters. These extensions, which are already in progress, are to be completed by January 1, 1907, by which date the Moose Mountain Mining Co. undertake to have ore ready for shipment. In order to perform their part of the contract the Mining Co. will at once put on a largely increased force of men to open up the mine and take out ore.

The Canadian Steel Goods Co., have placed an order with the Smart-Turner Machine Co., Hamilton, Ont., for a tilting tumbling barrel.

The Toronto Railway Co., Toronto, are building a number of street cars for Winnipeg, Man., and also for the York Radial Co., Toronto.

The St. Lawrence & Chicago Navigation Co. have placed an order with the Canadian Shipbuilding Co., Toronto, for a monster freight steamer to be used for the northern lake trade. It is said the vessel will be about 500 feet in length and probably will belong to the 10,000 ton class.

The new Union Station to be built in Toronto will cost about \$1,000,000, and is to be completed in February, 1908.

The Smart-Turner Machine Co., Hamilton, Ont., have recently received an order for one of their pumps from Murray's Freestone Quarries.

An advisory board of engineers will receive bids on March 22 for the construction of a tunnel under the Detroit River, from Detroit, Mich., to Windsor, Ont., for the improvement of the Michigan Central Railroad. The tunnel will be approximately a mile and a half long, approaches and under-river construction.

The town of Morrisburg, Ont., have received a lease from the Department of Railways and Canals, giving the municipality authority to draw water from the canal in order to furnish power to the Canada Tin Plate Co., which will be established there.

The Railway Commission, the Grand Trunk Railway Co. and the Ontario Power Co. have come to an agreement respecting the crossing of tracks of the former by the power wires. Rigid steel structures are to be employed in all cases. Where the line is single track the span is to be 56 feet; where it is double track the span must be 76 feet. This is the width when the wire crosses the track at right angles, and when it is made on the slant the distance from the tracks must be as great as when the crossing is at right angles. The cost is to be borne by the power company and the specifications are to be approved by the commission.

The contract for the complete engineering and construction work in connection with the new union station at Toronto has been awarded jointly by the Canadian Pacific and Grand Trunk companies to the Westinghouse, Church & Kerr Co., New York. The company is a Westinghouse enterprise, and Mr. George Westinghouse is its president and directing and controlling spirit. The Toronto contract is a very extensive affair, embracing both the erection of the station and the signalling devices, which will be of the most approved kind.

The steamer Cayuga of the Niagara Navigation Co., Toronto, will be launched in a few days, the hull being almost completed.

The premises of the Standard Cap Co., Toronto, were destroyed by fire February 22. Loss about \$6,500.

The board of the Canadian National Exhibition Association have adopted plans for the new press bureau and a new horticultural building. The press bureau will be 70x40 feet, two stories high, with two entrances leading to a rotunda, from which rooms are provided for the press. The horticultural building will be 220 feet from extremity to extremity, and will be in the form of a cross, each wing being a different section.

The four will accommodate respectively fruit, flowers, vegetables and honey. In the centre will be a dome of glass fifty feet in diameter and rising to a height of 65 feet. It will be erected on the site of the present wooden structure, at a cost of about \$70,000.

A recent acquisition to the Toronto ticket office of the Canadian Pacific Railway Co. is a beautifully finished model of S.S. Princess Victoria, the "flagship" of the Canadian Pacific Railway coastal fleet. The original is in service principally between Vancouver, Victoria, B.C., and Seattle, Wash., maintaining a speed of 24½ miles per hour, and accommodating 500 first and second-class passengers. Built on the Tyne, and placed in commission in August, 1903, she has become the most popular boat on the coast. The model has reached Toronto after being on exhibition at the Lewis and Clark Exposition, Portland, Ore.

The Dominion Government have accepted from the provincial authorities of Ontario a transfer of the dams and locks built and operated by the latter along the Trent valley waterways.

The Ideal Concrete Machinery Co., South Bend, Ind., are considering the erection of a branch works in Hamilton, Ont.

A large building of the Tillson Co., Tillsonburg, Ont., used for packing oatmeal and other cereals, was destroyed by fire February 15. Loss about \$5,000.

The Warden King Co., Montreal, manufacturers of the Daisy heater and boiler, will establish warehouses in Toronto, and have purchased property just east of the Post Office, 90x80 feet, on which they will erect new buildings to cost about \$45,000.

The Toronto Bolt & Forging Co., Swansea, Ont., are preparing plans for a 400-foot extension to their works at that place.

The ratepayers of Dunnville, Ont., have carried the by-law to raise \$20,000, to establish a municipal gas plant.

The Stratford Improvement Co., Stratford, Ont., have guaranteed to build factories in their survey at a total cost of \$100,000, within a period of three years. The city will build a trunk sewer in the southern part of Shakespeare ward to the company's property, at a cost of about \$5,000.

The Wall Street Methodist Church, Brockville, Ont., was damaged by fire February 17, to the extent of about \$10,000.

The ratepayers of Watford, Ont., have voted in favor of granting a loan of \$15,000 to the Lloyd-Thompson Automatic Wire Weaving Co., to erect a factory in that place.

The Canadian Bank of Commerce will erect a branch bank building in Dresden, Ont.

Messrs. Hyslop Bros., Toronto, have purchased property at the corner of Shuter and Victoria Streets, that city, where they will erect an automobile factory.

The Hamilton Cataract Power, Light & Traction Co. have recently ordered a direct connected centrifugal pump and motor, from the Smart-Turner Machine Co., Hamilton, Ont.

The Silver Leaf Mining Co., Toronto, have been incorporated with a capital of \$5,000,000, to carry on a mining, milling and reduction

business. The provisional directors include C. A. Foster, J. Hawley and S. Hodgson Toronto.

The Erie & Ontario Dredging Co., Welland, Ont., have been incorporated with a capital of \$90,000, to carry on the business of a contracting, dredging, towing and wrecking company. The provisional directors include D'Arcy Scott, Ottawa; E. A. C. Pew, Toronto, and E. J. Kingston, Buffalo, N.Y.

The London Pant, Overall & Shirt Mfg. Co., London, Ont., have been incorporated with a capital of \$40,000, to manufacture wearing apparel, etc. The provisional directors include T. Deeley, A. T. McMahan and J. Granger, London.

The Cheapside Natural Gas & Oil Co., Cheapside, Ont., have been incorporated with a capital of \$10,000, to carry on the business of an oil and gas company. The provisional directors include J. Armstrong, J. H. Hare and W. R. Dennis, Walpole.

The Churchill Mfg. Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture beds, cots, stretchers, etc. The provisional directors include F. A. Moore, H. F. Gooderham and C. A. Crawford, Toronto.

The Roy Co., Toronto, have been incorporated with a capital of \$20,000, to manufacture jewelry, etc. The provisional directors include R. Roy and J. Belanger, Toronto.

The Canada Shoe Co., Brampton, Ont., have been incorporated with a capital of \$40,000, to manufacture shoes, etc. The provisional directors include G. L. Williams, T. Thanburn and F. A. Williams, Brampton.

The Hillhurst Wine Mfg. Co., Thorold, Ont., have been incorporated with a capital of \$100,000, to manufacture wine, etc. The provisional directors include E. G. Brown, G. H. Brown and Le R. Lewis, Thorold.

Messrs. Fox Bros. & Co., Windsor, Ont., have been incorporated with a capital of \$40,000, to manufacture furniture, etc. The provisional directors include C. W. Fox, J. Kelsey and H. J. Herbert, Detroit, Mich.

The Metropolitan Oils & Soaps, Limited, Toronto, have been incorporated with a capital of \$100,000, to manufacture soaps, oils, etc. The provisional directors include J. McLaughlin, J. D. Pringle and W. A. Nisbet, Toronto.

The corporate name of the Canadian Consolidated Mines, Limited, Toronto, has been changed to that of the Consolidated Mining & Smelting Co.

The Atikokan Iron Co., Port Arthur, Ont., are installing two 75 kilowatt direct connected units, consisting of Robb-Armstrong engines and Westinghouse generators.

The extensive saw and shingle mills at Thessalon, Ont., and valuable timber limits in that vicinity, owned by Messrs. N. and A. E. Dymont, have been sold to an American syndicate, including Messrs. F. P. Nester, Duluth, Minn., and W. Bishop, Chicago, Ill.

The Macdonald Engineering Co. are erecting a mill at Keewatin, Ont., for the Keewatin Flour Mills Co.

The Maple Leaf Milling Co. will erect another flour mill at Kenora, Ont.

A new school building will be erected in Petrolea, Ont., at a cost of about \$17,000.

The Bell Telephone Co., Montreal, will expend about \$2,000,000, in extending and improving their system.

The McLeod-Hawthorne Co., Montreal, have been incorporated with a capital of \$75,000, to manufacture trunks, valises, etc. The charter members include K. McLeod, E. H. Hawthorne, and J. Sager, Montreal.

The Hydrogenic Fuel Co. of Canada, Montreal, have been incorporated with a capital of \$100,000, to manufacture apparatus and appliances for the combustion of hydrogenic fuel, etc. The charter members include J. C. Simpson, S. A. McMurray and F. H. Shaw, Montreal.

The General Development Corporation of Canada, Montreal, have been incorporated with a capital of \$1,000,000, to carry on the business of a construction and development company, etc. The charter members include H. A. T. Robinson, W. G. P. Mordean and E. B. Robinson, London, England.

The Canadian Bag Co., Montreal, have been incorporated with a capital of \$1,000,000, to manufacture bags, twines, etc. The charter members include H. R. Drummond, H. L. Rutherford and E. McDougall, Montreal.

