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Vol. 48. TORONTO, NOVEMBER 6, 1908. No. 9.

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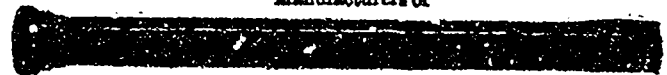
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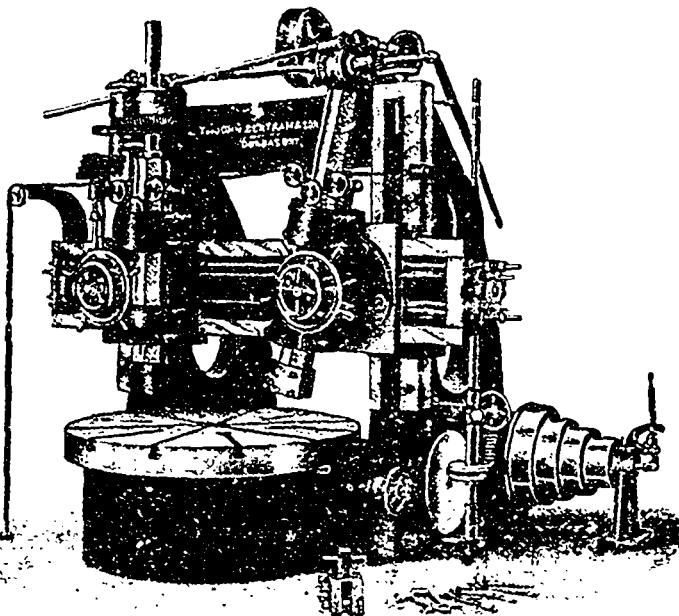
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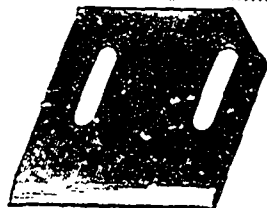
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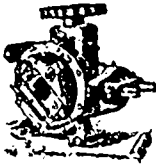


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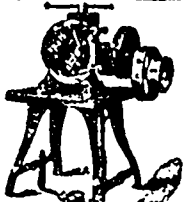


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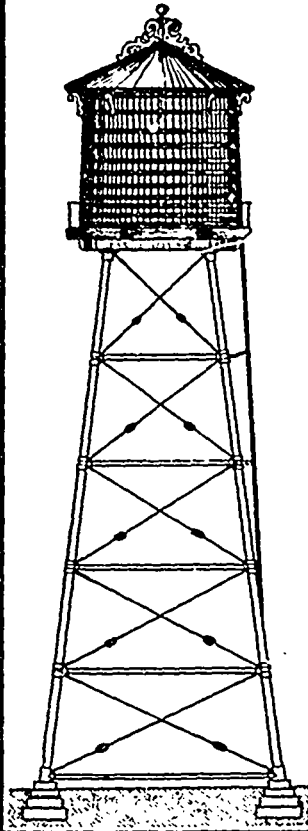
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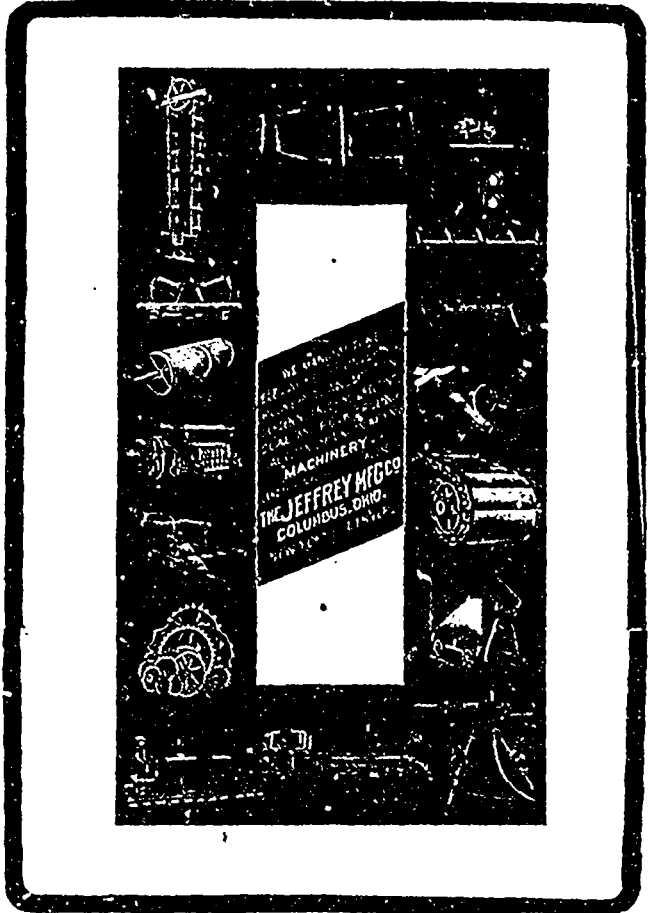
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The Day of Judgment is Come After All

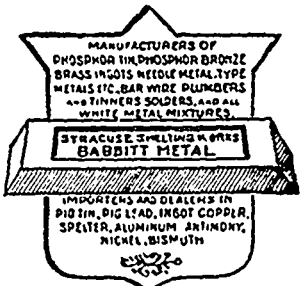
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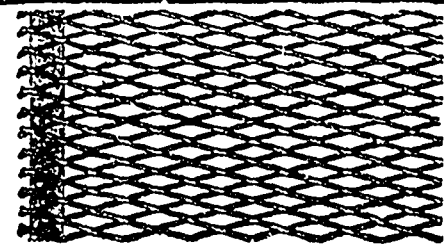
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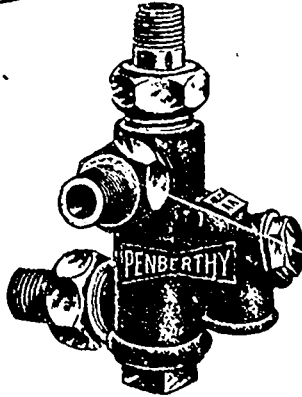
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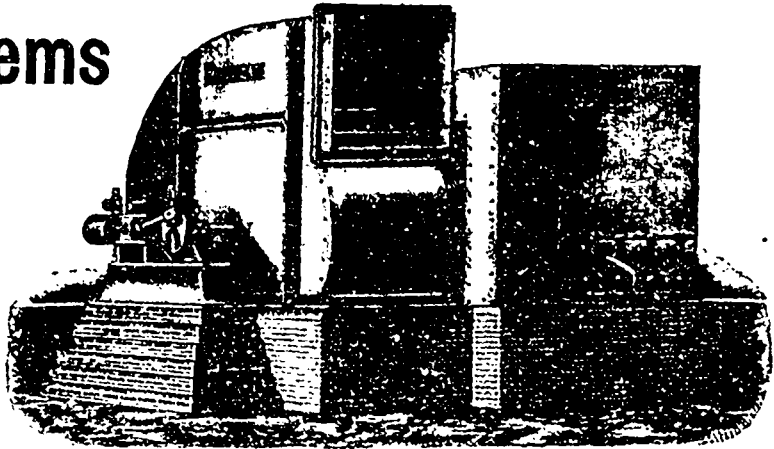
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PACKARD lamps will give a better and more uniform service in proportion to their cost than any lamp made.

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When you are next in the market for anything in the electrical supply line communicate with us—we can save you money.

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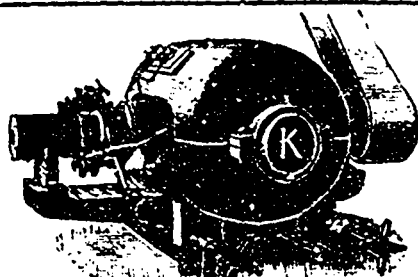
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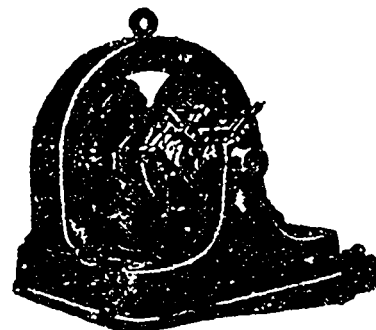
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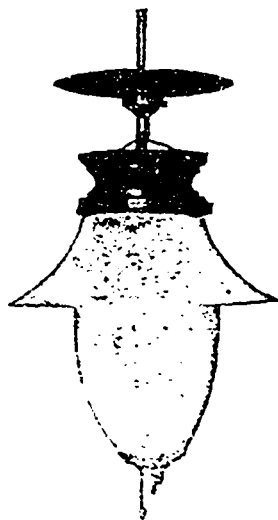


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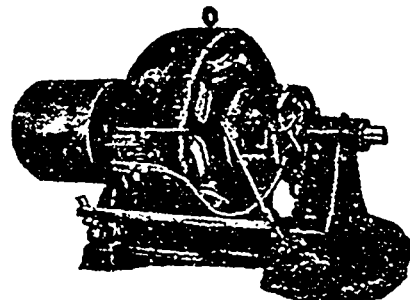
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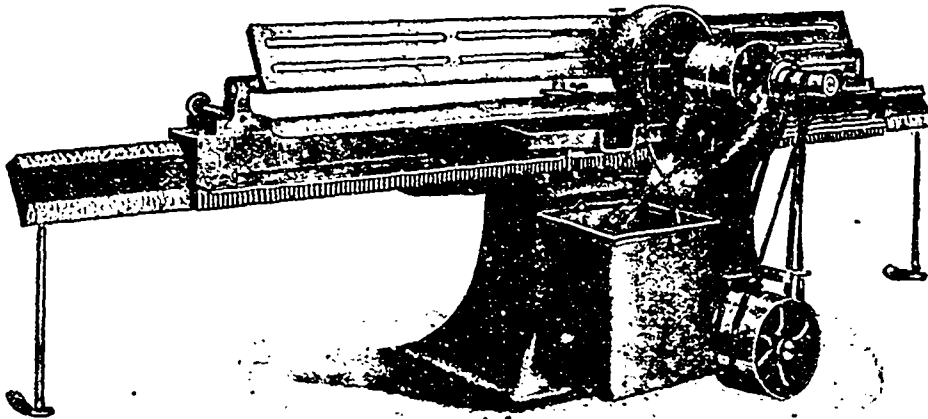
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J. J. CASSIDY, - - - Editor and Manager.

Classified IndexPage 39
Index to AdvertisersPage 46**THE CANADIAN MANUFACTURER**

Reaches all the Blast Furnaces, Iron and Steel Works, Rolling Mills, Manufacturers of Iron and Wood-Working Machinery, Steam Engines and Boilers, Pumping and Mining Machinery, Electric Machinery, Textile, Pulp and Paper Mill Machinery, Water Power Plants, Cement, Sewer Pipe and Terra Cotta Works, Dealers in Steam Fitters' and Plumbers' Supplies, and all Hardware Merchants in Canada.

CANADIAN RIGHTS IN THE ERIE CANAL.

On October 26 the United States Supreme Court affirmed a constitutional principle which puts the Erie Canal under national control if Congress sees fit to assert it.

In the case of a debt claim against the owner of a canalboat the Court, overruling the New York Court of Appeals, holds that the action is within the maritime jurisdiction of the federal judiciary and not within the jurisdiction of the State tribunals.

The Court bases this decision on the principle that under the constitution the Erie Canal is to be classed with navigable waters of the United States, and a canalboat with ships or vessels navigating such waters. "The only distinction between canals and other navigable waters," says Justice Brown in the opinion of the majority, "is that they are rendered navigable by artificial means and sometimes, though by no means always, are wholly within the limits of a particular state. He adds:

"We fail to see, however, that this creates any distinction in principle. Canals, though frequently within the limits of a single state, generally connect waters lying outside the state. In this case the Erie Canal, though wholly within the state of New York, is a great highway of commerce between ports in different states and foreign countries, and it is navigable by vessels which also traverse the waters of the Hudson River."

This adds another to the long line of opinions in which the Supreme Court of the United States interpreting the commerce clause of the constitution and the maritime jurisdiction of the federal courts, has steadily enlarged the scope of national power. Until about a half century ago federal admiralty jurisdiction in the United States was held to be limited to tidewater, but it has since then been extended to take in not only all navigable rivers and lakes connected in any way with the ocean, but also canals, such as the Erie, lying wholly within the boundaries of a state and made by the state. The result is that a vast range of inland waterways formerly supposed to be within the domain of state sovereignty are now held to be under national control.

The decision does not, it is true, involve the ownership of the Erie Canal, which still remains in the State where it has always been.

The interest of Canada in this decision is whether Canadian vessels are to be allowed passage through the canal, being under the supreme jurisdiction of the United States, the same

as United States vessels are now allowed passage through Canadian canals. There is an immense amount of shipping, principally of lumber, from Hull and Ottawa, on the Ottawa river, and from other Canadian points, through the New York State canals, done entirely and exclusively in United States vessels, and in which no Canadian vessel is allowed to participate, the contention of the New York State authorities being that they had a right to deny to foreign vessels the use of the state canals.

It would seem that heretofore the United States Government have accepted this view, for in the Treaty of Washington of 1871, Clause XXVII., dealing with the question of the rights of passage to one country through the canals of the other country, it is provided as follows:

The Government of Her Britannic Majesty engages to urge upon the Government of the Dominion of Canada to secure to the citizens of the United States the use of the Welland, St. Lawrence and other canals in the Dominion on terms of equality with the inhabitants of the Dominion; and the Government of the United States engages that the subjects of Her Britannic Majesty shall enjoy the use of the St. Clair Flats Canal on terms of equality with the inhabitants of the United States, and further engages to urge upon the State Governments to secure the subjects of Her Britannic Majesty the use of the several state canals connected with the navigation of the lakes or rivers traversed by or contiguous to the boundary line between the possessions of the High Contracting Parties, on terms of equality with the inhabitants of the United States.

The efforts of the United States Government to induce the government of the State of New York to accord to Canadian vessels the same use of the Erie Canal as is accorded to American vessels were never successful, and from the time of the making of that treaty in 1871 until now Canadian vessels have been denied the use of the New York canals.

It is now in order for the Dominion Government to bring this matter to the attention of the United States Government, and no doubt, in the light of the October 26 decision of the Supreme Court of the United States, the treaty right of Canadian vessels to the use of the New York canals will be promptly and cheerfully accorded.

TARIFF PREFERENCE FOR SOUTH AFRICA.

According to an Ottawa despatch the Dominion Government have decided to offer the tariff preference of 33½ per cent. to the colonies in the South Africa Customs Union in

return for tariff concessions by them to Canada. If the offer is accepted the reduced rates will go into effect on a date to be agreed upon by both parties. The tariff edition of THE CANADIAN MANUFACTURER, contains the full official schedules of the South Africa tariff and also the provisions for a preferential tariff reduction of twenty-five per cent. in favor of Great Britain and such British possessions as might desire to be brought under the operations of it, the South African colonies interested being Cape Colony, Natal, Orange River Colony, Transvaal and Southern Rhodesia.

The several classes of the tariff are :

- (1) Specific and ad valorem duties.
- (2) Specific and a few ad valorem duties.
- (3) Duties of 2½ per cent.
- (4) Free goods.
- (5) Unenumerated goods, 10 per cent. ad valorem.

The preference to Great Britain is 25 per cent. of any duty chargeable at the ad valorem rate in classes 1, 2 and 5. In respect of clause 3, the 2½ per cent. rate is rebated entirely. A clause in the convention provides for a similar preference to British Colonies. This clause reads as follows :

A rebate similar to that for which provision is made in the last preceding article shall be granted in like manner, and under like provisions, to goods and articles the growth, product or manufacture of any British Colony, protectorate or possession granting equivalent reciprocal privileges to the Colonies and territories belonging to the union, provided that no such rebate shall be granted in the case of any particular Colony, protectorate or possession until on and after a date to be mutually agreed upon and publicly notified by the parties to the convention.

The Government, it will be seen, are taking measures to secure for the products of Canada entrance to the market of South Africa on more advantageous terms.

The initial move was made by the establishment of a line of freight steamers between Canada and the Cape, which has already had the effect of developing an export trade to South Africa. Now a reduction in the Canadian duties will be made, provided South Africa gives us a quid pro quo.

The Canadian Government's action is taken in pursuance of that clause in the tariff, which provides that the preferential tariff may be extended to any other British Colony or possession, the customs tariff of which is, on the whole, as favorable to Canada as the British preferential tariff is to the Colony or possession.

It will be remembered that some two years ago the Dominion Government subsidized a South African service, and the Allans, the Elder-Dempsters and the Furness-Withy Co. took up the work of supplying a monthly service between Montreal and South African ports, in summer, and St. John and South Africa, in winter. The Allans afterward dropped out of the agreement, leaving the service in the hands of the other two companies.

In the early days of the service there was a great deal of dissatisfaction expressed by the steamship companies over the manner in which their steamships were detained at the different South African ports, owing to the very poor facilities which the ports afforded. This, it appears, has been materially bettered within the past few months, so that now a steamship can make the trip within a reasonable period.

The South African tariff is protective in its character, including practically every article which Canada would be likely to export to that part of the world.

There is a strong feeling that the Alaska Boundary Commission enquiry must be the last in which Canadian territory shall be submitted to arbitration where the Canadian case is not entrusted to Canadians.

AT THE PARTING OF THE WAYS.

It is in evidence that public sentiment in Canada regarding Imperial federation and preferential trade arrangements within the Empire has experienced a very decided cooling off as a result of the award of the Alaska Boundary Commission, decided by the casting vote of Lord Alverstone, the Chief Justice of England, and the people are again giving ear to proposals for reciprocity with the United States. The willingness for preferential trade with Great Britain is not as strong as it was previous to the decision, the idea being that while no serious objection is entertained against the award in favor of the United States, bitter blame attaches to Lord Alverstone for his consent to it. The feeling in Canada is expressed in strong language that Great Britain is quite willing to sacrifice, and has sacrificed Canadian interests to propitiate the friendship of the United States, and such being the case the willingness to maintain the tariff preference is fast disappearing. It is certainly not appreciated, and in the light of current events might with propriety be withdrawn.

The political allegiance we owe to Great Britain has had its force in the belief that the interests of Canada were safe in her keeping and would be upheld in all events; but we find that such is not the case, but rather that Canada is to be sacrificed whenever the political exigencies of Great Britain require it. Canada would be glad to continue her fealty to Great Britain if it were appreciated. Canada has always been a loyal daughter in her mother's house, but she must and will be mistress in her own. It may be that we are at the parting of the ways. Heretofore Canadian relations with other countries, particularly with the United States, have been adjudicated at Washington or London, Ottawa having but little to say or do in the matter other than to consent to what had been done, and to register the decision. Great Britain would have been humiliated and defeated as a result of the war in South Africa had it not been for the assistance rendered her by Canada and other colonies, as witness the battlefields there so fearfully imbued with the blood of loyal Canadians. Great Britain seems to have forgotten the occasion, but her prestige would have vanished, and the Boer would have driven the Briton from the Dark Continent but for colonial aid. British ingratitude and sycophancy has taught Canada a painful lesson which should not be forgotten, a lesson which should teach us to depend upon our own nerve and muscle for our position and success in life.

CANADIAN MANUFACTURERS, "SECONDARY INDUSTRIES" AND MR. CHAMBERLAIN'S PROPAGANDA.

At Glasgow, on October 6, in outlining his proposed fiscal policy for Great Britain, alluding to the concessions which the colonies should make, Mr. Chamberlain said :

Canada has been protective a long time. The principle industries are there, and you can never get rid of them; but the secondary industries have not yet been created, and there is an immense trade still open to you to maintain and increase. We can intervene now, but it is doubtful whether we could intervene twenty years hence. We can say to our great colonies: We understand your views and aspirations, and do not desire to dictate, or think ourselves superior to you; we recognize your right to develop your industries, so as not to be dependent on foreign supplies, but there are many things you do not know how to make for which we have a great capacity of production. Leave them to us; do not increase the tariff walls against us.

