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DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

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A PROTECTIVE DUAL TARIFF.

The following preamble and resolutions were adopted by the American Protective Tariff League at its annual meeting in January:

Whereas, The American Protective Tariff League has always stood and now stands for a Tariff on imports "which shall adequately secure American Industrial Products against the competition of Foreign Labor"; and

Whereas, A Dual Tariff has been agitated and recommended by many organizations, be it

Resolved, that the American Protective Tariff League favors a Dual Tariff, provided that the minimum Tariff upon foreign products shall at all times fully represent the difference in cost of production; and,

Resolved, that the maximum tariff shall be levied upon the products of all nations which discriminate against the exports of the United States.

The difference between the American Protective Tariff League and the Canadian Manufacturers' Association, the professions being identical, is that the American concern not only preaches its doctrine and acts upon it, and the Canadian concern don't.

PRODUCTION OF PIG IRON IN CANADA.

The Bulletin of the American Iron and Steel Association gives in the following table the total production of all kinds of pig iron (including spiegeleisen and ferro-manganese) in Canada from 1894 to 1906. Prior to 1894 the pig iron production of Canada was not ascertained by the Association.

Years.	Gross Tons.	Years.	Gross Tons.	Years.	Gross Tons.
1894.	44,791	1899...	94,077	1904 ..	270,942
1895.	37,829	1900...	86,090	1905...	468,003
1896	60,030	1901...	244,976	1906...	541,957
1897.	53,796	1902...	319,557	.....	.....
1898.	68,755	1903	265,418	.....	.....

During the first half of 1906 Canada had thirteen completed furnaces in blast and during the last half it also had thirteen furnaces in blast. In the first half of 1905 it had thirteen furnaces in blast, and during the last half of the year twelve furnaces. It will be observed that in the two years, from 1904 to 1906, the production of pig iron in Canada more than doubled.

EDUCATIONAL.

A few nights ago the technical committee of the Canadian Manufacturers Association visited the Toronto School of Practical Science for the purpose of examining the various departments of that institution, the methods employed, the subjects taught, and as far as possible, the progress and efficiency being attained by the students. Some of the members of the board of education accompanied the delegation, as did also the inspector of manual training. When the inspection was finished, the party, with the staff of teachers, repaired to one of the classrooms to discuss what they had seen and heard.

Principal Eldon stated in general terms the object of the instruction imparted, and briefly described the lines along which the school was proceeding.

On behalf of the delegation, Mr. J. P. Murray stated that the association had received a request for books which might be given as useful and appropriate prizes to the students. In the past prizes had been awarded the students, but they had not been properly selected, and he had suggested that a committee inspect the institution in the manner they had been doing that evening. The C.M.A. had also an idea that the technical school could be a great help to the manufacturing industries, and the C.M.A. was prepared to assist to the extent of its power, with a view of reciprocal relations between the school and the industrial field.

He was obliged to confess that his observations and enquiries had brought disappointment with them. He was interested in the textile industry, and when he asked the pertinent question: "Supposing I desire to send some students here to get technical knowledge on textile manufacture, could you instruct them practically and properly?" he received a reply in the negative. Was a technical school true to name that ignored one of the greatest industries in the manufacturing world?

He was pleased to learn it was the hope to have the buildings extended, with more complete shops, which would enable them to bring the practical up in line with the theoretical, and if the idea be taken up properly, many manufacturers would contribute the plants required for equipment. Mr. Parkinson, speaking for the board of education, explained that the present building was used to relieve the overcrowding of the high schools in the city.

But for circumstances over which they had no control, the ideal technical school of the future would be now a realized fact. It was not want of money, but the board was to some extent delayed by a scheme of the provincial government, which at one time proposed to have all the different high schools amalgamated into one and located within the university grounds, but the scheme was abandoned.

The Manufacturers' Association and the community generally should thank Mr. Murray for the interest he so frequently shows in the welfare and success of the technical school. The school is doing a grand work in imparting technical education to the large and intelligent number of young Canadians into whose hands the management of a large proportion of the manufacturing industries of the country must come. Mr. Murray's allusion to the textile industry was indeed timely, for there is no human being in Canada, from the infant in the cradle to the oldest in the land who is not vitally interested in the textile industry, and Canada is without doubt the largest per capita consumer of textiles, particularly of woolens, in the world. But stranger to say, of all the many important industries in the country, the manufacturer of woolen goods receives the scantest recognition from the government in the way of tariff protection. It is unfortunate not only for the manufacturers themselves, but the entire country also, that the imports of textile fabrics, clothing, etc., into Canada is greater in value than any other article, and that these imports pay a lower rate of duty than any other dutiable article.

Perhaps Mr. Murray and the association which he represents might throw important light on the subject if he and they gave it due consideration. Mr. Murray wants to know where he could find young men, even among the graduates of the technical school, and the echo answers where? But suppose that the technical school was prepared to fill a demand for such educated men, where is the demand to come from? Where are the textile establishments in Canada to give employment to such educated men? There few in existence like that with which Mr. Murray is connected. Suppose that only the one school of practical science that Mr. Murray visited was fully prepared and equipped to turn out say a score of graduates a year, what would become of them? Where would they find occupation? The question is easily answered—they would through sheer necessity, gravitate towards the United States, and find appreciation and good remuneration in American textile mills. That is what would become of them. That is the way the brains and the brawn and muscle of Canada would be drawn upon to grease the wheels of American industrial establishments, and to build up a competition that is already squeezing the life out of Canada, and what is true of the textile industry is also true of the malleable iron and many other Canadian industries.

In reply to the suggestion that the capacity and equipment of the technical school buildings are to be enlarged it is intimated that many manufacturers, and perhaps the Association also, will contribute liberally to the further equipment including technical books. It is to be hoped that all these hoped for things will be done; but it should be borne in mind that something more is necessary in the way of education, not only of young men whose tastes lead them to equip themselves to become masters in the industrial walks of life, but also of those who are to follow other professions—lawyers, doctors, clergymen and all the classes who obtain their foundational knowledge in Canadian colleges and similar institutions. In our colleges we find endowed chairs of political science, filled, usually, with professors who teach nothing more than abstract theories, who think that free trade is the only correct theory of successful government. Free trade is indeed a beautiful theory, but, except to some extent in Great Britain, has never been successful in practice in any civilized country.

Why then, do not our manufacturers endow in our colleges chairs of political science and fill them with those who can and will lecture their classes on the true value of tariff protection? If the educated young men of the country are well and properly grounded in theory of tariff protection, the country would be filled with protectionists and the government of the country would represent their views.

MR. SPEAKER.

A few days ago Hon. Charles Marcil, Deputy Speaker of the Dominion House of Commons, at a social gathering in the city of New York at which he was a guest, in replying to a complimentary toast, said, regarding Canada.

Canada is, indeed, to-day in every sense of the word a nation. The slender ties which link us to Great Britain, in the words of Burke, "Grow from common names, from kindred blood, from similar privileges and equal protection. They are ties which, though light as air, are as strong as links of iron.

We rely upon the friendship of the United States and hope to achieve a share of their success, a success which has dazzled the world, and equalled, if not surpassed, the achievements of humanity of all ages. Practically the world seconded the efforts of your forefathers in building up these United States. We, in turn, are to-day attracting the attention of that world. Canada has become the new promised land.

Two hundred thousand settlers from the United States, many of them former Canadians, have gone in that great Canadian West within the past five years; we rely on having 100,000 this year coming from well-nigh every state of the union; they are invading that greatest wheatfield in the world, 900 miles long, 300 miles wide.

American citizens and American property are coming to Canada to-day because it is realized that Canada is the land of great promise. It is no longer the "few arpents of snow" of the French king, but the great land of the 20th century, where crops can be raised to supply the whole continent.

We are just beginning to realize the gigantic possibilities of Canada, with its fertile land, its salubrious climate, its great mines, immense areas of timber, numberless waterpowers and gigantic waterways. All these are the equal of any to be found on the globe. They are now open to the world, and American enterprise and initiative are in the vanguard. Both are welcome.

In spite of your prohibitive tariff against us, we are to-day your third best customer, immediately after Great Britain and Germany. We are importing this year from the United States close on to $200,000,000, while we sell here only half that figure, as against $133,000,000 to Great Britain, thousands of miles away.

Within the next ten years Canada will expend $500,000,000 in railway building alone. While you are engaged in the great work of building the Isthmian Canal, we in friendly rivalry are throwing across the continent our third transcontinental line, establishing the shortest route between Northern Europe and the Orient. These are but a few isolated instances of our material progress.

Canada extends to you the hand of fellowship in the

great work of making of America, the whole of America, what God intended it should be—a land of liberty, freedom and civilization. Three hundred years have elapsed since civilized man began this work. It is time to pursue it with greater vigor than ever.

Let us all, brethren alike in our common ideals and common aspirations, resolve each in his own sphere, to do all that in him lies, to foster friendly feelings, come what may, between the mother country, the greatest empire in the world's history, and the common matter of our two North American nations. Let there be peace between the United States and the British Empire and Canada, her eldest daughter, and the peace of the western world, at least, is for all time assured, and a tremendous influence will be exercised for the good of the world at large.

I can imagine no more appropriate and fitting place to formulate such a hope than in this gathering of framers of public opinion in this great city and throughout the continent.

Brave and well spoken words, but Mr. Marcil should bear in mind that if Canada aspires to the manufacturing and commercial greatness now enjoyed by the United States, it must be by the adoption of a similar fiscal policy. Canada enjoys all the natural advantages that characterize the United States, and though that country has the start as regards industrial progress; and though it has at present a much larger population—a larger home market for its domestic products than Canada, the economic differences between that country and this are lessening every day, and the equalization will go on and rapidly progress, particularly if Canada should observe and practice the theory and policy that has made the United States the great industrial nation it now is. Otherwise it cannot be done. The United States, to use a homely phrase, is a tub that stands on its own bottom. Canada does not and will not until we think more of Canada than of any other nation on earth. Do away with preferential trade or any other form of favoritism unless we receive a quid pro quo.

ROUSING RALLIES.

A subject now generally being discussed in the daily papers, and to which big headlines are given, concerns the "rousing rallies" that the political parties are causing to take place in various parts of the country. It is to be observed that these meetings, being of the grit persuasion, always pass resolutions endorsing the government, and if any allusions are made to the fiscal policy, it is to point with pride to the rejuvenated tariff—that is so perfect and beautiful in all its parts and proportions, and that is to be of such remarkable benefit to Canada. It makes no difference whatever that perhaps not one person in the audience, including the silver-tongued orators, are able to mention even one item in the new tariff that is different from the corresponding item in the old tariff, or how any change that may have been made is intended to affect the general welfare. Reports of the meetings are prepared, usually beforehand, in which the speeches of the chief speakers are reported, and such of the small fry as may be presumptous enough to break through the thin ice of their timidity, may have their names mentioned as having "also spoken" in an entertaining manner of course.

Of course this method of conducting public political meetings is not confined to the grits, the chief object with them being to encourage the idea that the status must be preserved—to let well enough alone, and leave it with those who may be looking after things to continue to look after them. Their party is in power, and want to remain there. There is not much difference in the objects and management of the meetings of the other fellows; they are the outs and want to get in. For instance, a few days ago in a town not very distant from Toronto was held a meeting of a "Conservative Association" which elected officers and committee men for the ensuing year, which included the names of about every conservative in the county, and then the resolutions prepared before hand were read and seconded and in due time passed "enthusiastically and unanimously." One announcement was that the association was formed for the purpose of gaining seats in the Dominion House of Commons and of holding the seats now possessed by the party. Also, a committee was raised to arrange details for the next general election campaign; then it was resoluted that in the opinion of the convention the existence of the association was vitally necessary to the welfare and stability of the party, and, of course, of the country; then a resolution condemning the actions and maladministrations of the party in power, and all that sort of thing; then a vote of confidence in their own leaders. But no allusion whatever to any great policy of their party—nothing to show that any change of government would be to "the general advantage of Canada." No advocacy of the great policy of protection that made Canada the wonderful industrial country it now is. "Rousing rallies" seem to be about the size of the political leaders of both parties. The free traders seem to be having it all their own way, and, facilis decendus averni. But what about protection? Where are the advocates of the National Policy?

SUBSIDIZED SHIPPING.

South American journals comment regretfully on the rejection by the United States Congress of the ship subsidy bill, which would have promoted trade with South America. No subsidy would be necessary to develop that trade only that it is hampered by high protective duties. The best way to promote the shipping industry is to lower the duties on South American products coming into the United States.—Toronto Globe.

Funny ideas indeed. Under free trade, according to The Globe, no subsidy would be necessary to develop trade between the United States and South American countries, the best way to promote the shpping industry between those countries being to lower or remove the duties. Great Britain is most eminently a free trade country, and yet she pays millions of pounds as subsidies to her ship owners. Canada is by no means a protectionist country, as compared to the United States, nor yet a free trade country like Great Britain, and yet she pays millions of dollars yearly as subsidies, mostly to British shipowners, to carry Canadian merchandise to other British ports, largely to Great Britain, and even a larger amount of

subsidy to British ships trading between Canada and foreign countries. The mail subsidies and steamship subventions between Canada and Great Britain and many of her possessions, and for services with China, Japan and France, was large, in 1906 the whole expenditure in that behalf in that year aggregating $3,845,751.

In this connection it may be interesting to know the character of the vessels employed in the sea-going and the coasting trade of Canada in 1906. The following shows the number and tonnage of sea-going vessels, vessels (except ferries) trading on the lakes and rivers between Canada and the United States, and vessels employed in the coasting trade, distinguishing British from foreign, which arrived at and departed from Canadian ports in 1906:

SEA GOING.

	Vessels.	Tons.
British	17,305	11,364,395
Foreign	12,517	5,479,034
Total	29,822	16,843,429

No Canadian vessels included.

ON INLAND WATERS.

Canadian	20,038	8,936,973
American	25,133	8,951,770
Total	45,173	19,888,743

EDITORIAL NOTES.

A bill has been introduced into the Ontario Legislature which, if passed, will make the Ontario Association of Architects a very close corporation. This bill, as drafted, provides that none but "a qualified architect unless he is registered under this act," can sign himself as a qualified architect, unless he is virtually a member of the Architects' Association. This act, if adopted, will prevent many who now earn their living by making plans from doing so, and it will effectually prevent any intending builder from preparing his own plans, however competent he may be. It will hit the building trades very hard, and a manufacturer would be debarred from erecting a coal shed or horse stable in connection with his factory except under the superintendence of a member of the Architects' Association. We have knowledge of many worthy and competent architects, but this thing of making close corporations is in restraint of trade and should be discouraged.

Mr. J. G. Lethbridge, master of the Dominion Grange, in his address to that body, boasted that last year he had in his official capacity, sent petitions to every other Grange in Canada to be signed and forwarded to their respective members of parliament at Ottawa protesting against the giving of bounties by the Dominion Government for the manufacture of iron and steel in Canada, and that he had joined with other similar bodies in presenting a petition to the government asking for a tariff for revenue only.

We are now in receipt of a letter from a prosperous farmer living near Woodstock, Ont.—one of the "old guard" farmers who is yet a staunch believer in the N.P. who criticizes the campaign of those agricultural classes against the bestowment of bounties for the encouragement of the production of iron and steel. He says very correctly, that their doing so is inconsistent and shows a rapid change of front from the position assumed by them, and by their mouth-piece, the Farmers' Sun, when the pork packers wished to continue to import hogs in bond because of the shortage of supplies in Canada. Then the cry of the farmers as voiced by the Sun was for protection of their hog industry. Then the farmers wanted protection to help them in producing pigs for edible purposes, but now they do not want the furnace men to have any protection for their production of iron pigs for manufacturing purposes.

The per capita circulation of money in the United States on February 1 was $33.96, as compared with $31.89 on the same date of last year. This is the highest average ever reached.

The Dominion Grange, of which Mr. J. G. Lethbridge of Strathburn, Ont., is master, began the annual meeting of the Grange in Toronto a few days ago.

Mr. Lethbridge in his address, noted the flourishing condition of the grange during the past year and the necessity for every Canadian to feel grateful for the advances made by this country. In connection with the action of the Dominion Government regarding the tariff and the bounty question, Mr. Lethbridge said:

"It was my privilege as master of this grange to join with the presidents of the Farmers' Association and Manitoba Grain Growers' Association in presenting a memorial to the government asking that the tariff be reduced to a revenue basis, and that revenue based on an honest and economical expenditure of the public funds. The Montreal Witness was good enough to say that this was the strongest memorial ever presented to the Government by organized agriculture, and that its contents were what the Government should have known without being told. However, some of our members of parliament stated upon the floor of the House that the memorial did not represent the views of the farmers of Canada. My opinion is that if this question was presented to the farmers of Canada without the heat of a political campaign, the expression voiced in our memorial would be the expression of nine-tenths of the farmers of our country.

"The result of the tariff revision you all know, and while the changes have not been very great, we should be encouraged to know that the tendency is downward and that the high tariff men were practically defeated or at least very much disappointed.

"Another question of equal importance is the iron and steel bounties which the Government proposes to continue for another four years and which, if continued, will add several million dollars more to the gifts already made to the iron and steel barons. In the absence of our secretary, I sent petitions to every grange in Canada, to be signed and forwarded to their respective members, protesting against a continuance of this system of giving away our public funds.

We again direct the attention of Canadian manufacturers to the constant and systematized efforts being made in season and out of season by the free traders to injure the cause of tariff protection; and we again ex-

phasize the fact that no efforts whatever, in parliament or out or anywhere else, by scattered protectionists, were made to counteract the evil efforts. Why don't the manufacturers wake up?

A Washington telegram of February 15, says: The House Committee on Ways and Means decided to-day to indefinitely postpone consideration of the Williams bill for reciprocal free trade in coal between the United States and Canada.

New England industries within easy reach by water of Nova Scotia coal, depend of necessity on West Virginia and Pennsylvania for their fuel: and Ontario, the great manufacturing province of Canada, cannot raise a pound of steam except with Ohio and Pennsylvania coal. Our imports of bituminous coal and coal dust in 1906 amounted to 5,222,576 tons, valued at $8,804,088, upon which $2,456,030 duty was paid, and our imports of anthracite coal, which is duty free, amounted to 2,200,863 tons, valued at $10,304,303. In the same year our exports of bituminous coal, nearly all of which was to the United States, amounted to 1,927,680 tons, valued at $4,790,601. Ontario manufacturers are badly handicapped in having to pay nearly $2,500,000 duty on their fuel, the Nova Scotia miners not being at all benefitted.

A London cablegram says:

The Chairman of the Lanarkshire Steel Co., stated that had it not been for the Canadian preference, 1,000 employees would have been dismissed during the shipping strike last year.

This means that a thousand Canadian workmen, their families and dependants were deprived of their means of support to the end that an equal number of souls in Lanarkshire, Scotland, might be employed. The lack of adequate tariff protection did the job. The food produced by Canadian farmers that should have found a home market, supplying the needs of Canadian workers was sent abroad to feed their foreign competitors. Will Canadian farmers ever see the point? The best market is the home market.