The Fogarty Co., Montreal, have been incorporated with a capital of \$126,500, to manufacture shoes, rubbers, etc. The charter members include G. S. Fogarty, E. J. Wayland and R. H. Teare, Montreal.

The Smith Marble & Construction Co., Montreal, have been incorporated with a capital of \$40,000, to manufacture marble, granite, etc. The charter members include P. Smith, A. Smith and W. J. Henderson, Montreal.

The premises of Messrs. John Burns & Co., Montreal, manufacturers of cooking apparatus, steel ranges, etc., were damaged by fire February 16.

The Canadian Bank of Commerce have purchased the Merchants Bank of Prince Edward Island.

The Caldwell Special Clothing Mfg. Co., Hull, Que., will open up a factory there in a short time. Messrs. B. A. C. and D. W. F. Caldwell, Lanark, Ont., are interested.

The Roman Catholic Church, Thetford Mines, Que., was destroyed by fire February 19. Loss about \$45,000.

Mr. David McNicoll, vice-president of the Canadian Pacific Railway Co., says that as a result of negotiations with the Harbor Commissioners at Quebec City, Pier No. 1 at that place will be pushed rapidly to completion to be used by the Canadian Pacific Railway for their steamers Empress of Britain and Empress of Ireland, which will make Quebec their port during the coming season. They desire to have the pier so constructed that they can run their passenger trains right down to the boat's side.

The saw and grist mills of Messrs. Champoux Bros., at Disraeli, Que., were destroyed by fire February 20. Loss about \$25,000.

Messrs. Itzwere & Sarrasin, Ste. Cune-gonde, Que., will erect a sawmill there at a cost of about \$13,000.

The James McCready Mfg. Co. of Canada, Montreal, have been incorporated with a capital of \$1,000,000, to acquire the boot and shoe manufacturing business now carried

on by the James McCready Co., Montreal, and the Arthur Congdon Co., Winnipeg, Man. The new company will be the sole selling agents for the Canadian Rubber Co. in Manitoba and the North-West. The concern will have branch houses at Calgary, Winnipeg, Toronto and other cities east and west. The following are the officers of the new company: President, C. F. Smith; vice-president and general manager, Clarence F. Smith; vice-president and Western manager, Arthur Congdon; secretary-treasurer, John Hamill.

The Montreal Street Railway Co., Montreal, have awarded the contract for a new power house, to cost about \$1,000,000. The company also let a contract for 6,000 tons of steel rails.

The Transcontinental Railway Commissioners will shortly call for tenders for ties and steel rails for the sections of the line for which contractors are being asked to bid, that is to say, from Winnipeg, Man., to Superior Junction and from Quebec to La Tuque.

The Sovereign Park Hotel Buckingham, Que., was destroyed by fire February 19. Loss about \$10,000.

The Kemp Mfg. Co., Toronto, have purchased a site in Montreal and will erect a large warehouse for their tin and enamel goods.

A business block in Montreal, owned by the Canadian Pacific Railway Co. was destroyed by fire February 13. Loss about \$50,000.

Messrs. Mackenzie & Mann, of the Canadian Northern Railway, have awarded a contract to Messrs. Mullarkey & O'Brien, contractors, Montreal, to build about 100 miles of railway, comprising some 80 miles from Garneau Junction into the City of Quebec, and from Montfort Junction to St. Jerome, Que.

The Temiskaming & Northern Ontario Railway have ordered a 75-ton wrecking crane, a 25-ton pull ballast unloader, and a ballast plow from Messrs. F. H. Hopkins & Co., Montreal.

The American Locomotive Works, Montreal, are now delivering to the Intercolonial Railway 16 high class passenger engines of the modern Pacific type.

The Locomotive & Machine Co., Montreal, delivered during January three 10-wheel locomotives per week to the Canadian Pacific Railway Co. and have completed the delivery of six 2½-yard Atlantic type steam shovels to the same company.

The Metapedia Waterworks Co., Metapedia, Que., have been incorporated with a capital of \$20,000, to construct waterworks. The charter members include G. G. McKenzie, Campbellton, N.B.; A. C. Dutton, Springfield, Mass.; and C. Bernier, Montreal.

The Quebec Furniture Mfg. Co., Quebec, have been incorporated with a capital of \$100,000, to manufacture furniture. The charter members include L. J. Roberge, Levis, Que.; N. Gilbert and C. Darveau, Quebec.

The Dominion Stove & Heater Works, Montreal, have been incorporated with a capital of \$500,000, to manufacture stoves, etc. The charter members include L. E. Kimpton, H. L. Mitchell and R. T. Heneker, Montreal.

The Smart Bag Co., Montreal, have been incorporated with a capital of \$1,000,000, to manufacture jute and cotton bags, etc. The charter members include C. A. Smart, H. N. Chauvin, and J. E. Coulin, Montreal.

The Dynamic Machine Works, Montreal, have been incorporated with a capital of \$15,000, to manufacture electrical and mechanical apparatus, etc. The charter members include S. Humphreys, G. Humphreys and E. J. Fetherstonhaugh, Montreal.

The Miramichi Pulp & Paper Co., Chatham, N.B., have placed an order with the B. F. Sturtevant Co., Boston, Mass., for the installation of a standard economizer. The economizer is to be installed in connection with Sturtevant induced draft apparatus.

The brick block of the Royal Bank of Canada, St. John, N.B., was destroyed by fire February 15. Loss about \$100,000.

The car works of the Intercolonial Railway Co., Moncton, N.B., were destroyed by fire February 24. Loss about \$1,000,000.

The Y.M.C.A. of St. John, N.B., will erect a new building at a cost of about \$30,000.

The town council of Dalhousie, N.B., will install an electric light system.

The council of Moncton, N.B., will consider the erection of a new pumping station to cost about \$25,000.

Messrs. Amland Bros., Limited, St. John, N.B., are applying for incorporation, with a capital of \$49,000, to manufacture electric light, power and heat. The applicants include R. B. Amland, W. E. Amland and F. W. Amland, St. John, N. B.

The Builders' Wood Working Co., Moncton, N.B., are applying for incorporation with a capital of \$20,000, to manufacture shingles, sashes, doors, etc. The applicants include J. A. Bourque, T. D. Le Blanc and S. Melanson, Moncton, N.B.

The Truro Knitting Mills Co., Truro, N.S., will erect an extension to their mill and also erect a worsted mill for making yarns.

A valuable deposit of graphite has been discovered at French Vale, Cape Breton, by Mr. Neil D. Campbell. Samples were analyzed and were found to contain 70 per cent. of graphite, an unusually high percentage. The Intercolonial Railway passes within four miles of the property, while at a distance of six miles a splendid natural harbor on the Bras d'Or Lakes is found.

R. H. Grimstead, Minneapolis, Minn., is considering the erection of a factory in Winnipeg, Man., for the manufacture of steel harrows.

A movement is afoot to construct a 158-mile road for automobilists near Winnipeg, Man. It will be oval in form, and the expense of construction and maintenance will be met from the tolls collected from those who use it. It is proposed to run some big races on the road, which will be oiled to keep down the dust.

The store of Messrs. T. Hill & Son, Russell, Man., was destroyed by fire February 19. Loss about \$15,000.

The Toronto Railway Co. have begun to build a number of cars for Winnipeg, Man. They will be most up-to-date in structure and design.

The Allward & McCormick Glass Co., Winnipeg, Man., have been incorporated

with a capital of \$100,000, to manufacture glass, etc. The provisional directors include J. R. Allward, A. McCormick and G. F. Stephens, Winnipeg.

A. McMillan, Esq., Winnipeg, Man., has secured patent rights for a process of welding and tempering copper.

The Northern Elevator Co., Winnipeg, Man., will erect an elevator at Aberdeen, Man.

The Rathwell Flour Mills Co., Rathwell, Man., will erect a flour mill at that place.

The Gurney Stove Co., Winnipeg, Man., will erect a building to be used for warerooms and offices.

The Kemp Mfg. Co. will erect a four story brick addition to their building in Winnipeg, Man.

The Salvation Army will erect two auxiliary barracks in Winnipeg, Man., at a cost of \$10,000 each.

The International Harvester Co., Hamilton, Ont., will erect a large warehouse and office building in Regina, Sask.

The Edmonton Lumber Co., Strathcona, Alta., will erect a sawmill there at a cost of about \$50,000.

A school building will be erected at Nanton, Alta., at a cost of about \$8,000.

The Alberta Milling Co., Edmonton, Alta., will erect a large grain warehouse there.

The Great Northern Railway Co. will apply for a charter to build a line from Havre, Montana, to Edmonton, Alta., via Medicine Hat, a distance of about 420 miles.

Calgary, Alta., will expend \$130,000 in extending the waterworks system and electric lighting.

The coal tonnage on the Canadian Northern Railway is steadily increasing. During January 400 tons were shipped to points down the line. Edmonton, Alta., now supplies the entire territory as far as Humboldt and the coal market is steadily growing. Three cars were shipped to Winnipeg, Man., as a trial consignment to be tested in public institutions there.

Messrs. Mueller & Niederstadt will erect a brewery at Regina, Sask., at a cost of about \$5,000.

Among the firms who have tendered for construction of the Grand Trunk Pacific from Touchwood Hills to Edmonton, Alta., 450 miles, are Foley Bros. & Larson, J. McArthur, the Canadian White Co., McDonald, McMillan & Co., and Johnson & Sons. When this work begins almost a thousand miles of new line will be under way.

The premises of Messrs. Cameron & Co., Edmonton, Alta., hardware merchants, were destroyed by fire February 19. Loss about \$15,000.