Later on in his speech Mr. Chamberlain, speaking of Canada and the other colonies said: "They would reserve to us the trade we already enjoy."

Mr. Chamberlain did not explain what he meant by the term "secondary industries," but we presume he had reference to things Canada requires or might require but does not now produce. Our principal industries are already established, and he would very kindly permit us to retain them, and to impose duties against similar products come from where they may, even from Great Britain, but articles that we do not now produce, such as Great Britain produces, Canada should never, no never undertake to manufacture; and this abnegation should be in consideration of some tariff favor which Mr. Chamberlain would have the British Government show to Canada.

This proposition is simply preposterous. Time was when it was a penal offense to send a pound of pig iron away from Great Britain, or a pound of any kind of machinery or raw material intended for the manufacture of any article that was or could be produced in that country; and every restriction possible was imposed upon the emigration of British skilled workmen; and the proposition of Mr. Chamberlain that Canada should refrain from expanding her enterprises by engaging in "secondary industries" will never be considered. It has a strong flavor of the events that led up to the separation of the American colonies. It cannot be imagined that Canada, as devoted as she is to Imperialism, would listen for a moment to such a suggestion.

Canada will go a long way and make large sacrifices for the unification and consolidation of the British Empire, but she will never stultify herself by agreeing to any emasculation of her energies such as Mr. Chamberlain's proposition calls for. It may be that there are many things which we do not now produce that are made in Britain; but it does not follow that Canadians could not acquire the necessary knowledge to produce them, Mr. Chamberlain to the contrary notwithstanding.

CANADIAN LOYALTY TO CANADA.

On the return trip of the excursion of members of the Canadian Manufacturers' Association from the Pacific Coast, when approaching Toronto, a newspaper representative submitted to some of the members of the party the following questions:

- 1.—Are you in favor of reserving to British manufacturers the Canadian market for the products of secondary industries not now existing in this country?
- 2.—Are you in favor of leaving the tariff walls against Britain as at present?

To these questions Mr. George E. Drummond, the president, speaking for the entire association said:

On general principles the Canadian Manufacturers' Association is heartily in sympathy with Mr. Chamberlain's propaganda for a policy of self preservation in Great Britain, and closer trade relations between the Mother Country and the colonies, on the basis of such mutual preferences as conditions within the several parts of the Empire may be found to permit of.

We favor the appointment of a commission, consisting of representatives from the Mother Country and the colonies, to fully investigate the whole question as suggested in the resolutions adopted at the recent conference of Chambers of Commerce of the Empire held in Montreal, which resolution was unanimously supported by the representatives of our association.

Mr. Drummond declined to make any further or more explicit reply to the questions submitted.

No doubt Mr. Drummond voices the sentiments not only of the Canadian Manufacturers' Association, but of all Canadian manufacturers, and of all thinking Canadians, and while Mr. Chamberlain's propositions are receiving the consideration of the people of this country, it is timely to hear what

some of our thinking men have to say in the matter. Mr. John Charlton, M.P., who has given the matter close attention, says that the question of protection so far as it relates to the intercourse of Great Britain with foreign countries is a matter of domestic concern to the British people, and one in which the Canadian people have neither voice nor direct interest, the position of Mr. Chamberlain with regard to colonial trade being a matter in which we have a direct interest; and this is a question to which we should give careful consideration. Loyalty to the interests of the Empire is a most commendable sentiment, but loyalty on the part of Canadians to Canadian interests should not be sent to the rear.

Mr. Charlton points out that in justice to ourselves it should be remembered that Canada has given a tariff preference to Britain since 1897. To avoid misunderstanding the situation, we should bear in mind that Britain in her tariff policy has never given the slightest return in the shape of preferential treatment to Canada. It seemed to some Canadians that the scheduling of our cattle might have been dispensed with, or that the moderate grain tax that has recently been repealed might have been waived in the case of our own exports of grain to the British market. Our preferential duty in favor of Britain rose from 12½ per cent. in 1897 to 33½ per cent. in 1899. In the summer of last year, at the Colonial Conference, Mr. Chamberlain spoke almost contemptuously of this preference. He said:—"I have to say to you that while I cannot but gratefully acknowledge the intention of this proposal, and its sentimental value as a proof of good will and affection, yet its substantial results have been altogether disappointing to us, and I think they must have been equally disappointing to its own promoters." Let us see what were the results of this preferential policy. In 1873 our imports from Great Britain were \$68,522,000. In 1893 our imports from Great Britain had gone down to \$43,148,000, and in 1897 to \$29,412,000. The application of preferential duties arrested this decline, and speedily produced a rapid advance in the volume of our imports from Great Britain. In 1900 these imports had gone up to \$44,789,000, in 1902 to \$49,250,000, and in 1903 to \$59,068,000, or an increase of more than 100 per cent. in six years. Surely Mr. Chamberlain was not warranted by the facts in the presentation of his views at the colonial conference.

Apparently still oblivious to the fact that Canada is now giving the mother country a substantial and valuable preference, Mr. Chamberlain, in his speech at Glasgow said: "He believed that the colonies are prepared to meet us in return for a moderate preference. They would reserve to us the trade we already enjoy, also arrange their tariff in the future in order not to start industries in competition with those already in existence in the mother country."

This declaration savors somewhat of the good old Imperial policy of early colonial days, when the colonies were reserved as a preserve for the manufacturing interests of Britain, and were not permitted to engage in the business of producing goods for their own consumption. If it is the dream of the Imperialist that Canada will surrender one iota of her autonomy, or will refrain from developing her enormous resources, and extending her industrial system, and will impose effective restrictions upon her own progress, then, beyond question, a mistake has been made. Mr. Chamberlain proposes to impose a duty of not more than two shillings per quarter (eight bushels) upon wheat, and upon other grains, perhaps, except maize; a corresponding duty upon flour, and 5 per cent. upon eggs and dairy products. Preferential duties would also be imposed upon fruits and wines, but not upon

animals, meats, fish, lumber and mine products. In the advantages of the preference upon grain and flour the Maritime Provinces, Quebec and British Columbia would not participate, and Ontario would be benefited to a limited extent only. In return for this preference we are given plainly to understand by Mr. Chamberlain that Britain would expect something very substantial, in addition to the preference already given by Canada. Let us see what our present preference is worth to Great Britain, and what her proposed preference would be worth to us. The duty collected upon British imports last year was \$9,841,000. Had there been no rebate of 33½ per cent. from the full rate of duty collected from other nations, and if Britain enjoyed the rebate of 33½ per cent. upon all her dutiable imports, she would have paid to our Customs Department last year an additional \$4,921,000.

The direct advantage derived from our preference is this large saving of duty, which otherwise would have been paid, was the rescuing of the British export trade to Canada from practical extinction. In 1902 our export of wheat to Great Britain was 33,102,000 bushels; of all other grain except corn, 8,782,000; of flour, 645,000 barrels; of rye flour and oatmeal, 90,842 barrels. It will be assumed that the preference applies to this entire list, though it is doubtful whether it is intended to apply to coarse grain, and the preference in this case of two shillings sterling per quarter would amount to \$2,726,000, while if upon wheat and flour only it would amount to \$2,146,000. Our export of eggs, cheese and butter to Great Britain in 1902 amounted to \$26,959,000. A preference of 5 per cent. upon this would be \$1,348,000, which, added to a preference of two shillings per quarter upon all our exports of grain except maize, would make a total of \$4,074,000, or \$838,000 less than the advantage given to Great Britain through our remission of duties upon her exports to this country. It may be urged in this connection that our exports of grain to Great Britain would be stimulated by the preference, but there is no reason why our imports from Great Britain should not be stimulated in an equal degree by our preference of 33 1-3 per cent.

WESTERN WANTS.

On the return of the excursion of members of the Canadian Manufacturers' Association from the western parts of Canada, Mr. Drummond, the president, speaking of what he saw, said to a reporter:

The one condition of affairs which we could not view with satisfaction was the large volume of United States goods which are flooding our Western markets under our present tariff, and the large proportion of United States coinage everywhere in use throughout the West. In both of these features we are convinced that Canada is suffering a distinct loss, and that the existing conditions should be remedied at the earliest possible moment. It was very gratifying to learn from practical men throughout the West that Canadian goods were right in quality, and in many cases superior to those of foreign manufacture. Splendid results are already apparent from the tour. New branch offices have been opened by many of our members at different centres in the West, and arrangements made in many other cases for permanent representation. We believe, too, that many Western centres offer splendid advantages for manufacturing. We are returning home with the determination to impress upon every Canadian in the East the greatness of our Western country, and to exert our untiring efforts to meet the requirements of the Western markets. As Canadians, we are delighted with the prospect that we will be able to accomplish this. Prominent representative men everywhere assured us of the growing Canadian sentiment and the desire to encourage home production rather than to continue foreign importation.

The East and West are one. They are not divided by a

diversity of interests. We have had abundant evidence on all sides that when national questions are discussed the East and West will stand together for that policy which will build up Canada and develop her great resources for her own sons.

Mr. Edward Gurney, one of the oldest and most successful manufacturers in Canada, and an ex-president of the Association, speaking of the establishment of manufactories in the West, said: "The capital of Canada is now fully employed, and there is no more than enough necessary for the increase of plant and buildings incident to the great demand for materials throughout the country, and it is not likely that there will be any branching out of manufactories into the West until there is an accumulation of surplus capital both in the East and the West seeking employment."

The great inflow of population into the West is of an agricultural character principally; and while Canadian manufacturers of agricultural and farm machinery have never been able to meet the demands of the country, and now that the demand has been so greatly increased, and while the domestic supply has not been increased, the situation shows that the demand must either be supplied by imports or go unsatisfied. Of course the demand is met by imports, and it was this that Mr. Drummond alluded to as a condition which he could not view with satisfaction. Mr. Drummond attributes the fact that the large volumes of United States goods which are flooding our Western markets is due to insufficient tariff protection, and this may be true to a certain extent, but Mr. Gurney strikes the key note, and explains the situation when he says that Canadian capital is now fully employed, and that there is no more than enough of it to provide for the increase of plants already in existence; and that there will not be any further increase of manufacturing facilities unless there be an accession of capital from other countries. Within the last few years there has been a considerable accession of such capital invested in Canadian manufacturing industries, chiefly from the United States, and very little if any from Great Britain; but it is true that millions of dollars worth of agricultural and farm machinery, and many other kinds of merchandise are imported into Canada every year to supply the wants of the country that cannot be supplied from domestic sources.

Of these imports of articles of prime necessity, more than three fourths are from the United States and only about one eighth from Great Britain, although only two thirds the duty imposed by the general tariff is levied upon British products. American manufacturers cater to the wants of Canadian consumers which British manufacturers do not do; and it is certain that were many lines of goods, particularly manufactures of steel and iron, placed in the free list, our imports of them from Great Britain would continue to be of infinitesimal value. The British preference has utterly failed to increase our imports of them, and British manufacturers have very quietly surrendered the Canadian market to their American competitors. Are the Canadian people to be deprived of the goods? British manufacturers will not supply them: Mr. Gurney says that Canadian manufacturers have not the facilities for doing so because of lack of capital; British capitalists do not invest their wealth in Canadian manufacturing industries; Mr. Drummond is not pleased because large volumes of American goods flood out Western country, and many members of the Manufacturers' Association advise that the tariff wall against the United States be made considerably higher. "Made in Canada" is a most excellent sentiment, which it is well to cultivate, but it will not warm the back nor fill the belly when Canadian goods are not to be had.

CANADA LEADS.

The following interesting statement regarding trade expansion in the countries named has been published by the Department of Trade and Commerce. The countries are named in the order of their increased percentage of trade during the five years 1897-1902. It shows that Canada leads them all in the exports and imports of merchandise.

COUNTRY.	TOTAL TRADE.			Per-centage of Increase
	1897.	1902.	INCREASE.	
Canada.....	\$266,218,094	\$439,212,202	\$172,984,108	64.97
Italy.....	440,683,269	626,893,133	186,209,864	42.27
Argentine Rep.	192,477,209	272,637,574	80,160,365	41.84
Japan.....	189,541,081	262,443,241	72,902,160	38.49
United States.	1,826,341,567	2,417,983,175	591,641,608	32.39
Cape Colony.	178,862,916	233,312,649	54,449,733	30.44
Germany.....	1,979,130,000	2,453,491,000	474,361,000	23.96
Great Britain	3,334,876,851	3,950,834,168	615,957,317	18.47
Belgium.....	675,381,112	797,746,000	122,364,888	18.11
Switzerland..	332,807,773	386,543,454	53,735,681	16.14
France.....	1,457,922,000	1,669,960,000	212,038,000	14.51

EDITORIAL NOTES.

If Canada were to go over to the United States it could then get a share of England's great friendship.

Canada is that portion of North America which the United States doesn't want at present.

The Toronto Telegram enquires if England is the American republic's greatest colony, and says:

England is a colony of the United States. Canada was accused of being a colony because the alleged first impulse of Canadians was to meet every occasion and issue with the question:—"What will they say in England?" England must be a colony because the real first impulse of the Old Country editors and politicians is to meet every occasion and issue with the question:—"What will they say in the United States?" It has actually come to this that England can hardly discuss any domestic question of peace or war, of import tariff or preference to the colonies, without loudly and earnestly speculating as to the possible effect of English action upon the feelings of the United States.

We cannot vouch for the accuracy of the report that is said to have come from across the Atlantic that one of the results of the recent visit of our American friend "Uncle Sam" to London, and the sycophantic osculatory adorations which Lord Alverstone, the great English "jurist," exhibited towards him, was that Uncle Sam was compelled to purchase new trousers, the seat of those he wore on the occasion having been actually osculated away.

Sir Louis Jette and Mr. A. B. Aylesworth will have a place in history as the authors of a dignified and effective protest against the sacrifice of Canada's interests by Lord Alverstone in the Alaskan award. "We do not consider the finding of the tribunal as to the islands at the entrance of Portland Channel or as to the mountain line a judicial one," they state, "and we have, therefore, declined to be parties to the award. Our position during the conference of the tribunal was an unfortunate one. We have been in entire accord between ourselves, and have severally and jointly urged our views as strongly as we were able, but we have been com-

polled to witness the sacrifice of the interests of Canada, powerless to prevent it, though satisfied that the course the majority determined to pursue, in respect to the matter above specially referred to, ignored the just rights of Canada."

The new tariff arrangement which the Grand Trunk Railway made for the handling of freight billed through to Australasia and the Orient, as announced a short time ago, is in connection with the ocean part of the route. The new steamship service is a part of the Northern Securities Syndicate, and is known as the Canadian-Australian & Puget Sound Steamship Co., with headquarters at Tacoma. Three vessels will be run, and the Grand Trunk's through freight for transpacific carriage will be fed to them by the Northern Pacific, the Chicago, Burlington & Quincy, and the Great Northern. Freight for Australia or the Orient via San Francisco will be accepted by the G. T. R. as heretofore, as it need not necessarily go via Tacoma. Any report that the new steamship service is the property of the Grand Trunk is officially denied here. A through freight arrangement is all that is affirmed.

The New York Evening Post publishes the following despatch from Washington:—"The Department of Commerce to-day announces the establishment of another section in the rising wall of tariffs against us, recently discussed in these despatches. All British territory in South Africa, the department announces, has put into operation a preferential tariff system in favor of Great Britain, similar to that employed by Canada since 1897. Under that law Canada's purchases of merchandise from the United Kingdom have increased from \$33,000,000 in 1886 to \$56,000,000 in 1903. The plan has been under legislative consideration in South Africa since the Bloemfontein conference last March, and has finally been adopted, together with a new general tariff for the South African customs union. The rate of rebate in favor of productions or manufactures of the United Kingdom is 25 per cent. on most articles bearing an ad valorem duty, but articles taxed less than 2½ per cent. are made free from the mother country. Similar concessions will be granted to any British colony, protectorate or possession which grants equivalent reciprocal privileges to the South African customs union. American exports to British Africa, about 90 per cent. of which go to territory within this new customs union, amounted to \$33,000,000 last year, or about one fourth of the imports from the United Kingdom. American exports, moreover, have been gaining on the British with surprising rapidity. It was not until 1898 that they amounted to one-tenth of the British.

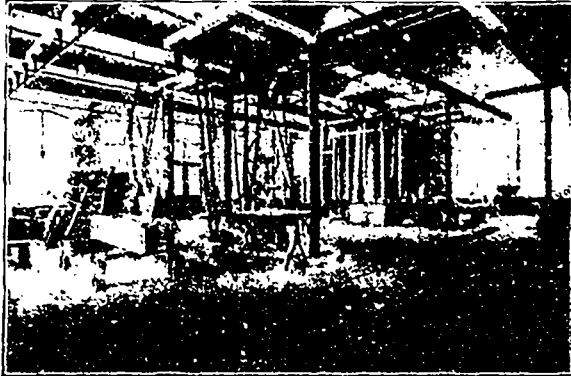
We are in receipt of a letter from Mr. Edgar Tripp, Port of Spain, Trinidad, Commercial Agent for the Government of Canada for the islands of Trinidad and Tobago, British West Indies, in which he says:

I notice in the August 21 issue of THE CANADIAN MANUFACTURER that Mr. T. Geddes Grant is described as Commercial Agent for the Government of Canada. Several other publications in the Dominion have made the same mistake, arising, I presume, from the fact that Mr. Grant is agent for the Canadian Manufacturers' Association. I had expected that Mr. Grant while in Canada, would have corrected this erroneous statement, but as he does not appear to have done so, may I beg that you will be good enough to publish this correction.

Of course we have pleasure in acceding to Mr. Tripp's request.

THE NEW FOUNDRY AND PATTERN DEPARTMENTS OF THE B. F. STURTEVANT CO., HYDE PARK, MASS.

For several years the B. F. Sturtevant Co. has felt the excessive pressure of increased business and the necessity for much more extended facilities for manufacturing than those possessed by its old plant at Jamaica Plain, Mass. The fire



FLASK SHOP.

which visited this plant in 1901 had the effect of definitely settling the question of removal, and plans were immediately begun for a thoroughly modern manufactory at Hyde Park, about nine miles from Boston, where an abundance of skilled labor is always available.

The site selected was admirably adapted for the requirements; the tract of land contains over 15 acres and has a frontage of 1,300 feet along the freight yard tracks of the New York, New Haven & Hartford Railroad, near its station at Readville. The water supply is ample and the space for dumping waste is sufficient to meet all requirements for years to come.

The plant comprises a commodious four-story office building, measuring 45 x 125 feet; a three-story building 80 x 500 feet devoted to the manufacture of blowers, heaters and galvanized iron work; a building 80 x 250 feet of the same height, on the first floor of which all engines will be tested, stored and shipped, while the other floors will be utilized by the electrical department; a general machine shop measuring 120 x 500 feet, with 40 feet side galleries devoted principally to the building of engines; a forge shop 40 x 100 feet; a two-story building of the same floor area devoted exclusively to lockers, washing and sanitary facilities for the employees; a pattern and storage building 80 x 150 feet in ground plan; a foundry measuring 170 x 350 feet; a power house 80 feet square with detached fire and service pump house. All told the aggregate floor area of the buildings exceeds nine acres. Brick has been used for all walls.

