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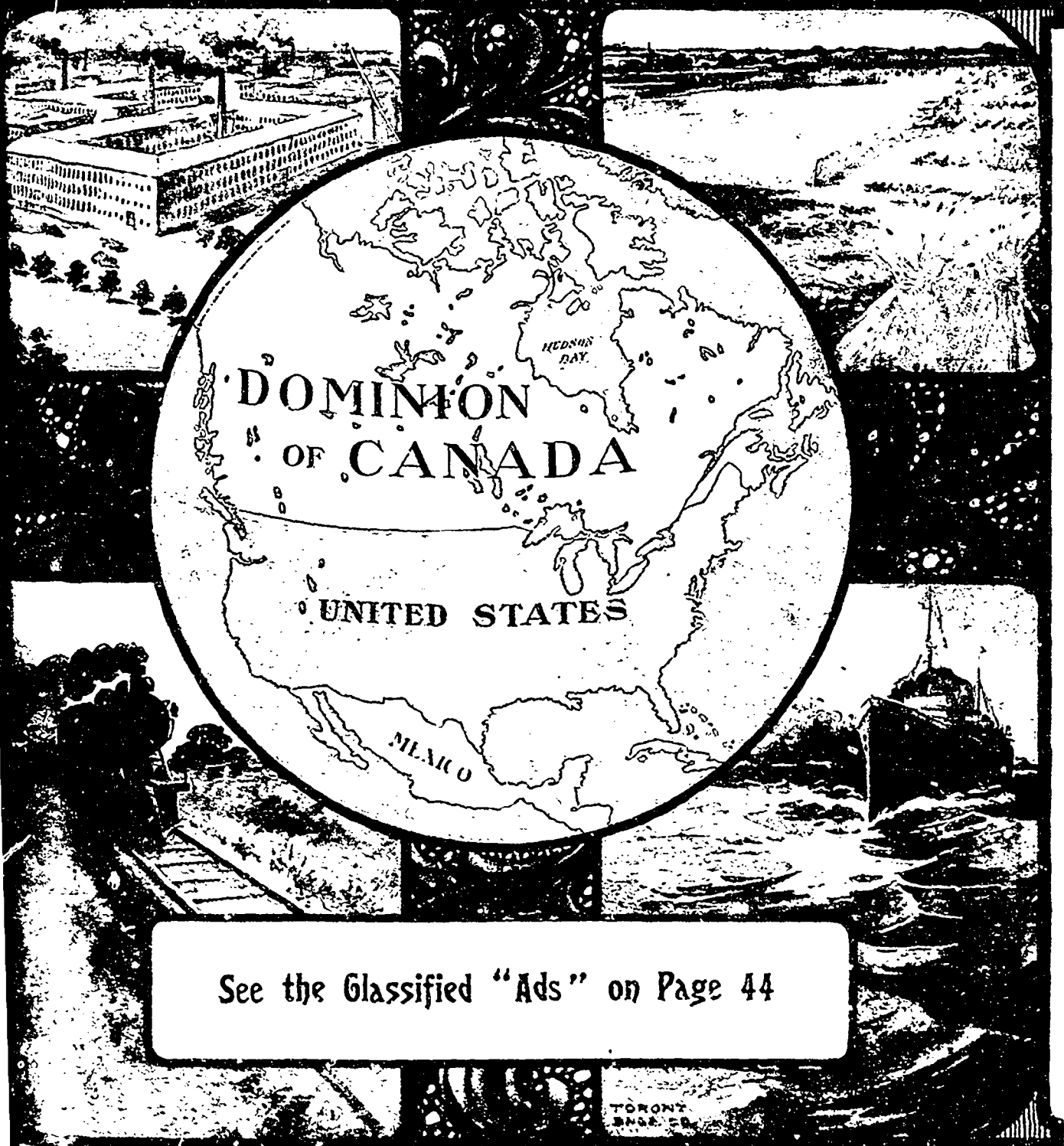
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TORONTO

MARCH 1, 1907



See the Classified "Ads" on Page 44

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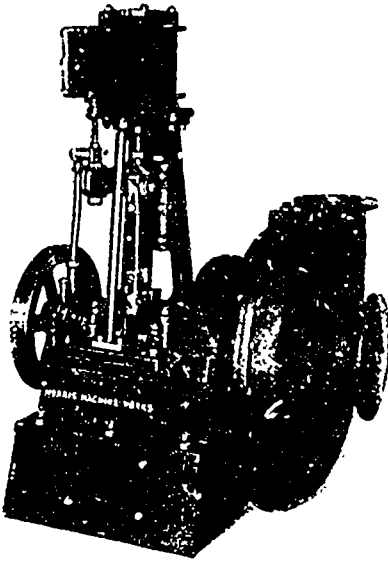
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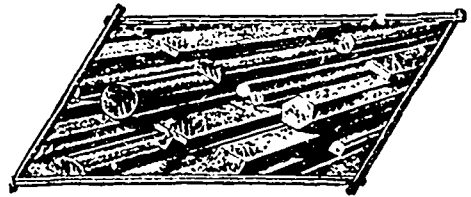
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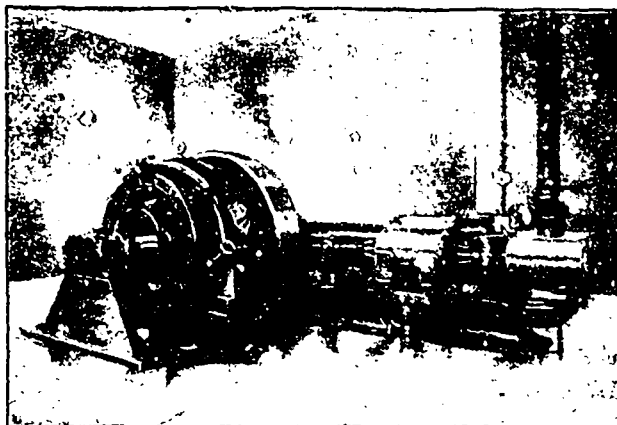
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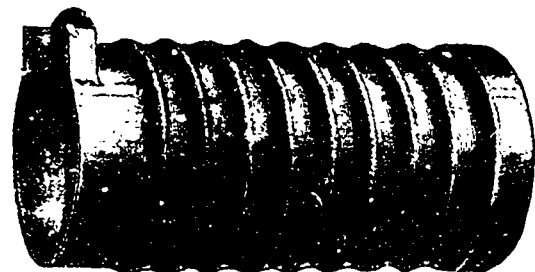
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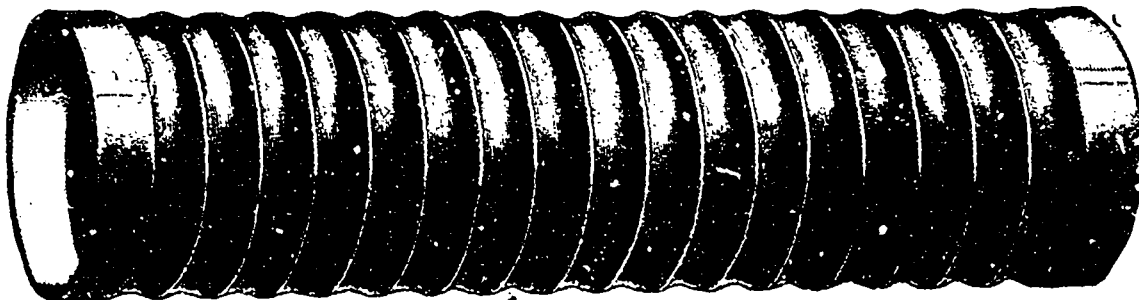
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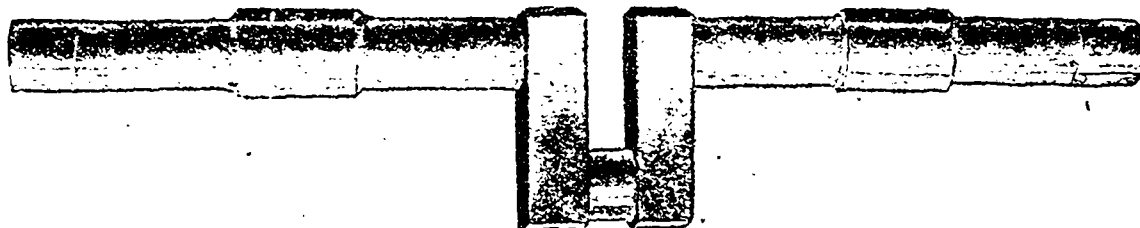
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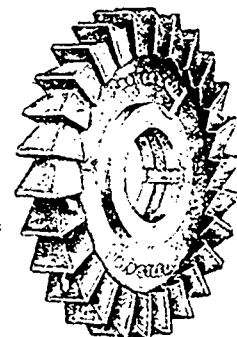
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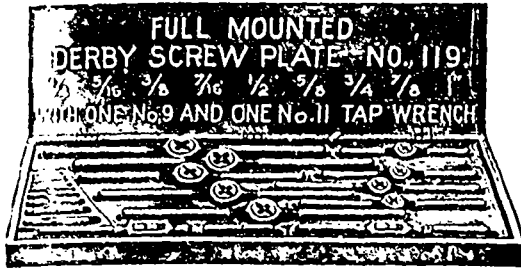
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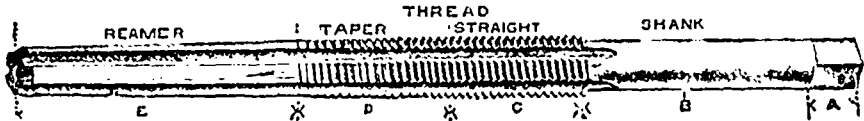
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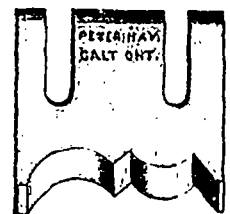
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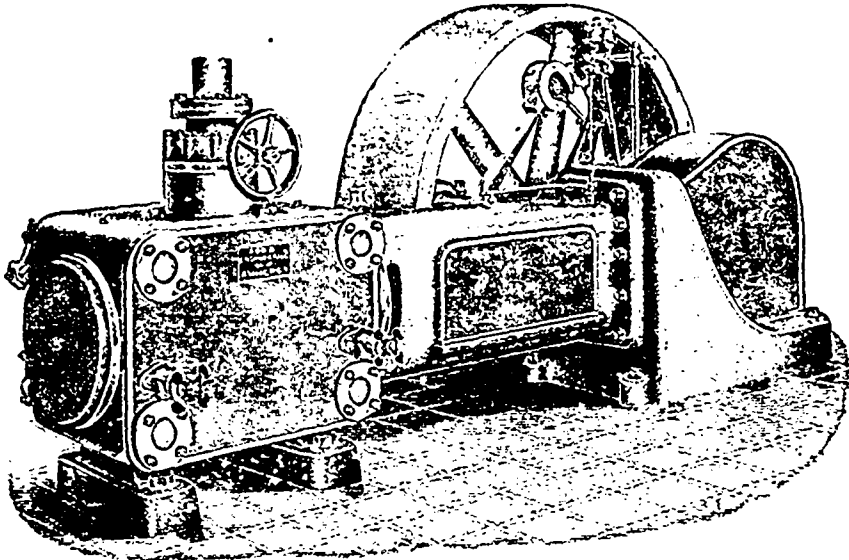
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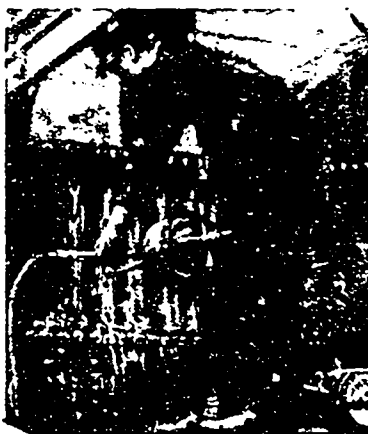
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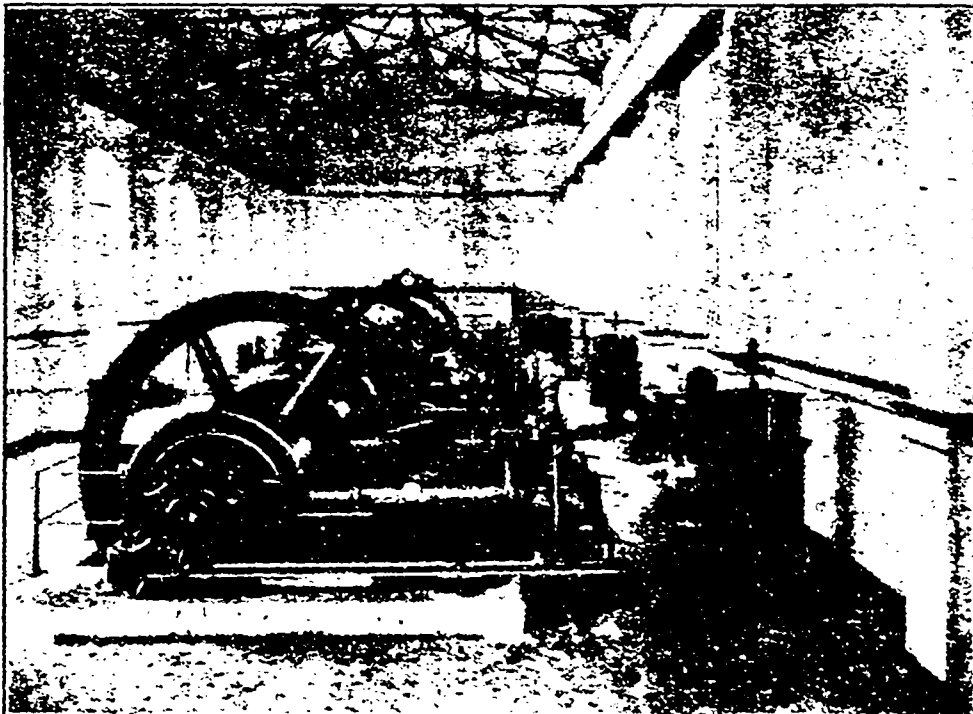
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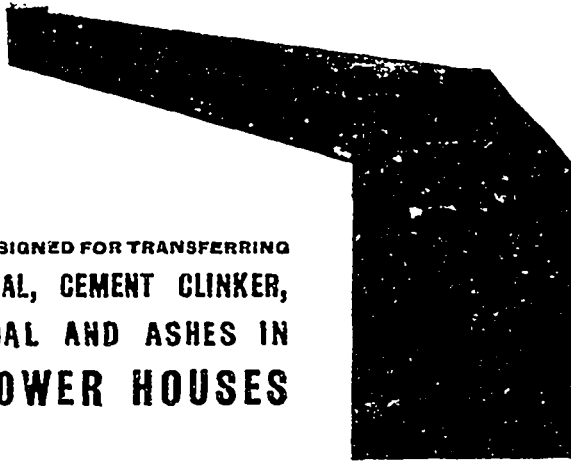
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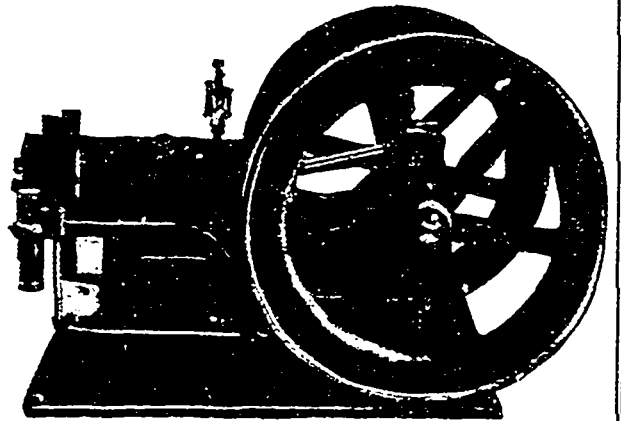
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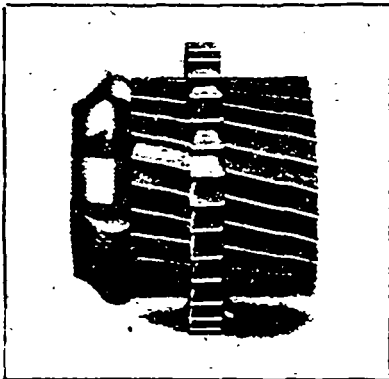
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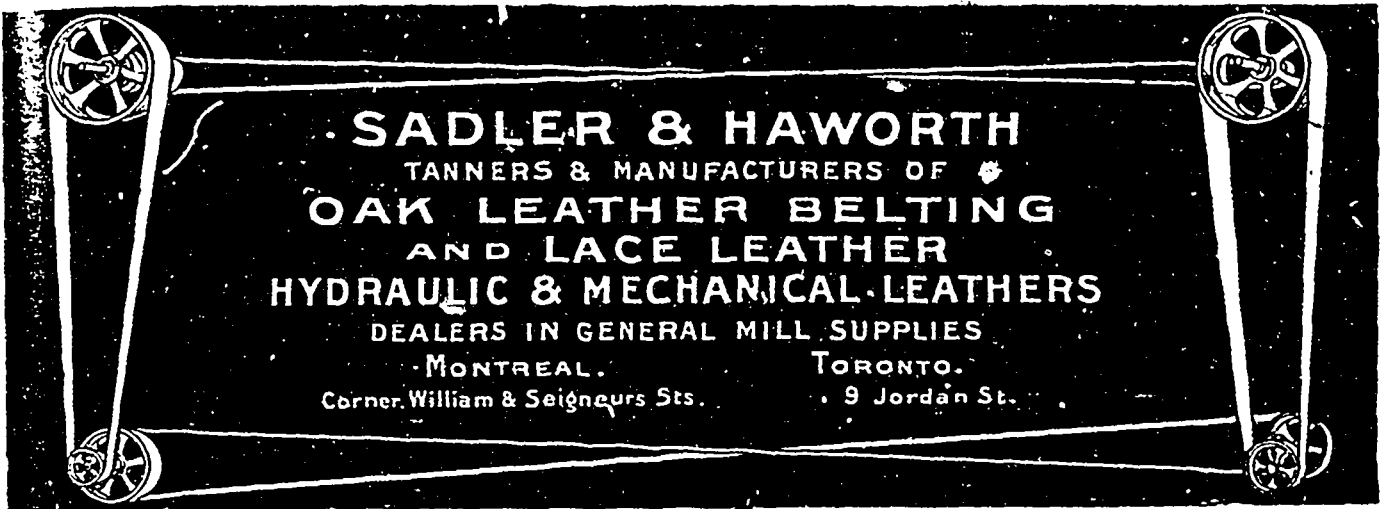
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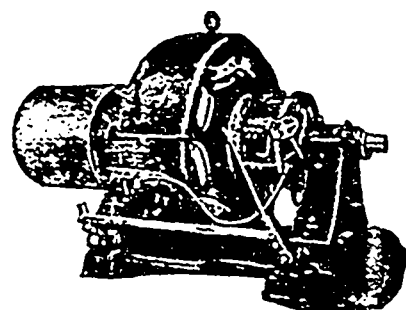
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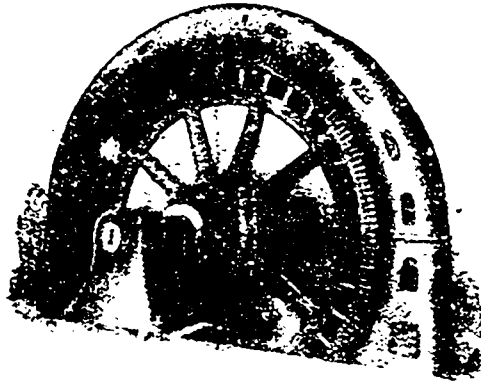
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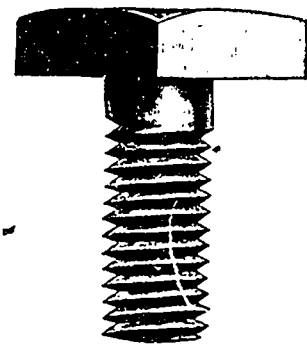
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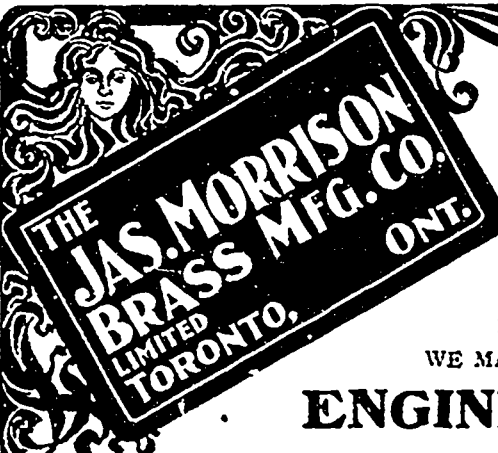
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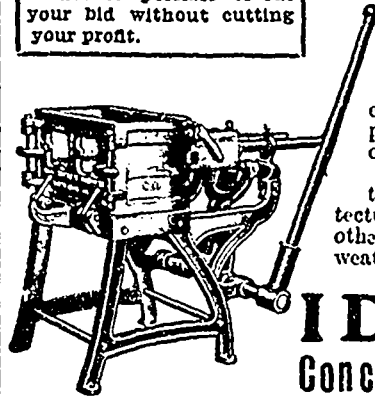
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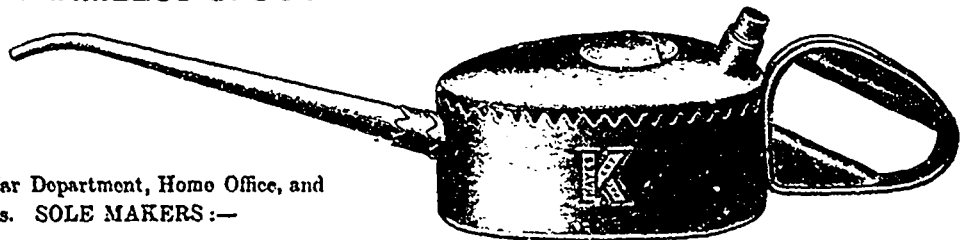
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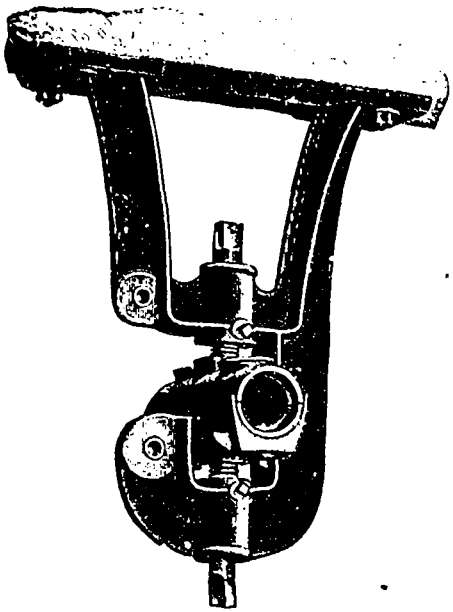


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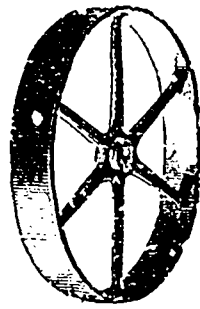
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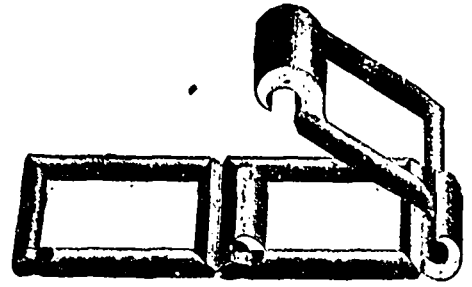
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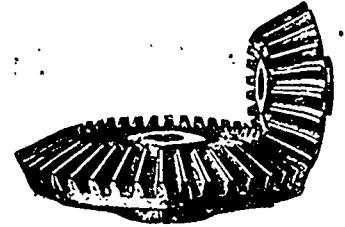


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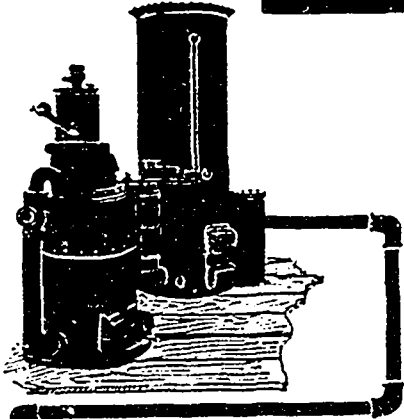


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Classified IndexPage 42
Index to AdvertisersPage 49

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THE MALLEABLE IRON INDUSTRY.

In the reorganization of the tariff now under manipulation by the Dominion Government great and important changes proposed in the duties on malleable iron, have called out comments upon the subject from many newspapers. The proposition to make these changes, startling as they are, have called forth a vigorous protest, presented to the Government a few days ago, signed by all the prominent manufacturers of malleable iron in Ontario. It is as follows:

"We, the undersigned corporations, largely engaged in the manufacture of malleable iron castings in the Dominion of Canada, respectfully and most earnestly represent that the proposed change in the tariff would affect most injuriously such industry and result practically in closing up to a large extent such business and throwing over 1,000 people out of employment.

"(1) The proposed alteration in the tariff as shown in item 1002, schedule B. of the new tariff, viz: The substitution for the words "rolled iron and rolled steel" in the original new tariff of the words "malleable iron castings," and also the change in item No. 411, "malleable sprocket" or link belting chain from 15, 17½ and 20 per cent. in the original new tariff to 'free' under the proposed tariff.

"(2) The undersigned beg to state that the following are the reasons why such a change would work injuriously and partly destroy the malleable iron industry in Canada: (a) Under the proposed change it would be impossible to compete successfully with the United States. Every manufacturer of malleable iron castings in Canada, with probably one exception, produces at present more or less castings entering into the building of harvester machinery. (b) Several of the undersigned

have built and equipped large additions to their respective plants, not anticipating this proposed tariff change. This would not only mean a most serious financial loss, but would stop all further expansion.

"One firm here represented cancelled an order for eighty workmen's cottages, as a result of change above referred to.

"In view of the foregoing we would respectfully ask the tariff commission and government to impose a duty of at least 20 per cent. on malleable iron castings for harvesting machinery and sprocket and link chain belting, coming in from the United States.

"Any lower rate of duty than this would practically mean the ruin of the malleable iron industry in Canada."

Protest was signed by the following influential concerns; The Smith's Falls Malleable Iron Co., the Ontario Malleable Iron Co., the Galt Malleable Iron Co., the Walker-ville Malleable Iron Co., the McKinnon Dash and Metal Works Co., of St. Catharines and the Pratt & Letchworth Co., of Brantford.