A waterworks system will be installed at Indian Head, Sask.

Rosthern, Sask., will install an electric lighting and power system.

The Raymond Mill & Elevator Co., Magrath, Alta., will erect a flour mill at a cost of about \$25,000.

The Smart-Turner Machine Co., Hamilton, Ont., have recently shipped one of their standard duplex pumps to the Standard Soap Co., Calgary, Alta.

The Lillooet Lumber Co., Vancouver, B.C., have been incorporated with a capital

of \$300,000, to manufacture lumber, timber, etc. The provisional directors include J. S. Lovell, W. Bain and R. Gowans, Toronto.

At the recent annual meeting of the stockholders of the British Columbia Copper Co., President Lockwood said: Against our profits for the past year have been charged large sums for extensive developments which have been going on in preparation for trebling the output of the mother lode mine. These expenditures will continue for the next four or five months. Our development work has disclosed large bodies of ore of higher grade than that upon which we have been operating. This ore will become available upon the completion of the company's new smelting plant. The machinery for this plant has been contracted for, deliveries to begin the latter part of March, and complete installation is expected during the coming summer. The new plant will have a capacity of 50,000 tons of ore per month, as against 18,000 tons per month with the present plant; the furnaces will be the largest and most modern in British Columbia and both the mines and smelting plant will have full electrical equipment.

There is needed in the city of Victoria, B.C., says the Colonist, a cooorage capable of producing several hundred barrels a day. This represents the present demand for barrels and the number is by no means furnished within the province. The recent demand for barrels has been created by the wants of the whaling station. The whaling station alone uses on an average of 100 barrels a day. Barrels are also extensively used in the fish curing business, which is assuming larger proportions every year, and there are other businesses which annually require larger numbers of them.

Messrs. McLennan, McFeely & Co., Vancouver, B.C., hardware merchants, will erect a four story steel, stone and brick warehouse there.

The Canadian Pacific Railway Co. will erect a steel bridge over the Pitt River, Vancouver, B.C.

Messrs. Hall Bros., Vancouver, B.C., will erect a 500,000 barrel flour mill at that place.

The Queen's Hotel, Trout Lake, B.C., owned by Messrs. Abramson Bros., was destroyed by fire recently. Loss about \$18,000.

John Lineham, Esq., Calgary, Alta., will erect a 400,000 bushel elevator at Vancouver, B.C.

Messrs. William Shannon and George Martin, Vancouver, B.C., will erect a wooden pipe factory near Eburne, B.C.

Commissioner McInnes, administrator of the Yukon Territory, at Dawson City, has gone to Ottawa to secure the aid of the Government in installing a water system, to cost \$6,000,000, to make it possible to work gravel estimated to contain over \$200,000,000 worth of gold. He will also investigate the standing of concessions, ask for the organization of the civil service, the passage of a new miners' lien law, and for an investigation into the exorbitant rates of transportation charges of the White Pass Co. He will also endeavor to secure new regulations for the disposal of Crown lands and timber, a new system of policing the Territory, and the extension of the constitution of the Yukon Council.

ELECTRICITY.

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

Mr. J. A. Culverwell, managing director of the Central Ontario Power Co., states that his company are preparing to string wires and utilize the power at Burleigh Falls early this coming season. Fully 5,000 h.p. will be available, and this will be supplied to Peterborough, Bowmanville, and Oshawa. Mr. Culverwell has obtained franchises from all the different townships to erect poles and string wires, with the exception of North Monaghan. The line will be run directly to Peterborough, thence to Millbrook, thence to Bowmanville and Oshawa. The distance from Peterborough to Oshawa is 63 miles. As to what price the Central Ontario Power Co. will furnish power it is impossible to state at present, but there will be ample power to supply all probable demands.

The Board of Trade of Kenora, Ont., have requested the town council to have a survey plans and estimates drawn up to ascertain the best route and cost for an electric road railway between that place and Keewatin, Ont.

ELECTRIC SMELTING A GREAT SUCCESS.

Hon. Frank Oliver, Dominion Minister of the Interior, received from Dr. Eugene Haanel, Superintendent of Mines, a telegram which reads as follows:—"Sault Ste. Marie,

Ont., February 24. To Hon. Frank Oliver, Ottawa: Successful demonstration of all points stated in my memorandum on electric smelting of Canadian iron ores requiring investigation. Output greater than figure adopted by Harbord in report of commission. Successful smelting of magnetite and desulphurization of pig. Successful substitution of charcoal, and therefore of peat for coke. Consumption of electrode insignificant. Production of nickel pig of fine quality from roasted pyrrhotite. Forty tons of pig have so far been produced. Process admits of immediate commercial application. Experiments will be completed in about two weeks. (Signed) Eugene Haanel, Superintendent of Mines."

The movement which has resulted in such complete success at Sault Ste. Marie began about three years ago, when Hon. Clifford Sifton sent a commission to Europe, headed by Dr. Haanel, to investigate the system of smelting iron ores and making steel by electricity. The system was found to be in successful operation at Gysinge, in Sweden, and at Livet and La Praz, in France. Samples of the steel produced were submitted to Professor Harbord, a noted metallurgist, in England, and after being tested at Woolwich reported on favorably. The electric process was thus shown to be a sound and commercial one, but apparently the cost of manufacture was not brought down below that of production by the blast furnace. The ore employed in France was hematite and it still remained to be seen whether the Canadian magnetite ores could be successfully treated, and at a lower cost than when coke was used. Dr. Heroult of La

Praz, France, the inventor of a system of electric smelting, thought he could demonstrate the commercial feasibility of smelting magnetite by electricity, and Dr. Haanel recommended that he be given a chance. Hon. Mr. Oliver approved of the experiments, and it was decided that they should take place at Sault Ste. Marie, where the Algoma Steel Co. offered a site and a supply of electricity free of charge for six months.

Last fall Dr. Heroult arrived in Canada and immediately went to work at Sault Ste. Marie. Electric furnaces of special design were constructed and electrical appliances of the finest kind obtained from the Westinghouse Co. and from Sweden. The apparatus was a long time in coming, and all sorts of unexpected delays occurred. The greatest possible care had to be taken in installing and adjusting the electrical machinery, for nothing could be left to chance. The preliminary experiments took place in a small furnace, and resulted in the successful production of pig iron from hematite ore, and of nickel pig from nickeliferous pyrrhotite. A larger furnace, the fittings of which were invented by the scientists employed in the experiments, was afterwards erected. It is in this furnace that pig iron, steel and nickel pig have been produced on a large scale.

It is impossible to overrate the important consequences to Canada bound to follow from these successful experiments. With vast deposits of iron ore existing throughout Ontario and Quebec, and contiguous to them large water powers for the cheap production of electrical energy, it does not need much thinking to see that iron and steel industries free from the smoke nuisance will speedily

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VARNISH MANUFACTURERS

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be established. The successful production of nickel pig is also a wonderful achievement. In the Sudbury district the supply of ore is almost inexhaustible, and for the finished product there is an immense and ever-growing demand. Further particulars of the scientific triumphs at the Soo will be eagerly awaited, but enough has been learned to prove that Canada will be one of the greatest iron, steel and nickel producing countries in the world.

FUEL.

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

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

In connection with the report of Mr. G. G. S. Lindsay, general manager of the Crow's Nest Pass Coal Co., made at the recent annual meeting in Toronto, is given the coal and coke production of the company's works in British Columbia, since the inception of work in 1898:

	Coal.	Coke.
In 1898.	8,986 tons	361 tons
In 1899.	116,200 tons	29,658 tons
In 1900.	220,458 tons	73,496 tons
In 1901.	425,457 tons	125,085 tons
In 1902.	441,236 tons	120,777 tons
In 1903.	661,118 tons	167,739 tons
In 1904.	742,210 tons	245,118 tons
In 1905.	831,249 tons	257,702 tons

PUBLICATIONS.

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

Bulletin No. 128 entitled "Economizers," in the Sturtevant Engineering Series, has recently been issued by the B. F. Sturtevant Co., Boston, Mass. This publication briefly outlines the essential features of an economizer, displays the advantages of the Sturtevant type with staggered pipes and metal-to-metal joints, and by means of well selected photographs clearly illustrates the important parts of these machines.

The Winnipeg Telegram is arranging to publish a special seed number in two colors. It will be handsomely illustrated with attractive half-tones, and will be issued in connection with the regular daily and weekly issues of that valuable journal.

Mr. George J. Sheppard, manager of the Canadian Pneumatic Tool Co., a subsidiary branch of the Chicago Pneumatic Tool Co., has sent us a copy of the Fourth Annual Report of the Chicago Co., in which are a number of facts quite interesting to the Canadian trade as well as to all who are interested in pneumatic tools, air compressors, etc. Mr. Duntley, the president, shows that the operations of the company during the past year resulted in the largest sales since its organization, the profits amounting to 9.15 per cent. During the past year the

Consolidated Pneumatic Tool Co., London, England, developed the organization of Fraserburgh plant, Scotland, and extended its operations until at the present time it is running to full capacity, the foreign operations during the year including the organization of the International Compressed Air & Electric Co., Berlin, Germany, which is now conducting continental operations; and the Chicago Co. also acquired the business and plant of the Canadian Pneumatic Tool Co. with works at Montreal, and the Philadelphia Pneumatic Tool Co., of Philadelphia, Pa.

PERSONALS.

Mr. John M. Gill, manager of the James Smart Mfg. Co., Brockville, Ont., sailed on steamer from Boston on Saturday last, February 24 for a somewhat prolonged business and pleasure trip to the "Old Country."

