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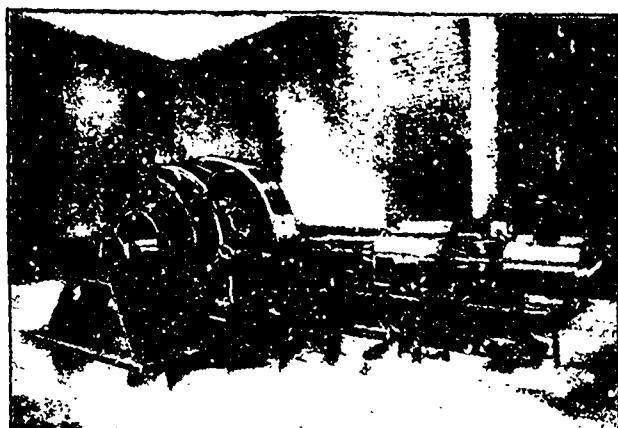
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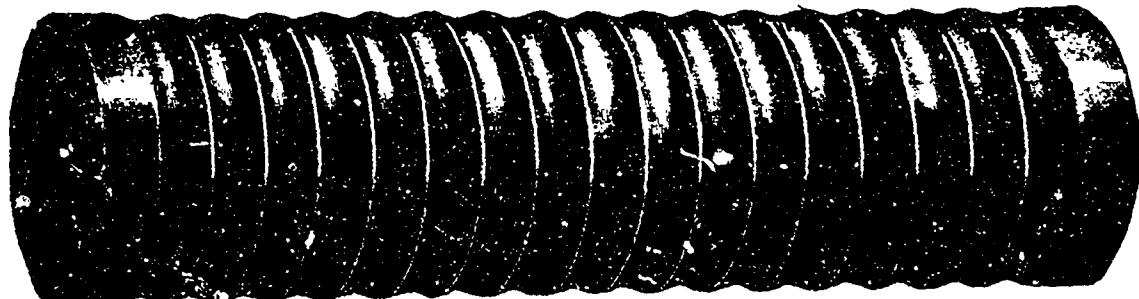
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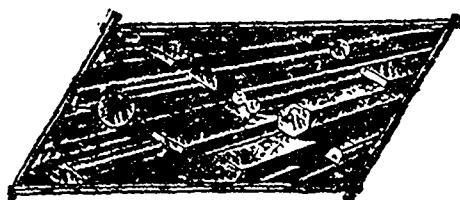
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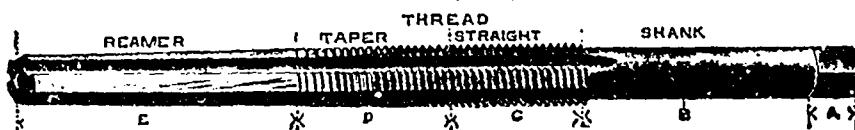
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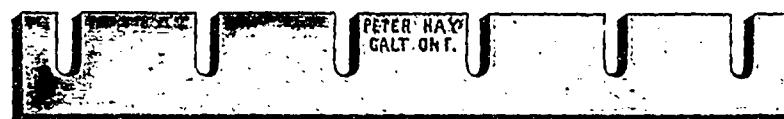
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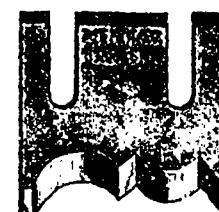
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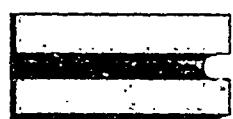
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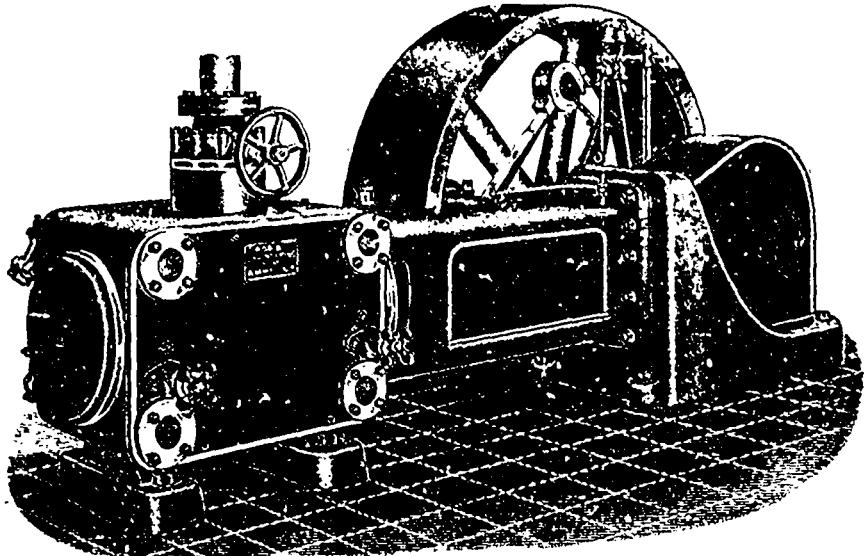
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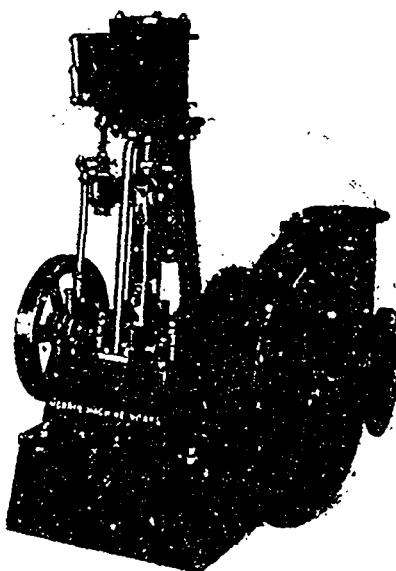
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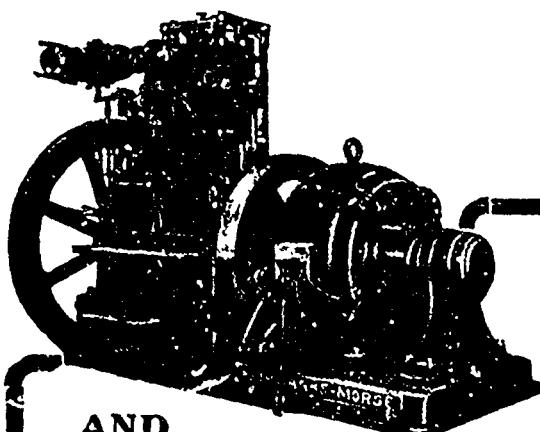
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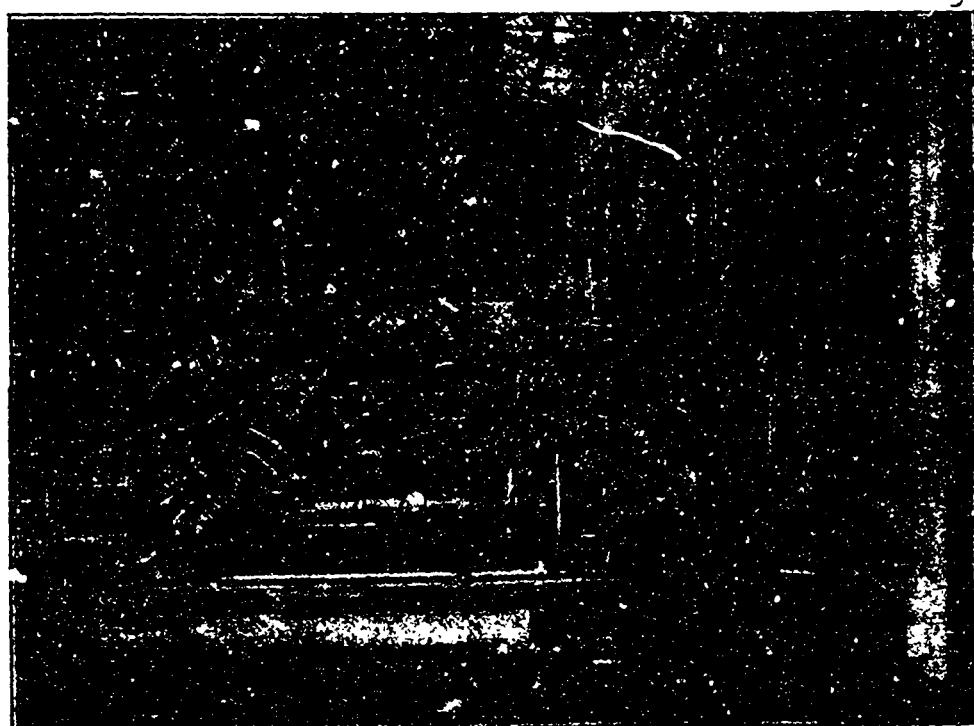
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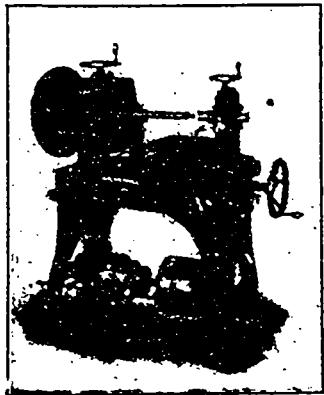
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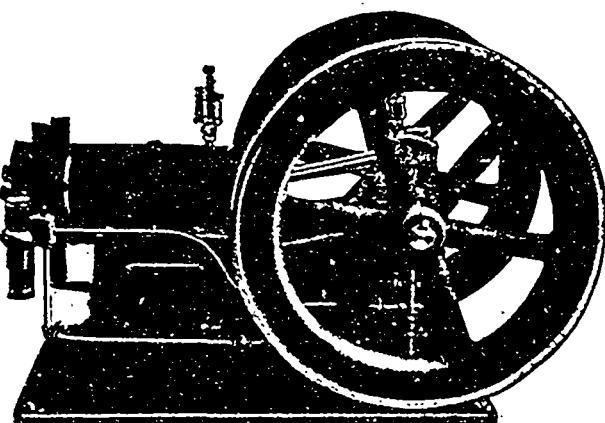
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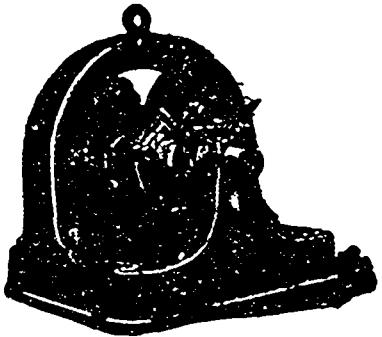
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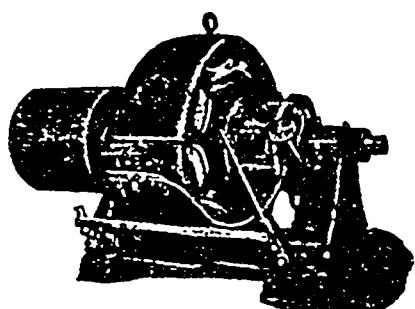
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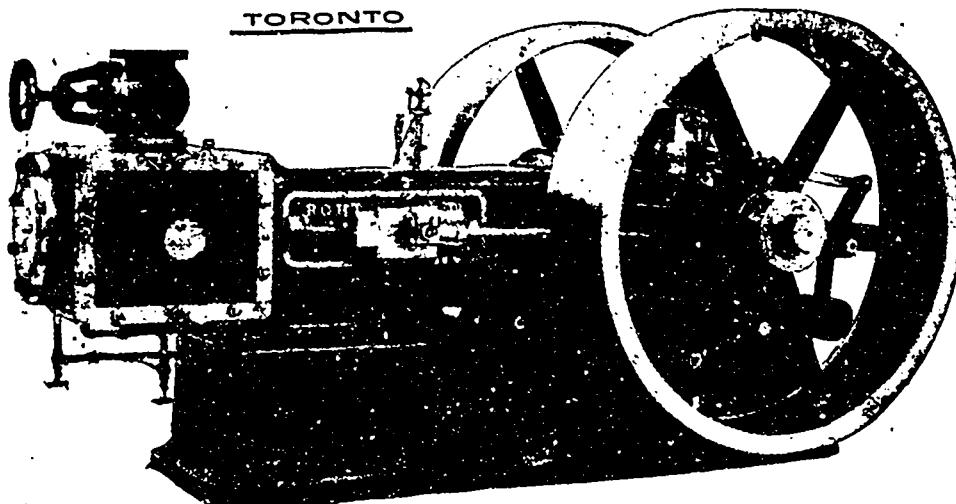
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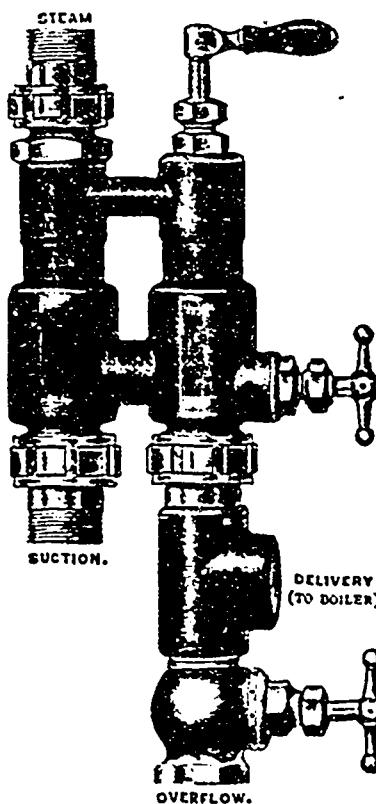
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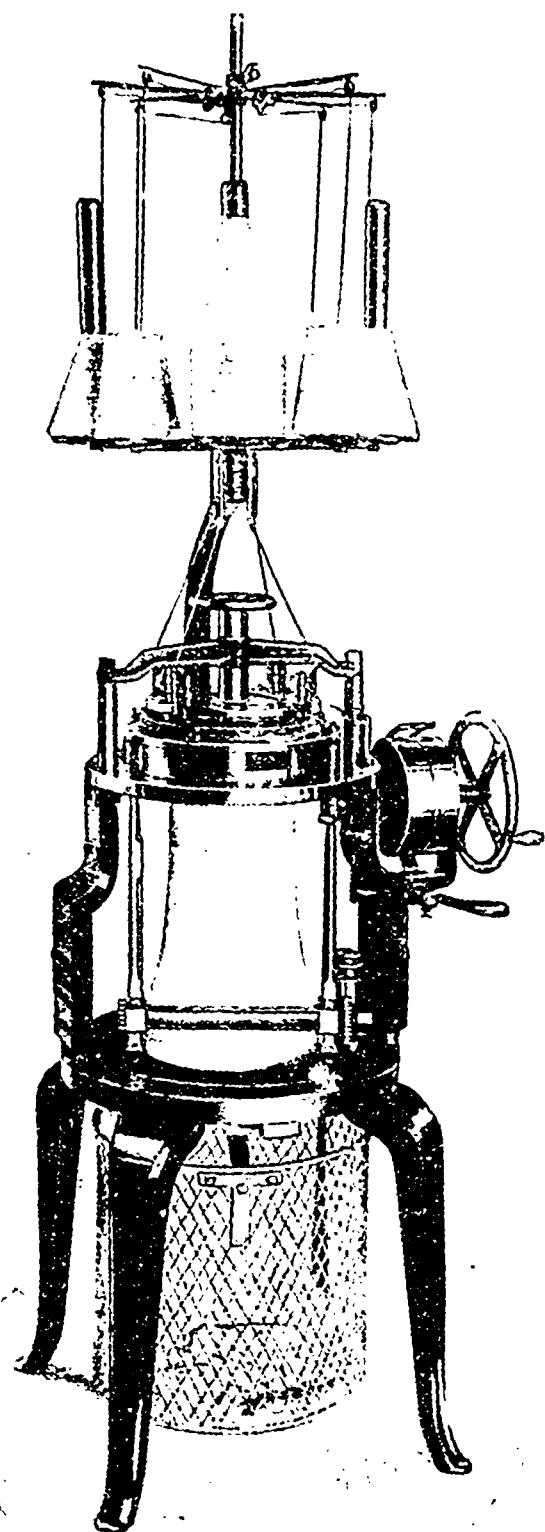
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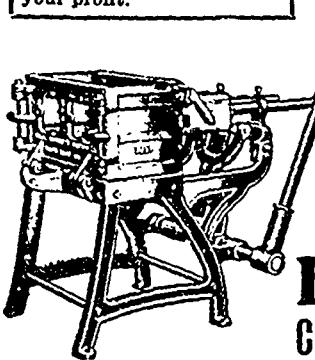
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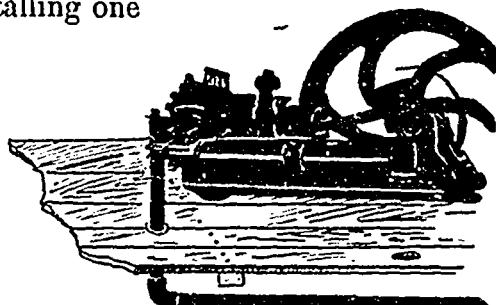
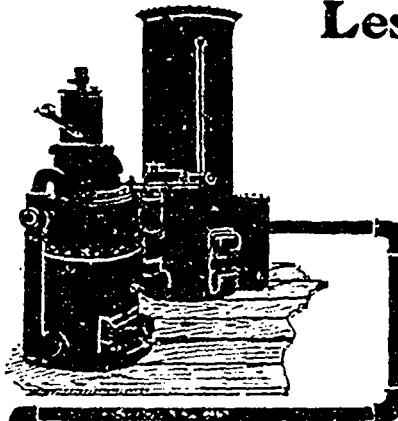
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MR. FIELDING'S NEW TARIFF.

Finance Minister Fielding laid before the Dominion House of Commons on Thursday last, November 29, a draft of his long promised Canadian tariff which will finally be ratified, but which became operative throughout the country immediately upon its presentation. It is, however, open for discussion by the members of Parliament, and some changes may be made in it before its ratification, but it is not probable that any very important alterations will be effected. It is impossible at this time to say at what particular time the discussion will cease and the bill become law.

A very noticeable feature of the new tariff is that the rates of duty on imports are placed and arranged in three columns—first the British preference rates; second, the Intermediate rates, which at present do not apply to imports from any country, but which may become operative should a treaty or arrangements of a reciprocal character be effected, and third, the General tariff applicable to all but British countries, except to those entitled to the provisions of the second named rates. Some articles may be dutiable at rates named in the second or third column, and come in free of duty if of British origin. They may be subject to the general tariff, which is reasonably high, they may be subject to the lower intermediate tariff if they come from any country concluding a reciprocity treaty with Canada, or if coming from Great Britain, obtain the advantage of the still lower British preference rate. In some cases this latter rate is less than the former one-third reduction, in some cases it is more, but it will probably average about the same as formerly.

To explain the animus and spirit of the new tariff, we quote from some of the resolutions submitted by Mr. Fielding:

The rates of customs duties, if any, set forth in column two (intermediate tariff) shall apply:

To goods the produce or manufacture of any British or foreign country to which the benefits of such intermediate tariff shall have been extended in the manner hereinafter provided, when imported direct from such foreign country or from a British country.

That the rates of customs duties, if any, set forth in column three (the general tariff) shall apply to all goods not entitled to admission under the intermediate tariff or under the British preferential tariff.

The Governor in Council may extend the benefit of the British preferential tariff to any British country not named in the resolutions, and from and after publication of such Order in Council the British preferential tariff shall apply to goods the produce or manufacture of such British country, subject to the provisions of these resolutions.

Withdraws the benefit of the British preferential tariff from any British country (other than the United Kingdom) which has received the same, and from and after the publication of such order the general tariff or the intermediate tariff, as mentioned in the said order, shall apply to goods the produce or manufacture of such British country, subject to the provisions of these resolutions.