In the draft bill which was presented by Mr. Fielding in the House of Commons on November 29 last, item 411 reads as follows: Malleable sprocket or link belting chain, British preferential, 15 per cent.; intermediate, 17½ per cent., general tariff, 20 per cent; and in schedule B. relating to "goods subject to drawback for home consumption," item 1002 refers to "Rolled iron, rolled steel and pig iron," subject to drawback of 95 per cent. "when used in the manufacture of mowing machines, reapers, harvesters, binders and attachments for binders." Since the introduction of the bill in November quite a number of changes in it have been suggested, item 411 being changed so as to place malleable sprocket or link belting chain in the free list; and the portion of duty repayable as drawback on rolled iron and rolled steel, and pig iron, reduced to 99 per cent. discount. It is now proposed to still further blacken the eye of the industry.

This remarkable and disastrous assault upon one of the most important and flourishing industries in Canada is easily traced and attributed to the systematic and energetic campaign carried on in the agricultural constituencies, and by the free trade opponents of the bounties upon the production of iron and steel. From riding after riding, and from a great many agricultural associations in different parts of the country, delegations bearing largely signed petitions were presented to Mr. Fielding, demanding that the bounties be abandoned immediately. There is reason to suppose that the proposed bounties will be adhered to: but there is no doubt about the willingness of the Minister to sacrifice other important industries, notably the manufacture of malleable iron to the senseless clamor.

A very general impression prevails that the manufacturers of agricultural implements are heartily in accord with the agricultural associations in their fight in the malleable iron industry, although they deny the impeachment. In the fiscal year 1906, the exports of agricultural implements made in Canada were valued at \$2,497,601. Malleable iron castings, including sprocket chains, enter very largely into the manufacture of agricultural implements. In the same year our imports of the articles here alluded to, viz., harvesters, mowing machines,

reapers, parts and n.e.s., into all of which malleable iron is an integral part, were, from the United States, valued at \$657,331; and of malleable sprockets, \$43,988, a total value for the United States of \$701,319, the value of the imports of the same articles from all other countries being only \$12,254.

The malleable iron goods consumed in the manufacture of agricultural implements sold for consumption in Canada, are probably all made in Canada, while, for a number of years, the malleable iron goods consumed in the manufacture of agricultural implements for export is made in the United States, imported almost duty free, by which we mean that upon such imported malleable used, a rebate of 99 per cent. of the duty is allowed.

While the question of duties upon malleable iron goods is now so prominently under discussion it may be interesting to show how that article and agricultural implements also, have been affected by previous tariffs.

Item 244 of the Canadian tariff of 1886-87 provided as follows: "Malleable iron castings and steel castings not elsewhere specified, \$25 per ton, provided the duty shall not be less than 30 per cent. ad valorem."

Item 468 provides: "Mowing machines, self binding harvesters, harvesters without binders, binding attachments, reapers, sulky and walking plows, and all other agricultural machines and implements not otherwise provided for, 35 per cent. ad valorem."

The Canadian tariff of March, 1890, provides in item 408: "Malleable iron castings and steel castings not elsewhere specified, \$25 per ton, provided the duty shall not be less than 30 per cent. ad valorem."

Item 405: "Mowing machines, self binding harvesters, harvesters without binders, binding attachments, reapers, sulky and walking plows, and all other agricultural machines and implements not otherwise provided for, 35 per cent. ad valorem."

The tariff of July, 1894, provides: Item 255, "Malleable iron castings and iron or steel castings, n.e.s., 25 per cent. ad valorem."

Item 294. "Mowing machines, self binding harvesters, harvesters without binders, binding attachments, reapers, sulky and walking plows, harrows, cultivators, seed drills and horse rakes, 20 per cent. ad valorem."

Item 295. "Portable machines, portable steam engines, threshers and separators, horse powers, portable saw mills and planing mills and parts thereof in any stage of manufacture, 30 per cent. ad valorem."

It will be noticed that the tariff of 1894 embodied a great many reductions in duties, particularly on the articles here under consideration. On malleable iron and steel castings there was a reduction equivalent to 14 6-7 per cent. ad valorem; on agricultural implements a general reduction of 15 per cent., and agricultural machines and machinery, 5 per cent. In fact reductions in duty were made in several hundred items; and it should be taken into account that it was at a time when it was accomplished under great difficulties. It was at a time when prices were being lowered in the United States and in every other great manufacturing country—at a time when hard times had made it necessary for manu-

facturers to have to sell at cost or less than cost if they could raise the cost by so doing. It was at this period of depression, of strong foreign competition and of slaughter prices that the revisions of the 1894 tariff was undertaken. Many dutiable articles were placed in the free list, and upon many other dutiable articles the duty was very materially reduced.

And then the tariff of June, 1897, in which appeared the rates of duty imposed on imported animal and agricultural and animal dairy products, intended for the protection of that noisy class of producers who are now so vociferous in demanding the emasculation or destruction of so many manufacturing industries. Item 16 of that tariff imposed a protective duty of 35 per cent. on fresh mutton and lambs: Item 11 a duty of 20 per cent. on living animals. Item 14 a duty of 3 cents per pound on fresh meats. Item 18 a duty of 2 cents per pound on lard. Item 30 a duty of 3 cents per dozen on eggs. Item 31 a duty of 4 cents per pound on butter. Item 32 a duty of 3 cents per pound on cheese, and so on and in like manner throughout the long list. For whose benefit were these high duties imposed? Certainly not for the manufacturers nor for the laboring classes of the country.

In the 1897 tariff is provided as follows: Item 243. "Forgings of iron or steel of whatever shape or size, or in whatever stage of manufacture, n.e.s.; and steel shafting turned, compressed or polished; and hammered iron or steel bars or shapes, n.o.p. 30 per cent. ad valorem."

Item 244. "Iron or steel castings in the rough, 25 per cent. ad valorem."

Item 317. "Mould boards or shares, or plow plates, land slides and other plates for agricultural implements, when cut to shape from rolled plates of steel, but not moulded, punched, polished or otherwise manufactured, 5 per cent. ad valorem."

The articles included in these three tariff items, comprise about all the metal used in the manufacture of agricultural implements.

Item 318. "Mowing machines, harvesters, self-binding or without binders, binding attachments, reapers, cultivators, plows, harrows, horse-rakes, seed drills, manure spreaders, weeders and malleable sprocket or link belting chain for binders, 20 per cent. ad valorem."

The proposed 1906 tariff, introduced into the House of Commons, November 29, 1906, provides that all previous tariffs be repealed, to be substituted by the one under consideration. It is divided into three parts, ad valorem British Preferential, Intermediate and General.

Item 411 of it says: "Malleable sprockets or link belting chain, 15 per cent., 17½ per cent. and 20 per cent." respectively.

Item 445. "Mowing machines, harvesters, self-binding or without binders, binding attachments and reapers, 12½ per cent. 17½ per cent. and 17½ per cent." respectively.

Item 444. "Mould boards or shares or plow plates, land slides and other plates for agricultural implements, when cut to shape from rolled plates of steel but not moulded, punched, polished or otherwise manufactured, free," in each column.

Item 1002. "Rolled iron, rolled steel and pig iron, when used in the manufacture of mowing machines, reapers, harvesters, binders and attachments for binders, 95 per cent. (99 per cent?) of the duty to be remitted as drawback."

Of course all the provisions of this proposed tariff are of a tentative character and liable to be changed while under discussion in the House. In fact quite a large number of items have been so changed. Information now is that item 411, as above, which provides for a general duty of 20 per cent. on malleable sprocket or link belting chains, is to be changed and that article is to go in the free list: and that item 1002, which provides for drawback in rolled iron and rolled steel to be changed to "malleable iron castings." Those are the proposed changes which give so much disquietude to the malleable iron manufacturers. If insisted upon it will be a most disastrous blow to a most important Canadian industry.

THE COMPLEX TARIFF.

When Mr. Fielding, the Finance Minister, was introducing his new tariff in the House of Commons he explained that perhaps the most prominent feature of it would be its simplicity and its permanence. It would be so simple that any child could comprehend its meaning, and it would be, as regards permanence, like the laws of the Medes and Persians. That tariff has been before the House ever since November, and at this writing nearly 150 changes have been made in it, many of them of most vital character; and how many other changes will be made before it receives its ratification, or when its ratification will occur is more than any fellow can find out. The previous tariff, in fact all preceding Canadian tariffs, were characterized by having only one column or rate of duty, easily to be comprehended, the only exception being when Mr. Fielding introduced the unfortunate British preference of it; but it may be said of that diversion from the otherwise oneness and simplicity of it, that the net result of the duty imposed on the preferred articles could be learned by deducting one-third from the regular rates.

But all that is now changed, and the British preference is characterized by having about as many different rates as there are articles to which it is to be applied.

This simplified and permanent tariff, which is to hamper and in many instances injure and destroy some of the important industries of Canada, embraces the following complex schedule:

1. The British Preferential Tariff.
2. The Intermediate Tariff.
3. The General Tariff.
4. The French Treaty Tariff.
5. The German Syntax Tariff.
6. The Rebate Tariff.
7. The Anti-Dumping Tariff.
8. The Anti-Combine Tariff.
9. The Drawback Tariff.
10. The Non-dutiable or Free Trade provisions.

Some of these tariffs are of most remarkable character,

and place in the hands of the Government autocratic power such as the Czar of Russia would scarcely dare initiate.

CANADA'S FOREIGN TRADE IN JANUARY.

The trade returns for the month of January show a continued expansion of Canada's trade. The duty collected on imports for the month totalled \$4,096,788 as compared with \$3,604,752 for January, 1906, an increase of \$492,036. The total of imports for the month was \$26,531,978, an increase of \$3,949,842 over the same month last year. The imports for the first seven months of the present fiscal year totalled \$194,984,279, an increase of \$34,074,634 over the corresponding period of 1905-6. During the same period the total duty collected increased by \$5,944,397 as compared with last year.

The total exports of domestic products for the month of January amounted to \$16,721,081, a decrease of \$932,623 from January, 1906. The exports of coin and bullion amounted to \$4,612,898, an increase of \$716,761.

For the seven months of the present fiscal year the total exports were \$175,451,041, an increase of \$12,743,883 over the first seven months of 1905-06.

Canada's total trade for the seven months was \$370,435,320, an increase of \$46,817,517 over the same period of the preceding year. Exports of the mine for the seven months show an increase of \$1,269,867; exports of fisheries show a decrease of \$2,890,917; exports of the forest show an increase of \$6,905,602; domestic agricultural exports a decrease of \$4,229,369; manufactures an increase of \$773,865.

These facts are interesting and suggestive, nearly a half million dollars more duty collected on foreign goods in one month more than in the corresponding month of the previous year. The tariff duties are low and therefore foreign made goods, made by foreign labor, displace home made goods made by Canadian labor. This should not be. Nearly four million dollars worth of foreign goods were imported in January, 1907, than in 1906, displacing an equal value of Canadian made goods. This should not be. The reduced values of domestic exports in January, 1907, as compared with exports of similar exports in 1906, is probably due, to great extent, to the severity of the weather the present winter. It will be seen that the exports of coin and bullion in the month of January were valued at \$4,612,898. This is remarkable. This precious metal was drawn from the hoardings of the people of Canada in one month to be sent abroad to pay for the excess of imports over exports. If Canadian made goods had been given the preference over foreign made goods—if the products of the labor of Canadians had been given the preference over the products of the labor of foreigners, this great export of Canadian gold would not have occurred. It would have remained in the pockets of the Canadian people and in the Canadian banks. The exports of coin and bullion from Canada in 1906 were valued at \$9,928,828, nearly all of which was to the United States, to pay for goods imported from that country in excess of the value of our exports of merchandise. This should not be so. In fact our exports of coin and bul-

lion in 1906 were very much greater than in any other year since Confederation. During the last 10 fiscal years 1897-1906—Canada's exports of the precious metal amounted to the enormous sum of \$39,295,951, all of which was sent abroad to pay for our excess of imports of foreign merchandise over our exports of Canadian products. This is an average of nearly \$4,000,000 a year, and as we have shown, nearly \$11,000,000 was sent to the United States last year to pay largely for goods that should have been made in Canadian workshops.

So much for low duties.

COTTON SEWING THREAD AND THE TARIFF.

The new Canadian tariff relating to cotton sewing thread is included in item 535 and 536, the rate for duty being as follows:

Item 535. Cotton sewing thread in hanks, three and six cord, British preferential tariff, 10 per cent., intermediate tariff, 12½ per cent., general tariff, 15 per cent.

Item 536. Cotton or linen thread, n.o.p. crochet and knitting cotton, British preferential tariff, 17½ per cent., intermediate tariff, 22½ per cent., general tariff, 25 per cent.

Under the previous tariff, that of June 29, 1897, the duty on cotton sewing thread was stated as follows:

Item 370. Cotton sewing thread in hanks, three and six cord, 15 per cent.

Item 371. Cotton sewing thread and crochet cotton, on spools or tubes, or in bulk, and all other cotton thread, n.e.s. 25 per cent.

Under the United States tariff now in force, and which went into effect in July, 1897, the duty on cotton sewing thread is stated as follows:

Item 303. Spool thread of cotton, including crochet, darning and embroidery cottons, on spools or reels, containing on each spool or reel not exceeding one hundred yards of thread, six cents per dozen; exceeding one hundred yards on each spool or reel, for every additional hundred yards or fractional part thereof, in excess of one hundred, six cents per dozen spools or reels; if otherwise than on spools or reels, one half of one per cent. for each one hundred yards or fractional part thereof; provided that in no case shall the duty be assessed upon a less number of yards than is marked in the spools or reels.

In the fiscal year 1906 the imports of cotton sewing thread into Canada were valued as follows:—On spools, from all countries, \$357,061; Great Britain, \$158,488; United States, \$178,539. In hanks Great Britain \$383,887; United States, \$222, total \$384,109. The other imports of cotton threads during 1906 were for special purposes and were not large.

Previous to the 1903 tariff on sewing thread no distinction was made between that which came on spools or in hanks. In fact very little was imported otherwise than on spools. But an "infant industry" so called was introduced, for the encouragement of spooling, and sewing thread in hanks was admitted at 15 per cent., while that on spools was dutiable at 25 per cent. That the spooling industry has thrived and prospered under the tariff protection given is shown in the fact that while, in 1906, the value of thread imported on spools amounted to \$357,000, that in hanks was valued at \$384,000, the process of spooling being done in Canada instead of in the country where the thread was made. So much for protection, for more than

one half the sewing thread consumed in Canada is spun in Canada.

There is another noticeable feature of the consumption of sewing thread in Canada, as we have shown, while American duty on sewing thread is a half cent on every one hundred yards imported—a very high duty indeed—last year Canada imported to the value of \$178,539 from the United States, while from free trade Great Britain we bought to the value of \$158,448 only, under a hazy, nay, an effective prohibitory tariff, within a comparatively few years, the cotton sewing thread manufacturing industry has assumed most magnificent proportions while at the same time the price has been reduced, and the cost of production has been reduced to such an extent that Canada now finds it to her advantage to use much more of American thread than of thread made in free trade Britain. Protection did it and continues to do it. Sad to say, because there has never been adequate protection in Canada, there has never been a thread manufacturing industry in Canada, nor will there ever be until such protection is given. Time was, and for many, many years, and until McKinleyism forced things into a better channel, that no cotton sewing thread was made in the United States, that is, none to equal that made in Paisley, Scotland, by Coates, Clark, Brooks and others. Their names, and the thread made by them, was known to every housewife and sewing girl in the civilized world, and beside the thread made by these Paisley concerns there was none used. But when the United States entered upon the policy of high protection, and the Scotch manufacturers found it inconvenient to meet the requirement of the American tariff, the Clarks, to enable them to hold their American trade, erected extensive thread mills at Newark, New Jersey. That was in 1896, and, for the same reason the Coates' erected mills at Pawtucket, Rhode Island, the capacity of which have been enlarged from time to time until they have now grown to be as extensive as those at Paisley. The Paisley thread industry under free trade, has become almost insignificant compared to the American industry, under high protection, and because Canada has never offered adequate protection to the industry, there is no cotton sewing thread industry in the Dominion.

A POLITICAL NECESSITY.

Discussing the forthcoming Colonial Conference, and Canada's relation thereto, the Toronto Globe says:

Canada's position can be stated with frankness. Coming to a combination of circumstances protection is a political necessity in the Dominion, and the protection interests are no more willing to accept competition from within than from without the empire. It is to be used to disguise this fact by meaningless resolutions favoring "any preference that will not injure Canadian industry." If the preference allows the sale of any British or colonial goods whatever in Canada it must divert industry to that extent from one occupation to another. A preference that does not allow the sale of goods is a lamb and a need not be considered. If it allows such sale it is certain to be opposed by the strongest and best organized political interest in the Dominion. The Liberal Government took advantage of public indignation over the results of an era of extreme protection and established the present

British preference. Its benefits to the Dominion have been real and apparent and its influence on Imperial sentiment has been so strong that it cannot successfully be assailed. It stands as an example to the other colonies and as Canada's contribution to the unifying influences.

The Globe is quite right in saying that the "protected interests" meaning Canadian manufacturers, are no more willing to accept competition from within the Empire, meaning competition from Great Britain, than from without the Empire, meaning from the United States, Germany or any other country. The "combination of circumstances" to which the Globe alluded is included in what it so frequently sneers at as the National Policy, or that policy of the Canadian government which gives adequate tariff protection to every Canadian manufacturing industry. That policy has often been tried, never deceived, and is always ready to be tried again. That policy came into existence under the regime of Canada's first premier, Sir John Macdonald: and his party did not go out of power because of any dissatisfaction of the people with it, but for other causes entirely. When the present government came into power they found the National Policy of protection so entrenched in the industrial life of the people that it was as the Globe says, "a political necessity in the Dominion," and though the inclination of the present Government has always been to deviate as far as possible from that policy, even to-day the foundations of the fiscal policy that we now have supports and influences the various tariffs that we now labor under.

We quite agree with The Globe that any tariff, preferential or other, that does not in its operation allow the importing of goods from another country is undesirable for Canada desires no Chinese tariff wall. We want no tariff that would prevent revenue, but as far as possible the burden of raising the revenue should be laid on the shoulders of the foreign manufacturer—not upon Canadian consumers.

We are told that the Liberal Government, in an effort to injure the National Policy, established the present British preference. So they did, and with what effect? The internal destruction of the Canadian woolen manufacturing industry, British woolen manufacturers sell thousands of pounds worth of their products to the United States upon which they pay an average of 91 per cent. ad valorem, where they sell hundreds of pounds worth in Canada upon which the average duty is only about 22 per cent.

Why should such a difference exist? Canada should have a simplified tariff, one schedule against the whole outside world, and it should be high enough to afford adequate protection to every Canadian manufacturing industry.

BUTTER AND CHEESE AND THE TARIFF.

In his evidence before the Agricultural Committee of the House of Commons a few days ago, Mr. J. A. Ruddick, Dairy and Cold-storage Commissioner, emphasized the importance of the producer paying increased attention to the home markets, and pointed out that under the census of 1901, while the export of dairy produce was

valued at \$29,000,000, the home consumption absorbed products to the value of \$66,000,000.

The figures show that the production of dairy products in Canada, supposedly butter and cheese, in 1901, was valued at \$95,000,000, of which about 70 per cent. was consumed in Canada in the home market, and about 30 per cent. exported.

According to the Trade and Navigation returns, Canada's exports of butter and cheese in the fiscal year 1906 were as follows:—Butter, 34,081,142 pounds, valued at \$7,086,019; cheese, 215,916,157 pounds, valued at \$24,441,664; a total value of \$31,527,683 of exports. If \$31,527,683 is 30 per cent. of the entire production, that production must be valued at \$105,092,279, of which \$73,564,596 was consumed at home. This amount shows to a certain extent the value of the home market to the Canadian producers of butter and cheese.

But Canadian producers of butter and cheese did not supply all of the Canadian demand for those articles in 1906, for our imports of them in that year were 143,451 pounds of butter valued at \$34,944, and of cheese, 368,631 pounds valued at \$65,309, a total value of \$100,253.

In 1906 the Canadian duty on butter was four cents per pound, and of cheese three cents and the amount of duty paid in that year was—on butter \$5,232 and on cheese, \$10,923, total, \$16,155.

Where did these imports of butter and cheese come from? Of butter, 103,923 pounds, valued at \$25,810, and of cheese, 162,989 pounds, valued at \$28,838, total value \$54,648, came from the United States.

Who paid the duty? The contention of the streams of agricultural delegates that have interviewed the government on tariff matters, the Globe, the Farmers' Sun, et al is that the consumer pays the duty always. But here we see that in the face of the duty of four cents a pound on butter and three cents on cheese, more than \$100,000 worth of these articles were imported into Canada last year, very largely from the United States; and it cannot be said that Canada was not able to supply that demand, for in the same year our exports of those two articles were valued at more than \$31,500,000.

WORKINGMEN'S COMPENSATION.

A radical departure from the present law is embodied in the amendment to the Workmen's Compensation for Injuries Act, introduced by Mr. Thomas Crawford, of Toronto. The measure, which is based upon the enactment of the Imperial Parliament in 1906, as a result of an enquiry by Royal Commission, has for its main feature the provision that all workmen injured in the course of their employment are entitled to compensation from their employers, whether the accident was caused by the negligence of the employer or a defective plant or not. Under the bill injured workmen are to receive 50 per cent. of their wages during the time that they are disabled. In case of death, those who are dependent on him are to receive a sum whose maximum is fixed at \$1,500. Many types of accidents are to be reported to the Lieutenant-Governor in Council, and in cases in which compensation is demanded under the Act, are to be heard

by arbitrators appointed by the county judges instead of by the High Court. As an alternative to incurring the liability, as outlined above, employers, if the bill passes, will be empowered to arrange for a scheme of insurance instead of compensation. Of course, the employer may ensure himself against this as against other liabilities, and, in the event of the failure of the firm, the workmen will have a lien on this insurance.

The only event in which the employer is freed from the obligation of paying his injured workmen is made clear in the section which states that "if it is proved that the injury to the workman is attributable to the serious and wilful misconduct of the workman, claims shall be disallowed."

The chief new feature is the establishing of the liability of employers, whether they have been guilty of negligence or not. The only exception is in case of "serious and wilful misconduct" on the part of employees. There is a further departure toward simplicity in the provision for a summary decision before arbitrators appointed by the County Judge. The British law on which Mr. Crawford's bill is largely founded, provides that no compensation is in any event payable unless the injury disables the workman from earning full wages at his employment for at least one week, and that if the workman is so disabled for less than two weeks, no compensation is payable in respect of the first week. This proviso is intended to prevent malingering or false claims. The maximum compensation in any case is £300, and the minimum on the death of a workman whose relatives are wholly dependent upon him, £150. Within these limits the compensation is fixed at the average earnings for three years. There are proportionate reductions where dependents are only partially supported by the workman. If there are no dependents the employer pays medical and funeral expenses with a limit of £10. Where total or partial incapacity results, the workman receives a weekly sum during the incapacity not exceeding 90 per cent. of his average weekly earnings during the preceding twelve months. If he is under twenty-one years of age, and his earnings are less than a pound a week, he receives 100 per cent. of his weekly average. In Mr. Crawford's bill the scale of compensation is graded to allow the workman 50 per cent. of his wages during his disability, or, in case of death, a maximum of \$1,500 to his dependents.

The intention of the bill, and the effect of it, if it is passed, is to compel the manufacturer to pay for accidents to employees *nolens volens*. and another effect will be to reduce the general compensation to employees to the extent, at least, of the cost to the manufacturer of whatever it may cost him for insuring his servant against any accident that may occur while in the discharge of his duty. To our view there is no more right, reason or justice in making the employer liable for an accident to his employee while in the discharge of his duty than to compel him to pay for the accidental destruction of the employees' house by fire. The employer should not be liable for either.

It is claimed that the reason for Mr. Crawford's sum-

mary method of recovery for damage by accident to an employee is because of the unwieldiness of the courts and the expense and delay incident to any action thereon. Such obstacles in the courts are very importunate, of course, and it is the duty of the legislature to remedy them if possible: but it is no part of the duty of the legislature to impose wrongs and hardships upon employers because of the unwieldiness and inadaptability of the courts. Under Mr. Crawford's proposed law should there be a hundred or more or less workers in a factory and a cyclone, or hurricane, or an electric discharge from the sky injure all of them, for which the employer could in no way be deemed liable, being the so-called "Act of God," yet the proprietor would be held liable, and in a most summary manner be mulet in heavy damages.

Suppose it were susceptible of proof that to a workman could be attributed an accident through his own negligence and willful misconduct, and that at the same time and by the same mishap material injury or destruction occurs to the property of the employer, would not the careless workman be liable for the damage? But this contingency does not appear to be provided for in Mr. Crawford's bill.

GERMANY AND CANADA.—THE INTERMEDIATE TARIFF.

"Export," organ of Germany's Central Geographical Union, for the spread of information concerning commercial geography and for aiding German efforts to establish trade in foreign parts, has a leading article on the tariff and trade relations between Canada and the Empire. It thinks the tariff war, waged for some time, is in a fair way of being settled in a manner favorable to both countries.

After discussing Canada's three tariffs—general, intermediate and preferential—"Export" says that the situation or relations with Germany are still strained. The differentiation in Germany's tariff rates that resulted in laying burdens on Canada, it is claimed, resulted in misunderstandings. A hope is expressed that both parties will get together for the purpose of going over the legislation and regulations of the past, with a view to a remedy.

The writer hopes that Germany is ready to remove the burdens with which she met Canada's movements in favor of the United Kingdom and about which Canada complained when they were put on, and concerning which she complains. "Canada is ready to reciprocate," says this writer, and he urges an arrangement that will benefit both parties. Possibilities are pointed out that would benefit the Empire's sugar and other manufactured products under the intermediate tariff schedule. It is declared that Canada's tariff policies for a long time will be dictated by the farms and forests. By the development of vast tracts in Manitoba, Saskatchewan, and other sections an enormous increase in Canada's wheat crop is being recorded. This is leading to a largely increased export trade, which is still further augmented by beef both on the hoof, in cold storage, and in cans. Exports of lumber are also large. All of these products are needed

in Germany. Canada is growing more and more to be a country whose exports are to be somewhat limited to the products of the farms, forests, mines, and fisheries. Most of these are differentiated against in the Empire to such an extent as to practically exclude them.

This differentiation was Germany's answer to Canada's tariff favoring imports from the United Kingdom. Germany believed it had the right to the preferential rates, basing its belief on the terms of its tariff treaty with Great Britain and colonies, which provided that German goods should not be more unfavorably dealt with in the British colonies than British goods, or words to that effect. The British Government gave notice in 1898 of its intention to abrogate that treaty. A *modus vivendi* was worked out by Germany's diplomatic representative in Canada. Every effort to get Canada to give up her position failed. Germany, while willing to admit Canada's right to give the mother country preferential rates, still struggled to get concessions. These efforts failed. Even France, because of a treaty made a few years before, had advantages denied to Germany. Step by step the differential tariffs on the side of Germany and the preferential on the part of Canada led to a tariff war that is still being waged.