The Mergenthaler Linotype Co., of New York, have opened a branch office at 51 King Street West, Toronto, with Mr. Thomas S. Bland as manager. A full supply of linotype parts will be carried in stock in the Toronto agency.

Mr. H. H. Macrae has been appointed general manager of the Electrical Development and Toronto & Niagara Power Companies.

Mr. A. C. Neff, F.C.A., delivered a lecture on "Business Investigations" before the members of the Toronto Institute of Chartered Accountants last week, dealing with the subject in a manner calculated to benefit

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The last chapter is a long way from the first, for it takes longer to wear out **Harbison-Walker Refractories** than any other fire-brick made.

This is a true story. You can see the proofs, any time, in this office—letters from users of refractories who have set down in black and white facts and figures which are the most valuable records of experience ever collected in the history of fire brick manufacturing.

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We have expert knowledge for your brick troubles.

Always state for what purpose brick are to be used.

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especially prospective candidates for the institute examinations. He outlined the various methods of conducting such investigations and pointed out the necessity and importance of thorough work on the part of the investigating accountant. In order to obtain capital the certificate of a chartered accountant was frequently asked for as regards the volume of business done, the gross profits, running expenses, net profits, etc. The subject was discussed by several of the members at the close of the lecture. Mr. W. B. Tindall, F.C.A., occupied the chair.

A complimentary dinner was tendered Mr. L. R. Arnett, inspector of the Siche Gas Co., Toronto, recently, who since has left for Plainfield, N.J., to assume his new duties as managing director of the American company, which is known as the Siche Gas Co. There are four companies now handling the Siche system: The Siche Gas Co., 81 York Street, Toronto; the Siche Light Co., 340 Craig Street West, Montreal; the Western Light Co., 328 Smith Street, Winnipeg, Man., and the Siche Gas Co., Plainfield, N.J. Among those present at the dinner were: Mr. Reuben Millichamp, president of the

Toronto company; J. J. Seitz, W. P. Firth, G. Staunton, J. H. Chewett, W. H. Banfield, J. Hugill, and H. J. D. Naftel.

The coal areas of Canada are estimated at 97,200 square miles, not including areas known, but as yet undeveloped, in the far north. In Nova Scotia alone it is estimated that there are 7,000 million tons.

Mr. Geo. Barr, Chicago, Ill., has placed an order with the Smart-Turner Machine Co., Hamilton, Ont., for an automatic spike machine.

ONTARIO PULP WOOD POLICY.

The Ontario Government have decided upon their pulp wood policy, as announced by Hon. Frank Cochrane, Minister of Lands and Mines.

Concessions will be disposed of by public competition, going to the bidder who will offer the largest bonus in addition to the ones which will be fixed by the Minister of Lands and Mines. It is expected that the bonuses alone will yield several hundred thousand dollars to the revenue of the Province.

Coincident with this announcement Mr. Cochrane stated that five pulp concessions which had been granted to companies by the late Government had been cancelled owing to non-fulfilment.

The agreements cancelled are with the Nepigon Pulp, Paper & Mfg. Co., made in April, 1900, superseding an agreement entered into in 1896; the Keewatin Power Co., April, 1901; the Montreal River Pulp & Paper Co., March, 1902; the Rainy Lake Pulp & Paper Co.; the Dryden (Ont.), Board Mills Co.

These concessions will not be retained in the hands of the Government longer than is necessary to make a public sale, and advertisements will be published immediately, asking for tenders for the concessions in the areas covered by the lapsed agreements.

Large bonuses have already been offered by responsible parties who desire to possess these properties that have just lapsed from the first holders. The dues at the present time are 40 cents per cord on spruce, and 10 cents per cord on poplar and jack pine.

Hereafter concessaires will not be allowed to cut timber having a diameter of less than eight inches at the stump, as against a former reduction of six inches. This will result in



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added protection to the timber. The boundaries of the various areas will also be strictly defined, and the getting out of the timber will be closely supervised by Government officials.

Rangers will guard against fire, and successful tenderers will be required to build mills on their respective concessions, as was provided for in the old agreements, and to manufacture pulp within the Province. The department will decide as to the amount of capital to be invested, and will control all details.

The areas where concessions are to be granted are in proximity to the Montreal River, in the Nipissing district; the Nepigon River, in Thunder Bay district; Rainy Lake, Wabigoon River, and Lake of the Woods, all in the Rainy River district.

TORONTO ESTIMATES.

The estimates for 1906 made by the City Engineer for expenditures in the different departments in Toronto call for large amounts of money.

The estimates for the Waterworks and Works Department total \$985,575.74, against an expenditure of \$333,237.14 in 1905.

The estimates for Waterworks alone are \$581,818.55, as against an expenditure last year of \$177,491.34. The estimates for the Works Department are \$403,757.19, as against an expenditure of \$155,745.80 in 1905.

Considering the details the City Engineer says: "It will be noticed that the sum of \$250,000 has been inserted for the purpose of purchasing an additional fifteen million gallon, triple expansion, pumping engine,

similar to the one recently installed. During the past year we have pumped one hundred million more gallons of water than the previous year, and as the city is rapidly growing and the consumption of water consequently increasing, I consider it absolutely necessary that the contract for another engine be awarded during the year."

In the Waterworks part of the estimates the chief items are as follows:

	Expended 1905.	Estimated 1906.
Maintenance and Distribution.....	\$36,941 70	\$33,000 00
Main Pumping Station.....	39,785 35	40,864 00
Main Pumping Station, coal.....	44,325 71	45,000 00
Meter and Machine and Blacksmith Shop.....	14,333 95	16,603 00
High Level Station..	11,659 86	14,000 00
Hydrants and Valves	5,669 36	5,500 00
Reservoir.....	5,739 35	8,328 00
Cartage.....	6,447 29	6,000 00
House Services.....	6,339 30	7,000 00

The main items in the Works estimates are: Roadway repairs, \$23,800, increase, \$7,087; sidewalks, \$12,000; asphalt repairs, \$25,000; house numbering and street names, \$5,000, increase \$4,237.42; street pavement, south from Harbor Street, west side Yonge Street wharf, \$5,191; Don speedway, \$20,000; University Avenue roadway, Queen to College, \$3,048; new bridge at Shaw Street, \$45,000; new bridge, Crawford Street, \$45,000; bridge repairs, \$14,370, increase, \$6,909.45; two new public lavatories and care of same, \$10,850;

steel bridge, Wallace avenue, \$4,500; maintenance and repairs to sewers, \$22,000; cleaning gullies, \$9,000; dredging slips, \$6,500; street railway matters, \$5,000; sand pump, \$14,000; new hydraulic dredge, \$54,000; salaries, \$25,000; last year, \$26,711.04; Island Waterworks, \$3,500.

WESTINGHOUSE AUXILIARY-POLE MOTORS, DIRECT CURRENT 4 TO 1 VARIABLE SPEED, TYPE SA.

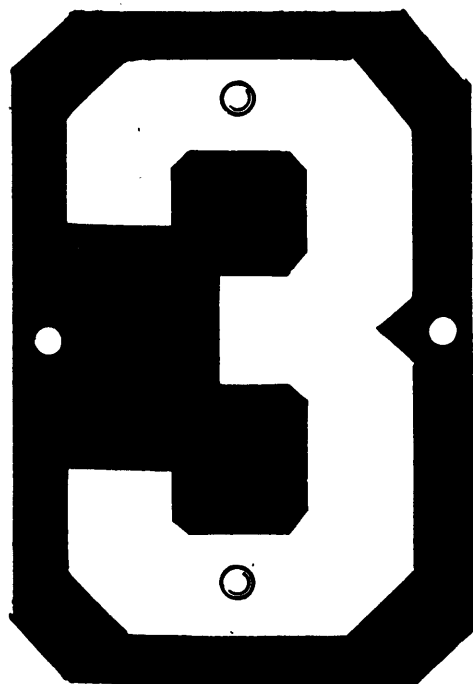
In many classes of work a wide speed variation is required and to meet the demands of such service the Westinghouse Electric & Mfg. Co., Pittsburg, Pa., have developed a line of direct-current motors having a speed range of four to one on a single voltage. This wide speed variation is obtained by field control, and the type SA motors compare favorably in every respect with the best direct-current constant-speed machines.

The new motors are exactly similar, mechanically and electrically, to the Westinghouse type S motors, except for the addition of auxiliary poles and coils. These are introduced in order to control the field form during the variation of field strength necessary to obtain so wide a range of speed. The cast steel poles with machine-formed coils are placed midway between the main poles and securely bolted to the frame. The construction is very simple and introduces no complications whatever, nor does it make difficult the removal of the main poles and field coils, as is evidenced by the fact that an auxiliary pole and coil can easily

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Seventeen Sturtevant Fans

are used in connection with the planing mill exhaust system at the Angus Shops of the Canadian Pacific Railway. They handle shavings enough to feed 1,700 H.P. of boilers.

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460

be taken out, without in any way disturbing the main field winding, by simply disconnecting the coil connections, withdrawing the bolts which hold the pole to the frame and sliding the pole and coil out parallel to the shaft.

The auxiliary field winding is connected in series with the armature and therefore produces a magnetizing effect which is proportional to the armature current. The auxiliary coils are placed as close to the armature surface as mechanical considerations will permit and their turns are concentrated at that point. This arrangement adds materially to the performance of the motor as it applies the corrective influences of the auxiliary winding directly at the points where the distorting effect of the armature current is strongest. This arrangement is much more effective than the distribution of the ampere turns along the length of the auxiliary poles. The magnetic field of the auxiliary winding acts in direct opposition to that produced by the armature current. The resultant field is made up of three components—that due to the shunt winding, that due to armature reaction, and that due to the auxiliary windings. The field distortion usually produced by armature reaction is therefore overcome and the shape of the magnetic field at the point of commutation is maintained as formed by the main

poles, and good commutation is made possible over a wide range of speed.