From time to time, in consideration of benefits satisfactory to the Governor in Council, extends the benefit of the intermediate tariff, in whole or in part, to any British or foreign country the produce or manufacture of which have previously been subject to the rates of customs duties set forth in the general tariff, and from and after the publication of such order, the rates of duty set forth in the intermediate tariff, so far as they are mentioned in the said order, shall apply to goods the produce or manufacture of such British or foreign country, when imported direct from such foreign country or from a British country, subject to the provisions of these resolutions; and

Withdraws the benefit of the intermediate tariff from any country to which it has been extended, and from and after the publication of such order the rates of customs duties set forth in the general tariff shall apply to goods, the produce or manufacture of such country, subject to the provisions of these resolutions.

In the case of articles exported to Canada, of a class or kind made in Canada, if the export or actual selling price to an importer in Canada be less than the fair market value of the same article when sold for home consumption in the usual and ordinary course in the country whence exported to Canada at the time of its exportation to Canada there shall, in addition to the duties otherwise established, be levied, collected and paid on such article on its importation into Canada a special duty (or dumping duty) equal to the difference between the said selling price of the article for export and the said fair market value thereof for home consumption;

Provided that the said special duty shall not exceed 15 per cent. ad valorem in any case;

Provided also that the following goods shall be exempt from such special duty, viz.:

Goods whereon the duties otherwise established are equal to 50 per cent. ad valorem.

Goods of a class subject to excise duty in Canada.

Sugar refined in the United Kingdom.

Provided, further, that excise duties shall be disregarded in estimating the market value of goods for the purposes of special duty when the goods are entitled to entry under the British preferential tariff. That articles, which are the produce or manufacture of any foreign country which treats imports from Canada less favorably than those from other countries may be subject to a surtax of over and above the duties specified in the said schedule "A," such surtax in every case to be one-third of the duty specified in the general tariff in the said schedule "A."

Whenever from or as a result of proceedings in any court of justice it appears to the satisfaction of the Governor in Council that with regard to any article of commerce there exists any conspiracy, combination, agreement or arrangement of any kind among manufacturers of such articles or dealers therein to unduly promote the advantage of the manufacturers or dealers at the expense of the consumers, the Governor in Council may admit the article free of duty or so reduce the duty thereon as to give to the public the benefit of reasonable competition in the article, if it appears to the Governor in Council that such disadvantage to the consumer is facilitated by the duties of customs imposed on a like article.

That whenever the Governor in Council deems it to be in the public interest to inquire into any conspiracy, combination, agreement or arrangement alleged to exist among manufacturers or dealers in any article of commerce to unduly promote the advantage of the manufacturers or dealers in such article at the expense of the consumers, the Governor in Council may commission or empower any Judge of the Supreme Court or Exchequer Court of Canada, or of any superior court in any Province of Canada, to inquire in a summary way into and report to the Governor in Council whether such conspiracy, combination, agreement or arrangement exists.

The grouping of the tariff has been entirely changed, the idea being to place articles together or in the same group, according to their nature and composition so as to make interpretation easier. The old tariff had a separate free list, but the adoption of a three-column tariff has rendered it necessary that the articles entitled to free entry should be classified along with the dutiable articles. This action has also been made necessary by reason of the fact that some articles are made free under one tariff and dutiable under the others.

Schedule A of the tariff relates to all articles imported from other countries, dutiable and free, the last item of which is to the effect that all goods not enumerated in the Act as subject to any other rate of duty, nor declared free of duty, and the importation of which are prohibited, are dutiable at 15 per cent., 17½ per cent. or 20 per cent. according to source of origin. Schedule B relates to goods

subject to drawback for home consumption. Schedule C relates to prohibited goods. Another section of the tariff relates to the iron and steel bounties.

The grouping of imports are as follows:

Group 1. Animals, agricultural products, fish and provisions.

Group 2. Sugar, molasses and manufactures thereof.

Group 3. Tobacco and manufactures thereof.

Group 4. Spirits, wines and other beverages.

Group 5. Pulp, paper and books.

Group 6. Chemicals, drugs, oils and paints.

Group 7. Earths, earthenware and stoneware.

Group 8. Metals and manufactures thereof.

Group 9. Wood and manufactures thereof.

Group 10. Cotton, flax, hemp, jute and other fibres, and silk, wool and manufactures thereof.

Group 11. Miscellaneous.

THE PREFERENTIAL TARIFF.

The preferential tariff feature of the Halifax resolution of the Canadian Manufacturers' Association, reciting the necessity of a revision of the tariff, is as follows:

"While such a tariff should primarily be framed for Canadian interests, it should nevertheless give a substantial preference to the Mother Country, and also to any other part of the British Empire with which reciprocal preferential trade can be arranged, recognizing always that under any condition the minimum tariff must afford adequate protection to all Canadian producers."

In his address before the recent convention of the Association at Winnipeg the retiring president, Mr. Ballantyne, speaking of Imperial preference, said:

"When a number of members of the Association visited the United Kingdom last year (1905) the leaders of the party took pains to make our position regarding the question of a preferential tariff clear to the British people. We told the merchants and manufacturers of the United Kingdom that it was our ambition to make in Canada everything which we could advantageously produce, and that while we did not desire a prohibitive tariff against Great Britain, we would insist upon sufficient protection so as to at least put our Canadian manufacturers on an equal footing with those of Great Britain; but we were anxious to divert into British channels, so far as possible, the trade we did with foreign countries. In other words—that when we must go abroad to buy goods we would prefer to buy them from our fellow citizens of the British Empire. The leaders of the tariff reform movement in England expressed approval of our attitude, and I am glad to be able to say that when the Chambers of Commerce of the Empire assembled in London in July of this year a resolution in favor of mutual preference within the Empire was carried by a vote of 104 in favor to 41 against."

Industrial Canada, the official organ of the Association speaks of the incident as an important matter, deserving of more attention from the Canadian press than it has yet received. It created a new situation, it says, for it showed that the movement for preferential trade has made extraordinary progress in Britain during the last three years. The resolution was carried by an overwhelming majority, a demand for a vote by chambers showing the following result: For, 105; against, 41; neutral, 21. It cannot be said, we are told, that the

British merchants and manufacturers who voted for the resolution, did so under any misunderstanding of what was meant by it. On previous occasions Mr. Drummond had explicitly explained the policy of the Association to the Chambers of Commerce, and when the Association party were in England last year Mr. W. K. George and Mr. W. K. McNaught and the leaders took pains to state the views of the Association regarding the preferential tariff in the clearest possible way, in order that there might be no misunderstanding. According to these accounts it was a sort of *veni, vidi, vici* affair, the Englishmen surrendering almost without a murmur of dissent.

Following is the text of the resolution alluded to, passed at the London Congress in July last, having reference to "Commercial Relations Between the Mother Country, Her Colonies and Dependencies":

"Resolved, that the Congress urges upon His Majesty's Governments in the United Kingdom and in the various colonies and dependencies, the granting of preferential treatment in their respective markets on a reciprocal basis, each to the other, believing that thereby the bond of union will be strengthened, and the British Empire largely freed from dependence on foreign countries for food and other supplies.

"And that this Congress further urges upon the Government of the Empire that they treat this matter as of present practical importance, and that each organization represented at this Congress pledges itself to press their respective Governments to take such action at the Colonial Conference of 1907 as will give effect to the principle advocated in this resolution."

Altogether 182 Associations were represented at the Congress, 89 in the different colonies and India, 88 in the United Kingdom, and 5 in English communities in Europe, the delegates numbering about 500.

A special meeting of the Association of Chambers of Commerce of the United Kingdom was held in Bristol, England, in September last, which was largely attended, there being in attendance delegates from nearly a hundred Chambers in different parts of the Kingdom. The Convention was presided over by Sir William H. Holland, M.P., president of the Association.

When the resolution having reference to preferential trade was reached, Mr. C. J. Wilson, of the South of Scotland Chambers, moved:

"That this meeting approves of the resolution come to at the Sixth Congress of Chambers of Commerce of the Empire held in London in July, in which preferential trade within the Empire was asked for, as binding the Empire together by the ties of commerce as well as by sentiment, and as leading on to the desirable end of free trade between every part of the British Empire."

The resolution was seconded by Mr. G. E. Davies, of the Bristol Chamber.

After some discussion Colonel Harding, of the Leeds Chamber, moved an amendment to the original resolution, seconded by Mr. J. Walton, M.P., of the Barnsley Chamber, as follows:

"That while in warm sympathy with the desire for larger Imperial trade, this meeting cannot recommend a departure from the home policy of free trade in the

absence of practical proposals, but would welcome the gathering of an Imperial Conference for the official and responsible consideration of the matter."

After further discussion, the president put the resolution to the meeting as amended by Colonel Harding and declared it carried. Mr. Davies asked whether the amended resolution would take the place of the original one, and the president answered in the affirmative.

And so was the effacement effected of the preferential tariff resolution of the late Congress of Chambers of Commerce of the British Empire, as far as could be done to the merchants and manufacturers of Great Britain represented in the Association of Chambers of Commerce of the United Kingdom in their late convention in Bristol.

DOES BRITAIN WANT THE PREFERENCE? IS THE PRICE TOO HIGH?

"When a number of members of the Canadian Manufacturers' Association visited the United Kingdom last year the leaders of the party took pains to make our position regarding the question of a preferential tariff clear to the British people. We told the merchants and manufacturers of the United Kingdom that it was our ambition to make in Canada everything which we could advantageously produce, and that while we did not desire a prohibitive tariff against Great Britain, we would insist upon sufficient protection to at least put our Canadian manufacturers on an equal footing with those of Great Britain, but that we were anxious to divert into British channels, as far as possible, the trade we now do with foreign countries. The leaders of the tariff reform movement in England expressed approval of our attitude, and I am glad to be able to say that when the Chambers of Commerce of the Empire assembled in London in July of this year a resolution in favor of mutual preference within the Empire, moved on behalf of the Canadian Manufacturers' Association and the Board of Trade throughout the Dominion by our ex-president, Mr. George E. Drummond, was carried by a vote of 104 in favor to 41 against. This is very significant when it is known that Mr. Drummond was very explicit in his statement of the Canadian attitude in the speech which he made in moving the resolution."

[From the address of Mr. C. C. Ballantyne, president of the Canadian Manufacturers' Association at the recent Winnipeg convention of the Association.]

There were 88 Boards of Trade of the United Kingdom represented at the Congress at which Mr. Drummond's resolution was passed, the balance of the representation being of Boards distributed throughout the balance of the Empire, including Canada, and there were 41 Boards which voted against the resolution.

The Association of Chambers of Commerce of the United Kingdom is composed of all the Boards existing in the Kingdom, about a hundred in number, including several on the Continent. A special meeting of the Association was held in Bristol, England, in September last, to consider among other things, the transactions that were had at the July Congress, including the preferential tariff of which President Ballantyne spoke enthusiastically. There were some 94 different British Chambers represented, Sir W. H. Holland, M.P., president of the Association, presided. When the resolution re "Preferential Trade within the Empire" came up for discussion, Mr. C. J.

Wilson, speaking for the South of Scotland Chamber, moved:

"That this meeting approves of the resolution come to at the Sixth Congress of Chambers of Commerce of the Empire, held in London in July, in which preferential trade within the Empire was asked for, as binding the Empire together by ties of commerce as well as by sentiment, and as leading on to the desirable end of free trade between every part of the British Empire."

In speaking to his resolution Mr. Wilson said:

"They, (the South of Scotland Chamber) were convinced that a great addition to the commerce of the Empire could be made if only profitable employment could be found for all our people at good wages, which meant that in one market or another we must sell more of our manufactured goods. A great many foreign countries had put on a tariff against our manufactured goods for the express purpose of keeping us out of their markets, and they had gone on raising these tariffs little by little until they accomplished their object, as the Americans had done, until there really was too little employment in this country for the people. That position could only be mended, either by reducing the number of the people who wanted to do the work, or by increasing the quantity of the work to be done. Other nations had found themselves in the same position, and they had chosen to increase the quantity of work, and in that way had succeeded in keeping us out of their markets by tariff walls. Why should the same tactics not succeed in our case? Some people answered this by saying it would never do for us. it is opposed to the principle of free trade.' Quite so; we want free trade; we would be quite content if we could get free trade. The principle enumerated in the resolution was that we wanted free trade within the Empire as they have it in the United States, France and Germany, trade without restriction within the Empire; and the same terms extended to all nations who would trade with us on a free trade basis. Our market is so valuable to many nations that our hope is that if we laid down that principle and carried it out, some other nations might find it to their advantage to give us free trade terms. The American says 'We are now 80 millions of people, increasing rapidly year by year. Come over and manufacture your goods in the States and you will then have a free trade market with 120 millions—40 upon your side and 80 upon ours. It cannot be denied that this is a very specious argument, and hence it is that we see so many British manufacturing concerns starting branch factories inside the tariff walls of other nations. Some of these had already prospered exceedingly, and every prosperous one tempted others to follow their example. We must try to withdraw that temptation. We must try to keep the people in our own country, because by doing so they continue to consume nearly six times as much of our produce as they do when settled under the 'Stars and Stripes.' Our idea then is that by preferential trading with our colonies we will not only strengthen the bonds of Empire, but we should materially increase the volume of work for our people. We have great faith in the skill of British manufacturers, but no amount of skill or technical knowledge or industry is sufficient to compete with a tariff wall which may be increased in height indefinitely. We have seen that in the history of the Scotch woolen export trade to America. There they had gradually raised the tariff until the present rate is from 100 to 125 per cent. on the value of the goods, and their rate has been enough to very greatly curtail, if not to annihilate the export of Scotch woolens to America. The fact is, they had determined to make the rate upon articles which they could manufacture for themselves

so high that the work of providing for their market should be done exclusively by their own people. In order to do this they raised the price of the imported articles, but meantime they had built up a home industry in woolens that made domestic goods, as they are called, cheap in their own market, and had given employment to their own people at good wages, although the influx of population from other countries was very great. Indeed such an influx coming into our market would make renumerative wages impossible. What we want is to increase the area of our free markets and thus give employment to our own people. Therefore, I am justified in asking upon such an important question as this that he be allowed to add to the resolution by asking the executive of the Association to press this matter upon the attention of the government, so that action might be taken."

Mr. Wilson, as mover of the resolution, no doubt voiced the sentiments of all who were in favor of it; and from his address we may safely conclude what the views are of such British manufacturers and business men who favor the resolution to which Mr. Ballantyne spoke so approvingly, and to which he attaches so much importance. Free trade and increased employment for British laborers is the burden of the song, but not one word to show that Canada or any other British possession was to be benefitted by preferential trade. The life and vigor that was to accrue to it was to come by a policy which would result, as intended, in entire free trade throughout the British Empire. Tariffs might be permitted for a while for revenue purposes only, but British manufacturers must supply the wants of the colonies just as Mr. Chamberlain suggested in the first place.

Mr. Wilson's resolution was seconded by Mr. G. E. Davies, of the Bristol Chamber, in doing which he said:

"The resolution appeals to our free trade friends as binding the colonies to the Mother Country, and promoting trade between them. That has not always been so. Years ago there was a difference of opinion as to the value of the colonies; but that feeling has passed away, owing largely to the patriotic action of Canada and Australia during the South African war. . . In 1897 our export trade with Canada was under £6,000,000, whereas since the establishment of a preferential tariff our trade with Canada has risen to £11,000,000. If you consider how that affected the trade of Great Britain it is well to remember that the increase was almost entirely in manufactured goods, the making of which gave work and wages to the working people of Great Britain. The objection to the resolution is that a preference given to the colonies might tend to infringe what some regard as the sacred principles of free trade. Foreign nations have been watching England for sixty years, and they see what the effects of free trade have been on her, and the result has been that the great mercantile and manufacturing nations had come to the conclusions that the example of England was not one which was good for them . . . The conditions of trade in England can not be considered satisfactory. . . Whereas the increase of the exports of manufactured goods of the United Kingdom between 1872 and 1905 was 9 per cent., that of France was 29 per cent., of Germany 61 per cent., and of the United States 239 per cent. Even the increase in English trade was due to the colonies. Colonial trade should be encouraged and developed."

Mr. Wilson said that preferential trade was asked for at the Congress, and that the resolution went on to say. "binding the Empire together by ties of commerce as

well as by sentiment." That was said by all the speakers at the Congress, and a number of them suggested that it would lead to free trade within the Empire.

The president, Sir W. H. Holland, asked whether speakers did not repudiate free trade within the Empire, to which Mr. Wilson replied that it was clear that they were looking forward to the time when it would be so.

Mr. Joseph Watson, M.P., of the Barnsley Chamber, said:

The whole trade of Canada had increased by leaps and bounds in the last ten years, and yet it would be found that we hold a less percentage of the trade of that colony than we did ten years ago. The trade of the United States with Canada increased to an enormously greater extent than our own. Those who speak of establishing, on an equitable basis, preferential trade with Canada are met with great difficulty. Great Britain is Canada's only free market in the world, but Canada taxes the goods we send there some 20 per cent. after giving us a rebate. In addition they gave to her manufacturers last year bounties amounting to \$2,500,000 to enable them to shut out British iron and steel. Canada is a protectionist country, and if we go in for retaliatory tariffs that would be one of the first countries we would have to attack. Canadians have told us that they do not intend to ask for free trade within the Empire, because Great Britain refuses to go to the point at which they could not adequately protect their products. There are 400 million people in the Empire, three fourths of whom do not want anything to do with the idea of preferential trade. . . . I feel bound to oppose the resolution."

Mr. A. J. Hobson, of the Sheffield Chamber, said:

. . . Not only is the colonial trade only a fraction of our whole trade, but, in the British Empire the trade of India is the largest item. The protectionist colonies of Canada and Australia are only a fraction of a fraction of our trade. Not one in ten in Great Britain are interested in the increase of colonial trade. Are we going to bind the British Empire together by a policy which is going to be represented—and easily represented, in view of the last election—as a burden and yoke upon the majority of the people, although it might be promoting the interests of the minority of the people? . . ."

Colonel Harding, of the Leeds Chamber, said:

"I am prepared to make many sacrifices to secure Imperial free trade, and if it could be brought about I am prepared to recommend my countrymen to endure the burdens and sacrifices. . . The mover of the resolution pointed out the growth of our trade in Canada as a consequence of preferential trade, but I agree with Mr. Walton that there is no evidence that that increase had been due to preferential trade, but to the expansion of Canadian trade generally. What is the use of preference being given to us over other countries if the duty against British goods is to be kept at such a level that it would effectively protect the native industry? I do not see the use of abstract resolutions of the present kind, and suggest an amendment as follows:

"That while in warm sympathy with the desire for larger Imperial trade, this meeting cannot recommend a departure from the home policy of free trade in the absence of practical proposals; but would welcome the gathering of an Imperial Conference for the official and responsible consideration of the matter."

Mr. J. Walton, M.P., of Barnsley Chamber, seconded Colonel Harding's resolution, and after some further discussion the president of the Association, Sir W. P. Holland, M.P., put the resolution to the meeting

as amended by Colonel Harding and declared it carried. Mr. T. Davies, of the Bristol Chamber, asked whether the amended resolution would take the place of the original one, and the president said it would.

There is room for much honest difference of opinion regarding the question of preferential trade within the Empire. As we have shown, as far as the Chambers of Commerce in the British Kingdom represent the views of the influential men of that country, the only arrangement they are willing to make, or endorse, is one which includes free trade; and Canadian manufacturers would rather be excused from any such an arrangement.

MADE IN CANADA.

