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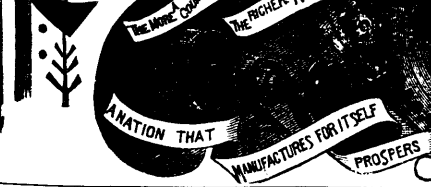
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VOL. 53.

TORONTO, AUGUST 17, 1906.

No. 4.

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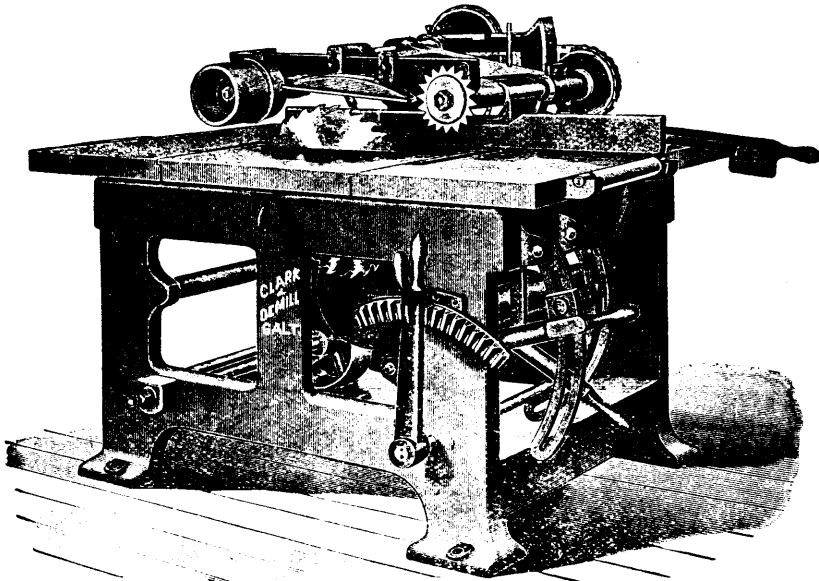
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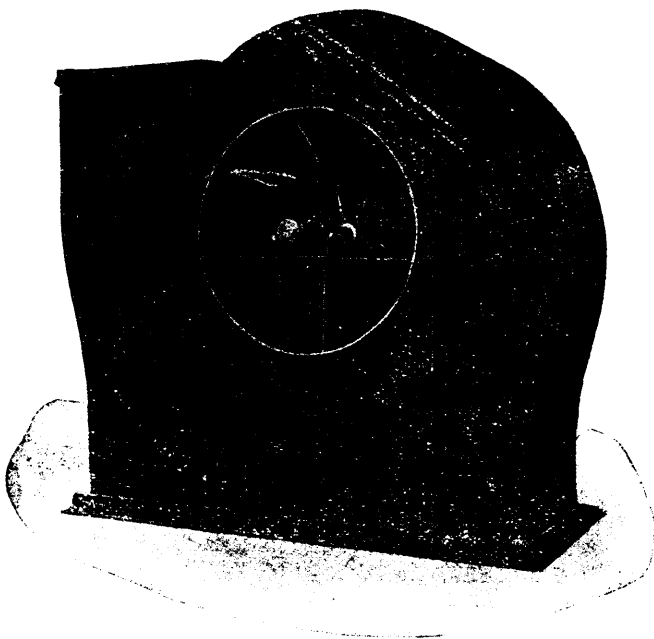
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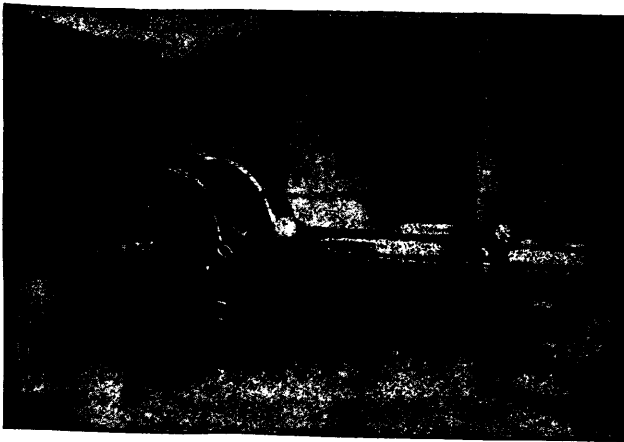
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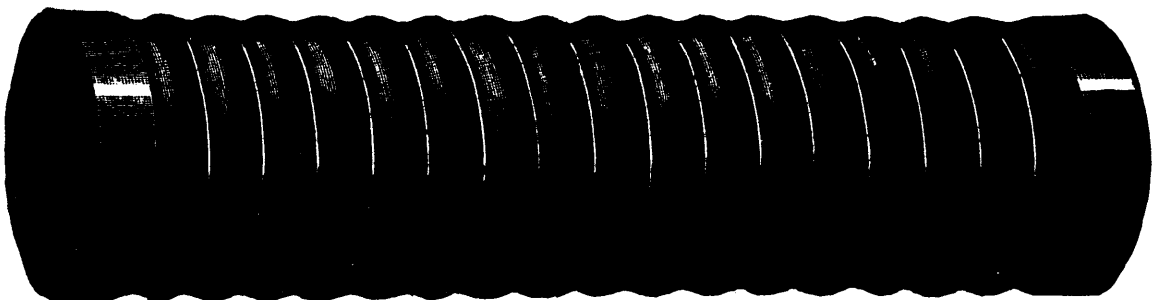