Oshawa fears free trade in malleable iron.

The manufacture of malleable iron is an industry that now employs 1,000 hands and gives Oshawa a pay roll of $10,000 per week.

The foul fury of free trade fanaticism, as it is preached by the Toronto Star even more than by the Toronto Globe and other organs, is to wreck one of the brightest little towns in Canada.

The destruction of the malleable iron industry in Oshawa will simply employ 1,000 American hands on the work that is now done by 1,000 Canadian hands.

The destruction of the malleable iron industry in Oshawa will simply build up some American community with the pay roll of $10,000 a week that now builds up Oshawa

Why should the Hamilton Times, the Toronto Star, Globe and Ottawa Journal be forever assailing Canadian industry with a free trade fad that must build up the United States and pull down Canada?

Oshawa is to be an example of what will happen all over Ontario, whenever politicians become crazy enough to practise the preachings of the Toronto Star & Co. Every industrial community in Canada would perish, even as Oshawa must perish, when it is assassinated with the free trade theories of organs that are mere advance agents of United States prosperity.—The Toronto Telegram.

The Telegram alludes to the Oshawa disaster, but there are probably a dozen other manufacturing industries in Canada that produce malleable iron, and the fate of Oshawa will be common to them all. Free trade does it. It is done at the demand of certain farming and agricultural associations to whom a ready and willing ear is given when they visit Ottawa. The manufacturing industries of Canada, all of them, are facing a most disastrous and unfortunate crisis.

The bequest of the late Mr. A. McCharles, of Sudbury, of $10,000 to the University of Toronto, is characteristic of the man. It is to enable that institution to offer prizes for the invention or discovery by Canadians of new and improved methods for the treatment of Canadian ores, for lessening the danger attendant on the use of electricity for light and power purposes, and for practical results of scientific research."—Toronto Globe.

We have searched through our exchanges very sedulously for items relating to contributions from any source to enable any institution to offer prizes for the dissemination of knowledge regarding the policy of tariff protection, but in vain. We observe the pernicious doctrine of free trade flowing in every direction, but nothing for protection.

The United States was enriched by practically $500,000,000 through its exportations last year of cotton and cotton goods, according to a statement issued by the Bureau of Statistics. Of the $413,000,000 worth of raw cotton exported, $173,000,000 went to the United Kingdom and $7,333,000 to Canada. The figures show a slight increase in the export of cotton sent to Canada compared with 1905. The value of cotton cloths exported last year was $32,500,000, of which more than three-quarters of a million dollars' worth was to Canada.

Initial shipments of denatured alcohol have been made from distilleries at Peoria, Ill., to New York, says the Orange Judd Farmer, where it is quoted at 37 cent a gallon in single barrels and 36 cents in lots, the equivalent of 31 cents in Peoria, package included. The price of wood alcohol has dropped from 75 cents to 45 cents.

Canada scored an increase of eight millions in the gross revenue for the eight months ending with Frebruary last, and an increase of five millions in the net revenue. This is Canada's growing time.—The Globe.

Where did the money come from, and who paid it? The money was paid for the purchase of goods that might have been made at home, and would have given occupation to Canadian labor and Canadian capital if they had been adequately protected.

As a result of the increase of orders for electric railroad equipment, similar to that now used on trunk lines for their suburban services, the Westinghouse Electric & Manufacturing Co. have been compelled to enlarge their plant in East Pittsburgh by the addition of an eight-story building. This will cost, when completed, $500,000,

and will furnish employment to 2,500 more workmen. The output of the works, which last year approximated in value $40,000,000, will be increased by at least one-third within the next two years, and the number of persons employed will also be augmented from 17,500 to 20,000. This increase in the number employed will bring the Westinghouse employes in the Turtle Creek Valley alone up to 35,000. Protection does it. Will our free trade friends think of the demand of 35,000 employes of one concern in one locality alone, and their families, for food stuffs. It means that more than a hundred thousand hungry mouths are to be fed three times a day, and that farmers, in the neighborhood mostly, find it profitable employment in producing farm truck of every variety to supply this home market. This one manufacturing concern alone, in only one locality, creates a home market for the farmers that would not exist otherwise. And Canadian free traders fail to see the point. Protection and prosperity go hand in hand.

All the imports of malleable iron castings, and iron or steel castings into Canada in 1906 amounted to 4,957 hundred weight valued at $16,819, upon which the duty collected at 25 per cent. ad valorem was $4,204.75. The duty gave fair encouragement to about a dozen different concerns in Canada who manufactured malleable castings. Next year, under the free trade tariff, the importations will likely constitute the entire consumption of the article. All of our imports last year were from the United States. Not a dollar's worth from Great Britain.

All the imports of tinware imported into Canada in 1906 were valued at $228,458, of which, to the value of $187,479, came from the United States, and only $29,427 from Great Britain. The United States duty on the article is one and one half cents per pound, but no duty is imposed in Great Britain. High protection knocks free trade all to smithereens.

The imports of tin plates entered for consumption in Canada in 1906 were 605,182 hundred weight, valued at $1,869,000 of which 254,740 hundred weight valued at $733,167 were from the United States, the balance from other countries. There is no duty on tin plate.

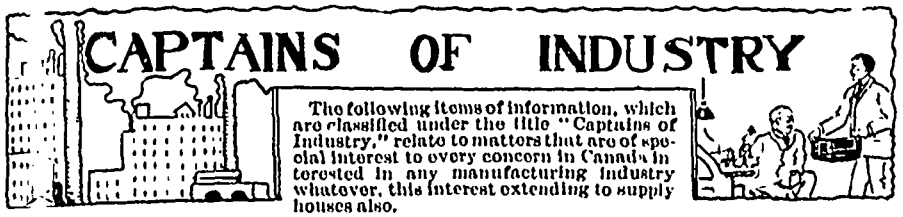
Near Beeville, Texas, asparagus is grown that nets producers $2,000 an acre. Of course, the producers, meaning the garden farmers, do not consume the asparagus, but sell it in the manufacturing towns and cities where there are thousands of consumers who are glad to get it and to pay at the rate of $2,000 per acre to the growers for it. If there was no manufacturing centres in the neighborhood the growers would have no market for their asparagus that now pays them $2,000 per acre.

The American customs authorities have promulgated 39 articles determining methods of searching the mails for dutiable articles. If the seventy millions suffer from foreign parcels it will not be through lack of vigilance.—The Globe.

The Globe is badly afflicted with nightmare rabies concerning the enforcement of the law—not Canadian law, but Yankee law against smuggling. There are many laws that the enforcement of which the Globe does not like. It frets and fumes at the dread of being detected when travelling abroad in violating the law against smuggling. It evidently desires occasionally to send a dutiable article through the mails to the United States hoping that its character will not be discovered, and kicks if any of the 39 articles catches on to the racket. It is not the correct thing to thus endeavor to defraud the customs, nor to endeavor to inveigle its correspondents, willingly or not, to do the same thing. The Globe should not do naughty things.

It is interesting to note that the United States, which has steadily reduced its importations of tin plate from *more than 1,000,000,000 pounds in the fiscal year 1891* to 127,000,000 in the calendar year 1906, has now become an exporter of that article, and that the exportations of tin plate of domestic manufacture were, in 1906, $1,001,688 in value, against $702,977 in 1905, $651,774 in 1904, $143,691 in 1902, $51,614 in 1901, and $31,082 in 1900. This exportation of $1,000,000 worth of tin plate of domestic production is exclusive of the foreign tin re-exported. Practically all of the tin plate now brought into the United States from abroad is re-exported, chiefly in the form of cans and boxes containing merchandise sent to foreign markets, its exporters receiving back under the title of "drawback" 99 per cent. of the sums paid as duty thereon. The total quantity of tin plate imported into the United States in the fiscal year 1906 was 120,819,732 pounds, and the exports of tin plate of foreign production in that same period were 120,491,271 pounds, all except 57,648 pounds being in manufactured articles.

An act has been passed by the British Parliament to secure reliable statistical returns of the country's industrial products, somewhat similar to the manner in which the United States has long pursued. The law is called the "Census of Production Act." Under its provisions a return must be made in 1908, and subsequently, at such intervals as may be determined by the board of trade, of the output, the number of days worked, the number of persons employed, the power used or generated, etc., in all trades where production is carried on, including business where work is given out to be executed elsewhere than on the premises of the person or firm making the return. The law applies to all factories and workshops, mines and quarries, buildings and alterations on buildings, all works of construction such as railroads, canals, tramroads, harbors, docks, sewers, roads, reservoirs, laying of water or gas pipes, telegraph and telephone lines, etc. It does not ask for a return of wages paid or of capital invested in the industries, but is restricted to production and employment. Municipalities are placed on the same footing as other employers.



The Implement & Monument Co., Shelburne, Ont., have been incorporated with a capital of $40,000, to manufacture goods, wares and merchandise. The provisional directors include F. H. Silk, G. Lee, E. C. Campbell, Shelburne, Ont.

The Bonanza Larder Lake Mining Co., Haileybury, Ont., have been incorporated with a capital of $1,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. E. Day, H. Jewell and E. V. O'Sullivan, Toronto.

The Deseronto Furniture Co., Deseronto, Ont., have been incorporated with a capital of $65,000, to manufacture lumber, timber, furniture, etc. The provisional directors include J. Dalton, Deseronto, Ont., W. S. Love, and I. F. Love, Napanee, Ont.

The Beaver Consolidated Mines, Toronto, have been incorporated with a capital of $1,500,000, to carry on a mining, milling and reduction business. The provisional directors include M. MacDonald, A. L. Bitzer and G. Grant, Toronto.

Cobalt Concentrators, Limited, Toronto, have been incorporated with a capital of $500,000, to carry on a mining, milling and reduction business. The provisional directors include G. R. Sproat, C. P. Charlebois, and J. T. White, Toronto.

Big 4 Larder Lake 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. E. Day, J. M. Ferguson and E. V. O'Sullivan, Toronto.

The Jessop Prospecting & 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 F. A. Lewis, E. Gillis, and D. A. Rose, Toronto.

Federal Mines, Limited, Toronto, have been incorporated with a capital of $6,000,000, to carry on a mining, milling and reduction business. The provisional directors include J B Holden, A. Mearns and F. L. Whately, Toronto.

The Petrolea Bridge Co., Petrolea, Ont., have been incorporated with a capital of $40,000, to manufacture structural steel, bridge working machinery, concrete, cement, etc. The provisional directors include J. Fraser, T. Johnstone and I. Greenizen, Petrolea, Ont.

The Hiawatha 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 J. Arkley, W. W. Boucher and D. H. McAllister, Ottawa.

The Holman Silver & Aluminum Works, Toronto have been incorporated with a capital of $40,000, to manufacture aluminum ware, silver ware, metals, etc. The provisional directors include H D McCormick, F A. Lewis and D. A. Rose, Toronto.

The Schultz Bros. Co, Brantford, Ont., have been incorporated with a capital of $400,000, to manufacture sashes, doors, blinds, boxes, lumber, timber, lath, shingles, brick, cement, etc. The provisional directors include G. C. Shultz, J. G. Allan and G. H. Tanton, Brantford, Ont.

Messrs. Norton Fisher & Co., Shelburne, Ont., have been incorporated with a capital of $40,000, to manufacture goods, wares, merchandise, etc. The provisional directors include N. Fisher, D. B. Lafranier and J. A. Mills, Shelburne, Ont.

Nash Thermostats, Limited, Toronto, have been incorporated with a capital of $120,000, to produce heat for public buildings, factories, etc. The provisional directors include A. Mills, W. E. Raney and C. M. Colquhoun, Toronto.

Cullen 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 A. A. Bond, J. Mitchell and F. J R. Skill, Toronto

The Jewellers' Journal Publishing Co, Hamilton, Ont., have been incorporated with a capital of $40,000, to carry on a printing, publishing and lithographing business. The provisional directors include M. J. O'Reilly, F. B. Edmunds and A. M. Herriman, Hamilton, Ont.

The Haileybury Silver Mining Co., Haileybury, Ont., have been incorporated with a capital of $50,000, to carry on a mining, milling and reduction business. The provisional directors include C. T. Young, T. H. Connor and G. T. Hamilton, Haileybury, Ont.

The Temple-Pattison Co., Toronto, have been incorporated with a capital of $200,000 to manufacture chemicals, dental and surgical instruments, etc. The provisional directors include H. P. R. Temple, J. W. Carrick and J. S. Denison, Toronto.

The Carnegie Library, municipal buildings and fire hall, Sault Ste. Marie, Ont., were destroyed by fire March 7. Loss about $36,000.

The two new departmental buildings to be erected in Ottawa will cost about $2,750,000. One building will have a floor area of about 300,000 square feet, and will cost, exclusive of the land, about $2,000,000. The building will be used for departments. The other building will have an area of about 100,000 square feet, and will cost about $750,000, exclusive of the cost of the land. The land for the site of the two buildings had been secured at a cost of about $500,000.

A large canning and preserving plant will be erected at Pelham, Ont., at a cost of about $12,000. The officers include:—G. Arnold, Ridgeville, Ont., president; A. Armbrust, Pelham, Ont., vice-president; and G. J. McCormick, Welland, Ont., secretary.

Woods Western Limited, Ottawa, have been incorporated with a capital of $500,000, to manufacture dry goods, contractors' and lumbermen's supplies, tents, tarpaulins, etc. The provisional directors include J. W. Woods, D. N. Finnie, Ottawa, and R. McLennan, Winnipeg, Man.

R. Irvine, Limited, Ottawa, have been incorporated with a capital of $20,000, to manufacture mineral and aerated waters, etc. The provisional directors include L. N. Bate, C. A. Parker and G. J. Bryson, Ottawa.

The Hazel Jule 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 W. H. Wilson, C. E. Evans, and H. L. Graham, Toronto.

The Cobalt Silver Stone Mining Co., Ottawa, have been incorporated with a capital of $500,000, to carry on a mining, milling and reduction business. The provisional directors include J. Morgan, A. E. Honeywell, and W. Charbonneau, Ottawa.

The York Masonic Hall Co., North Toronto, Ont., have been incorporated with a capital of $20,000, to erect a masonic hall, etc. The provisional directors include R. W. Hull, C. C. Norris, and G. McLeish, Toronto.

The Jumbo Cobalt Silver 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 G. G. Plaxton, J. E. Parsons and A. Lorsch, Toronto.

The Pure Milk Co., Hamilton, Ont., have been incorporated with a capital of $150,000, to carry on a general dairy and cold storage business. The provisional directors include J. Milne, W. Southam and W. H. Forster, Hamilton, Ont.

The American 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 C P. Gilchrist, W. Grief and G. B. Thomas, Cleveland, Ohio.

The North West Bay 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 S. Grimason, F. Turner and J. T. Rigg, Haileybury, Ont.

The Delora Mining & Reduction Co., Toronto, have been incorporated with a capital of $100,000, to carry on a mining, milling and reduction business. The provisional directors include G. G. Plaxton, J. E. Parsons, and M. M. Campbell, Toronto.

The Silver Bird Cobalt Mines, Toronto, have been incorporated with a capital of $1,500,000, to carry on a mining, milling and reduction business. The provisional directors include H. D. McCormick, J. F. Lennox, and E. Gillis, Toronto.

The Massive Corundum Co., of Ontario, Niagara Falls, Ont., have been incorporated with a capital of $2,000,000, to carry on a mining, milling and reduction business. The provisional directors include F. W. Griffiths, W. H. McGuire, and C. S. Peaslee, Niagara Falls, Ont.

Messrs. Kelly & Bros., Kenora, Ont., have been awarded the contract by the Canadian Pacific Railway Co. for the construction of a large engine house at a cost of about $100,000.

The Cobalt North Star Silver Mining Co., Bridgeburg, Ont., have been incorporated with a capital of $10,000, to carry on a mining, milling and reduction business. The provi-

sional directors include H. J. Hopkins, W. C. Paul and G. C. Pickhardt, Buffalo, N.Y.

Messrs. Newsome & Gilbert, Toronto, have been incorporated with a capital of $100,000, to manufacture stationery, etc. The provisional directors include A. T. Gilbert, W. H. Newsome and H. A. Munro, Toronto.

Messrs. McFarlane & Douglas, Ottawa, have been incorporated with a capital of $100,000, to manufacture fireproof windows, doors, shutters, sheet metal, etc. The provisional directors include T. D. McFarlane, J. R. Douglas and F. N. McFarlane, Ottawa.

The Zimmerman Mfg. Co., Hamilton, Ont., have been incorporated with a capital of $300,000, to manufacture hosiery, skirts, underwear, etc. The provisional directors include A. Zimmerman, A. F. Zimmerman and S. C. Newburn, Hamilton.

The Emerald Development Co., Sudbury, Ont., have been incorporated with a capital of $150,000, to carry on a mining, milling and reduction business. The provisional directors include F. H. Searle, W. A. Werrett, and L. E. Hambly, Toronto.

The Culver 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 A. Dods, G. Grant and M. F. Punnaville, Toronto.

Duftons', Limited, Stratford, Ont., have been incorporated with a capital of $100,000, to manufacture woolens, cottons, yarns, etc. The provisional directors include E T Dufton, A Tilley, Stratford, Ont., and J F Dufton, Mitchell, Ont.

The Cobden Copper Co. Sault Ste. Marie, Ont., have been incorporated with a capital of $500,000, to carry on a mining, milling and reduction business The provisional directors include C. B. Sexsmith, W. Hallam, and T. H. Baker, Toronto.

The Queen of Sheba Gold Mines, Sudbury, 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. R. Frankland, L. E. Hambly, and J. K. Leslie, Toronto.

The Pense Cobalt Mining Co., Toronto, have been incorporated with a capital of $1,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. Pearson, J. H. Denton and C. M. Taylor, Toronto.

The Toronto, Hamilton & Buffalo Railway Co. are negotiating for the building of a switch at London, Ont., one and a half miles long.

The ratepayers of St. Mary's Ont., will vote on a by-law, April 1, to loan $6,000 to Messrs. Weir & Weir, for the enlargement of their flax plant.

The ratepayers of Thessalon, Ont., will vote on a by-law, March 18, to grant a bonus of $10,500 to the Saginaw Lumber & Salt Co.

St Mary's Cathedral Hamilton, Ont., will be enlarged at a cost of about $12,000

Messrs. Krug Bros. & Co., furniture manufacturers, Chesley, Ont., will erect a new factory 300x100 feet

H. Wineberg, jeweler, Toronto, will erect a tenement house, 132x102 feet at a cost of about $100,000.

Messrs. Wm. Barber & Bros., Georgetown, Ont., have been incorporated with a capital of $100,000, to manufacture paper, pulp, etc The provisional directors include J. R. Barber, R. R. Barber, Georgetown, Ont., and C. H. Barber, Cornwall, Ont.

A new fire hall will be erected in London, Ont.

The Commercial Club, Hamilton, Ont., will erect a building at a cost of about $35,000.

The South Western Oil & Gas Lands, Petrolea, Ont., have been incorporated with a capital of $60,000, to manufacture oil, gas, petroleum, pipes, pumps, tanks, etc. The provisional directors include D. Urquhart, H. W. Page and B. W. Essery, Toronto.