What it meant to Germany appears in the record of its trade in recent years. The total exports of Germany to Canada in 1902 amounted to 38,700,000 marks; in 1903 to 35,800,000; and in 1904 to 23,200,000; and in 1905 to 21,800,000. This falling off is seen in its full significance when it is pointed out that the normal conditions, had there been no tariff war, would have been just the opposite—a steady gain. During the years indicated Canada's exports to Germany averaged annually about nine or ten million marks. This small amount seems much more insignificant when the fact is recalled that the German Empire is a large importer of the very commodities that Canada exports—food products of all kinds, particularly cereals and meats. It is hardly necessary to detail the efforts of each if not to injure the other, at least to make it "let up" in its rates. The German Empire went further and further in its differentiation till it affected a great many articles of Canadian production. This has had its effect. Canada, increasing its production of the articles needed most in international markets, is looking for more than a *modus vivendi*.

It is claimed that Germany can cover a large part, if not its entire demand, for wheat, meats, lumber, etc., in Canada, just as well as in the United States. Indeed, Canadian wheat might be used as a weapon with which to beat the Americans into subjection. Just as soon as the Empire, says "Export," appears as a purchaser of large quantities of Canadian wheat and meat, the American farmer will begin to bring pressure on Congress in order to secure better trade relations with the Empire. In the six years, 1900-1905, Canada sold Germany beef worth \$8,000,000. At present prices this trade could be easily enlarged, but its enlargement is only possible by giving to Canada the same terms as are accorded to Austria-Hungary, Russia, etc. If the war goes on, Canada's

exports to Germany will grow less and less. If Canada enters into reciprocal relations, Germany is sure to become one of the biggest and best buyers in her markets. All the empire asks is a fair chance. It admits Canada's rights to give Great Britain preferential rates. What Germany wants is intermediate rates granted or regulated in such a way as to permit of German goods competing with British.

To secure this competition, Germany favors a change from ad valorem to specific duties and desires changes made in administrative methods that will expedite custom house clearances. Besides the benefits to Canada and Germany, better results would soon be recorded between Germany and other British colonies, for success in one is sure to be followed by emulation and success in the others.

In this connection it is interesting to note the fluctuations of trade in the last five years between Canada and Germany. The greatest value of Canadian products ever exported to Germany was in 1902 when it amounted to \$2,692,578, and the greatest value of German goods entered for consumption in Canada was in 1903 when it amounted to \$12,282,637. The trade in the five years alluded to was as follows, the figures relating to domestic exports and goods entered for consumption:

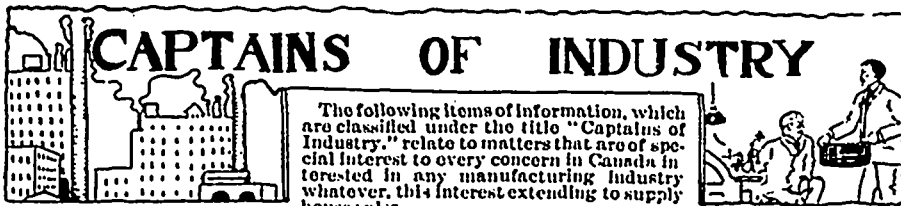
	Exports to Germany.	Imports from Germany.
1902	\$2,692,578.....	\$10,823,169
1903	2,097,699.....	12,282,637
1904	1,819,223.....	8,175,604
1905	1,146,654.....	6,695,414
1906	1,872,557.....	6,987,314

In 1906 the total value of dutiable goods imported from Germany was \$5,001,722, and of free goods \$1,985,592.

The figures do not indicate all of the dutiable goods imported into Canada from Germany in 1906, for, as shown in the trade and navigation returns, the surtax duties collected amounted to \$2,210,706 on merchandise valued at \$5,943,038. The value of goods imported direct from Germany which paid the surtax was \$4,899,916, the surtax duty paid on which was \$1,827,470. The goods of no country except Germany is liable to the surtax, but German goods, imported through any other country are liable to it.

EDITORIAL NOTES.

The correspondence between Great Britain and Canada in regard to the approaching Colonial Conference has been presented to the House by Sir Wilfrid Laurier. In so far as Canada is concerned, the chief feature of the return is that the Canadian Government has so far not suggested any special subjects or resolutions for discussion at the conference. New Zealand, Australia and Cape Colony have each proposed a long series of subjects and resolutions dealing with preferential trade, an Imperial Council, an Imperial Court of Appeal, decimal currency and the metric system, treaty obligations, coasting laws, etc. As a matter of course, Sir Wilfrid, and several other ministers will go to London and it is to be hoped that it will be in the character of interested spectators rather than as participants in any free trade within the Empire scheme calculated to hamper Canada's expansion as an independent nation among nations.



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

The Ottawa Wood-Bending Co., Ottawa, will be recapitalized at \$40,000, and a large factory will be erected in Hull, Que. They will manufacture all kinds of bent wood work, such as hockey sticks, skis, wagon shafts, etc.

The building formerly occupied by the Brantford Sewer Co., Brantford, Ont., has been purchased by the Cockshutt Securities Co.

The Windsor Board of Trade, Windsor, Ont., held its annual meeting a few days ago and elected new officers. J. F. Smyth was elected president; Arch McNee, vice-president, and J. G. Garnier, secretary-treasurer. A strong effort will be made to induce industrial firms to locate there, and the president, with a large committee, will visit Toronto to secure the necessary legislation to permit the city to bonus such concerns when necessary.

J. Griffin, Fort William, Ont., will erect a four-story business block.

S. Ballachey, Paisley, Ont., will erect a new creamery.

A cold storage plant will be established at Owen Sound, Ont., at a cost of about \$40,000.

A plant may be established at Stratford, Ont., for the manufacture of acetylene gas generators. W. J. McLean, St. Williams, Ont., is interested.

McKinnon Bros., Port Arthur, Ont., have secured a site and will erect a factory for the manufacture of automobiles and bicycles.

The Ottawa Turkish Baths, Ottawa, will be enlarged at a cost of about \$20,000.

The Dominion Power & Transmission Co., Hamilton, Ont., have taken over the Cataract Power Co. The company also have direct control of the Terminal Station Co., and an interest in the Hamilton & Brantford Electric Railway Co.

Several freight cars of the Grand Trunk Railway Co., near Belleville, Ont., were destroyed by fire recently. Loss about \$25,000.

The Jackson Co., clothing manufacturers, Goderich, Ont., have commenced operations.

The Sawyer-Massey Co., Hamilton, Ont., will erect a warehouse at a cost of about \$15,000.

The Algoma Bridge Co. will establish a large plant at Sault Ste. Marie, Ont.

Messrs. C. S. Peaslee & Son, Prospect, N.Y., will erect a large shoe factory at Niagara Falls, Ont. When completed the factory will have 20,000 square feet of floor space.

The wood work and bee supplies department of Gould, Shapley & Muir, Brantford, Ont., were damaged by fire February 11. Loss about \$35,000.

It is stated that a branch of the Compagnie des Metaux Unita, manufacturers of steel mining drills, and tools, Paris, France, will be established in Toronto, and that the company will give employment to about 2,000 men.

Dr. Reddick, Larder Lake Mines, Ottawa, have been incorporated with a capital of \$2,000,000, to carry on a mining, milling

and reduction business. The provisional directors include J. S. Virtue, G. R. Lipsey and J. B. Bedard, Ottawa.

The McConnell Silver Mining Co. of Cobalt, Ottawa, have been incorporated with a capital of \$200,000, to carry on a mining, milling and reduction business. The provisional directors include A. McConnell, J. T. Baskin and H. G. Campbell, Ottawa.

The Lake George Cobalt Silver Mining Co., Toronto, have been incorporated with a capital of \$600,000, to carry on a mining, milling and reduction business. The provisional directors include W. McBain, T. A. Silverthorn and R. M. Martin, Toronto.

The Canadian Mines Syndicate, Ottawa, have been incorporated with a capital of \$100,000, to carry on a mining, milling and reduction business. The provisional directors include J. P. Dickson, J. B. Watson and T. A. Beament, Ottawa.

The Ottawa Cobalt Mining Co., Ottawa, have been incorporated with a capital of \$250,000, to carry on a mining, milling and reduction business. The provisional directors include H. H. Lang, A. T. Taillon, and J. U. Vincent, Ottawa.

Messrs. Eby-Blain, Limited, Toronto, have been incorporated with a capital of \$400,000, to manufacture groceries, merchandise, etc. The provisional directors include J. F. Eby, H. Blain and W. J. McMurtry, Toronto.

The Davies Wholesale Tailoring Co., Toronto Junction, Ont., have been incorporated with a capital of \$40,000, to manufacture clothing, men's furnishings, etc. The provisional directors include C. H. Davies, G. H. Langan, Stratford, Ont., and E. J. Kurtz, Nashville, Ont.

The Excelsior Constructing & Paving Co., Toronto, have been incorporated with a capital of \$30,000, to manufacture concrete, cement, etc. The provisional directors include J. G. Murphy, W. Mitchell and S. H. Bradford, Toronto.

Messrs. J. J. Walsh & Co., Toronto, have contracts to erect sixty-five new dwellings in Parkdale this coming summer.

The Niagara, St. Catharines & Toronto Railway Co., St. Catharines, Ont., will extend their line to Virgil Village, a short distance from Niagara-on-the-Lake, Ont.

The Board of Directors of the Y.W.C.A., Hamilton, Ont., will erect a new building.

The Little Larder Lake Gold Mining Co., Haileybury, Ont., have been incorporated with a capital of \$100,000, to carry on a mining, milling and reduction business. The provisional directors include J. E. Day, J. M. Ferguson and A. W. Bixel, Toronto.

The Golden Horn Mines, Toronto, have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business. The provisional directors include G. R. Strathy, W. C. MacKay and F. Pottage, Toronto.

The Electric Bean Chemical Co., Ottawa,

have been incorporated with a capital of \$50,000, to manufacture patent medicines, etc. The provisional directors include R. N. Bates, W. Bradley and D. E. Winter, Ottawa.

The Northern Larder Lake Mining Co., Haileybury, Ont., have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include M. P. Wright, W. S. Blackwall and S. D. Briden, Haileybury, Ont.

R. H. Knight, Limited, Sault Ste. Marie, Ont., have been incorporated with a capital of \$40,000, to manufacture goods, wares, merchandise, etc. The provisional directors include R. H. Knight, J. F. Beattie and W. H. Hearst, Sault Ste. Marie, Ont.

The Sarnia Automobile & Bus Co., Sarnia, Ont., have been incorporated with a capital of \$40,000, to manufacture automobiles, motor cars, etc. The provisional directors include S. Hitchcock, R. MacKenzie, and J. W. Ryder, Sarnia, Ont.

The Fruit Grower Publishing Co., Grimsby, Ont., have been incorporated with a capital of \$25,000, to carry on a printing, publishing and engraving business. The provisional directors include J. A. Livingston, H. L. Roberts, Grimsby, Ont., and W. J. Andrews, Clinton Township, Ont.

The Smart-Turner Machine Co., Hamilton, Ont., have sold automatic feed pumps and receivers to Bechtels, Limited, Waterloo, Ont., and to the Dominion Heating & Ventilating Co., Hespeler, Ont.

The Silver Pick Cobalt Mining Co., Ottawa, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include C. T. Moffat, C. G. Brown and E. Marriott, Ottawa.

Canadian Engineers, Limited, Ottawa, have been incorporated with a capital of \$40,000, to carry on the business of mechanical, mining, electrical, civil and consulting engineers. The provisional directors include T. T. Simpson, R. W. Farley and S. J. Chapleau, Ottawa.

The Lincoln-Nipissing Development Co., St. Catharines, Ont., have been incorporated with a capital of \$160,000, to carry on a mining, milling and reduction business. The provisional directors include E. C. Holder, T. Nihan and C. J. E. Baby, St. Catharines, Ont.

The Viceroy-Cobalt Mining Co., Toronto, have been incorporated with a capital of \$3,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. F. Boland, H. J. Macdonald and C. L. Bray, Toronto.

The Dunnville Consolidated Telephone Co., Dunnville, Ont., have been incorporated with a capital of \$60,000, to carry on the business of a telephone company. The provisional directors include R. A. Harcourt, I. Marshall and A. W. Haun, Dunnville, Ont.

The Smart-Turner Machine Co., Hamilton, Ont., are supplying a double pump and receiver outfit to the Continental Lumber Co., Toronto.

The Argyll Silver Mining Co., Toronto, have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business. The provisional directors include W. Postlethwaite, F. V. Moore and G. Marks, Toronto.

The Robinet Brick Co., Sandwich, Ont., has been incorporated with a capital of \$200,000, to manufacture brick, tile, sewer pipe, cement, lime, stone, etc. The provisional directors include J. Robinet, F. J. Robinet, Sandwich, Ont., and V. M. Allan, Windsor, Ont.

The Silver Square Mining Co., Cobalt, Ont., has been incorporated with a capital of \$200,000, to carry on a mining, milling and reduction business. The provisional directors include J. Shilton, W. H. Wallbridge and H. J. Dunn, Toronto.

The St. Lawrence Cobalt Mining Co., Brantford, Ont., has been incorporated with a capital of \$40,000, to carry on a mining, milling and reduction business. The provisional directors include E. J. Plumley, G. V. Sahlorn and W. E. Waterman, Buffalo, N.Y.

The Fluid Oil & Gas Co., Manitowaning, Ont., has been incorporated with a capital of \$20,000, to manufacture oil, gas, petroleum, etc. The provisional directors include R. W. Wallace, Manitowaning, Ont., R. E. Fitzgibbon and W. B. Beecher, Pittsburg, Pa.

The Queen City Groceries, Toronto, have been incorporated with a capital of \$50,000, to manufacture goods, wares, merchandise, etc. The provisional directors include G. G. Fitch, J. E. Parsons and M. M. Campbell, Toronto.

W. C. Clark, Shelburne, Ont., is installing a Smart-Turner power pump.

The Hood Knitting Co., Lindsay, Ont., has been incorporated with a capital of \$20,000, to manufacture knitted goods, cloth, yarns, etc. The provisional directors include E. Hood, G. Hood, Toronto, and A. Horn, Lindsay, Ont.

The Merner Mfg. Co., Alliston, Ont., has been incorporated with a capital of \$300,000, to manufacture engines, threshers, agricultural implements and machinery, etc. The provisional directors include S. Merner, Berlin, Ont., A. Merner, and E. M. Devitt, Waterloo, Ont.

Barnard's Point Gold Mining Co., of Larder Lake, Hamilton, Ont., has been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include H. Barnard, B. Brockton and W. Marshall, Hamilton, Ont.

The Stadacona Cobalt Silver Mining Co., Cobalt, Ont., has been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. A. O'Connell, A. Ross and F. H. Manley, Montreal.

The Canada Chair Co., Perth, Ont., has been incorporated with a capital of \$40,000, to manufacture chairs, cots, cabinets, etc. The provisional directors include J. H. Mendels, W. W. Walker and C. J. Foy, Perth, Ont.

The Toronto Plate Glass Importing Co., Toronto, has been incorporated with a capital of \$250,000, to manufacture glass, etc. The provisional directors include E. Hill, S. J. Bradford and J. G. Hutchinson, Toronto.

The planing mill of the Grand Trunk Railway Co., London, Ont., was destroyed by fire February 23. Loss about \$30,000.

J. I. Wilson & Son, Chatham, Ont., will prepare plans for a new Queen's Hotel to be erected at Ridgeway, Ont., to replace the one recently destroyed by fire.

The Roundhouse of the Canadian Pacific Railway Co., Havelock, Ont., will be doubled in capacity.

The Canada Casket & Lumber Co., Rodney, Ont., has been incorporated with a capital of \$10,000, to manufacture lumber, furniture, woodenware, etc. The provisional directors include D. H. McRitchie, W. N. Lusty, and A. J. Liebner, Rodney, Ont.

The Battle Creek Toasted Corn Flake Co., London, Ont., has been incorporated with a capital of \$100,000, to manufacture nut foods, flake foods, cereals, druggists' supplies, etc. The provisional directors include C. R. Somerville, T. Baker and J. M. Moore, London, Ont.

The Smart-Turner Machine Co., Hamilton, Ont., are supplying a single and a duplex outside packed plunger pump with pot valves to the steamship Agawa, of the Lake Superior Power Co., Sault Ste. Marie, Ont., and to the Western Salt Co., Mevontown, Ont.

The Hamilton & Fort William Navigation Co. have placed an order with the Canadian Shipbuilding Co., Toronto, for an 8,000-ton steamer to be used on the upper lakes for shipping coal and ore. The new vessel will be 160 feet long and will have a depth of 29 feet and a 53-foot beam. Quadruple expansion engines and Scotch boilers of the latest type will be installed.

A canning factory may be established at Ridgeway, Ont. A. Long, Ridgeway, is interested.

The Brown, Bigelow Co., St. Paul, Minn., may establish a lithographing and printing concern in London, Ont.

E. Carlton, proprietor of the Balmoral Hotel, Hamilton, Ont., may erect a sixty-room hotel there.

The International Portland Cement Co., Ottawa, will double the capacity of their plant, making it 4,500 barrels per day.

The Massey-Harris Co., Brantford, Ont., will erect an addition to their plant at a cost of about \$25,000.

The John Mann, Sen & Co., Brantford, Ont., have purchased a plant for the manufacture of sand lime brick. The plant will have a capacity of 30,000 brick per day.

The Board of Trade for the town of Whitby, Ont., has been organized by the election of an executive committee of eighteen and the following officers:—President, Dr. W. Adams; vice-presidents, James Rutledge and A. M. Ross; treasurer, John Thomson; secretary, Dr. John Waugh.

An air compressor plant having a daily capacity of 2,600,000 gallons will be installed at Berlin, Ont., at a cost of about \$7,500.

St. Catharines, Ont., invite tenders up to March 11 for the paving of several streets, either with vitrified brick, sheet asphalt or bitulithic.

The Mornington township council, Burns, Ont., will build a steel and concrete bridge over the Milverton River.

J. Anderson, Hickson, Ont., invites tenders up to March 11 for the construction of two steel bridges in East Zorra Township, Oxford County, Ont.

The Eagle Knitting Co., Hamilton, Ont., have ordered a single outside packed plunger pump with pot valves from the Smart-Turner Machine Co., Hamilton, Ont.

M. J. Adams, J. H. McKnight, S. R.

Wickett and J. M. Sinclair, Toronto, are making an application to the Ontario government for a charter to build and operate an elevated railway in Toronto and suburbs.

The First Baptist Church, Ottawa, will be improved at a cost of about \$15,000.

The Dominion Express Co. are considering the erection of a new building at Galt, Ont. J. Way, Stratford, Ont., will erect a three-story brick building.

E. Bourne, London, Ont., will erect a three-story block of stores at a cost of about \$17,000.

The Ham & Nott Co., Brantford, Ont., are considering the erection of a new building and installation of new power plants at a cost of about \$100,000.

The Confederation Lumber Association, Toronto, will erect a large addition to their building.

The Petroka Bridge Co., Petroka, Ont., have been awarded the contract for the construction of the new Wiley bridge over the Thames River, south of Athens, Ont., at a cost of about \$122,500.

The Toronto, Hamilton & Buffalo Railway Co., Hamilton, Ont., will erect new work shops, to replace the buildings recently destroyed by fire, at a cost of about \$10,000.

The Temiskaming & Northern Ontario Railway Commission have ordered 200 new freight cars to be built at a cost of about \$175,000. One hundred wooden cars will be built by the Rathbun Co., Des Moines, Ont., and the other hundred steel cars will be built by the Montreal Car Construction Co., Montreal.

Tenders will soon be called for the construction of a single span steel bridge across the Walibi River, New Liskeard, Ont. The bridge is to be 75 feet long, and 22 feet wide with sidewalks five feet wide on each side.

The Bridge & Terminal Co., Owen Sound, Ont., are applying for incorporation to build a bridge over Owen Sound Bay.

The Smart-Turner Machine Co., Hamilton, Ont., are supplying the Algoma Steel Co., Sault Ste. Marie, Ont., with a duplex ball valve pump.

S. T. Kilgour, President of the National Car Co., Toronto, while on a visit to Whitby last week, visited the site offered by that town for the company's projected works. On accepting the site he announced that work on the factory would be begun at the earliest possible moment.

It is expected in Thorold, Ont., that the North America Refining & Smelting Co. will locate their smelter in Thorold township, a short distance from the town. The township is to vote this month on a by-law to exempt the concern from taxes.

A. E. Foxton, of Brockville, Ont., has been appointed secretary-treasurer of the new Canadian branch of the Billings & Spencer Co., of Hartford, Conn., whose plant is to be located in Welland, Ont.

The Grand Trunk Pacific officials expect that over one hundred towns and villages will be founded this year along their new line from Edmonton to Winnipeg.

The Bell Telephone Co., of Canada, are asking its shareholders to authorize an issue of \$3,750,000 bonds.

A London, Ont., despatch says that the Bennett Theatrical Enterprise Co., of the

city, will establish a plant for making moving picture films.

Adam Zimmerman, M.P., S. C. Newburn, A. F. Zimmerman and C. S. Scott, of Hamilton, Ont., are interested in an application for a charter for a company to manufacture high grade ballbriggan underwear. A site 500x300 feet has been secured at Aberdeen Avenue and Garth Street, and as soon as the weather will permit a factory will be erected under the direction of the Lawson Mfg. Co., of Lowell, Mass., who will also select the plant.

The Smart-Turner Machine Co., Hamilton, Ont., are supplying the London Soap Co., London, Ont., with one of their single vacuum pumps.

A large deputation from Quebec City waited on Sir Wilfrid Laurier and Sir Frederick Borden asking the government to grant to the Ross Rifle Co., a strip of land now part of the historic Plains of Abraham, near the company's present works. If the request is granted the plant will be materially enlarged. Sir Wilfrid Laurier's answer would indicate that the government intends granting the request.

The Temiskaming & Northern Ontario Railway Commission have awarded the contract to Messrs. McRae, Chandler & McNeil, of Quebec, for the construction of the new extension from the present terminus to connect with the Trans-continental Railway at a point about 250 miles north of North Bay, Ont.

G. H. Proctor, Sarnia, Ont., has been awarded the contract for the erection of the new armories, Peterborough, Ont., at a cost of about \$125,190.

The grand stand and horticultural buildings to be erected at the Exhibition grounds, Toronto, will cost about \$306,465.

The Canada Printing Ink Co., Toronto, are increasing their capacity by the addition of new machinery.

The ratepayers of Deseronto, Ont. will vote on a by-law to municipalize the gas and waterworks system. The amount to be asked is \$50,000.

The Crandall Cutlery Co., of Pennsylvania, will establish a branch factory at Dundas, Ont.

Among the purchasers of duplex pumps from the Smart-Turner Machine Co., Hamilton, are Wm. & J. G. Greer, Toronto; the Canadian White Co., Montreal; the Doty Engine Works Co., Goderich, H. P. McIrose, Guelph, Ont.

The Toronto, Hamilton & Buffalo Railway has offered to build a switch a mile and a half long through a section of vacant land on the eastern outskirts of Brantford, if that city will provide right of way. It is understood the owners will give the right-of-way at the city's request.

Gorman, Eckert & Co., spice millers, Hamilton, Ont., who have outgrown their present works, have bought the property of the Bennett Mfg. Co., who recently discontinued business. The valuable woodworking machinery from the Bennett concern is being removed to Toronto.

A plant to run ten drills will be installed by the Right of Way Co., Cobalt, Ont.

The McKinley-Darragh mine at Cobalt, Ont., is to be equipped with a ten-drill compressor and two 80 h.p. boilers.

It is reported that New Liskeard and Haileybury men will build an electric railway from Portage Bay to Cobalt, and thence to Haileybury and New Liskeard. Power can be obtained from the Montreal River.

The Canada Screw Co., of Hamilton, has been incorporated under Dominion letters patent, with a capital stock of \$2,500,000. The incorporators are C. A. Birge, Charles Alexander, F. H. Wilton, J. O. Callaghan, W. F. Coote, C. S. Wilcox and Hon. Wm. Gibson. The company have secured a site for a new rail factory and have been granted a fixed assessment of \$125,000 for ten years.

Major A. Burdette Lee, president of the Rice Lewis Co., Limited, Toronto, died at his home in that city on Monday, February 25, after about two weeks' illness.

Darling & Pearson, architect, Toronto, have received instructions from the Saskatchewan Department of Public Works to prepare plans for a new land titles office at a cost of \$100,000.

T. A. Lytle, Toronto, will erect a four story addition to his premises on Adelaide Street West, at a cost of about \$50,000.

Messrs. Strauss & Ross, Toronto, are negotiating with the council, St. Mary's, Ont., to establish a knitting factory there.

W. S. Robinson, Gravenhurst, Ont., has ordered a centre outside packed duplex pump with pot valves from the Smart-Turner Machine Co., Hamilton, Ont.

At the annual meeting of the Toronto Industrial Exhibition held on the 26th ult., three new directors were elected. They were Ex.-Ald. Robert Fleming, Toronto; Mr. Thomas Graham, Claremont, and Mr. Robert Miller, Stouffville, all of the agricultural section. They take the places of Lieut.-Col. McGillivray, president, who has been ill for a year; Lieut.-Col. Lessard, and Dr. Andrew Smith. The annual report was most satisfactory and Dr. Orr, the secretary and manager, was highly complimented on the showing.

A deputation from Bracebridge, Ont., waited upon Hon. Frank Cochrane, of the Ontario Legislature, asking that the municipality be given permission to develop an aggregate of 1,800 h.p. of electrical energy at High and Wilson Falls, on the north branch of the Muskoka River. The town already has a development of 1,000 h.p. from the Muskoka River, but this is not sufficient to meet the demands. The Minister's answer was encouraging.

Mr. F. A. Acland, Western editorial representative of the Toronto Globe has been appointed assistant to the Deputy Minister of Labor at Ottawa.

The Hamilton Incubator Co., Limited, Hamilton, Ont., are building a new two story brick factory, at a cost of about \$9,000. The foundation is now laid, and the building is expected to be ready for occupation about June 1. The new building will be devoted entirely to the manufacture of incubators and brooders. About 60 hands will be employed, doubling the present capacity. New machinery, planers, moulders, belting, etc., will be required.

The Canadian Axminster Carpet Co., Hamilton, Ont., have just completed their plant, and are placing on the markets axminster

rugs and carpets. This year a dye house and a spinning house will be added.