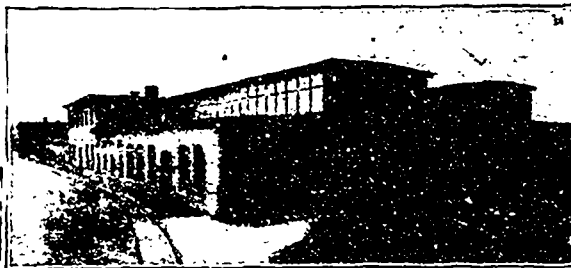
the construction of such buildings as are equipped with travelling cranes, all upper floors are of plank with top course of maple, laid on heavy wooden beams and designed in the case of the principal buildings for carrying safe loads of 200 to 250 pounds per square foot. The roofs

are of heavy plank covered with tar and gravel.

The arrangement of the buildings is the result of the most careful study and endeavor to simplify to the limit the matter of inter-transportation. Numerous spur tracks permit of ready handling of in-coming and out-going freight, while a complete system of industrial railways connects all departments. The industrial system is equipped with 12 pound T rails laid 24 inches gauge on centres.

Before the completion of the new power house, a temporary plant was established in the foundry building. This comprises a locomotive boiler, draft for which is produced by a Sturtevant induced draft fan, and two 75-K W Sturtevant generators driven by two Sturtevant 13 x 12 horizontal engines which furnish direct current at 220 volts. This is utilized both for power and for arc and incandescent lighting throughout the plant. The entire transmission equipment including motors and bangers, is of Sturtevant manufacture.

The foundry and pattern departments which form the subject of this description, were the first to be put in operation prior



FOUNDRY AND PATTERN BUILDINGS.

to the removal of the entire plant from Jamaica Plain.

The pattern building is divided midway of its length by fire walls enclosing stairs, elevators, etc. One-half the building, with stories respectively 17 and 15 feet, is devoted to the flask and pattern making rooms, while the other half, provided with intermediate floors, making four in all, is utilized for pattern storage.

The flask-shop measuring about 60 x 80 feet, is equipped with hand cross cut and splitting saws, boring machine and lathe, all driven by a 10 h p Sturtevant motor suspended from the ceiling. The industrial railway runs directly into this room from the foundry

40 feet and together with an over-head transfer truck reduces to a minimum the cost of handling flasks. The lumber for their manufacture is unloaded from cars directly in front of the

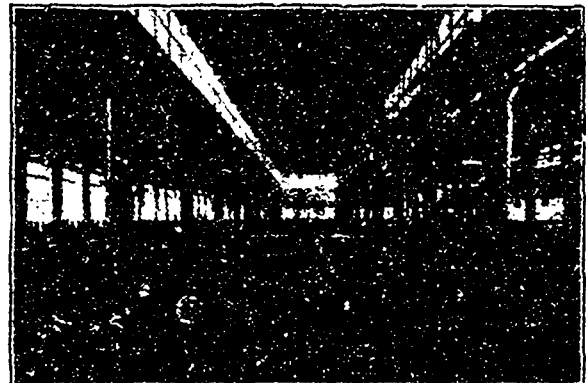
building. This room also includes the metal pattern makers' department equipped with the necessary machine tools. Adjacent thereto is the locker, wash and toilet room for the building.

Immediately above is the pattern shop abundantly lighted on three sides and equipped with a full complement of tools including one single and two double saw benches, two hand saws, a buzz planer and a double surfacer, five lathes, one of which is a 66 inches by 11 1/2 feet gap lathe, a drill press, a core box machine, numerous wood trimmers, etc. All the power machines are operated by two 10 h. p. Sturtevant motors, both being required for ordinary work, but one always serving as a possible relay in case of accident.

The benches which accommodate two men each and measure 2 feet 6 inches in width by 16 feet in length are so arranged along the sides of the building that the men all receive a left-shoulder light. Behind each bench is a working table 4 feet wide by 16 feet long. The benches are supported by cast iron legs of special design which were built by the Sturtevant Co.; the same design is used throughout the plant. They are equipped with Emmert vises and their tops are of heavy maple plank. A drying chamber for glued work is provided which receives warm air through the general heat flue from a Sturtevant heating apparatus below.

Around the pipe columns which support the floors of the pattern storage end of the building are clamped the pattern shelving brackets which are adjustable to any height. All patterns are consecutively numbered upon the drawings as made. When the patterns are delivered to the pattern storage department proper locations are assigned and records thereof made upon cards, one for each pattern.

These cards are filed in the order of the pattern numbers. Four figures with the addition of a letter are in every case sufficient to locate a pattern. A given location, for instance, may be 2125B; that is, it is upon the second floor, as shown by the first numeral, "2," it is in the twelfth row of shelves and the fifth division of that row as shown by the succeeding numerals "12" and "5"; and



ONE OF THE CRANE-WAYS.

on the B level, the floor level being designated A, and the letters B, C, D, etc., indicating the shelves in their order above.

The first floor is of concrete and is designed for the keeping of heavy cast

ated in unison by a novel device installed by the G. Drouve Co. The western side of the foundry is given up to bench and small floor moulding, the bench moulders' floors being separated at the bench ends by wooden partitions. The floors throughout this side of the building as well as those in the storage bins and centre runways are of concrete. Alongside the industrial railway, which serves iron from ladle trucks to the bench floors, is a sunken trench laid with common brick as a suitable place for drippings and for the putting of hot castings.

In the centre line of each of the crane-ways and in the bent between them runs an industrial railway with turn-tables connecting with the cross aisles which provides for the distribution of metal, etc., to all parts of the

building. The floor between the crane-ways is supplied with a series of 1½ ton small travelling cranes of about 10 feet span equipped with Sturtevant electric hoists built especially for this work.

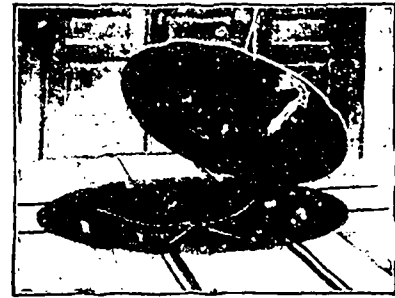
All materials are received from a track which runs along one side of the foundry and are delivered through wall openings to the bins which fill a portion of the side wing adjacent to the cupolas. For the present the sand storage bins and mixing room are also within this building.

An ingenious system of charging has been devised under which the charging cars pass at floor level in front of the bins, are there loaded with the requisite amounts, weighed, and passed to the elevator where they are raised to the charging floor. As each car is unloaded it is pushed forward and started down an incline, whence it passes back in a direction opposite to that traversed while being loaded on the floor beneath. A novel apparatus gradually brings it to a standstill while yet upon the incline, and then releases it so that it may, by its own weight, roll on to an elevator which is automatically tripped and descends to the ground floor level. Here it is removed by one of the loading men and the elevator returned to its place above ready to receive another load.

The cupolas are two in number 56 inches and 72 inches in diameter. The opportunity has been improved to show the eminent adaptability of the Sturtevant pressure blower, a No. 8 and a No. 10 blower driven respectively by a 30 and a 40 h.p. Sturtevant belted motor are supported upon the charging platform through which they discharge directly downward

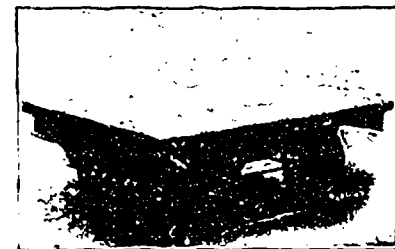
and thence to the cupolas. It is intended to make this installation the subject of critical experiment for the establishment of important principles.

The entire transportation equipment, including tracks, turn-tables, cars, trucks,



TURN TABLE FOR INDUSTRIAL RAILWAY.

etc., was designed and built by the Sturtevant Co. The tracks in the foundry are imbedded in the concrete runways and all changes of direction are secured by turn-tables, there being no switches in the works and therefore no radial truck cars, all cars having rigid bases. The turn-tables are very heavy in design to avoid distortion or breakage and consist of a bottom frame with four roller wheels which are carried upon composition trunnions, and a cover, which is recessed for crossing tracks at right angles, and provided on the underside with a chilled tread with which the wheels come in contact. A small idler wheel is provided which automatically stops the turn-table on each quarter but



PLATFORM CAR.

readily releases it. The cover is accurately centered by a chilled conical bearing.

The cars are provided with a special type of ball bearing which is practically devoid of machine work, but with chilled wearing surfaces. The ordinary flat cars as well as the charging cars are built up of structural steel. The geared ladle cars have malleable iron frames and enclosed spur gear mechanism. Similar construction is employed in the case of the transfer cars for geared crane ladders of medium size, while a simple low platform truck is utilized in the case of the largest crane ladders. The dump cars are in the form of inverted cones and so balanced as to be tipped with the utmost ease. The taper of the cone is such that these cars are practically self-dumping.



CHARGING CAR.



CHARGING FLOOR.

iron patterns. It is served by an industrial railway and turn-table which permits of transfer to the elevator and thence to other floors. Communication between the pattern shop and storage department is direct, while the fire risk is reduced to a minimum by a double system of fire doors.

The moulder's written order to make a specified number of castings is issued at the foundry office directly to the pattern keeper who makes a record thereon of the pattern location, attaches it to the pattern and sends both to the foundry. A metal clip placed upon the storage record card indicates that the pattern is out.

The foundry consists essentially of two long crane-ways each 35 feet wide, a centre bent of the same width, and side floors 30 feet wide. The brass foundry, core room and wash room are located at one end; the charging floor at one side, nearly midway of the length; and the cleaning room at the other end. The crane-ways are designed for 20 ton electric travelling cranes.

Brick division walls three and one-half



CHARGING CAR ENTERING CHUTE.

feet high running lengthwise of the foundry separate the floors on the lines of the columns. Lighting is secured through monitors in both of the crane-ways and through ample side windows. Each line of monitor transoms is oper-

The brass foundry, located at one corner of the main building, is provided with four crucible furnaces and a special form of reverberatory furnace designed principally for the melting of babbit or similar soft metals. An overhead traveler with interlocking transfers on the side floors serves the moulding area of the room. Blast for the furnaces is furnished by a No. 3 Sturtevant "Monogram" Blower and the entire machinery, consisting of a spruce cutter, a magnetic separator, a tumbling barrel and emery wheels is driven by a 5 h.p. Sturtevant Motor attached to the wall. The entire floor is of concrete in which is imbedded a section of the industrial railway communicating with the balance of the foundry.

In the middle of the end of the foundry is the core room. The ovens are six in number, three being seven feet in diameter, of the reel type and three being respectively four, five and seven feet in width by eight feet ten inches in length, provided with cars. An overhead travelling crane serves these latter ovens and provides for the transfer of heavy cores



TWO TON TRANSFER LADLE TRUCK.

to the industrial railway which passes through this room. A portion of the room is partitioned off and serves for the women core makers employed in this department. The floor is of concrete. The tops of the ovens are utilized for storage of cores upon a special rack of steel construction. A Blake wire-straightener, driven by a 5 h.p. Sturtevant motor, together with a Hanna pneumatic shaker are the principal machines in this room.

At the other end of the foundry is the cleaning room, through which run the longitudinal tracks from each main aisle of the foundry. A five ton three-motor electric crane equipped with Sturtevant motors serves the principal portion of the floor in this room. The tumbling barrels, six in number, are completely enclosed in housings of steel plate. These together with a Sly cinder mill and several emery wheels are driven by a 30 h.p. Sturtevant motor. A temporary air compressor located in one corner and driven by a Sturtevant motor, supplies air at 100 pounds pressure to chippers, shakers, hoists, etc., employed in connection with this work. The lighting and

ventilation of this room are noticeably good.

Adjacent to the cleaning room is the pickle room; the floors are both of concrete. The pickle beds are of teeter board construction so designed that the acid may be drained back into the vats and the board subsequently teetered over for washing into the trench upon the other side of the room. The floor slopes so as to give perfect drainage. A pneumatic travelling crane serves this room.

One of the noticeable features in the equipment of this plant is to be found in the sanitary arrangements. Most generous provision has been made in the case of the foundry, which has a large locker and wash room. Expanded metal lockers to the number of 225 are already in position. Enamelled iron sinks, six in number, are served with tempered water and are generously patronized by the employees. A series of slate partitioned shower baths has proved to be very acceptable during the past summer. The floor of this room is of tar concrete; the upper walls and ceilings which are white and fresh are in pleasing contrast to the steel work and base of the walls which are finished in dark green. Within the same room is installed the time recording system so placed that a double line of men pass the board, one upon either side, as they go and come from the room. The foundry foreman has not been forgotten in the matter of convenience and he with his assistants is provided with an attractive office, well lighted and susceptible of thorough ventilation from out of doors.

Naturally the entire plant is heated and ventilated by the Sturtevant System. In the case of the pattern building the apparatus, consisting of an engine-driven fan and steel pipe heater, is placed close to the division wall, delivers the heated air into a vertical flue and thence to the various rooms. The air for this apparatus is taken directly from out of doors. As a result, there is a peculiar freedom from dust in the pattern storage rooms, which could not be avoided were any of the air drawn back from the pattern shop. The foundry apparatus is located overhead in the end of one of the cranes and arranged to take fresh air from out of doors or return the air from the building and reheat it. This apparatus consists of a three-quarter housed steel-plate fan discharging in two directions into galvanized iron pipes. The fan is driven by a direct-connected horizontal engine. The heating apparatus for each building is designed to operate with exhaust steam. The entire heating system in each building is under thermostatic control, by which means an even temperature is maintained throughout all the rooms.

Distribution of air is made through a system of overhead galvanized iron piping, discharging downward to the floor, thereby distributing the air in even volume and economizing in the amount of heat required. The foundry apparatus is of material service upon summer days particularly during the "heat," when it is employed to force cool air into the building.

A complete underground tunnel system

is provided for distribution of steam and return of the water of condensation, distribution of electricity, compressed air, oil, etc., from the power house to the various buildings. The tunnel measures five feet wide and six and a-half feet in



ONE TON ELECTRIC HOIST.

height, and thereby offers ready access to its contents. In the pattern building and foundry the pipes are laid in concrete trenches covered by iron plates, which present equal facility for reaching the pipes and wires.

ONTARIO PUBLIC WORKS.

Work has been commenced by the Department of Public Works at Muskrat Lake, a short distance below Pembroke. This work has been rendered necessary to lower the water in Muskrat Lake and relieve the low-lying lands, which are flooded periodically by freshets.

A swing bridge is being erected over the Magnetawan River at Parry Sound. The bridge will be situated about seven miles from Burk's Falls, and will cost about \$3,000.

Work has been commenced on the new bridge over the Winnipeg River at Rat Portage.

Another new swing bridge is being erected over Lindsay Street, in the town of Lindsay.

The substructure and piers for a new bridge over the Seguin River in Parry Sound has also been commenced, and the Ontario Government will erect a new steel superstructure.

The Cranbrook Sash & Door Co., Cranbrook, B.C., have been incorporated with a capital of \$40,000, to acquire the business of the Cranbrook Sash & Door Co., and to manufacture lumber, sashes, doors, etc.

CAPTAINS OF INDUSTRY.

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

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

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

The Black Cat Gold Mining Co., Toronto, have been incorporated with a capital of \$2,000,000, to carry on a mining, milling and reduction business. The provisional directors include R. C. Le Vesconte, Toronto, L. E. Ziegler and Geo. Kinsey, Cincinnati, Ohio.

Mr. Edward Ramage, of Toronto, and associates are forming themselves into a stock company to be known as the Clyde Steel Works, to engage in the building, repairing and altering all classes of steel and iron vessel. They are now endeavoring to obtain a suitable location, preferably in Toronto, and as soon as such location is secured, they will proceed actively in carrying on their enterprise. Mr. Ramage has recently severed his connection with the Bertram Engine Works Co., Toronto, where he was engaged for nearly ten years in a very responsible position. Mr. Ramage already has a valuable outfit of heavy tools and machines, suitable for the work he is engaging in.

The Globe Paint Co's works, Toronto, have been damaged by fire. Loss about \$2,500.

Messrs. W. H. Sinclair and James C. Grier have secured the contract for the stone and brick work for a big furniture factory for Collingwood, Ont. Their portion will amount to about \$10,000.

A site has been selected for the proposed new enamelling factory in Renfrew, Ont.

The \$5,000 by-law, to improve the electric light plant at Almonte, Ont., was carried recently.

The Iron & Steel Co. of Canada, Belleville, Ont., have been incorporated with a capital of \$300,000, to acquire the Belleville Rolling Mills and to manufacture iron and steel. The provisional directors include C. M. Stork, J. F. Wills and M. Wright, Belleville, Ont.

Messrs. T. Tomlinson & Sons' foundry, Toronto, was damaged by fire a few days ago. Loss about \$2,000.

One of the Flavelle Milling Co's elevators at Lindsay, Ont., was damaged by fire October 22.

The new factory of the Burlington Canning Co., at Burlington, Ont., was wrecked, October 30, by the collapse of the building, which destroyed much of the machinery. Loss, about \$2,000.

A. A. Wateron; Leamington, Ont., is in Windsor, Ont., trying to secure a site for a foundry and machine shop which he purposes erecting.

The Wm. McCann Milling Co's works, Toronto, were partially destroyed by fire a few days ago. Loss about \$6,000.

The new lighthouse marking the entrance to the Welland canal at Port Colborne, Ont., has been completed. It is built of concrete and iron and stands 51 feet high, and is equipped with a powerful fog horn, which will be of material assistance to navigators.

The new steel storage elevators "D" and "E" of the Canadian Pacific Railway, Fort William, Ont., are about completed, which will give the company an increase of about 5,000,000 bushels storage capacity.

The Tilson Co., Tilsonburg, Ont., have installed a 5-bushel automatic scale furnished by the Union Scale & Mfg. Co., Chicago, Ill. The scale will be used for weighing grain from the elevator to the mill.

The addition to King's elevator at Port Arthur, Ont., is about completed. It consists of nine concrete storage bins with a capacity of 30,000 bushels each.

The Westport Milling Co. will install a new 35-inch turbine in addition to the other improvements being made to its mill and power plant at Westport, Ont.

The Avery Stamping Co., Cleveland, Ohio., general metal workers and manufacturers of steel shovels, scoops, spades, etc., inform us that they propose to establish works in Canada, preferably in Ontario, for the manufacture of full lines of their goods. This does not imply any intention on their part to abandon their works in Cleveland, where they have been located a number of years, doing a large trade in the United States, but are looking around for a desirable location in Canada as an extension of their business.

The Canada Steam Pump & Machine Co., Toronto, recently shipped steam pumps to the following companies. The A. R. Williams Machinery Co., and the I.X.L. Laundry Co., Toronto; F. F. Dalley Co., Hamilton, Ont.; The Elmira Agricultural Works, Elmira, Ont.; The J. E. Murphy Lumber Co., Algoma District, Ont. A number of pumps have also been shipped to the West and to the

Maritime Provinces. The company have also installed a number of engines including a Corliss engine and connections for the Imperial Varnish & Color Co., Toronto.

One of two locomotives which are being built at the Baldwin Works in Philadelphia, for the Canadian Copper Co., at Sudbury, Ont., will be a mechanical novelty in its way, as parts will be composed of nickel steel, making it cost \$4,000 more than the ordinary locomotive. An important feature of the boiler from a mechanical standpoint will be that every 100 pounds of steel in it will contain from three to four pounds of nickel. The other parts which will be of nickel steel will be the frames and rails, driving axles, crank pins, piston rods and other important parts. The International Nickel Co., which controls the Canadian Copper Co., will provide the nickel.

A steel light-ship, building for the Canadian government for use on the lower St. Lawrence, was launched recently at the Polson Iron Works, Toronto. The vessel is 112 feet long and 29 feet beam. She will have lighting apparatus of the finest kind, as well as a powerful fog signal.

Commissioner R. J. Fleming, Toronto, recommends the property committee of the city council to give the Foundry Specialties, Limited a lease of a block of property lying to the south of the channel, leading from Toronto Bay into Ashbridge's Bay. The lot has 200 feet frontage by a depth of 150 feet. The officers of the company are Messrs. James Milne, president, and George W. Grant, treasurer.