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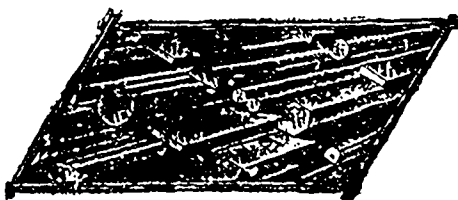
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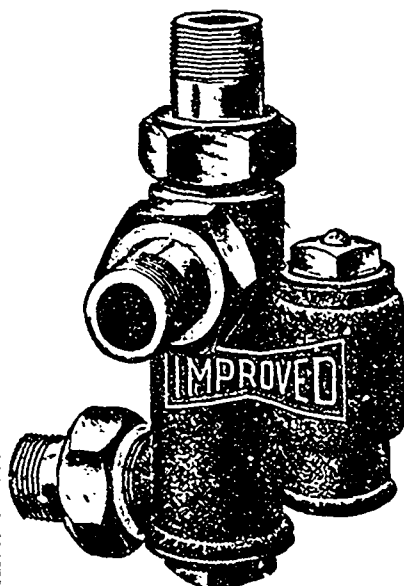
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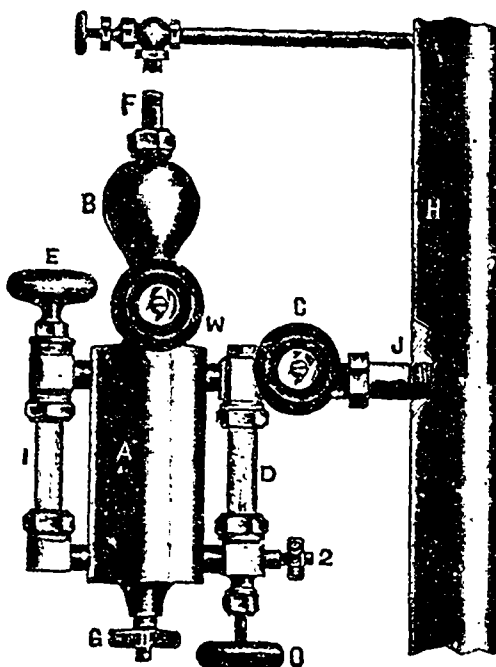
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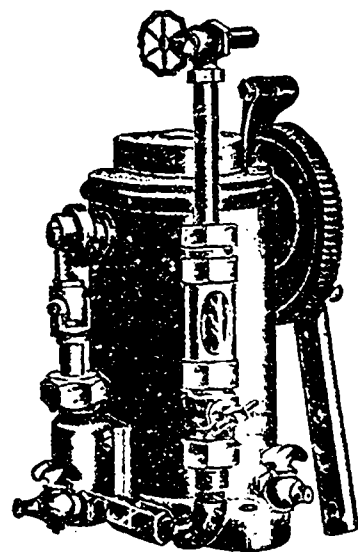
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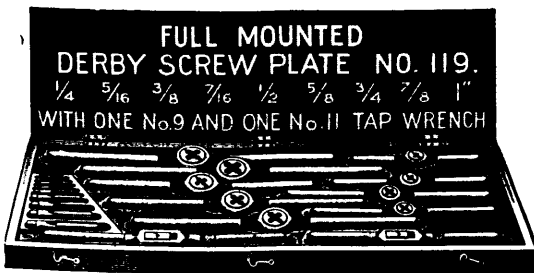
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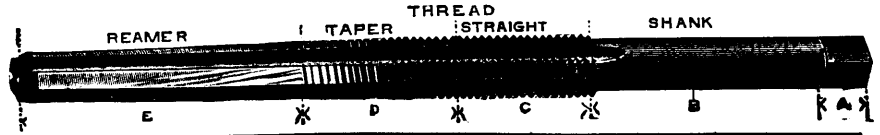


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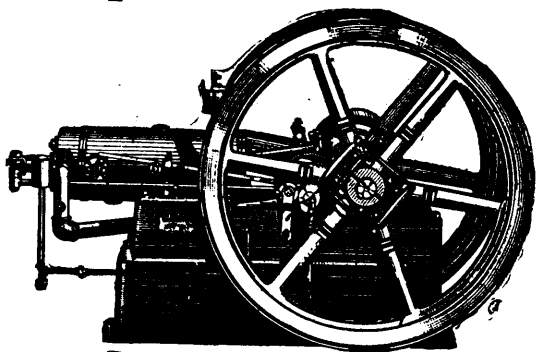
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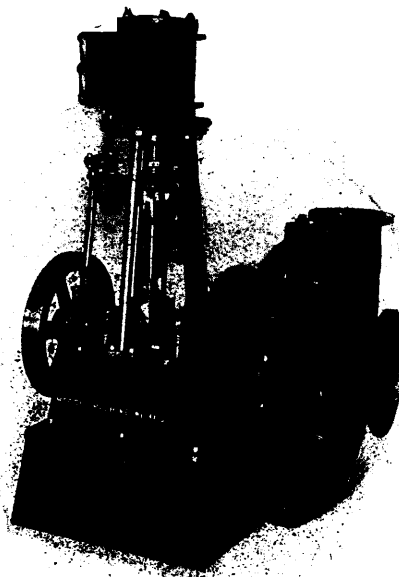
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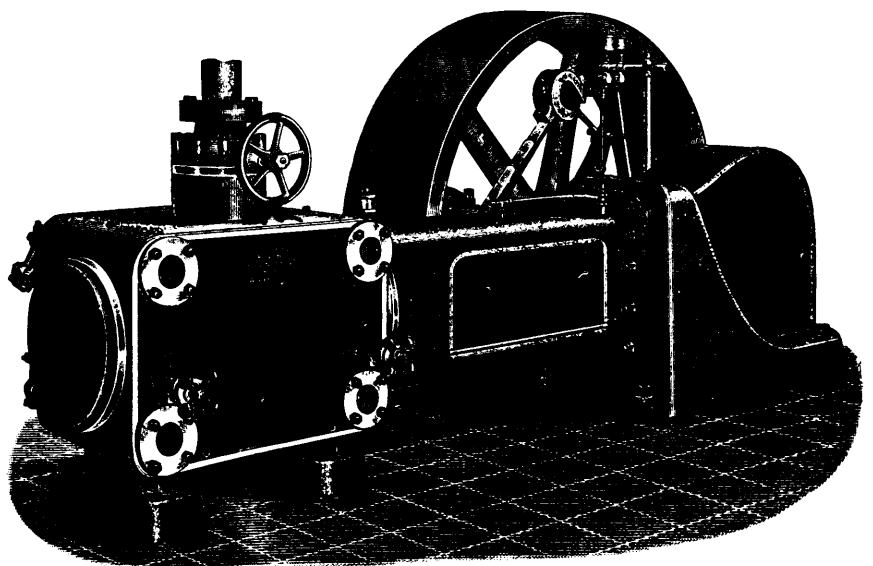