The Wade Mfg. Co., Dundas, Ont., manufacturers and designers of silverware and gold plated novelties will enlarge their plant this year.

The Copley, Noyes & Randall Co., Limited, Hamilton, Ont., manufacturers of men's, young men's, youth's, and boys' ready-made clothing, have just completed a new factory building on Merrick Street, Hamilton. The new building is of brick, 120x78 feet, four stories and basement, and with the old building gives a total floor space of 60,000 feet. About 500 hands will be employed in the new building, the old being reserved hereafter for warehouse purposes. Electric power will be used, and natural gas for shrinking cloth.

The foundations are completed for the new station of the Cataract Power Co., at the corner of King and Catherine Streets, Hamilton. The Canadian White Co., Limited, Montreal, are the contractors.

The Mount Royal Spinning Co., Montreal, have been incorporated with a capital of \$3,000,000, to manufacture textile fabrics, etc. The charter members include W. C. McIntyre, R. M. Marler and A. Racine, Montreal.

The Bonaventure & Gloucester Intra-provincial Ferry Co., Bonaventure, Que., have been incorporated with a capital of \$15,000, to build wharves, piers, etc., and to carry on a general navigation business. The charter members include A. Noel, J. Hony, Bonaventure, Que., and L. Noel, Lévis, Que.

The Kaine & Bird Transportation Co., Quebec City, have been incorporated with a capital of \$100,000, to manufacture steamships, vessels, etc., and to carry on a salvage and wrecking business. The provisional directors include J. C. Kaine, M. P. Connelly and M. H. Kaine, Quebec City.

Messrs. B. C. Howard & Co., Sherbrooke, Que., have purchased from G. Ball, Nocton, Que., the saw mill and rights on the Chaudière River, including 10,000 acres of valuable timber lands.

J. A. Jacobs, Montreal, will erect a warehouse on St. Helen Street at a cost of about \$19,000.

A new post office will be erected at St. Lambert, Que.

A 25 h.p. producer gas plant was in operation last week at the Christian Bros. printing factory, Cote Street, Montreal. It is the third gas plant erected for this county. J. deClerey, C.E., Montreal.

J. McMorie, Richmond, Que., has orders up to March 9 for the remodeling of the town hall.

The brass and tinware factory of Messrs. James Robertson & Co., Montreal, was damaged by fire February 15. Loss about \$20,000.

Business Properties, Limited, Montreal, have been incorporated with a capital of \$99,000, to construct houses, buildings, etc. The charter members include A. M. Wood and H. A. Beatty, Montreal.

Canadian Exploration Co., Montreal, have been incorporated with a capital of \$50,000, to manufacture implements, etc. The charter members include

D. Armour, J. W. Weldon and S. J. LeHuray, Montreal.

The Church Kimpton, Limited, Montreal, have been incorporated with a capital of \$20,000, to manufacture fuel, lumber, etc. The charter members include G. H. Church, W. G. Mitchell and W. C. Strachan, Montreal.

The American Locomotive Works, Montreal are enlarging their structural steel plant.

The Roman Catholic Seminary, Marieville, Que. was destroyed by fire, February 23. Loss about \$150,000.

A 30 h.p. producer gas plant is under construction at the factory of the Kingsburg Locomotive Co., in Maisonneuve, Que., by J. deClerey, C.E., Montreal. It is the third order given by this firm to J. deClerey after three years economical running on the two former plants.

The roundhouse of the Grand Trunk Railway Co. in the Point St. Charles yards, Montreal, was damaged by fire February 13.

The Canadian Pacific Railway Co. are building three new liners for use this coming summer. These consist of two new steamers for the lake fleet and one freighter for the British Columbia coast. The lake steamers, which are being built by the Fairfield Co., of Glasgow, will have about double the carrying capacity of the vessels now in service. The freighter for the British Columbia coast, which is to be about 200 feet in length, is being built by Messrs. Graysons, Limited, of Birkenhead.

The Grand Trunk Pacific Railway Co. have tendered for contracts amounting to \$6,000,000 for the five sections of the National trans-continental line.

The premises of Messrs. Cunin Bros., stove pipe manufacturers, Montreal, were damaged by fire recently. Loss about \$2,000.

The rate-payers of Iberville, Que., voted favorably on a by-law granting certain privileges to the Dean Pipe Mfg. Co., New York, who will establish a plant there.

The premises of Belangers' Furniture Co., Old Machine Co., J. S. Mitchell & Co., and the crockery store of Messrs. Kerr & Foss, Sherbrooke, Que., were destroyed by fire recently. Loss about \$40,000.

M. Workman, Montreal, has purchased property on St. Catherine Street and will erect a seven-story building.

The carriage factory of J. Labelle, Pont Vieu, Bank River, Que., was destroyed by fire a short time ago.

The Roman Catholic church, St. Aime, Richelieu County, Que., was destroyed by fire. Loss about \$70,000.

A new steel bridge will be built at Huntingden, Que.

The Delaware & Hudson Railway Co. have received a loan of \$6,000,000, to extend their line from Sand to Quebec City.

H. G. Vogel Co., Montreal, have secured the contract for the installation of automatic fire sprinklers for L. O. Grothe, corner St. Lawrence Boulevard and Ontario Street, Montreal.

H. White, Bathurst, N.B., has been awarded the contract to build the Bathurst station bridge. The bridge will be of wood and will cost about \$13,000.

The foundry of the Maritime Engineering Co., Moncton, N.B., was destroyed by fire February 12, entailing a loss of over \$1,000.

The congregation of the Roman Catholic church, Grand Falls, N.B., will erect a new edifice 120x60 feet.

The Cove Hydro Electric Co., Boston, Mass., may instal an electric plant in Sackville, N.B., to light the town. They also propose to light Dorchester, Memramcook, Moncton, and several other places along the line.

A purification plant will be installed at Fredericton, N.B., at a cost of about \$125,000.

Tenders are asked up to March 19 for the construction of a steel super-structure for a bridge over the Assiniboine River at Shellmouth, Man.

A large garage, 200x66 feet, will be erected in Winnipeg, Man.

R. Cote, St. Boniface, Man., will receive tenders up to March 15 for the supply of 25 hydrants.

The town of Portage la Prairie, Man., are considering taking over the electric light plant.

J. M. Grassie, Strathclair, Man., will erect a three story hotel at a cost of about \$10,000.

The plant of the Huber Mfg. Co., Marion, Ohio, will be moved to Portage la Prairie, Man., where the company already have an agency in connection with the Portage Iron & Machine Co. The plant will be greatly enlarged.

The premises of the Central School, Selkirk, Man., were destroyed by fire recently. Loss about \$18,000. It will be rebuilt.

The Globe Land Co., Winnipeg, Man., have been incorporated with a capital of \$25,000, to manufacture lumber, timber, builders' supplies, etc. The provisional directors include D. S. Robb, S. W. Montgomery and E. J. Tarr, Winnipeg, Man.

The city of Brandon, Man., invites tenders up to April 11 for the supply of from 6,000 to 8,000 barrels of Portland cement.

A. & W. Melville, Winnipeg, Man., invite tenders up to March 8 for the construction of a brick and stone block in Saskatoon, Sask., for the National Trust Co.

The city of Winnipeg, Man., invites tenders up to March 7 for furnishing and erection of two steel caissons, each about 15 feet in diameter by 43 feet in depth, to be used in sinking additional wells for increased water supply for the city.

The Kettle River Quarries Co., Winnipeg, Man., are considering purchasing a ten ton roller.

St. Boniface, Man., invites tenders up to March 22 for the supply of a street sprinkler and street sweeping machine.

A new fire hall will be erected at Moose Jaw, Sask., at a cost of about \$19,000.

The city council, Moose Jaw, Sask., will grant a free site for an armoury for the Moose Jaw Mounted Rifles if the government will build one.

W. B. Sherman, Calgary, Alta., will erect a new theatre.

A gravity water supply system will be installed at Moose Jaw, Sask., at a cost of about \$90,000, and granolithic sidewalks will be constructed at a cost of about \$26,865.

Saskatoon, Sask., invite tenders up to March 20 for pipe laying for waterworks and sewerage and for about 27,000 feet of trenching.

T. L. Buckton and several others, Olds, Alta., will erect a large flour mill.

The E. B. Eddy Co., Hull, Que., have purchased a site in Medicine Hat, Alta., and will erect a factory for the manufacture of matches, pails, brooms, etc.

A new school will be erected at Sintaluta, Sask.

A town hall is being erected at Wauchope, Sask.

The Alberta Pacific Elevator Co. will erect a large elevator at Red Deer, Alta.

The North American Lumber & Supply Co., Saskatoon, Sask., have been incorporated with a capital of \$100,000, to manufacture timber, lumber, building material, etc. The provisional directors include C. J. Lee, Saskatoon, Sask., R. P. Ward and E. A. Konantz, St. Paul, Minn.

A municipal gas plant will be installed in Regina, Sask.

An incinerator will be erected at Victoria, B.C., at a cost of about \$35,000.

The government will erect a large immigration building at Victoria, B.C.

W. Jack, Nanaimo, B.C., and Mr. Eastham, of Tacoma, Wash., have organized the Independent North Wellington Colliery Co., for the purpose of exploiting over 300 acres of six-foot seam of coal underlying the Jack property at Nanoose Bay, near Nanaimo, B.C.

The Anglo-American Lumber Co., Vancouver B.C., have increased their capital to \$20,000.

FINANCIAL.

The Monarch Bank of Canada will establish branches at St. John, N.B., Halifax, N.S., Montreal, St. John's, Nfld., Vancouver, B.C., and Moncton, N.B.

The Bank of Montreal will open a branch in Portage la Prairie, Man.

The Royal Bank have opened a branch in Calgary, Alta., this being the thirteenth bank in that town.

The Hochelaga Bank are opening a branch at Berthier en haut, Que.

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

The Imperial Bank will erect a branch at the corner of Bloor Street and Lansdowne Avenue, Toronto.

The building of the City and District Savings Bank, Montreal, will be altered at a cost of about \$50,000.

The Royal Bank of Canada have opened branches at Durban, Man., and Halbrite, Sask.

The Canadian Bank of Commerce will erect a new building at Medicine Hat, Alta., at a cost of about \$25,000.

The Eastern Townships Bank and the Bank of Nova Scotia will open branches at Quebec City.

The Bank of Toronto have closed their branch in Rossland, B.C.

The Dominion Bank may open a branch at Toronto Junction, Ont.

A branch of the Bank of British North America will be opened at Quebec City.

La Banque Nationale will open a branch at Shawinigan Falls, Que.

PUBLICATIONS.

Desk Blotter.—The Canadian Rand Drill Co. are sending out desk blotters each month containing a handy calendar of the succeeding month.

The Commercial Graphophone is the title of a booklet issued by the Columbia Phonograph Co., showing the value of the graphophone in commercial work. Its place in connection with letter writing is firmly established.

Contractors' Machinery and Supplies.—A ninety-one page catalogue for 1907 of the Niagara Falls Machine & Foundry Co., Niagara Falls, Ont., showing some of the specialties turned out from the plant of this company. These include hoisting engines of different styles, derricks and derrick fittings, pipe fittings and wrenches of various styles. This company are enlarging their plant at present to keep up with a rapidly growing business.

Electric Heating.—The growing use of electricity in the household and elsewhere for heating is illustrated in a catalogue issued by the Simplex Electric Heating Co., of Cambridge, Mass., for whom the Canadian General Electric Co. are selling agents for Canada. Where a small supply of heat is needed for short periods nothing can equal electricity and its many economic adaptations will prove a revelation to many.

Motor Driven Machine Tools.—Milling machines and propellers are two specialties of the Garvin Machine Co., New York City. These as illustrated in several classes and designs in their booklet are all motor driven. Their list of motor driven tools is being added to constantly.

Westinghouse Motor Applications.—Two booklets from the publicity department of the Westinghouse Co. describe the Westinghouse motor driven Larsen ice making and refrigerating machinery and motor driven automatic pin ticketing machines.

Steam Specialties.—A small booklet of the Canada Foundry Co., Toronto, illustrates and describes a few of the steam specialties manufactured by them. These lines, including reducing valves, pump governors, steam traps, feed water controllers and injectors are all new and built on scientific principles.

Conveyor Machinery.—Two bulletins have just been issued by the Jeffrey Mfg. Co., Columbus, Ohio, replete with illustrations of the Jeffrey conveyor machinery at work in various places. The economy of adopting such a system is well brought out in connection with the handling of fuel for a power house.

Friction Clutches.—A cloth bound catalogue has been received from Davia Bridge & Co., Castleton Iron Works, Manchester, England. It is well illustrated with views and drawings of the various friction clutches manufactured by this firm and contains a complete price list of the various lines.

Cassella Color Co., New York, have sent sample cards of goods showing fast dyeings on cotton colors and immediate colors for calico printing giving the formulae for the various colors and their method of application.

Canadian Lumberman.—The special trade review number of the Canadian Lumberman and Woodworker, surpasses anything heretofore produced along this line in Canada.

It contains 94 pages besides the regular and special covers, the latter being printed in two colors and containing a typical lumbering scene on the front. Several special articles of particular interest to the lumbering trade are included.

WHAT IS A COMMERCIAL TRANSACTION?

By C. T. STUART.

Not long ago, a lawyer discussing a point in the rules of evidence before a Montreal court, said, "There is no exact definition of what a 'commercial transaction' strictly means, or what a 'trader' is in set terms. We all know well enough what is meant, but terms to express the definite breadth and limitations of the phrase is as yet wanting in jurisprudence."

That is surely wrong. If we do understand what is meant, we can say it, and if we think enough, we can define the term "commercial transaction" exactly and to the point.

"An exchange of valuable considerations for mutual gain," is, I believe, the correct and complete definition. Or, we may have an exchange of gifts not for ostensible gain. We may have gambling transactions when the "valuable consideration" is not an exchange at all, but an entirely one-sided gain. We may have the business transactions of a "hold up" where the highwayman gives no valuable consideration in exchange, and we call it a steal. But the trader conducts his system of give and take on the basis of what one party wants to sell and the other wants to buy. One delivers the goods, the other pays the price, and both are willing, and both expect to gain, or make a little, by their bargain. Here you are at the corner stone of sound business—a working satisfaction on both sides of the trade, or exchange for mutual gain.

ANNUAL REPORT OF N.S. STEEL & COAL CO.

The annual meeting of the Nova Scotia Steel & Coal Co., New Glasgow, N.S., and Montreal, was held at the latter place on Feb. 18. As will be seen from the statement of earnings, the report was a favorable one:

The report was as follows: Your directors submit herewith their sixth annual report, with a statement of assets and liabilities and an abstract of the profit and loss account for the year ending December 31, 1906. The total volume of business transacted by the company during the past year was considerably larger than that of any previous year. The sales for the year increased \$956,000 over the preceding year. From our steel department we shipped 42,831 tons of finished material, being an increase of practically 50 per cent. over 1905. On December 31 we had orders on our books for 22,000 tons of steel at better prices than prevailed during 1905.

The quantity of coal mined exceeded that of the previous year by 126,172 tons, the company still being the second largest producer in Nova Scotia.

Your directors are pleased to report that the profits for the year 1906 were \$960,281.93 as compared with \$559,906.63 for the preceding year. The amount to the credit of the profit and loss account on January

1, 1906, was \$795,325.03, which, with the profits of the year, make a total of \$1,557,606.06 to the credit of this account on December 31, 1906. The registered dividend of 10 per cent. on the preferred shares has been paid quarterly.

The sum of \$101,878.75 has been transferred to the credit of the special reserve fund, of which \$75,000 is for general depreciation and renewal, \$12,378.75 for furnace renewals, being 25 cents per ton on the output of pig iron during the year, and \$14,500 for depreciation of the shipping property owned by the company. The balance forwarded to the credit of profit and loss on January 1, 1907, is \$1,180,783.85 against \$795,325.03 on January 1, 1906.

The sum expended on capital account in plant and improvements, in acquiring iron ore areas, submarine coal areas and real estate at Montreal and elsewhere, amounts to \$199,256.10.

Your directors have aimed to place the company in a strong financial position before resuming the payments of the dividends on common stock. They have also found it desirable before resuming these dividends that there should be reasonable certainty of their continuance under normal business conditions. While the profits for the year of the profit and loss account seem to warrant the payment of a dividend for the past year, the directors believe that the interests of the shareholders will be best served by paying a

A quarterly dividend of 1½ per cent. to be paid to holders of common stock.

THE SOUTHERN CALIFORNIA NEW TRAIN.—BEST ROUTE.

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

SHORT-CUT TO GEORGIAN BAY.

There is a fair prospect of the contemplated electric line between Montreal and Midland soon being materialized. This matter took Sir Adolphe Caron and Senator Domville to England this past summer, where they found the British capitalists favorably disposed in regard to the scheme.

As matters are going now Ontario will soon be a network of electric wires—there are so many new lines building, notably the Windsor-Chatham and St. Mary's lines. Then there is the huge new plant of the Ontario Power Co. at Niagara, whose new steel tower lines are a new feature in the landscape in the vicinity of Niagara. The additions now being made by the Canadian Westinghouse Co. will make the Ontario Power Co.'s generating plant the most extensive in the country.

If this Montreal-Midland line goes through a quick means of transportation will be given the wheat of the West. It will mean a complete revolution in the shipping of the greatest of Canadian exports.

Welfare Work.

The Solution of the Vexed Problem of Labor and Capital.

When the fourth annual gathering of the employes of the Williams, Green & Rome Co., of Berlin, Ont., was held recently, a situation regarding the relations existing between the firm and the employes was revealed that is unique in the industrial annals of Canada. Several manufacturers from other places in Ontario were present and what they saw in results of Welfare Work inaugurated by the firm four years ago, was a revelation. They were impressed with the feeling of peace and harmony that prevailed and the oneness that existed among the employes themselves, and between them and the management. One of the features of the evening was the presentation by the president, Mr. S. J. Williams, of an opened savings bank account to every employe with one dollar deposited for every year's service.

HISTORICAL REPORT.

Miss Collard presented an historical sketch outlining the Welfare Work as carried on during the past four years, as follows :

Four years ago, the president, Mr. Williams, thought it advisable for the government of the business, to form a committee of management for the factory, known as the Executive Committee. This committee meets twice a week to deal with current business, and reports are heard from each department once a month, as to the progress of the work. Complaints from any of the departments are brought before this committee to settle, but it is worthy of note that there have been very few complaints during the four years that the executive has been in charge.

The first movement in the line of Welfare Work was to call a meeting of all the heads and sub-heads of the factory. Mr. Williams spoke to them, telling them that there was a great deal of friction throughout the factory, and that each person was not striving to do all he could for someone else, and each person was not taking his share of the responsibility. These words fell on good ground, and within twenty-four hours after this meeting, several of those present had endeavored to straighten out difficulties of long standing. Since that time, there has been a steady growth of kindly feeling and good fellowship throughout the factory; the result is, more and better work has been done.

When the Welfare Work was started, the factory was working ten hours per day, six days a week, but we are now able to turn out more work with fewer employes, in nine hours per day and Saturday half holiday all the year round, than formerly in the ten hour days per week.

When we began this work, we had nothing but a place of business, a factory where nothing but business was known; now we have a social life along with business, and we are happier and more prosperous on this account.

We had few social events in 1906 as compared with the year 1905. Our Dramatic Society put on a play in the Opera House May 1st, the proceeds of which went to the Library fund. We were unable to hold a picnic during the summer of 1906 on account of the particularly heavy business on hand. On September 20th, the Executive Com-

mittee, twelve in number, were sent by the firm on an educational trip to Dayton, Ohio, to visit the factory of the National Cash Register Co., to whom we are indebted for a great many of the ideas in Welfare Work that we have in this factory. We feel very close to the National Cash Register Co., for we know that we are working along similar lines, that is, for the betterment of our fellow-workmen, and for higher standards among them.

Our new Welfare Hall, capable of seating over 500, fills a long felt need. Formerly we had no place to hold any meeting or entertainment except in our workrooms, until this hall was given to us. We now believe what our president has so often said to us: "We get what we deserve, and we deserve what we get." Our annual Hal-lowe'en party was the occasion of the opening of the hall, and it was a splendid success.

The following comprise the different features of our Welfare Work.

LIBRARY AND READING ROOM.

The Library contains about 300 volumes of standard fiction, the best magazines and leading newspapers of the Province, also all local newspapers. It is open during noon hour and after five o'clock for the exchange of books, and three evenings in the week. A librarian is in attendance. During working hours, if an operator is out of work for a short time, he or she is requested to spend that time in the library, instead of interfering with other workers.

EMPLOYES' DINING ROOM.

This room has grown from a lunch counter where only tea and coffee were served, in 1901. It is managed by representatives from each department, who finance it. The waitresses are volunteers from the different departments, chosen weekly. The firm supplies light, heat, and pays the attendant in charge. The employes, with some assistance from the firm, supplied the dining-room equipment. The room has a seating capacity of eighty and is well patronized.

GIRLS' REST ROOM.

This room is managed by a committee of girls representing each department. It is for the comfort of any of the girls who are indisposed. There is a bath in connection, and the girls are allowed twenty minutes of the firm's time per week for a bath, and pay 5c. per bath. This money is used for the maintenance of the room.

DRY ROOM.

The room is managed by representatives from each department, and is used for drying employes' wearing apparel in inclement weather. Here also is a supply of skirts, slippers, stockings, and umbrellas for the use of the employes, at a rate of one or two cents per article. This money is used to repair and replace articles used.

MEN'S CLUB ROOM.

This room is controlled by the W. G. & R. Athletic Association, and has free for the members, tub and shower baths and indoor games. Lockers are supplied for a small fee.

BENEFIT ASSOCIATION.

Organized in the spring of 1905, with 66

members, we now have a membership of 127 and are still growing. Employes pay in 5, 10, 15 and 20 cents, bi-weekly, according to the wages earned, and are entitled to a free doctor and \$1.25, \$2.50, \$3.75 and \$5.00 per week, according to scale, for eight weeks, and one-half the amount for the following four weeks. In case of death, members paying 15 and 20 cents, bi-weekly, are entitled to \$50, and members paying 5 and 10 cents are entitled to \$25

FLOWER AND RELIEF FUND.

This is composed of voluntary contributions from employes, and is managed by a committee representing each department, who visit sick employes, sending them flowers, fruit, etc.

ATHLETIC ASSOCIATION.

This association was organized in the spring of 1904, and consists of bowling, tennis and football clubs. These games are played on our own athletic grounds in the rear of the factory. The society is managed by the men of the factory, and maintained by monthly assessments of the members.

DRAMATIC SOCIETY.

Managed by a committee appointed by the employes, and consisting of president, vice-president, secretary-treasurer and executive. One play a year is put on in the opera house, the proceeds of which are devoted to Welfare Work.

LITERARY AND DEBATING SOCIETY.

Organized in the fall of 1905. The first season there were 200 members. This year there are 250 members. Leaders are appointed and sides chosen for the season. Meetings are held bi-weekly, each side giving a program alternately for which marks are given by a committee of judges. At the end of the season the losing side provides a supper for the winners.

SUGGESTIONS AND COMPLAINTS.

Boxes are placed in each department, and employes are encouraged to make suggestions for the benefit of the business or for the benefit of the employes.

In order to secure absolutely fair dealing the boxes are opened by one person, copied on the typewriter under number, with no name attached, and brought to the Executive in this way for consideration.

In a little over a year 127 suggestions and 53 complaints have been received, and 38 suggestions adopted. Complaints receive prompt attention.

CASH PRIZES.

A premium of \$1 is given for every suggestion adopted, and every three months cash prizes of \$5, \$3 and \$2 are given for three suggestions which are judged by the Executive to be of greatest value to the business.

CLASSES.

Classes have recently been started in the factory, those for men embracing the study of mathematics, grammar, composition, parliamentary procedure, and reading. Mr. Dolan, of the Collegiate Institute, has charge of these classes, and the men of the factory are very grateful for his kindly interest and untiring efforts in their behalf.

Classes for girls, under the charge of Miss Maud Davis, a graduate of McDonald Institute, Guelph, include plain sewing, dress-making, basketry, and domestic science,

the firm having recently set up a complete domestic science equipment.

The factory is open every week evening for the benefit of the different classes and societies.

From the inception of the work here, Mr. Williams has made it a principle to give nothing to the employes unless they give something towards it, and take sufficient interest to keep up any new feature. In this way the employes appreciate everything which they receive.

In introducing various new methods we have, of course, had our troubles, but the interest has never wavered, the good work has steadily grown, and co-operative management has spread from the heads to sub-heads and employes generally.

In our Welfare Work there is no class distinction; the operators stand just as high as our office help, and receive the same consideration.

May the year 1907 be a banner year in Welfare Work in our factory, and it will be, if we have the loyal support of all as we have had in the past four years.

CO-OPERATION BETWEEN DEPARTMENTS.

Mr. Frank Hodgins, assistant superintendent, presented a statement showing wonderful increase in the output of the various departments over the previous year, and explained the internal workings of the system of administration. He showed that it is the company's policy to keep employes posted on the progress made and plans adopted, and brought out the fact that government by an executive committee eliminates any one dominating personality, and helps to secure the best efforts of all in team work.

The factory is managed by a committee consisting of superintendent, assistant superintendent, and the heads of various departments. This committee meets twice a week, once during factory hours, and once after hours, to discuss all matters pertaining to the government of the factory. The co-operation of one department with another is thus secured, and all decisions arrived at must be for the benefit of the whole.

Each department is governed by a committee consisting of head of department and assistants meeting once a week after hours.

Once a month a meeting is held of all heads and sub-heads of departments after hours, and at least once a month there is a meeting of all the employes. By means of this system the requirements of the management can be conveyed personally to every employe, which is much more effective than notices.

Miss Klachn, one of the young lady operators, read an address voicing deep appreciation of the ennobling influences now prevailing in the factory.

PRESIDENT'S ADDRESS.

In the heart to heart talk with his people, "Our 400" he called them, the president, Mr. S. J. Williams made a deep impression. Two terse statements made during the course of his address show plainly the interest of the firm in those dependant upon it. One was, "We believe the way to increase the output and the earnings of the wage earner is to raise the standard of the wage

earner," and the other, "We believe a man's best friend is the one who makes him do his best."

Referring to the relations between the travellers—"the men on the firing line,"—and the workers at home, he said the travellers form an important part in the work. To-day they are on top, as they have sent in more orders than can be turned out in several months. This spirit of competition is helpful. The shop employes know they must furnish the goods on time, or the traveller will not be satisfied. The traveller too can say to his customer that the articles made here are the best in Canada. They all take pride in that. Any amount of inspection may be put on the goods, but unless the operators forget self and put their heart and very best efforts into their work to please the traveller, the customer, and consumer, the best results cannot be achieved. This bond and this confidence between the traveller and the employe is what produces results.