The Dominion Linseed Oil Co., Toronto, have been incorporated with a capital of \$500,000. The directors are James Livingston, Baden, Ont.; John McGowan, Sr., Elora, Ont.; John McGowan, Jr., Elora, Ont.; S. J. Parker, Owen Sound; F. G. Sanderson, St. Mary's; John P. Livingston, Baden, and Peter Livingston, Baden. These gentlemen represent the Baden, Elora and Owen Sound linseed oil mills, the new company being practically a consolidation of the three concerns.

The McCormick Mfg. Co's biscuit works at London, Ont., was slightly damaged by fire October 28. Loss about \$500.

The Polson Iron Works, Toronto, are to build a steel frame for an 80-foot steamer intended for mission work among the Indians on Great Slave lake.

The Moore Moulthrop Co., a United States incorporation have been granted license to do a lumbering business in Ontario with a capital of \$10,000, and have appointed W. C. Moulthrop, of John Island, Ont., to be their attorney.

The Petrolea Torpedo Co., Petrolea, Ont., have been incorporated with a capital of \$20,000, to manufacture nitro-glycerine, dynamite, etc. The provisional directors include W. M. Lowery, Petrolea, David Barr, Dutton, and J. H. Kittermaster, Moore, Ont.

The steam saw mill and several hundred thousand feet of timber of the Canada Furniture Manufacturers, at Wiarton, Ont., were destroyed by fire October 22. Loss about \$40,000.

The Glengarry Mills, Limited, Toronto, have been incorporated with a capital of \$50,000, to erect factory buildings, etc. The provisional directors include A. W. McDougald, D. A. Rose and E. W. Portway, Toronto.

The Bradley Torpedo & Oil Co., Petrolia, Ont., have been incorporated with a capital of \$30,000, to manufacture petroleum oil, nitro-glycerine, etc. The provisional directors include W. J. Bradley, Jas. Falconer and H. J. Dawson, Petrolia.

The Sprouted Food Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture machinery for the preparation of grain for foods, etc. The provisional directors include J. P. Murray, J. Millar and J. Montgomery, Toronto.

The Automatic Ventilating Closets, Limited, Toronto, have been incorporated with a capital of \$60,000, to manufacture closets, plumbers and builders supplies, etc. The provisional directors include H. B. Robinson, C. H. Thompson and J. J. Dougherty, Toronto.

The Colonial Typewriter Co., Peterborough, Ont., have changed their name to The Colonial Ink Co.

The Williams Iron Mines Co., Sault Ste. Marie, Ont., have been incorporated with a capital of \$3,000,000, to carry on a general mining, milling and reduction business. The provisional directors include J. McKay, Sault Ste. Marie, H. Hulbert and J. E. Burchard, St. Paul, Minn.

The Central Contracting Co., Toronto, recently incorporated have been granted an extra provincial charter.

The Belmont Gold Mine, Limited, incorporated under the laws of Great Britain, have been licensed to do a mining, milling and reduction business in Ontario with a capital of \$400,000, and have appointed D. G. Kerr, mining engineer at Belmont, Ont., to be their attorney.

The James Dunlop Co., Hamilton, Ont., have been incorporated with a capital of \$50,000, to manufacture flour, feed, etc. The provisional directors include Jas. Dunlop, H. M. Dunlop and A. Marshall, Hamilton.

The Purdom, Gillespie Hardware Co., London, Ont., have been incorporated with a capital of \$20,000, to manufacture hardware and to acquire the business of Jas. Reid & Co., that city. The provisional directors include J. Purdom, Wm. B. Gillespie and A. Purdom, London.

The Kipp Oil Co., Chatham, Ont., have been incorporated with a capital of \$150,000, to prospect for oil, petroleum, natural gas, etc. The provisional directors include G. W. Kipp, Punxsutawney, Pa., J. T. O'Keefe and W. R. Hall, Chatham.

Messrs. R. W. & F. S. Hussey, of Knightstown, Ind., with several other American and Canadian gentlemen have become associated in business and have formed a joint stock company under the Ontario Companies' Act called The Hussey Mower Co., Limited, with an author-

ized capital of \$300,000, with head office in Toronto, for the manufacture of the Hussey No-Pitman Mowing Machine. They have not yet decided upon the location of their factory, but will do so at once so as to be able to meet the requirements of the 1904 harvest demand.

The Fence Mfg. Co., Stratford, Ont., have been incorporated with a capital of \$30,000, to manufacture wire fencing, etc. The provisional directors include Wm. H. Coulton, C. Werner, Ellico, Ont., and H. J. Hanan, Stratford.

The Bradley, Levy & Weston Machinery Co., Toronto, have changed their name to The Levy, Weston & McLeam Machinery Co., Limited.

Messrs. Sexton & Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture building materials and to construct buildings, etc. The provisional directors include P. Ryan, J. Cotterill and Wm. F. Sexton, Toronto.

Mr. J. B. Coates, sawmill and hoop and stave factory at Cowal, Ont., were destroyed by fire October 17. Loss about \$5,000.

The paper mills at Strathcona, Ont., were destroyed by fire October 25. Loss about \$12,000.

The W. J. Bradley Machinery Co., Toronto, have just supplied a large independent jet condenser for the electric light plant at Gravenhurst, Ont.

The factory buildings at Whitby, Ont., just purchased by the Farmer's Co-operative Harvester Co., will be thoroughly equipped for the manufacture of binders. The offices of the company will remain in the Temple Building, Toronto.

The Power Accessories Co., 231 King St., East, Toronto, whose plant was considerably damaged by fire on Oct. 14, is in operation again.

Mr. P. E. Durst, 19 Yonge St. Arcade, Toronto, has been appointed Canadian agent for the Hydro-Carbon system of smokeless combustion for steam power plants. He has just closed a contract for the equipment of the new building of the J. F. Brown Co., this city, with the new system; a battery of two boilers to be thus equipped. The Cyclone grate bar also manufactured by Mr. Durst will be used.

The Senior Ridley College building at St. Catharines, Ont., was destroyed by fire October 25. Loss about \$50,000. A more modern building will be constructed at once.

The steamer Advance at Sault Ste. Marie, Ont., was destroyed by fire October 26.

Thos. Urquhart, Mayor of Toronto, will receive tenders for the erection of a new fire hall on Berkeley St., that city.

Messrs. Cleland Bros., Meaford, Ont., manufacturers of wheelbarrows, etc., are preparing to build a large addition to their plant.

The Niles-Bement-Pond Co. have been awarded the contract for most of the machine tools for the new shops of the Canadian Pacific Railroad. The amount is about \$160,000. It is said that the orders for the remainder were given to the John

Bertram & Sons Co., Dundas, Ont., and other Canadian houses.

The Toronto Woolen Machinery Co's works and The Allan Paper Box Co's factory, Toronto, were damaged by fire, October 15. Loss about \$6,000.

The Dominion Motor & Machine Co's works, Toronto, were partially destroyed by fire, October 15. Loss about \$10,000.

Joseph Bourque, of Hull, Que., has been awarded the contract of erecting the new postoffice at Alexandria, Ont. The price is said to be \$11,000, exclusive of fixtures and heating apparatus.

Messrs. Vandervoort & Reed's sawmill, cheese box, barrel and stave factory at Foxboro, Ont., were destroyed by fire, October 24.

The Clifton Natural Gas Co., Niagara Falls, Ont., have been incorporated with a capital of \$40,000, to produce natural gas for power and heating purposes. The provisional directors include D. A. Coste, D. McGillivray, Port Colborne, Ont., and Wm. Marshall, Niagara Falls, Ont.

The Geo. Wilson Building & Contracting Co., St. Catharines, Ont., have been incorporated with a capital of \$40,000, to manufacture sash, doors, blinds, boxes, etc. The provisional directors include M. J. Murphy, H. H. Wilson, and F. W. Wilson, St. Catharines.

The Dominion Contractors Co., Montreal, have been incorporated with a capital of \$120,000, to carry on the business of contractors, and to operate saw mills, etc. The provisional directors include J. D. Porcheron, E. D. Porcheron and V. Mongeau, Montreal.

The Siche Light Co., Montreal, have been incorporated with a capital of \$100,000, to manufacture acetylene gas, carbide compounds, etc., and to instal gas plants. The provisional directors include T. F. Mackay, Westmount, Que., G. A. Forbes and G. H. Maurer, Montreal.

The Crocker Mfg. Co., who have a branch establishment in Sherbrooke, Que., have awarded the contract for a new building at Lennoxville, Que., to Mr. W. B. Neil, and the company will move to Lennoxville as soon as the buildings are completed.

It is reported that the Moline Plow Co., Moline, Ill., have secured a desirable site in Montreal, and will commence the erection of a splendid warehouse there next spring.

The McGill Y. M. C. A. at Montreal have decided to erect an \$80,000 building on the site of the present building.

The Eastern Township Mining & Smelting Co., are arranging to instal a smelter at Sherbrooke, Que.

The Londonderry (N.S.) Iron & Mining Co., have their plant almost completed and active operations will begin about the middle of November, says Mr. Thomas J. Drummond, president of the company. By that date furnace A will be ready and will have a capacity of 150 tons of pig iron daily.

The Ladies' Benevolent Home in Montreal was partially destroyed by fire, October 17. Loss about \$10,000.

T. A. Morrison & Co., Montreal, have sold a stone crushing plant to that city and a similar plant to the town of Farnham, Que., both of which are in successful operation.

Henry Tutt, Grand Trunk Railway car foreman, has received instructions from headquarters in Montreal to send in a requisition for the necessary material to erect a car-repair shop at East Toronto.

The Locomotive & Machine Co., Montreal, have been authorized to increase their capital from \$1,000,000, to \$3,000,000.

The Empire Tobacco Co., Montreal, have been authorized to increase their capital from \$300,000, to \$600,000.

Le Credit Cooperatif, Limited, Montreal, have been incorporated with a capital of \$10,000, to manufacture jewellery, musical instruments, etc. The provisional directors include, J. E. Guimond, A. Houle and Z. Daoust, Montreal.

The installation of gas buoys in the St. Lawrence river has been completed and it is now possible to have night navigation between Montreal and Sorel, Que.

Mr. G. Lajarmiere's cheese factory at La Chevrotiere, Que., was destroyed by fire, October 23.

The Avenue Realty Co., Montreal, have been incorporated with a capital of \$100,000, for the construction of buildings, etc. The provisional directors include T. Brosseau, D. C. MacCallum and D. Watson, Montreal.

The Parisian Corset Mfg. Co., Quebec City, have been incorporated with a capital of \$65,000, to manufacture corsets, dry goods, etc. The provisional directors include J. A. Cote, E. E. Ross, Quebec City, and F. A. Borden, Notre Dame, Que.

In our issue of October 16, an item appeared in Captains of Industry Department to the effect that the Canada Foundry Co. had purchased an air compressor from the Canadian Rand Drill Co. It seems that this announcement was an error as we are informed as a matter of fact that the contract for the compressor alluded to was awarded to the James Cooper Mfg. Co., Montreal, who are to furnish an Ingersoll-Sergeant compressor, the order following on the very successful installation and operation of a large compound steam and air ma-

chine of 1,700 feet capacity some few months ago; and it is claimed that these two compressors combined will form probably the largest air compressing plant installed for industrial purposes in Canada.

Messrs. H. G. Vogel & Co., Montreal, Canadian representatives of the Estey Sprinkler system of New York, one of the best known devices for fire protection in mills and factories, have lately installed this system in a large number of Canadian industrial establishments. Among these, either lately completed or now under way, are the plant of the Dominion Oil Cloth Co., Montreal; all the buildings of the Dominion Bridge Co., at Lachine, Que.; the Montreal Carriage Leather Co's plant; the Montreal shops of the Canadian Pacific Railway Co.; the new Montreal plant of the Sherwin-Williams Paint Co.; the buildings of J. C. Wilson & Co., Montreal; the plant of Woods, Limited, Ottawa; the Kingston Hosiery Co's mills at Kingston, Ont., and the plant of the A. Gravel Lumber Co., at Etchman Bridge, Que.

The Canadian Rand Drill Co., Sherbrooke, Que., inform us that they have recently booked orders for the whole of the compressed air plant to be used by Mr. M. P. Davis, contractor, in the work he is constructing at Niagara Falls, Ont.; also for a similar plant for the Canada Corundum Co., at Craigmont, Ont., and numerous smaller contracts.

The Nova Scotia Steel & Coal Co. are making good progress in opening up their newly acquired limestone properties at the North West Arm, Sydney, N.S. A branch line of railway is being built to connect with the Intercolonial Railway. This branch will be seven miles long. Some 50 men are at work at the quarries and a number of carpenters are at work building a tower 50 feet high for cable purposes in connection with the stone crusher.

Charles Fergie, Esq., returned to town from Montreal a few days ago. In conversation we learned from him that the installation of a brick plant was approved of by the directors of the Intercolonial Coal Mining Co. Fire brick and ordinary building brick will be manufactured. Mr. Fergie is confident the venture will be a success. The fire clay will be taken from below the third seam, and a tunnel

is now being driven from the Scott Pit or second seam through the third seam to cap the body of clay. The grinding pan will be erected at once, and fire lay will shortly be placed on the market for sale. —Stellarton Mining Record.

Work on the new mills of the Dominion Iron & Steel Co., Sydney, N.S., is nearly completed. It is announced that finished steel products will be turned out before the close of the year.

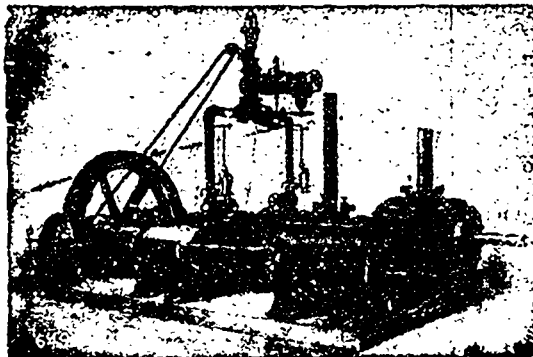
The Nova Scotia Steel & Coal Co., who are ever ready to adopt modern improvements in their mining operations, have erected a large and up-to-date engine for hoisting and lowering the men from and into the mine. The engine is of the latest model, with conical shaped drums.

The Mabou Coal Co., of Inverness County, N.S., have commenced coal shipments from Mabou. Two years ago, when this company commenced operations, it was feared that the coal deposits of Mabou would not amount to much and that the company would sink a sum of money only to realize that their efforts were unsuccessful. These fears have all been dissipated and the company have been advancing rapidly, as a result of their coal giving satisfactory results, and the seams indicate marvellous extent. The company are now hoisting out of three seams in two slopes. One of the shipping piers with its vast pockets is in constant use. The company also proposes to build a line of railway to Caribou Cove, Richmond County, so as to secure an open all the year round port for shipping purposes.

The International Copper Co., New York, which controls the Canadian Copper Co. plant at Sudbury, Ont., have awarded to the Robb Engineering Co., Amherst, N.S., a contract for a 300 h.p. direct connected tandem compound engine to be installed at the Sudbury works.

The Brown Machine Co., New Glasgow, N.S., have lately installed a number of coal screening equipments for different coal mining companies in Nova Scotia. The company have a thoroughly equipped plant including machine shop, pattern shop, etc., and do a variety of work connected with the equipment of coal mines and industrial plants.

John Robertson's sawmill and nearly a million feet of lumber at Burnsville, N.B., were destroyed by fire October 18.



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The Standard Coal & Railway Co., Parrsboro, N.S., have acquired a large area of coal land adjoining the property of the Cumberland Coal & Railway Co.

The Union Foundry & Machine Works, Limited, St. John, N.B., have been incorporated with a capital of \$45,000, to acquire the business of the Union Foundry & Machine Works and to manufacture engines, boilers, electrical machinery, etc. The provisional directors include Jas. Manchester, Wm. Bruckhof and G. H. Waring, St. John, N.B.

The Record Foundry & Machine Co., of Moncton, N.B., which has for some time done a considerable business in Quebec, Ontario and the West, have purchased the properties in Montreal, formerly occupied by the Malleable Iron Co. and the Sparham Fireproof Roofing Co. located on Mill Street, between the Lachine Canal and the harbor, with excellent shipping facilities, both by rail and water. They include a four story brick and several other buildings. The plant is now being thoroughly equipped and includes foundry, moulding shop, machine shop and other departments necessary in the manufacture of stoves, heaters, etc. The company is capitalized at \$1,000,000, with \$800,000 paid up. Mr. Joshua Peters is in charge of the new plant.

The C.P.R. Laundry, Limited, Winnipeg, Man., have been incorporated with a capital of \$75,000, to carry on a general laundry, dyeing and bleaching business. The provisional directors include W. Scott, A. Muushaw and Wm. Grant, Winnipeg.

Messrs. Frost & Wood's warehouse at Winnipeg, Man., was destroyed by fire October 25.

The Winnipeg, Man., City Engineer has submitted a draft by-law for raising \$400,000 for a civic gas plant.

The Canadian Northern Transfer Co., Winnipeg, Man., have been incorporated with a capital of \$500,000, to carry on a transfer and storage business. The provisional directors include Wm. Bain, S. G. Crowell and R. Richardson, Toronto.

The Echo Milling Co., Gladstone, Man., have been incorporated with a capital of \$60,000, to carry on a milling business, and to manufacture bricks, tile, pipes, etc. The provisional directors include P. Broadfoot, M. Wilson and F. B. MacKenzie, Gladstone.

The John Stevens Co., Winnipeg, Man., have been incorporated with a capital of \$20,000, to manufacture agricultural implements, machinery, etc. The provisional directors include John Stevens, G. Clark and F. H. Phippen, Winnipeg.

The Monteith Junction Elevator Co., Monteith Junction, Man., have been incorporated with a capital of \$15,000, to construct and operate elevators, chopping mills, etc. The provisional directors include Thos. Lockhart, W. C. McLaren and J. S. Grant, Souris, Man.

The Western Trading Co., Shoal Lake, Man., have been incorporated with a capital of \$90,000, to manufacture machinery, tools, implements, etc., and to

operate lumber and saw mills. The provisional directors include A. McMillan, Westbourne, Man.; Thos. Meredith, Yorkton, N.W.T., and J. Menzies, Shoal Lake.

The Morden Pump & Novelty Co., Morden, Man., have been incorporated with a capital of \$20,000, to manufacture pumps, axes, scales, etc. The provisional directors include Geo. Ashdown, C. R. Dunsford, and A. M. Stewart, Morden.

A. H. Suelgrove will rebuild his flour mill at Carman, Man., which was recently destroyed by fire. The new mill will have a daily capacity of 100 barrels.

The Hudson Bay Co. will build a flour mill in the Peace River district of the North-West Territory.

It is reported that the Dowd Milling Co. contemplate erecting a new flour mill at some point between Winnipeg, Man., and Fort William, Ont. The company have a 500-barrel mill at Packenham, Ont., and a 150-barrel flour mill and 100-barrel oatmeal mill at Quyon, Que. They also have elevators at Crystal City and Manitou, Man., and have recently opened offices at Winnipeg.

The Northern Iron Works will build a foundry 135x50 at Winnipeg, Man. Two cupolas will be installed, a main traveling crane and several smaller cranes. The cupola will be served by an electric elevator. The core and core oven room will be 35x25 feet and the pattern shop 50x40 feet, two stories.

The Crown Elevator Co. will build in St. Boniface, Man., one of the largest storage elevators and cleaning plants in the West. The entire work will cost \$150,000.

The Poplar Creek Gold Mines, Limited, have been incorporated at Victoria, B.C., with a capital of \$150,000, to carry on general mining, milling and reduction business.