The Canadian Fire Extinguisher Co., Toronto, have been incorporated with a capital of $40,000, to manufacture fire preventative appliances, electric light and gas fittings, machinery, motors, dynamos, switch boards, engines, pumps, brass, lead, valves, pipes, faucets, etc. The provisional directors include F. W. C. Dickson, J. Murphy and W. Lauder, Toronto.

A public library will be erected at Woodstock, Ont., at a cost of about $20,000.

A new Y.M.C.A. building will be erected in Toronto.

A site has been secured by the Y.M.C.A., Woodstock, Ont., and a new building will be erected at a cost of about $25,000.

The city hall, Peterborough, Ont., will undergo considerable alterations.

A new market hall building will be erected at Peterborough, Ont.

The Grand Trunk Railway Co. will erect a new station at Clinton, Ont.

A cold storage building may be erected at Ingersoll, Ont.

The North Ward School, Peterborough, Ont., will be remodelled at a cost of about $25,000.

The congregation of Trinity Church, Watford, Ont., will erect a new church at a cost of about $7,000.

The congregation of Charlotte Street Methodist church, Peterborough, Ont., will erect a new church building.

The citizens, Clinton, Ont., are advocating a waterworks and sewerage system.

A new fire station will be erected in the east ward, Brantford, Ont.

The waterworks system, Galt, Ont., will be extended at a cost of about $5,000.

C. Foster, of the Foster Mining Co., Cobalt, Ont., is erecting a saw mill having a capacity of 50,000 feet.

A flour mill will be established at Wallaceburg, Ont., with a capital of $40,000. A new plant will be erected having a capacity of 100 barrels per day, with elevator capacity of 10,000 bushels. A. E. Hawkins, Sarnia, Ont., and W. S. Somers, Wallaceburg, Ont., are interested.

The county of Metcalfe, Ont., will build a new steel and concrete bridge over the Sydenham River, two and a half miles west of Strathroy, Ont.

The ratepayers of Amherstburg, Ont., voted favorably on a by-law to grant the Canadian Canners, Limited, free water and exemption from taxes for ten years.

The ratepayers of Stratford, Ont., will vote on a by-law March 27, to exempt [illegible] & McLean, manufacturers of acetylene [illegible] plants, automobiles vans, etc., from taxation for ten years

Gorman, Eckert & Co., London, Ont. will expend $10,000 in altering the building they have just purchased.

The Cobalt Crystal Silver Mines, Toronto, have been incorporated with a capital of $50,000, to carry on a mining, milling and reduction business. The provisional directors include S. Johnston, A. J. Thomson and R. H. Parmenter, Toronto.

The North Bay Cobalt Silver Mining Co., North Bay, Ont., have been incorporated with a capital of $300,000, to carry on a mining milling and reduction business. The provisional directors include P. J. Finlan, Cobalt, Ont., J. Bourke, and A. G. Browning, North Bay, Ont.

The Prepayment Electric Meter Co. [illegible] borough, Ont., will erect a large factory

The Knickerbocker Cobalt Mines, Toronto, have been incorporated with a capital of $550,000, to carry on a milling, mining and reduction business. The provisional directors include S. Johnston, A. J. Thomson and R. H. Parmenter, Toronto.

The Toronto Automobile Co., Toronto, have been incorporated with a capital of $[illegible] to manufacture automobiles, motor cars, bicyles, cycles, etc. The provisional directors include J. S. Tomenson, C. H. M[illegible] and B. Browne, Toronto.

The Alpha Chemical Co., Berlin, Ont., are replacing their old elevator with a new one and fitting up their top flat for storage and manufacturing purposes. The improvements under way will cost about $1,500.

Werlick Bros., manufacturers of piano players, Preston, Ont., will build a factory this summer.

The Canadian Boomer & Boschert Press Co., Limited, Montreal, are furnishing a large hydraulic press to the Peterboro works of the Canadian General Electric Co., for use in the manufacture of transformers.

Silliker & Co., Limited, Amherst, N. S., are considering the removal of their woolen [illegible] plant to Halifax, where they have [illegible] arrangements for erecting new [illegible] The construction of the new plant will involve the expenditure of a large amount [illegible] for mechanical equipment, as the [illegible] be modern in every respect and will cover three acres of ground, costing about $[illegible] Engineers are now surveying the site for the plant and plans for the building

The Ontario Power Co. is planning to enlarge the capacity of its power house on the Canadian side of the river at Niagara Falls by extending it 160 feet in length to provide space for two additional generators of 12,500 h.p. each. The extension will be of [illegible] concrete, conforming to style of present building, and will make the total length of the power house 480 feet. The present conduit from the company's intake is of sufficient capacity to supply the additional generators.

The Guelph Carpet Mills, Guelph, are building a new weave shed, [illegible] 175x125 feet. It is expected that the building will be completed and machinery installed in April

The Canada Shoe Co., Limited, Brampton, Ont., a part of whose plant was destroyed by fire on January 24 last, are tearing down the ruins preparatory to rebuilding on a large scale as soon as the weather opens up. The contract for a two story brick building has been let to H. Hill, of Brampton.

Moffatt Bros., furniture manufacturers, Guelph, Ont., will double the capacity of their factory this year. One new four story building, 100x65 feet will be erected and two stories 100x45 feet will be added to another. The total cost of the buildings will be about $18,000.

The Canada Mfg. Co. are spending between $7,000 and $8,000 on enlargements to their factory at Berlin, Ont. An old unused wing of the present factory is being reconstructed and enlarged, and will be equipped for the manufacture of high class mahogany furniture. A new dry kiln, tin covered, on concrete foundation, with a capacity of about 20,000 feet will be added this spring.

H. Krug & Co. are building a large addition to their chair factory in Berlin, Ont. When completed the new building will be 150x85 feet, four stories of brick mill construction. About 100 feet of the addition is now built, the other 50 feet will require the tearing down of a part of the old factory.

The Berlin Felt Boot Co., Berlin, Ont., are equipping their factory No. 3 with electric motors to use municipal power.

L. McBrine & Co., manufacturers of trunks and valises, Berlin, Ont., are erecting a three-story brick warehouse, 128x96 feet, next to their factory. Hot air heating will be used, the heating system of the old building being sufficient for both buildings.

The Galt Malleable Iron Works, Galt, Ont., are building a 150x150 feet addition to their moulding shop, and expect to have it completed by April 1. A one story addition, 90x30 feet, to the shipping room will also be undertaken right away.

The Galt Robe Co., Galt, Ont., have moved into their new three story 60x50 feet brick addition.

Eagle & Groh, Preston, Ont., will erect a two story addition to their planing mill this spring.

The Berlin Glue Co., Berlin, Ont., will erect a concrete building, 96x48 feet, two stories and basement, for storing raw material.

The new factory of the Toronto-Waterloo Office Furniture Co., at Waterloo, Ont., is expected to be in operation before the end of March. The main building is 125x80 feet, four stories, solid brick, on concrete foundation. The engine and boiler room wing is 50x36 feet, three stories. The building is thoroughly modern in every respect, and equipped for the manufacture of all kinds of interior hardwood finish, office, store, and bar fixtures, etc.

The Western Shoe Co., Limited, have completed a building on Water Street, Berlin, Ont. The factory is being equipped with Canadian machinery by the United Shoe Machinery Co., of Montreal.

The Dominion Bridge Co., Montreal, have secured a site on Sorauren Avenue, Toronto, and will erect a 400x70 feet bridge shop, the present premises having proved too small for their needs. Work will be commenced as soon as possible in the spring. The new building will cost about $30,000.

The Anthes Furniture Co., Berlin, Ont., have completed the construction of their factory at Berlin, Ont., and machinery is now being installed. The building is of pressed brick, mill construction, three stories. The dry kiln is entirely separate, and has a capacity of about 60,000 feet. The most up-to-date systems of fire protection have been installed throughout. The factory will be devoted to the manufacture of fine mahogany furniture.

Messrs. Chas. Rogers & Sons, Toronto, will erect a three story factory adjacent to their premises on Defoe and Tecumseh Streets.

Messrs. Nerlich & Co., Toronto, will erect a two-story addition to their warehouse on Front Street at a cost of about $35,000.

The General Brass Works, Toronto, will erect a new factory and foundry 170x64 feet on Stirling Road, Toronto.

Mendal Granatstein, Toronto, will erect a warehouse at 94 Wellington Place, at a cost of about $14,000.

It is stated that the United States Steel Corporation have let a portion of the contracts for their new plant at Sandwich. Work on the new city and on the plant will begin immediately.

The Canadian Northern Railway Co. are having plans prepared for the erection of a freight shed on the waterfront, Port Arthur, Ont.

Mackenzie & Mann are considering the erection of an hotel at Port Arthur, Ont., at a cost of about $250,000.

It is stated that the Great Lake Engineering Works, Detroit, Mich., and the Toledo Shipbuilding Co., Toledo, Ohio, will consolidate and that they will erect a large shipyard plant in Canada at some point opposite Detroit.

At a meeting of the town council, Parry Sound, Ont., a few days ago, an agreement was ratified with the Dominion smelters for the erection of a custom smelter there. The plant is to cost $1,500,000 with a capacity of a thousand tons a day. The promoters of this company are connected with a large independent smelter concern in the United States. The town grants aid to the extent of $10,000, and a by-law to raise this sum will be submitted forthwith.

The blast furnace plant of the Atikokan Iron Co., Port Arthur, Ont., will be put in operation shortly. The structural work which has been going on for the past two years has been completed, and the furnace is now ready to erect. The plant will turn out about 150 tons of pig iron in 24 hours.

Up to date the capital of the mines incorporated in Cobalt, Ont., is $340,090,000.

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

The premises of the Toronto Plate Glass Importing Co., 135 Victoria Street, Toronto, were destroyed by fire March 9. Loss about $175,000.

The waterworks system, Port Arthur, Ont., will be improved at a cost of about $200,000.

J. Thompson and P. Smith, Hamilton, Ont., will erect a factory for the manufacture of underwear at a cost of about $50,000.

The Department of Marine & Fisheries, Ottawa, have awarded a contract to the Polson Iron Works, Toronto, for two steel tugs 80 feet long, one for use on the Rideau River, and the other for the Trent Valley Canal, Peterborough, Ont.

The municipal waterworks system, Fort William, Ont., will be improved at a cost of about $32,000. Supplies required include a quantity of 4, 6 and 8 inch pipe.

The Canadian Pacific Railway Co. are erecting an hotel at James Bay, Ont.

At the annual meeting of the Hamilton, Grimsby & Beamsville Railway Co., Hamilton, Ont., held recently, a resolution was passed authorizing the extension of the road to St. Catharines, Ont.

The Grand Trunk Railway Co. will erect a new depot at Brockville, Ont.

The congregation of the Baptist church, Auburn, Ont., are considering the erection of a new church.

An addition will be erected to the public school, Harriston, Ont.

J. Douglas, Strathnairn, Ont., invites tenders up to March 20 for the erection of a new school building.

The Canadian Pacific Railway Co. will erect a large addition to their terminals at Fort William, Ont.

The council, Goderich, Ont., have decided to lay three miles of cement walks and two miles of sewer.

The Canada Foundry Co., Toronto, have since January 1, delivered two ten wheel locomotives and one switching locomotive to the Canadian Northern Railway Co.

R. Bigley, stone and furnace manufacturer, Toronto, and agent for the Buck Stove Co., Brantford, Ont., has purchased a site near Toronto Junction, Ont., and will erect a factory at a cost of about $7,000.

F. Oliver, manager of the Perrin Plow Co., B. Knapp, Morrisburg, Ont., and R. S. Harder, Aurora, Ont., have purchased the plant of the Rideau Electric Co., Smith's Falls, Ont. The new company will commence at once the manufacture of stoves.

London Bros., Leamington, Ont., are erecting a new warehouse.

The Washburn Crosby Co., Minneapolis, Minn., are considering the erection of an 8,000 barrel flour mill at Keewatin, Ont.

The town council, Oshawa, Ont., have granted a 20 year franchise to W. C. Noxon, of Ingersoll, Ont., to operate electric light and gas plants there.

The Owen Sound Portland Cement Co., Owen Sound, Ont., have been awarded the contract for the supply of 20,000 barrels of cement for the city of Hamilton, Ont.

The Ottawa Car Co., Ottawa, are looking for a suitable site at Hintonburg, Ont., for the location of a new factory.

The National Spring & Wire Co., Michigan, have secured the right to do business in Ontario. A. W. Marquis, St. Catharines, Ont., has been appointed their attorney.

The International Veneer & Lumber Co., Philadelphia, Pa., will establish a factory at Arnprior, Ont., if given by the town a free site of two acres, a subvention of $2,000, exemption from taxation for ten years, free water for a 250 h.p. boiler during a period of

ten years, and assistance from the council in placing $8,000 stock.

The Muirhead Milling Co., Fort William, Ont., will erect a 200 barrel flour mill at Port Arthur, Ont., at a cost of about $100,000.

J. H. Ackert, Holyrood, Ont., has purchased a site in Lucknow, Ont., and will erect a lumber, lath and shingle mill.

The Ottawa Vine Vault Co., Ottawa, will erect a new building at a cost of about $28,000.

The Canadian Northern Railway Co. are looking for a site for their car works at Hamilton, Ont.

The Wolverine Brass Works, Grand Rapids, Mich., are considering establishing a branch in Toronto.

The Alvinston Power Co., Alvinston, Ont., will extend their plant.

At the annual meeting of the Electrical Construction Co., London, Ont., the following officers were elected:—President, Dr. J. B. Campbell; vice-president, W. Hearman; secretary, A. Gorman; directors, W. H. Wortman and J. A. Thomas. J. T. Cahill, who has been acting as manager, was permanently appointed to that position.

The Silver Belt Electric Railway Co. have been organized to construct an electric line from Latchford to Cobalt, Haileybury and New Liskeard, Ont. Branches will also be built to the various mining camps.

Bernard Cairns, Toronto, is moving from 23 Adelaide West to 77 Queen East. The new factory, a three story brick building, recently purchased for the purpose, is being equipped for the manufacture of rubber and metal stamps, office stamps, indelible ink, brass checks, brass signs, etc. It will be occupied about April 1.

The Fort William, Ont., council have agreed to guarantee the principal and interest on $100,000 and grant a site of ten acres of land with a river frontage of 150 feet to the Imperial Steel & Wire Co., who are to build a wire drawing mill with a capacity of 100 tons of wire daily, at an approximate cost of at least $200,000, which will give employment for 200 men daily throughout the year.

The mayor of Fort William, Ont., has submitted to the council of that city a proposition from Canadian capitalists who propose to spend $1,000,000 in the construction of plant, buildings, etc., for a shipbuilding plant and to employ at least 350 hands for two years and 500 hands thereafter. They ask a two per cent. guarantee on a bond issue of a million dollars, half the cost of a site and tax exemption for ten years. They agree to erect plant at once if the town passes the necessary by-laws.

Simcoe, Ont., has passed a by-law to instal a complete system of waterworks at a cost of about $70,000.

Hespeler, Ont., has carried a by-law to loan $15,000 to the Hespeler Hoisting Machinery Co., who will build a plant for the manufacture of elevators of all kinds.

The tender of a syndicate represented by Charles Millar, 55 Yonge Street, Toronto, for the lease of the North Temiskaming pulp limit has been accepted by the Ontario Government. Only poplar and jack pine above 8 inches are to be cut. At least $75,000 must be spent in each of the first two years and $100,000 in the third year in the erection of a pulp mill or a pulp and paper mill.

The Galt Brass Mfg. Co., Galt, Ont., are in the market for machinery and equipment for their new brass goods factory.

The Canadian Government will erect a sampling plant at Cobalt, Ont., at a cost of about $25,000.

H. Moggly, Rapid City, S.D., is considering the establishment of a $1,000,000 smelting plant in Canada, to deal with cobalt and nickel ores. Parry Sound, Ont., seems to be the most favored site at present as the Grand Trunk and Canadian Northern Railways now have entry.

Fort William, Ont., has been incorporated as a city.

Dr. D. McEachran, Montreal, will erect a six story apartment building on University Street, Montreal.

Several buildings, including the saw mill of J. Roux, Ste. Therese, Que., were destroyed by fire March 1. The estimated loss of the plant of J. Roux is about $25,000.

The Temiskaming & Northern Railway Commission, have awarded the contract to the Montreal Locomotive Works, Montreal, for six new locomotives, the aggregate cost to be about $125,000.

The various athletic associations of Longueuil, Que., will erect a club house.

The Canada Cabinet Co., Montreal, have been incorporated with a capital of $100,000, to manufacture office furniture, etc. The charter members include H. Miles, H. Upton and C. S. Underhill, Montreal.

The King Electrical Works, Montreal, have been incorporated with a capital of $30,000, to manufacture brass, copper, electrical machinery, dynamos, switch board, grilles, door plates, gas fixtures. The charter members include E. F. Surveyer, A. C. Casgrain and J. W. Weldon, Montreal.

The Smart Bag Co., Montreal, have been incorporated with a capital of $2,500,000, to manufacture jute, cotton, hemp, flax, wool, paper, burlap, linen, duck, twine, etc. The charter members include C. A. Smart, C. E. Archibald and F. H. Wilson, Montreal.

National Clothing Mfg. Co., Montreal, have been incorporated with a capital of $20,000, to manufacture clothing, goods, wares, merchandise, etc. The charter members include G. J. Jarjour, A. G. Coudsi and A. Rivet, Montreal.

Messrs. T. Pringle & Son, Montreal, have been incorporated with a capital of $250,000, to carry on the business of hydraulic, civil, and electric engineers, etc. The charter members include W. J. Henderson, A. C. Calder and J. Jenkins, Montreal.

Messrs. James Coristine & Co., Montreal, will erect a new office building, 78x60 feet.

The premises of the Swan Photograph Co., Montreal, was partially destroyed by fire recently. Loss about $6,000.

The Dominion Quarry Co., Montreal, have been incorporated with a capital of $20,000, to manufacture stone, limestone, etc., and to construct factories, stone-crushers, engine houses, etc. The charter members include L. C. Rivard, J. G. Avard, and A. B. Dufresne, Montreal, Que.

The Colonial Engineering Co., Montreal, have been incorporated with a capital of $125,000, to carry on the business of electrical, mechanical, and civil engineers. The charter members include V. E. Mitchell, E. L. Surveyor, and S. J. LeHuray, Montreal.

La Compagnie Marchand Freres, Montreal, have been incorporated with a capital of $20,000, to carry on a printing, publishing and lithographing business and to manufacture envelopes, boxes, paper bags, leather, etc. The charter members include O. Marchand, W. Marchand and O. Lapierre, Montreal.

The Bayless Paper & Pulp Co., Aust[in], Pa., will erect a new saw mill at Beaupr[é], Que., shortly.

Messrs. Collins & Kennedy, Ottawa, have been awarded the contract for the construction of the new post office at St. John's, Que.