"We have had only four years of Welfare Work. We have eliminated friction from every department. We formerly had fire-works every hour of the day. We do not know what they are now. We can truly say that we have made a success of what we started on four years ago." He then quoted some figures that proved the success of the movement. In the past fourteen months the company has put on its ledger the names of 458 new customers. The orders on hand for next spring are 90 per cent. ahead of what they were last year, and last year was the best in the company's history. The business of the company is 90 per cent. greater than it was four years ago.

That is the company's side of the story from the introduction and practice of Welfare Work on honest and fair principles. Then he showed the employes' side. Four years ago there were 522 on the pay-roll. Now there are 430. Yet the business has almost doubled. He asked whether Welfare Work, which is the only way by which such results can be attained, should not appeal to all manufacturers.

The 430 employees drew in wages last year \$28,000 more than the 522 did four years ago. This shows that Welfare Work has benefitted both sides, and the benefits must be mutual or the work cannot stand. The standard of health among the operatives has improved in the past four years, as there has been fully 33½ per cent. less absence from sickness.

The president extended to the employes the thanks of the management for their loyal support during the past twelve months. The credit for what has been accomplished, he said, did not belong to any one person or any one department; it is the result of harmony in all the departments, a working together for the common good, and it is a combination that cannot be touched by the old methods.

He referred to the National Cash Register Co., of Dayton, Ohio, which has the model factory of the world. The motto of its President, John H. Patterson, is,

"DO GOOD AND MAKE MONEY."

He defines Welfare Work as :

"CAPITAL, LABOR, AND MANAGEMENT, WORKING TOGETHER FOR EACH OTHER'S BENEFIT."

B. GREENING WIRE PLANT ENLARGED.

Recent enlargements have put the B. Greening Wire Co., Limited, Hamilton, Ont., in a position to materially enlarge their output.

The new netting mill, where they manufacture poultry netting and the lighter grades of fencing, is now in full operation. The new carpenter shop erected on an isolated lot on Napier Street beyond the office is just about completed. It is a two-story stone and brick structure 60x40 feet. The machinery is on the ground and the upper story is used exclusively for bench work. Part of the three story brick building which has just been vacated by these branches is being fitted up with looms which, we understand, will run night and day until the demand for screen cloth is overtaken.

The principal addition, now under construction with W. A. Edwards, as architect, is a weaving shed 180x130 feet, to be lit from the roof as well as sides, of modern mill construction. This will take care of all the increase in the weaving plant for some years to come and will also take portions of the looms occupying the four story building on Napier Street which will be taken up entirely by the wire mill for the production of galvanized wire for the netting and fine wire for the screen cloth looms.

With these additions the firm feel that they can take care of any demand that is at all likely to be made upon them for some years to come and they will be free next year to turn their attention to any other branch of their business that may require extension.

Besides the manufacture of wire, this firm make all kinds of wire cloth from the heaviest used for such as locomotive smoke stacks and refuse burners for saw mills to fine wire cloth for flour mills, office window blinds, mining purposes, car ventilators, etc.; steel wire chain which they make into cattle chains, dog chains, halter chains, tie out chains, and special chains for agricultural implement manufacturers; wire rope for passenger and freight elevators, derrick and contractors' use, mining purposes and transmission of power; perforated sheet metals in brass, copper, steel, and iron for grist mill machinery, mining purposes, grain cleaning machinery, etc.; crimped steel wire bonding for concrete work. This firm issue several catalogues for the different branches of business, and will be pleased to send any of these upon application.

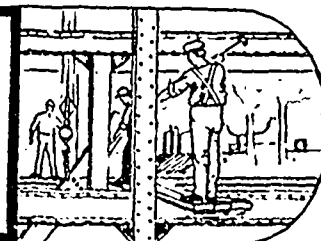
CANADIAN NORTHERN EXTENSIONS.

The Canadian Northern Railway propose extending their system in Ontario by 1,200 miles. The new branches will include lines from Pembroke to Port Hope, from Arnprior to a point between Brockville and Kingston, from Hawkesbury to a junction with the foregoing to the township of Bastard, from Washago to Kincardine, and from Washago to a point on Georgian Bay, east of Collingwood; from either Collingwood or Owen Sound to a point on the Ottawa-Toronto line, from Toronto, through Hamilton and London, to Detroit, with branches to St. Thomas and Sarnia; from the Niagara River through Hamilton to Goderich; from a point on Lake Erie west of Port Colborne, through Stratford or Berlin, to Georgian Bay.



Construction and Equipment

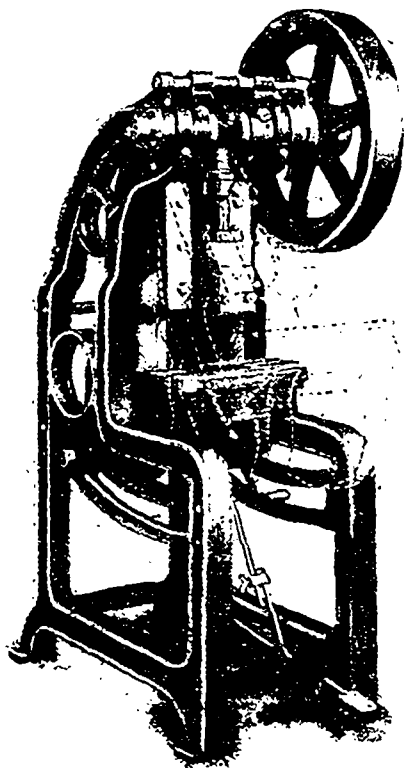
Giving information regarding modern materials and methods for the construction of factories, mills, etc., and about machinery and power appliances for their equipment.



THE HALL SAFETY AUTOMATIC PRESS.

Several good features are shown in the new safety automatic press which James B. Hall & Son, 112 Adelaide Street West, Toronto, are placing on the market.

The unique feature is the fact that it is inclinable, as shown in the accompanying illustration. The body of the press swings from the centre shaft bearings and does not affect the position of the fly wheel or belt and thus the press may be set while in motion. This feature is more conducive to perfect setting of dies in combination work. The advantage of this in many classes of work will be apparent to all who use power presses.



THE HALL SAFETY AUTOMATIC PRESS.

Another important feature is the safety automatic clutch. This clutch allows but one stroke of the press for each depression of the foot so that to obtain another stroke of the press the foot pedal must be released and again pressed down. The object of this feature is to reduce to a minimum the liability of accident to the operator. Another feature of the press is the device for setting the ram to the desired height, it being a simple yet rigid part.

ALCOHOL ENGINES AS A FUTURE POWER.

By Prof. ELIUD THOMSON.

In the case of denatured alcohol, which it is hoped may become available at a reasonable price before long, the same form of vaporizer as that used with gasoline will satisfy the conditions, except that it will receive a preliminary heating so as to confer upon the alcohol vapor the same degree of volatility as is possessed by gasoline at ordinary temperatures. In the same way, by raising the temperature of the vaporizer still more, it is quite possible to use liquid fuel of much higher boiling point, and even kerosene oil. The writer has, in fact, repeatedly

increase the temperature of the vaporizer. kerosene oil may finally replace the alcohol. But it is hoped that it will not be necessary to go so far.

It will doubtless take considerable time, possibly two, three or more years, before the arrangement or organization for the production and distribution of the denatured spirit is sufficiently perfected to give us the product at a price, which will compete with that of gasoline in the denser populated districts where the methods of distribution of the gas products are already in a high state of development. In the more sparsely populated districts, however, where, on account of the distances for distribution and inconvenience of storage, gasoline now commands an advanced price, it should not be long before denatured spirit should be able to compete. It is fortunate that in spite of the considerably less heat value possessed by alcohol, as compared with any of the oil products such as gasoline, the efficiency of the engine may be increased in the case of the alcohol by increasing the compression so as to make up the difference. The limit of compression in the ordinary type of engine is naturally dependent upon the pre-ignition point of the charge during compression, and inasmuch as there is always a certain amount of the prior heated exhaust gas mixed with the new charge, while the cylinder walls are also necessarily at a considerably higher temperature than is the water in the jacketing, or than is the radiating metal where air cooling is employed, it is obvious that pre-ignition, when the heavier vapors are employed, must be regarded as setting the limit of compression which is feasible. Upon this degree of compression, however, the efficiency of the engine in large measure depends. With the employment of alcohol the compression may be so raised that two things are accomplished: first, there is a greater extraction of energy on expansion, resulting in a cooler exhaust; second, the cooler gas which remains in the cylinder and is mixed with the new charge results in further rendering pre-ignition improbable.

It has sometimes been objected that the products of partial combustion or oxidation are likely to be acid or corrosive for such a metal as iron. If experience should show any considerable disadvantage in this, such corrosive action would only take place with the engines out of action or resting between runs, and doubtless could be neutralized by suitable means such as oil or alkaline substances introduced at the time of a shut-down lasting for a period more or less prolonged. Doubtless also a proper selection of materials for valves or valve seats subject to corrosive action would eliminate all difficulties arising, if any exist.—Electric World.

run an engine with the vaporizer arranged to have its temperature controlled, and employed gasoline, alcohol and kerosene oil interchangeably. An engine starting cold with an arrangement for allowing the exhaust gases to heat the vaporizer may burn a small amount of gasoline at the start, and on the attainment of a temperature sufficient to vaporize alcohol, the alcohol may be gradually turned into the vaporizer, and if the arrangement is such as to still further in-

The Saw-Tooth Roof in Factory-Roof Construction.*

BY FRED S. HINDS.

Before Dr. Cartwright invented the power loom in 1785, the cotton-spinning factories had attained quite a considerable growth in the Lancashire district of England. When the cotton loom came into practical use, weaving was carried on in the homes of operatives, up to the time when, with the increase in cotton weaving and the advent of the power loom, it developed upon the progressive operator to branch out into a new plant and set up a few power looms, as a weaving establishment. This naturally was a one-story building, and in time was designated as a "weave shed." Thus was commenced a system in textile manufacture which became popular, and is so to-day in England and on the continent. The spinning factory produces the yarn and the weave shed the cloth.

As these weaving companies changed from plain to fancy and colored weaving, and increased the width of the weave sheds to gain greater area, some method of roof lighting became necessary. Thus necessity, the mother of invention, produced the saw-tooth form of roof skylights for lighting the center of the wide one story buildings. The English and continental manufacturers were not long in appreciating the value of this method of lighting. The first use was on machine shops making cotton machinery. To-day they are found on all kinds of manufacturing plants.

The principle in this so called "saw-tooth" form of skylight is the focusing of a strong north light upon the work in process. This is secured by the greenhouse type of sash, applied to one side of the saw-tooth and exposed to the north light, the glass being set at such an angle as not to admit the direct rays of the sun. This type of sash reduces to a minimum the wood work, and thus minimizes the obstruction of light and the casting of shadows. The result is a practically continuous window of glass, which

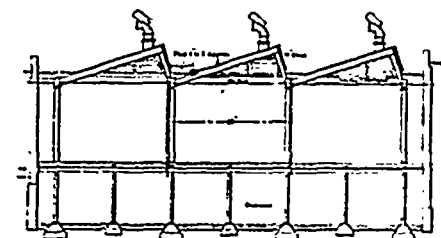


FIG. 1—STANDARD SAW-TOOTH SKYLIGHT IN MILL CONSTRUCTION.

gives a far greater lighting area than wall and windows, or than skylights placed in the usual manner at intervals.

The skylights may run across the building, or lengthwise of the building, so that the glass may face to the north. Placed across the building, they are somewhat simpler in construction and thus less expensive.

METHOD OF CONSTRUCTION.

To-day there are two constructive designs in applying these skylights; one English and the other American. The English design is in the true form of saw-tooth;

* Extracts from a paper read at a recent meeting of the American Society of Mechanical Engineers.

the American, in the modified form, or semi-saw-tooth flat-roof design. The English design was Americanized by the writer, as shown by the accompanying illustrations, to meet the conditions of our rigorous and changing climate.

In 1885, when associated with a mill architect and engineer, the writer was called upon to design some method of roof lighting on a one-story addition to be built in a mill-yard area formed by three buildings in the shape of the letter U. The problem was to light this area and project light into the first story of the then existing buildings

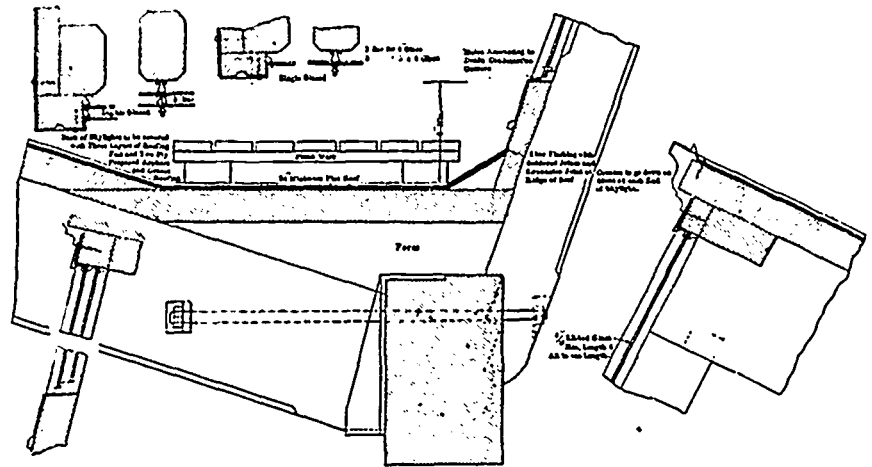


FIG. 2.—DETAIL OF SAW-TOOTH SKYLIGHT FOR FACTORY ROOF.

so as to make up for the loss of light due to roofing over the yard area. This same year the writer happened upon an English type of saw-tooth lighted weave shed in connection with a mill plant in the same neighborhood. Upon examination it was found to be giving trouble from leaks. In this type of roof the acute angle formed by the two sides of the skylight was finished in the form of a gutter, made up of sheet metal. These gutters fill up with snow and water, which, melting and freezing, cause excessive expansion and contraction, and the result is cracks and broken joints.

The writer, profiting from this experience, designed a semi-saw-tooth flat roof. In this type the space between the sky-lights was finished in the usual gravel roofing, the slant of the roof conveying the roof water to the end of the skylight, where it enters the gutter.

ANGLE OF THE GLASS.

The angle of the glass is designed by some at 60 degrees, but when the sun is in the zenith it will shine through these skylights. This matter has been lost sight of, as one of the leading features in the principle of saw-tooth skylights is the elimination of the direct rays. For the south the writer has used 77 degrees and for the north 71 degrees.

In my later designs I have reduced the wide flat roof space between the skylights, and somewhat reversed the modification, returning more closely to the English system, but at the same time preserving a narrow flat roof between the skylights, varying in width from 24 to 48 inches, according to circum-

stances. (See Figs. 1 and 2.) The flat gravel roof was then reduced from $\frac{1}{2}$ inch to $\frac{1}{4}$ inch pitch to the foot, in order to convey the water away in the usual manner, and avoid the building up of such high forms as would be necessary with $\frac{1}{2}$ inch pitch.

The height of the glass is based entirely on the class of manufacture and amount of light required. Four, five and six feet have been my usual basis to work from in determining the size to use. Four feet high, every 20 feet, is good for general use. Five feet is used for special cases, such as high erecting shops, and six feet for cases where extra strong light is required.

In the year 1900 the writer was called upon to design, in connection with the planning of a Southern cotton factory the weave shed for weaving pattern fabric. In adopting the saw-tooth skylight I had to

eliminate all cross timbers to avoid the casting of shadows. Appreciating the value of north light, and wishing to avoid any direct sun rays, I set the sash at an angle of 77 degrees. This angle, which brings the sash only 13 degrees from the vertical and therefore not at a great inclination, led to the belief that the elaborate trussed form in framing these skylights was entirely unnecessary to resist this small amount of thrust. I therefore adopted the tie-rod as the lower chord spanning from column to column, anchoring at each end wall.

LATEST SKYLIGHT DESIGN.

Fig. 2 illustrates the various details of my latest skylight design, and it will be noted that both the double glazing and single glazing are represented. I would draw particular attention to the details of the metal bars. The bars and the bottom of the glass are provided with small gutters for collecting any condensation, and openings are provided in the horizontal metal for letting out the water as it collects.

The double glazing is necessary for some manufacturing plants in the North, but only single glazing is used in the South. The flat gravel space between the skylights and the method of flashing are also detailed.

One element of weakness in the construction of some roofs of this type is that the galvanized iron is continued down onto the roof and becomes a part of the flashing. True flashing, and the best, should be of about 10-ounce zinc, running up behind the center flashing, or outer flashing, of the skylight.

Fig. 2 also shows the slat walk which

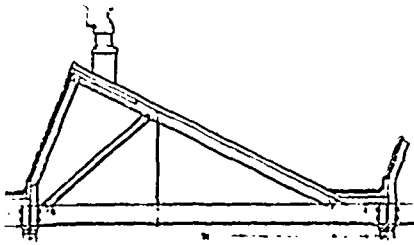


FIG. 3.—ELABORATE TRUSSED FORM OF SAW-TOOTH SKYLIGHT.

It is wise to provide in northern skylights, not only to walk upon, but also to facilitate the shoveling off of snow without destroying the gravel roofing.

DEALING WITH SNOW.

This leads to the subject of snow and the question whether it makes the use of skylights inadvisable. As the prevailing winds in snow-storms are either from the northeast or northwest, it is found to be true (according to observations in a locality in Massachusetts where this style of skylight is very popular) that the wind in a high storm will blow the snow out, because of the somewhat funnel or grooved shape of the skylights. However, suppose they do fill up somewhat with snow, it is not a great expense to hire cheap labor to shovel out this snow, as through our whole winter period heavy storms are only occasional. The cost of shoveling out the snow is a very small expense as compared with the enhanced value that fine lighting gives to the production of a plant. It must be conceded that with a monitor skylight in a drifting storm, the vertical side would resist the snow and pile it up, and naturally bring about the same result as with the saw-tooth. Right here the English system would show its serious defect. The advantage of the flat roof is that it spreads out the saw-tooth into a wider area and the snow cannot pile so deep as in the "V" form.

ELABORATE TRUSSING UNNECESSARY.

Fig. 3 illustrates the elaborate trussed form of framing, Fig. 4 a similar form in reinforced concrete. I believe it is entirely unwarranted, as it increases expense in construction and becomes an obstruction to its own light. Fig. 4 shows two very weak points. First, you will note at A that the tin roofing forming the gutter, or flat valley, runs up under the slag or gravel roofing, as you would flash under a slate roof. This is at a vertical wall. The same criticism applies at the gutter formed by the skylight itself, or at B.

It is well known in building construction that the worst form of gutter is to have the slant of a roof strike up against a vertical wall where a gutter, or flat valley, must be constructed to carry away the roof water. It makes a very acute angle in which snow and water can collect. The water is taken up by capillary attraction and percolates through some crack in the roofing higher up

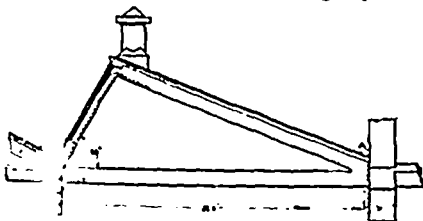


FIG. 4.—SAW-TOOTH SKYLIGHT IN REINFORCED CONCRETE.

than the highest point of the tin-work that runs up under the gravel roofing.

VERTICAL SASH.

Some designs have the sash set vertically. This is uncalled for, as, with the same height of glass, if the sash is set at an angle, the area of direct rays of light is increased. There is also less length of slant for the back of the skylight, and thus less roof area to cover. The vertical design was used for the purpose of hanging the sash with weights or on a pivot. The slant from the vertical is so small that there is no trouble from the weather beating in.

SASH CONSTRUCTION.

The sashes are constructed either of wood or sheet metal. If of wood, the glazing is with putty, if of metal, the glazing is done without putty and bars are formed to take care of condensation. With reference to wood versus metal skylights, and what metal workers are doing under contract at the present time, the following is a quotation from a letter on the subject:—"We have a contract at present for changing over four saw-tooth skylights, about 200 feet long by 15 feet glass opening, from wood construction, to metal construction; also for two saw-tooth skylights that we are erecting in metal. These are about 90 feet long by 10 feet 6 inches glass measure. Heretofore the saw-tooth skylights for this company have been built in wood and a departure was made in favor of metal."

VENTILATION.

The subject of ventilation, in connection with this particular class of skylight, has gone through changes along with the vicissitudes of the skylight itself. When these skylights were first introduced on weave sheds of cotton factories, no ventilation was provided. Later, as the skylight manufacturers developed new inventions, the Louvre ventilator was adopted and used in the end of the saw-teeth, as a substitute for round windows, which may have been hung on swivels. Next followed the usual style of galvanized iron ventilator, common in metal skylights used on other classes of buildings. The latest method is to hang one-half the length of the glass at the top and control by the usual quadrant for opening at any angle. These are good in periods of clear weather, and in connection with the roof ventilators give a very good current of air. In stormy weather these side lights must be closed, and the ventilation is taken care of by the Louvre and the roof ventilators.

ROOFING.

The most approved practice for covering

the back of these skylights is some form of asphalt roofing, the method of applying depending upon the angle, or slant of the roof. Those which have a slant of 4 inches to 1 foot can be covered with the usual asphalt felt roofing and covered with gravel, the same as a flat roof. If the slant is greater, then the two upper layers of felt should be applied in what is called prepared gravel asphalt roofing. The flat spaces between the skylights can be of the usual coal tar, felt roofing, and gravel, unless one prefers to have it all asphalt at a slightly increased cost.

Saw-tooth skylights do not add to the architectural beauty of a factory building, and therefore I have studied to keep them down to a reasonable height, and at the same time make them high enough to give the amount of light required.

APPLICATION.

Saw-tooth skylight construction is not only adapted to cotton factories but to factory buildings, machine shops and for all kinds of manufacturing plants, where better lighting is required than can be obtained from side windows. It is superseding the common monitor roof, and is especially adapted for use over erecting rooms and crane rooms of machine shops. It solves the problem of the one-story flat roof machine shop and factories, where this style of construction is desirable and wide buildings are required. In shop economics, and with the extensive area of modern plants, the monitor skylight compels an excessive length in buildings, while the saw-tooth skylight admits of a proportionately greater width and less length, hence giving a more compact arrangement of the shop departments and a consequently greater available area of floor space.

Where land is valuable, it is applicable to the two-story shop or factory, if special provision is made for lighting the first story. The manufacturer's general plan was to use the two outer divisions of first story for heavy tools, the center division for tool room, storage, etc., and the second story for light machine tools. Over this second story, the introduction of the saw-tooth skylight is applicable and very practical. Its practical value is in the improved arrangement of tools and benches. Instead of the benches being run around the room against the walls, they can be run across the room, benches and tools alternating down the length of the shop, according to the nature of the product. With this system a greater production is sure to follow and with the strong roof light, a higher degree of workmanship.

Application of Heat to Various Clay Wares.

By W. C. MITCHELL.

The drying of brick and kindred clay products is perhaps one of the most important parts pertaining to their manufacture.

There are innumerable methods adopted by clay manufacturers for removing the moisture from their products, and brick is one of the most staple articles manufactured in this country to-day, so much attention should be given to brick dryers.

There are a great many different artificial dryers on the market, some of which are protected by patents and others which are not.

Most all of these various drying systems have more or less good points and in most

cases will perform the duties for which they were intended remarkably well.

Having had considerable experience with various types of dryers, I never came in contact with any system that would not perform that work for which it was intended, if installed in the proper manner, and maintained as it should be, but, on the other hand, I have seen a number of dryers which were very expensive to install and also expensive to maintain as well as operate. I have also come in contact with a number of firms who would condemn their dryers simply because they were unable to dry about 50 per cent. more

brick per day than they actually had drying capacity for.

DRYING DEPENDS UPON THE CLAY.

In my opinion, I do not think it is possible for any individual or firm, to lay down a fixed rule pertaining to the drying capacity of a dryer which is applicable to all clays and conditions. Some clays in certain localities, and under certain conditions can be dried in from 12 to 18 hours, while others require from 24 to 60 hours to dry thoroughly, the exact time can only be determined by actual tests. I came in contact with a certain firm a few years ago who had installed a well known dryer, which was guaranteed to dry 30,000 soft mud brick per day. After being put in operation it was found that the dryer in reality would dry about 60,000 bricks per day, and it was necessary to cut off one-half the dryer tunnels and also sell one-half of the rack cars. Had the dryer firm known positively, that this particular clay could have been dried in half the time, they, no doubt, would have been several thousand dollars ahead of the deal, and would have been generous enough to give their customer a good box of Havanas. On the other hand, had the clay required double the tunnel and car capacity, they would have been several hundred dollars out of pocket and also gained the ill-will of their customer.

The above case is of very rare occurrence as this is the only one which ever came under my personal observation. In most instances the drying capacity of the dryer is under estimated, on account of close competition, and the dryer firm being eager to land the sale. The day is not far distant when the matter of determining the time required to remove the moisture from various clays can be determined definitely in our ceramic institutions in a scientific and analytical manner, which will mean thousands of dollars saved to both our brick and dryer manufacturers, and no doubt most of our larger firms will have private laboratories of their own in charge of some graduated ceramic student who, in a short time, can solve the difficult problems which the clay manufacturer invariably comes in daily contact with, and which frequently require months, and even years to solve under our present crude methods. The most popular, and I believe the most up-to-date and inexpensive drying system to install and operate, is what is known as the waste heat system.

This system in most instances can be installed at a very reasonable cost, and is also very economical to maintain and operate. There are very few brick plants in this country of any size, but which have an abundance of waste heat which can be obtained from either the cooling kilns or the exhaust from the engines, either one or both can be utilized in drying all the brick that they may make.

THE CONDITIONS TO CONSIDER.

In order to obtain the best results with a waste heat dryer, there are several things to be taken into consideration, namely:

1. The amount of waste heat available at all times, both from the cooling kilns and also the engines.
2. The location of your plant as to drainage, etc.
3. The size, class and number of kilns, and their situation relative to the drying tunnels.
4. The size of fans required.
5. The size of both suction and discharge tunnels.