The Granville Club Co., Vancouver, B.C., have been incorporated with a capital of \$100,000, for the construction of club houses, etc.

The Standard Lumber Co. have been incorporated at Victoria, B.C., with a capital of \$50,000, to manufacture sashes, doors, etc., and to operate saw and planing mills, etc.

The Wm. Holden Co. have been incorporated at Victoria, B.C., with a capital of \$10,000, to manufacture fish paste and oils and to carry on a general fish packing business.

The Sharples Mining & Milling Co. have been incorporated at Victoria, B.C., with a capital of \$300,000, to carry on a mining, milling and refining business.

The Western Steamship Co. have been incorporated at Victoria, B.C., with a capital of \$150,000, to carry on a general shipping and shipbuilding business.

Messrs. I. Matheson & Co., New Glasgow, N.S., have just installed a new tandem compound engine at the Sydney Mines plant of the Nova Scotia Steel & Coal Co., which is being used for operating a Capell mine fan. The new engine has a 16-inch high pressure and a 32-inch low pressure cylinder with a 24-inch

stroke. It weighs 40,000 pounds and drives the mine fan, which has a diameter of 20 feet and which making 150 revolutions per minute supplies 200,000 cubic feet of air at a 5½-inch water gauge pressure.

The Ingersoll-Sergeant Drill Co., New York, have ordered six gondola cars, of 100,000 pounds capacity, of the Pressed Steel Car Co., Pittsburg, Pa. These cars are to be 40 feet over end sills and 9 feet 10 inches over side stakes, and equipped with wooden drop ends, Kelso steel couplers 5 x 7 inch, Westinghouse draft rigging, pressed steel brake beams, arch bar trucks, grey iron journal boxes, M. C. B. journal bearings and wedges, 700 pound wheels and pressed steel bolsters.

Dixon graphite pipe joint compound, made by the Joseph Dixon Crucible Co., Jersey City, N.J., is rapidly pushing to the front. The company reports that large orders are constantly coming in, while the trade in smaller packages, which is handled by the dealers is also increasing. One concern recently ordered 600 pounds in small packages for use in its various plants. This compound is used to good advantage on all pipe joints, gasket surfaces, bolts, water tube caps, and in many other places on steamships. The Dixon company will be glad to send prices and samples to anyone who will drop them a postal.

THE HAMILTON CATARACT, POWER, LIGHT & TRACTION CO.

In the last issue of this journal was an article relating to "An Unusual Electrical Contract," in which a description was given of the changing of the wiring on the line from Decow Falls to Hamilton, Ont., the statement being made to the effect that in doing the work there was an ever present possibility of the workmen being electrocuted. The information was obtained from a Hamilton source, and now we are in receipt of a letter from Mr. W. C. Hawkins, general manager of the Hamilton Cataract, Power, Light & Traction Co., in which he denies the existence of the danger alluded to, and we have pleasure in reproducing his letter:

EDITOR THE CANADIAN MANUFACTURER.

Sir:— I beg to call your attention to an article in the second column on page 24 of your issue of 16 inst. The item is, perhaps, very good and interesting, but unfortunately it is so worded that anybody not posted might conclude that this company is making contracts with people to work upon transmission lines under danger of receiving current at the transmission voltage. This is NOT the case, of course, as the line, during their work, is as absolutely dead as the rails of the railway beside it, and has no electrical current on it of any kind, and there is no danger to the workmen at all as is stated in the last paragraph of the item. I would thank you to give this letter an equal prominence in your paper.

THE MARITIME HEATING CO.

The Maritime Heating Co., Amherst, N.S., which was formed some months ago with a capital of \$100,000, and which has

now a paid up capital of \$60,000, have purchased the old plant of the Amherst Heating Co., to which they have made a number of important additions including a new foundry and a moulding room 200 feet long, thoroughly equipped for all kinds of foundry work. The company operate a complete machine shop and have just installed several large machines for trimming castings, etc., which were purchased from the Bickford Drill Co., Cincinnati, Ohio. The company have acquired the patents of the Robb Hot Water Heater from the Robb Engineering Co., Amherst, and will make a specialty of manufacturing this heater. They will also do all kinds of foundry and machine work. They have recently received an order from the Canadian Automatic Scale Co., to build 1,000 scales. Mr. J. A. Black is secretary-treasurer of the company and Mr. Jno. A. Law mechanical superintendent.

LARGE PUMPING ENGINE FOR WINDSOR, ONT.

The City of Windsor, Ont., is situated on the Detroit River, just across from the City of Detroit. It numbers about 15,000 inhabitants, who are engaged largely in manufacturing. The surrounding territory is very level and is devoted to truck farming, the products finding a market in Detroit. Windsor has been eclipsed hitherto by its greater rival across the river, but recently a number of American firms have established manu-

facturing plants on the Canadian side in order to avoid the import duties, and there is prospect that the city will experience rapid growth.

The water supply of Windsor, like that of Detroit, is taken from the Detroit river, which is of uncommon purity. In order to raise the water to the height required for ordinary and fire service, it is, of course necessary to employ pumps, the same pumps being used for both domestic and fire service. On account of the level nature of the city, only 50 pounds water pressure is needed for domestic water supply, while 100 pounds is required for fire service. A large pumping engine, which is now being put in, is so arranged that this may be obtained at will.

This engine, which has been built by the Snow Steam Pump Works, Buffalo, N. Y., is a horizontal, cross-compound, crank-and-fly-wheel engine, with the fly-wheel between the steam and water ends. The engine is to be operated condensing in order to secure the highest economy. It will have a capacity of five million imperial gallons in 24 hours, when running at the rated piston speed of 207 feet per minute, or about 414 revolutions, the stroke being 30 inches. The high pressure cylinder is 17 inches in diameter and the low pressure, 34 inches; and steam is used at 100 pounds. The water cylinders are two in number and are provided with outside center-packed plungers, each 16 inches in diameter. This arrangement makes it easy to renew the plunger packings at any time, and renders any

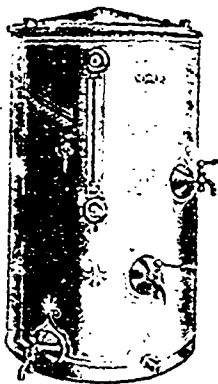
leakage immediately evident. The plunger cross-heads are each connected to the respective steam-end cross-heads by two side-rods arranged diagonally. The steam cylinders and heads are steam-jacketed and, together with the receivers, are to be encased with imported planished steel, while the trimmings will be nickel-plated. The engine is to be fitted with attached condensing apparatus and the boiler feed pump will also be operated by the main engine.

The Windsor pumping plant also supplies water to the City of Sandwich, of about 2,000 inhabitants, which is situated two miles down the river.

THE SCAIFE SYSTEMS.

Wm. B. Scaife & Sons Co., Pittsburgh, Pa., manufacturers of the Scaife and We-fu-go systems for softening and purifying water, have appointed Mr. C. A. Malau, of the city of Mexico, their sole representative in that Republic for the sale of their various systems for this purpose. The Scaife company is now manufacturing every type of water purifying systems; intermittent or continuous; treating the water either hot or cold. Their extensive experience in this line eminently fits them for carrying out any kind of water purification which they undertake. They are now softening and purifying 350,000,000 gallons of water daily for steam boilers and other industries where pure soft water is desirable with their various systems.

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IRON, STEEL,
PIG IRON,
COKE.

Cleveland, Ohio.

NO SURTAX ON BELGIAN GOODS.

Mr. Alexander Gibb, 13 St. John street, Montreal, has been appointed representative in Canada for J. Davys & Baugniet Freres, of Antwerp, Belgium, who are in a position to supply structural material to good advantage, as also plates, angles, tees and similar goods. Owing to the surtax on German material there should be a good opening for this material coming from Belgium. Mr. Gibb will be pleased to receive inquiries for the above.

COMMERCE AND PHYSICAL FEATURES OF THE GREAT LAKES.

By Major Henry A. Gray, M. Inst., C.E.

The constantly increasing importance of the Great Lakes for the purpose of commerce having recently caused considerable public attention on both sides of the Atlantic, it is thought that this paper on the commerce and physical features of these waters, prepared from notes and observations made from time to time during the past fifteen years, and from information gathered during that period, by the writer, while filling the position of Engineer-in-Charge of the Pub-

lic Works of Canada in the Lake District, will be of interest.

The average season of navigation on the lakes is about 220 days. In order to give an idea of the extent of the commerce on these lakes, it is shown that the annual average net tonnage for the last five years, of the Suez Canal—a world's channel of commerce and open every day in the year—was 6,983,167 tons; the annual average net tonnage of the lock and canal at Sault Ste. Marie, for the same period—open only an average of 220 days in the year—was 6,821,062. The registered American tonnage of the lakes, June 30, was 1,154,878 tons; 1,592 steam vessels, representing 736,751 tons, and 2,008 sail, representing 418,118 tons. This tonnage has more than doubled in the last five years, the increase being almost exclusively in steel steamships of 1,500 to 2,500 tons register.

The number of Canadian vessels on the lakes is 647, tonnage, 132,971; valuation, \$3,989,130. The total of coast and inland shipping registered in Canada is 7,153 vessels, of 1,040,481 tons register, valued at \$31,213,430.

In the "Statistical Report" re St. Mary's Falls Canal, by Col. G. J. Ly-

decker, Corps of Engineers, United States Army; for season of 1901, he gives the following statistics of commerce passing through canals at Sault Ste. Marie, Michigan and Ontario:


The total freight traffic of 28,403,065 tons is the maximum traffic in the history of the canals. It exceeds the traffic of 1900 by 2,759,992 tons, or 11 per cent. The total number of passengers was 59,663, an increase of 1,108, or 2 per cent. The season of navigation was open for a period of eight months and six days, during which time the average monthly traffic was 3,463,788 tons.

The American canal passed 25,582,038 freight tons, being an increase of 1,974,684 net tons over the year 1900, or eight per cent.; the number of passengers was 29,701, a decrease of 6,612, or 18 per cent. as compared with 1900. The Canadian canal passed 2,821,027 freight tons, being an increase of 735,308 net tons, or 39 per cent.; the number of passengers was 29,962, an increase of 7,720, or 35 per cent. as compared with 1900. Of the total freight the American canal passed 90 per cent., the Canadian canal 10 per cent.

The growth of the Lake Superior com-

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PRICES QUOTED FOR ALL SIZES OF BOILERS.

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merce during the past half century has been phenomenal. The estimated amount and value of articles which crossed the portage at Sault Ste. Marie in 1851, to and from Lake Superior, was 12,600 net tons, worth \$1,675,000. In 1861, a decade later, the traffic through the Michigan State locks was 88,000 tons, valued at \$6,000,000. In 1871, 585,000 tons, estimated value, \$13,000,000. In 1881, through the State and Weitzel locks, 1,567,741 tons at \$30,000,000. In 1891, through the Weitzel lock, 8,888,759 tons, valued at \$128,178,208. In 1901, through Weitzel, Poe and Canadian locks, 28,403,065 tons, valued at \$289,906,865.

The sailing vessel has almost disappeared from the lakes, the square-rigged ship is no longer seen, and only a few of the great cargo-carrying schooners are left. The sailing fleet was succeeded by the "propeller," as it is known locally, with its tow of one or more consorts, and it, in turn, is giving way to the modern steamer, maintained at a little more than one-half the cost, while having a carrying capacity quite as great, a speed double that of the propeller and consort, and making two or three round trips for one of the tow. Of large capacity and great power, regardless of wind or weather, the steamers of the prevailing type bear their cargoes to and from ports a thousand miles apart, with the precision of railroad trains, each of them transporting at once more than ten ordinary freight trains.

The work of this lake shipping is given approximately by the United States census report, 1890. The freight movement in 1889 on all the lakes was estimated by that report at 53,424,432 tons. The tonnage put afloat since then has increased this movement to 63,240,514 tons. Estimates only can be given, because at one point only on the lakes, Sault Ste. Marie, is there an official record made of tonnage movement. The movement through the Detroit river alone, in 1889, was estimated at 36,203,586 tons. The total entries and clearances, foreign and coastwise, for the port of London during that year, 1889, were 19,245,417 tons, and of Liverpool, 14,175,200 tons. The estimate of the tonnage movement through the Detroit river, in 1889, was 3,000,000 tons above the combined foreign and coastwise tonnage of the ports of London and Liverpool.

The rapid growth, too, of steam transportation and the competition of lake lines with the railways, have caused continued reductions in the cost of transportation. The cost per ton per mile of carrying freight, an average distance of 800 miles, was 1½ mill in 1889. The value of all the cargoes—27,500,000 tons—carried on the lakes during that year was over \$315,000,000. Had this been carried at railway rates, the cost to the public would have been over \$143,000,000; by the lake rates it was about \$23,000,000 only; so that transportation on the lakes saved to the public about \$120,000,000 per year. But, as to a large portion of this tonnage, any possible cost on wheels would not have permitted it to move at all. In such a case, its production at the point of origin would, of course, have been impossible. That in

turn, would have halted the pioneer emigrant this side of the richest areas of the continent.

The average distance for which freight on the lakes is carried is 566 miles. From this, the Census Bureau, estimates the ton mileage for the season of 1889 to be 15,518,360,000 tons miles. The aggregate ton mileage of railways for the year ending June 30, 1889, was 68,727,223,146, which shows the ton mileage of the lakes is nearly one-fourth of the total ton mileage of railways in the United States. In no other way could the relative importance of lake commerce be more effectively shown. During the season of 1870, grain was shipped from Chicago to Liverpool for 17 cents per bushel, a rate but little greater than was paid for transportation by canal from Buffalo to New York, only ten years before. In 1890, grain was shipped from Chicago to Liverpool for 9½ cents per bushel.

The Government of Canada has expended a large amount of money, in some instances assisted by the municipalities, on these lakes constructing breakwaters, piers, wharves, and in dredging out approaches to harbors and channels entering same, as well as inner basins for vessels to lie in, both for commercial purposes and refuge.

Up to the time of Confederation the amount expended by the Public Works Department of Canada for the above purposes was \$890,699.25, and from that period until June 30, 1893, the expenditure was \$3,439,364.63, making a total of \$4,330,063.88. This does not include the construction of a dry dock at Kingston, nor the Canadian canal and locks at Sault Ste. Marie. Owing to the low state of water in the lakes during the past two seasons of navigation, considerable demand has been made upon the Department of Public Works of Canada for dredging out channels at the entrance to many of the harbors to enable vessels to enter for the purpose of loading and unloading. Care had to be exercised in directing these operations, from the fact that when the present piers and other works were constructed at the several harbors, some years ago, these structures were considered quite safe, and as serving all purposes for which they were intended, if extended and built in from 10 to 13 feet of water, as vessels drawing these depths were the largest afloat. Recent years have developed a much larger capacity in vessels trading upon the upper lakes, and consequently a deeper draught. To accommodate this increased size and draught, and even to give access to those of less-tonnage during the low stage of water the dredging required was in many cases lower than the foundation of the structures. To obviate the difficulties and dangers to the present structures—where the increased depth is required—it has become necessary to protect the piers, etc., by driving sheet piling along the sides and ends; this method is the least expensive.

In the following it is endeavored to give a part of the latest and most reliable information relating to the Great Lakes. The lately completed lake surveys made by the United States have reduced to

exactness much that was previously only approximate.

The water surface of the Great Lakes, with the land draining into it, presents the total drainage basin of over 270,000 square miles, assembled as follows:

	Area of Water Surface, Square Miles.	Area of Water Shed, Square Miles.	Aggregate Area of Basin, Square Miles.
Lake Superior	31,200	51,600	82,800
St. Mary's River.....	150	800	950
Lake Michigan.....	22,450	37,700	60,150
Lake Huron & Georgian Bay.....	23,800	31,700	55,500
St. Clair River	25	3,800	3,825
Lake St. Clair	410	3,400	3,810
Detroit River	25	1,200	1,225
Lake Erie...	9,960	22,700	32,660
Niagara River	15	300	315
Lake Ontario.	7,240	21,600	28,840
	95,275	174,800	270,075

The combined areas of the lakes exceed the area of England, Wales, and Scotland.

The length of shore line of the lakes and their connecting rivers is about 5,400 miles. The elevation of the mean surface of the lakes above mean sea level is as follows:

Lake Ontario.....	246½
Lake Erie.....	572½
Lakes Huron and Michigan.....	581½
Lake Superior.....	601½

The difference of 20½ feet between Lake Superior and Huron occurs in the rapids of St. Mary's River; the 8 4-10 feet between Lakes Huron and Erie, mainly in Detroit River; the difference of 326 feet between Lakes Erie and Ontario occurs in the vicinity of Niagara Falls, and is principally assembled as follows: 100 feet in the five miles of rapids between Lewiston and the lower Suspension Bridge, 10 feet in the rapids between the Bridge and the Falls, 160 feet at the Falls, 50 feet in the rapids immediately above the Falls, and 6 feet in the upper Niagara River. The mean depth of Lake Superior is about 475 feet; the deepest point marks a depth of 1,008 feet, or 406 feet below the level of the sea. Lake Huron has a mean depth of 250 feet and a maximum depth of 750 feet. Lake Erie is comparatively shallow, having an average depth of less than 70 feet and a maximum of 210 feet. Lake Ontario has a mean depth of about 300 feet and a maximum of 738, or nearly 500 feet below the level of the sea. The channel of the rivers connecting the lakes seldom exceeds the depth of 50 feet. If the lakes could be drained to the level of the sea, Lake Erie would disappear, Lake Huron reduced to quite insignificant dimensions, Lake Michigan to a length of about 100 miles, with a width of 25 or 30 miles, Lake Ontario and Lake Superior, although with diminished areas, would still preserve the dignity of their present titles as Great Lakes.

A chemical analysis of water taken from the deepest part of Lake Superior failed, under the application of delicate tests, to indicate the presence of salt.

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The beds of the lakes away from the vicinity of the shore lines, and at depths exceeding 100 feet, are almost invariably covered with clay. The mean annual rain and melted snowfall of the several lake basins is as follows: Lake Superior, 29 inches; Lake Huron, 30 inches; Lake Michigan, 32 inches; Lakes Erie and Ontario, 34 inches. This is about equal to 31 inches on the entire lake basin. The following represents the average discharges at the outlets of the lakes:

Lake Superior at St. Mary's River, 86,000 cubic feet per second.

Lakes Michigan and Huron at St. Clair River 225,000 cubic feet per second.

Lake Erie at Niagara, 265,000 cubic feet per second.

Lake Ontario at St. Lawrence River, 300,000 cubic feet per second.

If the average discharge of the lakes passed through a river one mile wide with a mean velocity of one mile per hour, such river would have a depth of 40 feet from shore to shore.

The volume of water on the lakes is about 6,000 cubic miles, of which Lake Superior contains a little less than one-half. Perhaps a better idea of this volume may be obtained when it is said that it would sustain Niagara Falls in its present condition for about 100 years.

For about one-half the distance across the continent the waters of the St. Lawrence system divide the Dominion of Canada from the United States. The boundary line, beginning on the St. Lawrence in latitude 45 degrees, passing through the middle of Lakes Ontario, Erie, St. Clair, Huron, the St. Mary's River and Lake Superior, to a point on its north shore, 124 miles east of Duluth and Superior, the western end of Lake Superior. Lake Michigan is wholly within the territory of the United States. These great lakes contain more than one-half the area of all the fresh water of the globe. They make up the largest system of deep water inland navigation on the globe. No other inland water may bear upon its bosom so vast a commerce, as this does, the vital interests of so many millions of men. Lying in general direction, east and west between the 41st and 47th parallels, they penetrate the tide water on the St. Lawrence. The western extremity of the system, the head of Lake Superior, is 1,700 miles from Belle Isle, at the mouth of the St. Lawrence, and 4,618 miles from Liverpool.