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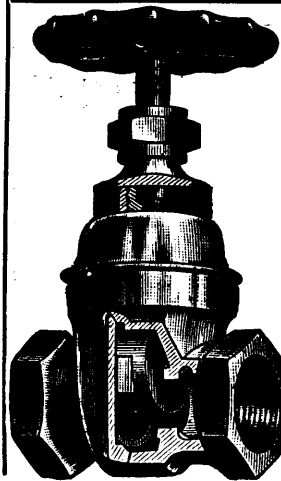
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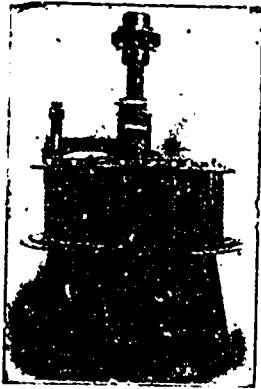
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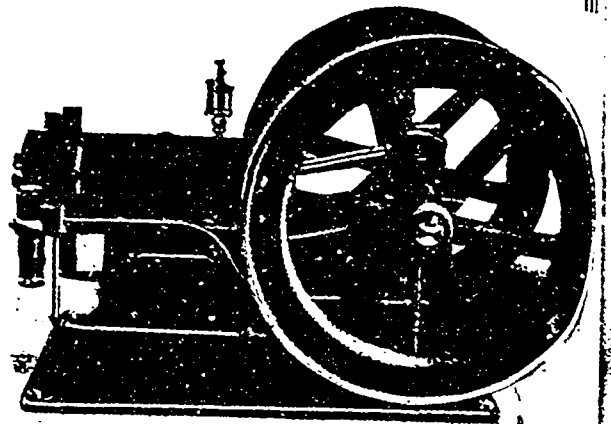
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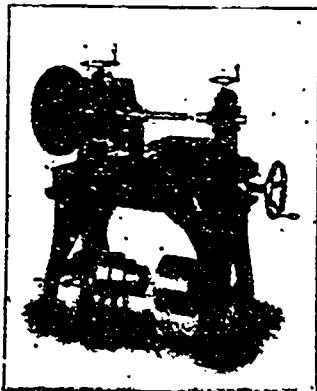