6. The arrangement of drying tunnels and the proper method to install the fan and speed same should run.

I will endeavor to explain the above in detail. Where down-draft kilns are used and the kilns are built in proportion to the capacity of the plant, I will say that any plant which has a capacity of 25,000 brick per day, or over, will always have an available cooling kiln to draw the waste heat from at all times while in constant operation. This, in itself, should be sufficient to furnish all the heat required without the necessity of utilizing the exhaust steam, but in cases where up-draft kilns are used, which usually hold from 300,000 to 500,000 brick and the capacity of the machine is only 25,000 to 30,000 brick per day, it would be necessary to have some other source of obtaining heat and for such plants it would be necessary to have in connection with the waste heat from kilns steam coils for utilizing the exhaust from engines and also an auxiliary furnace to take direct heat from. In estimating the amount of heat required at all times, it is first necessary to find out the exact amount of moisture your brick contain when they come from the machine and which has to be removed in a given time. The following data will give a satisfactory basis to estimate the amount of steam coils and the size furnace, etc., required. One pound of ordinary bituminous coal will furnish about 13,000 heat units. One square foot of grate surface will consume from 15 to 20 pounds of bituminous coal per hour. Three pounds of coal will generate 25 pounds of steam per hour which is equivalent to 1 h.p. or 100 lineal feet of heater and 3 lineal feet of 1 inch pipe will give off 5 heat units per minute and heat about 300 cubic feet of air 1 degree F.

Air at 32 degrees F. contain 1-160 of its weight in water when saturated with moisture and doubles capacity for saturation for every 27 degrees F. increase and it requires 3,500 cubic feet of air to absorb one pound of water at 32 degrees F. or 40 feet of cubic air at 160 degrees F.

YARD DRAINAGE.

Another very important factor to consider in installing a waste heat system is the yard drainage. Plants which are located in low, marshy places have to be very careful should they install an underground flue system to see that no water gets into the tunnels, as this will retard the drying facilities. In such localities I prefer the overhead pipe system as to the relative situation of the kilns to the drying tunnels. Will say that where the situation will permit, it is preferable for many reasons to have the distance between drying tunnels and kilns as near equal as possible and also as close to dry houses as possible. The size fan required depends entirely on the number of drying tunnels and the distance the heat has to be drawn.

The size of both suction and discharge tunnels are very essential features in the practical and economical operation of waste heat fans and should be proportioned according to the size fan used and the length of both the suction and discharge tunnels. For tunnels over 50 feet in length, 10 per cent. in area should be added for every additional 20 feet. The main discharge tunnel should be equal in area to the main suction tunnel and the distributing flues which distribute the heat underneath the cars of brick should have a combined

area equal to at least the area of the main discharge tunnel and the hot air vents or outlets in distributing flues should have a combined area of about 5 per cent. less than the combined area of the distributing flues. This, in itself, will insure a uniform and equal distribution of heat in the various drying tunnels at all times. Should the combined area of the hot air vents or outlet exceed the area of the distributing flues there will at times be an unequal distribution of heat in the drying tunnels. One of the most important features pertaining to a waste heat dryer is the proper arrangement of the fan relative to the various flues, etc. I have often come in contact with waste heat drying systems where the fan was placed on a line with the exit end of drying tunnels and was sitting parallel with the drying tunnels themselves which necessitated the large discharge tunnel being located on the outside of the drying tunnels themselves directly under the cooling track of the dryer and running at right angles to the fan. This mode of construction is by no means the most satisfactory.

AN INTERESTING EXPERIENCE.

I recently had the experience of changing a large 12 track waste heat dryer which was built as just described and turned the fan facing the drying tunnels and placed the large discharge tunnel directly underneath the exit end of drying tunnels so that the fan in discharging the hot air had a direct and continuous passage leading from it direct to the distributing flues which were built at right angles to the main discharge or supply flues. This method of course eliminates the curve in main discharge tunnel, decreases the friction and brings the heat in more direct contact with the brick or ware to be dried and also receives the full benefit of every unit of heat radiated from the main discharge tunnel, which increased the drying capacity of dryer about 25 per cent. and also gave a more equal distribution of heat in drying tunnel. I strongly advocate drying all classes of brick thoroughly. I have frequently heard dry pressed brick manufacturers ridicule the idea of running their brick through tunnel dryers before setting them in kilns. There may be instances where this would not be practical, but in 99 cases out of 100 dry pressed brick can be dried much more economical and with less danger of checking them when dried in artificial dryers. I have run dry pressed brick through dryers which were heated up to a temperature of over 200 F. in 24 hours drying them thoroughly without checking them a particle, after which they were set in kilns and heated up to a dull red heat within 48 hours after kiln was fired up, not damaging them in the least. This same clay made into dry pressed brick and set in the kilns direct from machine required from 7 to 8 days to thoroughly water smoke or dry them, without checking them. This meant a saving of 25 per cent. in fuel and about 50 per cent. of time in burning. I do not think the time is far distant when the majority of dry pressed brick manufacturers will adopt artificial dryers for drying their dry pressed brick before setting same in kilns.

In conclusion will say in installing a waste heat drying system avoid as many right angle curves as possible and eliminate all complicated features and get drying tunnels as near source of supply as is consistent with the arrangement of our plant.

STEEL CASTINGS COMPANY EXTENDING.

The Ottawa Steel Castings Co., started on February 17 to build a 203x67 extension to the premises on Bridge Street, Ottawa. The building will be devoted exclusively to the production of steel castings and will be equipped with travelling cranes and all modern appliances, for some of which the firm is now in the market.

HEAVY ROLLING MILL.

A new machine is shown illustrated here with designed as one of large capacity and great strength for crushing, grinding, flaking, crumping oats and other cereals.

The roll as will be seen from cut has a frame of great strength and rigidity. The bearings are long and large in diameter, are ring oiling ball and socket, self aligning and lapped with high grade babbitt. All adjustments are within easy reach of

operator. There are, however, clutches and clutches, and it is not an easy matter for even an engineer to select at first sight the one best suited to any particular service.

One of the principle advantages attaching to the inclusion of a friction clutch or clutches in a modern power installation is found in the ease with which it is possible to throw individual machines or a portion of a factory—in or out of work as required. In many factories there are machines which are required only for intermittent work perhaps for only an hour or two daily, yet, as ordinarily arranged, the driving shaft connected to it is kept in rotation with belts running on the loose pulleys of the machines for the whole time involving in many instances some considerable amount of friction which the motor is called upon to overcome to no useful purpose. Where gas engines of large power are employed, the adoption of a friction

temperature. In sanitation, ventilating, heating and lighting this building represents the acme of modern engineering ability.

SIDE THOUGHTS.

THE REAL THING.

A new milking machine has just been invented and is in successful operation at Dayton, Ohio. It is an electric motor which fastens to the rump of the cow, the electricity being generated by a small dynamo attached to her tail. She switches her tail, the dynamo starts, and by means of a bevel gear and block and tackle, the milk is extracted, strained, and the pail and strainer hung up to dry. A small phonograph accompanies the outfit and yells "so" every time the cow moves. If she lifts her foot to kick, a small dingus slides over a whatnot, and the phonograph says "d — it." If she continues to kick a hinged arm grabs up the milk stool and "lams" her on the back until it loosens a patch of skin the size of a dust pan.

THE JAP'S COLLECTION LETTER.

Shugio, an ambitious young Japanese salesman employed by an importer of Oriental goods in New York, has asked so often for a chance to do clerical work in the office that last week he was told he might write letters to three persons on the firm's books to ask them if they would make some payment on their accounts.

"Go easy with them," cautioned the importer. "They're all good customers, but just a bit slow."

Two days later the importer was surprised to receive checks in full for all three accounts. One check from a well-known woman was accompanied by a sharp note, and the head of the firm hastened to find the copy of Shugio's dunning letter. It read:

"Dear Mrs. —. If you do not do us the extreme honor of paying all the dollars and all the cents of this accounting which so long you have owed to our business of importing, we shall to our regret begin to do something that will cause you the utmost astonishment."—N. Y. Sun.

A MISUNDERSTANDING.

Tarantula Tom—"Why did Bill plug the tenderfoot?"

Lava Bed Pete—"It all come o' Bill's distressin' ignorance o' legal terms."

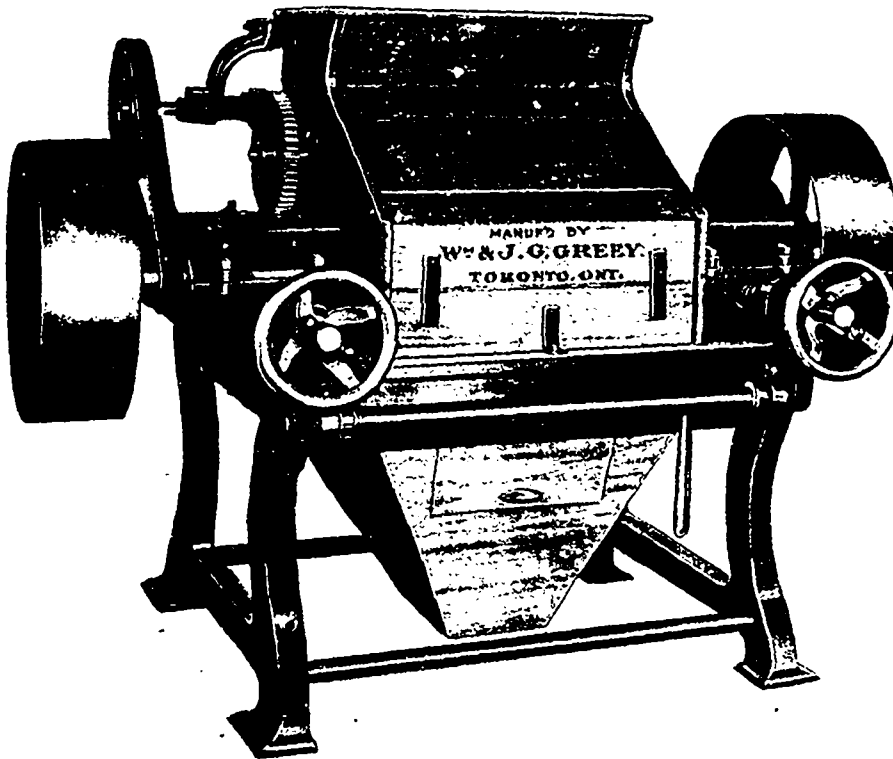
T. T. "How 'uz that?"

L. B. P. "Well, Bill owed the short-horn some money, an' was sorter slow about payin'. So the stranger writ him a letter sayin', 'I will draw on you at sight.' An' Bill thought that meant a gun-play; so, when he meets up with the stranger he draws first. It was a misunderstandin'."

Cleveland Leader.

NEW BOILER SHOP IN OTTAWA.

A new boiler shop has been erected on Bridge Street, Ottawa, by the Capital Boiler Works. The building is 86x66 feet, but will be further enlarged in the near future. Mr. Powers, president of the company, states that this shop will be devoted to boilers and blacksmith work and that in the old premises on Wellington Street, only gas buoys, such as the firm have been making for some time, will be made.



New Heavy Rolling Mill.

operator. The rolls may be set up to their work with enormous pressure and remain in true alignment at all times. They may be thrown apart by simply raising lever. Woodwork is carefully fitted and finished all joints are dust tight. A roll feed is usually furnished, but a vibratory feed may be put on if desired. Machine is driven by a pulley at end of each roll. Rolls may be gear driven if desired. Further particulars may be had from the manufacturers, Wm. & J. G. Grey, 2 Church Street, Toronto.

WHERE THE FRICTION CLUTCH COMES IN.

There is probably no appliance connected with the transmission of power that has been the subject of so much development and improvement during recent years as the friction clutch. This is hardly a matter for wonderment, as there are few power installations in which a frictional coupling cannot

clutch, too, is almost imperative, as it enables the engine to be started with no other resistance than that of the engine itself. The load may then be gradually put on the engine as required.

HERMETICALLY SEALED BUILDING.

Buffalo has an office building in which the old time idea of allowing free outside atmosphere to enter for ventilation has been superceded. The reason for this is that the building in question was built in an unattractive site amidst smoke, noise and dirt necessitating keeping from outside conditions as much as possible. Thick walls and double glass windows hermetically sealed are aids in this respect. All air entering the building is drawn from the outside atmosphere filtered and heated or cooled, depending on the season and sent in liberal quantities to every room ensuring ample fresh air of the desired

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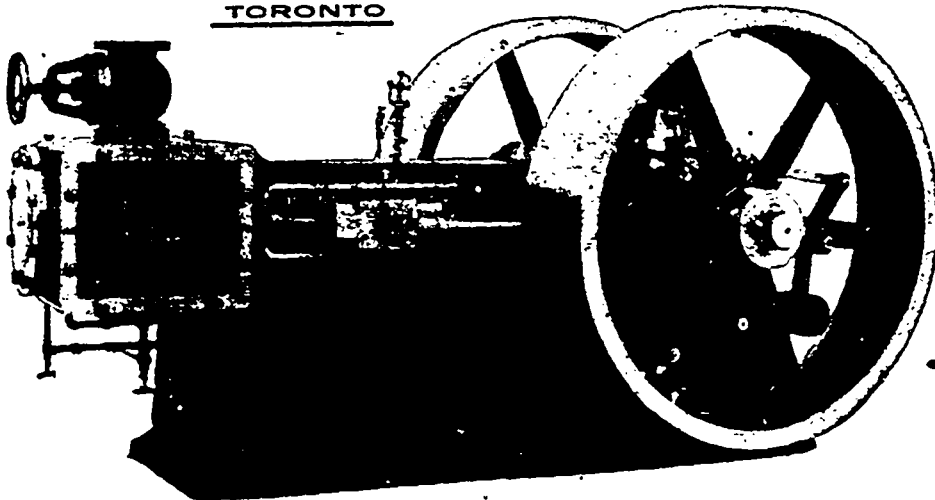
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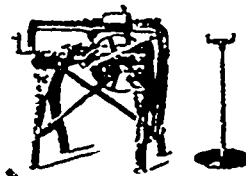
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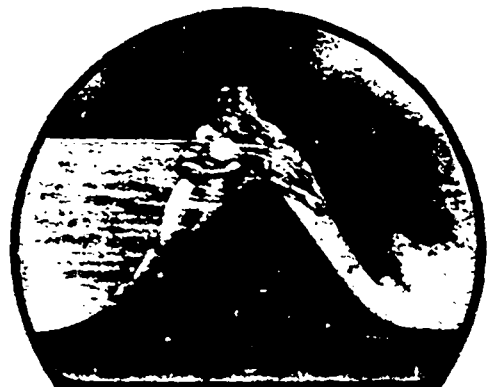
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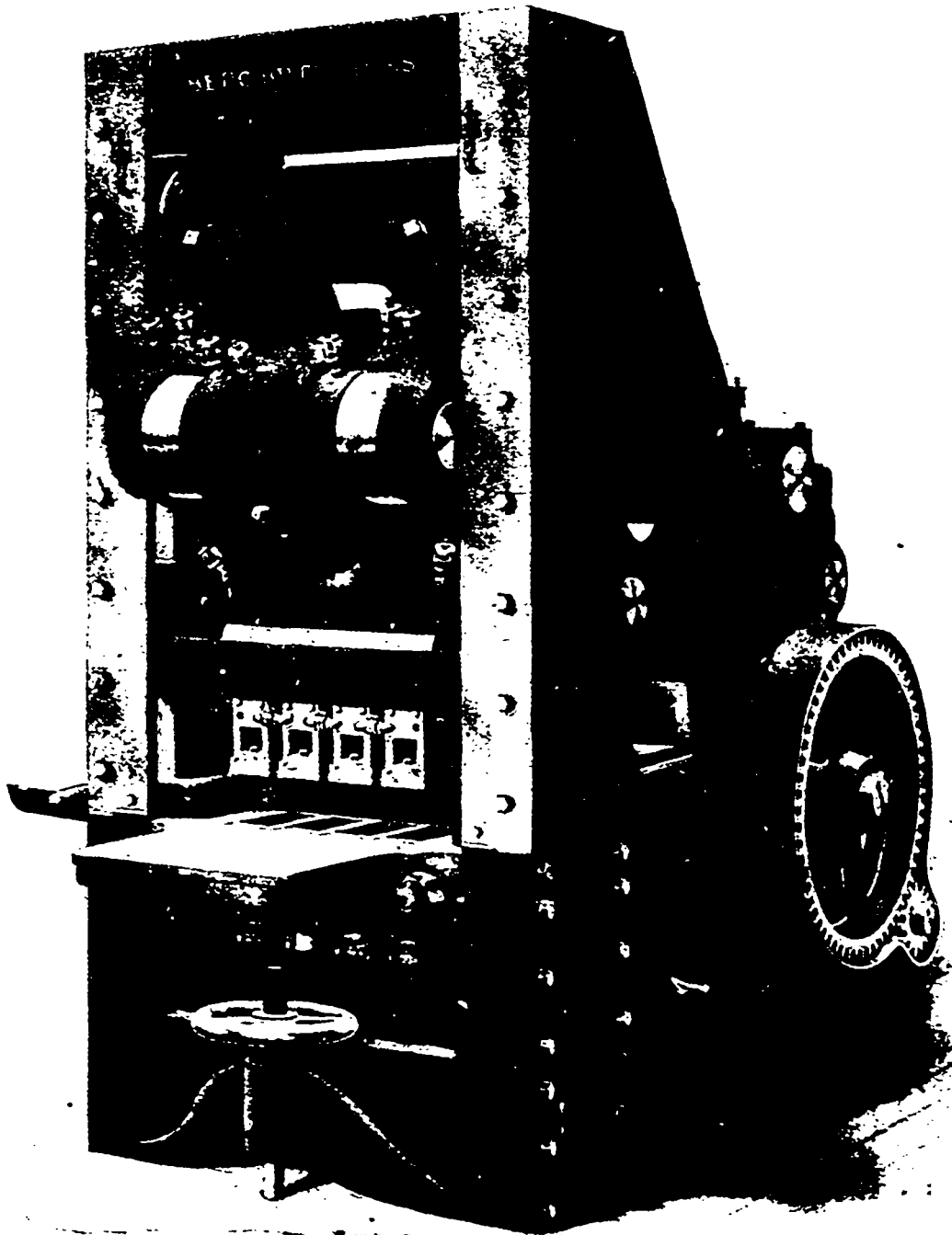
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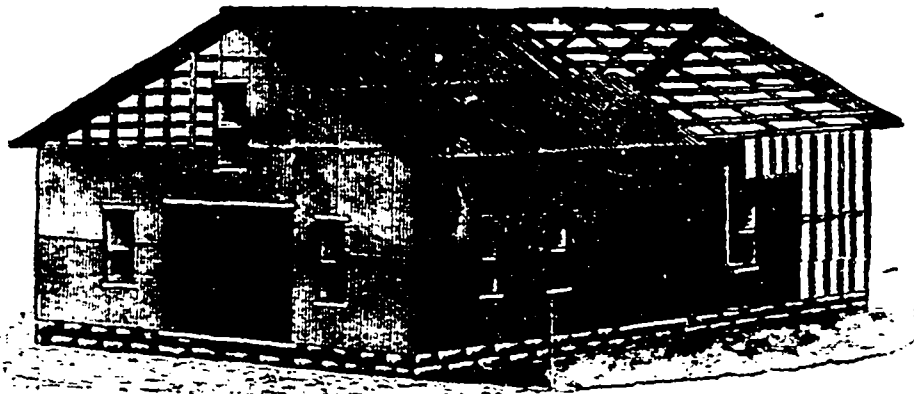
Our Machinery is the Heaviest, Strongest and Best Manufactured in the Dominion—and will give you results.

We install complete wire cut plants. Let us test your clay and report what we can do with it.

Bechtels, Limited

WATERLOO, - ONTARIO

A CHEAP AND DURABLE BUILDING



We want **manufacturers** who are planning **extensions** to write us about

"ACORN QUALITY" CORRUGATED GALVANIZED SHEETS

We can tell them how to build the **warmest** and **most durable** construction, in the **shortest time** and at the **lowest price**.

A building roofed and sided with our "Acorn Quality" Sheets is also **fire-proof, lightning-proof** and **water-proof**.

We will satisfy you, as we have **dozens** of other **Canadian manufacturers**.

LET US KNOW YOUR REQUIREMENTS.

The METAL SHINGLE & SIDING CO., Limited

PRESTON, ONT.

MONTREAL, QUE.

Sales Agents: ST. JOHN, N.B.
Emerson & Fisher

QUEBEC
J. A. Bernard

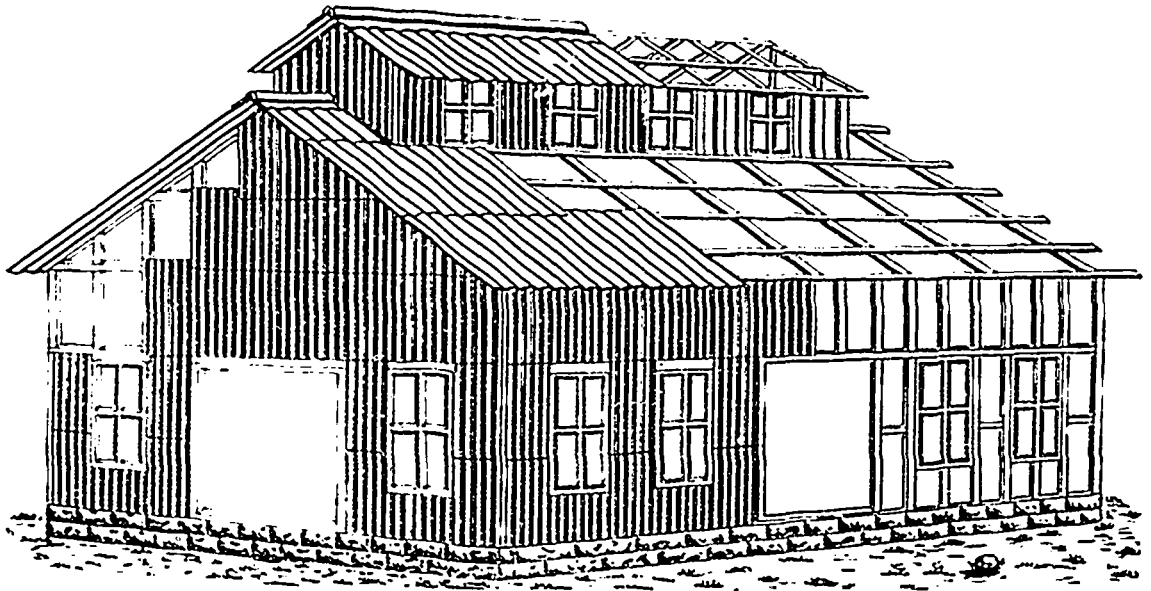
WINNIPEG
Clare & Brockest

CALGARY
Ellis & Grogan

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

CORRUGATED IRON

"Keeping Everlastingly at it Brings Success."



PEDLAR'S CORRUGATED IRON is made on a 38,000 lb. Press (the only one in Canada) one corrugation at a time, and is guaranteed true and straight to size.

We carry a 600 ton stock in Oshawa, Montreal, Ottawa, Toronto and London and can ship ordinary requirements the same day order is received.

Made in 1", 2", or 2½" corrugations in sheets any length up to 10 feet in 28, 26, 24, 22, 20, 18 gauge, both painted and galvanized.

This class of material is most suitable for fireproofing, Factory, Mill, Barns and Warehouse Buildings and is water and wind proof.

Corrugated Ridges, Lead Washers and Galvanized Nails carried in stock.

Send specifications to your nearest office for catalogues and prices.

The PEDLAR PEOPLE

Montreal, Que.
767-739 Craig St.

Ottawa, Ontario
423 Sussex Street

Toronto, Ontario
11 Colborne Street

London, Ontario
69 Dundas Street

Winnipeg, Man.
76 Lombard Street

Vancouver, B.C.
615 Pender Street

WRITE YOUR NEAREST OFFICE. HEAD OFFICE AND WORKS, OSHAWA, ONT.
LARGEST MAKERS OF SHEET METAL BUILDING MATERIALS UNDER THE BRITISH FLAG

WIRE GUARDS

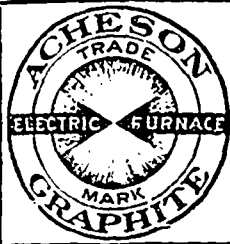
FOR

FACTORY AND MILL WINDOWS
SCHOOL AND CHURCH WINDOWS
STORE AND BASEMENT WINDOWS
AND FOR ALL PUBLIC BUILDINGS

HAMILTON, ONT.

THE B. GREENING WIRE CO., LIMITED

MONTREAL, QUE.



ACHESON-GRAPHITE—The Purest in the World

Manufactured in the Electric Furnace. Write us for full information regarding the use of this material in lubricating compounds, pipe joint compounds, as foundry facings, for electrotyping purposes, etc.

ACHESON-GRAPHITE ELECTRODES. Best for Furnace Work

Works at NIAGARA FALLS, ONT.

NIAGARA FALLS, N. Y.

INTERNATIONAL-ACHESON-GRAPHITE CO.,

Niagara Falls, N. Y., U. S. A.

James Thomson, Pres. and Man. Dir. J. G. Allan, Vice-Pres. James A. Thomson, Secretary. Alex. L. Gartshore, Treasurer.

The GARTSHORE-THOMSON PIPE & FOUNDRY CO.

LIMITED



3 in. to 60 in. diameter.

For Water, Gas, Culverts and Sewers Special Castings and all kinds of Flexible and Flange Pipe
WATER WORKS SUPPLIES HAMILTON, ONT.

CASTINGS GREY IRON
IN ROUGH OR MACHINED.

PATTERNS WOOD OR IRON.
ESTIMATES FURNISHED.

DAVID MAXWELL & SONS
ST. MARYS, ONT.

NORTHERN ALUMINUM CO., LIMITED

Shawinigan Falls, P.Q.

Business Office Pittsburgh, Pa.

ALUMINUM

INGOTS—SHEETS—TUBING, ETC.

Aluminum Stamped, Cast, Spun Articles of any Description to Order.

ALUMINUM WIRE and CABLES (BARE OR INSULATED) for Electrical Conductors.

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PARKDALE 1809



Manufacturers of

Post Office and

Telegraph Address:

SWANSEA, - ONT.

Vitrified
Salt-Glazed

SEWER PIPES

In Sizes from
1/4 in. to 24 in.

PRICE LIST AND DISCOUNTS ON APPLICATION.

THE DOMINION SEWER PIPE CO., Limited - Works and Office, **SWANSEA**
(near Toronto)

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

MACHINERY AND EQUIPMENT FOR SALE

PLATE GLASS

QUEEN CITY PLATE GLASS AND MIRROR CO., Limited; every description of glass for buildings. 213 Victoria street, Toronto.

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LEATHER BELTING - We are the largest manufacturers of leather belting in Canada. Sadler & Haworth, Toronto and Montreal.

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ROOFING READY FOR USE - With cement caps and nails; easily applied; write for particulars. Eureka Asbestos Co., Toronto.

ARCHITECTURAL SHEET METAL Manufacturers' fireproof metallic ceiling, siding, shingles, lathing, windows, doors, skylights, cornices, finials, ventilators, corrugated iron, zinc ornaments. The Metallic Roofing Co., Limited, Toronto; telephone Park eight hundred.