The range of this water system, it will be observed, is entirely within the limits of the north temperate zone, on the line on which population has most freely moved westward, where final settlement is most compact, and where climatic conditions insure the largest returns to capital and labor. Lake Superior the head of the system, alone receives the waters of 200 rivers. One hundred and fifty miles northwest of Port Arthur and Duluth are the fountains of three of the great drainage systems of the continent. Physical conditions there send flowing waters northward to the ocean through Hudson's Bay; southward, through the Mississippi Valley, and the Gulf of Mexico; and eastward, through the lakes and the St. Lawrence. For commercial pur-

poses the northern drainage system has not yet been utilized; but flowing water will forever be a potent instrument of commerce, southward and eastward, between the interior and the Atlantic coast.

Such are the peculiar and favoring physical conditions under which two great peoples of English tongue occupy, side by side, the North American continent from ocean to ocean, using in common this continental waterway, and by treaty stipulations interchanging with each other the use of improvements inside their respective boundary lines. From both sides then, of this continental boundary line, inevitably and forever, will come here for transit into the world's commerce, the products of the vast plains and the mountain region of the far Northwest. On this line, also, to a large extent, will be made the commercial exchanges of the Pacific Slope, Australia, China and Japan.

SHELDON & SHELDON.

The partnership heretofore existing between Messrs. J. D. McEachren and W. D. Sheldon, under the name of McEachren Heating & Ventilating Co., Galt, Ont., has been dissolved, Mr. McEachren retiring, and business is hereafter to be carried on under the name of Sheldon & Sheldon. Mr. W. D. Sheldon has been actively connected with this business for five years or more; and although the name of this concern has been changed, the management and staff will remain substantially as before.

Messrs. Sheldon & Sheldon now conduct and control probably the oldest and largest enterprise in Canada manufacturing drying, heating and ventilating appliances, forge and cupola blowers, exhausters, etc. They write us that their works are being operated to their full capacity.

PORTLAND CEMENT.

On the same day that a pamphlet reached the Record office relating to a probable over doing of the Portland cement business, owing to the old factories increasing their plants and the establishment of many new factories, not a single barrel of cement could be purchased in New Glasgow or Stellarton. The cement used in these parts is chiefly of German make, as the carriage rates from the works in Ontario make it too costly to purchase there. Why is not cement being manufactured in Nova Scotia? That there is the necessary material is far more certain than that there is limitless iron ore. Cement was made thirty odd years ago on a small scale as an experiment. Some of it was used in repairs to the provincial building. The removal of the reciprocity treaty blighted the enterprise in the bud.—Stellarton, N.S., Mining Record

A NO-HURRY COMMUNITY.

Americans who take life at express speed can hardly realize any other state of being.

The McCullough-Dalzell Crucible Co., Pittsburg, Pa., have just received what is probably the largest lump of crucible

clay ever brought into America, and gives some interesting data of the old town of Klingenberg, Germany, whence came this famous crown clay, used in making their crucibles. The citizens own these clay beds in common and divide all profits. Hours of work are few, holidays many, and the yearly output closely restricted. Orders must be placed months ahead, or lay over until another year, being filled absolutely and impartially in rotation. Here is evidently socialism of the highest type, characteristic of Germany and her solid-thinking, slow-going people. But, so perfect is the clay, that the McCullough-Dalzell Crucible Co., are forced to conform with the city's requirement, and make up their orders in advance of needing them.

EXPERT CONSULTING ENGINEERS.

The DeLano-Osborn Engineering Co., consulting and designing engineers, Manning Chambers, Toronto, have been retained as consulting engineers to prepare plans and specifications for the new plant of the Royal Portland Cement Co., to be erected at Longe Pointe, Montreal. The cement company own a tract of land at that place 1,000 feet wide and two miles long which contains extensive deposits of both clay and limestone of excellent character. The new cement plant will have an initial daily capacity of 1,200 barrels and will be large enough to enable the output to be increased to 1,600 barrels daily.

Among the important engineering contracts recently completed by the DeLano-Osborn Engineering Co., may be mentioned the new plant of the Cockshutt Plow Co., at Brantford, Ont. The company are at present engaged on a number of other important contracts.

"NOVO" AIR HARDENING STEEL.

Mr. William Abbott, 334 St. James Street, Montreal, has favored us with some interesting particulars respecting the use of "Novo" air hardening steel in machine shops and the variety of purposes for which it can be utilized, as well as some results of actual tests made both in Canada and the United States, which, he says, can be verified.

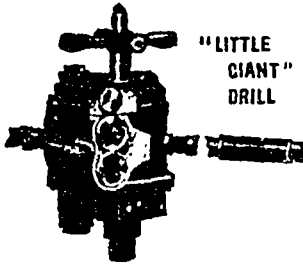
This steel enables work to be done in one-half or one-third the time usually required with ordinary tools, and will cut the hardest kind of materials which would otherwise be rejected as being too hard for turning, milling, reaming or drilling. It cannot be burned, and will never crack in hardening if instructions be observed.

Some of the tests which have actually been made, regarding which certificates are available, are as follows:

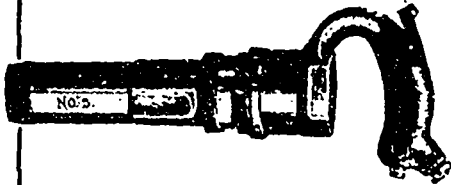
Cast Iron.—Roughing cut 147 feet per minute $\frac{1}{4}$ " cut, $\frac{3}{8}$ " feed on scale, on a 48" diam. by 22" face cylinder head. Tool finished work without being taken out of tool holder.

Steel Shaft.—Forty per cent. carbon roughing cut 132 feet per minute, $\frac{1}{4}$ " cut, $\frac{1}{8}$ " feed, diameter $4\frac{1}{2}$ " by 4 ft. long. Tool went over whole length of shaft twice without being taken out and finished the work in perfect condition.

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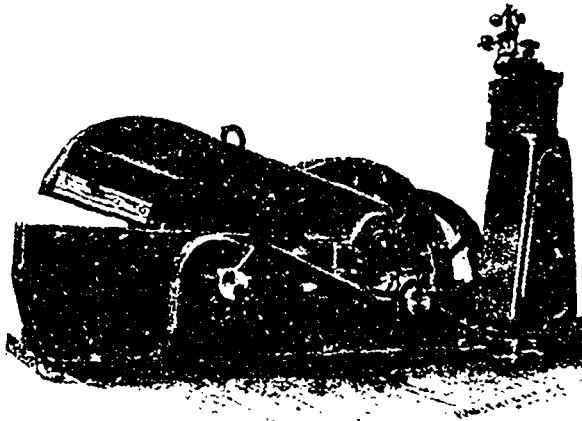
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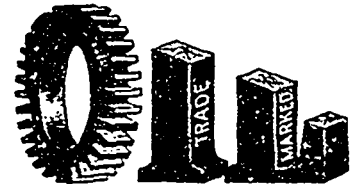
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Novo Reamers.—Three to four times the speed; thirty times the durability. 125 Nova Reamers 2" diam. by 8" long on hard cast iron bushings reamed out an average of 220 bushings without grinding against seven and eight bushings of the ordinary carbon steel reamers, and at double the speed on the same class of work the Novo reamers reamed out 105 bushings against two bushings of the ordinary carbon steel.

Novo Twist Drills.—Drill at 420 R.P.M. on annealed self-hardening steel at the rate of 1¼" per minute 50 per cent. increased speed; durability 100 to 1 in favor of Novo. At 128 R.P.M. a Nova twist drill 1 1-32" diameter drilled 596 holes without grinding through ¾" thick hard steel castings. Against this, 1 1-32 twist drill of best make drilled at 80 R.P.M. on same material five holes, and on the sixth the point burned off.

Novo Milling Cutters.—At four times increased speed will last twenty times longer. Write for particulars of most phenomenal test and voluntary testimonials.

Novo Boiler Flue Boring Bits.—Two tools ¾" by ¾" inserted in a holder bored 105 flue tube holes for 3¼" diameter tubes in 1½" thick marine boiler sheet steel without grinding; time for each hole two minutes forty-five seconds.

Novo End Mills.—On cast iron typewriter frames last for five weeks continuous milling without grinding, against three to four hours of the best carbon steel mills.

Locomotive Frame.—Planing 1" roughing cut, ¼" feed tool planed at 33 feet per minute, 2 days without grinding.

Novo Gun Barrel Drills.—Turn out 20% more barrels per day grinding 1 to 10 in favor of Novo. Novo punches for cold punching boiler sheets, 1 to 60 in favor of Novo. On steel nuts 1 to 10 in favor of Novo.

Novo End Mills.—On shot gun forgings will mill the hardest forgings on which all other mills had glazed off, at an increased speed with the greatest ease. Durability 30 to 1 in favor of Novo.

Locomotive Tire.—Boring out a 48" diam. tire at 91 feet per minute in 6 minutes. 1-16" cut ¼" feed. Former best time 3½ hours with a 3-32" feed.

Cast Steel Not Annealed.—0.6% carbon roughing cut 110 feet per minute ¾" cut, ¼" feed, 2½" diam. by 3 feet long. Tool went over entire shaft 3 times without grinding and came out in perfect condition.

Novo Formed Cutters in Automatic Screw Machine.—Keep an absolutely smooth edge and last 20 times longer.

Novo Forming Cutters and under cutters on brass, bronze and gun metal composition run 5 times the speed and keep a splendid cutting edge without losing size 25 times longer.

Mr. William Abbott, at above address, is sole Canadian agent for Novo air hardening steel, and carries a stock of it in all sizes; and he has arrangements with English manufacturers for supplies of twist drills, reamers, milling cutters, and other tools in "Novo" steel.

PERSONAL.

The Brooklyn Engineers' Club held the first meeting of the season on the evening of October 8. Besides the usual formal business, a very interesting paper entitled "A History of Pumps, Ancient and Modern," was read by Mr. John A. Drew of the Worthington Company. Mr. Drew sketched the development of pumping machines from the early Egyptian "Noria," resembling the familiar well-sweep, to the latest triple-expansion, condensing water-works pumping engines, requiring little more than a pound of coal per horse-power-hour. The paper was illustrated by a large number of lantern slides.

Dr. Wm. B. Phillips, Texas, who has charge of the preparation of the mineral exhibit of Texas at the St. Louis Exposition, says that the tin ores of that State will excite a great deal of interest. The ores are taken from the east slope of the Franklin mountain, about 12 miles north of El Paso, and occur in well-defined fissure veins, the largest of which has a width of from two to five feet, and can be traced on the surface for a distance of 1,200 feet.

Mr. J. Alex. Culverwell, Peterborough, Ont., has been honored by being re-elected a vice-president of Upper Canada College Old Boys' Association, which is practically the governing body of this great school, the Ontario Legislature, a few years ago, having placed the responsibility upon the association. Preparations are now being made to celebrate the 75th anniversary of the opening of the college, which was founded in 1829. Its present roll of pupils now numbers nearly 300.—Peterborough Review.

The Imperial Service Order is a decoration bestowed by the King for long and meritorious service in the employ of the governments of Great Britain and the self-governing possessions and only a limited number of servants are selected each year for decoration with the insignia of the order. The first investiture of the now order occurred in Ottawa a few days ago when the Governor-General bestowed the insignia upon a number of gentlemen, included among whom were Colonel Macdonald, Director-General of Ordnance; W. G. Parmelee, Deputy Minister of Trade and Commerce; John MacDougall, Commissioner of Customs; Chas. Jerome Jones, chief clerk Governor-General's office; Wm. Montizambert, Director-General of Public Health; Mr. Augustus Power, chief clerk Department of

Justice; S. W. McMichael, Inspector of Customs, Toronto; Eugene Etienne Tache, Deputy Minister of Public Works for Quebec, and Martin Murphy, provincial engineer of New Brunswick. Mr. J. M. Courtney, Deputy Minister of Finance, and Mr. Kivas Tully of Toronto, have also been awarded the decoration, but the former is absent in England and the latter was prevented from attending by indisposition.

The Gault Bros. Co., Montreal, through the action of the executors of the estate of Mr. A. F. Gault, has been subdivided into three different companies. One company will still be known as the Gault Bros. Co., and will operate the offices and warehouses in Montreal and in Vancouver, B.C., of which Mr. Leslie N. Gault will be president. The Winnipeg, Man., branch will be severed entirely from the company, and will be run by a syndicate to be known as the Gaults, Limited, of which Mr. R. W. McDougall will be president and Mr. H. M. Belcher general manager. The factory owned and operated by the old Gault Company will be managed by the Crescent Factory Co., and Mr. J. Rodger, who was formerly vice-president, succeeds the late Mr. A. F. Gault as president.

Mr. J. B. Jackson, Ingersoll, Ont., has been appointed commercial agent for Canada in Leeds and Hull, England. Coming from a county which ships enormous quantities of agricultural products, Mr. Jackson should be in a position to render good service to Canada. Mr. P. P. McNamara of Brockville has been appointed commercial agent in Manchester, England.

Mr. H. W. Breckenridge, secretary and treasurer of the Colburn Machine Tool Co., Franklin, Pa., was in Toronto this week calling on manufacturers.

The Engineers Club of Toronto will hold its next regular monthly meeting on the evening of November 11, at which a discussion will be held on Mr. C. W. Dill's paper "Roadways and Pavements."

Mr. R. J. Doyle, president of the R. J. Doyle Mfg. Co., Owen Sound, Ont., died at that place October 26, aged 69 years. Some years ago Mr. Doyle began experimenting with the marl found in great abundance in the vicinity of Owen Sound and other places in Ontario, and though the claim has been disputed, The Scientific American, after careful investigation, gave him credit for being the first man who manufactured Portland cement on the American continent from native products.

THE CHARTERED ACCOUNTANTS.

The first public meeting of an interesting programme, which has just been issued by the Institute of Chartered Accountants of Ontario, was held October 19 in their handsome new rooms, 27 Wellington street east. The president, Mr. Geo. Edwards, occupied the chair, and in the course of a few preliminary remarks welcomed the members and the students to the permanent home of the accountancy profession of the Province. The lecturer was Mr. A. C. Neff, F.C.A.,

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**AUCTION SALE OF TIMBER BERTHS.**

PUBLIC NOTICE is hereby given that pursuant to authority of Orders in Council, the Red and White PINE TIMBER in the following townships, berths and areas, namely:—

IN THE DISTRICT OF NIPISSING—the Townships of HUTTON, CREELMAN, PARKIN, AYLMER, MACKELCAN, MCCARTHY, MERRICK, MULLOCK (part of) FRENCH (part of), STEWART, LOCKHART, (part of) GARROW (part of), OSBORNE (part of), HANMELL and PHELPS (part of).

IN THE DISTRICT OF ALGOOMA—Berths Nos. 193 and 201, the townships of KITCHENER and ROBERTS and Block "W" near Onaping Lake.

IN THE RAINY RIVER DISTRICT—Berths G19, G21, C23, G29 and G33, and the following Berths with the right to cut and remove the pine, spruce, tamarack, cedar and poplar:—G4, G6, G17, G18, G24, G25, G26, G27, G28, G34, G35, G36, G37, G39, G40, G41, G42, G43, Berths Nos. S1, S2, S3, and S4, will be offered for sale by Public Auction at the Parliament Buildings, in the City of Toronto, on WEDNESDAY, the NINTH day of DECEMBER, 1903, at the hour of one o'clock in the afternoon.

Sheets containing terms and conditions of Sale and information as to Areas and Lots and Concessions comprised in each Berth will be furnished on application, either personal or by letter, to the Department of Crown Lands, Toronto, or the Crown Timber Agencies at OTTAWA, SAULT STE. MARIE, PORT ARTHUR, RAT PORTAGE and FORT FRANCES.

E. J. DAVIS,
Commissioner Crown Lands.

DEPARTMENT OF CROWN LANDS,
TORONTO, July 29, 1903.

N.B.—No unauthorized publication of this advertisement will be paid for.

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December 1st or January 1st services, in permanent positions. Successful General Agents of Harvesting Machinery, by Canadian Corporation, to represent their factories in Canada and United States. State experience, references, salary expected and age. All replies will be held confidential. Address, "CANADIAN,"
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An English corporation having acquired vast holdings of high-grade cannel coal in the United States, being in a position to deliver same to the market at a rare profit, having in fact a monopoly of the cannel coal in the United States, invite Canadian capitalists to join their enterprise on a fair basis of representation. An extensive market has been established for this coal, and preparations are being made to export it to Great Britain and Europe. The construction of a short line railroad is necessary to reach through this entire survey, and they will consider a Canadian contract for this work.

From this property we are able to deliver at tide-water high-grade coals for a century at a price not to exceed 86 cents per ton inclusive of all charges. This will put them in absolute control of the proposed Isthmuth canal trade and dictate the coal prices of the Southern Atlantic seaboard.

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OPPORTUNITY FOR INVESTMENT.

A Scotch gentleman largely interested in the United States, wishes to float the bonds of a small railroad in Canada, or have some reliable institution to guarantee to take these bonds upon completion of the road, and with this in view, is desirous of opening up correspondence with some reliable broker or financial agent.

If, however, a contractor could arrange part of the finances of the line in Canada, he could secure the construction of this road. The branch road connects with the largest trunk system in America, and passes through a thickly peopled country, opening up the largest known beds of coal and iron on the continent.

Investigation will show that the road can be sold for twice its cost the day it is completed.

Half of the road is at present graded and one-fifth of the rails-laid, all of which would be to the estimated benefit of the contractor.

Address: GLASGOW, care Canadian Manufacturer, Toronto, Canada, or Room 40, 130 Broadway, New York City.

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who recounted the history and experiences of the public accountant, and at the close of the discussion which followed received the thanks of those present. The hall was filled to overflowing by the members and students, and the event was most successful in every way.

A series of fifteen lectures has been arranged for by the Institute which will take place every second Monday, commencing November 2nd., and will be given by public accountants without remuneration, with the exception of two which prominent legal gentlemen will give. The speakers and the subjects are as follows: Mr. Geo. Edwards, F.C.A., Auditing, Final Questions of 1903; Mr. F. H. Macpherson, F.C.A., The Accountant in Court; Mr. Wilton C. Eddis, F.C.A., Book-keeping, Final Questions, 1903; Mr. T. G. Williamson, C.A., Municipal Balance Sheets; Mr. C. A. Masten, Barrister-at-Law, Company Law; Mr. A. L. Crossin, Layman's Business Law; Mr. W. B. Tindall, F.C.A., Bookkeeping, Intermediate Questions, 1903; Mr. Geo. O. Merson, C.A., Executors and Administrators; Mr. A. C. Neff, F.C.A., Auditing, Intermediate Questions, 1903; Mr. Geo. U. Stiff, C.A., A Statement of Affairs; Mr. D. Hoskins, F.C.A., Commercial Arithmetic; Mr. R. J. Bennett, C.A., Bonds and Sinking Funds; Mr. D. E. Thompson, K.C., LL.D., (subject to be chosen); Mr. C. E. Stone, C.A., Book-keeping for Retail Merchants.

THE SCHOOL OF PRACTICAL SCIENCE.

The Ontario Government have made the following appointments to and changes in the teaching staff of the School of Practical Science: Silas B. Wass to be fellow in mechanical engineering, J. G. McMillan fellow in mining engineering, J. G. R. Ardagh and F. G. Marriot fellows in chemistry, the latter to take the place of Jas. Horton, resigned;

J. L. R. Parsons fellow in surveying, in place of S. Gagne, resigned; H. M. Shippe to be fellow in electrical engineering instead of mechanical engineering, and J. R. Cockburn fellow in drawing instead of J. Challies, resigned. About 120 candidates were granted certificates entitling them to teach domestic science in the various high and public schools.