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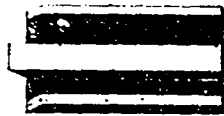
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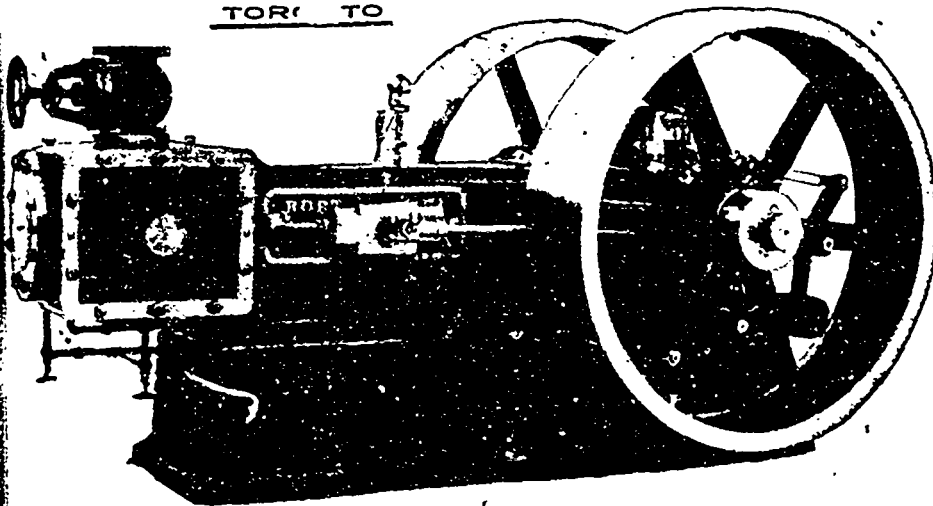
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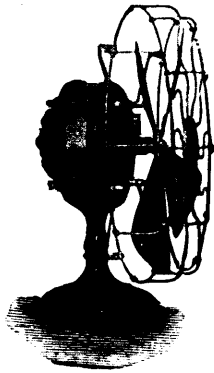
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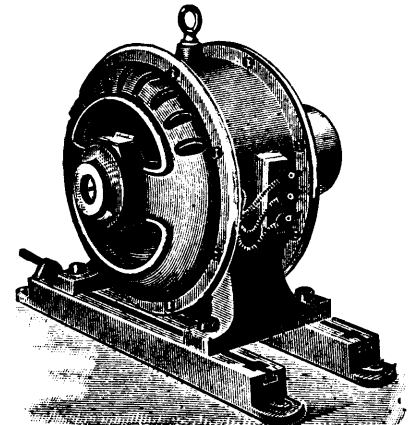
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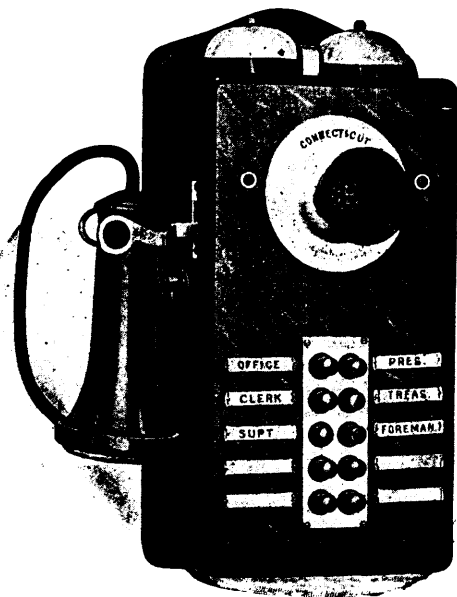
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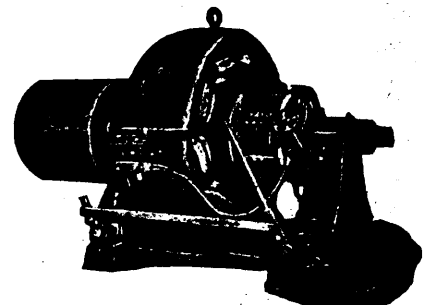
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Manufacturing Plant Number.	Total Horse-Power.	Horse-Power to drive Shafting.	Per Cent. to Drive Shafting.	Manufacturing Plant Number.	Total Horse Power.	Horse-Power to Drive Shafting.	Per Cent. to Drive Shafting.
1.....	400	157	39.2	7.....	40.4	20.7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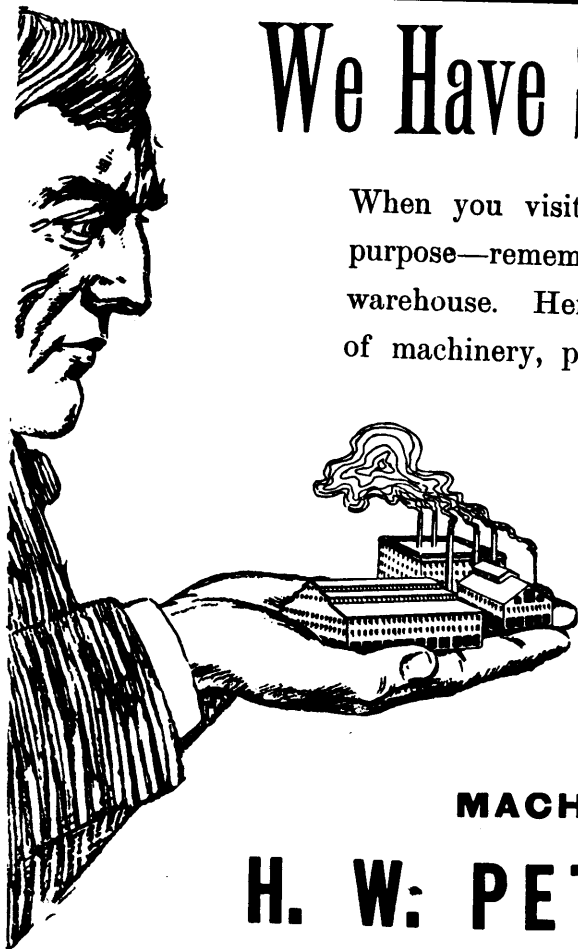
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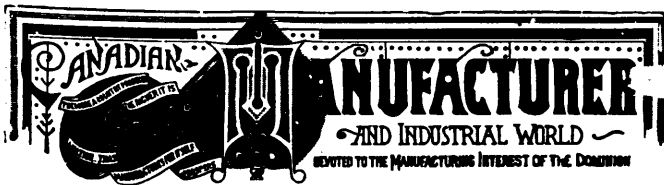
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J. J. CASSIDEY, - - - Editor.
D. O. McKINNON, - - - Business Manager.

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Index to AdvertisersPage 49

THE CHAMBERS OF COMMERCE CONGRESS.

Most of the Canadian delegates to the Congress of Chambers of Commerce of the British Empire recently in session in London have returned home after a most delightful outing, and those who have expressed themselves in the matter are unanimous in saying that what may be called the Canadian resolution regarding preferential trade within the Empire was received with much favor.

The discussion in the Congress on this subject was upon a resolution introduced by Mr. George E. Drummond, of Montreal, which was as follows:—

Whereas in the resolution of the fifth Congress of Chambers of Commerce of the Empire, held in Montreal in August, 1903, it was stated that the bonds of the British Empire would be materially strengthened by a mutually beneficial commercial policy; it is the opinion of this Congress that it is in the interest of the component parts of the Empire that steps should be taken towards consummating such an arrangement. There are in the United Kingdom, her colonies and dependencies, natural resources and industries which, if developed, would be sufficient to provide the British Empire with its food supply and all other necessities and requirements of life.

Be it therefore resolved that this Congress urges upon His Majesty's governments in the United Kingdom and in the various colonies and dependencies the granting of preferential treatment in their respective laws as to customs duties.

Speaking to his resolution Mr. Drummond admitted that the adoption of any policy which would injure Great Britain would be a bad blunder. The policy, whatever the details of it might be, must embody the principle of each for all and all for each. Referring to the fact that Great Britain did so little business in Canada, he urged that this was not the fault of Canada, and insisted that, notwithstanding the preferential tariff which we have already given, it would be necessary to maintain properly equipped industrial establishments of all sorts in Canada. British trade should be pushed and adver-

tised in Canada if British trade with Canada was to be increased.