INDUSTRIAL CENTRES

NIAGARA AND CATARACT POWER gives Welland cheapest electric lighting in Canada; manufacturers investigate our power, lake shipping and five railways. Write Board of Trade, Welland.

COVERINGS AND INSULATION

MICA FIREPROOF COVERINGS - Highest insulator of heat known. For boilers, flues, furnaces, steam and hot or cold water pipes, cold storage, sound insulation. Mica Boiler Covering Co., 86 to 92 Ann St., Montreal.

BOILERS AND ENGINES

BOILERS.-For special quotations on boilers and sheet iron work, write Park Bros., (Latham), Ont.

ARE YOU USING STEAM, ELECTRICITY, city gas or gasoline for power? We can guarantee to reduce your power bill more than 50 per cent.; in some cases we can save you 80 per cent.; we have a number of 15 horse power engines for immediate delivery; phone or write for information. Johnston Oil Engine Co., Limited, 33 Golden Avenue, Toronto. Phone Park 2331.

SCRAP METALS, PAPER, ETC.

E. PULLAN, TORONTO, positively the largest dealer in paper stock in the Dominion. Also buys rags, iron, metals, etc. Corner Adelaide and Maid. Phone Main 4633. Toronto

FACTORY EQUIPMENT

136 INCH STURTEVANT EXHAUST FAN and Shaving Cyclone, and about 100 feet of piping. These articles are for sale cheap. Putting in lawer plant. Apply Matthews Bros., Limited, 783 Dundas Street, Toronto.

SITUATIONS WANTED

FOREMAN PATTERN MAKER desires a change; experience with well-known firms in England and Canada. Testimonials and references forwarded on application. Address Pattern Maker, Canadian Manufacturer, Toronto.

SPECIAL MACHINERY

GENERAL MACHINE WORK and repairing special machinery. Fisher Bros., machinists, 816 Bathurst Street, Toronto.

FACTORY LOCATIONS.

The following Canadian municipalities are offering inducements to secure manufacturing establishments. Inquiries should be addressed to the Mayor, Town Clerk or Board of Trade of the respective cities:

- Barrie, Ont.
- Hamilton, Ont
- Peterborough, Ont.
- Regina, N.W.T.
- Sherbrooke, Que.

H. W. PETRIE'S LIST

Horizontal Stationary Tubular Boilers.

	Approx. H.P.
72"x14", 114 3/4" tubes, plug hat dome	125
60"x17" 6", 54 1/4" tubes, plug hat dome	85
63"x14", 64 3/4" tubes, plug hat dome	80
60"x13" 9", 54 3/4" tubes, plug hat dome	75
60"x15" 4", 50 3/4" tubes, plug hat dome	75
60"12", 74 3/4" tubes, plug hat dome	60
56"x14" 4", 61 3/4" tubes, plug hat dome	65
56"x12", 60 3/4" tubes, plug hat dome	55
48"x13" 6", 44 3/4" tubes, plug hat dome	50
48"x15" 6", 52 3/4" tubes, plug hat dome	46
46"x13", 53 3/4" tubes, plug hat dome	45
48"x13" 6", 42 3/4"x12" tubes, manhole dome	45
48"x13" 6", 42 3/4"x12" tubes, manhole dome	40
44"x13" 9", 48 3/4"x12" tubes, plug hat dome	40
44"x14", 51 3/4" tubes, plug hat dome	40
44"x14" 6", 40 3/4" tubes, plug hat dome	36
44"12", 46 3/4" tubes, plug hat dome	35
44"x11" 9", 42 3/4" tubes, manhole dome	35
44"x11" 6", 43 3/4" tubes, manhole dome	35
44"x11" 4", 46 3/4" tubes, manhole dome	35
44"x11" 3", 36 3/4" tubes, manhole dome	30
40"x12", 2 13" tubes, no dome	30
38"x15", 34 3/4" tubes, plug hat dome	28
38"x13", 33 3/4" tubes	25
38"x12", 20 3/4" tubes, manhole dome	25
36"x12", 26 3/4" tubes, plug hat dome	25

Throttling Governor Engines, Horizontal

	Approx. H.P.
20" x 24" plain slide valve, R. Hd.	225
16" x 24" rocking slide valve, L. Hd.	100
15 1/2" x 24" plain slide valve, L. Hd.	100
12" x 24" plain slide valve, R. Hd.	75
12" x 16" plain slide valve, L.H.	50
11" x 24" plain slide valve	50
10" x 24" plain slide valve, L. Hd.	45
9" x 22" plain slide valve, R. Hd.	45
10" x 12" plain slide valve, L.H.	25
9 1/2" x 10" centre crank, Dutton, NEW	20
8 1/2" x 18" M. Mowry	22
8 1/2" x 12" plain slide valve	20
9" x 10" Leonard centre crank	20

Centrifugal and Rotary Pumps

	Capacity. Gals. per m.
New No. 6 Northey, vertical centrifugal	900
No. 6 Horizontal Centrifugal, Morris	1050
No. 5 Horizontal Centrifugal, Morris	470
No. 3 Vertical Centrifugal, Morris	260
New No. 0 Taber Rotary Pump	100
New No. 2 Taber Rotary Pump	250
No. 0 Taber rotary pump	100
No. 0002 Taber rotary pump	25

Machinery Headquarters

H. W. PETRIE

Front Street W., TORONTO
St. James Street, MONTREAL

WANTED

Your Orders

-FOR-

Wire Machinery

Write us telling what you want to do in Wire Drawing; we will tell you how to do it.

The TURNER, VAUGHN & TAYLOR CO.

CUYAHOGA FALLS, O., U.S.A.



Tenders for Pulpwood Concession.

Tenders will be received by the undersigned, up to and including the eighth day of March next, for the right to cut the Pulpwood on a certain area, in the District of Nipissing, north of the Townships of Holmes, Burt, Eby, Otto, Boston, etc., and immediately west of the interprovincial boundary line.

Tenders should state the amount they are prepared to pay as Bonus, in addition to such dues as may be fixed, from time to time, for the right to operate a pulp, or pulp and paper industry on the area referred to. Successful Tenderers will be required to erect mills on the territory, or at some other place approved by the Lieutenant Governor in Council, and to manufacture the wood into pulp in the Province of Ontario.

Parties making tenders will be required to deposit with their tender, a marked cheque, payable to the Treasurer of Ontario, for ten per cent. of the amount of their tender, to be forfeited in the event of their not entering into agreement to carry out the conditions, etc. The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital required to be invested, etc., apply to the undersigned.

F. COCHRANE,
Minister of Lands, Forests,
and Mines.

Toronto, December 29th, 1906.

No unauthorized publication of this notice will be paid for.

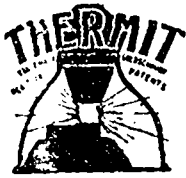
MAPLE LEAF

STITCHED COTTON DUCK

BELTING

DOMINION BELTING CO. LTD.

HAMILTON CANADA



THE WELDING PROCESS FOR THE FOUNDRYMEN
 Gives liquid steel at 5400° F. anywhere in half a minute.
 Write for booklet.
 Goldschmidt Thermo Co.
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Manufacturers of Engine Sized Superfine Papers, White and Tinted Book Papers, Blue and Cream Laid and Wove Foolscaps, Account, Envelope and Lithographic Papers, etc.

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CANADIAN OFFICE & SCHOOL FURNITURE CO. LIMITED
 PRESTON ONT.
 FIRE BANK OFFICE, COURT HOUSE & DRUG STORE FITTINGS.
 OFFICE, SCHOOL, CHURCH & RESTAURANT.
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For either new or old Buildings
OUR Metallic Cornices
 can't be equalled for practical service and artistic beauty.
 They are light in weight, easily handled and economical in cost—giving fire-proof protection as well as a handsome effect.
 Almost countless stock designs—or any particular size, shape or pattern to order. Write for full details.
METALLIC ROOFING CO., LIMITED
 Wholesale Mfrs.
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 Georgetown, Ont.
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Book and Fine Papers

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FILE and RASP MANUFACTURERS AND RE-CUTTERS.
 A trial order solicited. Write for terms.
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Rails and SUPPLIES,
 Now and Secondhand.
 For RAILWAYS, TRAMWAYS, Etc.
 Old material bought and sold.

RAWHIDE GEARS
 MANUFACTURED BY
THE HORSBURGH & SCOTT CO.
 Cleveland, Ohio.

Write for Free Copy
TENTH EDITION
 Dixon's latest book, "Graphite as a Lubricant," tenth edition, explains the modern practice of graphite lubrication and quotes experiments by scientific authorities and experiences of practical men.
 GET FREE COPY 33-C.
Joseph Dixon Crucible Co.
 JERSEY CITY, N.J., U.S.A.

VISES
 Bench Vises
 Drill Vises
 Miller Vises
 Pattern Makers' Vises
 Got Our Prices.
The Stevens Mfg. Co., Limited
 GALT, ONT.

The DOMINION OIL CLOTH CO. LIMITED
 Manufacturers of....
LINOLEUM FLOOR OIL CLOTHS TABLE OIL CLOTHS
 Also Carriage, Stair and Enamelled Oil Cloths, Decorative Burlaps.
Office and Works - MONTREAL

KEEPING DOWN COST
THE WEBSTER FEED WATER HEATER
 IS THE GREAT SAVER OF STEAM AND FUEL

First—It uses only just enough of the exhaust to bring the feed-water to the highest point.
 Second—It heats it by DIRECT CONTACT with the steam.
 Third—It prevents waste from "back pressure" on the engine.

These and other points of advantage are to-day reducing the cost of production for hundreds of manufacturers so greatly as to make it very hard to find for others with less efficient steam appliances to keep pace with them.

WRITE TO-DAY FOR CATALOGUE H.2.
DARLING BROTHERS LIMITED
 MONTREAL — TORONTO — WINNIPEG

WOOD ENGRAVING PHOTO ENGRAVING HALF TONES
 OR ANY CLASS OF ENGRAVING FOR ADVERTISING PURPOSES, CATALOGUES, MAGAZINES, &c.
J.L. JONES & CO.
168 BAY ST. - TORONTO

Classified Index of Lines Sold by Advertisers

All advertisers are invited to send in full list of lines sold by them. We desire to keep this index thoroughly up-to-date, but this will be impossible unless each advertiser sees to it that he is represented under each heading he is entitled to.

<p>Abrasives Williams, A. R. Machinery Co., Toronto</p>	<p>Annealing Muffles and Furnaces (Wire) Leslie, A. C. & Co., Montreal. Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.</p>	<p>Belt Fasteners Bristol Co., Waterbury, Conn. McLaren, D. K., Montreal and Toronto. Petrie, H. W., Toronto. Sadler & Haworth, Montreal and Toronto. Williams, A. R. Machinery Co., Toronto</p>
<p>Accountants Neff & Postlethwaite, Toronto. Viau, Henri, Montreal.</p>	<p>Antimony Syracuse Smelting Works, Montreal.</p>	<p>Belt (Gotton) Dominion Belting Co., Hamilton, Ont. Greay, Wm. & J. G., Toronto. McLaren, D. K., Montreal and Toronto. Petrie, H. W., Toronto. Sadler & Haworth, Montreal and Toronto.</p>
<p>Acids Canada Chemical Co., London, Ont. Nichols Chemical Co. of Canada, Montreal.</p>	<p>Anvils and Vises Leslie A. C. & Co., Montreal.</p>	<p>Belt (Leather) McLaren, D. K., Montreal and Toronto. Petrie, H. W., Toronto. Sadler & Haworth, Montreal and Toronto. Williams, A. R. Machinery Co., Toronto.</p>
<p>Air Compressors Allis-Chalmers-Bullock, Limited, Montreal. Canada Foundry Co., Toronto. Canadian Rand Drill Co., Sherbrooke, Que. Darling Bros., Montreal. Smart-Turner Machine Co., Hamilton, Ont.</p>	<p>Architects Parke, R. J. Toronto.</p>	<p>Belt (Rubber) Greay, Wm. & J. G., Toronto. Gutta Percha & Rubber Mfg. Co., Toronto. McLaren, D. K., Montreal and Toronto. Petrie, H. W., Toronto. Sadler & Haworth, Montreal and Toronto.</p>
<p>Alum Nichols Chemical Co. of Canada, Montreal.</p>	<p>Automatic Gear Cutting Machines Becker-Brainard Milling Machine Co., Hyde Park, Mass.</p>	<p>Belt (Supplies) Bristol Co., Waterbury, Conn. Dominion Belting Co., Hamilton, Ont. Greay, Wm. & J. G., Toronto. Gutta Percha & Rubber Mfg. Co., Toronto Jeffrey Mfg. Co., Columbus, Ohio. McLaren, D. K., Montreal and Toronto. Petrie, H. W., Toronto. Williams, A. R. Machinery Co., Toronto.</p>
<p>Aluminum Northern Aluminum Co., Pittsburg, Pa. Syracuse Smelting Works, Montreal.</p>	<p>Axles Nova Scotia Steel & Coal Co., New Glasgow, N.S.</p>	<p>Blast Furnace Brick Dunbar Fire Brick Co., Pittsburgh, Pa. Elk Fire Brick Co., St. Mary's, Pa. Hamilton Facing Mill Co., Hamilton, Ont. Harbison-Walker Refractories Co., Pittsburg, Pa. Pennsylvania Fire Brick Co., Beech Creek, Pa. Queen's Run Fire Brick Co., Lock Haven, Pa. Stowe-Fuller Co., Cleveland, Ohio.</p>
<p>Angles, Beams and Girders Bourne-Fuller Co., Cleveland, Ohio. Canada Foundry Co., Toronto. Nova Scotia Steel & Coal Co., New Glasgow, N.S.</p>	<p>Babbitt Metal Greay, Wm. & J. G., Toronto. Petrie, H. W., Toronto. Syracuse Smelting Works, Montreal.</p>	<p>Banks Bank of Hamilton, Hamilton, Ont.</p>
<p>Aniline Colors and Dyewood Extracts Benson, W. T. & Co., Montreal. Brunner, Mond & Co., Norwich, England. Canada Chemical Mfg. Co., London, Ont. Cassella Color Co., New York City. McArthur, Corneille & Co., Montreal. Nichols Chemical Co. of Canada, Montreal. Winn & Holland, Montreal.</p>	<p>Bar Iron and Steel Bourne-Fuller Co., Cleveland, Ohio Leslie, A. C. & Co., Montreal. London Rolling Mills, London, Ont. Union Drawn Steel Co., Hamilton, Ont.</p>	<p>Belt Dressing Greay, Wm. & J. G., Toronto. Petrie, H. W., Toronto. Sadler & Haworth, Montreal and Toronto. Williams, A. R. Machinery Co., Toronto.</p>

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$\frac{3}{4}$ Ton to 20 Tons

MADE IN CANADA.

ST. LAWRENCE SUPPLY CO., Limited

1591 ONTARIO STREET EAST, MONTREAL

CLASSIFIED INDEX.

(CONTINUED).

Blowers

Hamilton Facing Mill Co., Hamilton, Ont.
Sheldons, Limited, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Boiler Compounds

Canada Chemical Mfg. Co., London, Ont.
Hamilton Facing Mill Co., Hamilton, Ont.

Boiler Coverings

Mica Boiler Covering Co., Montreal.

Boiler Inspection

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

BOILERS (See Engines and Boilers)

Bolts and Nuts

London Rolling Mills, London, Ont.
Morow, John, Screw, Limited, Ingersoll, Ont.

Building and Paving Brick

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

Building Iron and Steel

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

Builders' Materials

Albert Mfg. Co., Hillsboro, Ont.
Canada Foundry Co., Toronto.
Conduits Company, Limited, Toronto.
Expanded Metal & Fireproofing Co., Toronto.
Gartshore, John J., Toronto.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.
Sheldons, Limited, Galt, Ont.

Burlap (Decorative)

Dominion Oil Cloth Co., Montreal.

Business Methodizers

Van, Hean, Montreal.

Cables

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

Canada Plates

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

Caps

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Card Clothing

McLaren, D. K., Montreal and Toronto.

Cast Iron Pipe

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

Castings (Grey Iron, Malleable Iron and Brass)

Greay, Wm. & J. G., Toronto.
Jenckes Machine Co., Sherbrooke, Que.
Kerr Engine Co., Walkerville, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
McKinnon Dash & Metal Works Co., St. Catharines, Ont.
Maxwell, David & Sons, St. Mary's, Ont.
Morrison, Jas., Brass Mfg. Co., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.

Cement

Mica Boiler Covering Co., Montreal

Cement Machinery

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

Centrifugal Pumping Machinery

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

Chain Making Machinery

(Welded Coil Chain)

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

Channels

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

Charcoal Pig Iron

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

Chemicals

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

Chemists

Heys, Thomas & Son, Toronto.

Chemists' Machinery

Greay, Wm. & J. G., Toronto.

Clay Working Machinery

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.
Bechtels, Limited, Waterloo, Ont.
Berg, A. & Sons, Toronto.
Greay, Wm. & J. G., Toronto.

Coal, Coke and Charcoal.

Bourne-Fuller Co., Cleveland, Ohio.
Hamilton Facing Mill Co., Hamilton, Ont.

Coal Cutting Machines

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

Coal Triples

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

Coil Chains

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

Coke Oven Brick

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

Collection Agency

Petrie, H. D., Hamilton, Ont.

Collectors (Pneumatic)

Greay, Wm. & J. G., Toronto.
Sturtevant, B. F. Co., Hyde Park, Mass.

Condensers

Smart-Turner Machine Co., Hamilton, Ont.

Conduits (Interior)

Conduits Company, Limited, Toronto.

Connecting Rods.

Canada Forge Co., Welland, Ont.

Contractors' Machinery

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

Contractors' Plants

Allis-Chalmers-Bullock, Limited, Montreal.
Jenckes Machine Co., Sherbrooke, Que.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.
Williams A. R. Machinery Co., Toronto.

Conveying Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
McDougall, John, Caledonian Iron Works Co., Montreal.
Perrin, William R. & Co., Limited, Toronto.
Smart-Turner Machine Co., Hamilton, Ont.

Copper Materials

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

Corrugated Iron

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

Covers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Cranes (Electric and Hand Power)

Smart-Turner Machine Co., Hamilton, Ont.

Cranks shafts

Canada Forge Co., Welland, Ont.

Crayons

Lowell Crayon Co., Lowell, Mass.

Crucibles

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

Crucible Caps

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

Crucible Covers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Cutter Grinding Machines

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

Dashes

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

Dies (Socket, Sewer Pipe and Tile)

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

Directories

Kelly's Directories, Limited, Toronto

Draw Benches (Wire)

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

Dredges

Allis-Chalmers-Bullock, Limited, Montreal.

Drill Chucks

Krug & Crosby, Hamilton, Ont.

Drills

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

Drills (Pneumatic and Rock)

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

Drop Forgings

Globe Machine & Stamping Co., Cleveland, Ohio

Drop Forging Dies

Globe Machine & Stamping Co., Cleveland, Ohio.

Dry Battery Filler

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

Dry Kiln Apparatus

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

Dust and Shavings Separators

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

Dye Stuffs and Chemicals

Benson, W. T. & Co., Montreal.
Brunner, Mond & Co., Northwich, England.
Canada Chemical Mfg. Co., London, Ont.
Cassella Color Co., New York City.
McArthur, Cornelle & Co., Montreal.
Nichols Chemical Co. of Canada, Montreal.
Winn & Holland, Montreal.

DYNAMOS (See Motors and Dynamos)

Electric Meters and Transformers

Packard Electric Co., St. Catharines, Ont.

Electric Mine Locomotives

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

Electric Transformers

Allis-Chalmers-Bullock, Limited, Montreal.

Electrical Supplies

Bristol Co., Waterbury, Conn.
Canadian General Electric Co., Toronto.

CLASSIFIED INDEX.

(CONTINUED)

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

Electrodes

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

Elevators and Conveyors

Darling Bros., Montreal.
Greecy, Wm. & J. G., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
Jenokes Machine Co., Sherbrooke, Que.

Elevator Insurance

Canadian Casualty & Boiler Insurance Co., Toronto.

Emery and Emery Wheels

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

Engineers (Chemical)

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

Engineers (Civil)

Parke, R. J., Toronto.

Engineers (Consulting)

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

Engineers (Contracting)

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

Engineers (Electrical)

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

Engineers (Mechanical)

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

Engineers (Mill and Hydraulic)

Fensom, C. J., Toronto.
Greecy, Wm. & J. G., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.

Engineers (Mining)

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

Engineers and Contractors

Greecy, Wm. & J. G., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
Jenokes Machine Co., Sherbrooke, Que.
Smart-Turner Machine Co., Hamilton, Ont.

Engineers' Supplies

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

Engines and Boilers

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

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

Engravers

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

Exhaust Fans

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

Exhaust Heads

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

Exhausters

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

Factory Sites

(See Factory Locations.)

Fans

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

Feed Water Heaters

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

Feed Water Purifiers

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Files

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

Fillet (Pattern)

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

Filters (Oil)

Babeck & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Perrin William R. & Co., Limited, Toronto.

Filters and Filtering Systems (Water)

Babeck & Wilcox, Limited, Montreal.
Jenokes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.
Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Financial

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

Finials

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

Fire Brick and Clay

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

Fire Escapes

Darling Bros., Montreal.

Fireproof Partitions

Metallie Roofing Co., Toronto.
Podlar People, Oshawa, Ont.

Flour Mill Machinery

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

Forges and Blowers

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

Forgings

Canada Forge Co., Welland, Ont.

Founders

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

Foundry Facings and Supplies

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

Fuel Economizers

Babeck & Wilcox, Limited, Montreal.
Sturtevant, B. F. Co., Hyde Park, Mass.

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

Galvanizing

Ontario Wind Engine & Pump Co., Toronto.
Galvanizing and Tinning Machinery and Furnaces (Wire)

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

Gas Blowers and Exhausters

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

Gas and Gasoline Engines

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

Gauges (Recording Pressure)

Bristol Co., Waterbury, Conn.

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

Gauges (Steam)

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

Gauges (Water)

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

Generating Sets

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

Generators

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.

Jones & Moore Electric Co., Toronto.
Phillips, Eugene F., Electrical Works, Montreal.
Toronto & Hamilton Electric Co., Hamilton, Ont.

Gloves, Mittens and Moccasins

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

Government Notices

Factory Inspectors.
Minister of Agriculture.

Graphite

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

Hack Saws

Krug & Crosby, Hamilton, Ont.

Hames

McKinnon Dash & Metal Works Co., St. Catharines

Hardware

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

Heating and Ventilating Apparatus

Darling Bros., Montreal.
Sheldons, Limited, Galt, Ont.
Sturtevant, B. F. Co., Beaton, Ontario.

High Pressure Blowers

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

Holisting Engines

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

Holsts (Chain and Pneumatic)

Canadian Rand Drill Co., Sherbrooke, Que.

Hose (Fire and Pneumatic)

Gutta Percha & Rubber Mfg. Co., Toronto.

Hydrants

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

Hydraulic Accumulators

Jenokes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.

Perrin, Wm. R. & Co., Limited, Toronto.

Smart-Turner Machine Co., Hamilton, Ont.

Hydraulic Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Canada Foundry Co., Toronto.
Darling Bros., Montreal.
Greecy, Wm. & J. G., Toronto.
Jenokes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.

Perrin, William R. & Co., Limited, Toronto.

Petrie, H. W., Toronto.

Smart-Turner Machine Co., Hamilton, Ont.

Hydro-Electric Plant

Allis-Chalmers-Bullock, Limited, Montreal.

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CLASSIFIED INDEX.

(CONTINUED).

Injectors

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

Insulated Wires and Cables

Phillips, Eugene F., Electrical Works, Montreal.

Insulation, Sound and Cold Storage

Mica Boiler Covering Co., Montreal.

Iron and Steel Specialties

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

Iron and Steel Inspection

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

Lamps—Electric

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

Lathes

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

Lathes (Wood-working)

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

Linoleum

Dominion Oil Cloth Co., Montreal.

Lubricators

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

Machinists

Goldie & McCulloch Co., Galt, Ont.
Krug & Crosby, Hamilton, Ont.
Robb Engineering Co., Amherst, N.S.
Smart-Turner Machine Co., Hamilton, Ont.

Machinists' Supplies

Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Hook Island, Que.
Goldie & McCulloch Co., Galt, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
Morrow, John, Screw, Limited, Ingersoll, Ont.
Petrie, H. W., Toronto.

Machine Tools

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

Malleable Castings

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

Marine and Stationary Engines and Boilers

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

Mechanical Draft

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

Metal Doors

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

Metal Stamping

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

Metallurgists

Mills, S. D., Toronto.

Mica Coverings

Mica Boiler Covering Co., Montreal.

Mill Machinery and Supplies

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

Milling Cutters and Machines

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

Mining Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian Rand Drill Co., Sherbrooke, Que.
Gartshore, John J., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.
Perrin, William R. & Co., Limited, Toronto.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Motors and Dynamos

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Petrie, H. W., Toronto.
Sturtevant, B. F. Co., Hyde Park, Mass.
Toronto & Hamilton Electric Co., Hamilton, Ont.

Motors (Electric)

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

Moulding Sand

Hamilton Facing Mills Co., Hamilton, Ont.

Moulders Supplies.

Hamilton Facing Mill Co., Hamilton, Ont.

Municipal Filtration Plants (Water)

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Nickel

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

Nozzles

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

Office and Bank Fittings

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

Oils and Lubricants

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

Oil Cloth

Dominion Oil Cloth Co., Montreal.

Paint Pigment

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

Paints and Colors

Berry Bros., Walkerville, Ont.
McArthur, Cornelle & Co., Montreal.

Paper Manufacturers

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

Patents

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

Patterns (Wood and Iron)

Maxwell, David & Sons, St. Mary's, Ont.

Perforated Metals

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

Personal Accident

Canadian Casualty & Boiler Insurance Co., Toronto.

Phosphorizers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Pig Iron

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

Pipe (Riveted, Iron and Steel)

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

Pipe Threading Machines

Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Hook Island, Que.
Morrison, Jas., Brass Mfg. Co., Toronto.
Petrie, H. W., Toronto.

Pipe Coverings

Mica Boiler Covering Co., Montreal.

Pipes and Tubes

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

Plaster

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

Plates

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

Plumbago

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

Pneumatic Separators

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

Pneumatic Tools

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

Pointer Rolls (For Rods and Wire)

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

Power Plants—Equipments

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Darling Bros., Montreal.
Economic Power, Light & Heat Supply Co., Toronto.
Electrical Construction Co., London, Ont.
Goldie & McCulloch, Galt, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
McDougall, John, Caledonian Iron Works Co., Montreal.

Paokard Electric Co., St. Catharines, Ont.