The Shawinigan Falls Terminal Railway Co., Shawinigan Falls, Que., have placed an order for a 600 h.p. electric locomotive with the Canadian General Electric Co.

The Temiskaming & Northern Ontario Railway Commission have ordered 100 steel underframe flat cars, 36 feet, 10 inches over buffers, and 100,000 pounds capacity, from the Dominion Car & Foundry Co., Montreal. An order has also been placed for 100 wooden flat cars, 36 feet 9¾ inches over end sills, and 60,000 pounds capacity, for April and May delivery.

C. M. Hays has gone to England, where he will consult with the directors of the Grand Trunk Railway Co., regarding the new station at Montreal, and the raising of the tracks in that city.

The Canadian Northern Railway Co. are taking over the Quebec & Lake St. John Railway.

It is stated that the Sebasticook & Moosehead Railway Co. of Maine, will extend their line to the Canadian Pacific, Wiscasset, and Quebec Railways.

The Transcontinental Railway Commission are endeavoring to secure a connection with the Canadian Pacific Railway track at Bic in order to haul steel material necessary for the superstructural work of the new Quebec bridge, so as to enable the Phoenix Bridge Co. to complete their contract by the month of December, 1908.

The rotary and shingle mills of the Fraser Lumber Co., New Mills, N.B., were destroyed by fire recently. Loss about $7,000.

A waterworks system will be installed at Grand Falls, N.B., at a cost of about $20[0].

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

An electric tramway may be laid between Halifax and Bedford, N.S.

A new school will be erected at Moncton, N.B., at a cost of about $40,000.

The Atlantic, Quebec and Western Railway Co., who have built twenty-two miles of railway from New Carlisle, N. to Port Daniel, are applying for legislation to enable them to issue bonds to the extent of $5[0],000,000 to complete the line to Cape Rosier and either to buy out the Atlantic & Lake Superior Railway running from Metapedia to New Carlisle, or to build a line of railway from these points to connect their [line].

Tenders are invited up to March 30 for the construction of an Oddfellows' Hall and Music Hall at Lunenburg, N.

St. Stephens Presbyterian church, Amherst, N.S., will be enlarged.

The Dominion Coal Co., Sydney, N.S., will shortly begin the erection of new buildings.

It is stated a steel ship building industry will be established at Hantsport, N.S. John Churchill, Hantsport, is interested.

The Robb Engineering Works, Amherst, N.S., have placed an order for a duplex boiler feed pump, with the Smart-Turner Machine Co., Limited, Hamilton, Ont.

Messrs. Rhodes, Curry & Co., Amherst, N.S., will erect a large addition to their car works planing mill in the spring.

T. W. Kneeland, Malone, N.Y., representing the Gaspereaux Power Co., is erecting a power house at White Rock Mills near Port Williams, N.S.

The Rolling Mills Co., Sydney, N.S., will erect a large plant.

Seventeen milling firms in Manitoba and Saskatchewan have merged under the name of the Canadian Consolidated Flour Mills Co. with a capital of $2,000,000. They have a combined output of 3,000 barrels per day and an elevator capacity of 1,500,000 bushels.

The Northern Electric & Mfg. Co., Montreal, are establishing a branch in Winnipeg, Man.

Public Works Department, Ottawa, are preparing plans for a new examining warehouse to cost about $150,000.

Canada West Manufacturers, Limited, Winnipeg, Man., have been incorporated with a capital of $50,000, to manufacture machinery, engines, implements, vehicles, etc. The provisional directors include G. Bingham, J. A. Cowan, and W. J. Cummings, Winnipeg, Man.

The Manitoba Glass Mfg. Co., Beausejour, Man., have been incorporated with a capital of $200,000, to manufacture glass, brick, etc. The provisional directors include J. Keilbach, G. Bohn and J. Wenowski, Beausejour, Man.

The Carter-Hall-Aldinger Co., Winnipeg, Man., have been incorporated with a capital of $50,000, to manufacture machinery, tools contractors and builders' supplies, etc. The provisional directors incude W. H. Carter,, P. C. Locke, Winnipeg, Man., and A. H. Aldinger, Chicago, Ill.

Bithulithic & Contracting, Limited, Winnipeg, Man., have been incorporated with a capital of $150,000, to manufacture iron, timber, stone, clay, cement, lime, asphalt, etc. The provisional directors include W.M. Marshall, V. B. Loudon and H. A. Robson, Winnipeg, Man.

Amalgamated Press of Canada, Winnipeg, Man., have been incorporated with a capital of $50,000 to carry on a printing, and publishing business. The provisional directors include J. MacLean, D. R. Dingwall, Winnipeg, Man., and T. Robertson, Toronto.

The Paper Manufacturing Co., Wisconsin, are considering the establishment of a plant at West St. Mark, Man., for the manufacture of gasoline launches, etc.

Messrs. Donovan & Garvin, Winnipeg, Man., have purchased the Co-operative Block, and will erect two additional stories.

The Department of Public Works, Ottawa, will shortly ask for tenders for a new postal station in Winnipeg, Man. The building will be 85x71 feet and will cost about $100,000.

Two additional stories will erected to the warehouse of Messrs. Stobart, Sons & Co., Winnipeg, Man., at a cost of about $25,000.

J. A. Gorby, Dauphin, Man., invites tenders up to March 30 for the construction of two 60 foot span steel bridges on piles, with steel joists, and one wooden 60 foot span Howe truss bridge.

An overhead bridge will be erected at Winnipeg, Man., at a cost of about $170,000, The entire length of the bridge will be 2,175 feet. The C.P.R. will be bridged by spans of 212, 109 and 258 feet respectively, and the girders on either side run 103, 109 and 129 feet. The floor elevation is 62 feet, roadway of the bridge is 24 feet wide and a clear height of 26 feet while the footways are drawn to a width of 6 feet.

St. Boniface, Man., invites tenders up to March 22 for the supply of 5,000 barrels of Portland cement.

The congregation of St. Giles Presbyterian church, Winnipeg, Man., will erect a new edifice.

The ratepayers of Wetaskiwin, Alta., voted favorably on the following by-laws: (1) To provide for the raising of the sum of $140,000 for the construction of a municipal system of waterworks and sewers. (2) For the raising of the sum of $30,000 for improving and extending the municipal electric light and power plant. (3) For $2,500 for buying a hospital site, and $10,000 for the erection of a hospital.

The congregation of St. Andrew's church, Indian Head, Sask., will erect a new edifice at a cost of about $21,000.

A post office will be erected in Edmonton, Alta., at a cost of about $250,000.

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

Tenders are invited up to March 19 for the construction of a fire hall at Regina, Sask.

The Medicine Hat Woolen Mills Co., soon to be known as the Lethbridge Woolen Mills Co., Lethbridge, Alta., have just contracted for their first supply of wool. The McCrady Hide & Wool Co., Calgary, Alta., will furnish 80,000 pounds and A. Carruthers, of Edmonton, 20,000 pounds.

A town hall may be erected at Carlyle, Sask., at a cost of about $15,000.

A new land titles building will be erected at Regina, Sask., at a cost of about $100,000.

A Roman Catholic school will be erected at Humboldt, Sask.

The North-Western Iron Works have been awarded the contract for the construction of the steel tanks for the soap factory to be erected by Messrs. J. M. Young & Thomas, Regina, Sask.

D. Whitney, Lethbridge, Alta., will erect a large business block at a cost of about $15,000.

The Northwest Electric Co., of Calgary and Edmonton, Alta., are opening a branch at Medicine Hat, Alta.

The electric lighting system, Indian Head, Sask., will be improved at a cost of about $25,000.

W. E. Bonner, Winnipeg, Man., will erect an hotel at Strathcona, Alta., at a cost of about $15,000.

The Lethbridge Brick & Terra Cotta Co., Lethbridge, Alta., will extend their plant at a cost of about $15,000. This will bring their capacity up to 40,000 brick per day.

Davis Acetylene Co., Toronto, have opened a branch in Regina, Sask.

Septic tanks are to be installed in the town of Strathcona, Alta.

A double track bridge will be built across the Elbow River, Calgary, Alta.

J. R. Stirrat and LeRoy M. Bachus, Seattle, Wash., are considering the erection of a large pulp mill on the west coast of Vancouver Island.

T. F. Williamson, Seattle, Wash., has been awarded the contract to log 400,000,000 feet of timber for the Weverhauser Co., on Vancouver Island. At a rate of 25,000,000 feet a year, the contract will spread over a period of sixteen years. The logs are to be put in the water at Union and towed from there to Chemainus, B.C. Mr. Williamson will build a logging railroad to get the logs to the water and at Union he will erect a wharf office building, store, cook house, etc.

The Saskatchewan Loan & Investment Co. have been organized in Moose Jaw, Sask., with a capital of $1,100,000.

Messrs. McCosh & Pringle, Lashburn, Sask., are erecting a large warehouse.

Messrs. Snyder & Armstrong, Lashburn, Sask., are erecting a warehouse at the rear of their premises.

The Imperial Elevator Co., Frobisher, Sask., are building a large warehouse east of their elevator.

The Saskatchewan Distributing Co., Halbrite, Sask., are erecting a large building to be used as a machinery warehouse,

The Macleod Building Material Co., Macleod, Alta., will establish a plant for the manufacture of concrete building material.

The Alberta Pacific Elevator Co., Calgary, Alta., will erect an elevator at Bawlf, Alta.

R. E. Sherlock, Lethbridge, Alta., will erect a three story brick block at a cost of about $40,000.

It is stated that the Reeves Engine Co. will erect large warehouses in Regina, Sask., and make that point their headquarters.

A large wholesale hardware company will be established at Regina, Sask., with a capital of $250,000. J. W. Smith, Regina, is interested.

The Pacific Whaling Co., who are operating a whaling station at Sechelt, B.C., are considering the erection of a large barrel factory at Nanaimo, B.C., where they will only manufacture barrels for their own stations.

Among the purchasers of Smart-Turner duplex pumps during the last few days have been the P. Burns Co., Calgary; the Port Credit Brick Co., Port Credit, Ont.; the Ontario Government; the Miramichi Machine & Foundry Co., Chatham, N.B.; the Doty Engine Works, Godench, Ont.; Kalbfleish Bros., Stratford, Ont.; the Canada Tin Plate & Sheet Steel Co., Morrisburg, Ont., and the Huntsville Lake of Bays & Lake Simcoe Navigation Co., Huntsville, Ont.

Galbraith & Airths, successors to Rhodes

& Galbraith, Chatsworth, Ont., expect to cut this year between 7,000,000 and 8,000,000 feet of lumber. They are installing a new boiler supplied by the Goldie & McCulloch Co., Galt, Ont.

D. Gavin, Vancouver, B.C., will erect a new warehouse at a cost of about $16,000.

The Schaake Machine Works, New Westminster, B.C., are erecting new works, which will be operated by electric power.

The Electric Turpentine Co., Vancouver, B.C., are erecting a two-cord continuous operating plant to work out certain mechanical economies, the intention being to construct at least a 50-cord plant within the ensuing year. As they will treat timber that has no value as merchantable lumber, it will be a benefit to the province at large.

Messrs. Robt. Hamilton & Co., Vancouver, B.C., have ordered two hand power travelling cranes from the Smart-Turner Machine Co., Limited, Hamilton, Ont.

The Grand Trunk Pacific Co. are erecting an hotel at Prince Rupert, B.C.

Messrs. A. Huggett & Co., Victoria, B.C., will erect a three-story building 80x25 feet.

The council, Victoria, B.C., will shortly call for tenders for a centrifugal pump to be installed at Elk lake. The pump is expected to cost about $3,000.

Messrs. Cavanagh & Holden, Vancouver, B.C., will erect a new building at a cost of about $25,000.

A new school will be erected in Nelson, B.C., at a cost of about $60,000.

A Normal school may be erected in Victoria, B.C.

Andrew Carnegie has given $50,000 towards the building of McGill University to be erected in Victoria, B.C.

A new Methodist school will be erected at Carbonear, Nfld.

The congregation of the Catholic church, North River, Nfld., are making preparations to erect a new edifice.

PERSONALS.

Mr. Herbert Bourne, of the Bourne-Fuller Co., of Cleveland, Ohio, accompanies the Cleveland Chamber of Commerce on its trip to Mexico. The party proposes to spend about two weeks on its tour, has its own private car, and will visit the principal cities along the way.

Mr. E. M. Moore has been appointed managing secretary-treasurer of the Ontario Lime Association, Toronto, succeeding Mr. Thos. Christie, who died February 14.

Mr. W. L. Lefavor, of Springfield, Mass., is at the Imperial Hotel, Galt, Ont., in the interests of parties applying for incorporation for the purpose of carrying on a brass foundry business in that place.

MASSEY-HARRIS ENLARGING.

The Massey-Harris Co. contemplate making extensive additions to their local plant this spring that will mean an outlay of at least $25,000. At the south end of the present foundry building the company will add an 100 more feet of a brick structure. This will mean the moving of the railway switches so as to give them the necessary room.

They will also construct a new blacksmith shop which will be built of steel and will be 15 feet wider than the present one. This will be constructed right where the present one now stands.

"Will you start right away?" was asked.

"Yes, we intend to start right early in the spring so as to have everything completed by the fall," said the superintendent. "We may have to put in 100 h.p. more, but this has not been finally settled."

The plans for the above extensions are under construction now and the work will be hustled through.—Brantford Courier.

FINANCIAL.

A branch of the Bank of Commerce has been opened at Kamsack, Sask.

J. S. Ross, of the Union Bank, has gone to the coast to open branches at Vancouver and Prince Rupert, B.C.

The Eastern Townships Bank have opened agencies at Philipsburg and St. Armaud, Que.

The Sterling Bank of Canada will open a branch in the Standard Life Bldg., Montreal.

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

A branch of the Bank of Toronto has been opened at St. Lambert, Que.

The Royal Bank of Canada have opened a branch at Port Essington, B.C.

The Bank of Nova Scotia will make extensive changes to their building in Amherst, N.S.

The Royal Bank of Canada will erect a new building in Montreal.

The Sterling Bank of Canada have opened a branch at Verner, B.C.

MINERAL OUTPUT OF ONTARIO.

According to the report prepared by the officials of the Department of Mines the mineral products of Ontario for the year 1906 represented a total value of $22,221,808, as compared with $17,854,296 in 1905. This is estimated on the value of the minerals in the form in which they leave Canada. The net value of the metallic output was $13,179,162 and of the non-metallic $9,042,646. The most noticeable gains during the year in the metallic group are those of silver, which was $2,170,212; nickel, $481,485; copper, $309,555; pig iron, $644,720. In the non-metallic the excess of values produced in 1906 over 1905 were: Portland cement, $595,563, and natural gas, $216,970. The output of crude petroleum was worth $136,999 less than in 1905. The output of the mines at Cobalt for the year was: Silver, 5,357,830 ounces, worth $3,543,089; cobalt, 312 tons, worth $30,819; nickel, 156 tons, and arsenic, $1,558. Until the close of 1906 the Cobalt camp has produced 8,016,061 ounces of silver, valued at $5,015,479; 446 tons of cobalt, 245 tons of nickel, and 1,919 tons of arsenic. For the three last named constituents mine-owners receive little or no return, but they are estimated to be worth $150,779, $13,467, and $3,596, respectively.

Following is the table of metallic products. Its gross value is $13,422,928, from which $243,766, the value of 101,569 tons of Ontario iron smelted into pig iron, is subtracted, making the net value $13,179,162.

Gold, ounces	3,519	$59,274
Silver, ounces	5,357,830	3,543,089
Cobalt, tons	312	30,819
Nickel, tons	10,932	3,836,419
Copper, tons	5,940	998,545
Lead	....	93,500
Iron ore, tons	128,099	301,692
Pig iron, tons	275,558	1,551,267
Zinc ore, tons	400	6,000

The output of the non-metallic group was

Arsenic, tons	1,298	
Brick, common, No.	300,000,000	$ 157,000
Tile, drain, No.	17,700,000	252,500
Brick, pressed, No.	39,860,000	337,725
Brick, paving, No.	3,000,000	45,000
Building and crushed stone	....	660,000
Calcium carbide, tons.	2,626	162,789
Cement, Portland, bbls	1,598,815	2,381,034
Cement, natural rock, bbls	8,453	6,000
Corundum, tons	2,914	262,445
Feldspar, tons	20,373	43,849
Graphite, tons	1,772	15,000
Gypsum, tons	3,265	6,665
Iron pyrites, tons	11,095	40,958
Lime, bush	2,885,000	496,785
Mica, tons	355	69,041
Natural gas	.....	533,446
Peat fuel, tons	300	900
Petroleum, Imperial gallons	19,928,322	761,536
Pottery	.....	65,000
Quartz, tons	3,856	3,856
Salt, tons	50,414	367,733
Sewer pipe	.....	365,000
Sodalite, cubic feet	200	6,000
Talc, tons	1,235	3,000

THE TROUT LAKE SMELTER.

A despatch from North Bay, Ont. says that the new smelter of the Montreal Reduction & Smelting Co., of Canada, Limited, now in course of erection at Trout Lake, Ont., will be capable of treating ores in twelve different processes so as to be able to treat all the known precious metals that have any commerical value. A building of 43,000 feet of floor space, with 950,000 feet of lumber in it has been constructed—removed over 15,000 square yards of cement work, built a dust chamber 500 feet long by 5½ inches by 7 inches in the clear, set a battery of boilers of 600 h.p. capacity, two 800 h.p. each Cross compound engines, with a 500 h.p. heater and condenser, all ready for operation; and, there are on the way over 1,000,000 pounds of machinery, some from England, Germany, France and from United States. The company have now installed upwards of 350,000 pounds of machinery that was made by Canadian manufacturers, and the management say they will be ready for active operations about May 1 next. The smelter will have a capacity af 3,000 tons per day.

THE SOUTHERN CALIFORNIA NEW TRAIN.—BEST ROUTE.

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

Plan to Provide a Supply of Skilled Workmen.

A CANADIAN IDEA THAT PROMISES GOOD RESULTS.

Every year manufacturers are finding the problem of securing a suitable supply of skilled workmen assuming a more serious aspect. The question is being discussed at meetings of associations, by engineering societies and at board meetings with but little being accomplished. It seems evident that as satisfactory conditions and surroundings are not to blame, the workmen themselves are not altogether responsible for the state of affairs but the general position of the labor market, in which many influences are at work, have brought about the peculiar situation that is entirely unsatisfactory to the manufacturing interests. Increased demand has been the most outstanding factor but it is the lack of recruits, the proportionately low number of apprentices to draw from who will later join the ranks, that seems to indicate little prospect of a solution of the difficulty. Unless we have to-day a small army of young men of intelligence growing up in the various trades it is inevitable that the various industries depending upon them for their services must suffer in the future and even to-day actual suffering in that direction is experienced. Too many young men with latent ability for excellent mechanics, on leaving school find their way to an office with its shorter hour attractions and there drift along through life in a mediocre manner, earning ten or twelve dollars a week when he might find his life's work, fit into his proper niche and earn twice as much in the mechanical line.

A Plan at Work.