We are not informed as to the precise number of boards of trade that were represented in the Congress, nor the number of delegates who attended it; but when the vote by chambers was taken on the resolution it disclosed that 104 votes were in favor of it, 41 against its adoption, 21 chambers declining to cast their ballots. It was evident that there were present at the discussion many men of many minds, and although there was a large majority in favor of the resolution, the fact that more than a third of the chambers represented at the Congress declined to endorse it, or declined to vote at all, indicated strongly adverse views. Delegates from Bombay and Bengal, India, opposed the resolution. Lord Avebury declared that though Canada had given Great Britain a substantial preference, Great Britain had given Canada free trade. The first thing in discussing preference was to start upon an equality. A Sheffield delegate declared that advocacy of colonial preference was part of the "protectionist propaganda which would lessen wealth and employment in Great Britain." Sir Samuel Bolton of London intimated that in the discussion London would be neutral—he did not wish Canadians to go away with the idea that London was hostile. A delegate from Australia said that in his country opinion was divided. It was not a burning question there, though if at any time Great Britain should alter her fiscal policy, Australia would respond in a hearty manner. A Melbourne delegate thought the resolution "sentimental, impracticable and impossible." Mr. Hamar Greenwood, M.P., a Canadian, said that it had been decided in Great Britain after a most strenuous electoral campaign in Great Britain, that no protective tariff was to be encouraged there. The government had been put in power by a majority of 350, and maintained that the homeland had a right to settle its own affairs in accordance with the wishes of its people. It was not for Canada to dictate to England. He felt indignant to see Canada continually knocking at the door of Britain in a threatening way. Mr. Drummond, the mover of the resolution, was, before the vote was taken, accorded time to reply, and said that Canada was more anxious on the subject than any other colony because she had at her elbow an aggressive competitor of 80 millions of people. The cry of reciprocity was rising in the United States, and if American reciprocity came it would mean absorption.

Regarding the work of the Congress, Commercial Intelligence, of London, says:—

The outstanding feature of the meeting of the Chambers of Commerce of the Empire was, of course, the animated debate on preferential trade. In another part of this issue we have endeavored to summarize as pithily as possible the chief points raised by the various speakers, and it will be seen that though the discussion was keenly conducted practically nothing new was brought forward and no fresh light was thrown upon the difficult problem. London still maintains its attitude of neutrality, a fact that speaks volumes for the tact and discretion of its management, even if it betrays a certain lethargy that ought not to be associated with an active living commercial organization. Australia appears to be divided,

India suspicious, South Africa frankly complacent. South Africa very properly feels she owes a debt of gratitude to the Mother Country. Canada is enthusiastically and practically whole-heartedly in favor of a change, for Canada has the American peril close at her elbow. Ultimately the voting resulted in a very large majority for fiscal reform.

AS TO RESULTS.

Aside from the social features of the Congresses of Boards of Trade of the British Empire, the one recently held in London being the sixth, it is difficult to see any substantial good resulting from them. As far as propagating a desire for closer trade relations between the Mother Country and the component parts of the Empire, the recent London congress, at which Mr. Drummond's resolution was carried by a good majority, disclosed the fact that irreconcilable differences of opinion existed with many, while with others, particularly delegates from London bodies, the utmost indifference prevailed. Of course quite a number of admirable resolutions were passed, which, if carried into effect would no doubt result in bringing the different parts of the Empire into closer accord than now exists, but judging from the failure of many similar resolutions passed at previous Congresses, no substantial good is likely to result from them. The London delegates seemed to have sized up the situation. They were good entertainers, and while showing the utmost courtesy to the visiting delegates, took but a very perfunctory interest in their resolutions and speech making. No doubt they represented the general sentiment of the British Government and of a preponderating portion of the people of Great Britain. Outside delegates all had their own axes to grind, but John Bull does not seem at all inclined to turn the grindstone. Illustrating this feeling of indifference, if not of contempt at the transactions of the Congress, we find the following in a London paper of recent date, as follows:—

In the Imperial House of Commons on Monday Mr. Lonsdale asked the Prime Minister whether his attention had been directed to the resolution in favor of a system of Imperial preference which was passed, by a majority of three to one, at the meeting of the Congress of Chambers of Commerce of the Empire on Wednesday last, and whether, in the event of this question being brought before the Colonial Conference of next year, the representatives of the Government will be permitted to consider it with an open mind.

Sir H. Campbell-Bannerman, the Premier, in reply, said:—The views of the Government upon this matter have been frequently stated, are well known, and are not likely to change. Of course, any proposals that may be brought forward by the representatives of the colonies at the Conference will receive respectful consideration.

Certainly the Premier of Great Britain is a queer sort of an Empire builder!

The Congress of Chambers of Commerce of the British Empire held sessions in Montreal in 1902, during which a couple of dozen resolutions were discussed and adopted; and we ask our readers to look backward through the intervening years since that time and recall if they can, the subjects of them and the consequent results to the

Empire. Following is a synopsis of the resolutions and what notice the British Government has taken of them:

1. Favoring closer trade relations between the countries of the Empire. Answer.—Great Britain has done nothing.
2. Describing the importance of the food supply to Great Britain from colonial instead of from foreign sources. Answer.—Great Britain has done nothing in the matter.
3. Supporting the idea of a continuous chain of state-owned cables and telegraphic connections to connect all British communities and possessions. Answer.—Great Britain has done nothing in the matter.
4. Urging the freer interchange on more even terms with foreign publications, of the periodicals of British countries. Answer.—Great Britain has done nothing in the matter.
5. Relating to fast steamship and mail service. Answer.—The Canadian Pacific Railway Co. have recently put into service two very fast and most excellent up-to-date steamers, but when expedition is required in business correspondence in this part of Canada at least, letters are marked "via New York."
6. Suggesting legislation throughout the Empire in the encouragement of conciliation boards in connection with labor disputes, etc. Answer.—Nothing has been done.
7. Re assimilation of patent laws. Answer.—Nothing has been done.
8. Protesting against restrictions on importation of Canadian cattle into Great Britain. Answer.—Nothing has been done. The question is hung up indefinitely.
9. Re encouragement of commercial education. Answer.—Nothing done.
10. Approving of colonial participation in the defence of the Empire. Answer.—Great Britain is and always will be willing for Canada to supply men, money, arms, ships and all munitions of war, to be absolutely under the disposal and control of the home government, but, fortunately, Canada does not view it that way. Canada proposes to disburse her own appropriations.
11. Declaring against any future treaty-making which might hamper British countries in arranging their relations to suit themselves. Answer.—Canada clamored for the termination of the old treaty between Great Britain and Germany. That treaty was terminated and a new one made, containing the most favored nation clause; and now Canadian goods pay a much higher rate of duty when entering Germany than that imposed on American goods. A vigorous protest from the British Government would have conserved Canadian interests, but now Canadian trade with Germany has shrunk to insignificant proportions.
12. Objecting to France imposing additional tax on goods from British countries entered through other than ports of the United Kingdom. Answer.—Nothing done.
13. Asking the British Government to take immediate steps to obtain most favored nation treatment for British colonies from countries which grant that treatment

to Great Britain. Answer.—Great Britain steadily and persistently ignores the request.