INDUSTRIAL PUBLICATIONS.

The International edition of Dun's Review, for November, is a special Cuban number, more than half of it being devoted to the industrial affairs of that Island. Those who are interested in trade with that country will find much valuable information in this publication.

The Buffalo Forge Co., Buffalo, N.Y., have sent us a copy of a catalogue on mechanical draft apparatus which they have just published; and it is indeed an elegantly gotten up volume. The points of interest to engineers and owners embodied in the book consist in the introduction of illustrations and data, which are reliable and not based on imaginary conditions. The illustrations given are principally from photographs of mechanical draft outfits installed by the company, and tables are given which show the capacities of fans for induced draft under average working conditions, as well as the theoretical output with unrestricted inlet and discharge. The Buffalo fan system of heating, ventilating and drying apparatus, high speed engines, etc., are also illustrated.

"The Electrician" Electrical Trades Directory and Handbook for 1904, to be published by the Electrician Publishing Co., Salisbury Court, Fleet Street, London, E.C., England, twenty-second edition, is in preparation and will be ready for distribution in January. It will contain a very carefully compiled list of British, colonial and foreign electricians, electrical engineers, etc., and of

all persons engaged in electrical pursuits throughout the world; useful tables and data relating to electric light and traction, electric power transmission, etc.

Messrs Pawling & Harmschfeger, Milwaukee, Wis., have issued a complete list of users of their cranes and hoists.

OPPORTUNITIES.

The following enquiries have been received at the offices of the High Commissioner for Canada in London, and at the Canadian Section of the Imperial Institute, London, England.

NOTE.—Those who may wish to correspond with any of these enquirers can obtain the names and addresses by applying to the CANADIAN MANUFACTURER, Toronto. No charge for giving information. When writing refer to the numerals opposite the enquiries, and enclose 2c. postage stamp for reply.

1112. A gentleman who is leaving for Canada shortly is desirous of obtaining the agencies of a few first-class lines requiring representation in the Dominion.

1113. A wholesale provision merchant in the North of England makes enquiry respecting regular supplies of split peas from Canada.

1114. A firm in London, England, is prepared to contract with Canadian manufacturers in a position to ship regular supplies of maple dowels.

1115. The manufacturers of agricultural and veterinary specialties, disinfectants, cattle foods, etc., seek the services of a Canadian firm possessing the necessary connection to act as their representative.

1116. The proprietors of a well-known time register are open to appoint suitable Canadian resident agent.

1117. A Glasgow, Scotland, house doing a large business in plumbago invites samples and quotations from Canadian producers who can ship regular supplies.

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EMERY WHEELS and
GRINDING MACHINERY**

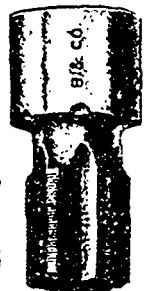
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SPINDLE STAY BOLT TAPS and TAPS for Screw
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Regular and Full Mounted Reece and Derby Plates, Bicycle
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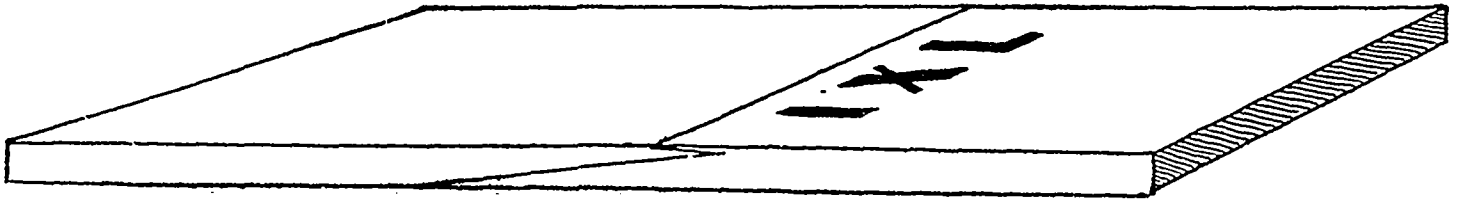
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We also guarantee that every belt made by us will give satisfaction in every respect. Will be pleased to send samples and quotations on demand.

There is no better Belting made anywhere than we are now turning out.

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A Steam Boiler Policy

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A Steam Boiler Policy in the Canadian Casualty and Boiler Insurance Company insures your Boilers, Buildings, surrounding buildings, goods stored therein. Fire Insurance on lives of Engineers and Firemen; Public Liability Protection; Defense of Suit; Consultation of our expert Engineers FREE. Competent inspection.

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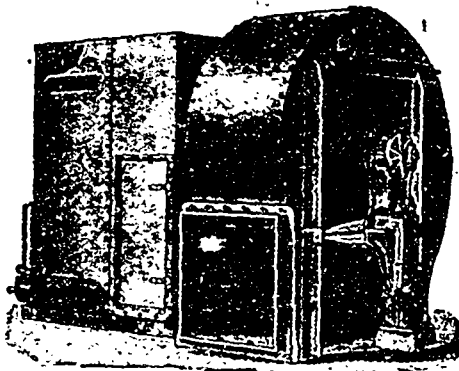
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One of the Rothschilds, when visiting this section of the world, stated that Peterborough was destined to become one of the great manufacturing centres of the Continent.

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An Immense Electrical Manufacturing Works are now erecting half a million dollars worth of additional buildings to their plant.

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CHEAP WATER-POWER,

Railways, Geographical position and Trent Valley Canal are inducements.

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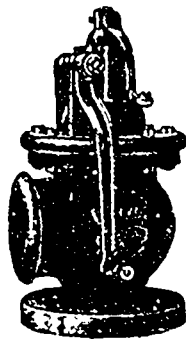
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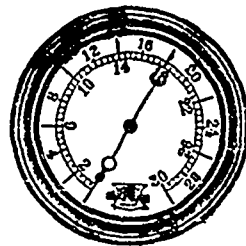
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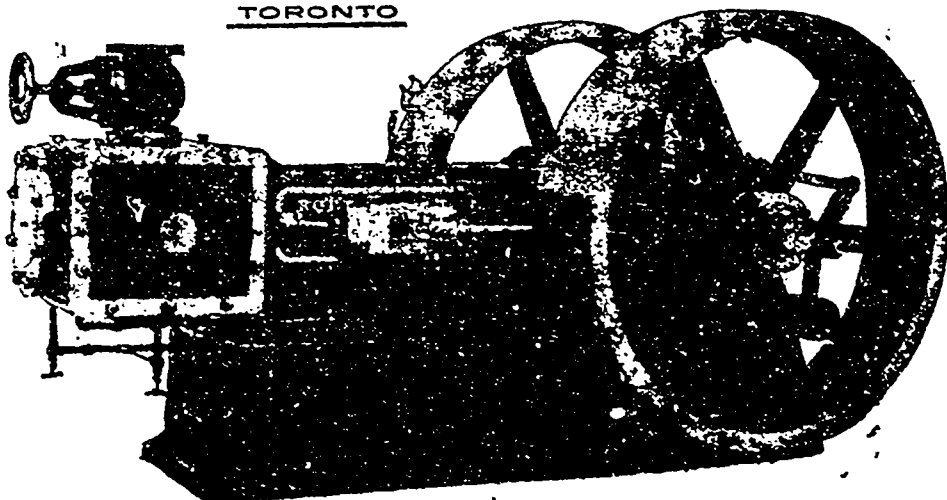
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The Mumford Standard internally-fired boiler combines, to a remarkable extent, the best features of the Scotch and English types of internally-fired boilers, together with the lighter weight, less floor space, and more perfect circulation of the best boilers of the American water tube type.

The construction throughout, except the tube sheets, is cylindrical and spherical—requiring no stays. The boiler is supplied with an outer steel casting, or for brick setting, as desired by the customer.

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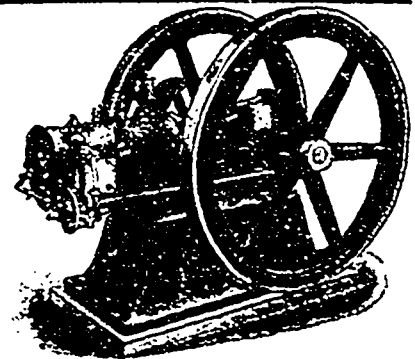
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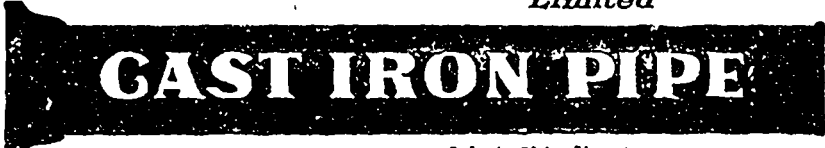
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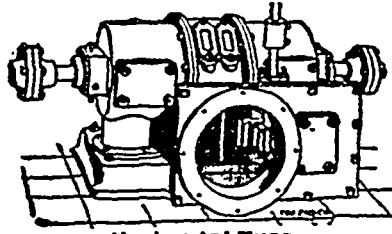
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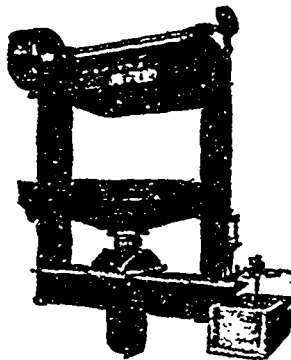
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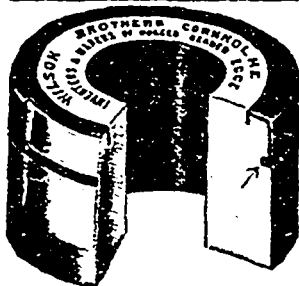
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Hamilton Brass Mfg. Co., Hamilton, Ont.
Meadows, Geo. B. Wire, Iron & Brass Works Co., Toronto.
McDougall, R. Co., Galt, Ont.
W. K. Fisher Bush & Metal Works Co., St. Catharines, Ont.

Bridges.

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.
Building Iron and Steel.

Canada Foundry Co., Toronto.
Expanded Metal & Fireproofing Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Builders' Materials

Albert Mfg. Co., Hillsboro, Ont.
Canada Foundry Co., Toronto.
Canadian Oils Elevator Co., Toronto.
Canadian Portland Cement Co., Deseronto, Ont.
Expanded Metal & Fireproofing Co., Toronto.
Gartshore, John J., Toronto.
Metallic Roofing Co., Toronto.
Owen Sound Portland Cement Co., Owen Sound, Ont.
Rice Lewis & Son, Toronto.
Sheldon & Sheldon, Galt, Ont.

Canada Plates

Leslie, A. C. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Samuel, M. & L. Benjamin & Co., Toronto.

Canoes

Peterborough Canoes Co., Peterborough, Ont.

Caps.

McCullough Dalzell Crucible Co., Pittsburg, Pa.

Cast Iron Pipe

Canada Foundry Co., Toronto.
Gartshore-Thomson Pipe & Foundry Co., Hamilton, Ont.
Rice Lewis & Son, Toronto.
Montreal Pipe Foundry Co., Montreal.

Castings (Iron and Brass.)

Toronto Iron & Brass Bedstead Co., Toronto.

Cement

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

Cement Machinery.

Wentz, R. F. Engineering Co., Toronto.

Chain Making Machinery

Turner, Vaughn & Taylor, Cuyahoga Falls, Ohio.

Channois

Bourne-Fuller Co., Cleveland, Ohio.
Leslie, A. C. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Samuel, M. & L. Benjamin & Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Charcoal Pig Iron

Canada Iron Furnace Co., Montreal.

Chemicals and Dye Stuffs

Bellhouse, Dillon & Co., Montreal.
Hensen, W. T. & Co., Montreal.
Brunner, Mond & Co., Northwich, England.
Cassella Color Co., New York City.
Geigy Aniline & Extmet Co., New York City.
Klipstein, A. & Co., New York City.
McArthur, Cornelle & Co., Montreal.
Winn & Holland, Montreal.

Chemists

Archbold, Dr. Geo., Prescott, Ont.
Heye, Thos. & Son, Toronto.
Metallurgical Laboratory, Pittsburg, Pa.
Wentz, R. F. Engineering Co., Toronto.

Clay Working Machinery.

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

Coal and Coke

Milnes, James H., & Co., Toronto.

Coal Cutting Machines

Jeffrey Mfg. Co., Columbus, Ohio.

Coal Triples.

Jeffrey Mfg. Co., Columbus, Ohio.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Coil Chains.

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

Continuous Rolling Mills

Morgan Construction Co., Worcester, Mass.

Contractors' Machinery

Carlin's, Thomas Sons Co., Allegheny, Pa.

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Conveying Machinery

Hodge Mfg. Co., Toronto
 Jeffrey Mfg. Co., Columbus, Ohio.
 Perrin, William R., & Co., Toronto.
 Stevens, Alfred J., Toronto.

Copper Materials

Greening, B., Wire Company, Hamilton, Ont.
 Samuel, M. & L. Benjamin & Co., Toronto.
 Syracuse Smelting Works, Montreal.
 Wire & Cable Co., Montreal.

Corrugated Iron and Steel.

Seaford, Wm. B. & Sons Co., Pittsburg, Pa.

Corundum.

Canadian Corundum Co., Toronto.

Corundum Wheels.

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

Covers.

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Crayons

Lowell Crayon Co., Lowell, Mass.

Crucibles

Dixon, Joseph, Crucible Co., Jersey City, N. J.
 McCullough Dalzell Crucible Co., Pittsburg, Pa.
 Samuel, M. & L. Benjamin & Co., Toronto.
 Syracuse Smelting Works, Montreal.

Crucible Caps and Nozzles

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Crucible Covers and Stoppers

McCullough Dalzell Crucible Co., Pittsburg, Pa.

Dies

Hamilton Stamp & Stencil Works, Hamilton, Ont.
 Dies (Socket, Sewer Pipe and Tile Clay)
 Turner Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Directories

Kelly's Directories, Limited, Toronto.

Draw Benches (Wire.)

Morgan Construction Co., Worcester, Mass.
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Drills

Bertram, John, & Sons Co., Dundas, Ont.
 Canadian Hand Drill Co., Sherbrooke, Que.
 Cooper, James, Mfg. Co., Montreal.
 Jeffrey Mfg. Co., Columbus, Ohio.
 London Machine Tool Co., London, Ont.

Dry Kilns.

Sheldon & Sheldon, Galt, Ont.
 Stevens, Alfred J., Toronto.
 Sturtevant, B. F. Co., Boston, Mass.

Dust and Shavings Separators

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

Electric Mine Locomotives

Jeffrey Mfg. Co., Columbus, Ohio.

Electrical Supplies

Canadian General Electric Co., Toronto.
 Electrical Construction Co., London, Ont.
 Forman, John, Montreal.
 Jones & Moore Electric Co., Toronto.
 Kay Electric Dynamo & Motor Co., Toronto.
 Packard Electric Co., St. Catharines, Ont.
 Phillips, Eugene F., Electrical Works, Montreal.
 Toronto & Hamilton Electric Co., Hamilton, Ont.
 United Electric Co., Toronto.
 Worth & Martin, Toronto.

Electro-Plating

Brantford Plating Co., Brantford, Ont.

Elevators

Canadian Oils Elevator Co., Toronto.
 Darling Bros., Montreal.
 Jeffrey Mfg. Co., Columbus, Ohio.

Emery and Emery Wheels.

Canadian Corundum Wheel Co., Hamilton, Ont.
 Forman, John, Montreal.
 Hart Corundum Wheel Co., Hamilton, Ont.

Employers' Liability Insurance

Maryland Casualty Co., Toronto.

Engineers (Cement).

Wentz, R. F. Engineering Co., Toronto.

Engineers (Chemical.)

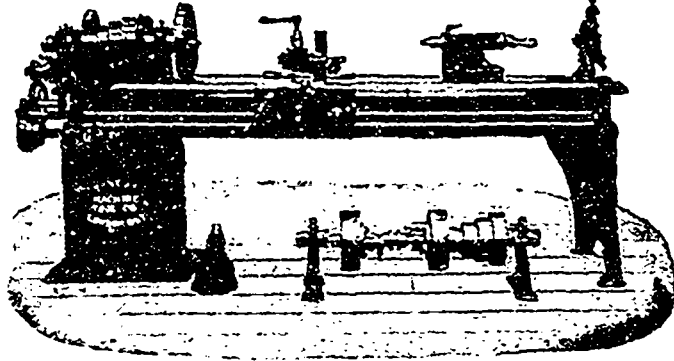
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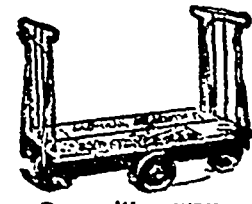
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Kelsch, R. S., Montreal.
Parks, R. J., Toronto.
Vogel, C. H., Ottawa.

Engineers (Consulting)

DeLano-Osborn Engineering Co., Toronto.
Electrical Construction Co., London, Ont.
Kelsch, R. S., Montreal.
Morgan Construction Co., Worcester, Mass.
Parks, R. J., Toronto.
Porrin, Wm. R. & Co., Toronto.
Simpson, T. T., Deschenes, Que.
Vogel, C. H., Ottawa.
Wentz, R. F., Engineering Co., Toronto.

Engineers (Contracting)

Darling Bros., Montreal.
Electrical Construction Co., London, Ont.

Engineers (Electrical)

Canadian General Electric Co., Toronto.
DeLano-Osborn Engineering Co., Toronto.
Electrical Construction Co., London, Ont.
Electric Engineering & Supply Co., Montreal.
Jones & Moore Electric Co., Toronto.
Kay Electric Dynamo & Motor Co., Toronto.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Toronto.
Worth & Martin, Toronto.

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Carrier, Lalno & Co., Levis, Quebec.
Darling Bros., Montreal.
DeLano-Osborn Engineering Co., Toronto.
Electrical Construction Co., London, Ont.
Kelsch, R. S., Montreal.
Kerr Engine Co., Walkerville, Ont.
Morgan Construction Co., Worcester, Mass.
Robb Engineering Co., Amherst, N.S.
Sheldon & Sheldon, Galt, Ont.
Wentz, R. F., Engineering Co., Toronto.

Engineers (Mill and Hydraulic)

Vogel, C. H., Ottawa.

Engineers (Mining)

Hors, Thos. & Son, Toronto.
Metallurgical Laboratory, Pittsburg, Pa.
Mills, S. D., Toronto.

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Jeffrey Mfg. Co., Columbus, Ohio.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

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Babcock & Wilcox, Limited, Montreal.
Canadian Helms Safety Boiler Co., Toronto.
Cowan & Co., Galt, Ont.
Goldie & McCulloch Co., Galt, Ont.
Hyde Bros. & Co., Pittsburg, Pa.
Leonard, E. & Sons, London, Ont.
McDougall, H. Co., Galt, Ont.
Hobb Engineering Co., Amherst, N.S.
Scaife Wm. B. & Sons Co., Pittsburg, Pa.
Stratford Mill Building Co., Stratford, Ont.
Williams, A. R., Machinery Co., Toronto.

Engravers

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

Exhaust Hoods

Burt Mfg. Co., Akron, Ohio.
Darling Bros., Montreal.

Exporters

Canadian Export Co., Toronto.

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Central Ontario Power Co., Peterboro, Ont.

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Sponce, R. & Co., Hamilton, Ont.

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Bradstreet's, New York City.
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Neff & Postlethwaite, Toronto.

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Perrin, Wm. R. & Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

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Hamilton Facing Mill Co., Hamilton, Ont.
Pennsylvania Fire Brick Co., Lock Haven, Pa.
Seloto Fire Brick Co., Scotoville, Ohio.