Perrin, Wm. R. & Co., Limited, Toronto.

Phillips, Eugene F., Electrical Works, Montreal.

Robb Engineering Co., Amherst, N.S.

Sadler & Haworth, Montreal and Toronto.

Smart-Turner Machine Co., Hamilton, Ont.

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

Toronto & Hamilton Electric Co., Hamilton, Ont.

Presses (Tile, Sewer Pipe, Nozzles and Sleeves)

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

Presses (Baling, Celluloid, Cider, Die, Filter Vulcanizing)

Perrin, Wm. R. & Co., Limited, Toronto.

Presses (Hydraulic)

Perrin, Wm. R. & Co., Limited, Toronto.

Pulleys

Darling Bros., Montreal.
Goldie & McCulloch Co., Galt, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.
McDougall, John, Caledonian Iron Works Co., Montreal.

Petrie, H. W., Toronto.

Smart-Turner Machine Co., Hamilton, Ont.

Producer Gas Plants

Economic Power, Light & Heat Supply Co., Toronto.

Producer Gas Co., Toronto.

Pumps and Pumping Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Canada Foundry Co., Toronto.

CLASSIFIED INDEX.

(CONTINUED).

Darling Bros., Montreal.
 Downie Pump Co., Downsville, Pa.
 Goldie & McCulloch Co., Galt, Ont.
 Jencks Machine Co., Sherbrooke, Que.
 Kerr Engine Co., Walkerville, Ont.
 Morris Machine Works, Baldwinsville, N.Y.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Ontario Wind Engine & Pump Co., Toronto.
 Perrin Wm. R. & Co., Limited, Toronto.
 Petrie, H. W., Toronto.
 Smart-Turner Machine Co., Hamilton, Ont.
Punches and Shears
 Globe Machine & Stamping Co., Cleveland, Ohio.
 Petrie, H. W., Toronto.
Purifiers
 Babcock & Wilcox, Limited, Montreal.
 Goldie & McCulloch Co., Galt, Ont.
 McDougall, John, Caledonian Iron Works Co., Montreal.
Purifying and Softening Systems (Water)
 Babcock & Wilcox, Limited, Montreal.
 Darling Bros., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.
Railroads
 Chicago & North-Western Ry., Toronto and St. Paul, Minn.
Railway Supplies
 Algoma Steel Co., Sault Ste. Marie, Ont.
 Allis-Chalmers-Bullock, Limited, Montreal.
 Gartshore, John J., Toronto.
 Greening, B. Wire Co., Hamilton, Ont.
 Gutta Percha & Rubber Mfg. Co., Toronto.
 Nova Scotia Steel & Coal Co., New Glasgow, N.S.
 Phillips, Eugene F. Electrical Works, Montreal.
Reamers
 Butterfield & Co., Rock Island, Que.
Rivets
 Bourne-Fuller Co., Cleveland, Ohio.
 London Rolling Mills, London, Ont.
Rock and Ore Crushers
 Allis-Chalmers-Bullock, Limited, Montreal.
 Bradley Pulverizer Co., Boston, Mass.
Rolling Mill Engineers
 Bourne-Fuller Co., Cleveland, Ohio.
Roofing
 Bourne-Fuller Co., Cleveland, Ohio.
 Metallic Roofing Co., Toronto.
 Pedlar People, Oshawa, Ont.
Rotary Blowers
 Sturtevant, B. F. Co., Hyde Park, Mass.
Rubber Goods
 Gutta Percha & Rubber Mfg. Co., Toronto.
Rubber Packing
 Gutta Percha & Rubber Mfg. Co., Toronto.
Rubber Washing Tubs
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.
Rural Mail Boxes
 Globe Machine & Stamping Co., Cleveland, Ohio.
Saddlery Hardware
 McKinnon D.-h & Metal Works Co., St. Catharines, Ont.
Safes and Vaults
 Goldie & McCulloch Co., Galt, Ont.
Saw Mill Machinery
 Allis-Chalmers-Bullock, Limited, Montreal.
Screws
 Morrow, John, Screw, Limited, Ingersoll, Ont.
Screw Plates
 Armstrong Mfg. Co., Bridgeport, Conn.
 Butterfield & Co., Rock Island, Que.
Second-Hand Machinery
 Krug & Crosby, Hamilton, Ont.
Sewer Pipes.
 Dominion Sewer Pipe Co., Swansea, Ont.
Shafting
 Bourne-Fuller Co., Cleveland, Ohio.
 Canada Forge Co., Welland, Ont.
 Goldie & McCulloch Co., Galt, Ont.
 Jeffrey Mfg. Co., Columbus, Ohio.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Nova Scotia Steel & Coal Co., New Glasgow, N.S.
 Petrie, H. W., Toronto.
 Smart-Turner Machine Co., Hamilton, Ont.
Shear Knives
 Ray, Peter Knife Co., Galt, Ont.
Sheets (Iron and Steel)
 Bourne-Fuller Co., Cleveland, Ohio.
 Leslie, A. C. & Co., Montreal.
 Lyssagt, John, Limited, Bristol, England, and Montreal.
 Metallic Roofing Co., Toronto.
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Sheet Metal Goods
 Globe Machine & Stamping Co., Cleveland, Ohio.
 Metallic Roofing Co., Toronto.
 Pedlar People, Oshawa, Ont.
Sheet Metal Stamping
 Globe Machine & Stamping Co., Cleveland, Ohio.
 Metallic Roofing Co., Toronto.
 Pedlar People, Oshawa, Ont.
Shovels.
 Hamilton Facing Mill Co., Hamilton, Ont.
Signal Contacts
 International-Acheson-Graphite Co., Niagara Falls, N.Y.
Smoke Stacks
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Robb Engineering Co., Amherst, N.S.
 Smart-Turner Machine Co., Hamilton, Ont.
Solder
 Globe Machine & Stamping Co., Cleveland, Ohio.
 Syracuse Smelting Co., Montreal.
Special Machinery
 Allis-Chalmers-Bullock, Limited, Montreal.
 Globe Machine & Stamping Co., Cleveland, Ohio.
 Krug & Crosby, Hamilton, Ont.
 Smart-Turner Machine Co., Hamilton, Ont.
Speed Recorders
 Bristol Co., Waterbury, Conn.
Sprinkler Insurance
 Canadian Casualty & Boiler Insurance Co., Toronto.
Stamps and Stencils
 Globe Machine & Stamping Co., Cleveland, Ohio.
Steam, Hot Blast Apparatus
 Sturtevant, B. F. Co., Hyde Park, Mass.
Steam Pumps
 Allis-Chalmers-Bullock, Limited, Montreal.
 Canada Foundry Co., Toronto.
 Darling Bros., Montreal.
 Goldie & McCulloch Co., Galt, Ont.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Petrie, H. W., Toronto.
 Smart-Turner Machine Co., Hamilton, Ont.
 Williams, A. R. Machinery Co., Toronto.
Steam Separators
 Babcock & Wilcox, Limited, Montreal.
 Darling Bros., Montreal.
 Morrison, Jas., Brass Mfg. Co., Toronto.
 Robb Engineering Co., Amherst, N.S.
 Sheldons, Limited, Galt, Ont.
 Smart-Turner Machine Co., Hamilton, Ont.
Steam Shovels
 Allis-Chalmers-Bullock, Limited, Montreal.
Steam Specialties
 Darling Bros., Montreal.
 Morrison, Jas., Brass Mfg. Co., Toronto.
 Sheldons, Limited, Galt, Ont.
 Sturtevant, B. F. Co., Hyde Park, Mass.
Steam Valves
 Babcock & Wilcox, Limited, Montreal.
 Darling Bros., Montreal.
 Kerr Engine Co., Walkerville, Ont.
 Morrison, Jas., Brass Mfg. Co., Toronto.
 Petrie, H. W., Toronto.
 Smart-Turner Machine Co., Hamilton, Ont.
 Williams, A. R. Machinery Co., Toronto.
Steel Rails
 Algoma Steel Co., Sault Ste. Marie, Ont.
 Drummond, McCall & Co., Montreal and Toronto.
 Gartshore, John J., Toronto.
Steel Shafting
 Canada Forge Co., Welland, Ont.
 Darling Bros., Montreal.
 Goldie & McCulloch Co., Galt, Ont.
 Leslie, A. C. & Co., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Stocks and Dies
 Armstrong Mfg. Co., Bridgeport, Conn.
 Butterfield & Co., Rock Island, Que.
 Morrison, Jas., Brass Mfg. Co., Toronto.
 Petrie, H. W., Toronto.
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 McCullough-Dalzell Crucible Co., Pittsburg, Pa.
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 Bourne-Fuller Co., Cleveland, Ohio.
 Canada Foundry Co., Toronto.
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 Continental Iron Works Co., New York City.
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 Allis-Chalmers-Bullock, Limited, Montreal.
Systematizers
 Viau, Henri, Montreal.
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 Canada Foundry Co., Toronto.
 Goldie & McCulloch Co., Galt, Ont.
 Jencks Machine Co., Sherbrooke, Que.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Ontario Wind Engine & Pump Co., Toronto.

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 Butterfield & Co., Rock Island, Que.
 Globe Machine & Stamping Co., Cleveland, Ohio.
Teas
 Bourne-Fuller Co., Cleveland, Ohio.
 Canada Foundry Co., Toronto.
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 Dominion Oil Cloth Co., Montreal.
 Storey, W. H. & Sons, Acton, Ont.
Thermometers (Recording)
 Bristol Co., Waterbury, Conn.
 Morrison, Jas., Brass Mfg. Co., Toronto.
Tin
 Leslie, A. C. & Co., Montreal.
 Syracuse Smelting Works, Montreal.
Tool Steel
 Bourne-Fuller Co., Cleveland, Ohio.
 Leslie, A. C. & Co., Montreal.
Traps (Steam)
 Morrison, Jas., Brass Mfg. Co., Toronto.
 Sturtevant, B. F. Co., Hyde Park, Mass.
Trucks
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Sheldons, Limited, Galt, Ont.
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 Canada Foundry Co., Toronto.
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 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.
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 Globe Machine & Stamping Co., Cleveland, Ohio.
 Petrie, H. W., Toronto.
 Smart-Turner Machine Co., Hamilton, Ont.
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 Allis-Chalmers-Bullock, Limited, Montreal.
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 Babcock & Wilcox, Limited, Montreal.
 Canada Foundry Co., Toronto.
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 Morrison, Jas., Brass Mfg. Co., Toronto.
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 Smart-Turner Machine Co., Hamilton, Ont.
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 Berry Bros., Walkerville, Ont.
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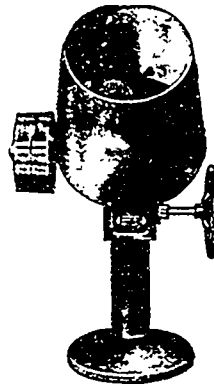
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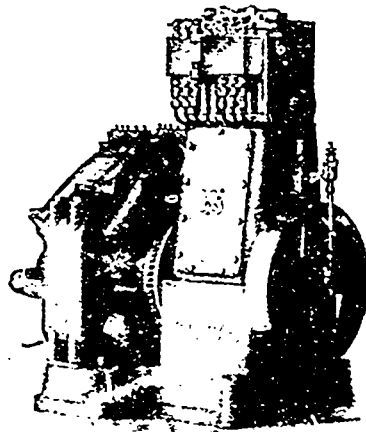
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INDEX TO ADVERTISEMENTS.

Where the folio is not given the Advertisement appears at intervals.

See Classified Index Beginning on Page 46

ofc..... outside front cover.

obc.....outside back cover.

A		B		C		D		E		F		G	
	PAGE		PAGE		PAGE		PAGE		PAGE		PAGE		PAGE
Abbott, Wm., Montreal.....	8	Babcock & Wilcox, Limited, Montreal.....	52	Canada Chemical Mfg. Co., London, Ont.....	7	Darling Bros., Montreal.....	9	Domestic Oil Cloth Co., Montreal.....	45	Factory Inspectors, Ontario.....	52	Gartshore, John J., Toronto.....	45
Agriculture, Ontario Minister of, Toronto.....	52	Bank of Hamilton, Hamilton, Ont.....	15	Canada Iron Furnace Co., Montreal.....	4	Department Public Works, Ottawa.....		Dominion Sewer Pipe Co., Swausen, Ont.....	43	Factory Locations.....	44	Gartshore - Thomson Pipe & Foundry Co., Hamilton, Ont.....	43
Aiken, K. L., Toronto.....	8	Barber, Wm. & Bro., Georgetown, Ont.....	45	Canadian Casualty & Boiler Insurance Co. Toronto.....	8	Dixon, Jos., Crucible Co., Jersey City, N.J.....	45	Dowie, Eben, Montreal.....	13	Fell, I. C. & Co., Toronto.....	4	Gibb, Alexander, Montreal.....	17
Albert Mfg. Co., Hillsborough, N.B.....	52	Becker, Limited, Waterloo, Ont.....	41	Canadian Copper Co., New York, N.Y.....	4	Dun, R. G. & Co., Toronto.....	15	Downie Pump Co., Downieville, Pa.....	10	Fensom, C. J., Toronto.....	8	Gillespie, W., Toronto.....	45
Algoma Steel Co., Sault Ste. Marie, Ont.....	4	Becker-Brandard Milling Machine Co., Hyde Park, Mass.....	12	Canadian Fairbank Co., Montreal.....	11	Dunbar Fire Brick Co., Pittsburg, Pa.....	9	Drummond, McCall & Co., Montreal.....	4	Fetherstonhaugh & Co., Toronto.....	obc	Globe Machine & Stamping Co., Cleveland, Ohio	52
Als-Chalmers-Bullock, Ltd., Montreal.....	55	Bell Telephone Co.....	54	Canadian General Electric Co., Toronto.....	39	Economica Power, Light & Heat Co., Toronto..	11	Dun, R. G. & Co., Toronto.....	15	Expanded Metal & Fireproofing Co., Toronto...	41		
Ambrose Hydraulic Construction Co., Montreal	39	Beason, W. T. & Co., Montreal.....	7	Canadian Manufacturer Pub. Co., Toronto.....	39	Electrical Construction Co., London, Ont.....	14	Dunbar Fire Brick Co., Pittsburg, Pa.....	9				
American Carpet & Upholstery Journal, Philadelphia, Pa.....		Berg, A. & Sons, Toronto.....	40	Canadian McVicker Engine Co., Galt, Ont.....	12	Elk Fire Brick Co., St. Mary's, Pa.....	9						
Armstrong Mfg. Co., Bridgeport, Conn.....	52	Berry Bros., Walkerville, Ont.....	49	Canadian Office & School Furniture Co., Preston, Ont.....		Engineering Review, London, England.....							
		Bower Inspection & Insurance Co., Toronto.....	obc	Canadian Rand Drill Co., Sherbrooke, Que.....	15	Expanded Metal & Fireproofing Co., Toronto...	41						
		Burns-Fuller Co., Cleveland, Ohio.....	4	Canadian Westinghouse Co., Ltd., Hamilton, Ont.....									
		Burkhardt, Toronto and New York.....	15	Carter Publishing Co., London, Eng.....	7								
		Bristol Co., Waterbury, Conn.....	obc	Cassells Color Co., New York and Montreal...	7								
		Brunner, Mond & Co., Northwich, England.....	39	Chicago & North-Western Railway, B. H. Bennett, General Agent, Toronto.....									
		Bullea, Hanbury A., Montreal.....	8	Conduits Co., Limited, Toronto.....	obc								
		Business Systems, Toronto.....		Continental Iron Works, New York, N.Y.....	3								
		Butterfield & Co., Rock Island, Que.....	9	Copeland-Chatterton Co., Toronto.....									
				Crain, Rolla L. Co., Ottawa.....									
				Crocker-Wheeler Co., St. Catharines, Ont.....									

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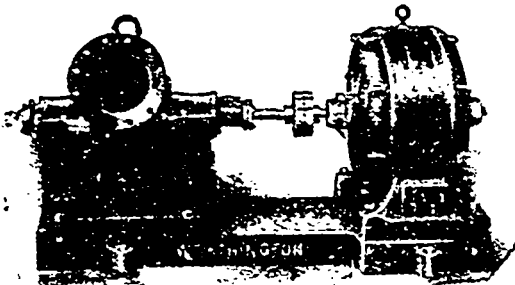
When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

INDEX TO ADVERTISEMENTS (Continued).

PAGE		M	PAGE
Goldie & McCulloch Co., Galt, Ont.....	3	Marion & Marion, Montreal.....	8
Goldschmidt Thermit Co., Montreal.....	45	Maxwell, David, & Sons, St. Mary's, Ont.....	43
Grand & Toy, Toronto.....	43	Metallic Roofing Co., Toronto.....	45
Greening, B. Wire Co., Hamilton, Ont.....	43	Metal Shingle Siding Co., Preston, Ont.....	41
Greay, Wm. & J. G., Toronto.....	18	Mica Boiler & Covering Co., Montreal.....	44
Gutta Percha & Rubber Mfg. Co., Toronto.....	6	Mills S. D., Toronto.....	8
H		Morris Machine Works, Baldwinsville, N.Y.....	2
Hall, J. B., Toronto.....	39	Morrison, James, Brass Mfg. Co., Toronto.....	16
Hamilton Facing Mills Co., Hamilton, Ont.....	abc	Morrison, T. A. & Co., Montreal.....	8
Harbison-Walker Refractories Co., Pittsburg, Pa.	40	Morrow, John, Screw, Limited, Ingersoll, Ont.....	16
Hay, Peter Knife Co., Galt, Ont.....	9	Mc	
Henry & Adams, Toronto.....	8	McArthur, Corneille & Co., Montreal.....	abc
Heys, Thomas & Son, Toronto.....	8	McCullough-Dalsell Crucible Co., Pittsburg, Pa.	40
Hors, F. W. & Son, Hamilton, Ont.....	8	McDougall, John, Caledonian Iron Works Co., Montreal.....	45
Horsburgh & Scott, Cleveland, Ohio.....	45	McGuire, W. J. & Co., Toronto and Montreal...	5
Hunt, Robert W. & Co., Chicago, Ill.....	8	McKinnon Dash & Metal Works Co., St. Catharines, Ont.....	5
I		McLaren, D. K., Montreal and Toronto.....	52
Ideal Concrete Machinery Co., South Bend, Ind.	17	McLean, W. B. & Co., Montreal.....	10
Imperial Oil Co., Petrolia, Ont.....	7	N	
International-Acheson-Graphite Co., Niagara Falls, N.Y.....	43	Neff & Postlethwaite, Toronto.....	43
J		Nichols Chemical Co. of Canada, Montreal.....	43
Jeffrey Mfg. Co., Columbus, Ohio.....	12	Northern Aluminum Co., Shawinigan Falls, Que. and Pittsburg, Pa.....	15
Jencks Machine Co., Sherbrooke, Que.....	15	Northern Electric & Mfg. Co., Montreal.....	14
Jones & Moore Electric Co., Toronto.....	14	Nova Scotia Steel & Coal Co., New Glasgow, N.S.....	43
Jones, J. L., Engraving Co., Toronto.....	45	O	
K		Oakey, John & Sons, London, England.....	8
Kahn, Gustave, Toronto.....	8	Ontario Wind Engine & Pump Co., Toronto.....	17
Kaye, Joseph & Sons, Limited, London, Eng.....	17	Orford Copper Co., New York, N.Y.....	41
Kelly's Directories, Toronto and London, Eng-land.....	41	O-hawa Hay Carrier Works, South O-hawa, Ont.....	39
Kerr Engine Co., Walkerville, Ont.....	16	P	
Krug & Crosby, Hamilton, Ont.....	39	Packard Electric Co., St. Catharines, Ont.....	15
L		Park Bros., Chatham, Ont.....	44
Laurie Engine & Machine Co., Montreal.....	abc	Parke, Roderick J., Toronto.....	8
Leslie, A. C. & Co., Montreal.....	53	Pears, George, Jr., Toronto.....	42
Loignon, A. & E., Montreal.....	53	Pedlar People, Oshawa, Ont.....	9
London Rolling Mill Co., London, Ont.....	53	Pennsylvania Fire Brick Co., Beech Creek, Pa.....	53
Lowell Crayon Co., Lowell, Mass.....	53	Perrin, William R. & Co., Limited, Toronto and Chicago, Ill.....	44
Lysaght, John, Limited, Bristol, England and Montreal.....	53	Petrie, H. W., Toronto.....	44
		Q	
		Queen City Oil Co., Toronto.....	abc
		R	
		Remington Typewriter Co., Toronto.....	abc
		Robb Engineering Co., Amherst, N.S.....	abc
		S	
		Sadler & Haworth, Montreal.....	abc
		St. Lawrence Supply Co., Montreal.....	abc
		Sheldons, Limited, Galt, Ont.....	abc
		Smart-Turner Machine Co., Hamilton, Ont.....	abc
		Smith's Falls Malleable Castings Co., Smith's Falls, Ont.....	abc
		Spence, R. & Co., Hamilton, Ont.....	abc
		Standard Bearings, Limited, Niagara Falls, Ont.	abc
		Stevens Mfg. Co., Galt, Ont.....	abc
		Storey, W. H. & Son, Acton, Ont.....	abc
		Stowe-Fuller Co., Cleveland, Ohio.....	abc
		Sturtevant, B. F. Co., Boston, Mass.....	abc
		Syracuse Smelting Co., Montreal and New York	abc
		T	
		Tippett, Arthur P. & Co., Montreal.....	abc
		Toronto & Hamilton Electric Co., Hamilton, Ont.....	abc
		Toronto Paper Mfg. Co., Cornwall, Ont.....	abc
		Trussed Concrete Steel Co., Toronto.....	abc
		Turner, Vaughn & Taylor, Cuyahoga Falls, Ohio.....	abc
		U	
		Union Drawn Steel Co., Hamilton, Ont.....	abc
		V	
		Viau, Henry, Montreal.....	abc
		W	
		Westinghouse Electric & Mfg. Co., Pittsburg, Pa.....	abc
		Williams A. R. Machinery Co., Toronto.....	abc
		Winn & Holland, Montreal.....	abc

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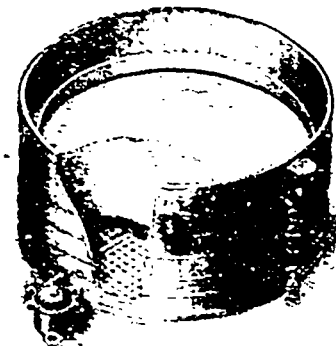
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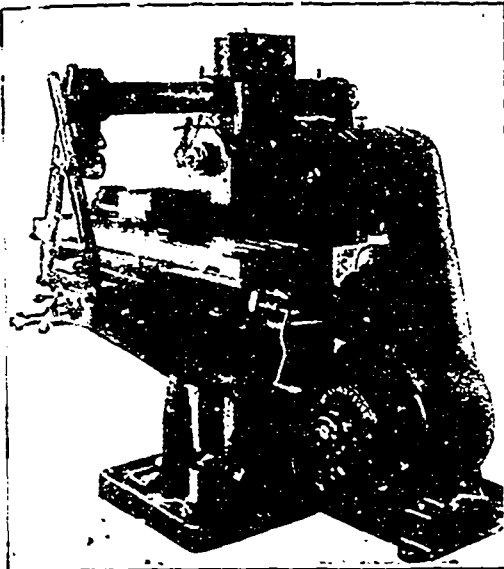


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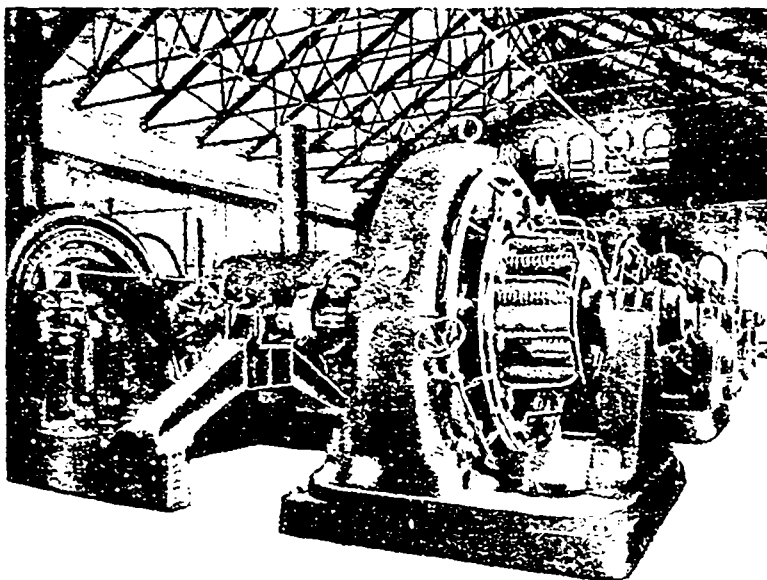
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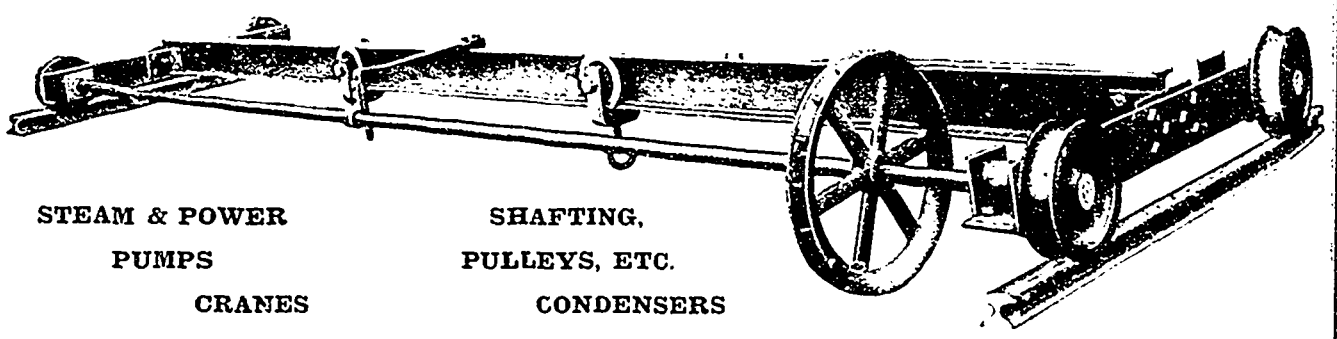
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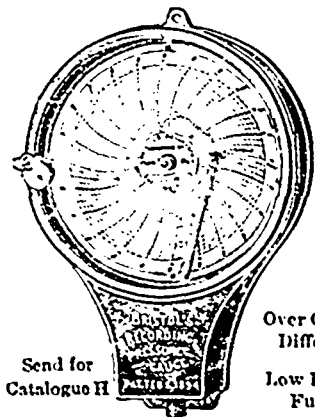
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