With a view to the possibility of supplying recruits and attracting a class of well educated youths giving them a chance at least of finding out their ability or taste for mechanics, Mr Joseph Dove-Smith, managing director of Standard Bearings, Limited, Niagara Falls, Ont., has arranged with the authorities of the Collegiate Institute there, to include a course in their factory as part of the curriculum of the young men in attendance. The plan has been entered into heartily and taken up enthusiastically by teachers and pupils alike with such success that the school authorities of neighboring districts are negotiating for the same privilege.

For one day or part of a day a week the scholars, who are grouped in divisions depending upon the size of the class, become, according to the day allotted for the various groups part of the organization of Standard Bearings. They enter at the regular hour, punch the time clock in the same manner as the other workmen, conform to all the rules of the factory and are under the direct supervision of the foreman of the department in which they may be engaged. It is such an entire change from the hum drum of study that the work is entered into with a zest and interest such as is not in the past at least been characteristic of the average apprentice. Their enthusiasm and willingness seem sponsored to give greater chance for development of latent mechanical talent. Many will find the interest increasing to such an extent that on leaving school they will be glad to follow up the work begun under auspicious circumstances and become producers in the industrial world. While at present in an experimental stage the idea is worth further consideration on the part of manufacturers in other places. Mr. Dove-Smith expressed to the Canadian Manufacturer extreme satisfaction with the results so far obtained and felt confident that his plan would be of great permanent value to the future efficiency of his working force.

Mechanical Engineer Discussion.

This subject was taken up in a paper read before the American Society of Mechanical Engineers by M. W. Alexander that brought forth a wide discussion showing the general interest taken in the question.

It was pointed out by President Fred. W. Taylor that no country can hope to hold its own in the severe industrial competition which is to come unless the rank and file of its artisans and mechanics are educated as well as quick witted. I do not, of course, refer to a classical, or even scientific education. I mean a thorough grounding in the principles and rudiments of the trades at which they are working. In giving this type of education to their workers I believe that the Germans are in a fair way to outstrip us, unless we become fully alive to the necessity for this work and active in its accomplishment.

There are many different forces and potential elements in this country which might and should be directed toward the attainment of this object.

I am looking forward to the time when our trades unions shall be a much more useful element both to themselves and to the whole community than they have been in the past. When they shall be imbued with the spirit of helping their members as well as their employers through the arts of peace rather than the arts of war. When their chief thought may be that of educating and improving their members, and thus rendering them worthy of higher wages, rather than that of devising ways for forcing their employers to make concessions to them. I think the time will come when they will realize that the true and permanent road toward high wages and prosperity lies in so educating themselves as to be able and willing to do more work in return for larger pay, rather than in fighting to do less work for the same pay or the same work for larger pay

However, I feel that we employers as a class need quite as much enlightenment in this respect as do the working classes, and that we should be brought to realize thoroughly that not only our personal interest, but our duty lies in helping to educate our employes so as to be fit for a higher wage and then in establishing such conditions as will enable them to get it.

The broad minded policy adopted by several of our larger companies, notable among which are the Baldwin Locomotive Works and the General Electric Co., in establishing systems for educating their apprentices, such as described in this paper, is to be highly commended. And I trust that all of our larger companies may in the near future follow their examples.

There are some advantages in the plan described by Mr. Alexander, of having apprentices taught in a department by themselves. But this plan is to my mind accompanied by the serious disadvantage that they are not surrounded by mature workmen. They are in competition with boys instead of men, and for this reason lack the most important object lesson of seeing skilful men working earnestly not only to do good work but to do it fast.

For our smaller engineering and manufacturing companies, however, in which ninety-nine hundredths of the work of the community is done, an apprentice system such as described is manifestly not possible.

As supplementary to the system described in Mr. Alexander's paper, I wish to call attention to a method by which not only apprentices but also those intelligent workmen who have not been so fortunate when young as to have the opportunity of serving an apprenticeship can be taught a trade quite as effectively in our small shops as they are in larger establishments under Mr. Alexander's system.

In the paper on "Shop Management," read before this society in 1903, forming part of Volume 24 of the Transactions, will be found a description of functional or divided foremanship, under which each workman has eight daily foremen over him instead of one.

Each of these foremen devotes his energies to one-eighth only of the work in which the ordinary foreman is supposed to be proficient, and as a consequence acquires a competence in his specialty far in excess of that possible to the old fashioned, all-around man. Under this system these functional foremen are called upon not only to teach but to stand over and train the men under them into a knowledge of how to do their work and also to manual dexterity. The rapidity with which the workmen and apprentices learn under this constant supervision and help is indeed remarkable. And as this system can be established in small shops as well as large, with great profit both to employers and employes, it offers a ready solution to the problem of educating our apprentices.

Another Opinion.

The subject was then taken up by H. K. Hathaway, who said that the shortage of efficient workmen is a problem of such vital importance that unless more attention is given to its solution, the expansion and development that our industries have enjoyed must inevitably be greatly restricted.

Every employer knows from bitter experience how difficult it is during times of prosperity like the present to obtain mechanics who are proficient in one branch of the trade, let alone men skilled in all its branches. This scarcity is due to causes of such a complex nature that I will not undertake to enumerate them.

Mr. Alexander has pointed out one way

to overcome this unfortunate condition, in his description of the training shop for apprentices maintained by the General Electric Co., and it is with great satisfaction that I note that the scale of wages paid is about 50 per cent. higher than are ordinarily paid apprentices, and this alone, if generally adopted, would do much to overcome the disinclination that most boys and young men have to serve an apprenticeship and I believe that still better results would be achieved if the wages paid started at about $8 per week and went up by easy stages to $12 per week for the final period. If this were done it would enable many young men between the ages of twenty and twenty-five years who are entirely dependent upon themselves for support, to enter the field of mechanics, and such young men would prove a far greater worth, both during their apprenticeship and afterward, than boys from sixteen to twenty years old. Furthermore, the shorter hours, clean hands, and eight dollars per week of the clerk would not appear to such marked advantage over an apprenticeship to the machinist trade.

The trade schools offer a partial solution to this problem, but there are so few of them and the number of students in each is so limited that very *little practical benefit can* be looked for from that quarter, unless we can have, through the generosity of our millionaires, many more of them, and I am inclined to feel that this is a much more practical and useful way to get rid of burdensome millions than building libraries.

The training shop of the General Electric Co. bears a strong resemblance to the trade school and from the fact that it is in close touch with great manufacturing works, has many advantages over the trade school, and is infinitely superior to the haphazard instruction that is characteristic of the average apprenticeship.

I cannot help thinking, however, that there is one serious fault in the system described by Mr. Alexander, and that is in the fact that one man and two assistants are expected to instruct and maintain discipline among 125 boys, to interview and select new recruits, to study carefully the mental and moral makeup of each boy, as well as his aptitude for his trade, and follow up the progress of many other boys who are completing their course in the factory department. This, it is explained, is made possible by utilizing most of the apprentices themselves for assistant instructors, and is in itself a statement that there is a shortage of men in charge. I do not see how instruction thus handed from one boy to another can be as efficient as it would be coming first hand from a competent and experienced instructor, and it is obvious that the progress of each boy must be seriously impeded by this method.

Unfortunately, however, the training shop plan is entirely out of the question for the average small manufacturing plant, and their solution must come from another source. Mr. Taylor's plan of functional foremanship, seems to offer the best solution to the problem of supplying the demand for efficient workmen, and I believe that if it were applied in the General Electric Co.'s training shop, the good work being done there could be greatly enhanced, the instruction made much more thorough and accomplished in a much shorter time.

I have had the good fortune to be occupied, during the past two years, in the application of this plan as a part of the Taylor System of management, in a works employing all told about 150 men, and as a result this plant is not troubled in the slightest degree by the dearth of skilled mechanics.

Under this system of functional management, where formerly the apprentice had to depend upon one "overworked foreman" for his instruction, there are now several foremen, the most important of whom, so far as the matter of instructing the workman is concerned, are the gang boss, the speed boss, the inspector, and the shop disciplinarian. These men continually come in direct contact with the workman and each has a special function or duty to perform.

It is the duty of the gang boss to see that all preparations for each job is made in advance and to instruct the workman as to the best method for setting up his machine and setting and clamping the work. The speed boss decides all questions and has charge of all matters relating to the cutting speed, feeds, depths of cut, the kind and shape of tool to be used and the method of setting the tool, the number of tools to be used simultaneously, all matters connected with the proper use of soda water, and instructs the workman in the manipulation of his machine. The inspector is solely concerned with the quality of the work and instructs the workman in the degree of accuracy and finish required, while the shop disciplinarian, as his title implies, maintains the discipline of the shop.

Under such a form of shop management it has been found possible to take an absolutely green man, who has never worked in a machine shop, and make an efficient operator of him on a drill press, or turret lathe, in from three to eight weeks. From the drill presses the best of these men are promoted to milling machines and planers, and from the turret lathes to engine lathes, becoming proficient in each class of work in a remarkably short space of time, owing to the systematic and thorough instruction they receive from the various functional foremen. That these men are doing efficient work is fully demonstrated by the fact that in this shop we are turning out 100 per cent. more work than was done before this system was installed, when every machine hand employed was supposed to be an all-round man.

One good example is a young man who started in about two years ago with no previous experience, and is now competent to run any machine in the shop and is at present running a lathe on which only work of a character requiring skill and accuracy is done. I mention this specific case because the man who formerly ran this lathe was looked upon as the finest workman in the shop, and at the time was the highest paid machinist in the employ of the firm, being considered indispensable by the superintendent in charge, when the functional system, was started. This man, who was in reality a scientific loafer, objected to being told how to run his machine, and as a consequence was allowed to leave, to be replaced by the young man first mentioned who not only turns out as good work as his predecessor, but about three times as much.

Another similar case is that of a young man who is now running a milling machine on which the most difficult and accurate work is done. This young man when he first came was considered so stupid that we a[lmost de]paired of making anything of him

From my experience thus far, I [truly be]lieve it is possible under the syste[m of fore]tional foremanship, to turn out in [so years]an all round mechanic who is in all [respects]more efficient workman than is [ordinarily]turned out in four years under the [present]and at practically all times during [his period]of training, to get practically the [same]efficiency from each man by rea[son of the]constant and thorough nature of t[he instruc]tion and help received at the ha[nds of the]*various functional foremen, while* [he wages]paid are so high as to attract n[o men]rather than immature and unsel[ected]

It has always seemed to me th[e height of]unfairness to withold the privilege [of learning]their condition by learning a trad[e from]serving men, who through unfor[tunate]cumstances over which they had [no control]were unable to acquire one, and to restrict this privilege to boys alone, who seldom fully appreciate it.

This state of affairs is probably due to the fact that under the usual system of management, an apprentice is considered an expense item for a large portion of his time and consequently paid low wages and expected *to accept the experience and instruction* he receives, in greater part as compensation for the period when his services are profitable to his employers.

Under the system I advocate, I think there would be very little to fear from this shortage of skilled labor which is at present such a burning question.

A Professor's View

Professor Lanza stated that the importance of providing skilled workmen, and the actual interest that the manufacturer should take in the subject is so evident, that it needs no further argument. In order that such education may be properly provided nowadays the manufacturers must realize that the matter cannot be left to the generosity of the multi-millionaires, their generosity alone will never accomplish it. The manufacturer has got to realize that it is necessary that he should bear his share of the expense and effort to accomplish it, even at the risk of losing the service of the men whom he has educated, by their going to other competing firms. Whether the program is to be carried out in the shop, or by means of schools connected with the shop, there are certain things that will have to be attended to and that are needed in consequence of the situation the boy himself. The author of the paper spoke of the teacher looking after the instruction of the boys. I think in any [case it is] ment that a man will be needed [who will devote] entire time to looking after, [not merely the] schooling of the boys, but also [in regard to] method of living. He should know [where] they board; how they live, [and what] their habits. Then, there are [other characteristics] teristics in the nature of the [boy which] to be carefully considered. [The young boy is] apt to look at any immediate [gain as being] as of undue importance; also [he likes to be] high, he likes to imagine that [he knows more] than he does, and there is one [great temptation] tion in such schools, and that [is to try to] superficially a large amount of [ground and] I think that the aim ought [rather to be that] thing should be done thoroughly [and what] the boy has done shall be [fully accomplished].

Apprenticeship System Vital.

L. D. Burlingame expressed hearty endorsation of any plan that would help toward the adoption and development of the modern apprenticeship system. From my experience with such a system at the works of the Brown-Sharpe Mfg. Co., I can see the importance of a system for training men to develop skill. It has been for many years our plan to give such training. I am glad to see that not only individual manufacturers throughout the country are taking up this matter of the apprenticeship system, but that organizations such as the Manufacturers' Association, that are interested in the development of mechanical industries, are also taking action in a way that will help to spread and develop such a system. Of course, I understand that such plans as outlined by Mr. Alexander, when applied to a shop, must be adapted to the conditions in that shop. At the Browne & Sharpe works we consider it is best to have the boys mix in with the other men from the beginning; whether it be pattern makers, machinists, or draftsmen apprentices, we have them acquire their knowledge by such contact throughout the time of their apprenticeship. One point in Mr. Alexander's paper that I have heard criticized is that one boy is allowed to teach another from step to step. I consider this an advantage, as it trains the boy who is acting as instructor as well as the boy being instructed, and if this is done under a competent supervisor, he will see that a high standard is maintained, in which case it does not lower the standard.

Regarding what President Taylor said as to making of specialists—we feel that we are carrying out this plan to some extent where a boy is given training in the important departments of the works, such as the planing, the milling, the lathe, and the assembling departments, for a certain defined period in each, and where there will be instruction under an expert in that line of work.

I shall watch with great interest the plan being carried out by the General Electric Co. I feel that Mr. Alexander has outlined very clearly the needs of our modern manufacturers for skilled labor and the means for developing such skill, and it seems to me he has shown in many ways exceptional skill in the plans suggested. I cannot too strongly urge that the apprentice system in its modern form should be pushed and developed throughout our manufactories in this country.

Further Advantages.

No greater problem is presented to manufacturers and superintendents to-day, said C. F. MacGill, than that of supplying the required number of skilled workmen. The plan under discussion furnishes, it seems to me, the best solution of the problem. I visited the apprentices' department of the Lynn works and found that the instruction given was very thorough and systematic, and of such a nature that in a remarkably short time the boys could be depended upon to do good commercial work.

In the primary training department work was done involving the simpler operations of drilling, boring, turning, balancing, etc., most of the work being on small cast iron pulleys. In the secondary or advanced training department, a really high grade of work was being done, turning armature shafts to a limit of one-half thousandth of an inch, making jigs and fixtures for use not only in the training departments, but throughout the works. I then went through some of the machine departments, where regular production work is done, and found the apprentices on that class of work for which it has been my aim for some years to train them.

I was particularly pleased with what I saw of their work in the steam turbine department at the River works. One apprentice in the fourth year of his course was running a ten foot vertical boring mill; others were working on large planers, milling machines, etc. It was very evident from the speeds and feeds used, that their training had been very thorough, and was producing good results. I cannot speak of the schools, as I was there in the summer, when they were not in session.

The impression seems to prevail among a number of engineers and educators that it is not necessary for an engineer or designer to be able to perform all of the operations involved in machine work, if he understands the underlying principles. I think this idea has done and will do a great deal of harm. The man who cannot do a given piece of work, does not really understand how to do it. Mr. Alexander has started right, and the system carried out at Lynn is producing good results. Combined effort along similar lines by manufacturers and machinery builders in the United States will go a great way toward solving the question of providing the required number of skilled workmen.

A LITTLE TALK ON BRICK FOR CUPOLAS.

In a booklet with the above title issued by the Harbison-Walker Refractories Co., Pittsburg, Pa., an interesting talk is given on the subject that is of value to all manufacturers whose plant includes a foundry.

Fire Clays.

There are three different classes of fire clays, viz.—soft clays, shale clays and flint clays. The soft and shale clays usually run high in silica; the flint clays run high in alumina.

Aluminous clays are more refractory than silicious clays, and they can be made into brick which is much tougher, stronger and in every way more suitable for use in cupola linings than bricks manufactured from soft or shale clays.

As there is considerable resemblance in the type of furnace, materials charged, etc., between the cupola and the blast furnace, it is only fair to assume that clays that make the best blast furnace brick can, with proper manipulation, make the best brick for linings of cupolas.

Cupola Linings.

Blocks for lining around the bottom of the cupola and for a distance of two feet or so above the tuyeres are made of flint clay high in alumina with sufficient bond clay to make the brick strong and tough. The manipulation of the clay and the mix, grind and burn are carefully considered and watched so as to secure the maximum heat resisting capacity, together with ability to stand the cutting action of the blast and the wash of metal and slag.

From a distance of about two feet above the tuyeres to the charging door, the blocks are made to stand abrasion, as well as heat, and they are exceedingly dense, hard and strong.

The economy of using high grade material is becoming more and more recognized. It is not so much the few dollars per thousand extra that may be paid for bricks of the highest grade as compared with the price of material not so good, but the fact that stoppages for repairs and loss of output are reduced to a minimum.

The policy of this company for 35 years has been to urge the use and economy of the high grades of fire clay brick for all purposes, even at a somewhat higher first cost. The cost of manufacture of high grade material is always higher than that of material lower in grade. These higher costs run all the way through from the mining of the flint clay to the burning of the brick; and the amount of coal necessary to burn our cupola blocks is double that required for certain classes of brick that are offered for cupola linings. From the very view of the consumer, it costs just as much to handle and lay brick of ordinary quality as it does to lay brick of the best quality.

We might summarize the reasons why you should use our material:—

1st—Direct ownership of most of the deposits of the best flint clay in the United States—over 40,000 acres.

2nd—First-class workmanship.

3rd—Greatest experience in manufacturing.

4th—No run of kiln brick shipped. All brick selected to insure uniformity.

5th—Prompt shipments.

6th—Careful packing.

7th—Small breakage.

8th—Largest output, 1,100,000 brick per day. Over 7,500 regular customers.

9th—Intelligent variation of methods of manufacture to meet different conditions.

10th—The same attention, care and courtesy given to the smallest customers that is given to the largest customers.

11th—Lowest prices, quality considered.

12th—Thirty-three plants on seven trunk lines of railroad, and so distributed among the consuming centers as to insure the most advantageous freight rates.

13th—A thoroughly organized traffic department in charge of an experienced railroad man, and readiness at all times to co-operate with customers to expedite deliveries.

Scores of cupolas are using our linings. The percentage of failures is exceedingly small and practically always due to causes over which we have no control. One of these is excessive pressure of blast, causing an impigning or cutting flame something like that from a blow pipe to play on the brickwork. Another reason is excessive slag, or slag of a very scouring nature, which cuts out the lining rapidly. Slag should be kept as neutral as possible.

Some Pointers on Bricks and Bricklaying to Get the Best Results.

1st—Bricks should be laid in that portion of the linings for which they are intended to be used, as conditions vary in different sections of the cupola.

2nd—The clay used should always be of the same grade as the brick. This is important, as one of the frequent sources of trouble is the use of inferior clay to lay brick.