14. Favoring the extension of commercial treaty rights, and the reorganization of the consular service so as to better promote Empire trade. Answer.—Not yet, not yet.

15. Urging the abolition of British light dues upon merchant shipping. Answer.—Not yet, not yet.

16. Favoring the compulsory adoption of the metric system within the Empire. Answer.—This ridiculous proposition was, very properly, recently turned down by the British Government.

17. Declaring that within the British Empire there are sufficient natural resources to supply the United Kingdom with all its food. Answer.—Any school history of Canada answers the question. Canada can do it.

18. Favoring a preference to British subjects in the granting of contracts for Imperial public works. Answer.—What has Canada got to do with the allotment of contracts for the construction of public works in Great Britain or any other part of the Empire? Why not attend to our own business.

19. Re importance of incorporating Newfoundland with the Canadian Dominion. Answer.—The Canadian Barkis is willing; and whenever the Newfoundland Barkis says the word, the benediction will be pronounced.

20. Approving a unification of the naturalization laws of the Empire. Answer.—A good suggestion badly neglected.

21. Favoring uniform laws for registration and protection of trade marks. Answer.—Another good suggestion badly neglected.

22. Approving the early enactment by the Dominion of a general bankrupt law. Answer.—Respectfully referred to Sir Wilfrid Laurier.

23. Indorsing the British policy of opening up China to trade. Answer.—Great Britain continues to dope China with opium.

24. Re discontinuance of insertion of the London clause in bill of lading. Answer.—For the better understanding of this proposition by the people of Canada a diagram with explanatory remarks is necessary. Referred back to the Congress for further information.

THE UNITED STATES CONSULAR SERVICE.

In April last the United States Congress enacted into a law what was known as the Lodge-Adams bill for the reorganization of the consular service of that country. The reorganization included a Board of experienced and widely known members of the consular service, who were to consider and prepare plans and regulations in the matter. It included Frank H. Mason, consul-general at Paris, chairman; Robert S. Chilton, jr., consul at Toronto; Edward H. Ozmun, consul at Stuttgart; Charles M. Dickenson, consul-general at Constantinople, and George H. Murphy, consular agent at St. Catharines, Ont. The two gentlemen last mentioned are among the five new inspectors of consulates. The Board was instructed to confer freely with Wilbur J. Carr, chief of the Consular Bureau.

Under the instructions issued by Secretary Root for the guidance of the Board, it was charged with the consideration of certain particular topics. The first of these was "Regulations for the New Inspection Service," under which head the Board was to frame such regulations as might be necessary for the purpose of defining the scope and activity of the five new inspectors of consulates. In the new law, which went into effect on June 30 last, provision was made for a salary of \$5,000 per annum to each of the inspectors, plus expenses; and they are to bear the title of Consul-General-at-Large. Under this regulation provision was made for inspection of the books of consulates and instructions to consuls as to how their duties are to be performed. The work that is worth most, or that might be made most valuable in consular offices, is the imparting of methods for doing correct work, particularly in getting at undervaluations, writing reports, answering questions regarding the manufacture and disposal of goods, investigating foreign systems of credit, industrial education and the like. Nowhere in the world is there greater need of good work in the way of suggestion, instruction and systemization along these lines than in any consular service; and the performance of consular duties should never degenerate into a perfunctory routine.

The second topic upon which the reorganization Board was required to report was "The Relation Between Consulates and the Embassies or Legations in the Countries where They are Located." This is a point regarding which there has been heretofore no fixed rule, the matter being left largely to individual discretion and judgment. In general, however, the diplomatic and consular services have been regarded as distinct and independent branches of the service. It has often happened that an ambassador or minister has, of his own initiative, undertaken to look after the various consulates in the country to which he is accredited, with the most beneficial results. As a rule, however, there has been little or no official connection between the two branches of the service, and the Board performed a most useful task in establishing definitely such principles or regulations as in its judgment it deemed desirable regarding this point of official procedure.

The third topic presented to the Board was the framing of "The Rules which Govern Promotion and Appointment." Congress failed to pass any clause in the bill providing for the establishment of a merit system in consular appointment and promotion, and the Board recommend the adoption by the Secretary of State of a system whereby a consul may be promoted for good service or transferred from one post to another as a result of his proven adaptability for certain work.

The fourth topic considered was "The Scope and Character of Examination for New Appointments," and the Board framed such rules as the personal experience of its members suggested, supplementary to those already promulgated by Secretary Root some time ago, which require that the applicant shall have a knowledge of more than one language, and must possess other special qualifications for consular work.

The fifth topic was "The Tariff of Fees for Consular Services." Formerly, these fees were arbitrarily fixed by law, but changes are now possible under the discretion conferred upon the president. The commercial world is especially interested in the possibility that charges for invoices may be modified so as to correspond to their length and complexity, and there are many similar points wherein the Board can effect important improvements.

The sixth and last topic considered was "Amendments of Existing Regulations Rendered Necessary or Expedient by the New Statute." As the law of 1906 is the first important change in the statutes regarding the consular service that has been enacted for more than half a century, it is only natural that many minor modifications in the regulations should be made necessary as a result of the new measure.

The intimate commercial relations that exist between Canada and the United States and which are becoming closer and more important every year, as shown in the statistical reports of both countries, emphasize the interest Canada naturally feels in this move on the part of the government of the United States to improve its consular service. It is true that the number of American consuls now stationed in Canada is not as large as it has heretofore been, it being the opinion of that government that even considering the rapidly increasing trade between the two countries, greater efficiency of service rather than numbers of consuls is more to be desired; and whatever the consuls who are stationed in Canada may have to report to their government concerning affairs in this country, we may be sure there will be no misrepresentations nor overdrawn statements. No better evidence of the ability of the gentlemen composing the Board appointed to study and report upon the complex questions submitted to them, in which Canada is more or less interested, than to know who some of them at least are.