Founders

Canada Foundry Co., Toronto.
Cowan & Co., Galt, Ont.
Gartshore-Thomson Pipe & Foundry Co., Hamil-
ton, Ont.
Karch, H. W., Hespeler, Ont.
McDougall, The R. Co., Galt, Ont.

Foundry Facing

Hamilton Facing Mill Co., Hamilton, Ont.

Galvanized Iron and Steel.

Leslie, A. C. & Co., Montreal.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Galvanizing

Brantford Plating Co., Brantford, Ont.
Ontario Wind Engine & Pump Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Galvanizing and Tinning Machinery and Furnaces (Clay.)

Mofgan Construction Co., Worcester, Mass.
Turner, Vaughn & Taylor Co., Cuyahoga Falls
Ohio.

Gas and Gasoline Engines

Dominion Motor & Machine Co., Toronto.
Goldie & McCulloch Co., Galt, Ont.
Morrison, T. A. & Co., Montreal.
Stratford Mill Building Co., Stratford, Ont.

Gas Plants

Siche Gas Co., Toronto.

Gas Producers.

Morgan Construction Co., Worcester, Mass.

Generators

Canadian General Electric Co., Toronto.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Kay Electric Dynamo & Motor Co., Toronto.
Phillips, Eugene F., Electrical Works, Montreal.
Toronto & Hamilton Electric Co., Hamilton, Ont.

Government Notices

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Minister of Agriculture.

Grinding Machinery

Hart Corundum Wheel Co., Hamilton, Ont.

Grinding Fans

Carlin's, Thomas Sons Co., Allegheny, Pa.

Hand Traveling Cranes

Morgan Construction Co., Worcester, Mass.

Hardware

Butterfield & Co., Rock Island, Que.
Cooper, James, Montreal.
Empire Machine & Metal Stamping Co., Toronto.
Gartshore, John J., Toronto.
Morrow, John, Machine Sew Co., Ingersoll, Ont.
Rice Lewis & Son, Toronto.
Samuel, M. & L. Benjamin & Co., Toronto.

Heating and Ventilating

Darling Bros., Montreal.
Leonard, F. & Sons, London, Ont.
Sheldon & Sheldon, Galt, Ont.
Stevens, Alfred J., Toronto.
Sturtevant, B. F. Co., Boston, Mass.

Hydraulic Accumulators

Morgan-Construction Co., Worcester, Mass.

Hydraulic Cranes

Morgan Construction Co., Worcester, Mass.

Hydraulic Machinery

Darling Bros., Montreal.
Jenckes Machine Co., Sherbrooke, Que.
Morgan Construction Co., Worcester, Mass.
Perrin, Wm. R. & Co., Toronto.
Wilson, J. C., & Co., Glenora, Ont.

Iron and Steel Specialties

Abbott, William, Montreal.
Armstrong Mfg. Co., Bridgeport, Conn.
Bourne-Fuller Co., Cleveland, Ohio.
Brown & Co., Paris, Ont.
Dodge Mfg. Co., Toronto.
Karch, H. W., Hespeler, Ont.
Leslie, A. C. & Co., Montreal.
Meadows, Geo. B. Wire, Iron & Brass Works Co.
Toronto.

McDougall, R. Co., Galt, Ont.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Rice Lewis & Son, Toronto.
Samuel, M. & L. Benjamin & Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Lamps—Electric

Forman, John, Montreal.
Packard Electric Co., St. Catharines, Ont.

Lathes

Bertram, John, & Sons Co., Dundas, Ont.
London Machine Tool Co., London, Ont.
McDougall, R. Co., Galt, Ont.
Williams, A. R., & Co., Toronto.

Leather Bolting

Canadian Oak Bolting Co., Brockville, Ont.
Fleming, W. A. & Co., Montreal.
McLaren, D. K., Montreal.
Rice Lewis & Son, Toronto.
Williams, A. R. Machinery Co., Toronto.

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Machinists.

Worth & Martin, Toronto.

Machinists' Supplies

Armstrong Mfg. Co., Bridgeport, Conn.
 Butterfield & Co., Rock Island, Que.
 Cooper, James, Montreal.
 Goldie & McCulloch Co., Galt, Ont.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Morrow, John, Machine Screw Co., Ingersoll, Ont.
 Worth & Martin, Toronto.

Machine Tools

Abbott, William, Montreal.
 Bertram, John, & Sons Co., Dundas, Ont.
 Darling Bros., Montreal.

Malleable Iron Castings

McKinnon Dash & Metal Works Co., St. Catharines, Ont.
 Ontario Malleable Iron Co., Oshawa, Ont.
 Smith's Falls Malleable Castings Co., Smith's Falls, Ont.
 Walkerville Malleable Iron Co., Ltd., Walkerville, Ont.

Metal Shears

Morgan Construction Co., Worcester, Mass.

Metal Specialties

Brantford Plating Co., Brantford, Ont.

Metal Stamping

Empire Machine & Metal Stamping Co., Toronto.

Metallurgists.

Metallurgical Laboratory, Pittsburg, Pa.
 Mills, S. D., Toronto.
 Wentz, R. F. Engineering Co., Toronto.

Mill Machinery and Supplies

Armstrong Mfg. Co., Bridgeport, Conn.
 Cooper, James, Montreal.
 Cooper, James Mfg. Co., Montreal.
 Cowan & Co., Galt, Ont.
 Darling Bros., Montreal.
 Fleming, W. A., & Co., Montreal.
 Gartshore, John J., Toronto.
 Goldie & McCulloch Co., Galt, Ont.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Hamilton Brass Mfg. Co., Hamilton, Ont.
 Hay, Peter Knife Co., Galt, Ont.
 Jenckes Machine Co., Sherbrooke, Que.
 Karch, H. W., Hespeler, Ont.
 Leonard, E. & Sons, London, Ont.
 London Machine Tool Co., London, Ont.
 McDougall, R. Co., Galt, Ont.
 Morrow, John, Machine Screw Co., Ingersoll, Ont.
 Rice Lewis & Son, Toronto.
 Robb Engineering Co., Amherst, N.S.
 Samuel, M. & L. Benjamin & Co., Toronto.
 Spence, R. & Co., Hamilton, Ont.
 Stratford Mill Building Co., Stratford, Ont.
 Wilson, J. C., & Co., Glenora, Ont.

Mining Machinery

Canadian Rand Drill Co., Sherbrooke, Que.
 Cooper, James, Montreal.
 Cooper, James Mfg. Co., Montreal.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Jenckes Machine Co., Sherbrooke, Que.
 Perrin, Wm. H. & Co., Toronto.
 Williams, A. R. Machinery Co., Toronto.

Motors and Dynamos

Canadian General Electric Co., Toronto.
 Electrical Construction Co., London, Ont.
 Forman, John, Montreal.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Jones & Moore Electric Co., Toronto.
 Kay Electric Dynamo and Motor Co., Toronto.
 Toronto & Hamilton Electric Co., Hamilton, Ont.
 United Electric Co., Toronto.

Novelty Manufacturers.

Worth & Martin, Toronto.

Nozzles.

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Office Furniture and Supplies

Canadian Office & School Furniture Co., Preston, Ont.

Oils and Lubricants

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

Oil Filters

Burt Mfg. Co., Akron, Ohio.
 Darling Bros., Montreal.

Paints and Colors

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

Paper Manufacturers

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

Patents

Budden, Hanbury A., Montreal.
 Case, Egerton R., Toronto.
 Fotherstonhaugh & Co., Toronto.
 Patent Exchange & Investment Co., Toronto, Ont.

Perforated Metals

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

Phosphorizers.

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Pig Iron

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

Pipe Threading Machines

Armstrong Mfg. Co., Bridgeport, Conn.
 Rice Lewis & Son, Toronto.

Pipe (Riveted Iron and Steel.)

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Pipes and Tubes

Abbott, William, Montreal.
 Bourne-Fuller Co., Cleveland, Ohio.
 Canada Foundry Co., Toronto.
 Gartshore-Thomson Pipe & Foundry Co., Hamilton, Ont.
 Montreal Pipe Foundry Co., Montreal.
 Rice Lewis & Son, Toronto.
 Samuel, M. & L. Benjamin & Co., Toronto.

Plaster

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

Plates

Bourne-Fuller Co., Cleveland, Ohio.
 Nova Scotia Steel & Coal Co., New Glasgow, N.S.
 Rice Lewis & Son, Toronto.
 Samuel, M. & L. Benjamin & Co., Toronto.
 Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Plating

Brantford Plating Co., Brantford, Ont.

Plumbago

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Pneumatic Tools

Chicago Pneumatic Tool Co., Chicago, Ill.
 Cooper, James, Mfg. Co., Montreal.
 Jenckes Machine Co., Sherbrooke, Que.

Pointers (For Rods and Wire.)

Morgan Construction Co., Worcester, Mass.
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Portland Cement

Canadian Portland Cement Co., Deseronto, Ont.
 Owen Sound Portland Cement Co., Owen Sound, Ont.
 Rathbun Co., Toronto.
 St. Lawrence Portland Cement Co., Montreal.

Power—Electric and Water

Central Ontario Power Co., Peterboro, Ont.

Power Plants—Equipments

Canadian General Electric Co., Toronto.
 Cooper, James, Mfg. Co., Montreal.
 Darling Bros., Montreal.
 DeLano-Osborn Engineering Co., Toronto.
 Electrical Construction Co., London, Ont.
 Goldie & McCulloch, Galt, Ont.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Jenckes Machine Co., Sherbrooke, Que.
 Jones & Moore Electric Co., Toronto.
 Kay Electric Dynamo & Motor Co., Toronto.
 Leonard, E. & Sons, London, Ont.
 Perrin, Wm. H. & Co., Toronto.
 Phillips, Eugene F., Electrical Works, Montreal.
 Robb Engineering Co., Amherst, N.S.
 Stevens, Alfred J., Toronto.
 Sturtevant, B. F., Co., Boston, Mass.
 Toronto & Hamilton Electric Co., Hamilton, Ont.
 United Electric Co., Toronto.
 Wilson, J. C., & Co., Glenora, Ont.

Presses (Tilo, Sower Pipe, Nozzles and Sleeves.)

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

Pulleys

Darling Bros., Montreal.
 Dodge Mfg. Co., Toronto.
 Goldie & McCulloch Co., Galt, Ont.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Wilson, J. C., & Co., Glenora, Ont.

Purifiers

Cowan & Co., Galt, Ont.
 Goldie & McCulloch Co., Galt, Ont.
 Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

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Chicago & North-Western Ry., Toronto & St. Paul, Minn.
Quebec Central Railway, Sherbrooke, Que.

Railway Supplies

Algoma Steel Co., Sault Ste. Marie, Ont.
Cooper, James, Montreal.
Gartshore, John J., Toronto.
Greening, B. Wire Co., Hamilton, Ont.
Montreal Steel Works, Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Phillips, Eugene F., Electrical Works, Montreal.

Rivets

Bourne-Fuller Co., Cleveland, Ohio.

Roll Lathes

Morgan Construction Co., Worcester, Mass.

Rolling Mills

Morgan Construction Co., Worcester, Mass.

Rolling Mill Engineers

Morgan Construction Co., Worcester, Mass.

Roofing

Metallie Roofing Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Rubber Goods

Gutta Percha & Rubber Mfg. Co., Toronto.

Shafting

Bourne-Fuller Co., Cleveland, Ohio.
Jeffrey Mfg. Co., Columbus, Ohio.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Shoar Knives

Carlin's, Thomas Sons Co., Allegheny, Pa.
Hay, Peter Knife Co., Galt, Ont.

Sheets (Iron and Steel)

Abbott, William, Montreal.
Bourne-Fuller Co., Cleveland, Ohio.
Leslie, A. C. & Co., Montreal.
Samuel, M. & L. Benjamin & Co., Toronto.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Smoke Stacks.

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Softening Systems (Water)

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Solder

Syracuse Smelting Co., Montreal.

Stamps & Stencils

Hamilton Stamp & Stencil Works, Hamilton, Ont.

Stand Pipes,

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Steam Gauges

American Steam Pump Co., Battle Creek, Mich.
Crosby Steam Gauge & Valve Co., Boston, Mass.
Williams, A. R., Machinery Co., Toronto.

Steam Pumps

American Steam Pump Co., Battle Creek, Mich.
Darling Bros., Montreal.
Goldie & McCulloch Co., Galt, Ont.
Leonard, E. & Sons, London, Ont.
Williams, A. R., Machinery Co., Toronto.

Steam Separators

Darling Bros., Montreal.

Steam Specialties

Darling Bros., Montreal.

Steam Valves

American Steam Pump Co., Battle Creek, Mich.
Crosby Steam Gauge & Valve Co., Boston, Mass.
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Kerr Engine Co., Walkerville, Ont.
Williams, A. R., Machinery Co., Toronto.

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Morgan Construction Co., Worcester, Mass.

Steel Rails

Algoma Steel Co., Sault Ste. Marie, Ont.
Cooper, James, Montreal.
Drummond, McCall & Co., Montreal and Toronto.

Steel Shafting

Darling Bros., Montreal.
Dodgson Mfg. Co., Toronto.
Leslie, A. C. & 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.
Hico Lewis & Son, Toronto.
Worth & Martin, Toronto.

Stoppers.

McAllough-Dalzell Crucible Co., Pittsburg, Pa.

Structural Steel.

Abbott, William, Montreal.
Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Tanks (Iron and Steel)

Scaife, Wm. B. & Sons Co., Pittsburg, Pa.

Taps

Bourne-Fuller Co., Cleveland, Ohio.

Textile Manufacturers

Canadian Colored Cotton Mills Co., Montreal.
Cantlie, James, A., Montreal.
Dominion Oil Cloth Co., Montreal.
Hamilton Cotton Co., Hamilton, Ont.
Morrice, D. Sons & Co., Montreal.
Reich & Co., Bradford, England.
Smith Wool Stock, Toronto.
Storey, W. H., & Sons, Acton, Ont.

Tin

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Samuel, M. & L. Benjamin & Co., Toronto.
Syracuse Smelting Works, Montreal.

Tin Plates

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Tool Steel

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Morgan Construction Co., Worcester, Mass.
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Leslie, A. C. & Co., Montreal.
Samuel, M. & L. Benjamin & Co., Toronto.
Wire & Cable Co., Montreal.

Wire Cloth

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Wire Drawing Machinery

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Turner, Vaughn & Taylor, Cuyahoga Falls, Ohio.

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Wire Specialties

Empire Machine & Metal Stamping Co., Toronto.
Meadows, Geo. B. Wire, Iron & Brass Works Co., Toronto.

Wire Testing Machinery

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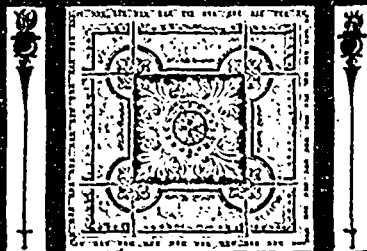
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Cowan & Co., Galt, Ont.
Karch, H. W., Hespeler, Ont.
London Machine Tool Co., London, Ont.
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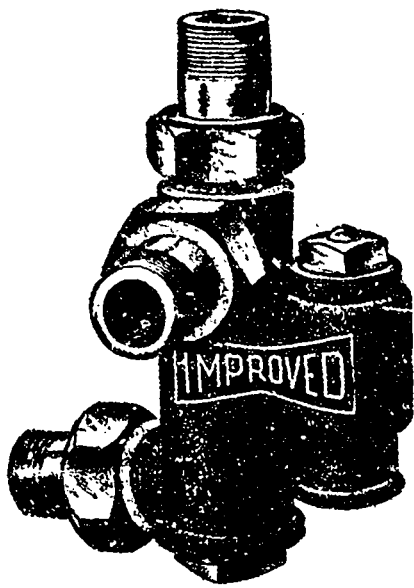
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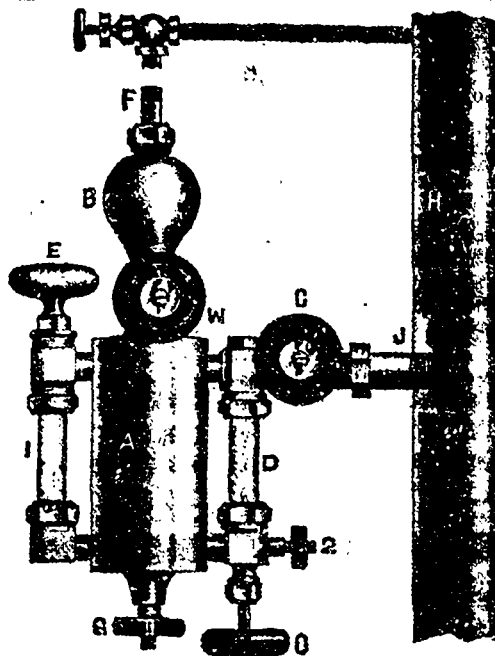
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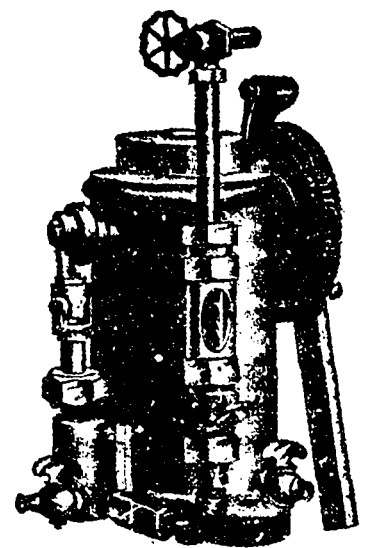
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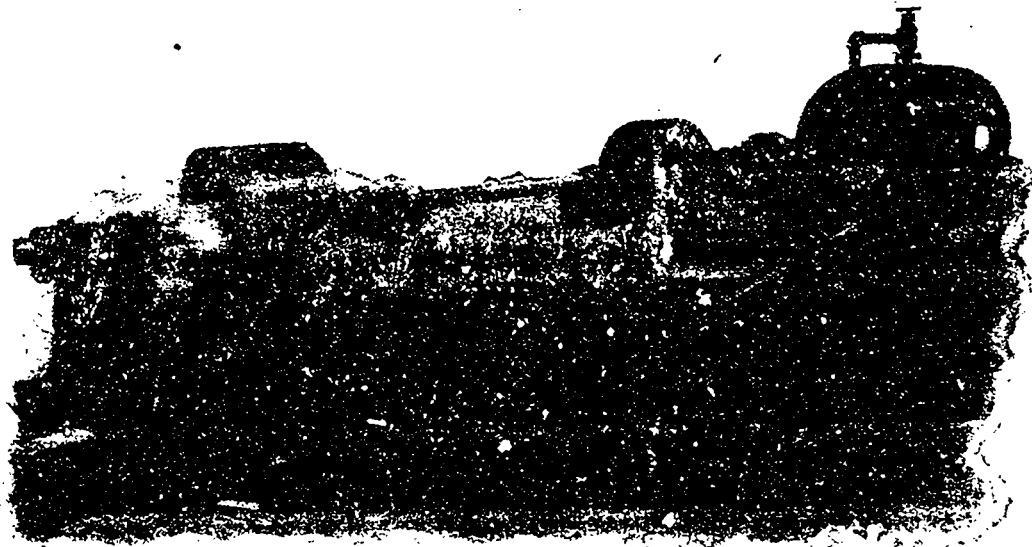
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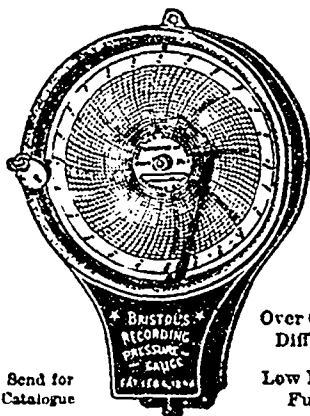
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