Type SA motors are shunt wound, which gives a definite speed for each point of the controller, which is nearly constant for all loads. Heavy overloads may be momentarily developed without injurious sparking. The motors are reversible without danger and without readjustment of the brushes, and, as the armature and auxiliary windings are connected permanently in series, it is only necessary to change the external armature connections to reverse the directions of rotation.

These motors develop their full rated output throughout their entire range of speed. They will carry full rated load at any speed within their range for six hours with a temperature rise not exceeding 40 degrees cent. in armature and field, and not exceeding 45 degrees cent. on commutator, as measured by thermometer. At all loads and all speeds commutation is excellent, and an overload of 25 per cent. may be carried for one hour without injurious sparking. All motors are thoroughly ventilated, running cool and at a uniform temperature. Their efficiency is high and their speed regulation practically exact. With the exceptions noted, type SA motors are mechanically identical with the type S, and corresponding parts are interchangeable.

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.

TENDERS

For Morrisburg Municipal Power Plant.

Tenders, accompanied by full set of plans and specifications complete to work by, will be received by A. A. Logan, "Reeve," up to 6 p.m., on March 20, 1906, for the erecting and fully completing in the most advanced methods an Electrical Development Plant of 1,100 electrical h.p. under nine feet six inches head of water. The tenders to include all and every expense from the beginning of the excavating of earth to the fully developed power, together with about one mile of transmission line from the site of the power plant to the Canada Tin Plate & Sheet Steel Co.'s buildings, including cable across the Williamsburg Canal, excepting such expenses only as the Council of the Village of Morrisburg may see fit to incur in the way of inspecting, engineering, etc. All plans and specifications must after selection by the Council of Morrisburg be submitted to the Department of Railways and Canals of Canada for their approval before contract can be let thereon. No expense to be incurred by the Village of Morrisburg in connection with any tender or plans and specifications submitted for approval. It is desirable to have voltage, etc., to conform to our present electric light plant, namely—volts (no load), 2,080; (full load), 2,300; 3-phase frequency, 60 cycles per second. As it is desirable to complete this plant as quickly as possible, each tender should state length of time they will require to do the work in.

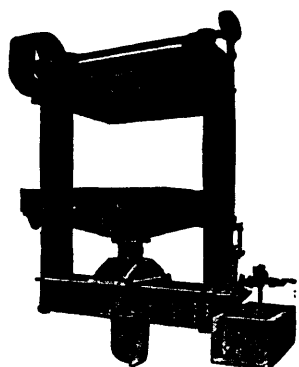
Tenders will also be received up to same date for the preparing of plans and specifications, the superintending of the work, and the furnishing of such contractors plant as will be necessary to do the work with, for and on the account of the Municipality.

Mark tender and address to

A. A. LOGAN,

Reeve.

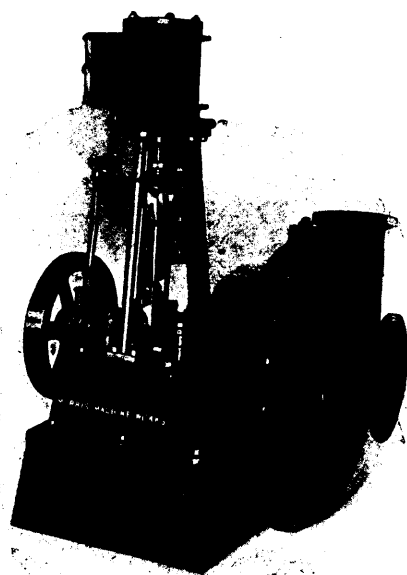
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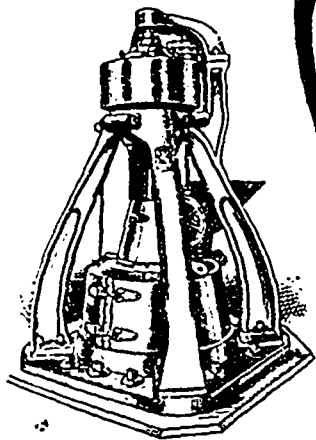
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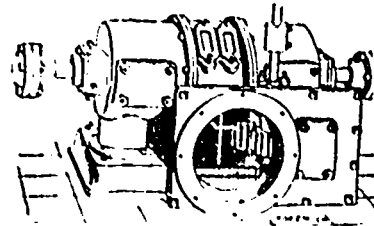
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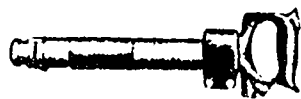
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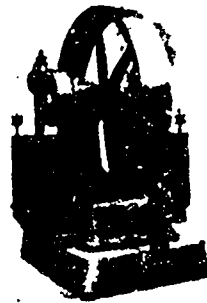
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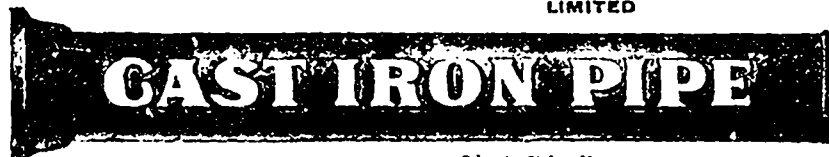
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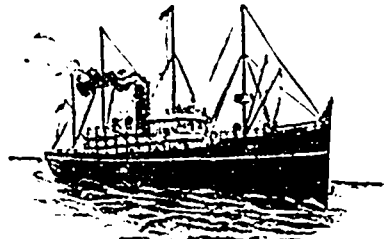
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Date of Publication of 1906 Edition.

FEBRUARY 28th.

London:

THE CARTER PUBLISHING CO., 8, NEW BRIDGE STREET, E.C.

9. Register of British and Foreign Shipping.
10. Shipping and Forwarding Agents, Export Packers, Steamship Lines.
11. Export Sections of London and Provinces (separate towns), giving names of exporters, places of shipment and class of goods shipped.
12. Index to class of Goods Shipped with names of Shippers.
13. Trade Mark Section.
14. Manufacturers Trade Directory (Buyers' Guide).

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER

CLASSIFIED INDEX.

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Canada Chemical Co., London, Ont.
Nichols Chemical Co. of Canada, Montreal

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Syracuse Smelting Works, Montreal.

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Hopkins, F. H. & Co., Montreal.
Leslie, A. C. & Co., Montreal.
London Rolling Mills, London, Ont.
Union Drawn Steel Co., Hamilton, Ont.

Belt Dressing

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Petrie, H. W., Toronto.
Sadler & Haworth, Montreal and Toronto.
Williams, A. R. Machinery Co., Toronto.

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

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McLaren, D. K., Montreal and Toronto.
McLaren, J. C. Belting Co., Montreal and Toronto.
Petrie, H. W., Toronto.
Sadler & Haworth, Montreal and Toronto.

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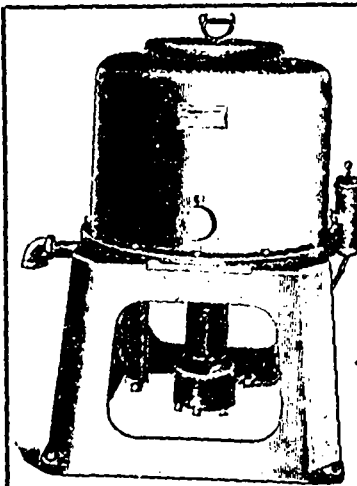
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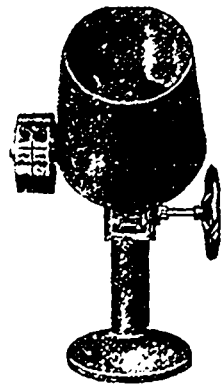
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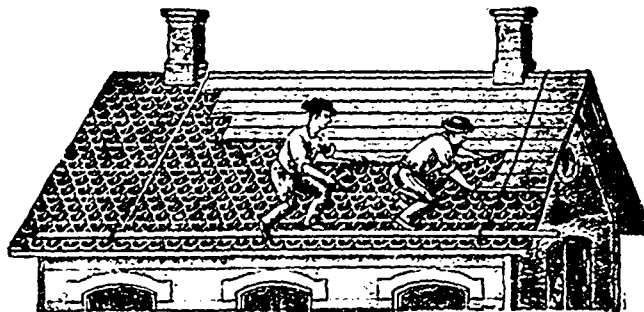
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CLASSIFIED INDEX.

(CONTINUED).

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

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Bristol Co., Waterbury, Conn.
Dominion Belting Co., Hamilton, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
Montreal Belting Co., Montreal.
McLaren, D. K., Montreal and Toronto.
McLaren, J. C., Belting Co., Montreal and Toronto.
Petrie, H. W., Toronto.
Sadler & Haworth, Montreal and Toronto.
Williams, A. R. Machinery Co., Toronto.

Blast Furnace Brick

Dunbar Fire Brick Co., Pittsburgh, Pa.
Elk Fire Brick Co., St. Mary's, Pa.
Hamilton Facing Mill Co., Hamilton, Ont.
Harbison-Walker Refractories Co., Pittsburgh, Pa.
Pennsylvania Fire Brick Co., Lock Haven, Pa.
Queen's Run Fire Brick Co., Lock Haven, Pa.
Stowe-Fuller Co., Cleveland, Ohio.