The chairman of the Board, Col. Mason, is an old newspaper man well known to most Canadian readers by his writings on economic questions. He entered the consular service of his country by appointment of President Hays in 1880, and it was while serving as consul-general at Frankfort-on-the-Main that he first began to achieve distinction, his reports on industrial, commercial and economic subjects winning for him world-wide recognition as a keen observer and able writer.

Mr. Robert S. Chilton, jr., now United States consul at Toronto, is one of the best equipped men in the consular service of his government. His record shows that in 1876 he entered the service as a temporary clerk in the Department of State, and was advanced rapidly on merit until in 1888 he reached the highest grade, Class 4, from which he resigned to accept an appointment as private secretary to Vice-President Morton. In 1893 he became chief clerk of the Department of State, and then confidential clerk to the Assistant Secretary of State. From 1896 to 1902 Mr. Chilton acted as chief of the Consular Bureau, and served for a period as special inspector of consulates on the appointment of Mr. Hay as Secretary of State during the administration of President McKinley. In March, 1905, Mr. Chilton was appointed consul at

Toronto, and now this long and exceptionally brilliant series of promotions reaches its climax in his appointment as a member of the Consular Reorganization Board. In 1895 Mr. Chilton made an official tour of the world, inspecting consulates and making recommendations that resulted in most salutary and important reforms in the service.

Mr. George H. Murphy became consular agent for the United States at St. Catharines, Ont., in March, 1905, but under the reorganization that consulate ceased to exist in June, 1906. Mr. Murphy was appointed a consular clerk at Washington in 1886, and during his twenty years of service has had a most extensive consular experience both in Europe and elsewhere. Under the Lodge-Adams bill Mr. Murphy has become one of the five inspectors of American consulates, for which he possesses fine qualifications.

Without doubt the most important feature of this reorganization of the consular service of the United States is the fact that all the consuls of every class are paid a fixed salary, and that none of them are allowed to receive any fees whatever for any service that they may perform; another most important feature being that any additions to the number must be at the foot of the list, promotion to be by merit alone.

ALCOHOL AS FUEL.

It is not at all probable that the Dominion Government will enable the would-be users of alcohol as a fuel to obtain the article in this country as cheaply as it will be in the United States after January 1 next. Under existing laws, which cannot be changed except by Act of Parliament, the Department of Inland Revenue have an entire monopoly of the manufacture of denatured alcohol, carried on exclusively at works in Ottawa, and only sold to the public at \$1.50 per gallon, packages and freight charges extra. Of course the price makes the use of the article prohibitory; and therefore manufacturers and others who would otherwise use large quantities of it if it could be had as cheaply as it soon will be in the United States, must remain at the tail end of the procession until the Dominion Government can make it convenient to conform with the new conditions.

According to an American contemporary the use of alcohol as fuel opens vast possibilities in many industrial pursuits in that country, in which the farmer will profit largely as well as the manufacturer. It tells us that the efforts of the commercial and industrial interests of the country to adjust their minds for a contemplation of the immense possibilities for commercial development which are opened up by the denatured alcohol bill are just beginning. It seems to be opened up by the virtual revolution in manufacturing processes generally, including a new era in the agricultural world. Cheapening of the cost of manufacturing of numberless articles is perhaps the most important development to be expected. New processes of manufacture will call for the introduction of new forms of apparatus. The opportunity to utilize certain farming products, which have hitherto been cast aside as worthless, will stimulate new lines of activity

in the farming sections, provide thousands of tillers of the soil with new sources of income, and result in a demand from them for new equipment, with which to conduct their new enterprises.

Whatever effect this may have on home trade, it is bound, it says, to exert an equally great influence upon foreign trade, revolutionizing prices of numerous articles now exported in large quantities, and cheapening the cost of making other lines of goods to a point where these goods can hereafter be made in the United States, whereas it has always been necessary heretofore to import them from Europe. Conspicuous instances of what may be anticipated in this direction is afforded by the business in aniline dyes. The Germans have always had a complete monopoly in the preparation of aniline dyes, supplying practically all of the material used in the European and American textile industries. This is because by the use of alcohol they have been able to make the dyes so much cheaper than has been possible elsewhere.

As a direct result of the removal of the tax upon commercial alcohol, there will be erected throughout the United States hundreds of distilleries, which will be found wherever potatoes, corn, sugar cane or beets are grown on an extensive scale. One interesting evidence of what is expected from the industrial development which will be made possible by the use of grain alcohol is contained in the announcement that a large manufacturing establishment in the West has already enlarged its plant for making gas engines, so that it will soon be able to make not less than 20,000 engines a year. Several other companies have also made preparations to do the same thing on a somewhat smaller scale.

It is reasonable to expect that fuel stations for the distribution of alcohol will be located throughout the country just as petroleum tanks are now. As alcohol motors can be used much more cheaply than animal power on farms, it seems certain that they will be largely substituted for horses and that they will at the same time cut down the amount of manual labor which has always been one of the most trying features of farm work.

The possibilities of alcohol as a household fuel are engaging the attention of another large class of manufacturers. It is estimated that grain alcohol can be produced and sold at 15 cents a gallon at a fair profit. This estimate is based on the experience in such countries as Germany, where it is a staple product at present. Germany already has a successful lamp burner, with a Welsbach mantle, which gives a most satisfactory light from alcohol, and when alcohol is once introduced as a household lighting agent, some way is certain to be found for its use in cooking stoves, where it would have many advantages, because it radiates so little heat, produces no soot and is free from the disagreeable odors so unpleasantly associated in the mind with kerosene and gasoline.

Referring again to its use in the production of power, it is to be said to the credit of alcohol that it works admirably in all respects, giving very clean combustion, producing little wear and tear on the engine, and in other ways recommends itself so highly, that all arguments seem to be in favor of it.