This journal has always advocated the establishment of manufacturing plants in Canada for supplying the needs of Canadian consumers, and to effect this we have advocated the imposition of a protection tariff. The tariff we now have is effecting this most desirable constantly. There are millions of foreign capital now invested in manufacturing plants in Canada brought here through and by the protective feature of the Canadian tariff. These plants, many of them, are established to produce articles finished and prepared to go into immediate general consumption, and the production of such goods is, we are glad to say, confined to large and gratifying extent, to Canadian factories. There are many other establishments which are engaged exclusively in the production of machines and machinery to be used in other factories. Thus, in one instance, say a biscuit factory, where the product is destroyed in its use, or an oil factory where the product is used finally for decorative and similar purposes, and in the other instance where the production of machinery is involved for the manufacture of bread and biscuit, or of oils and paints. No manufacturer in these days uses machinery that is not of the best and most effective description, and he stands in his own light if he purchases such made in Canada if it is not the equal in all respects to similar machinery made anywhere else. In the manufacture of textile goods, for instance, the manufacturer goes abroad for much or all of his textile machinery, simply because Canada does not produce such machinery of the highest quality and perfection; but when the question of power machinery arises it is found that boilers, engines, dynamos, etc., can be and are produced in Canada equal to the best produced anywhere else. It may be true that the total manufacturing capacity of Canadian concerns is not sufficient to meet all the demands that may be made upon them; for if they could meet all these demands there would be no such imports from abroad as are now made; and to large extent these imports are made for that reason.

But that is not the only reason, and we illustrate our argument by stating what is within our knowledge, all the concerns involved being enthusiastic members of a manufacturers' association, one of the most prominent tenets of which that "made in Canada" should actuate and control its members, a large and wealthy foreign concern—the better to accommodate its Canadian trade, and wishing to avoid paying protective duties, established

a first-class plant in Canada, and are doing a most gratifying business in the production of what may be called constructive machinery. The charges for their machinery are right and reasonable, the references regarding the effectiveness and operation of the machinery given by respectable Canadian users are of the best and most satisfactory description, and a guarantee always goes with the machinery. Nothing further in this direction could be desired of any Canadian manufacturing concern; and there are many such concerns in Canada.

We also have knowledge of quite a number of manufacturing concerns about engaging in business in Canada of a destructive character, and therefore requiring machinery to enable them to produce, who imagine that machinery "made in Canada" cannot for that reason be good enough for them, and who therefore go abroad and import machinery that cannot possibly be any better than that made at home. These, too, are members of this association who profess such unbounded fealty to Canadian manufacturing interests, and who would be glad to see a prohibitory tariff imposed upon such goods as they make and free trade on such machinery as they require.

THE IMPENDING TARIFF CHANGES.

At a political banquet given in Montreal November 20, Hon. W. S. Fielding, Minister of Finance, delivered an address in which he discussed the affairs of Canada with much freedom, and considering that the Dominion Parliament was then about to assemble, foreshadowed much important legislation which is about to be made. Speaking of the tariff Mr. Fielding said:

"There are, of course, differences of opinion on questions of that character in every province, but viewing the question broadly we have to recognize that there is danger of a line of division being chosen between East and West. There is a conflict of opinion, perhaps not between East and West, but between the West and the large and powerful manufacturing interests of the East. No doubt, as the years roll on, manufacturing interests will grow up in the West and there will be a greater variety of opinion within that region than there is at present. But for the present and for a very long time to come, the agricultural interest must be the predominating one, in our Western country, and the agriculturists as a rule feel that their interests will be protected by a low tariff, at all events by a much lower tariff than many of the manufacturers desire. Probably if the Western farmer were to consult his own wishes alone he would take away much of the advantage which manufacturers already enjoy under our tariff laws. Under such conditions the adoption of the extreme protective views which prevail in some quarters would undoubtedly tend to disturbing, and perhaps dangerous agitation in the West.

"In many parts of the East such a policy would be no less objectionable. But I am speaking now particularly of the West, because there the agricultural industry is the overshadowing one. I have repeatedly urged upon my manufacturing friends that whatever policy would

best fill up our North-West lands with a prosperous and contented people is the best policy for the whole country, the best policy even for the manufacturers themselves; for the settlers in these new lands should naturally be the customers of the Eastern manufacturer.

"We have tried at the time to show the Western farmer that he must not expect to have things entirely as he would wish them, but that he must be prepared to give and take, and have reasonable regard for the Eastern section, which has hitherto contributed so much towards the opening up of the Western country.

"I think our efforts in these directions have not been in vain. I think that most of the manufacturers are disposed to recognize that the policy of a moderate tariff is, on the whole, a better one, even from their point of view, than a very high tariff, which would at once challenge the hostility of the greater part of our population. We have had such a moderate tariff. Many people, no doubt, were alarmed by the changes made in 1897. The country has prospered under that tariff. Just how far a tariff may influence the prosperity of a country will, I suppose, be a subject of debate. It is not very long since our Conservative friends thought the tariff was a controlling force in such matters. At all events, so far as the conditions of trade and commerce may be affected by legislation, I think I may fairly claim that the tariff policy of the Liberal Government has been most successful. The time has arrived when some changes have to be made. For reasons which have been fully explained in Parliament, we have determined to change the form and state of our tariff schedules, and, while we are doing this we may find it necessary here and there to make changes as respects particular items. As respects these items, I am, of course, not free to make any statement. Tariff changes in detail can only be made known at the proper moment, on the floor of the House of Commons. But the general principles upon which we are acting are well known, and can be stated here.

"Dealing with the tariffs generally, it will be our aim to have such rates of duty as will give a reasonable degree of encouragement to the industries of the country without imposing unreasonable burdens upon the consuming class. Then it is our intention to adhere to that principle of British preference which, in face of much adverse criticism, we laid down in 1897, and which, we believe, has done much for the advancement of Canada in the eyes of the Empire and of the civilized world. The degree of preference may have to be revised in some cases as compared with present rates, but the principle will remain. It will continue to be our purpose to give substantial preference to the goods of our Motherland as compared with the goods of foreign countries.

"Then we shall have another tariff column which shall contemplate legitimate discrimination between the products of countries which are anxious to trade with us and the products of those countries which put up bars against us. To the working out of these problems we have given much time and thought, and have every reason to believe that the conditions we are reaching

will commend themselves to the judgment of Parliament and the country.

"At all events, I have the pleasure of stating to you that within a few days, at a very early stage, of the session about to open, we will have our tariff revision ready to submit, and invite the judgment of the House and of the country upon it. That it will satisfy the extremists of the higher tariff school or of the low tariff school we do not hope, but we trust that our tariff will find favor with the great mass of the people of Canada."

EDITORIAL NOTES.

In a recent decision by Judge Somerville, the board of United States general appraisers has sustained a protest filed by W. H. Allison, of Detroit, it being held that importations of wood pulp from Canada are not liable to countervailing duties. The collector of customs at Detroit assessed in addition to the regular duties a countervailing tax amounting to 25 cents for each cord of pulp wood shown to have been used in the manufacture of the wood pulp. The board holds that in harmony with decisions of the federal courts the imposition of the extra duty is illegal.

The British Electrical Magazine reports that the development of the suction gas plant and the successful production of nitrates from the air by electrical means are matters which are attracting the attention of the agricultural section of the British community. The development of the former on a commercial scale may bring the latter directly within the reach of the farmer who tills the land upon an extensive scale. A combination of suction gas plants and gas dynamos will at once give him a cheap and handy method of generating electrical energy. The standardization of the gas engine was accomplished many years ago; consequently the matter of the prime mover is practically settled.

In the new Japan tariff which came into effect a few days ago there is a general rise in the import duty on nearly all the items previously taxed. This is especially true of goods wholly or partly manufactured, when the increase is generally very great, in several cases the rate being equal to or greater than the present general tariff, war and consumption taxes combined. The tendency towards increasing protection may be gauged by the rise in the average ad valorem rate of duties on dutiable goods. Prior to 1899, the first year of the present tariff, this average rate had varied but little, being 3.77 per cent. in 1868, 5.02 per cent. in 1877, and 3.79 per cent. in 1898; in 1899 the rate rose to 9.71 per cent., which was also that of 1903, but in 1905 the rate rose to 11.66 per cent.

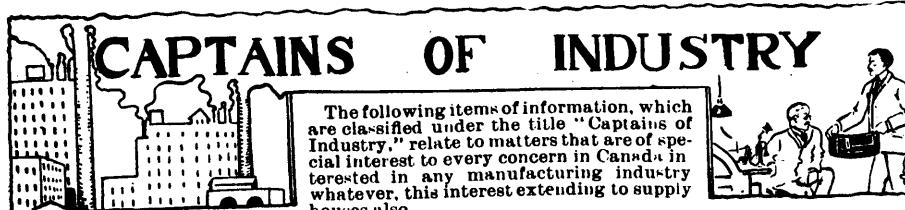
The analysis of Canada's trade for the last fiscal year contained in the report of the Trade and Commerce Department shows that of our total imports of \$283,163,805, we took \$69,165,516 worth, or 24.42 per cent.,

from Great Britain and \$168,798,376 worth, or 59.59 per cent., from the United States. On the other hand, of our total exports of home produce, valued at \$235,483,956, Great Britain took \$127,456,471 worth, or 54.12 per cent., while the United States took but \$83,546,406 worth or 35.68 per cent. Canada's imports from the United States consisted of \$89,540,776 worth of dutiable and \$79,257,600 worth of free goods. From Great Britain our imports were in the proportion of \$52,597,326 dutiable and \$16,568,190 free. In other words only 53 per cent., or not much over one-half of our imports from the United States pays duty, while the proportion of our imports from Great Britain which pays duty is 74 per cent. or nearly three-fourths.

The total value of minerals raised in the United Kingdom during the year 1905 exceeded \$475,000,000 in value. Of this sum by far the greater part was represented by coal, the total weight of which reached 236,128,936 tons, and is the greatest output ever recorded. The value of this coal production was \$410,192,765. Of this total 67,160,645 tons was exported and the balance, 168,968,291 tons was retained and consumed in the United Kingdom. Approximately one-half of the pig iron manufactured in the United Kingdom was made from iron ore raised there, which amounted to 14,590,703 tons, showing an increase of 816,421 tons over 1904. It is interesting to note that the imports of iron ore into the United Kingdom were only about 50 per cent. of the quantity mined at home, but the Spanish ore made more pig iron than the total quantity of the English ore.

The United States Department of Commerce and Labor, through its Bureau of Manufactures, has compiled from the tariff schedule of all countries, the rates of duties imposed upon agricultural products of every description, the publication of which has been begun in the Bureau's Consular and Trade Reports, and will be continued from day to day until the entire work shall have been published.

China has again decreed the abolition of the culture of the opium poppy and the use of opium or its products in any of its forms, save medicinal. This action, which comes in the shape of an imperial edict, was the direct result of the report of the Chinese commission appointed to visit Europe and the United States and the edict is signed by the heads of both civil and military affairs. This is not the first attempt of China to free herself from the effects of the opium trade. The first effort was made in 1839. That result led to a war with Great Britain, which profited by the export of opium to China, and as a result of the war the edict was recalled and China had to pay an indemnity of about \$6,000,000. The Chinese commission which visited England in 1905 found public sentiment far different from what it was three-quarters of a century ago. Hence the issue of this second edict, the abolition of the opium trade, both in the way of home products and imports.



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 Canadian Art Stone Works Co., Welland, Ont., will erect three new buildings at a cost of about \$15,000.

The Temiskaming & Northern Ontario Railway Commission, Ottawa, have awarded the contract to John Cahill, Bonfield, near North Bay, Ont., for 275,000 railway ties.

The National Drug & Chemical Co., Toronto, will erect a five story warehouse on Wellington Street.

Geo. Walter Green, Peterboro, Ont., will double the capacity of his foundry and machine shop.

The Stevens Co., Galt, Ont., will erect a new moulding shop in connection with their factory.

The premises of the Thompson Carriage Co., Woodstock, Ont., were damaged by fire November 15.

The Dominion Dash Co., Walkerville, Ont., will erect a new building there.

The Canada Screw Co., Hamilton, Ont., will erect several new buildings.

S. Salmon, New Liskeard, Ont., may erect a grist mill at a cost of about \$15,000.

The American Clay Machinery Co., Wilmoughby, Ohio, intend establishing a clay and sand brick making plant at Brantford, Ont.

The Automatic Phone Co., Brantford, Ont., will erect a large building there.

The Toronto, Hamilton & Buffalo Railway Co. will erect a station at Dundas, Ont.

A. Waddell, owner of the Wellington Flour Mills, Elora, Ont., will move to Porth Arthur, Ont., where he has organized the Lake Superior Milling Co., as a joint stock company with a capital of \$40,000.

The congregation of All Saints Church, Peterborough, Ont., will erect a new édifice.

The ratepayers of Harriston, Ont., will vote on a by-law for the erection of a new public school.

The congregation of the Eglinton Methodist church, North Toronto, Ont., will erect a new church building.

The congregation of the Central Presbyterian church, Hamilton, Ont., will erect an edifice.

It is stated a new Legislative library will be erected in connection with the Parliament Buildings, Toronto.

The dormitories of the Guelph Agricultural College, Guelph, Ont., will be extended at a cost of about \$15,000.

The General and Marine Hospital Association, St. Catharines, Ont., intend erecting a new modern hospital.

The ratepayers of Peterborough, Ont., will vote on a by-law to provide for the construction of a trunk sewer, also for four bridges.

The Fire, Water & Light Committee, Winnipeg, Man., invite tenders up to December 31 for the supply of a quantity of water

pipe and specials of various sizes, and gates and hydrants for extension of the high pressure system.

The Philip Carey Co., Cincinnati, Ohio, manufacturers of flexible and cement roofings, asbestos pipe and boiler coverings, magnesia steam pipe boiler coverings, etc., will establish branch works at Hamilton, Ont.

A new street car line will be built to the Exhibition grounds, Toronto, at a cost of about \$125,000.

The paper mills of the E. B. Eddy Mfg. Co., Ottawa, were damaged by a tank containing 30,000 gallons of water falling through the roof. Loss about \$10,000.

The building of the Canadian Pacific Railway Co., corner of Yonge and King Streets, Toronto, will be improved and altered at a cost of about \$10,000.

R. Watson, wholesale confectioner, Toronto, has purchased the factory of the Lizst Piano Co., on Sorauren Avenue, the property of the York County Loan Co., for the sum of \$42,000.

The congregation of the Methodist church, Billings' Bridge, Ottawa South, Ont., will erect a new church building.

The W. I. Kemp Co., Stratford, Ont., have been incorporated with a capital of \$300,000 to manufacture machinery, implements, etc. The provisional directors include W. I. Kemp, Stratford, Ont., N. J. Kemp and J. S. Lewis, Newark Valley, N.Y.

The Douglas 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 J. Douglas, A. Daggett and G. Laird, Toronto.

The Cobalt Electrical Development Co., Haileybury, Ont., have been incorporated with a capital of \$500,000, to supply heat, power, electricity, etc. The provisional directors include M. P. Wright, R. P. Shillington and W. C. Young, Haileybury, Ont.

The Sombra Oil & Gas Co., Chatham, Ont., have been incorporated with a capital of \$40,000, to manufacture oil, gas, petroleum, etc. The provisional directors include N. H. Bowlby, Chatham, Ont., J. W. Shay and E. I. Barnard, Pittsburg, Pa.

The Power City Stone Co., Niagara Falls, Ont., have been incorporated with a capital of \$40,000, to manufacture stone, gravel, sand, etc. The provisional directors include J. H. Symmes, G. G. Durham and R. Boyle, Niagara Falls, Ont.

The Massey Light, Heat & Power Co., Massey, Ont., have been incorporated with a capital of \$10,000, to manufacture gas and electricity to supply heat, power and light. The provisional directors include J. Brophy, J. N. Cameron and H. H. Flesher, Massey, Ont.

The United Silver Co., Cobalt, Ont., have been incorporated with a capital of \$1,000,000, 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 Percival Plow & Stove Co., Merrickville, Ont., have been incorporated with a capital of \$200,000, to manufacture plows, stoves, furnaces, implements, etc. The provisional directors include J. B. Waddell, Smith's Falls, Ont., E. W. Stickney and R. C. Percival, Merrickville, Ont.

The Meisel Mfg. Co., Port Arthur, Ont., have been incorporated with a capital of \$50,000, to manufacture all kinds of machinery, etc. The provisional directors include G. C. Meisel, Port Huron, Mich., J. Conmee, and G. Clavet, Port Arthur, Ont.

The Monarch Mining Co., Toronto, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. F. McLaughlin, J. T. White and W. N. Ferguson, Toronto.

The Coin Silver Mining Co., Windsor, Ont., have been incorporated with a capital of \$300,000, to carry on a mining, milling and reduction business. The provisional directors include F. E. Schoonmaker, E. H. Sellers and G. W. Rice, Detroit, Mich.

The Cobalt Smiley Mining Co., Toronto have been incorporated with a capital of \$40,000, to carry on a mining, milling and reduction business. The provisional directors include G. Russell, G. M. Clark and W. R. P. Parker, Toronto.

The Gilson Mfg. Co., Guelph, Ont., have been incorporated with a capital of \$50,000, to manufacture gasoline engines, iron, steel, etc. The provisional directors include J. Gilson, H. W. Bolens, Port Washington, Wis., and C. L. Dunbar, Guelph, Ont.

The Imperial Cobalt Silver Mining Co., Toronto, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. W. McDonald, G. J. Valin and T. Brown, Toronto.

The Edward Cobalt Mines, Toronto, have been incorporated with a capital of \$100,000, to carry on a mining, milling, and reduction business. The provisional directors include W. R. P. Parker, G. M. Clark and J. A. McEvoy, Toronto.

The Empress Cobalt 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 J. W. McDonald, G. J. Valin and T. Brown, Toronto.

The Temiskaming Mining Co., Toronto, have been incorporated with a capital of \$2,000,000, to carry on a mining, milling and reduction business. The provisional directors include C. W. Kerr, C. S. MacInnes and C. C. Robinson, Toronto.

The Forest Reserve Mining Co., Toronto, have been incorporated with a capital of \$100,000, to carry on a mining, milling and reduction business. The provisional directors include F. Pottage, P. J. Montague and F. N. Tennant, Toronto.

The Cobalt Annex Silver Mines, Haileybury, Ont., have been incorporated with a capital of \$100,000, to carry on a mining, milling, and reduction business. The provisional directors include A. T. Budd, Hailey-

bury, Ont., G. M. Petrie and F. Pottage, Toronto.

The McCurry Mfg. Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture drugs, etc. The provisional directors include H. R. McCurry, J. Edwards, Toronto, and C. Ayars, London, Ont.

Canadian Billings & Spencer, Limited, Brockville, Ont., have been incorporated with a capital of \$200,000, to manufacture forgings, tools, machinery, etc. The provisional directors include J. G. Gardner, W. S. Buell, and J. H. Botsford, Brockville, Ont.

The Delta Lime Co., Delta, Ont., have been incorporated with a capital of \$30,000, to manufacture lime, wood, etc. The provisional directors include W. M. Cameron, Carleton Place, Ont., F. H. Cameron, Delta, Ont., and W. H. Wood, Brockville, Ont.

The Lorrain Mining Co., Toronto, have been incorporated with a capital of \$400,000, to carry on a mining, milling and reduction business. The provisional directors include G. H. Draper, T. E. Smith, Kenora, Ont., and A. H. Smith, Toronto.

The Cobalt and New Ontario Prospectors, Developers & Investors, Limited, Toronto, have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business. The provisional directors include J. L. Ross, A. W. Holmstead and T. A. Silverthorn, Toronto.

The London Rolling Mills, London, Ont., are rapidly establishing a high reputation among users of all descriptions of bar iron. Writing the Rolling Mills a few days ago, the Verity Plow Co., of Brantford, Ont., say:—"The stock we received from you we were certainly very much pleased with and there was just the qualities therein that suit our purposes here."