Blowers

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Sheldon & Sheldon, Galt, Ont.
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Hamilton Facing Mill Co., Hamilton, Ont.

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

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Morrow John Machine Screw Co., Ingersoll Ont.

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

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Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Expanded Metal & Fireproofing Co., Toronto.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

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Canada Foundry Co., Toronto.
Conduits Company, Limited, Toronto.
Expanded Metal & Fireproofing Co., Toronto.
Gartshore, John J., Toronto.
Hopkins, F. H. & Co., Montreal.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.
Sheldon & Sheldon, Galt, Ont.

Cables

Dominion Wire Rope Co., Montreal.
Greening, B. Wire Co., Hamilton, Ont.
Phillips, Eugene F. Electrical Works, Montreal.

Canada Plates

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

Canoes

Peterborough Canoe Co., Peterborough, Ont.

Caps

McCullough-Dalsell Crucible Co., Pittsburg, Pa.

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

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Canada Foundry Co., Toronto.
Montreal Pipe Foundry Co., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.

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Jenckes Machine Co., Sherbrooke, Que.
Kerr Engine Co., Walkerville, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
Smart-Turner Machine Co., Hamilton, Ont.

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Bradley Pulverizer Co., Boston, Mass.
McDougall, John, Caledonian Iron Works Co., Montreal.

Centrifugal Pumping Machinery

Morris Machine Works, Baldwinsville, N.Y.
Smart-Turner Machine Co., Hamilton, Ont.

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(Welded Coil Chain)

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

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

Charcoal Pig Iron

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

Chemicals

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Nichols Chemical Co. of Canada, Montreal

Chemists

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

Clay Working Machinery

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Hamilton Facing Mill Co., Hamilton, Ont.
Milnes, James H. & Co., Toronto.
Wick, H. K. & Co., Buffalo, N.Y.
Wilson, H. T. Coal Co., Detroit, Mich.

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

Coal Tipples

Jeffrey Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.

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

Coke Oven Brick

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

Collection Agency

Petrie, H. D., Hamilton, Ont.

Concrete Mixers

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

Condensers

Smart-Turner Machine Co., Hamilton, Ont.

Conduits (Interior)

Conduits Company, Limited, Toronto.

Contractors' Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Gartshore, John J., Toronto.
Hopkins, F. H. & Co., Montreal.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.
Smart-Turner Machine Co., Hamilton, Ont.

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Allis-Chalmers-Bullock, Limited, Montreal.
Hopkins, F. H. & Co., Montreal.
Jenckes Machine Co., Sherbrooke, Que.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.
Von der Osten, E. & Co., Toronto.
Williams A. R. Machinery Co., Toronto.

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Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
Link-Belt Engineering Co., Philadelphia, Pa.
McDougall, John, Caledonian Iron Works Co., Montreal.

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

Copper Materials

Greening, B. Wire Co., Hamilton, Ont.
Phillips, Eugene F. Electrical Works, Montreal.
Syrause Smelting Works, Montreal.

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(CONTINUED).

Corrugated Iron

Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Cotton Banding and Rope

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

Covers

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

Cranes (Electric and Hand Power)

Smart-Turner Machine Co., Hamilton, Ont.

Crayons

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

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

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

Crucible Covers

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

Kelly's Directories, Limited, Toronto

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Dredges

Allis-Chalmers-Bullock, Limited, Montreal.

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 Kiln Apparatus

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

Dust and Shavings Separators

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

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Brunner, Mond & Co., Northwich, England.
Canada Chemical Mfg. Co., London, Ont.
Cassella Color Co., New York City.
Geigy Aniline & Extract Co., New York City.
McArthur, Corneille & Co., Montreal.
Nichols Chemical Co. of Canada, Montreal.
Winn & Holland, Montreal.

DYNAMOS (See Motors and Dynamos)

Electric Meters and Transformers

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

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Keystone Engineering Co., Toronto.

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Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Electrical Construction Co., London, Ont.

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Keystone Engineering Co., Toronto.
Packard Electric Co., St. Catharines, Ont.
Toronto & Hamilton Electric Co., Hamilton, Ont.
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Darling Bros., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.
Link-Belt Engineering Co., Philadelphia, Pa.

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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)

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

Engineers (Consulting)

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Gearing, H. Toronto.
Hunt, Robert W. & Co., Chicago, Ill.
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Perrin, William R. & Co., Limited, Toronto
Vogel C. H., Ottawa.
Von der Osten, E. & Co., Toronto.

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Canadian White Co., Montreal.
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Fensom, C. J., Toronto.
Jones & Moore Electric Co., Toronto.
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Gearing, H., Toronto.
McDougall, John, Caledonian Iron Works Co., Montreal.
Hunt, Robert W. & Co., Chicago, Ill.
Kerr Engine Co., Walkerville, Ont.
Marion & Marion, Montreal.
Robb Engineering Co., Amherst, N.S.
Sheldon & Sheldon, Galt, Ont.
Smart-Turner Machine Co., Hamilton, Ont.

Engineers (Mill and Hydraulic)

Fensom, C. J., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.
Vogel, C. H., Ottawa.

Engineers (Mining)

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

Engineers (Municipal)

Von der Osten, E. & Co., Toronto

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Jeffrey Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.
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Hopkins, F. H. & Co., Montreal.
Jenckes Machine Co., Sherbrooke, Que.
Morris Machine Works, Baldwinville, N.Y.
McDougall, John, Caledonian Iron Works Co., Montreal.
Petrie, H. W., Toronto.
Robb Engineering Co., Amherst, N.S.
Sheldon & Sheldon, 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

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

Exhaust Heads

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

Exhausters

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

Explorer and Geologist

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

Factory Sites

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

Feed Water Heaters

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

Files

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

Fillet (Pattern)

Hamilton Facing Mill Co., Hamilton, Ont.
McLaren, J. C. Belting Co., Montreal.
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.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.

Financial

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

Finials

Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Fire Brick and Clay

Dunbar Fire Brick Co., Pittsburg, Pa.
Elk Fire Brick Co., St. Mary's, Pa.
Hamilton Facing Mill Co., Hamilton, Ont.
Harbison-Walker Refractories Co., Pittsburg, Pa.
Pennsylvania Fire Brick Co., Lock Haven, Pa.
Queen's Run Fire Brick Co., Lock Haven, Pa.
Stowe-Fuller Co., Cleveland, Ohio.

Fire Escapes

Darling Bros., Montreal.

Fireproof Partitions

Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Flour Mill Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Goldie & McCulloch Co., Galt, Ont.

Forges and Blowers

Canada Foundry Co., Toronto.
Hamilton Facing Mill Co., Hamilton, Ont.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Founders

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

Foundry Facings and Supplies

Hamilton Facing Mill Co., Hamilton, Ont.

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)

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

Gas and Gasoline Engines

Morrison, T. A. & Co., Montreal.
Smart-Turner Machine Co., Hamilton, Ont.

Gauges (Recording Pressure)

Bristol Co., Waterbury, Conn.

Gauges (Steam)

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

Gauges (Water)

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

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.

Government Notices

Factory Inspectors,
Minister of Agriculture.

Graphite

Dixon, Jos. Crucible Co., Jersey City, N.J.
Hamilton Facing Mill Co., Hamilton, Ont.
McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Pittsburg Crucible Works, Pittsburg, Pa

Hardware

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

Heating and Ventilating Apparatus

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

Hoisting Engines

Allis-Chalmers-Bullock, Limited, Montreal
Jenckes Machine Co., Sherbrooke, Que.

Hoists (Chain and Pneumatic)

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

Hose (Fire and Pneumatic)

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

Hotel

Gallatin Hotel, New York City.

Hydrants

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

Hydraulic Accumulators

Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.
Smart-Turner Machine Co., Hamilton, Ont.

Hydraulic Leather

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

Hydraulic Machinery

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

Industrial Plants

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

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Insulated Wires and Cables

Phillips, Eugene F., Electrical Works, Montreal.

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.
 Metallic Roofing Co., Toronto.
 Nova Scotia Steel & Coal Co., New Glasgow, N.S.
 Pedlar People, Oshawa, Ont.
 Petrie, H. W., Toronto.
 Union Drawn Steel Co., Hamilton, Ont.

Injectors

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

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.

Loom Reeds

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

Lubricators

Hamilton Facing Mill Co., Hamilton, Ont.

Machinists

Goldie & McCulloch Co., Galt, 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.
 Hopkins, F. H. & Co., Montreal.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Morrow, John, Machine Screw Co., 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

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

Marine and Stationary Engines and Boilers

Allis-Chalmers-Bullock, Limited, Montreal.
 Jenckes Machine Co., Sherbrooke, Que.
 Smart-Turner Machine Co., Hamilton, Ont.

Mechanical Draft

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

Metal Doors

Metallic Roofing Co., Toronto.
 Pedlar People, Oshawa, Ont.

Metal Stamping

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

Metallurgists

Mills, S. D., Toronto.