3rd—Clay should be mixed to a thin soup, and brick rubbed to make a tight joint. Not more than 300 or 350 pounds of clay should be used to the 1,000 9 inch equivalent brick.

All brick work should be as true as possible and should be free from projections.

4th—Heating up and cooling down slowly adds very much to the life of the brick work.

5th—Cupolas should be lined with cupola blocks and not 9 inch sizes, as frequently used. After a cupola is lined, it should be dried out with a good wood fire over night. Cupolas up to 60 inches should have lining about six inches thick. Larger cupolas should have a nine inch lining.

Slag Materials.

Limestone and oyster shells are the slag materials in most common use. Fluor spar is occasionally used, and it should be remembered that fluor spar is exceedingly destructive of the lining. A scouring slag always cuts out the brickwork, and an effort should be made to have the slag as neutral as possible.

Daubing and Patching.

The best material to be used for daubing is a plastic fire clay and silica. When properly mixed, the mixture is plastic and adhesive, it does not crack, expand or contract, and stands heat. The fire clay should be soaked for 24 hours or longer, as it absorbs water slowly. The use of split brick pressed into the daubing with the flat side against the lining is effective and is recommended. This, of course, decreases the amount of daubing to be used and prevents skin drying of same, also prevents breaking away from wall as soon as steam is generated behind the skin dried surface. Split brick can be put in nearly as cheaply and quickly as a cupola can be daubed, and are almost equivalent to a new lining.

Deterioration of Lining

Linings may be burned out quickly by improper charging, too many tuyeres or tuyeres of too small diameter which causes the blast to be thrown against the lining. Sometimes an excess of fuel is the cause for rapid deterioration. When a lining is rough and jagged, it is an indication that too much fuel is being used for the iron melted.

It is quite possible that the use of chrome brick in the lower part of the lining would prove an economy in the case of a cupola where fire brick cuts out very rapidly

PRACTICAL HINTS FOR CONCRETE CONSTRUCTORS.

By W. J. Douglas.

In plans and specifications for small work don't call for two or three different mixtures of concrete where it is not necessary. If you can in safety do so, specify one lean concrete for your foundations, say 1:4.5, and use a 1:2:5 (or depending on your aggregate a 1:2½:5) in your superstructure. Frequently on small work with only one mixer the contractor would make money by placing the richer concrete throughout.

On foundation work where mass is desired and reinforced concrete is not practicable, and where the supporting foundation bed will not safely stand more than two or three tons per square foot, a cheaper and frequently equally good foundation may be obtained by using a cheaper aggregate than first-class concrete stone, such as broken brick, broken concrete, the softer varieties of rock, slag and cinder.

Care should be taken not to suddenly change the cross-section from a heavy one to a thin one unless this is imperative. All quick changes from heavy to light section should be reinforced with steel. The greater the change, the greater amount of reinforcement is needed.

Abutments of U-shape built of unreinforced concrete frequently crack at or near the intersection of the wing-walls with the head wall. Heavy steel reinforcement at this junction of the walls is suggested, even where the walls themselves are not built of reinforced concrete. If this cannot be afforded, use tie-rods joining the side walls or build the head wall detached from the side walls.

If a structure is not to be tooled or finished by other means, its design should be simple in its architectural details, the beauty of the structure in this case being made to depend on the harmony of proportion. Such a structure should have filleted corners and well rounded details, simple mouldings and large details in general, so that it will stand out boldly a confessed simple concrete structure.

In waterproofing a flat surface, attention is called to the loose skin method (probably as good as any in use), which consists in placing shingled layers of waterproofing paper, cemented together by a waterproofing composition, upon the surface of the concrete, without having the lower layers of the paper covering adhere to the concrete. The theory of this is, if the concrete cracks the waterproofing layers will not crack with it.

The best safeguard against leakage is to get the water away by drainage slopes, French drains, etc. Expansion joints in retaining walls should be carried down to the foundation bed.

When forms are removed the concrete surface is as a rule unsightly. Parts executed upon different days, under different foremen, with sand and rock varying in color, show a decided difference in color. If forms are not oiled or soaped the knots will discolor the concrete, the print of each knot being clearly marked on the surface of the concrete in a brownish color. If they are oiled with a fatty oil, the oil will be in part absorbed by the concrete, making additional stains.

The best way of obliterating the unsightly appearance of unfinished concrete is to tool it, using a bush-hammer, crandall, point or pick, and using a chisel or file for the arrises; especial care being taken to use sharp tools.

In designing forms for finished concrete cast in place, the designer should be careful not to use long, continuous studs cut out to the profile of the work; if he does, it will be impossible to get the forming off without ruining the edges. The forms will be wedged tight at these points, due to the load of the concrete which is moulded against the forms, and is made worse by the swelling of the lagging and studs caused by the water in the concrete.

The use of short studs, with small wedges at dangerous corners, will prevent the troubles just referred to.

Care should be taken to locate the forms in such a way that tie-rods will not come closer than 4 inches to a projecting corner or other detail.

Concrete should be protected from the cold so that it will not freeze. There are innumerable coverings for the top surface of concrete to prevent freezing. Canvas, cement bags, tar paper, straw, sand and manure are all used for this purpose. (The heating of materials has been previously referred to — one of the best guarantees that the concrete will not freeze). When canvas is used it should be kept an inch or two away from the concrete, leaving an air space between the concrete and canvas. Cement bags should be in layers and well lapped. Tar paper should be well lapped and used as suggested for canvas. Straw should be used about one foot deep, and, in extreme weather deeper. In conjunction with tar paper and canvas, it works very well. Manure is the best of materials, as it is a heat generator but it discolors the concrete (this is seldom of import). Concrete should not be placed in running water or still water if it practicable to get rid of the water.

The cost depends upon specifications, the customs of a community, the engineer in charge, the market, the demand for labor, the kind of labor available, the hours of labor, the location of the work, the cost of materials, the storage room available in order to handle the construction, the haul and the kind of work, the time of year, the climatic conditions, including freshet conditions and the time allowed to complete the work, including the penalties for failure to finish in the stipulated time.

Reinforced concrete is so new and the demand for this class of design is so great that engineers have not been able to spend as much time as they should in figuring out systems of reinforcement which would not greatly increase the cost of placing the concrete. This cost varies between 7 cents per cubic yard for mass work to $10 and if cheap work is wanted, the concrete must be placed at a reasonable figure. A considerable part of this cost is due to ornamentation which goes with the most expensive reinforced work. Narrowness of forms, excessive detail and steel reinforcement are the items which run the cost of placing concrete to such an extraordinary figure.—Engineering News.

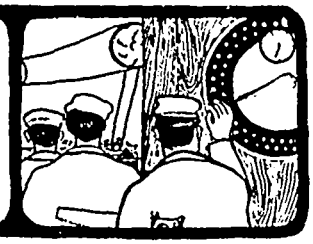
BOOK REVIEW.

Twentieth Century Book of Recipes Formulas and Processes, containing 1,000 selected scientific, chemical, technical and household recipes, formulas and processes edited by Gardner D. Hiscox, M.E. Price $3.00, 787 pages, New York, Norman W. Henley Publishing Co.

The above is the latest publication issued by the Norman W. Henley Publishing Co. and is of a standard in keeping with many other high class books published by this firm. The editor, Mr. Hiscox, has already made a name for himself as an author of mechanical and technical books, and in this latest does not lose any of his former reputation. This book is designed to fill the requirements of the mechanic, the manufacturer, the salesman and the housewife, and covers the ground in a comprehensive manner. Considerable care has been taken in the selection of the various recipes to make them of the greatest value to the needs of everyday life. Each of the matter has been specially translated for this work from foreign technical periodicals and books. Inasmuch as a particular formula may not always be applicable the editor has considered it advisable to give as many recipes as his limited space would allow under each heading. Being issued under such favorable auspices this book is sure to commend as a valuable addition to the literature affecting every day practical life.

Office Methods and Appliances

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



Methods of Keeping Foundry Costs.

By J. F. Johnson.*

A foundry business is peculiar in a great many respects, unlike any other manufacturing business, on account of the uncertainties, regarding product, amount of material and supplies used on any particular job. This makes it a very difficult matter to get an accurate system of costs. The supplies for any job and apportionment of direct charges in the different plants being so varied and what is applicable to one class of product, it would not apply to another. The system outlined will meet all these obstacles and give every plant its true cost.

The object of the Cost Committee of Jobbing Foundries Association is to outline a uniform system of foundry cost keeping to meet the requirements of all shops doing a medium or heavy grade of work and when found suitable in the judgment of the Committee, to submit it to the various foundries and ask them to adopt it or something nearly like it. We hope in this way to create a better feeling in the foundry business and avoid the ruinous prices on work that has been such a factor in the past few years. I do not know of any manufacturing business where so much is invested where so little is known as to actual cost of product, as in this business. We do not intend to convey the impression that we wish any foundry to adopt any particular way to keep their accounts. Their book keeping can be kept to best suit themselves, so as to arrive at the proper charges to be taken care of for the month, and the proper distributions made when their general books are closed. I wish to impress on every foundryman the necessity of having first-class clerical help, or the best results cannot be obtained from this or any other system.

Most foundrymen are content to have one or two men about them, acting in the capacities of foundry clerk, shipping clerk, timekeeper, storekeeper, bookkeeper and probably stenographer. You cannot expect to get any accurate results from such a working force. The men are probably over-worked, underpaid, the work is not of the cleanest, and hours too long, besides the man who is able to fill all of these positions satisfactorily, would not be engaged in the foundry business as he could get better remuneration for such services elsewhere. From my observations the foundry business is conducted on the hit or miss plan. Large contracts are taken every day by parties merely looking at the blue prints and price quoted at once, without going into any details, as to amount of loss on account of defective work and unavoidable losses. It appears to be the general impression that foundry costs are arrived at by averaging the cost of metal, adding the direct labor and then adding about 75 to 100 per cent. for fixed and general charges. This is a gross mistake, as I venture to say that no foundry in this country doing a general line of jobbing work can get their indirect expenses so low as 75 per cent. of the direct labor. I would say that 150 to 200 per cent. would be nearer.

The most important object of the Jobbing Founders' Association is to get a good system and have various foundries adopt it and find out their true cost, and in this way avoid ruinous prices in the future. I am satisfied no sane man will take a job if he knows he will lose a certain amount beforehand. I have in mind now, a foundry that has taken work away from us at a very low price. The price being over ½ cent a pound lower than we had been getting. He had the extra freight against him also, we being located where deliveries could be made by team. I am positive this foundry does not have any idea as to cost of its product, or it would not have taken this work at the prices it did. We found, after doing the work for a period extending over two years, that we could not produce these castings for anything like the price he is getting. This is merely one of the many.

I notice in the papers and different magazines the sale of foundries, and receivers appointed for others. What is the cause of all this? Simply because they have been selling their product without knowing as to its cost.

I have gone far enough, I think, explaining why and the object of getting a universal cost system for foundry business and hope all foundrymen will give this feature of their business their special attention, and in the future it will be for the benefit of all.

I have the different forms used at our plant and will try to explain as best I can their individual use and the different steps taken to arrive at the monthly cost, both average per pound and cost of each job. These forms will be submitted to any one after the meeting for their personal inspection and any further information I can furnish.

The first step is to enter the order taken by giving it a shop order No. and issuing shop bills or material to different departments interested. This, I think, is a universal practice and understood by every one present. In addition to this shop bill, we issue to the moulder a small card, giving the shop order No., pattern No. and No. of pieces to be made. He is thus better able to report his time on the job and incidentally afford an additional check on the number of pieces made, as he keeps a record on this card of what he moulds and turns it in to the foundry clerk each evening. This helps to prevent castings being made in excess. We next issue to each man every day a time slip. He makes this out after the completion of his day's work and hands it to the foreman before leaving. We find this more satisfactory than having foundry clerk take the time, as it gives him (the clerk) a check on the time by comparison with his record when a pattern is changed. Every day a report is made by the foundry clerk of the cast; giving the shop order No., No. pieces, pattern No. and weight of castings, both good and bad. We next have a record of all metals charged in cupola during the month, giving date, kind and weight. This can be kept in book form or loose sheets. The next step and of the utmost importance, is to have a store room where all materials are kept for stock, and these materials can only be gotten by an order from the foreman. You must have a responsible party in charge, and one able to compile a report at the end of each month of all material used and charged to the proper accounts. You cannot get the true cost unless this is done.

This store house is credited every month to stores account and proper jobs and accounts charged. A periodical inventory is taken to compare actual stock on hand with the book value and thus keep a check on the storekeeper as to the correctness of his accounts. This may seem needless work, but it is a good feature and sometimes prevents thefts and careless work.

As the time slips are received each day in the office, after being approved by the foreman, these are entered on a distribution or operating sheet, giving the shop order No., pattern No., class of work, time and amount. At the end of the month these sheets are added and results shown on recapitulation sheet. This gives you the total moulding cores and labor on each job. The cost of the different pattern Nos. can be taken from the sheets at any time after closing the month's work, so as not to delay the closing of the month's business.

Another report of great value to us, we call a summary of the product. This report gives average number of moulders and men employed during the month, with product, average pounds per moulder per day, average weight of piece per month, and other useful information for sake of comparison with other months. We are thus able to tell if our product is varying, and to what extent. This report is self-explanatory and can be compiled very easily.

We now come to the final steps, which are arrived at after books are closed and all expenses determined. It is nothing more or less than a final recapitulation of foundry product, showing cost of different items, as obtained from your books, these figures are actual and are bound to be correct, on account of being taken from books that are supposed to be correct. This sheet shows actual cost of foundry product for the month; al-

*From a paper read before the Pittsburg Foundrymen's Association.

so the different items, the practice and average cost per pound. This can be compared with previous months and if running on the same class of product, it keeps a check on your foundry and enables you to tell if certain expenses are increasing or decreasing, and in what amounts. I would advise all to keep this cost, as the foreman can be called to account if found that foundry is running unsatisfactorily.

We have now reached the final stage, or step. A cost sheet, showing actual cost of each job, the metal, direct labor, apportionments and total cost. On the left hand side is shown the selling value. By merely glancing at each side you can readily see which jobs are losing and which are profitable. The selling price per pound is obtained from the estimates on the work, and where no estimates have been made you use price you intend charging the customer for this work. In arriving at this final result, the matter of apportionments have been considered carefully, and we think our method as nearly correct as it is possible to obtain. I base this assertion on these statements as for the following reasons:

All fixed charges should be apportioned on the productive labor, because time is the factor, and these expenses are the same whether your output is large or small, and your product is also regulated by the time the floor space is occupied by certain pieces of work. All expenses which are regulated by the output, should be apportioned on the weight, because weight is the factor, and more expense is necessary for the larger pieces and because these expenses are governed by the weight, that is, such items as flask supplies, fuel for cupola, yard labor, cleaning etc., which fluctuate according to the output.

A great many may take exception to this method, but I think it is nearer correct than any other I have observed, and your apportionments are based in their relation to the factors governing these expenses and applied to these factors. I have tried to explain our method in the clearest and most simple manner, and trust I have interested you sufficiently to give a similar method a trial. I do not mean to say you should adopt this method, but something along these lines, as being the only true and correct way of ascertaining your actual costs.

THE PULL AND THE JOB.

A pull may put you in the way of getting a job, but after that results count. Many business men are pestered by those who are seeking to get something by favoritism ——.

But does it pay?

Not long since a young man in the Middle West needed work and needed it bad, tells a writer in the Saturday Evening Post. He bethought himself of a rich and influential friend and he lost no time in applying for something to do. As it happened, the rich friend had no vacancy at that moment, so he gave the young man several letters of recommendation, in the form of a personal request, to business men of his acquaintance.

The seeker after work took the letters with a glad heart and went away. The manager of the first place visited read the letter carefully and handed it back, politely sorry that he had nothing to offer at present. This was a shock to the young fellow, but he swallowed his disappointment and trudged on to the next place. Luck was no better here, and it did not seem likely to improve further on.

The young man did not get far from the second office when he pulled his four letters of recommendation from his pocket and looked them over. After a moment's hesitation he tore them into pieces and flung these into the gutter. Turning sharply, he reentered the office he had just quitted, and the manager, noting him, frowned.

"What do you want now?" the manager asked in an annoyed tone.

"Pardon me," said the young man; "but I've just torn up those letters from Mr. S——. Could you give me a job on my own hook?"

The manager looked amused and said: "We need a young fellow to chip castings in the machine shop at six dollars a week; if you like, you can have that until something better turns up."

"Yes, sir," replied the job hunter, "I'm ready now."

THE SOCIAL SIDE VERSUS SUCCESS.

Young men who are ambitious to amass money often make a great mistake in thinking that it is a waste of time to cultivate their social faculties, that society has nothing to do with money making, says Success. They think that spending time in society is a hindrance; that it will keep them back.

The result is that there are multitudes of well-to-do men in this country who can scarcely say their souls are their own in a drawing-room or elsewhere in society. They are simply dummies. They can talk only about their business. They are dumb upon other subjects. They taboo what is called society. It is a bore to them simply because they have never developed their social qualities. They do not like the drawing-room because they do not feel at home there. It is a stupid place for them. They do not know what to do or to say. They are strong in their little *business rut. They are at home there. If* you call on them in their offices they are strong, resourceful; but the moment they put on a dress suit and go into a drawing-room they are mere sticks, weaklings, not the giants they were yesterday in their offices or factories or stores. They feel restricted, shackled, out of place, just as one feels when trying to be natural before the camera.

They are, in a way paralyzed, because faculties of an entirely different kind from those used in their business are called upon to act, and they are unused to it; those particular faculties are untrained, not ready to respond to the demand upon them. Men with a tithe of their ability far outshine them in the social circle, put them entirely in the shade, make them feel very uncomfortable indeed, and as if they were "nobodies."

Many college men think it is a waste of time to go into society. They think they must spend the precious hours grinding away at their books. The result is, that these men often gain a great deal of learning, but, as they have never cultivated their conversational powers, or their social side, their knowledge is largely unavailable.

If you are cold, self-centred and uninteresting, if your greatest wealth is not in shape to give to others through your conversation, your social intercourse, what does the world care about your position? In fact, the more you know, and the more money you have, the more conspicuous will your boorishness and your unsocial qualities become.

THE LOADED FIRE EXTINGUISHERS.

Several years ago I walked the streets of Chicago for two days with nothing to eat—my sole available assets being a return ticket, good until the following January, from the Windy City to Baltimore, Maryland, writes L. E. C. in The Saturday Evening Post. This was in May. I had gone West looking for a job.

When the last square meal I had eaten was forty hours, or more, a matter of history, I decided to sell my railroad ticket and buy a meal ticket, which was what I stood most in need of.

On my way uptown I ran across an old friend named Wells. I told him frankly my circumstances. Wells said, "I've got just about what you're looking for. Old Man Simpson over here has a fire extinguisher proposition that he is going to put on the market right away. He's looking for agents for all parts of the United States. Come with me. Maybe he can fix you up."