The Guelph Glazing Co., Guelph, Ont., have been organized to carry on a glazing business. The directors are J. Irwin and R. L. Stewart, Guelph, Ont.

The premises of the United Factories, Toronto, were damaged by fire November 27. Loss about \$30,000.

The steamer Strathmore, with a consignment of 34,000 bushels of wheat from Fort William to Kingston, Ont., was destroyed by fire near Michipicoten Island.

The Lufkin Rule & Measuring Co., Saginaw, Mich., have secured premises in Windsor, Ont., and will erect a factory. Meantime they have secured temporary quarters and will begin operations at once.

The premises of the McArthur Block, Sturgeon Falls, Ont., were destroyed by fire November 25. Loss about \$40,000.

The foundry of the Taylor-Forbes Co., Guelph, Ont., was damaged by fire November 22.

The directors of the Toronto Hotel Co., Toronto, have under consideration an extension to the King Edward Hotel.

The Canadian Shipbuilding Co., Bridgeburg, Ont., have commenced building a 5,000 ton steamer for the St. Lawrence & Upper Lakes Steamship Co.

The Cobalt Union Mines, Toronto, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. A. Milne, W. B. Newsome and J. S. Black, Toronto.

The German Development Co., Ottawa, have been incorporated with a capital of \$1,000,000, to carry on a smelting and refining business. The provisional directors include H. B. McGiverin, A. E. Barlow and M. Cohn, Ottawa.

The Dominion Dredging Co., Ottawa, have been incorporated with a capital of \$145,000, to carry on a dredging and constructing business. The provisional directors include E. A. Larmouth, R. McNeill and W. A. Cameron, Ottawa.

The Ruby Silver Mining & Development Co., Hamilton, Ont., have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business. The provisional directors include J. M. Peregrine, G. R. Lloyd and H. S. Lees, Hamilton, Ont.

The Hunter Cobalt Silver Mining Co., Ottawa, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include F. R. Latchford, J. Heney and J. J. Heney, Ottawa.

The Nova Scotia Silver Cobalt Mining Co., Toronto, have been incorporated with a capital of \$2,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. Montgomery, W. R. Williams and G. F. Thompson, Toronto.

The North Cobalt Mining Co., Cobalt, Ont., have been incorporated with a capital of \$50,000, to carry on a mining, milling and reduction business. The provisional directors include J. E. Judge, New York, E. O. Seeley, and R. M. Holden, Cobalt, Ont.

The Cobalt Native Silver Mining Co., Haileybury, Ont., have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business. The provisional directors include A. T. Budd, Haileybury, Ont., W. A. Sadler and D. H. Glanville, Cobalt, Ont.

The Consolidated Hardware Mfg. Co., Hamilton, Ont., have been incorporated with a capital of \$40,000, to manufacture tacks, nails, wire, tools, etc. The provisional directors include T. H. Wynn, F. Forsyth, and C. H. Brigger, Hamilton, Ont.

The British Canadian Engineering Co., Toronto, have been incorporated with a capital of \$250,000, to carry on an engineering and foundry business. The provisional directors include J. I. Sutcliffe, R. Williamson and M. C. McConnell, Toronto.

The Alpha Chemical Co., Berlin, Ont., have been incorporated with a capital of \$75,000, to manufacture chemicals, varnish, polish, dye, ink, oil, soap, etc. The provisional directors include W. J. Moody, H. Pearce and D. Moody, Berlin, Ont.

The Exploration Co., of Canada, Toronto, have been incorporated with a capital of \$100,000, to carry on a mining, milling and reduction business. The provisional directors include A. O. Beardmore, H. C. Osborne and A. T. K. Evans, Toronto.

The Mann Lumber & Cheese Box Co., Peterborough, Ont., have been incorporated with a capital of \$40,000, to manufacture lumber, timber, cheese boxes, etc. The provisional directors include E. H. Mann, W. J. Allison and W. Shaw, Peterborough, Ont.

The Green-Meehan Mining Co., Toronto, have been incorporated with a capital of \$2,500,000, to carry on a mining, milling and

reduction business. The provisional directors include C. W. Kerr, S. MacInnes, and C. C. Robinson, Toronto.

The Crude Oil, Gas & Power Co., Windsor, Ont., have been incorporated with a capital of \$100,000, to manufacture gas, oil, etc. The provisional directors include H. J. Boerth, N. P. Hickey, Detroit, Mich., and C. L. Meyer, Windsor, Ont.

The Leach Concrete Co., Toronto, have been incorporated with a capital of \$10,000, to manufacture re-inforced concrete, and to carry on a building and contracting business. The provisional directors include W. Leach, R. W. Eyre and H. M. Sinclair, Toronto.

The Victoria Silver Cobalt Mines, Toronto, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. H. Stowe, L. A. Gemmell, Toronto, and A. H. Perfect, Toronto Junction, Ont.

The Ontario Nickel Co., Worthington, Ont., have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include H. H. Dow, Midland, Mich., W. S. Gates, Worthington, Ont., and A. E. Convers, Cleveland, Ohio.

Calcium Products, Limited, Toronto, have been incorporated with a capital of \$50,000, to manufacture calcium compounds, lime, chemicals, etc. The provisional directors include A. Walker, G. Ritchie and N. B. Gash, Toronto.

The Manhattan Cobalt Mining Co., Toronto, have been incorporated with a capital of \$100,000, to carry on a mining, milling and reduction business. The provisional directors include D. Urquhart, A. MacGregor and H. W. Page, Toronto.

The Little Nipissing Silver Cobalt Mining Co., Toronto, have been incorporated with a capital of \$50,000, to carry on a mining, milling and reduction business. The provisional directors include R. W. Eyre, E. E. Wallace and A. T. Struthers, Toronto.

The Nipissing Power Co., Toronto, have been incorporated with a capital of \$100,000, to supply electricity, light, heat, power, etc. The provisional directors include J. D. Montgomery, E. R. Lynch and J. P. Crawford, Toronto.

Messrs. Butterworth & Co., Ottawa, have been incorporated with a capital of \$100,000, to manufacture heaters supplies, furnaces, tools, etc. The provisional directors include E. B. Butterworth, C. A. Butterworth and F. X. Plant, Ottawa.

The Marvel Acetylene Generator Co., Bradford, Ont., have been incorporated with a capital of \$10,000, to manufacture acetylene, gas fittings, machinery, etc. The provisional directors include A. J. Moore, F. W. Moore and A. E. Scanlon, Bradford, Ont.

The ratepayers of Elmira, Ont., voted favorably on a by-law to expend \$25,000 improving the waterworks system.

J. P. Murray and A. E. Osler, Toronto, W. E. Phin, Welland, Ont., F. A. Hilton, Buffalo, N.Y., and W. G. Burlston, T. H. Taylor and B. Van Horne, of Niagara Falls, N.Y., are seeking incorporation for the Niagara Frontier Bridge Co., with power to construct and operate a bridge over the Niagara River from

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near the boundary line between the townships of Stamford and Niagara to a point on the right bank.

The Canadian Pacific Railway Co. will build a bridge, 1,900 feet long and 125 feet high, over the town of Parry Sound, Ont., and the Seguin River at a cost of about \$300,000.

The F. B. Wood Co., Hamilton, Ont., will erect a large addition to their factory.

The Gerhard Heintzman Piano Co., Toronto, will erect an addition to their factory at a cost of about \$10,000.

The Phillip Mfg. Co., Toronto, will erect a two story factory, having 132,000 square feet of floor space.

The Hamilton Bridge Co., Hamilton, Ont., have been awarded the contract to construct the new Canadian Pacific Railway bridge at Lethbridge, Alta.

A high level bridge will be built across the Don River and the tracks of the Canadian Pacific Railway and Grand Trunk Railway at the junction of King and Queen Streets, Toronto.

The Quaker Oats Mills, Peterborough, Ont., will double the capacity of their plant there.

The Canadian Pacific Railway Co. have contracted for 1,000 h.p. from the Kakabeka Power Co. for their works at Fort William, Ont.

A rink will be erected in connection with the Mimico Industrial School, Toronto, at a cost of about \$2,000.

The premises of the Ontario Tack Co., Hamilton, Ont., were damaged by fire recently.

Messrs. Edmanson, Bates & Co., Toronto, intend erecting a five story warehouse on Adelaide Street.

A complete sewerage system may be installed in Belleville, Ont.

A market building will be erected at Stratford, Ont., at a cost of about \$10,000.

The Canadian Pacific Railway Co. are negotiating for an entrance into Sarnia, Ont.

The electric light system, Ottawa, will be extended at a cost of about \$50,000.

W. Lavoie, Montreal, is negotiating for the establishment of a factory at Peterborough, Ont., for the manufacture of hosiery, etc.

The cheese factory of Wm. Morris, near Banner, Ont., was destroyed by fire recently.

The Hamilton Fire & Water Committee, Hamilton, Ont., will ask the citizens to vote on two by-laws, one for \$50,000, for electric pump for the waterworks, and the other \$30,000 for an east end fire station.

The ratepayers of Lindsay, Ont., will vote on a by-law to raise \$20,000, for installing a proper system of filtration in connection with the town water system.

The citizens of Peterborough, Ont., are considering the construction of an electric railway from that city to Rice Lake, Ont.

The ratepayers of Peterborough, Ont., will vote on a by-law to raise \$38,000, for the construction of a new steel bridge there.

The Michigan Ammonia Works, Detroit, Mich., will establish a branch at Guelph, Ont.

A three story public school will be erected at Cobalt, Ont., at a cost of about \$8,000.

The St. Joseph Hospital, Sudbury, Ont., will be enlarged at a cost of about \$40,000.

The ratepayers of Hamilton, Ont., will vote on a by-law to raise \$120,000 to install a sewerage system in the east end.

The ratepayers of Toronto will vote January 1 on the installation of a \$3,000,000 trunk sewer.

It is stated that an electric road will be built from Seaforth, Ont., to Brussels, and connecting with the Guelph to Goderich branch of the Canadian Pacific Railway, at Walton, Ont. The line would be about 20 miles in length, and would connect several small villages with the railways at Seaforth, Brussels and Walton.

The Modern Bedstead Co., Cornwall, Ont., have been organized and will erect a large factory for the manufacture of iron and brass beds, etc.

The Bell Telephone Co. will erect a new central office 65x30 feet, at Peterborough, Ont.

The ratepayers of Collingwood, Ont., will vote on a by-law to raise \$18,000, for the construction of a new school.

The Presbyterian Church Extension Union, Toronto, have purchased a site on Pape Avenue and will erect a new church.

The Penman Mfg. Co., Paris, Ont., have ordered a 350 h.p. Corliss engine from the Robb Engineering Co., Amherst, N.S.

The Sutherland-Innes Co., Chatham, Ont., will establish a stave plant at Rainey River, Ont.

The Atwell Fleming Printing Co., Toronto, will erect a new building at a cost of about \$20,000.

The Canada Cycle & Motor Co., Toronto Junction, Ont., will erect an addition to their factory at a cost of about \$4,000.

The Victoria Biscuit Co., Guelph, Ont., will erect a new factory at a cost of about \$20,000.

The Great Lakes Portland Cement Co., Port Colborne, Ont., have purchased a site of land and will erect a factory there.

The Toronto Plate Glass Co., Toronto, will erect a factory at a cost of about \$16,000.

The Canadian Electrical Exhibition Co., Montreal, have been incorporated with a capital of \$20,000, to carry on the business of electricians, engineers, manufacturers of electricity, etc. The charter members include W. M. Walbank, R. S. Kelsch and J. W. Pilcher, Montreal.

The General Metal Foundry & Machinery Co., Montreal, have been incorporated with a capital of \$190,000, to manufacture machinery, tools, engines, boilers, etc. The charter members include L. M. Lymburner, J. E. Matthews and J. B. Mathieu, Montreal.

The Hannan Stores, Limited, Montreal, have been incorporated with a capital of \$100,000, to manufacture gents' furnishings, wearing apparel, etc. The charter members include J. J. Hannan, H. J. Elliott and F. A. Revol, Montreal.

The Public Works Department, Ottawa, invite tenders up to December 20 for the construction of a landing pier at St. Valier, county of Bellechasse, Que.

The Department of Marine & Fisheries, Ottawa, invite tenders up to December 10 for the furnishing of steel plates and shapes for the construction of a "dipper" dredge at Sorel, Que.

Messrs. Croker & Boucher, Montreal, have purchased a site and will erect a large warehouse there.

The congregation of the Congregational church, Montreal Annex, will erect a new church.

The Manufacturers Cotton Co., Lachine, Que., will erect a factory at a cost of about \$800,000, if they are granted a bonus of \$25,000, and exemption from taxation for twenty-five years.

Messrs. R. & W. Kerr, Montreal, Que., have been incorporated with a capital of \$90,000, to manufacture hardware, furniture, etc. The charter members include R. Kerr, E. F. Kerr and J. L. Kerr, Montreal.

The Premier Asbestos Co., Montreal, have been incorporated with a capital of \$50,000, to manufacture minerals, machinery, implements, etc. The charter members include E. Languedoc, W. J. Henderson and A. C. Calder, Montreal.

The Dominion Chrome Co., Montreal, have been incorporated with a capital of \$20,000, to manufacture minerals, machinery, implements, etc. The charter members include H. W. Beauclerk, A. C. Calder and J. Jenkins, Montreal.

Mussens, Limited, Montreal, have been incorporated with a capital of \$500,000, to take over the business of W. H. C. Mussens & Co., and to manufacture railway, mining and contractors' supplies, machinery, etc. The charter members include W. H. C. Mussens, G. Boulter and C. G. McKinnon, Montreal.

The premises of the Northwestern Fur Mfg. Co., Montreal, were damaged by fire November 24. Loss about \$5,000.

The Canadian Pacific Railway Co. have placed an order with the Angus shops for ten passenger locomotives, each weighing 210,000 pounds.

Mr. Graham Fraser, late of the Nova Scotia Steel & Coal Co., New Glasgow, N.S., has purchased a site near Longue Point, Que., for the sum of \$65,000, and will erect a new establishment for the manufacture of car wheels.

The Montreal Street Railway Co., Montreal, will issue and offer \$2,000,000 to the shareholders on December 14.

The Canadian Brewing Co., Montreal, will alter their brewery at a cost of about \$10,000.

The Redemptionist Fathers, Ste. Anne de Beaupre, Que., will erect a new chapel there.

The Prince of Wales Fusiliers, Montreal, will erect a large home shortly.

The Public Works Department, Ottawa, invites tenders up to December 17 for the construction of a pier in Lake St. Francis, at Lambton, County of Beauce, Que.

A two story addition will be erected to the Arena, Montreal, at a cost of about \$75,000.

Messrs. Jenkins Bros., New York, have ordered a 150 h.p. engine from the Robb Engineering Co., Amherst, N.S., for the new factory they are building in Montreal.

The Canadian Refining Co., Ottawa, will establish a plant at Hull, Que.

J. H. McKay, Amherst, N.S., has been awarded the contract for the construction of the Intercolonial Railway station at Pugwash, N.S.

The Nova Scotia Steel & Coal Co., Sydney,

N.S., will add another blast furnace to their plant at Sydney Mines, N.S.

The rail mill of the Dominion Iron & Steel Co., Sydney, N.S., which has been closed for some time has resumed operations.

The Department of Railways & Canals, Ottawa, invites tenders up to December 10 for the construction of locomotive shops for the Intercolonial Railway Co., Moncton, N.B.

A new Roman Catholic church will be erected at Grand Falls, N.B.

A Normal School building may be erected at Fredericton, N.B.

J. Burgess, J. E. Stewart and J. F. Tweedie, Victoria county, N.B., will apply for a charter to construct an electric railway from St. John to Grand Falls, N.B., a distance of 125 miles.

The D. E. Adams Coal Co., Winnipeg, Man., have been incorporated with a capital of \$100,000, to manufacture coal, coke, wood, etc. The provisional directors include D. E. Adams, H. E. Adams and D. Cameron, Winnipeg, Man.

The congregation of St. John's Anglican church, Winnipeg, Man., will erect a new cathedral at a cost of about \$350,000.

The Masonic Fraternity, Portage la Prairie, Man., will erect a large hall.

The Fairchild Implement Co., Winnipeg, Man., will erect a large block at a cost of about \$100,000.

The Beaver Lumber Co., Winnipeg, Man., have been incorporated with a capital of \$3,000,000, to manufacture lumber, timber, etc. The provisional directors include R. W. Gibson, H. Crowe and J. H. Munson, Winnipeg, Man.

The ratepayers of Winnipeg, Man., will vote on a by-law to raise \$75,000 for the erection of three suburban fire stations.

Messrs. Wm. Gray & Co., Chatham, Ont., purpose erecting a large carriage factory at Fort Rouge, Winnipeg, Man., at a cost of about \$100,000.

F. Nation, Brandon, Man., will erect a block 150x120 feet.

Messrs. Kerrick & Co., St. Paul, Minn., have been awarded the contract for the construction of a large depot 100x40 feet for the Midland Railway Co., Portage la Prairie, Man.

The flour mill of the Harding Milling Co., Harding, Man., was destroyed by fire November 17. Loss about \$24,000.

The Edmonton Tent & Mattress Co., Edmonton, Alta., may establish a branch in Winnipeg, Man.

The McTaggart Wright Co., Winnipeg, Man., have been incorporated with a capital of \$25,000, to carry on a general contracting and warehousing business. The provisional directors include J. A. McTaggart, G. Wright and F. G. Walsh, Winnipeg, Man.

Messrs. Barnhill & McLennan, Amherst, N.S., have purchased a large lumber property at Etiomani, Sask., on which they intend building a 100 h.p. rotary saw mill. The machinery for the mill has been ordered from the Robb Engineering Co., Amherst, N.S.

Messrs. Swift & Co., Winnipeg, Man., are considering the establishment of a packing house at Edmonton, Alta.

The premises of the Windsor Hotel, Regina, Sask., were destroyed by fire, November 19. Loss about \$125,000.

The Canadian Port Huron Co., Winnipeg, Man., will erect a new warehouse in Calgary, Alta.

Geo. Perry, Moose Jaw, Sask., is erecting a hotel which will cost about \$50,000, when completed.

The ratepayers of Regina will be asked to vote on a by-law to raise \$100,000 for the erection of a fully equipped municipal hospital.

Hugh Armour, Regina, Sask., is erecting an abattoir 85x45 feet.

A. O. Dwyer, Edmonton, Alta., will erect a large packing plant at a cost of about \$500,000.

The citizens, Edmonton, Alta., will expend \$60,000 in agricultural exhibition buildings and grounds.

The council, Edmonton, Alta., will purchase a fire alarm system.

The congregation of Christ church, Saskatoon, Sask., will erect a church building at a cost of about \$50,000.

The ratepayers of Wetaskiwin, Sask., will vote on a by-law for the erection of a new hospital.

The congregation of the Congregational church, Medicine Hat, Alta., will erect a new church building.

The ratepayers of High River, Alta., will vote on a by-law to raise \$15,000, for the erection of a town hall.

Perfection Lodge, A. F. and A. M., Calgary, Alta., intend erecting a six story block at a cost of about \$85,000.

The H. L. Jenkins Lumber Co., Seattle, Wash., are removing their head office to Vancouver, B.C., and will erect a large mill at Burard Inlet, B.C.

The Canadian Pacific Railway Co. will erect a bridge at Millstream, B.C., at a cost of about \$30,000.

Messrs. Fell & Co., Victoria, B.C., will erect an addition to their building.

A large body of copper ore has been discovered at Mount Sicker, near Victoria, B.C.

The factories of Messrs. Robertson & Hackett, Vancouver, B.C., were destroyed by fire November 20. Loss about \$60,000.

The new theatre will be erected in Vancouver, B.C., at a cost of about \$60,000.