Mill Machinery and Supplies

Allis-Chalmers-Bullock, Limited, Montreal.
 Armstrong Mfg. Co., Bridgeport, Conn.
 Becker-Brainard Milling Machine Co., Hyde Park, Mass.
 Darling Bros., Montreal.
 Gartshore, John J., Toronto.
 Goldie & McCulloch Co., Galt, Ont.
 Gutta Percha & Rubber Mfg. Co., Toronto
 Hamilton Brass Mfg. Co., Hamilton, Ont.
 Hamilton, Wm., Mfg. Co., Peterborough, Ont.
 Hay, Peter Knife Co., Galt, Ont.
 Hopkins, F. H. & Co., Montreal.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Jenckes Machine Co., Sherbrooke, Que.
 Morrow, John, Machine Screw Co., Ingersoll, Ont.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 McLaren, D. K., Montreal and Toronto.
 McLaren, J. C. Belting Co., Montreal.
 Petrie, H. W., Toronto.
 Robb Engineering Co., Amherst, N.S.
 Smart-Turner Machine Co., Hamilton, Ont.
 Spence, R. & Co., Hamilton, Ont.
 Wilson, J. C. & Co., Glenora, Ont.

Milling Cutters and Machines

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

Miners' Lamps

Allis-Chalmers-Bullock, Limited, Montreal.

Mining Machinery

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

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.
 Keystone Engineering Co., Toronto.
 Petrie, H. W., Toronto.
 Sturtevant, B. F. Co., Hyde Park, Mass.
 Toronto & Hamilton Electric Co., Hamilton, Ont.
 United Electric Co., Toronto.

Moulding Sand

Hamilton Facing Mills Co., Hamilton, Ont.

Moulders Supplies.

Hamilton Facing Mill Co., Hamilton, Ont.

Nickel

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

Novelty Manufacturers

Worth & Martin, Toronto.

Nozzles

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

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.
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Oil Cloth

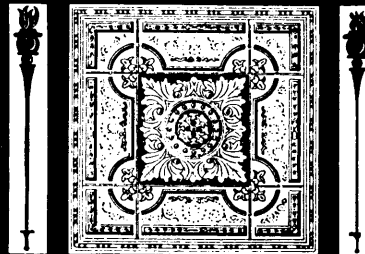
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Budden, Hanbury A., Montreal.
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Marion & Marion, Montreal.

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Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Personal Accident

Canadian Casualty & Boiler Insurance Co., Toronto.

Phosphorizers

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

Piano Action and Key Machinery

H. Gearing, Toronto.

Pig Iron

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

Pipe (Riveted, Iron and Steel)

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

Pipe Threading Machines

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

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

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.
Babcock & Wilcox, Limited, Montreal.
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Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Darling Bros., Montreal.
Electrical Construction Co., London, Ont.
Goldie & McCulloch, Galt, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto.
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.
Smart-Turner Machine Co., Hamilton, Ont.
Sturtevant, B. F. Co., Boston, Mass.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.
Wilson, J. C. & Co., Glenora, Ont.

Presses (Tile, Sewer Pipe, Nozzles and Sleeves)

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

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Darling Bros., Montreal.
Goldie & McCulloch Co., Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.
McDougall, John, Caledonian Iron Works Co., Montreal.
McLaren, J. C., Belting Co., Montreal and Toronto.
Petrie, H. W., Toronto
Smart-Turner Machine Co., Hamilton, Ont.
Wilson, J. C. & Co., Glenora, Ont.

Pumps and Pumping Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
American Steam Pump Co., Battle Creek, Mich.
Canada Foundry Co., Toronto.
Darling Bros., Montreal.
Downie Pump Co., Downieville, Pa.
Goldie & McCulloch Co., Galt, Ont.
Jenckes Machine Co., Sherbrooke, Que.
Kerr Engine Co., Walkerville, Ont.
Morris Machine Works, Baldwinsville, N.Y.
McDougall, John, Caledonian Iron Works Co., Montreal.

Ontario Wind Engine & Pump Co., Toronto.

Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.

Punches and Shears

Globe Machine & Stamping Co., Cleveland, Ohio.
Petrie, H. W., Toronto.

Purifiers

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

Purifying and Softening Systems (Water)

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

Railroads

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

Railway Supplies

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

Reamers

Butterfield & Co., Rock Island, Que.

Rivets

Bourne-Fuller Co., Cleveland, Ohio.
London Rolling Mills, London, Ont.

Rock and Ore Crushers

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

Rolling Mill Engineers

Bourne-Fuller Co., Cleveland, Ohio.

Roofing

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

Rubber Goods

Gutta Percha & Rubber Mfg. Co., Toronto.

Rubber Packing

Gutta Percha & Rubber Mfg. Co., Toronto.

Rubber Washing Tubs

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

Rural Mail Boxes

Globe Machine & Stamping Co., Cleveland, Ohio.

Safes and Vaults

Goldie & McCulloch Co., Galt, Ont.

Saw Mill Machinery

Allis-Chalmers-Bullock, Limited, Montreal.

Screws

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

Screw Plates

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

Shafting

Allis-Chalmers-Bullock, Limited, Montreal.
Bourne-Fuller Co., Cleveland, Ohio.
Goldie & McCulloch Co., Galt, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.
McDougall, John, Caledonian Iron Works Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow N.S.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.

Shear Knives

Hay, Peter Knife Co., Galt, Ont.

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Bourne-Fuller Co., Cleveland, Ohio.
Leslie, A. C. & Co., Montreal.
Lysaght, John, Limited, Bristol, England, and Montreal.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Sheet Metal Goods

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

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Sheet Metal Stamping

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

Shovels.

Hamilton Facing Mill Co., Hamilton, Ont.

Smoke Stacks

Gearing, H. Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
Robb Engineering Co., Amherst, N.S.
Smart-Turner Machine Co., Hamilton, Ont.

Solder

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

Special Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Globe Machine & Stamping Co., Cleveland Ohio.
Smart-Turner Machine Co., Hamilton, Ont.

Speed Recorders

Bristol Co., Waterbury, Conn.

Sprinkler Insurance

Canadian Casualty & Boiler Insurance Co., Toronto

Stamps and Stencils

Globe Machine & Stamping Co., Cleveland, Ohio.

Steam Pumps

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

Smart-Turner Machine Co., Hamilton, Ont.
Williams, A. R. Machinery Co., Toronto.

Steam Separators

Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
Robb Engineering Co., Amherst, N.S.
Sheldon & Sheldon, Galt, Ont.
Smart-Turner Machine Co., Hamilton, Ont.

Steam Shovels

Allis-Chalmers-Bullock, Limited, Montreal.

Steam Specialties

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

Steam Valves

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

Steel Rails

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

Steel Shafting

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

Stocks and Dies

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

Stoppers

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

Structural Steel

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

Sulphate of Alumina

Nichols Chemical Co. of Canada, Montreal.

Suspension Furnaces

Continental Iron Works Co., New York City.

Tanks (Oil and Water)

Canada Foundry Co., Toronto.
Goldie & McCulloch Co., Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.

Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.
Ontario Wind Engine & Pump Co., Toronto.

Taps and Dies

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

Tees

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

Textile Manufacturers

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

Textile Supplies

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

Thermometers (Recording)

Bristol Co., Waterbury, Conn.

Tin

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

Tool Steel

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

Trucks

Hopkins, F. H. & Co., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Sheldon & Sheldon, Galt, Ont.

Trucks (Railway)

Canada Foundry Co., Toronto.

Trucks (Wire Mill Supplies)

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

Tubs (Cleaning and Coating Wire)

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

Tumbling Barrels

Globe Machine & Stamping Co., Cleveland, Ohio.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.

Turbines

Canada Foundry Co., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough Ont.
Jenckes Machine Co., Sherbrooke, Que.
Wilson, J. C. & Co., Glenora, Ont.

Valves

American Steam Pump Co., Battle Creek, Mich.
Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Hamilton Brass Mfg. Co., Hamilton, Ont.
Kerr Engine Co., Walkerville, Ont.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.
Williams, A. R. Machinery Co., Toronto.

Valves (Rubber)

Gutta Percha & Rubber Mfg. Co., Toronto.

Varnishes

Berry Bros., Walkerville, Ont.

Ventilators

Darling Bros., Montreal.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Wagon and Carriage Wood Work

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

Washers or Hollinders (Cleaning Rubber)

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

Water Power Development

Vogel, C. H., Ottawa.

Water Purifying Chemicals

Canada Chemical Mfg. Co., London, Ont.

Wheelbarrows.

Hamilton Facing Mill Co., Hamilton, Ont.

Windmills

Ontario Wind Engine & Pump Co., Toronto.

Wire Mill Supplies

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

Wire and Wire Rope

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

Wire Rope Fittings

Dominion Wire Rope Co., Montreal.

Wire Cloth

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

Wire Drawing Machinery

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

Wood-Working Machinery

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

Zinc

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

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J. J. CASSIDEY, Manager.