I went. Simpson had a fire extinguisher with a rocket attachment that he thought was the greatest thing ever in that line. Before I left he hired me to go as his agent to Maryland—wages twenty-five dollars per week and expenses. I didn't let on that I had a return ticket to Baltimore. He gave me two weeks' pay in advance—fifty dollars—and some thirty-odd dollars for railroad fare. That night I went uptown with eighty dollars and had a little time of my own before leaving "the burg." In the morning I started East with my samples.

In Maryland I put up at ——. Immediately I billed the whole county for a big demonstration with my fire extinguisher. I obtained all of the barrels and boxes in the neighborhood, sprinkled them with *coal oil, and piled them up as high as a house.*

On the night of the demonstration all of the farmers for miles around gathered for the show. I noted a look of expectancy on the faces of many of them, but I did not to the celebration. I had hired two or three of them to help me work the extinguishers. These fellows touched off the pile when I gave the word.

It blazed like powder. And when we got those fire extinguishers in action I nearly fainted. The more we spouted the chemicals the bigger the fire grew. The farmers gave a Ha! Ha! that could have been heard in the next town. I smelled a rat in a jiffy. Some wag had poured kerosene in the extinguishers and passed the word around among the crowd.

Without waiting to protest I dashed over to the hotel with a couple of men and grabbed some of the extinguishers in my own room that had not been tampered with. Then the hand brigade started back for the blaze. In about two minutes we had that very heap a black pile of charred wood—the laugh was on the farmers, and they took the joke good-naturedly.

The story got in the papers and boomed business for me in a way I could not have done for myself, even if I had an advertising agency at command. Those fire extinguishers sold themselves.

Twenty-five years have passed but I can

still see those farmers grinning as we doused the fire with oil to put it out.

PROFITS DEPEND UPON SALES.

Many manufacturers fail to give to the selling end of their business the credit and attention it deserves.

Generally speaking this is the case where the manufacturer is a master workman in his line, where he is not only intensely interested in the productive end of the business, but is the genius of that department, so that all his workmen depend upon him for instructions.

It is but natural that such a man should become immersed in the factory rather than in the office, that he should be the guiding spirit of his productive force rather than of his sales force.

Yet in nine cases out of ten he does not make the profit nor the progress made by a competitor who is personally his inferior in the productive end of the business and so leaves the guidance of that department to a superintendent while he devotes his attention to the selling end of the business and gives ample time to such matters as cost accounting, the development of modern methods in bookkeeping in collecting as well as in sales.

Carnegie gave credit for his success to the "organization," which conducted his business. *He dominated the organization, giving especial attention to selling* and leaving the productive work to the best men he could secure. It is stated that in dull times he kept his plant busy at prices higher than competitors were asking by reason of his ability to get orders.

When business was of small proportions, when competition was less pressing and when profits were larger, the manufacturer in Canada who ran his shop and let a clerk and a salesman take full charge of his selling could hope to make progress, but to-day, when competition is becoming keener every day, and when every kind of ingenuity is brought into play to get business it is essential that the manufacturer assume full control of his business. He admits his own inefficiency if he cannot train a man from his works staff or secure one from elsewhere, to be superintendent of that end of the business. If his selling force is large it should have a sales manager. But he should be in even closer touch with the sales force than the productive force, for upon them depend in large measure his progress and profits.

A few years ago a partnership was disrupted because the "practical" man, who was in control in the factory, objected to the employment of increased help in the office. The partners separated. One partner continued to manage his office, spending what seemed a ruinous price to get a competent superintendent and to maintain his office and selling force. He had some difficulty financing his business for a year or two but has "won out," and is now steadily building up a strong business. The other partner was an infinitely better workman. His product was better than his competitors, but he lacked nerve as a salesman and refused to pay the price necessary to get a good one and to back him up with requisite office staff. His first salesman proved a failure, his second was tempted away by a competitor, the third proved unreliable. Desperate he started out *with a few samples, taking them to Eaton's* and Simpson's. He sold his entire stock, but at prices which left him little more for the season's operations than the salary his old partner paid his superintendent—and a connection with only two buyers. Both of these had, however, been given a precedent for expecting low prices. He gave up the struggle, and is now superintendent of another firm's workshop.

It is trite to say the latter was a poor business man. It is necessary to get closer to the situation and to recognize that his weakness was his failure to recognize the necessity of spending money, to build up and to maintain aggressive, efficient sales force.

MODERN MACHINERY METHODS.

United States Consul Marshal Halstead, writing from Birmingham, says that the many visits of British manufacturers to American factories are bearing fruit, one iron and steel manufacturer stating that he "had been through some of the shops in America where the same kind of work was done and believed their new shops were ahead of the Americans."

An English manufacturer is hardly regarded as up-to-date to-day unless he has seen American factories. No one who has not lived in England during the last seven or eight years can realize how great the awakening has been here, nor how changed the British mental attitude is regarding new ways of doing things. There has been much wise and clever adaptation to British cheaper labor needs of American machinery ideas. It has often been found profitable to simplify highly organized American machinery, even separating processes and dispensing with complicated parts requiring skilled mechanics to manage them, substituting instead hand-guiding manipulation for automatic work.

It is held, and seems to me and to many other Americans here who know England as well as they do America, to be correct that in the making of certain classes of articles this simplification and division and the employment of girls as operators, who are paid from 8 shillings ($1.94) to 15 shillings ($3.64) a week, enables manufacturers here to produce at figures competitive with much of the work of the most modern and highly developed automatic machinery. Americans could have sold a great many of these simplifie[d] which still, I should remark, ret[ain] sential principles; but American manufacturers would not, I have bother with the trade.

One machinery merchant here, [tried] in vain to get certain American manufacturers to make the kind [of] he knew could be sold here—[and] the American machinery merchant [has] a great many minor business peopl[e] could not afford the costlier type [of] machinery—ultimately had design[s] machines prepared and had them [made] He could not, however, command [the] as he did not have sufficient capit[al]. Several machinery manufacturers have [developed] very large trade out of this type [of] American machine for use with [cup] Large quantities of small articl[es] cut from bar stock where formerly [they] were cast or produced upon simple lathe[s] the turnings for each of the several tools [on a] lathe being done by hand. It has [revolu]tionized the brass trade.

United States Consul Smith, [at] Victoria, reports that steamship service [between] British Columbia and ports of Mexico [will] be commenced in March next. This service will be monthly and the steamship company will be paid an annual subsidy of $100,000 gold, each government paying $50,000. The consul further reports that advices have been received at Victoria that the effort being made in the New Zealand parliament to authorize that government to establish steamship service between New Zealand and British Columbia is likely to succeed. It is proposed that the service shall be once every three weeks by vessels of not less than 6,000 tons each, furnished with refrigerating and chilled chambers for carrying fruit and dairy products. Time for the voyage shall not exceed 18 days each way. For this service it is proposed to pay a maximum subsidy of $100,000 gold per annum. At present the only direct connection between British Columbia and New Zealand is by two freight steamers making bi-monthly trips, for which service $50,000 per annum is paid by New Zealand and a similar amount by Canada.

Profit-Making in Factory Management.

By C. U. Carpenter.

In the following extract from a series of articles in the Engineering Magazine, the *selling branch of manufacturing is dealt with* so well that it is worthy of careful attention of Canadian manufacturers.

The necessity for comprehensive reports of varied character is, of course, obvious. The exact character of these reports and the ground that should be covered therein is not always so obvious. In fact, seldom is there found a system of reports that is really comprehensive and logical.

Any attempt to define a system of this character must be at first general in character because of the differing conditions in each business. I have, however, applied the fundamental ideas explained below to a number of lines, and have never yet failed to make a practical application of their meritorious features, although their form was [often] changed.

In developing such a line of [reports, let us] begin by considering what we need in the way of methods to increase the working efficiency of the concern, and what will enable us to oversee and check up the [daily] production and sales conditions. First, then, we want methods for determining what is to be accomplished in the production [department]—in the character, regularity, [and] output, in the cost of production, in the development of new ideas or [methods] to conquer competition, in the [steady] development of greater efficiency and [reduction] costs. Second, we want methods for determining what volume of business must be secured, and what profit must be [made] on each and every class of goods [manufactured] in each selling territory, what [expenses] are

be allowed to pile up while goods are being placed upon the market. Next, we need methods by which the selling organization can be forced to meet these requirements and bring the necessary results.

In short, we must have plans and methods by which the manufacturer can first get a clear conception of what should be accomplished in each division of his business; and next, means by which he can get a firm grasp upon the details of his business so as to force the accomplishing of these longed-for results.

In general outline the reports must be:—the "Monthly Analyzed Profit and Loss Sheet," the "Sales Reports," the "Factory Reports" and the "Cost Reports." All will be more fully outlined as the discussion develops, but the scope may be outlined as follows:

The Monthly Analyzed Profit and Loss Sheet.

1. The Monthly analyzed Profit and Loss Sheet should show:

a. Delivered sales, with proper divisions for each class of goods produced, and receipts of other character.

b. The factory cost of the goods in each division.

c. The cost of delivery, including freight and cartages properly classified.

d. The receipts and disbursements on all work of a character auxiliary to the main lines of production, such as repair departments, moving departments, etc.

e. The selling expense, divided into proper classification for analysis.

f. The office and general expenses that can properly be charged against each selling branch or territory.

g. The division of general or executive expense of such nature that it cannot be charged directly against a branch.

The importance of this report will be immediately recognized. It provides an analysis that enables any manager to locate immediately the points of profit and the points of loss, provided the distribution of credits and debits is correctly made. It is the primary report upon which the balance of the reports are founded. While it may appear complicated, the business man knows that it is necessary; and the one who fears its complication can be assured that it can be developed very easily by ordinary methods of accounting and the inauguration of comparatively simple systems in the factory.

The Sales Reports.

2. The Sales Reports.—Coupled with the preceding report should be first, a comprehensive memorandum outlining in a simple manner the necessary work of the selling department, no matter how the goods are distributed upon the market. This report should show what goods must be sold, at what profit they must be sold, and under what expense they must be sold, in order to secure the desired profit on the balance sheet at the end of the year. It is not a difficult matter for an intelligent man to take such a report as the outlined "Analyzed Profit and Loss" report, consider what profit his business should show, and calculate from this the profit he should expect from each branch of it in order to secure this profit, and under what expense it is possible to run in order that his gross profit from his sales may not be eaten up by selling and general expenses. A simple enough method of procedure, but one seldom taken. And often where this sensible calculation is made little real scientific effort is made to "hew to the line," to insist upon reasonable profits, to hold down expenses and to conduct the business along the lines which such an analysis shows are absolutely necessary.

The next report on sales needed is naturally the one showing the actual results, territory by territory; showing volume and profit secured and expense of getting the business. It is immediately apparent that a weekly (or in some concerns a daily) comparison of the actual sales results with the data showing the results that must be secured or as I term it the "must data" will prove invaluable.

There are naturally a number of sales reports of a different character from these two just outlined that should be secured from the selling end of the business, but they are amplifications of the main reports and will be touched upon later under the sales division.

Factory Reports and Their Bearing on Deliveries.

3. Factory Reports.—The discussion of factory reports will naturally follow the description of the factory system and so cannot well be elaborated upon here. They should, however, naturally give the first importance to exhibiting progress upon contract, special and stock work, weekly; showing clearly the location of this work in the shop and the steps taken to get it out on time. The manufacturer who is constantly harassed by tardy deliveries and hampered by the lack of such data, can hardly realize the effective use that can be made of such weekly reports. The knowledge of exact conditions coupled with the devising of ways and means to overcome threatened delays, and constant pressure upon the factory, bring excellent results.

Sales Department Methods.

Thorough and careful consideration of sales-department methods is considered essental in this series. A full study of any business is incomplete if the sales-department methods are neglected. For the "production of orders" is a most essential link to the chain.

The possibilities of scientific development in this branch of the ordinary business are so great that they must be carefully studied. To this statement I often hear the manager say "scientific development of the selling end of the business! Why! a salesman is a salesman. The selling of the goods is an art in itself. A matter of individualism. Salesmen are born, not made. Training of salesmen! Bosh!"

Real Salesmanship.

The managers who make such statements are usually of the type that will employ a new salesman, let him "dig around the shop a bit," give him a catalogue and start him out. A mere "taking of orders on price alone," not a finished salesman. For the gulf of difference between a man who takes orders because he quotes lower prices than his competitor, and the salesman who sells the goods at a higher price than his competitor because of his skill and knowledge of his business, is a very wide and deep one. That there is a "psychology of salesmanship" I would be the last one to deny. But inate sterling ability, unless back[ed] proper knowledge, will not wi[n] natural selling ability a thorou[gh] in the "talking points" of the p[roduct] defects (and good points) of the [competitor] the best methods of meeting ar[guments] objections, gained from the ex[perience] all of the best men in the selli[ng] tion, the most successful mean[s] strating the merits of the goods [to] pective customer—and you ha[ve a] salesman.

Training Men Collectively.

Train your men collectively. [Then] organize them along scientific lin[es] back up your training by sim[ple] quate systems whereby you ma[y know] the territories are being comple[tely] your prospective customers are [classified] dled properly, profitable prices [are] and competition being met, a[nd] have an invincible selling organ[ization].

Instead of this condition, one [often] group of salesmen, jealous and [distrustful] of each other, lacking in the de[sire to work] together for the good of the [company] out a thorough knowledge of the [merits of] goods or their competitor's [product] very chary about sharing what [knowledge] they do possess either with [each other] the poor new-comer. Usually the [latter] is almost entirely responsible [for such] dition.

The possibilities that lie in the [development] ment of proper method are [enormous]. Actual experience to be described [in these] articles has proven it beyond the [slightest] ture of a doubt.

Executive Conditions.

The weaknesses outlined in the [preceding] ing will surely be felt in the [executive] division whether that consists of [one] twenty. With the possibility [of having] only such insufficient data as can [be secured] with lack of organization, methods [and] tems, such as has been outlined, [what can] the executive do but struggle [in the] dark and in doubt, trusting that [his well] trained salesman can sell his product [at] a price that a reasonal le profit [will be] after his factory, without proper [organiza]tion, system, and training, has

ADDING PERSONAL INTEREST TO LETTERS.

Here is a little new wrinkle [in] form letters, says American [Printer]. Get your letter up so that [the] line or two of the letter contain [the] the firm addressed or have some [general] word or two which will apply [to] the firm addressed. Then have [these] printed in process with the [body] line or two and the address of the [firm] this line or two put in on each [machine] typewriter. In this way you [have] partly done by process and [partly] typewriter, which it is almost [impossible] distinguish from a typewritten [letter] desk, the average man who [receives] letter does not distinguish it. [Remember] that a letter of this kind sent [with a] two cent stamp will bring quite [a large] number of replies that an ordinary [circular] letter will. The extra cost of [typing] lines on the typewriter is far [more than] up by the results obtained.

MACHINERY AND EQUIPMENT FOR SALE

BELTING

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

BUILDERS' SUPPLIES

OUR SPECIALTIES — LIME, CEMENT, sewer pipe, plaster Paris, fire brick and fire clay. ONTARIO LIME ASSOCIATION, 118 Esplanade Street East, Toronto.

INDUSTRIAL CENTRES

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

COVERINGS AND INSULATION

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

BOILERS AND ENGINES

BOILERS.—For special quotations on boilers and sheet iron work, write Park Bros., Chatham, Ont.

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

MACHINERY FOR SALE

ONE CANADA ELECTRIC DYNAMO WITH direct connection to Robb Armstrong engine. One Gasoline Engine, 3 h.p. Northey make. One steel frame Windmill, 50 ft. high, 8 ft. wheel. All of the above is in good working order. For particulars apply to John Rice, Sec.-Treas., Ontario Ladies' College, Whitby, Ont.

RUBBER STAMPS

B. CAIRNS, 77 QUEEN STREET EAST, Toronto—Rubber Stamps, Seals, Name Plates, Stencils.

RUBBER STAMPS AND SUPPLIES OF every description. Illustrated catalogue free. Agents wanted. Corporate seal $3.25, express prepaid. J. Starnaman & Son, Berlin, Ont.

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

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1-36 INCH STURTEVANT EXHAUST FAN and Shaving Cyclone, and about 100 feet of piping. These articles are for sale cheap. Putting in larger plant. Apply Matthews Bros., Limited, 788 Dundas Street, Toronto.

SITUATIONS WANTED

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

SPECIAL MACHINERY

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

PLATE GLASS

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

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Gives liquid steel at 5100° F. anywhere in half a minute.

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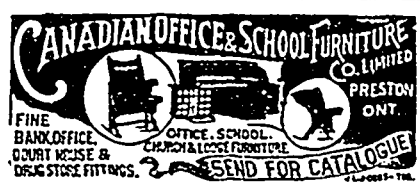

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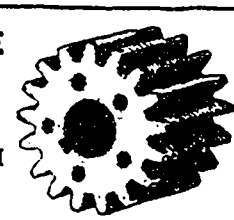

FACTORY LOCATIONS.

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

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

H. W. PETRIE'S LIST

Horizontal Stationary Tubular Boilers.

	Appr.
72"x14', 114 3" tubes, plug hat dome	
60"x17' 6", 54 4" tubes, plug hat dome	
63"x14', 64 3½ tubes, plug hat dome	
60"x13' 9", 84 3" tubes, plug hat dome	
60"x15' 4", 80 3" tubes, plug hat dome	
60"12', 74 3" tubes, plug hat dome	
56"x14' 4", 64 3" tubes, plug hat dome	
56"x12', 60 3" tubes, plug hat dome	
48"x13' 6", 44 3" tubes, plug hat dome	
48"x15' 6", 52 3" tubes, plug hat dome	
46"x13', 53 3" tubes, plug hat dome	
48"x13' 10", 52 3" tubes, plug hat dome	
48"x13' 6", 42 3"x12' tubes, manhole dome	
44"x13' 9", 48 3"x12 tubes, plug hat dome	
44"x14½', 51 3" tubes, plug hat dome	
42" 14' 6", 40 3" tubes, plug hat dome	
44"12', 46 3" tubes, plug hat dome	
44"x11' 9", 42 3" tubes, manhole dome	
44"x11' 6", 43 3" tubes, manhole dome	
44"x11' 4", 46 3" tubes, manhole dome	
44"x11' 3", 36 3" tubes, manhole dome	
40"x12', 2 13" tubes, no dome	
38"x15', 34 3" tubes, plug hat dome	
38"x13', 33 2" tubes	
38"x12', 26 3" tubes, manhole dome	
36"x12', 26 3" tubes, plug hat dome	

Throttling Governor Engines, Horizontal

	Appr.
20" x 24" plain slide valve, R. H.	
10" x 24" rocking slide valve, L. H.	
15½" x 24" plain slide valve, L. H.	
12" x 24" plain slide valve, R. H.	
12' x 16" plain slide valve, L. H.	
11" x 24" plain slide valve	
10" x 24' plain slide valve, L. H.	
9" x 22" plain slide valve, R. H.	
10" x 12' plain slide valve, L. H.	
9½" x 10" centre crank, Dutton, N.B.	
9½" x 18" M. Mowry	
8½ x 12" plain slide valve	
9" x 10" Leonard centre crank	

Centrifugal and Rotary Pumps

	Capac. Gals. per
New No. 6 Northey, vertical c.	ntrifugal
No. 6 Horizontal Centrifugal, M	rris
No. 5 Horizontal Centrifugal, M	rris
No. 3 Vertical Centrifugal, M	
New No. 0 Taber Rotary Pump	
New No. 2 Taber Rotary Pump	
No. 0 Taber rotary pump	
No. 0002 Taber rotary pump	

Machinery Headquarters

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

Classified Index of Lines Sold by Advertisers

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

Abrasives

Williams, A. R. Machinery Co., Toronto.