Messrs. Henry Birks & Sons, Montreal, will erect an addition to their factory at Vancouver, B.C.

The Hastings Shingle Mfg. Co., Vancouver, B.C., will erect a new saw mill at a cost of about \$40,000.

The planing mill of Messrs. Robertson & Hackett, Granville, B.C., was destroyed by fire recently. Loss about \$40,000.

The tonnage output of copper ore in the Boundary district of British Columbia in October amounted to 95,160 tons, which compares with 91,311 tons during September.

A new metal called monel is being produced at the Canadian Copper Co., Sudbury, Ont. It consists of a compound of copper, nickel, iron and one or two other minerals, which are found in the district, and its importance lies in the fact that it is much less costly than nickel, is less liable to rust, and will serve all the purposes that is served by that metal in the industrial world. The company have now got beyond the experi-

mental stage, and L. O. Armstrong, of the Canadian Pacific Railway Co., who was over the Sudbury mines on his recent visit to Northern Ontario, says that the reception accorded it, combined with the fact that it costs very much less to produce than nickel, as the costly refining process is dispensed with, while it fulfills all the purposes for which nickel is famed, affords grounds for believing that it is to play an important part in structural work in the future. The new metal is said to be of equal ductile strength with nickel, and to possess all its other essential qualities, but it is not claimed that it would serve the purpose of nickel steel, used as armor plate.

FINANCIAL.

It is stated that the Monarch Bank of Canada have purchased the premises of Rice Lewis & Sons, Toronto, for the sum of \$150,000.

The Northern Bank have moved into their new premises at Prince Albert, Sask.

A branch of the Bank of British North America has been opened at Darlingford, Man.

The Canadian Bank of Commerce have secured a site in Wingham, Ont., and will erect a bank building.

The Imperial Bank will erect an office building at North Battleford, Sask.

The Bank of Nova Scotia will open a branch at Regina, Sask.

The Eastern Townships Bank have opened a branch at Sweetsburg, Que.

The Union Bank of Canada have established a branch at Lethbridge, Alta.

The Northern Bank purpose opening a branch in Macleod, Alta., shortly.

It is stated that the Dominion Bank, Peterborough, Ont., will erect a new bank building.

The Canadian Bank of Commerce have opened a branch at Stoney Plain near Edmonton, Alta.

The Bank of Toronto are erecting a new bank building at Quill Lake, Sask.

The Canadian Bank of Commerce, Lunenburg, N.S., has been closed and the Union Bank of Halifax have opened a branch in the building formerly occupied by this bank.

The Northern Bank have purchased a site in Victoria, B.C., and will erect a bank building.

The Merchants Bank will erect a bank building at Victoria, B.C.

The Bank of Montreal have secured a site in Cobalt, Ont., and will establish a branch.

The Union Bank of Canada have purchased a site in Brandon, Man., and will erect a building.

The Traders Bank have opened a branch at Tavistock, Ont.

The Bank of Montreal will erect a building at North Toronto, Ont.

The Canadian Bank of Commerce, Vancouver, B.C., will erect a business block at a cost of about \$450,000.

The Royal Bank of Canada have purchased the property now occupied by McArthur & Co., Montreal, and will erect a bank building

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The Standard Bank of Canada have secured premises in Cobalt, Ont., and will open a branch.

The Royal Bank of Canada have purchased a building in Winnipeg, Man., for \$200,000, which will be altered into a bank building.

The Bank of Ottawa will shortly open a branch in Melfort, Sask.

The Home Bank of Canada recently opened a branch in Winnipeg, Man.

PUBLICATIONS.

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

The Brown Boggs Co.—Section B of this firm's catalogue, including pages 128-276, giving full descriptions, with illustrations, of their sheet metal working tools and machinery of all descriptions. An important feature of this section of the catalogue is the description of power presses, dies, etc., which this firm is now making a specialty of.—The Brown, Boggs Co., Limited, Hamilton, Ont.

Building Organization Chart.—A unique brochure issued by the Canadian White Co., Limited, Montreal, giving details concerning the progress of the company since its first contract slightly over a year ago, also containing a business organization chart of the company, giving the personnel of the building staff, giving former connection of each. The Canadian White Co., Sovereign Bank Bldg., Montreal.

Good Hard Cash.—This striking heading serves to interest one in a striking new brochure giving list of accident policy claims paid by the Canadian Casualty & Boiler Insurance Co., 22-24 Adelaide St. East, Toronto. Almost every conceivable kind of sickness or accident seems to be included in the list.

Sawmill Carriages.—A 40 page catalogue with illustrated descriptions of sawmill carriages and their equipments, showing also husk frames and their fittings. The Wm. Hamilton Mfg. Co., Limited, Peterboro, Ont.

Sturtevant High Pressure Blowers.—It is not surprising that the B. F. Sturtevant Co. have won a reputation for high standard goods. Attention to detail in securing the desired effect is a feature of all this company's productions. This is seen in their catalogues—in none more so than in the catalogue No. 140 now being sent out, devoted to high pressure blowers. The printing is artistic to the last degree, while the arrangement of the text is such as to make the catalogue an educational publication as much as description of the blower referred to. The B. F. Sturtevant Co., Hyde Park, Mass.

Bristol Recording Gauges.—Catalogue No. 44, devoted to recording pressure gauges. It includes three classes, standard gauges, portable gauges, and round gauges, all of which are made in any range by The Bristol Co., Waterbury, Conn.

What We Do.—A 20 page catalogue issued by the Wellman-Seaver-Morgan Co., Cleveland, O., to illustrate what they do in iron and steel works machinery; ore and coal handling machinery, cranes, etc. Among the works built by this firm and included in the

illustrations are Canadian plants at Sault Ste. Marie, Hamilton and Sydney.

Rockwell Heating Machines.—A four-page folder giving, with illustrations, information concerning these machines and their advantages for annealing, hardening, tempering, coloring, etc., (for oil or gas fuel). The Rockwell Engineering Co., 26 Cortland Street, New York.

"Pittsburgh" Automatic Two-way Vises.—A 32-page catalogue giving full descriptions, with many illustrations, of the "Pittsburgh" automatic double and single swivel vises. Different models are made for iron workers, woodworkers, fitters, single swivel and heavy chipping vises for special work; automobile, jewelers and experimental vises.—The Pittsburgh Automatic Vise & Tool Co., Pittsburgh, Pa.

Jeffrey Pulverizers.—Catalogue No. 31, devoted to crushing and pulverizing machinery for reducing asbestos, barytes, clay, coal, coke, charcoal, ores, cement rock or mar, carbon, fire clay, glue stock, lime stone or other rock, mica, mineral paints, slag, tan bark, wood fibres, etc. Jeffrey Mfg. Co., Columbus, Ohio, and Montreal.

Air Compressor Lubrication.—A 24-page booklet emphasizing the value of Dixon's Ticonderoga flake graphite for air compressors. The Joseph Dixon Crucible Co., Jersey City, N.Y.

The Silent Partner.—The November issue of this publication presents an even more enticing series of epigrams and an even stronger presentation of business principles than former issues. It must prove a power for good on behalf of the publishers. The Globe Machine & Stamping Co., Hamilton Ave., Cleveland, Ohio.

The A B C of Patents.—A 32-page treatise, giving practical pointers, including a synopsis of the patent, trade-mark, designs and copyright laws in Canada and the United States, with a short reference to patents in the principal foreign countries. By Frederic B. Fetherstonhaugh, Toronto.

Shelf Boxes and Screw Cabinets.—A 12-page catalogue devoted to description of the Bennett shelf boxes and dust-proof screw cabinets. The descriptions of the latter should be especially interesting to readers of this paper. The cabinets are made with 83 drawers or 105 drawers and is especially suited for keeping bolts, nuts, screws or any of the many small supplies held in large quantities in the stock rooms of manufacturing plants. Cameron & Campbell, Toronto, Canada.

Westinghouse Bearing Metal.—The Canadian Westinghouse Co., Hamilton, are sending out a leaflet announcing that through the exhaustive researches made to secure a satisfactory bearing metal, they have developed "a product of superior quality now in general use on generators and motors manufactured by this company. It has given such universal satisfaction that the metal is offered for sale at a low price with the assurance of high quality and relief from the troublesome effects caused by the use of inferior metals. The price, which varies with market quotations of metals, quoted on application to nearest district office."

Reduced Prices on Electrical Supplies.—A bulletin giving list of stock which has accumulated in the Toronto warehouse of the

Canadian General Electric and which they desire to clear out, reducing prices as an inducement. Quantity and price of each line is given. Sales Dept., Canadian General Electric Co., Toronto.

Power Transmission Appliances.—Catalogue "F," a 116-page book giving full information with illustrations, size and price tables, regarding the belting, shafting, collars, couplings, hangers, pillow blocks, pulleys, friction clutches; complete power transmission equipment, including rope drives, which the company design and install, also elevating and conveying machinery sold by the Canadian Fairbanks Co., Montreal, Toronto, Winnipeg and Vancouver. This company have made power transmission appliances one of the strong features of their business and this catalogue illustrates the thorough way they handle such a line. For copy write to Canadian Fairbanks Co., Montreal.

The Copper Handbook, Vol. VI., for 1906, is before us. This is, we believe, the only publication devoted exclusively to the copper industry, and is as up-to-date as any of its predecessors, and far more bulky and exhaustive in its treatment of the manifold phases of an industry that is so worldwide in scope. It is encyclopaedic in arrangement, written throughout in plain language, easily understandable by those lacking technical education on the subject. The work begins with a chapter on the history of copper, followed by articles on the geology, chemistry, mineralogy, metallurgy and uses of the metal, with eight chapters devoted to condensed descriptions of all the known copper deposits of the globe. A glossary of mining terms will be found useful to all readers not thoroughly conversant with practical mining, milling and smelting. The statistics of the copper trade and of copper share finances are covered in 40 pages of highly condensed and accurate tables. The major portion of the book is devoted to describing practically all known copper mines of the world, and listing every copper mining company of importance. This chapter is arranged alphabetically, by titles, rendering it self-indexing, and saving more than 50 pages of double column index that otherwise would be required to merely give the titles of 4,626 mines and companies listed in the book, there being 777 more titles than in the preceding annual edition. The descriptions range in length from two lines, in the case of unimportant old and idle properties to nearly 16 pages in the case of the Calumet & Hecla, a mine that employs 7,000 men and will have paid \$100,000,000 in dividends by April next. The detailed descriptions in the main chapter are especially valuable because of their completeness, covering, as they do, exact titles, full addresses, details of organization, officers and finance, and full and careful particulars regarding location, area, ores, mine development, equipment and prospects. Heretofore works of reference devoted to mines have confined themselves either to the financial or the mining end, but the Copper Handbook covers all the features of interest to investors, miners or scientists, not of one mine or company, but of thousands, not in one district, but in every district of the world. The book also gives ratings to mines and companies. The good companies are commended and the fraudulent ones, of which there are many, are denounced in plain lan-

guage. The reader is not asked to take these ratings on faith, but the facts on which such ratings are based are given in detail. The accuracy of the ratings is demonstrated by the fact that of many libel suits threatened by many of the companies denounced as fraudulent, not one has been brought into court. The publisher makes the unusual offer of sending this book, on a week's approval, fully prepaid, to any address in the world, without any advance payment. This offer has been made for six years past, and the publisher states that of the many thousands of books sent out, less than three per cent. have been returned as unsatisfactory. The Copper Handbook contains 1,116 pages, octavo, brevier type; \$5 in buckram binding, with gilt top, \$7.50, in full library morocco, full gilt.—Horace J. Stevens, editor and publisher, 301 Postoffice Block, Houghton, Mich.

The value of the natural gas produced and sold in the United States in 1905 was \$41,562,855, as compared with \$38,496,760 in 1904, a gain of \$3,066,095, according to the annual report of the United States Geological Survey, compiled by W. T. Griswold for the Division of Mining and Mineral Resources, just published. The number of rolling mills supplied with natural gas in 1905 was 81 and the number of steel works 90, as compared with 61 and 82, respectively, in 1904.

The United States Geological Survey (Division of Mining and Mineral Resources) has just published the statistics of the production of petroleum in that country in 1905, compiled by W. T. Griswold. The total production amounted to 134,717,580 barrels, as compared with 117,080,960 barrels in 1904, an increase of 17,636,620 barrels. The report is full of valuable statistical and historical information.

The Steel Square as a Calculating Machine, by Albert Fair. 81 pages, illustrated, 12mo. cloth. Price, 50 cents. New York: The Industrial Publication Co. Although there are in market several treatises on the steel square, there is none which explains the principle upon which the tool works, and unless the workman understands these principles he is liable to make the most curious mistakes. In the volume before us the explanations are full, clear and so simple that any intelligent boy can understand them, and put them in practice.

"The Romance of John Bainbridge," by Henry George, jr., author of "The Menace of Privilege," etc. The MacMillan Co., of Canada, Toronto. This is a most interesting story in which is contained much love, much moralizing, and much of Henry Georgeism, all told in the happy and effective strain in which the author is so successful. No matter how busy the busy man may be he can well afford to find time to read this book. It will do him good, and will give him an insight of matters that concern him very intimately. The price of the book is \$1.50.

PERSONALS.

Mr. H. A. Burson has recently been appointed chief engineer of the Packard Electric Co., Limited, St. Catharines, Ont. The company are making extensive alterations in their works, not only with a view of increasing the output of their present lines of manufacture necessitated by the rapidly growing de-

mand, but also to add other lines of apparatus which will in due course be offered to the trade. Mr. Burson graduated in electrical engineering at McGill in 1901, receiving the degree of M.Sc., and from 1901 to 1903 was demonstrator in the Department of electrical engineering under Prof. Owens, and received the degree of M.Sc., for original research work. In the spring of 1903 he went to the Bullock Electrical Mfg. Co., Cincinnati, Ohio, where he was associated with Mr. B. A. Behrend, chief engineer. In 1904 he was appointed chief electrical engineer of Allis-Chalmers-Bullock, Limited, at Montreal. In his capacity as chief engineer of the Packard Electric Co., it is safe to assume, that with the assistance of his staff of able and competent shopmen, the present products of the company will be brought up to the highest standard, as will also the new lines of apparatus which the company will shortly put upon the market.

WHERE THE MONEY GOES.

The Government estimates for the next fiscal year reach the total of \$105,689,519. Among the Ontario items are the following:

Alexandra Public Building, reconstruction..... \$3,000

Belleville Armories..... 30,000

Brantford public building improvements..... 4,000

Chatham Armories..... 19,000

Dominion public buildings, post-office renewals, repairs, etc..... 16,000

Galt public buildings, alterations to post-office..... 2,500

Guelph Armories..... 50,000

Hamilton Drill Hall, addition..... 100,000

Hamilton post-office, alteration..... 10,000

Kingston military buildings, artillery barracks..... 18,000

London military buildings, magazine and new stores building..... 15,000

London post-office improvements..... 7,000

North Bay public buildings..... 25,000

Oshawa public buildings..... 2,000

Ottawa military buildings, additional stores building..... 7,000

Ottawa departmental buildings..... 45,000

Owen Sound public buildings..... 30,000

Peterborough Armories..... 30,000

St. Catharines public building..... 4,000

St. Mary's public building..... 20,000

St. Thomas drill hall, grading grounds..... 3,000

Sandwich, public building..... 1,000

Simcoe, public building..... 10,000

Stratford Armories..... 5,000

Toronto Customs House, alterations..... 15,000

Toronto Customs House, Government share of paving, and Esplanade in front of Customs House property..... 3,315

Toronto Dominion buildings, improvements, renewals, repairs, etc..... 5,000

Toronto drill hall and armories, accommodation for new corps..... 150,000

Toronto drill hall and armories, Government share of paving University and Chestnut Streets..... 19,000

Toronto military buildings, magazine..... 3,000

Toronto military buildings, barracks for permanent corps, to replace property sold to the city..... 50,000

Toronto post-office, restoration..... 15,000

Toronto post-office, land, building, pneumatic plant and machinery..... 20,000

Toronto post-office, additional postal station "F".....	\$37,000
Toronto postal station "C," pavement, etc.....	500
Wingham public building.....	1,000
Woodstock Armories.....	7,000
Belle River, dredging entrance, etc...	1,450
Beaverton, harbor improvements....	1,500
Blanche River, improvements.....	8,000
Bronte, dredging.....	4,000
Colborne, harbor, wharf.....	8,000
Collingwood, harbor improvements...	22,000
Goderich, harbor improvements....	50,000
Post-office repairs and improvements.....	25,000
Hamilton, harbor improvements....	41,000
Kincardine, harbor repairs.....	45,000
Little Current, improvement of northern channel.....	50,000
Meaford, harbor improvements.....	21,000
Midland, harbor dredging.....	40,000
Ottawa, wharf at foot of Rideau Canal.....	5,000
Owen Sound, harbor.....	20,000
Point Edward, dredging.....	29,000
Port Burwell, harbor.....	60,000
Port Hope, repairs and dredging....	8,000
Port Stanley, harbor improvements..	75,000
River Otonabee, dredging.....	10,000
River Thames, wharfs.....	1,800
Rondeau Harbor, improvements....	60,000
Saugeen River, improvements.....	7,600
Sault Ste. Marie, wharf, dredging approaches.....	50,000
Toronto, harbor improvements and repairs.....	100,000
Winnipeg River, improvements.....	10,000
Port Arthur and Fort William harbors.....	500,000

THE ESTIMATES.

The estimates for the nine months of the fiscal period ending March 31, 1907, and for the fiscal year ending March 31, 1908, have been presented in the House of Commons at Ottawa. The total estimated expenditure for the two periods amounts to \$115,065,905.73. Of this \$9,376,386.70 is for redemption of debt. The expenditure on consolidated fund for the nine months of 1907 is \$54,186,099.46, and for the fiscal year 1908, \$45,224,645.72; the total capital expenditure for nine months, \$18,419,765, and for 1908, \$38,298,340.

The amount asked for under the head of railways and canals during the year 1908 amounts to \$32,953,340, of which \$2,308,000 is allotted to the Intercolonial Railway, \$401,410 to the Prince Edward Island Railway, \$28,360,000 to the National Transcontinental Railway, and \$1,883,880 to canals. For the nine months of 1907 \$2,519,590 is asked for the Intercolonial Railway, \$185,500 for the Prince Edward Island Railway, \$10,000,000 for the Transcontinental Railway, and for canals \$1,298,475, the grand total for both periods being \$46,995,900. The estimated expenditure on rebuilding the concrete piers on the Murray Canal is \$18,000 for 1906-7 and \$55,000 for 1908; to build the retaining wall for the Welland Canal, \$90,000 for 1906-7, and \$70,000 for 1908, and the new entrance pier at Maitland, \$30,000 for 1906-7 and \$15,000 for 1908. The expenditure on improvements to Quebec harbor for 1906-7 is estimated at \$230,000; for 1908, \$280,000. Harbor and river improvements at Port Arthur and Fort William, \$300,000 for 1906-7 and \$500,000

for 1908. Improvements at St. Andrew's Rapids, Red River, \$125,000 for 1906-7 and \$200,000 for the year ending March 31, 1908. Estimates for the new departmental buildings at Ottawa amount to \$500,000 for 1906-7 and \$400,000 for 1907-8.

THE SOUTHERN CALIFORNIA NEW TRAIN.—BEST ROUTE.

The Los Angeles Limited, electric lighted, new from the Pullman shops, with all latest innovations for travel comfort, leaves Chicago 10.05 p.m. daily, arrives Los Angeles 1.45 p.m. third day via Chicago, Union Pacific & North-Western Line and The Salt Lake Route. Pullman drawing room and tourist sleeping cars, composite observation car, dining cars, a la carte service. For rates, sleeping car reservations and full particulars, apply to your nearest agent or address B. H. Bennett, 2 East King St., Toronto.

ELECTRIC MOTOR DRIVE.