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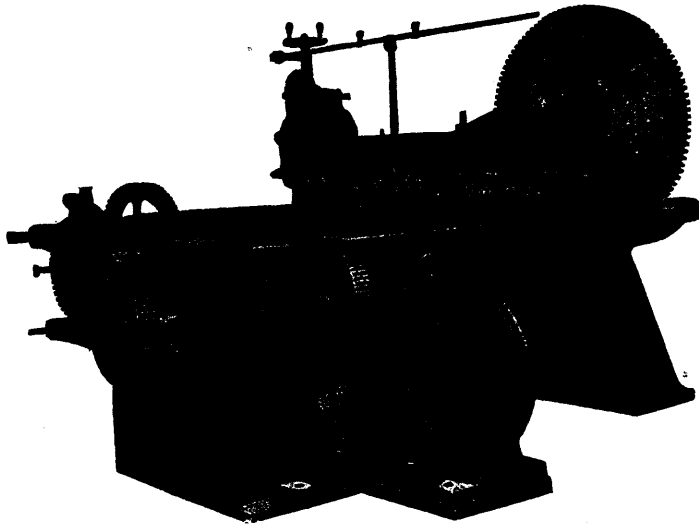
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NAMES.	Place.	Frequency.	Their Price.	Combina- tion.	NAMES.	Place.	Frequency.	Their Price.	Combina- tion.
American Architect.....	New York..	Weekly	\$6 00	\$6 25	Illustrated London News.....	London.....	Weekly	\$6 00	\$6 25
American Electrician.....	New York..	Monthly	1 00	1 25	Inter-Ocean.....	Chicago....	Weekly	1 00	1 25
American Federationist.....	Washington.	Monthly	1 00	1 25	Iron Age.....	New York..	Weekly	5 00	5 25
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Architect and Builders Magazine	New York..	Monthly	2 00	2 25	Leslies' Monthly Magazine....	New York..	Monthly	1 00	1 25
Architectural Record.....	New York..	Monthly	3 00	3 25	Literary Digest.....	New York..	Weekly	3 00	3 25
Architectural Review.....	London....	Monthly	4 00	4 25	Machinery (Engineering Edition)	New York..	Monthly	2 00	2 25
Atlantic Monthly.....	Boston....	Monthly	4 00	4 25	McClure's Magazine.....	New York..	Monthly	1 00	1 25
Boys' Own Paper.....	London....	Weekly	1 75	2 00	Mines and Minerals.....	Scranton..	Monthly	2 00	2 25
Brick-Builder.....	Boston....	Monthly	5 00	5 25	Modern Methods.....	Detroit.....	Monthly	50	1 50
British Architect.....	London....	Weekly	6 00	6 25	Montreal Herald.....	Montreal...	Daily...	3 00	3 25
Buffalo Express, Illustrated....	Buffalo....	Weekly	2 00	2 25	Montreal La Presse.....	Montreal...	Daily...	3 00	3 25
Builders' Journal.....	London....	Weekly	3 50	3 75	Montreal Witness.....	Montreal...	Daily...	3 00	3 25
Camera.....	Philadelphia.	Monthly	1 00	1 25	Motor Age.....	Chicago....	Weekly	2 00	2 25
Canada First.....	Toronto....	Monthly	1 00	1 25	Motoring, Illustrated.....	London....	Weekly	2 25	2 50
Canadian Magazine.....	Toronto....	Monthly	2 50	2 75	Municipal Journal.....	New York..	Monthly	3 00	3 25
Cassiers' Magazine.....	New York..	Monthly	3 00	3 25	National Builder.....	Chicago....	Monthly	2 00	2 25
Chemical News.....	London....	Weekly	5 25	5 50	National Monthly.....	Toronto....	Monthly	1 00	1 25
Colliers' Weekly.....	New York..	Weekly	5 20	5 25	New York Clipper.....	New York..	Weekly	4 00	4 25
Commercial Intelligence.....	London....	Weekly	5 00	5 25	New York Commercial.....	New York..	Daily...	6 00	6 25
Compressed Air.....	New York..	Monthly	1 00	1 25	North American Review.....	New York..	Monthly	5 00	5 25
Cooking School Magazine.....	Boston....	Monthly	1 00	1 25	Our Dumb Animals.....	Boston....	Monthly	50	75
Cornhill Magazine.....	London....	Monthly	2 50	2 75	Outing.....	New York..	Monthly	3 00	3 25
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Electrical World and Engineer..	New York..	Weekly	3 00	3 25	Photographic Times.....	New York..	Weekly	1 00	1 25
Electrician.....	London....	Weekly	7 30	7 50	Photography.....	London....	Weekly	2 25	2 50
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Engineering and Mining Journal.	New York..	Weekly	5 00	5 25	Power.....	New York..	Monthly	1 00	1 25
Engineering Review.....	New York..	Monthly	1 00	1 25	Queen, The.....	London....	Weekly	10 00	10 25
Engineering Review (Fieldens)..	London....	Monthly	3 05	3 25	Review of Reviews.....	London....	Monthly	2 00	2 25
Everybody's Magazine.....	New York..	Monthly	1 50	1 75	Scientific American.....	New York..	Weekly	3 00	3 25
Field and Stream.....	New York..	Monthly	1 50	1 75	Scribners' Magazine.....	New York..	Monthly	3 00	3 25
Forest and Stream.....	New York..	Weekly	4 00	4 25	Sporting Times.....	London....	Weekly	3 00	3 25
Four Track News.....	New York..	Monthly	1 00	1 25	Street Railway Journal.....	New York..	Monthly	3 00	3 25
Gentleman's Magazine.....	London....	Monthly	4 00	4 25	Toronto Saturday Night.....	Toronto....	Weekly	2 00	2 25
Girl's Own Paper.....	London....	Weekly	1 75	2 00	Toronto Sunday World.....	Toronto....	Weekly	2 00	2 25
Good Housekeeping.....	Toronto....	Monthly	1 00	1 25	Youth's Companion.....	Boston....	Weekly	1 75	2 00
Good Road's Magazine.....	New York..	Monthly	1 00	1 25	Weldon's Ladies' Journal.....	London....	Monthly	1 25	1 50
Hardware Dealers' Magazine....	New York..	Monthly	1 00	1 25	Winnipeg Free Press.....	Winnipeg...	Daily...	3 00	3 25
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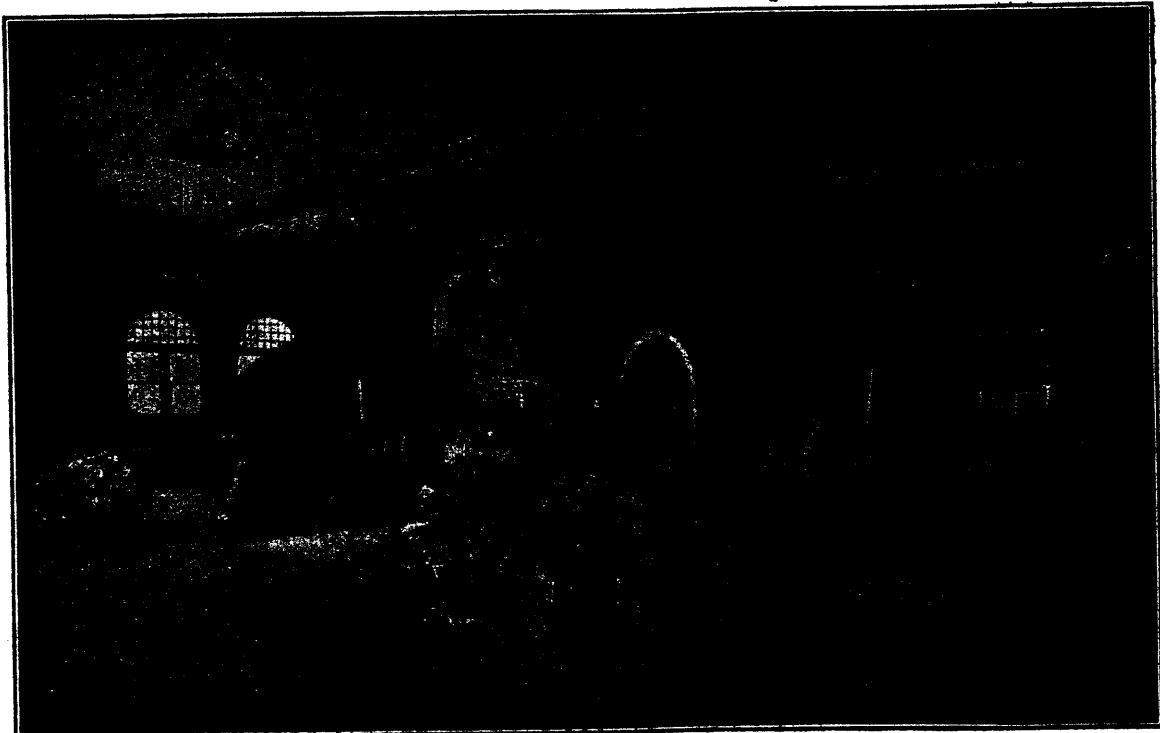
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By Geo. H. MILLER,
Superintendent.

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SUCCESSORS TO

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Under U.S. and Canadian Patents

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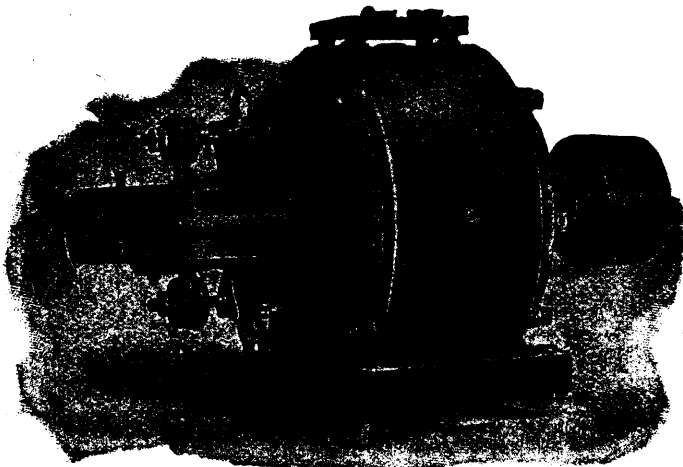
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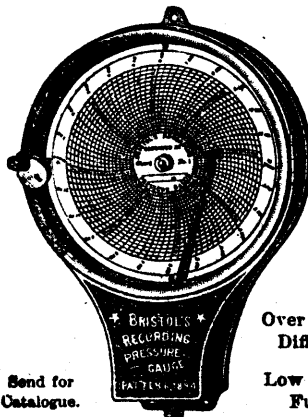
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You Must Buy Well to Sell Well

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