Accountants

Neff & Postlethwaite, Toronto.
Viau, Henri, Montreal.

Acids

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

Air Compressors

Allis-Chalmers-Bullock, Limited, Montreal.
Canada Foundry Co., Toronto.
Canadian Rand Drill Co., Sherbrooke, Que.
Darling Bros., Montreal.
Smart-Turner Machine Co., Hamilton, Ont.

Alum

Leslie, A. C. & Co., Montreal.
Nichols Chemical Co. of Canada, Montreal.

Aluminum

Northern Aluminum Co., Pittsburg, Pa.
Syracuse Smelting Works, Montreal.

Angles, Beams and Girders

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

Aniline Colors and Dyewood Extracts

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

Annealing Muffles and Furnaces (Wire)

Leslie, A. C. & Co., Montreal.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Antimony

Syracuse Smelting Works, Montreal.

Anvils and Vises

Leslie A. C. & Co., Montreal.

Architects

Parke, R. J. Toronto.

Automatic Gear Cutting Machines

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

Axles

Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Babbitt Metal

Greey, Wm. & J. G., Toronto.
Petrie, H. W., Toronto.
Syracuse Smelting Works, Montreal.

Banks

Bank of Hamilton, Hamilton, Ont.

Bar Iron and Steel

Bourne-Fuller Co., Cleveland, Ohio
Leslie, A. C. & Co., Montreal.
London Rolling Mills, London, Ont.
Union Drawn Steel Co., Hamilton, Ont.

Belt Dressing

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

Belt Fasteners

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

Belting (Cotton)

Dominion Belting Co., Hamilton, Ont.
Greey, Wm. & J. G., Toronto.
McLaren, D. K., Montreal and Toronto.
Petrie, H. W., Toronto.
Sadler & Haworth, Montreal and Toronto.

Belting (Leather)

Greey, Wm. & J. G., Toronto.
McLaren, D. K., Montreal and Toronto.
Petrie, H. W., Toronto.
Sadler & Haworth, Montreal and Toronto.
Williams, A. R. Machinery Co., Toronto.

Belting (Rubber)

Greey, Wm. & J. G., Toronto.
Gutta Percha & Rubber Mfg. Co., Toronto.
McLaren D. K., Montreal and Toronto.
Petrie, H. W., Toronto.
Sadler & Haworth, Montreal and Toronto.

Belting and Supplies

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

Blast Furnace Brick

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

CLASSIFIED INDEX.

(CONTINUED).

Blowers

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

Boiler Compounds

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

Boiler Coverings

Imperial Boiler Covering Co., Montreal.

Boiler Inspection

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

BOILERS (See Engines and Boilers)

Bolts and Nuts

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

Building and Paving Brick

Dunbar Fire Brick Co., Pittsburgh, Pa.
Hamilton Facing Mill Co., Hamilton, Ont.
Harbison-Walker Refractories Co., Pittsburg, 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

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

Builders' Materials

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

Burlap (Decorative)

Dominion Oil Cloth Co., Montreal.

Business Methodizers

Gale, Henri, Montreal.

Cables

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

Canada Plates

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

Caps

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Card Clothing

Lovell, D. K., Montreal and Toronto.

Cast Iron Pipe

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

Castings (Grey Iron, Malleable Iron and Brass

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

Cement

Imperial Boiler Covering Co., Montreal

Cement Machinery

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

Centrifugal Pumping Machinery

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

Chain Making Machinery

(Welded Coil Chain)

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

Channels

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

Charcoal Pig Iron

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

Chemicals

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

Chemists

Heys, Thomas & Son, Toronto.

Chemists' Machinery

Greey, Wm. & J. G., Toronto.

Clay Working Machinery

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

Coal, Coke and Charcoal.

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

Coal Cutting Machines

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

Coal Tipples

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

Coil Chains

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

Coke Oven Brick

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

Collection Agency

Petrie, H. D. Hamilton, Ont.

Collectors (Pneumatic)

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

Condensers

Smart-Turner Machine Co., Hamilton, Ont.

Conduits (Interior)

Conduits Company, Limited, Toronto.

Connecting Rods.

Canada Forge Co., Welland, Ont.

Contractors' Machinery

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

Contractors' Plants

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

Conveying Machinery

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

Copper Materials

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

Corrugated Iron

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

Covers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Cranes (Electric and Hand Power)

Smart-Turner Machine Co., Hamilton, Ont.

Crankshafts

Canada Forge Co., Welland, Ont.

Crayons

Lowell Crayon Co., Lowell, Mass.

Crucibles

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

Crucible Caps

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

Cruicible Covers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Cutter Grinding Machines

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

Dashes

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

Dies (Socket, Sewer Pipe and Tile)

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

Directories

Kelly's Directories, Limited, Toronto

Draw Benches (Wire)

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

Dredges

Allis-Chalmers-Bullock, Limited, Montreal.

Drill Chucks

Krug & Crosby, Hemilton, Ont.

Drills

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

Drills (Pneumatic and Rock)

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

Drop Forgings

Globe Machine & Stamping Co., Cleveland, Ohio

Drop Forging Dies

Globe Machine & Stamping Co., Cleveland, Ohio.

Dry Battery Filler

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

Dry Kiln Apparatus

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

Dust and Shavings Separators

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

Dye Stuffs and Chemicals

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

DYNAMOS (See Motors and Dynamos)

Electric Meters and Transformers

Packard Electric Co., St. Catharines, Ont.

Electric Mine Locomotives

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

Electric Transformers

Allis-Chalmers-Bullock, Limited, Montreal.

Electrical Supplies

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

CLASSIFIED INDEX.

(CONTINUED)

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

Electrodes

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

Elevators and Conveyors

Darling Bros., Montreal.
Greey, Wm. & J. G., Toronto.
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)

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

Engineers (Civil)

Parke, R. J. Toronto.

Engineers (Consulting)

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

Engineers (Contracting)

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

Engineers (Electrical)

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

Engineers (Mechanical)

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
Electrical Construction Co., London, Ont.
Fensom, C. J., Toronto.
Greey, Wm. & J. G., 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.
Greey, Wm. & J. G., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.

Engineers (Mining)

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

Engineers and Contractors

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

Engineers' Supplies

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

Engines and Boilers

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Goldie & McCulloch Co., Galt, Ont.
Jenckes Machine Co., Sherbrooke, Que.
Morris Machine Works, Baldwinsville, N.Y
McDougall, John, Caledonian Iron Works Co., Montreal.
Petrie, H. W., Toronto.
Robb Engineering Co. Amherst, N.S.
Sheldons, Limited, Galt, Ont.
Smart-Turner Machine Co., Hamilton, Ont.
Sturtevant, B. F. Co., Boston, Mass.
Williams, A. R. Machinery Co., Toronto.

Engravers

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

Exhaust Fans

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

Exhaust Heads

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

Exhausters

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

Factory Sites

(See Factory Locations.)

Fans

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

Feed Water Heaters

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

Feed Water Purifiers

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Files

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

Fillet (Pattern)

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

Filters (Oil)

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

Filters and Filtering Systems (Water)

Babcock & Wilcox, Limited, Montreal.
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.
Harbison-Walker Refractories Co., Pittsburg, Pa.
Leslie, A. C. & Co., Montreal.
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.
Greey, Wm. & J. G., Toronto.

Forges and Blowers

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

Forgings

Canada Forge Co., Welland, Ont.

Founders

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

Foundry Facings and Supplies

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

Fuel Economizers

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

Furniture (Lodge, Opera and School)

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

Galvanizing

Ontario Wind Engine & Pump Co., Toronto.

Galvanizing and Tinning Machinery and Furnaces (Wire)

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

Gas Blowers and Exhausters

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

Gas and Gasoline Engines

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

Gauges (Recording Pressure)

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

Gauges (Steam)

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

Gauges (Water)

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

Generating Sets

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

Generators

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

Gloves, Mittens and Moccasins

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

Government Notices

Factory Inspectors.
Minister of Agriculture.

Graphite

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

Hack Saws

Krug & Crosby, Hamilton, Ont.

Hames.

McKinnon Dash & Metal Works Co., St. Catharines

Hardware

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

Heating and Ventilating Apparatus

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

High Pressure Blowers

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

Hoisting Engines

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

Hoists (Chain and Pneumatic)

Canadian Rand Drill Co., Sherbrooke, Que.

Hose (Fire and Pneumatic)

Gutta Percha & Rubber Mfg. Co., Toronto.

Hydrants

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

Hydraulic Accumulators

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

Hydraulic Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Canada Foundry Co., Toronto.
Canadian Boomer & Boschert Press Co., Montreal
Darling Bros., Montreal.
Greey, Wm. & J. G., Toronto.
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

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Injectors

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

Insulated Wires and Cables

Phillips, Eugene F., Electrical Works, Montreal.

Insulation, Sound and Cold Storage

Mica Boiler Covering Co., Montreal.

Iron and Steel Specialties

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

Iron and Steel Inspection

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

Lamps—Electric

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

Lathes

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

Lathes (Wood-working)

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

Linoleum

Dominion Oil Cloth Co., Montreal.

Lubricators

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

Machinists

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

Machinists' Supplies

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

Machine Tools

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

Malleable Castings

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

Marine and Stationary Engines and Boilers

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

Mechanical Draft

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

Metal Doors

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

Metal Stamping

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

Metallurgists

Mills, S. D., Toronto.

Mica Coverings

Mica Boiler Covering Co., Montreal.

Mill Machinery and Supplies

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

Milling Cutters and Machines

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

Mining Machinery

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

Motors and Dynamos

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

Motors (Electric)

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

Moulding Sand

Hamilton Facing Mills Co., Hamilton, Ont.

Moulders Supplies.

Hamilton Facing Mill Co., Hamilton, Ont.

Municipal Filtration Plants (Water)

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Nickel

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

Noxzles

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

Office and Bank Fittings

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

Oils and Lubricants

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

Oil Cloth

Dominion Oil Cloth Co., Montreal.

Paint Pigment

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

Paints and Colors

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

Paint and Color Machinery.

Greey, Wm. & J. G., Toronto.

Paper Manufacturers

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

Patents

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

Patterns (Wood and Iron)

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

Perforated Metals

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

Personal Accident

Canadian Casualty & Boiler Insurance Co Toronto

Phosphorizers

McCullough-Dalzell Crucible Co., Pittsburg Pa.

Pig Iron

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

Pipe (Riveted, Iron and Steel)

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

Pipe Threading Machines

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

Pipe Coverings

Mica Boiler Covering Co., Montreal.

Pipes and Tubes

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

Plaster

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

Plates

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

Plumbago

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

Pneumatic Separators

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

Pneumatic Tools

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

Pointer Rolls (For Rods and Wire)

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

Power Plants—Equipments

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

Presses (Tile, Sewer Pipe, Nozzles and Sleeves)

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

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

Canadian Boomer & Boschert Press Co., Montreal
Perrin, Wm. R. & Co., Limited, Toronto

Presses (Hydraulic)

Canadian Boomer & Boschert Press Co., Montreal
Perrin, Wm. R. & Co., Limited, Toronto

Pulleys

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

Producer Gas Plant

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

Pumps and Pumping Machinery

Allis-Chalmers-Bullock, Limited, Montreal
Canada Foundry Co., Toronto.
Canadian Boomer & Boschert Press Co., Montreal

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Darling Bros., Montreal.
Downie Pump Co., Downieville, Pa.
Goldie & McCulloch Co., Galt, Ont.
Jenckes Machine Co., Sherbrooke, Que.
Kerr Engine Co., Walkerville, Ont.
Morris Machine Works, Baldwinsville, N.Y.
McDougall, John, Caledonian Iron Works Co., Montreal.
Ontario Wind Engine & Pump Co., Toronto.
Petrie, Wm. R. & Co., Limited, Toronto.
Petrie, H. W., Toronto.
Smart-Turner Machine Co. Hamilton, Ont.

Punches and Shears

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

Purifiers

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

Purifying and Softening Systems (Water)

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

Railroads

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

Railway Supplies

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

Reamers

Butterfield & Co., Rock Island, Que.

Rivets

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

Rock and Ore Crushers

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

Rolling Mill Engineers

Bourne-Fuller Co., Cleveland, Ohio

Rolls, Chilled Iron and Sand Cast.

Greey, Wm. & J. G., Toronto.

Roofing

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

Rotary Blowers

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

Rubber Goods

Gutta Percha & Rubber Mfg. Co., Toronto.

Rubber Packing

Gutta Percha & Rubber Mfg. Co., Toronto.

Rubber Washing Tubs

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

Rural Mail Boxes

Globe Machine & Stamping Co., Cleveland, Ohio.

Saddlery Hardware

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

Safes and Vaults

Goldie & McCulloch Co., Galt, Ont.

Saw Mill Machinery

Allis-Chalmers-Bullock, Limited, Montreal.

Screws

Gartshore, John, Screw, Limited, Ingersoll, Ont.

Screw Plates

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

Second-Hand Machinery

Krug & Crosby, Hamilton, Ont.

Sewer Pipes.

Dominion Sewer Pipe Co., Swansea, Ont.

Shafting

Bourne-Fuller Co., Cleveland, Ohio
Canada Forge Co., Welland, Ont.
Goldie & McCulloch Co., Galt, Ont.
Greey, Wm. & J. G., Toronto.
Jeffrey Mfg. Co., Columbus, Ohio.
McDougall, John, Caledonian Iron Works Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.

Shear Knives

Dr. Peter Knife Co., Galt, Ont.

Sheets (Iron and Steel)

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

Sheet Metal Goods

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

Sheet Metal Stamping

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

Shovels.

Hamilton Facing Mill Co., Hamilton, Ont.

Signal Contacts

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

Smoke Stacks

McDougall, John, Caledonian Iron Works Co., Montreal.
Robb Engineering Co., Amherst, N.S.
Smart-Turner Machine Co., Hamilton, Ont.

Solder

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

Special Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Fisher Bros., Toronto.
Globe Machine & Stamping Co., Cleveland, Ohio.
Greey, Wm. & J. G., Toronto.
Krug & Crosby, Hamilton, Ont.
Smart-Turner Machine Co., Hamilton, Ont.

Speed Recorders

Bristol Co., Waterbury, Conn.

Sprinkler Insurance

Canadian Casualty & Boiler Insurance Co., Toronto.

Stamps and Stencils

Globe Machine & Stamping Co., Cleveland, Ohio.

Steam, Hot Blast Apparatus

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

Steam Pumps

Allis-Chalmers-Bullock, Limited, Montreal.
Canada Foundry Co., Toronto.
Darling Bros., Montreal.
Goldie & McCulloch Co., Galt, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.
Williams, A. R. Machinery Co., Toronto.

Steam Separators

Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
Morrison, Jas., Brass Mfg. Co., Toronto.
Robb Engineering Co., Amherst, N.S.
Sheldons, Limited, Galt, Ont.
Smart-Turner Machine Co., Hamilton, Ont.

Steam Shovels

Allis-Chalmers-Bullock, Limited, Montreal.

Steam Specialties

Darling Bros., Montreal.
Morrison, Jas., Brass Mfg. Co., Toronto.
Sheldons, Limited, Galt, Ont.
Sturtevant, B. F. Co., Hyde Park, Mass.

Steam Valves

Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
Kerr Engine Co., Walkerville, Ont.
Morrison, Jas., Brass Mfg. Co., Toronto.
Petrie, H. W., Toronto.
Williams A. R. Machinery Co., Toronto.

Steel Rails

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

Steel Shafting

Canada Forge Co., Welland, Ont.
Darling Bros., Montreal.
Goldie & McCulloch Co., Galt, Ont.
Greey, Wm. & J. G., Toronto.
Leslie, A. C. & Co., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Stocks and Dies

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

Stoppers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Structural Steel

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

Sulphate of Alumina

Nichols Chemical Co. of Canada, Montreal.

Suspension Furnaces

Continental Iron Works Co., New York City.

Switchboards

Allis-Chalmers-Bullock, Limited, Montreal.

Systematizers

Viau, Henri, Montreal.

Tanks (Oil and Water)

Canada Foundry Co., Toronto.
Goldie & McCulloch Co., Galt, Ont.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.
Ontario Wind Engine & Pump Co., Toronto.

Taps and Dies

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

Tees

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

Textile Manufacturers

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

Thermometers (Recording)

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

Tin

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

Tool Steel

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

Traps (Steam)

Morrison, Jas., Brass Mfg. Co., Toronto
Sturtevant, B. F. Co., Hyde Park, Mass.

Trucks

Greey, Wm. & J. G., Toronto.
McDougall, John, Caledonian Iron Works Co., Montreal.
Sheldons, Limited, Galt, Ont.

Trucks (Railway)

Canada Foundry Co., Toronto.

Trucks (Wire Mill Supplies)

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

Tubs (Cleaning and Coating Wire)

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

Tumbling Barrels

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

Turbines

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

Upright Drills

Krug & Crosby, Hamilton, Ont.

Valves

Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Canadian Boomer & Boschert Press Co., Montreal.
Kerr Engine Co., Walkerville, Ont.
Morrison, Jas., Brass Mfg. Co., Toronto.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.
Williams, A. R. Machinery Co., Toronto.

Valves (Rubber)

Gutta Percha & Rubber Mfg. Co., Toronto.

Varnishes

Berry Bros., Walkerville, Ont.

Ventilators

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

Wagon and Carriage Wood Work

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

Washers or Hollinders (Cleaning Rubber)

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

Water Purifying Chemicals

Canada Chemical Mfg. Co., London, Ont.

Water Softening Plants

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Wheelbarrows.

Hamilton Facing Mill Co., Hamilton, Ont.

Windmills

Ontario Wind Engine & Pump Co., Toronto.

Wire Mill Supplies

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

Wire and Wire Rope

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

Wire Cloth

Greening, B. Wire Co., Hamilton, Ont.
Greey, Wm. & J. G., Toronto.

Wire Drawing Machinery

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

Wood-Working Machinery

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

Zinc

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

NOTICE The following are the Factory Inspectors for the Province of Ontario:
JAS. T. BURKE, Parliament Buildings, Toronto.
THOMAS KEILTY, Parliament Buildings, Toronto.
ARTHUR W. HOLMES, Parliament Buildings, Toronto.
JOHN ARGUE, Parliament Buildings, Toronto.
MARGARET CARLYLE, Parliament Buildings, Toronto.
MRS. JAS R. BROWN, Parliament Buildings, Toronto.
Persons having business with any of the Inspectors will find them at the above address. HON. NELSON MONTEITH, Minister of Agriculture

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