Of recent years engineers have discussed the power lost in shafting and belting, the great amount of space taken up by the same, the high cost of maintenance, the liability of breakdowns and the inflexibility of belt-driven machinery, writes Geo. H. Schaeffer, in the American Machinist.

It is the purpose of this article to give a short comparison between belt-driven and motor-driven machinery, and also to give the advantages of the latter.

With the advent of the electric motor there came a probable solution for belt drive. Up to 1900 few manufacturers had adopted motor drive and its use was not advocated. At the present time, however, the motor has reached a high state of perfection and is vastly superior and much cheaper than it was several years ago. Since 1900 practically all large manufacturers have adopted it.

The question which first concerns the manufacturer is: What advantage is there in the use of the electric motor, and what is the cost of its installation as compared with shafting and belting? and I will consider the operating expenses under each class of drive, viz., motor and belt.

ANNUAL FUEL EXPENSE.

This depends on the efficiency of transmitting power to the machines. The average loss of power in belt and shaft transmission for about 50 shops, half in France and half in the United States, was 40 per cent. of the power generated, making the efficiency 60 per cent. On the other hand, with electric drive, allowing 93 per cent. efficiency for the generator, 80 per cent. for the motors, 95 per cent. for transmission or loss in line (which are quite low) we get an efficiency of 70 per cent. This means an increase of 10 per cent. over belt drive and consequently a reduction in the fuel bill of 10 per cent.

ANNUAL EXPENSE OF ATTENDANCE.

It is a well known fact that belting must be adjusted about once a month and the shafting be cleaned weekly. With a motor one oiling lasts from two to three months and no attendance is required except a man to start and stop it and the man in charge of the machine does this. This

makes the cost of attendance of the motor almost negligible.

ANNUAL COST OF REPAIRS.

With an engine and intermediate gearing, bearings must be renewed, the shafting inspected and the belting repaired or renewed frequently. On the other hand, with motor drive, having an engine coupled to a generator, we avoid this trouble and expense. As far as the motors are concerned the repairs are negligible. Here is an instance: In the shop of the Allgemeine Electricats Gesellschaft, where 500 motors are installed at the present time, only 39 had to be repaired in 30 months.

FREQUENCY AND DURATION OF BREAKDOWNS AND THE EFFECT ON THE PLANT.

A breakdown in any shop results in a loss, and the larger the shop the greater the loss. With motor drive breakdowns are reduced 75 per cent.

In a modern shop the greatest item of expense is the wages. On an average, three men are employed per horse power. Anything which will increase the output per horse power without increasing the wage item is of the greatest importance. The question as to the advantage of electric drive hinges chiefly upon the effect on the output of the product per man per machine. This in turn depends on:

1. The general arrangement of machinery to facilitate the handling of work. With shafting the machines must be placed with regard to the line shaft. Motor driven machines can be placed in any convenient position.

2. Clear headroom for use of electric cranes and small hoists. With belt-driven machines, travelling cranes and small hoists are at a great disadvantage.

3. Light and cleanliness. The output or work per man greatly depends upon his surroundings. The lighter and cleaner his surroundings, the more pleasant will be his disposition.

4. Speed control. It is absolutely necessary that the speed of a machine be under perfect control, and that the speed be capable of variation over a large range. The control of speed is accomplished more quickly and at less expense with the motor than by any other method.

5. Use of electricity for other purposes than power. Besides running machinery we can use electricity for lighting, welding, brazing, soldering, etc. This varied usefulness tends to foster these different operations and thus increase the scope of work in any one shop.

Another advantage is that for a given horse power of engine more machines can be used with electric drive than with belt drive. This follows from the fact that a certain number of machines are idle all the time, but their shafts and belts are continuously running and therefore absorbing power. With the electric drive this power can be used to drive extra machines.

Experience has shown that the average load on the generator is 20 per cent. and maximum load 35 per cent. of the motor rating. Therefore, to get full load on the generator we must install five times as much motor horse power as generator horse power. An example of this is shown by the installation of electric drive at the Baldwin Locomotive Works, where the capacity of

the generators was estimated at one generator horse power for every four motor horse power.

In short, the advantages of motor drive are the increased output per man, good speed regulation and greater efficiency of machine drive. In regard to first cost it may be stated that in some cases, for example in a mill, the first cost of electric drive is cheaper than belt drive. On the other hand, in a machine shop electric drive is the more expensive. It has been estimated that the saving in power by using motor drive will pay the cost of the plant in from one to five years.

ONTARIO CLAY-WORKERS' CONVENTION.

The annual convention of the Ontario Clay-Workers' Association is to be held at the Rossin House, Toronto, on Wednesday, Thursday and Friday, December 12, 13 and 14.

As will be seen from the programme the convention is likely to prove one of the most educative, one of the most interesting yet held by this association. The following outline of the programme is provided:

WEDNESDAY FORENOON.

Reception and registration at secretary's office at Rossin House.

WEDNESDAY AFTERNOON.

2.30 p.m. Welcome to Toronto by Mayor Coatsworth, President's annual address, secretary-treasurer's report, report of committees.

3.15 p.m. Lecture by Prof. Coleman, School of Practical Science, Toronto.

5.00 p.m. "Mining and preparation of material," J. S. McConnell, manager Milton Pressed Brick Co., Milton, Ont.

THURSDAY FORENOON.

9.00 a.m. Trip by special train to plant of Don Valley Brick Co., Todmorden, Ont.

THURSDAY AFTERNOON.

2.30 p.m. Lecture on "Technical Education in its relation to the clay industries," Prof. Edw. Orton, jr., Ohio State University, Columbus, Ohio.

5.00 p.m. "Down Draft Kilns," Wm. McCrory, Lyons, Ont.

8.15 p.m. Complimentary banquet to members of C.C.P.M., by Toronto Clay Product Manufacturers.

FRIDAY FORENOON.

9.00 a.m. "Uses of Exhaust Steam on a Brick Plant," A. M. Wickens, chief engineer, Canadian Casualty & Boiler Insurance Co., Toronto.

11.00 a.m. "Comparative Economy of Construction and Operation of Down Draft and Continuous Kilns," J. B. Miller, superintendent Don Valley Brick Co., Toronto.

11.45 a.m. "Brick Spiel," H. de Jeannis, editor "Brick," Chicago, Ill.

FRIDAY AFTERNOON.

2.30 p.m. Lecture by Prof. Baker, Ontario School of Mining, Kingston, Ont.

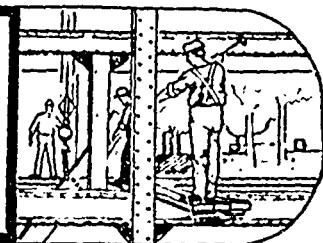
4.30 p.m. "Waste Heat Drying," Wm. Bailie, former superintendent La Prairie Brick Co., La Prairie, Que.

5.00 p.m. Question drawer.



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.



Reinforced Concrete Construction in Toronto.

Manufacturers and contractors in all parts of Canada and in other countries will be interested in the section of the by-law now before the Toronto city council which contains the regulations affecting reinforced construction.

City Architect MacCallum, under whose direction the by-law was prepared, has given much time to study of this kind of construction. In a recent visit to New York he found that the new regulations being prepared there are essentially the same as those he had outlined, the only difference being of minor importance. After some discussion representatives of the two municipalities reached the same viewpoint regarding even the minor points and it is now understood that the regulations of New York and Toronto will be practically identical.

The regulations are as follows:

PERMISSION TO ERECT.

110. (1) Before permission to erect any reinforced concrete structure is issued, complete drawings and specifications must be filed with the Inspector of Buildings showing all the details, and the size and position of the reinforcing rods, stirrups, etc., and giving the composition of the concrete, provided, however, that permission to erect any reinforced concrete does not in any manner imply the acceptance of the construction until after tests have been made of the actual construction to the satisfaction of the Inspector of Buildings.

(2) The execution of concrete work shall be confided to workmen who shall be under the control of a competent foreman or superintendent.

PROPORTION OF CONCRETE.

(3) The concrete shall be mixed in the proportions of not less than one part of cement, two parts of sand and four parts of clean stone or gravel, or in such other proportions as may be necessary to make the resistance of the mixture to crushing not be less than 2,000 pounds per square inch after hardening for 28 days.

METHOD OF TESTING.

(4) The tests to determine this value must be made by a competent engineer, furnished by the owner of the building, or by the contractor, and such tests as well as the preparing of the mixture for the same shall be made in the presence of and under direction of the Inspector of Buildings or his regularly authorized assistants. All concrete work entering into the construction of any building shall be made of like material and proportioned in the same manner as the concrete in the accepted tests.

MIXING OF CONCRETE.

(5) The concrete used in reinforced con-

crete construction must be what is usually known as a "wet" mixture, and all concrete shall be thoroughly mixed by machine to an even, uniform consistency.

When a section or panel of reinforced concrete or any trussed concrete member is started it must be finished in its entirety before shutting down for any purpose which will make a necessary delay of more than 30 minutes duration, and any batch or remnant of concrete which has been allowed to stand until it begins to set must be at once removed and shall not be mixed and used in any portion of the work.

PUTTING CONCRETE IN PLACE, ETC.

(6) All concrete must be placed in the forms in its final position as quickly as possible after being properly mixed, and particular attention must be given to the thorough puddling of concrete around all reinforcement, and under the lower flanges of all beams so as to make the entire mass a monolithic body entirely free from voids or unfilled portions.

QUANTITY OF CEMENT.

(7) Only high grade Portland cement shall be used in reinforced concrete construction. Such cement when tested neat shall after one day in air develop a tensile strength of at least 200 pounds per square inch, and after one day in air and six days in water shall develop a tensile strength of at least 500 pounds per square inch, and after one day in air and 27 days in water shall develop a tensile strength of at least 600 pounds per square inch.

Provided always that a copy of a duly certified statement of the result of each such test of the cement to be used in any concrete construction shall be filed with the City Architect before the said cement is used in said construction. Other tests as to fineness, constancy of volume, etc., made in accordance with the method prescribed in recognized "Standard Specifications for Cement," shall be furnished when deemed necessary by the City Architect.

SAND.

(8) The sand to be used must be clean, sharp and coarse, perfectly free from loam or dirt.

CUSHED STONE OR GRAVEL.

(9) The stone used in the concrete shall be clean crushed stone or gravel of a size that will pass through a three-quarter inch ring. The stone shall be fresh broken and screened, free from dust, and if gravel is used it shall be thoroughly washed.

REINFORCING, METHOD OF.

(10) All reinforcing steel shall be completely enclosed by the concrete; the thickness of concrete on the bottom or exposed

side of any reinforcing steel member of a lintel, beam, girder or column shall not be less than two inches, and there shall not be a less thickness than one inch on the bottom of the steel in a floor slab.

THICKNESS OF CONCRETE BETWEEN REINFORCEMENT RODS.

(11) The steel in lintels, beams or girders shall be disposed so that there shall not be less than one and a half times the thickness of the steel, in concrete, between the different pieces of steel of which the reinforcement is composed.

STRESSES.

(12) Reinforced concrete shall be so designed that the stresses in the concrete and the steel shall not exceed the following limits:

	Lbs. per sq. inch.
Extreme fibre stress on concrete in compression.....	500
Concrete in direct compression	350
Shearing stress in concrete	50
Tensile stress in steel.....	16,000
Compression in steel	12,000
Shearing stress in steel.....	10,000

ADHESION OF CONCRETE TO STEEL.

(13) The adhesion of concrete to steel shall be assumed to be not greater than the shearing strength of the concrete.

MODULI OF ELASTICITY.

(14) The ratio of the moduli of elasticity of concrete and steel shall be taken as 1 to 12.

BENDING MOMENTS.

(15) The following assumption shall guide in the determination of the bending moments due to the external forces: Lintels, beams and girders shall be considered as simply supported at the ends; no allowance being made for continuous construction over supports, and the bending moment for a uniformly distributed load on such a member shall be taken at not less than $\frac{W L}{8}$, where W is the uniformly distributed load in pounds and L is the span in inches.

(16) Floor plates when constructed continuous and when provided with reinforcement at top of plate over the supports, may be treated as continuous beams, and the bending moment for a uniformly distributed load taken at not less than $\frac{W L}{10}$. But in the case of square floor plates which are reinforced in both directions and supported on all sides the bending moment may be taken at $\frac{W L}{20}$.

(17) The floor plate to the extent of not more than five times the width of any beam or girder may be taken as part of that beam or girder in computing its moment of resistance.

December 7, 1906.

MOMENT OF RESISTANCE.

(18) The moment of resistance of any reinforced concrete construction under transverse loads shall be determined by formulas based on the following assumptions:

(a) The bond between the concrete and steel is sufficient to make the two materials act together as a homogeneous solid.

(b) The strain in any fibre is directly proportionate to the distance of that fibre from the neutral axis.

(c) The modulus of elasticity of the concrete remains constant within the limits of the working stresses fixed in this by-law.

(d) The tensile strength of the concrete shall not be considered.

SHEARING STRESS AND ADHESION.

(19) When the shearing stresses developed in any part of a reinforced concrete construction, exceed the safe working strength of concrete as fixed in this by-law, a sufficient amount of steel shall be introduced in such a position that the deficiency in the resistance to shear is overcome.

(20) When the safe limit of adhesion between the concrete and steel is exceeded, provision must be made for transmitting the strength of the steel to the concrete to at least such an extent as will bring the adhesion to within the safe limit fixed in this by-law.

REINFORCED CONCRETE COLUMNS.

(21) Reinforced concrete may be used for columns when the ratio of length to least side of diameter does not exceed twelve. The reinforcing rods shall be rigidly tied or latticed together at intervals of not more than the least side or diameter of the column.

(22) In all cases where reinforced concrete columns rest upon girders, walls or foundations or other piers either wrought or cast iron or steel, bearing plates or bases must be provided. The plates or bases to be of sufficient size to distribute the load which the column supports to such an extent that the compressive stress per square inch on the girder, wall or foundation or other pier, will not be in excess of that allowed in this by-law for masonry, brickwork or the different kinds of concrete, or if the girder, wall or foundation or other pier is constructed of material the strength of which is not specially referred to in this by-law, the plates or bases must be of a sufficient size to distribute the load to such an extent that the safe compressive stress per square inch allowed by standard engineering authorities on such material will not be exceeded. The plates or bases must also be either of sufficient thickness or be braced or webbed so as to resist within the limit of stress allowed in this by-law; the bending and shearing stresses to which they will be subjected by the columns and the ends of all reinforcing rods must be milled or sawn off normal to the perpendicular axis and each must have a full and perfect bearing on the plate or base.

TESTS—TO BE MADE BY CONTRACTOR ON DEMAND.

(23) The contractor shall be prepared to make and shall make load tests on any portion of a reinforced concrete construction within a reasonable time after erection, as often as may be required by the Inspector of Buildings. Such tests shall show that the construction will sustain a load of three times that for which it is designed without any sign of failure.

(24) No concrete work shall be done in freezing weather except when the influence of frost can be and is entirely excluded.

HOLLOW CONCRETE OR CEMENT BLOCKS.

111. (1) The exterior walls of buildings not exceeding 35 feet in height to the highest point of the roof, from the finished ground line adjoining the walls or surface of sidewalk, if built on the street line, may be constructed from the ground floor joist up with hollow concrete or cement blocks, provided the blocks meet the requirements hereinafter specified, and that the walls are made of the same thickness as hereinbefore called for in the tables for brick walls.

(2) The blocks upon which joists rest are to be solid, and if special blocks are not used and blocks have to be cut to allow joists to enter the walls, the spaces in the blocks between the joists to be filled in solid with concrete of a similar description to that of which the blocks are made and all portions of the wall, also piers or buttresses which support beams or girders causing concentrated loads shall be solid blocks and of sufficient strength to sustain within the limit hereinafter specified the full load for which support is intended.

(3) The hollow space in a block shall not exceed one-third ($\frac{1}{3}$) of the superficial area and no block shall be used which will at the age of twenty-eight (28) days crush at less than one thousand (1,000) pounds per square inch of solid area, and no block in a wall, pier or buttress shall be subjected to a greater stress than one hundred and fifty (150) pounds to the square inch of available effective section.

(4) No concrete or cement blocks shall be used in the construction of any building until they shall have attained the age of at least three (3) weeks, and all blocks shall be made with Portland cement of a similar quality in all respects to that hereinbefore specified for under the title of "Reinforced Concrete Construction."

(5) The manufacturer or user of any such blocks shall, before commencing the erection of a structure with them, submit a sample to the Inspector of Buildings for approval, and at their own expense and under the supervision of the said Inspector or his representative have, at any and all times, such tests made as may be required.

(6) No concrete or cement blocks shall be used in the construction of any structure until they shall have been approved of and accepted by the Inspector of Buildings.

ANNUAL CONVENTION OF CEMENT USERS.

The third annual convention of the National Association of Cement Users will be held at Tattersall's, Chicago, from January 7 to 12, 1907. One of the features of this convention will be the comprehensive display of the Ideal Concrete Machinery Co., of South Bend, Ind.

This company are never at a standstill and from year to year add parts, accessories or attachments to their famous "Ideal" block machine, which gives their customers an opportunity to add to their equipment.

During the past year they have perfected a complete brick machine, which can also be used as an attachment to their well-known block machine.

An extensive set of friezes and belt courses

so arranged as to give perfect return corner effects, will greatly please and interest contractors, builders and architects.

A new water table set with return corner attachments; new circle plates with end angle attachments and inner angle scrapers; new metal ties adaptable to their silo block attachments; tiles in elaborate designs produced on the Ideal machine at the rate of twelve at a time, are some of the good things which the company have in store for delegates and visitors at the convention.

The new model E interchangeable 24 inch block machines will also be shown. New face plates in endless variety. Porch pier block moulds with fluted corners, and round designs, will further prove that this company intends to remain in the lead.

Fence posts moulds to interest the agricultural and railroad visitors.

Their stellar attraction, however, around which centers the great interest of this splendid array of new features, will be the Ideal concrete mixer, which they at last have brought to that perfection of detail which entitles it to be classed an "Ideal." All readers of THE CANADIAN MANUFACTURER are invited to inspect this exhibit.

BRITISH COLUMBIA INDUSTRIES.

American Consul A. G. Smith, of Victoria, B.C., reports progress and prosperity in the country round about his consular district. He writes:

As a municipality Victoria was fairly prosperous in 1905, largely owing to the great influx of tourists from the United States during the summer months, the number being conservatively estimated at 50,000. Trade in general was not very brisk. The departure of the British fleet, which sailed for other waters, caused quite a loss in income to Victoria.

The sentiment is rapidly changing for American made goods, hence every kind of article manufactured in the United States for export can now be seen in all the principal stores here. This, too, in spite of the \$100 annual tax on commercial travelers who are not residents of the province and the tariff on imports.

The most important addition to the manufactures of Vancouver Island was the erection of a large Portland cement factory on Tod's Inlet, 10 miles north of Victoria. This enterprise involved an outlay of \$75,000. During the year it turned out 72,000 barrels of cement. Recently the capacity of the plant was doubled, hence, unless prevented by shortage of labor, it will turn out 150,000 barrels in 1906. It employs over 200 men.

The mining in Vancouver Island in 1905 was not as successful as in previous years. The gross output of coal shows a decided decrease, caused by a seven months' strike at Nanaimo. The non-success of the exploration for ore in the gold-copper mine at Mount Sicker is evident, yet the output of the mine for the year was 32,000 tons, valued at \$97,000. The eight metalliferous mines of the island shipped 61,126 tons of ore and gave employment to 202 persons. The mineral product of British Columbia for the year 1905 was valued at \$22,461,325, distributed as follows: Gold, \$5,902,402; coal, \$4,152,936; copper, \$5,376,222; lead, \$3,399,022; silver, \$1,971,818, and all other, \$1,658,925. This is an increase in value over 1904 of \$3,483,966.

ALUNDUM.

A PRODUCT OF NIAGARA ELECTRICAL POWER.

No more remarkable advance in mechanical lines has taken place in modern times than the development of grinding. The field of the old grindstone was limited, and the sharpening of edged tools was almost its only use. The introduction of the emery-wheel, however, made grinding a very important operation. The emery-wheel has not only rapidly replaced the grindstone, but in many operations the work of the cold-chisel, the lathe-tool, the file, and other steel-cutting tools is now done more efficiently by grinding.

Before the invention of the electric furnace, artificial abrasives suitable for grinding-wheels were unknown. Wheel manufacturers necessarily depended upon natural products, - chiefly corundum and emery. As emery occurs in considerable quantities in various parts of the world, it came to be recognized and used as the chief raw material for grinding-wheels and other products employed in grinding metals. On this account the modern grinding-wheel made of any abrasive is popularly known as the "emery-wheel."

The Norton Company, in their constant aim to develop more efficient grinding-wheels and materials, have during the past few years been operating an electric furnace plant at Niagara Falls, New York, in which has been developed and brought out a superior abrasive, alundum.

The invention of alundum is the latest of the important electro-chemical inventions, which during the past few years, have attracted so much attention and made Niagara Falls the centre of electro-chemical industry in the United States.

The introduction of alundum in the field of grinding has been remarkably successful and rapid. The requisites sought for and attained in this abrasive are extreme hardness and sharpness, combined with uniformity and proper temper. So successful has been its development that alundum has become known as the standard of high quality and uniformity as an abrasive.

The process of making alundum consists in taking the purest amorphous oxide of aluminum found in nature, and known as the mineral Bauxite, purifying and melting it in the electric furnace in a large, homogeneous bath or fluid mass. Upon cooling, this molten fluid solidifies and crystallizes in solid masses of alundum of great purity and absolute uniformity throughout.

Bauxite, the raw material from which alundum is made, is the purest naturally occurring amorphous oxide of aluminum known. This mineral was originally found at Baux, France, from which it derives its name, but purer forms are now obtainable in the United States. The best quality only is used in the manufacture of alundum, and in its preparation practically all impurities are removed. The high grades of Bauxite used are of rare occurrence. The Norton Company, however, own their own mines from which the purest grade is obtained.

The bauxite is heated in large preliminary heating furnaces to drive off the combined water, and is then melted directly in electric furnaces of special design. Bauxite was considered infusible until the invention of this process, no heat of combustion being

able to melt it, the electric arc only being equal to this task.

Eleven electric furnaces have been installed, each capable of producing three tons of alundum every 24 hours. Electric power necessary to melt these large charges into solid, uniform ingots of alundum is produced by the Falls of Niagara and is furnished by the Niagara Falls Power Co.

The temperature, at which the furnace charge melts in one homogeneous mass, is above the limit by which temperatures are measured by any means known to science, and is variously estimated between 6,000° and 7,000° Fahrenheit.

The operation of these furnaces and the composition of the molten bath is under the control of the furnace operative. Exact quality and uniformity, which is so important in steel manufacture, is fully as important in the manufacture of alundum. The highest grades of steel are now being made in electric furnaces similar in design to the alundum furnace, because impurities can be removed at the high temperatures obtained by the electric arc, and the quality of the molten bath uniformly maintained. In the alundum furnace both the purity and uniformity of the alundum is assured. Each step in the process is under the close supervision of expert chemists, who are constantly directing and following the work by careful analyses in our own chemical laboratory.

The large masses of molten bauxite are allowed to cool and crystallize in great ingots of purified crystalline alundum. Beautiful crystals are found in the centre of these masses, showing nearly all the variety of colors found in the ruby and sapphire, of which alundum is the commercial, artificial product. The rarer colors of light pink, blue and purple found in the rarer oriental gems are sometimes noticed in small crystals. The ingots of alundum are broken up into small pieces by means of powerful crushers. It is then passed through series of rolls to reduce it to the various sizes of grain, which are finally separated by passing over sieves of different mesh to prepare it for manufacture into Norton grinding wheels, rubbing and sharpening stones, and other articles.

The solid massive alundum, while resembling the purest natural corundum in chemical composition, has the remarkable quality of being considerably harder than the natural product. This is due to the perfectly fluid condition in which the mass is melted, the control of its composition, the rate and method of its cooling and crystallization by which it receives its temper, the absence of water of combination (which almost invariably exists in natural corundum), and the pure and even state in which the fluid mass crystallizes.

The process of manufacturing alundum is patented, being thoroughly protected by United States and foreign patents, both in process and apparatus. These patents are owned and controlled by the Norton Co. exclusively.

The necessary requisites for the most efficient abrasive for grinding wheels are.

- 1st.—Sharpness. 3rd.—Right temper.
- 2nd.—Hardness. 4th.—Uniformity.
- 5th.—Abundant supply.

To have sharpness in order to obtain the most satisfactory results,—so far as rapid and continued cutting is concerned,—a peculiar quality is necessary. There must be a fracture which will give a number of sharp-cutting points. This is obtained in alundum to better advantage than in any other abrasive material.

In the matter of hardness the recognized standard is the diamond, which is No. 10 in the scale of hardness; nothing that man had yet discovered or made equals the diamond in hardness. The term "hardness" is, therefore, a comparative term, the hardness of a mineral being ascertained by its ability to scratch another mineral of a known degree of hardness, or to be scratched by such a mineral.

Pure crystalline corundum, represented by the best sapphire or ruby, has always been the standard for No. 9 in the scale of hardness. This is readily scratched by alundum, in fact, alundum powder is used for cutting and drilling rubies and sapphires for watch jewels, etc.

After numerous careful tests, comparing alundum grains with other grains, including the diamond, alundum is found to exceed 9½ in the scale of hardness where the diamond is 10. By "temper" is meant its strength of grain and the character of its fracture under grinding pressure. An alundum grain is remarkably tough and will stand more crushing pressure before breaking than any other abrasive grain, but when it does break it breaks with a sharp, crisp fracture, giving a fresh, keen-cutting edge. This is a most important quality in an abrasive.

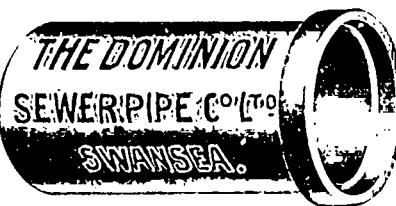
The purity and uniformity of alundum far surpasses that of any other abrasive. Purity, besides resulting in greater hardness and better temper, is necessary in the bonding of the grain into wheels in order to secure accurate and uniform results, and uniformity is necessary to secure constant efficiency and accuracy of grade and temper in a wheel, so that wheels can be accurately duplicated at any time and maintain their standard of work.

Uniformity is one of the most important requisites in an abrasive. The ability to duplicate a grinding wheel is essential to efficient results from its use. In grinding wheels the abrasive grain of given size is bonded together to produce a certain grade or temper for a certain kind of work. This means that the bond, which holds the grains together, must be harder or softer according to the particular work required of the wheel. Different grades are required for different materials to be ground; cast iron, steel, brass, glass, bone, leather, wood and other substances demand wheels of special grade which must be duplicated to make the grinding operation continuously efficient.

It is for this most important reason that great stress is placed on evenness in quality of the abrasive itself. Grades cannot be duplicated accurately without having a known and dependable factor in the uniformity of the material composing the wheel; and this important requisite is to the highest degree found in alundum.

Alundum and the process of making it were awarded the Grand Prize at the St. Louis Exposition. The individuals responsible for its invention and development were honored with diplomas and medals for their part in this most notable, practical invention.

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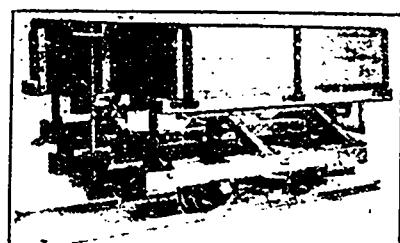
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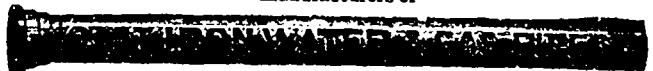
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The Greatest Pulverizing Machine
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Used Wherever Portland Cement is Made

OVER 50 PER CENT. OF THE PORTLAND CEMENT MANUFACTURED IN THE
UNITED STATES TO-DAY IS GROUNDED IN THE GRIFFIN MILL.

The Griffin Mill pulverizes more cement than the combined output
of all other machines used for this purpose.

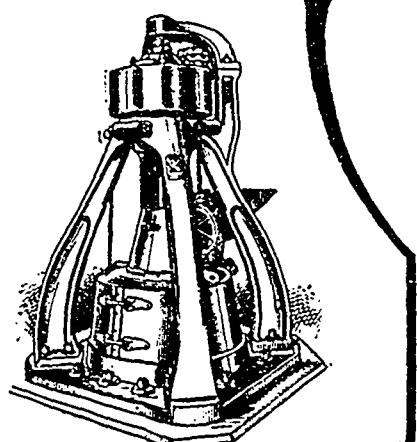
Thoroughly tested by continually successful and constantly increasing
use during the past sixteen years.

Portland Cement Clinker reduced from $\frac{1}{2}$ inch to required fineness
in one operation, with no auxiliary apparatus. No other machine
made will do this.

Buy the GRIFFIN MILL and get the BEST. It holds the world
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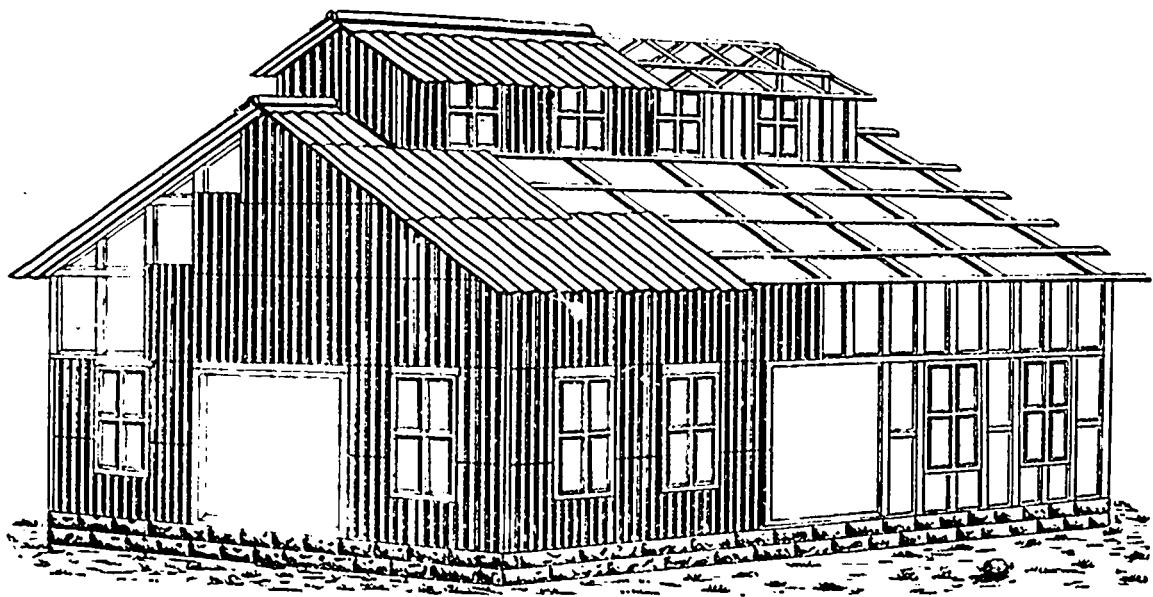
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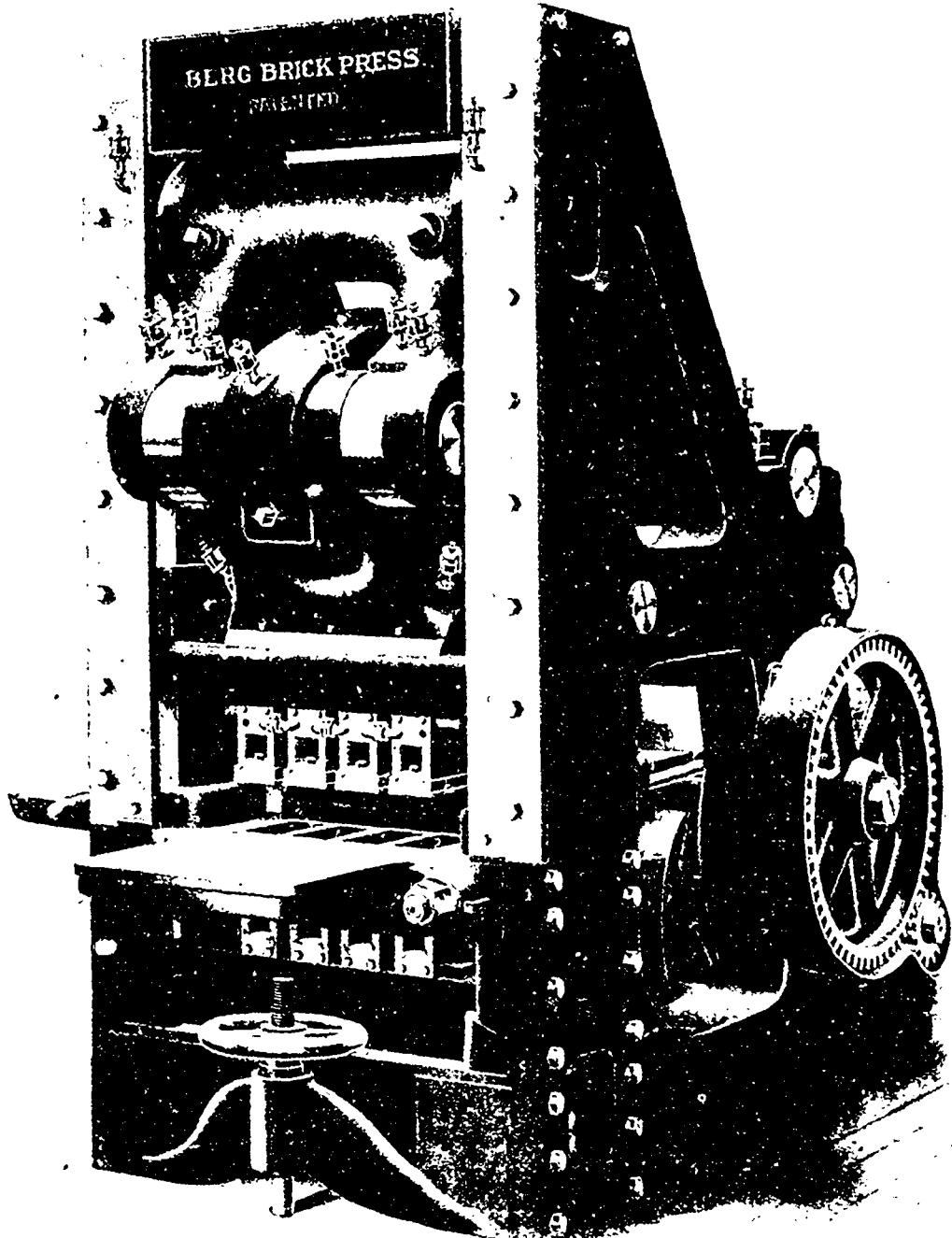
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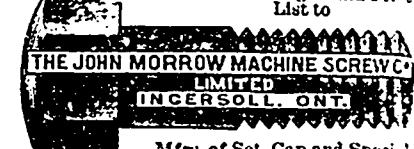
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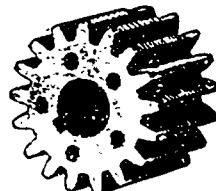
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"Everything in Air Machinery."



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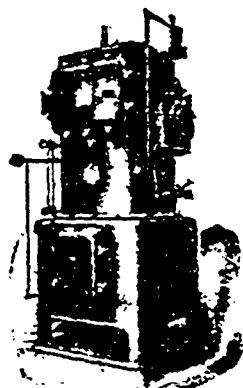
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All advertisers are invited to send in full list of lines sold by them. We desire to keep this Index thoroughly up-to-date, but this will be impossible unless each advertiser sees to it that he is represented under each heading he is entitled to.

Abrasives	Annealing Muffles and Furnaces (Wire)	Belt Fasteners
Williams, A. R. Machinery Co., Toronto.	Lealie, A. C. & Co., Montreal.	Bristol Co., Waterbury, Conn.
Accountants	Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.	McLaren, D. K., Montreal and Toronto.
Neff & Postlethwaite, Toronto.		Petrie, H. W., Toronto.
Viau, Henri, Montreal.		Sadler & Haworth, Montreal and Toronto.
Acids		Williams, A. R. Machinery Co., Toronto.
Canada Chemical Co., London, Ont.	Antimony	Belting (Cotton)
Nichols Chemical Co. of Canada, Montreal.	Syracuse Smelting Works, Montreal.	Dominion Belting Co., Hamilton, Ont.
Air Compressors		McLaren, D. K., Montreal and Toronto.
Allis-Chalmers-Bullock, Limited, Montreal.	Anvils and Vises	Petrie, H. W., Toronto.
Canada Foundry Co., Toronto.	Hopkins, F. H. & Co., Montreal.	Sadler & Haworth, Montreal and Toronto.
Canadian Rand Drill Co., Sherbrooke, Que.	Lealie A. C. & Co., Montreal.	Williams, A. R. Machinery Co., Toronto.
Darling Bros., Montreal.		Belting (Leather)
Smart-Turner Machine Co., Hamilton, Ont.	Architects	McLaren, D. K., Montreal and Toronto.
Alum	Parke, R. J., Toronto.	Petrie, H. W., Toronto.
Nichols Chemical Co. of Canada, Montreal.	Vogel, C. H., Ottawa.	Sadler & Haworth, Montreal and Toronto.
Aluminum		Williams, A. R. Machinery Co., Toronto.
Northern Aluminum Co., Pittsburg, Pa.	Automatic Gear Cutting Machines	Belting (Rubber)
Syracuse Smelting Works, Montreal.	Becker-Brainard Milling Machine Co., Hyde Park,	Gutta Percha & Rubber Mfg. Co., Toronto.
Angles, Beams and Girders	Mass.	McLaren, D. K., Montreal and Toronto.
Bourne-Fuller Co., Cleveland, Ohio.	Axes	Petrie, H. W., Toronto.
Canada Foundry Co., Toronto.	Hopkins, F. H. & Co., Montreal.	Sadler & Haworth, Montreal and Toronto.
Hopkins, F. H. & Co., Montreal.	Nova Scotia Steel & Coal Co., New Glasgow, N.S.	Belting and Supplies
Nova Scotia Steel & Coal Co., New Glasgow, N.S.		Bristol Co., Waterbury, Conn.
Aniline Colors and Dyewood Extracts	Babbitt Metal	Dominion Belting Co., Hamilton, Ont.
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Cassella Color Co., New York City.	Banks	Petrie, H. W., Toronto.
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Nichols Chemical Co. of Canada, Montreal.	Bar Iron and Steel	Blast Furnace Brick
Winn & Holland, Montreal.	Bourne-Fuller Co., Cleveland, Ohio.	Dunbar Fire Brick Co., Pittsburgh, Pa.
	Hopkins, F. H. & Co., Montreal.	Elli Fire Brick Co., St. Mary's, Pa.
	Lealie, A. C. & Co., Montreal.	Hamilton Facing Mill Co., Hamilton, Ont.
	London Rolling Mills, London, Ont.	Harrison-Walker Refractories Co., Pittsburg, Pa.
	Union Drawn Steel Co., Hamilton, Ont.	Pennsylvania Fire Brick Co., Beech Creek, Pa.
		Queen's Run Fire Brick Co., Lock Haven, Pa.
	Belt Dressing	Stowe-Fuller Co., Cleveland, Ohio.
	Petrie, H. W., Toronto.	
	Sadler & Haworth, Montreal and Toronto.	
	Williams, A. R. Machinery Co., Toronto.	

CONTRACTORS DERRICKS

$\frac{3}{4}$ 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 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.
Morrow John Machine Screw Co., Ingersoll, Ont.

Brass Founders

Hamilton Brass Mfg. Co., Hamilton, 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.
Conduit Company, Limited, Toronto.
Expanded Metal & Fireproofing Co., Toronto.
Gatshore, John J., Toronto.
Hopkins, F. H. & Co., Montreal.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.
Sheldons, Limited, Galt, Ont.

Burlap (Decorative)

Dominion Oil Cloth Co., Montreal.

Business Methodizers

Vau, Henri, Montreal.

Cables

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

Canada Plates

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

Caps

McCullough-Dalzell Crucible Co., Pittsburgh, Pa.

Card Clothing

McLaren, D. K., Montreal and Toronto.

Cast Iron Pipe

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

Castings (Grey Iron, Malleable Iron and Brass)
Jencks Machine Co., Sherbrooke, Que.
Kerr Engines 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.
Smart-Turner Machine Co., Hamilton, Ont.

Cement Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Benton Pulverizer Co., Boston, Mass.
McDougall, John, Caledonian Iron Works Co., Montreal.

Centrifugal Pumping Machinery

Kerr 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.

Clay Working Machinery

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

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 Tipples

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

Coll 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

Petric, H. D., Hamilton, Ont.

Concrete Mixers

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

Condensers

Smart-Turner Machine Co., Hamilton, Ont.

Conduits (Interior)

Conduits Company, Limited, Toronto.

Contractors' Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Gatshore, John J., Toronto.

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

Jenckes Machine Co., Sherbrooke, Que.

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

Smart-Turner Machine Co., Hamilton, Ont.

Contractors' Plants

Allis-Chalmers-Bullock, Limited, Montreal.

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

Jenckes Machine Co., Sherbrooke, Que.

Petric, 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., Pittsburgh, Pa.

Smart-Turner Machine Co., Hamilton, Ont.

Cranes (Electric and Hand Power)

Smart-Turner Machine Co., Hamilton, 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., Pittsburgh, Pa.
Syracuse Smelting Works, Montreal.

Crucible Caps

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

Crucible Covers

McCullough-Dalzell Crucible Co., Pittsburgh, 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.
Petric, H. W., Toronto.

Drop Forgings

Globe Machine & Stamping Co., Cleveland, Ohio.

Drop Forging Dies

Globe Machine & Stamping Co., Cleveland, Ohio.

Dry Kiln Apparatus

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

Dust and Shavings Separators

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, Cornicille & 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 Repairs

Keystone Engineering Co., Toronto.

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
Keystone Engineering Co., Irvona
Packard Electric Co., St. Catharines, Ont.
Toronto & Hamilton Electric Co., Hamilton Ont.

Elevators and Conveyors

Darling Bros., Montreal.
Jeffrey Mfg Co., Columbus, Ohio
Jenckes 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)

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

Engineers (Civil)

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

Engineers (Consulting)

Aitken, K. L., Toronto.
Electrical Construction Co., London Ont.
Fensom, C. J., Toronto.
Hunt, Robert W. & Co., Chicago, Ill.
Keystone Engineering Co., Toronto, Ont.
Marion & Marion, Montreal
Parks, R. J., Toronto.
Perrin, William R. & Co., Limited, Toronto
Vogel, C. H., Ottawa.

Engineers (Contracting)

Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Darling Bros., Montreal.
Electrical Construction Co., London Ont.
Fensom, C. J., Toronto.
Keystone Engineering Co., 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.
Keystone Engineering Co., Toronto
Marion & Marion, Montreal.
Toronto & Hamilton Electric Co., Hamilton, Ont.

Engineers (Mechanical)

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
Electrical Construction Co., London, Ont.
Fensom, 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.
Smart-Turner Machine Co., Hamilton, Ont.
Vogel, C. H., Ottawa.

Engineers (Mining)

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

Engineers and Contractors

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

Smart-Turner Machine Co., Hamilton, Ont.

Engines and Boilers

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Canzisa Foundry Co., Toronto.
Goldie & McCulloch Co., Galt, Ont.

Hopkins, F. H. & Co., Montreal.
Jenckes Machine Co., Sherbrooke, Que.
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. I. Engraving Co., Toronto.

Exhaust Fans

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, page 31.)

Feed Water Heaters

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

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Robb Engineering Co., Amherst, N.S.

Smart-Turner Machine Co., Hamilton, Ont.

Feed Water Purifiers

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Files

Spenco, R. & Co., Hamilton, Ont.

Fillet (Pattern)

Hamilton Facing Mill Co., Hamilton, Ont.

Sadler & Haworth, Montreal and Toronto.

Filters (Oil)

Babcock & Wilcox, Limited, Montreal

Darling Bros., Montreal.

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

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

Filters and Filtering Systems (Water)

Babcock & Wilcox, Limited, Montreal.

Jenckes 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

Metallic 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

Metallic Roofing Co., Toronto.

Pedlar People, Oshawa, Ont.

Flour Mill Machinery

Allis-Chalmers-Bullock, Limited, Montreal.

Goldie & McCulloch Co., Galt, Ont.

Forges and Blowers

Canada Foundry Co., Toronto.

Hamilton Facing Mill Co., Hamilton, Ont.

Sheldons, Limited, Galt, Ont.

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

Founders

Canada Foundry Co., Toronto.

Goldie & McCulloch Co., Galt, Ont.

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

Jenckes Machine Co., Sherbrooke, Que.

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

Robb Engineering Co., Amherst, N.S.

Smart-Turner Machine Co., Hamilton, Ont.

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

Foundry Facings and Supplies

Hamilton Facing Mill Co., Hamilton, Ont.

Fuel Economizers
Babcock & Wilcox Limited, Montreal

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

Galvanizing

Ontario Wind Engine & Pump Co., Toronto

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

Gas and Gasoline Engines

Economic Power, Light & Heat Supply Co., Inc.
Morrison T. A. & Co., Montreal

Smart-Turner Machine Co., Hamilton, Ont.

Gauges (Recording Pressure)

Bristol Co., Waterbury, Conn.

Gauges (Steam)

Petrie, H. W., Toronto.

Williams, A. R. Machinery Co., Toronto

Gauges (Water)

Babcock & Wilcox, Limited, Montreal

Generating Sets

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

Generators

Allis-Chalmers-Bullock, Limited, Montreal.

Canadian General Electric Co., Toronto.

Canadian Westinghouse Co., Ltd., Hamilton, Ont.

Electrical Construction Co., London, Ont.

Forman, John, Montreal.

Jeffrey Mfg Co., Columbus, Ohio.

Jones & Moore Electric Co., Toronto.

Phillips, Eugene F., Electrical Works, Montreal

Toronto & Hamilton Electric Co., Hamilton, Ont.

Gloves, Mittens and Moccasins

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

Government Notices

Factory Inspectors.

Minister of Agriculture.

Graphite

Dixon, Jos. Crucible Co., Jersey City, N.J.

Hamilton Facing Mill Co., Hamilton, Ont.

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Hack Saws

Krug & Crosby, Hamilton, Ont.

Hames

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

Hardware

Butterfield & Co., Rock Island, Que.

Garside, John J., Toronto.

Globe Machine & Stamping Co., Cleveland, Ohio.

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

Morrow John Machine Screw Co., Ingersoll, Ont.

Heating and Ventilating Apparatus

Darling Bros., Montreal.

Sheldons, Limited, Galt, Ont.

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

Hoisting Engines

Allis-Chalmers-Bullock, Limited, Montreal.

Jenckes Machine Co., Sherbrooke, Que.

Hoists (Chain and Pneumatic)

Canadian Hand Drill Co., Sherbrooke, Que.

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

Hose (Fire and Pneumatic)

Gutta Percha & Rubber Mfg. Co., Toronto.

Hydrants

Kerr Engine Co., Walkerville, Ont.

Jenckes Machine Co., Sherbrooke, Que.

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

Hydraulic Accumulators

Jenckes Machine Co., Sherbrooke, Que.

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

Smart-Turner Machine Co., Hamilton, Ont.

Hydraulic Machinery

Allis-Chalmers-Bullock, Limited, Montreal.

Canada Foundry Co., Toronto.

Darling Bros., Montreal.

Jenckes Machine Co., Sherbrooke, Que.

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

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

Petrie, H. W., Toronto.

Smart-Turner Machine Co., Hamilton, Ont.

Hydro-Electric Plant

Allis-Chalmers-Bullock, Limited, Montreal.

HARBISON-WALKER REFRactories CO.

PITTSBURGH, PA.

Manufacturers of
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Refractories.

Importers of
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Sole Agents for
Carl Spaeter Magnesite.

Fire Clay, Silica,
Magnesia, Chrome

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Brick. Open Hearth Furnace
Brick. Cupola Linings. Brick
for Gas Furnaces. Brick for Mill,
Forge and Heating Furnaces.
Brick for Copper, Nickel, Brass
Furnaces, etc. Rotary Cement
Linings. Brick for Lime Kilns, etc.

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CLEVELAND, O.

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SILICA FIRE CLAY
ALUMINITE
SILICA CEMENT

MACHESITE

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CLASSIFIED INDEX.

(CONTINUED).

Insulated Wires and Cables	Metallurgists	Patents
Phillips, Eugene F., Electrical Works, Montreal.	Mills, S. D., Toronto.	Budden, Hanbury A., Montreal. Fetherstonhaugh & Co., Toronto. Marion & Marion Montreal.
Iron and Steel Specialties	Mill Machinery and Supplies	Patterns (Wood and Iron)
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 Mont- real. 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.	Allis-Chalmers-Bullock, Limited, Montreal. Armstrong Mfg. Co., Bridgeport, Conn. Becker-Brainard Milling Machine Co., Hyde Park, Mass. Darling Bros., Montreal. Gartshore, John J., Toronto. Goldie & McCulloch Co., Galt, Ont. Gutta Percha & Rubber Mfg. Co., Toronto. Hamilton Brass Mfg. Co., Hamilton, Ont. Hay, Peter Knives Co., Galt, Ont. Hopkins, F. H. & Co., Montreal. Jeffrey Mfg. Co., Columbus, Ohio. Jencks Machine Co., Sherbrooke, Que. Morrow, John, Machine Screw Co., Ingersoll, Ont. McDougall, John, Caledonian Iron Works Co., Mont- real. 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.	Maxwell, David & Sons, St. Mary's, Ont.
Injectors	Milling Cutters and Machines	Perforated Metals
Canada Foundry Co., Toronto. Hamilton Brass Mfg. Co., Hamilton, Ont. Williams A. R. Machinery Co., Toronto.	Becker-Brainard Milling Machine Co., Hyde Park, Mass.	Globe Machine & Stamping Co., Cleveland, O... Greening, B. W. Co., Hamilton, Ont. Metallic Roofing Co., Toronto. Pedlar People, Oshawa, Ont.
Iron and Steel Inspection	Mining Machinery	Personal Accident
Hunt R. W & Co., Chicago, Ill.	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.	Canadian Casualty & Boiler Insurance Co., Toronto
Lamps—Electric	Motors and Dynamos	Phosphorizers
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.	Allis-Chalmers-Bullock, Limited, Montreal. Canadian Rand Drill Co., Sherbrooke, Que. Gartshore, John J., Toronto. Hamilton, Wm. Mfg. Co., Peterborough, Ont. Hopkins, F. H. & Co., Montreal. Jeffrey Mfg. Co., Columbus, Ohio. Jencks Machine Co., Sherbrooke, Que. McDougall, John, Caledonian Iron Works Co., Mont- real. Perrin, William R. & Co., Limited, Toronto. Petrie, H. W., Toronto. Williams, A. R. Machinery Co., Toronto.	McCullough-Dalzell Crucible Co., Pittsburgh, Pa.
Lathes (Wood-working)	Moulding Sand	Pig Iron
Goldie & McCulloch Co., Galt, Ont. Petrie, H. W., Toronto. Williams, A. R. Machinery Co., Toronto.	Hamilton Facing Mills Co., Hamilton, Ont.	Bourne-Fuller Co., Cleveland, Ohio. Canada Iron Furnace Co., Montreal. Nova Scotia Steel & Coal Co., New Glasgow, N.S. Syracuse Smelting Works Montreal.
Linoleum	Moulders Supplies.	Pipe (Riveted, Iron and Steel)
Dominion Oil Cloth Co., Montreal.	Hamilton Facing Mill Co., Hamilton, Ont.	Babcock & Wilcox, Limited, Montreal. McDougall, John, Caledonian Iron Works Co., Mont- real.
Lubricators	Municipal Filtration Plants (Water)	Pipe Threading Machines
Hamilton Facing Mill Co., Hamilton, Ont.	Pittsburg Filter Mfg. Co., Pittsburg, Pa.	Armstrong Mfg. Co., Bridgeport, Conn. Butterfield & Co., Rock Island, Que. Petrie, H. W., Toronto.
Machinists	Nickel	Pipes and Tubes
Goldie & McCulloch Co., Galt, Ont. Krug & Crosby, Hamilton, Ont. Robb Engineering Co., Amherst, N.S. Smart-Turner Machine Co., Hamilton, Ont.	Canadian Copper Co., New York, N.Y. Orford Copper Co., New York, N.Y.	Bourne-Fuller Co., Cleveland, Ohio. Canada Foundry Co., Toronto. Montreal Pipe Foundry Co., Montreal.
Machinists' Supplies	Nozzles	Plaster
Armstrong Mfg. Co., Bridgeport, Conn. Butterfield & Co., Rock Island, Que. Goldie & McCulloch Co., Galt, Ont. Gutta Percha & Rubber Mfg. Co., Toronto. Hopkins, F. H. & Co., Montreal. Jeffrey Mfg. Co., Columbus, Ohio. Morrow, John, Machine Screw Co., Ingersoll, Ont. Petrie, H. W., Toronto.	McCullough-Dalzell Crucible Co., Pittsburg, Pa.	Albert Mfg. Co., Hillsborough, N.B.
Machine Tools	Office and Bank Fittings	Plates
Becker-Brainard Milling Machine Co., Hyde Park, Mass. Darling Bros., Montreal. Petrie, H. W., Toronto.	Canadian Office & School Furniture Co., Preston, Ont.	Bourne-Fuller Co., Cleveland, Ohio. Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Malleable Castings	Oils and Lubricants	Plumbago
McKinnon Dash & Metal Works Co., St. Catharines, Ont. Smith's Falls Malleable Castings Co., Smith's Falls, Ont.	Dixon, Jos. Crucible Co., Jersey City, N.J. Hamilton Facing Mill Co., Hamilton, Ont. Imperial Oil Co., Petrolia, Ont. Queen City Oil Co., Toronto.	Hamilton Facing Mills Co., Hamilton, Ont. McCullough-Dalzell Crucible Co., Pittsburgh, Pa.
Marine and Stationary Engines and Boilers	Oil Cloth	Pneumatic Tools
Allis-Chalmers-Bullock, Limited, Montreal. Jencks Machine Co., Sherbrooke, Que. Smart-Turner Machine Co., Hamilton, Ont.	Dominion Oil Cloth Co., Montreal.	Allis-Chalmers-Bullock, Limited, Montreal. Canadian Rand Drill Co., Sherbrooke, Que. Hamilton Facing Mill Co., Hamilton, Ont.
Mechanical Draft	Paints and Colors	Pointer Rolls (For Rods and Wire)
Babcock & Wilcox, Limited, Montreal. Shildons, Limited, Galt, Ont. Sturtevant, B. F. Co., Boston, Mass.	Berry Bros., Walkerville, Ont. McArthur, Cornhill & Co., Montreal.	Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.
Metal Doors	Paper Manufacturers	Power Plants—Equipments
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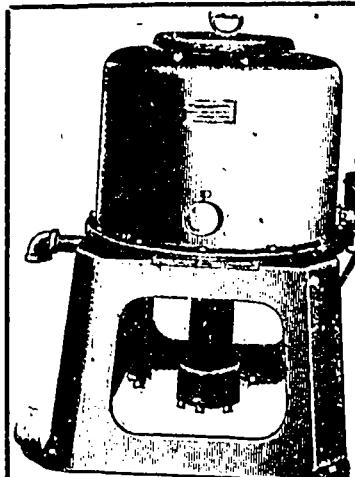


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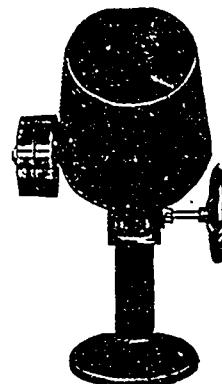
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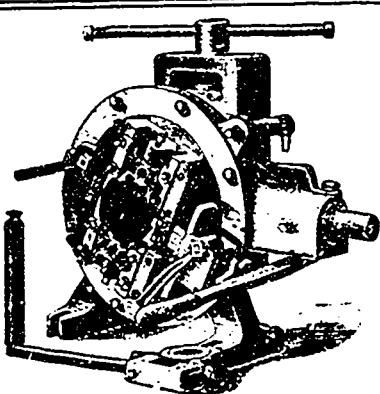
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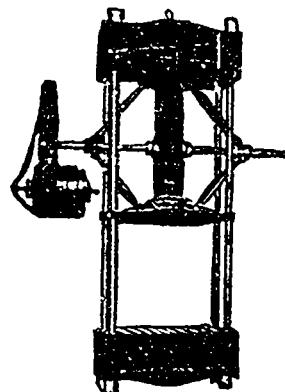
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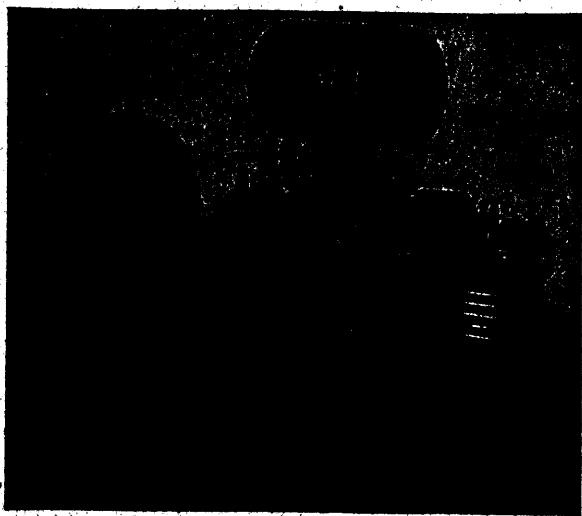
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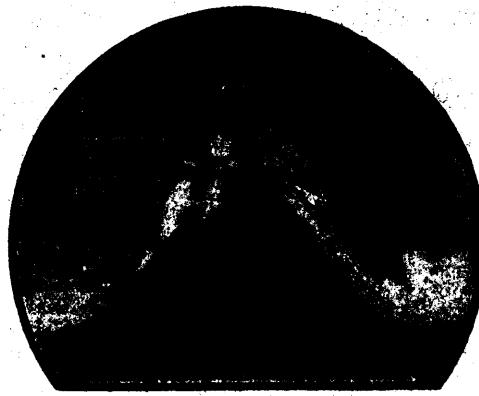
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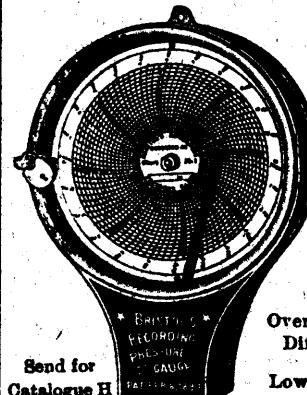
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