Probably the new fuel will in the end be a greater boon to the farmer than to anyone else, first, by providing him with an income from products, which have previously been thrown away as of no value, and second, by supplying him with a new and economical means of power. Potato raisers, for instance, can now sell their entire product, for all potatoes can be used for alcohol manufacture, regardless of their flavor or size, whereas the farmer has previously been able to sell only the most perfect part of his crop. From 300 bushels of potatoes about

225 gallons of alcohol can be obtained, meaning that an acre of potatoes produces very much more alcohol than an acre of corn.

The enumeration of the possibilities under the new state of affairs might be amplified indefinitely, and at this time about all that can be said is that the entire agricultural and industrial community must take warning that a great revolution is coming, which will mean thousands of dollars of wealth to those who first grasp the opportunities, and prepare to conform their interests to the new conditions.

EDITORIAL NOTES.

When the full facts regarding British and United States trade in Canada during the last fiscal year are shown in detail it will be developed that despite the trade barriers between the Dominion and our neighbors, that the growth of business with the United States, as compared with Britain, is very remarkable. It is undoubtedly true, whatever may be done to foster Canadian trade with Great Britain, and however much imperial and patriotic sentiment may desire its increase, that many considerations will to a large extent offset any advantages that tariffs, or shipping preferences or other ingeniously devised schemes may give the mother country as against the United States. There is the fact that it is our neighbor to begin with, that a few hours at most separate the trading and manufacturing centres of the two countries. A trip from one country to the other is no more regarded by the citizens of either in the light of a journey to a foreign country than is a trip from Ontario to Quebec so regarded by a Canadian. Cleveland, Buffalo and Boston are just across the way from Toronto and Montreal. St. Paul and Chicago are nearer Winnipeg than Toronto, and Seattle and San Francisco are closer to Vancouver and Victoria than is Winnipeg. To get goods from Great Britain is a work of months; to get them from across the line that of days only. Goods of United States manufacture suit the Canadian market—those from Britain do not always do so to nearly the same degree. We commend these conditions to Mr. Grigg, the commissioner of the British Government, who is now touring Canada in an endeavor to discover why British products are not in as good demand in Canada as those made in the United States.

The question as to whether or not the embargo now imposed upon the importation of Canadian cattle into Great Britain should be removed is by no means dead in that country. Recent revelations regarding the sources and nature of people's food have given life to this all-important problem and create an opportune moment for drawing the attention of the British people to the fact that one great source of healthy food supply is subjected to regulations which seriously handicap it. The one ostensible reason why this embargo was in the first place imposed, was a groundless suspicion as to the unhealthy condition of the Canadian herds. Action in the first place was taken by a Conservative government in Great Britain as a departmental regulation only; but subsequently the same government made it statutory, so that before any change can take place an act will have to pass not only the House of Commons but the House of Lords. This latter body is mindful of the interests of the landlords, who fear that by the importation of Canadian store cattle the price of the British raised stock would decline. It is, therefore, nothing more nor less than a measure of protection imposed by a Conservative government and allowed to stand by a Liberal government, despite the loud Liberal protestations regarding taxation of the people's food.

Exhibitors at the Canadian National Exhibition.

TO BE HELD AT TORONTO, AUGUST 27 TO SEPTEMBER 10, 1906.

Judging from the list of exhibitors and from the interest manifested in the exhibition by manufacturers, the Canadian National Exhibition of 1906 will be larger and more representative of Canadian industry—and especially of manufacturing—than even the brilliant successes of former years.

Below we give a complete list of the exhibitors. This list is official and is here published for the first time:

MANUFACTURERS' SECTION.

Macey Co., (Adams Furniture Co.), Grand Rapids, Mich.
 Authors & Cox, Toronto.
 American Cereal Co., Chicago.
 Anglo-American Leather Co., Toronto.
 Atlantic Soap Co., Toronto.
 Armour, Limited, Toronto.
 Burton's Music House, Toronto.
 Brinton Carpet Co., Peterborough, Ont.
 Bates Mfg. Co., Limited, Toronto.
 Borden's Condensed Milk, Montreal.
 Berliner Gramophone Co., Montreal.
 Walter Baker Co., Limited, Boston, Mass.
 Bovril, Limited, Montreal, Que.
 Brunswick-Balke-Collender Co., Toronto.
 Berlin Rubber Mfg. Co., Limited, Berlin, Ont.
 Blue Ribbon Tea Co., Toronto.
 Cudaby Packing Co., South Omaha, Neb.
 Canadian Rubber Co., Limited, Montreal, Que.
 Cairns, R., Toronto.
 Canadian Aluminium Works, Limited, Chambly Canton, Que.
 Crown Mfg. Co., Limited, Toronto.
 Carling Brewing Co., Toronto.
 Canadian Time Recording Co., Toronto.
 Computing Scale Co., Limited, Toronto.
 Canadian Gelatine Co., Toronto.
 Canadian Shredded Wheat Co., Toronto.
 Cowan Co., Limited, Toronto.
 Capewell Horse-Nail Co., Toronto.
 Christie Brown Co., Toronto.
 Defender Photo Supply Co., Toronto.
 Dalton Bros., Toronto.
 Dominion Organ & Piano Co., Limited, Bowmanville, Ont.
 Dunlop Tire Co., Toronto.
 Dominion Canister Co., Limited, Dundas, Ont.
 Egg-o-See Cereal Co., Toronto.
 East & Co., Toronto.
 Edwardsburgh Starch Co., Toronto.
 Eureka Refrigerator Co., Toronto.
 Fry & Sons, Toronto.
 Fairweather, J. W. T., & Co., Toronto.
 Globe Wernicke Co., Stratford, Ont.
 Gold Medal Furniture Mfg. Co., Toronto.
 Gowans, Kent & Co., Limited, Toronto.
 Gillett, E. W. Co., Limited, Toronto.
 Heintzman, Gerhard, Limited, Toronto.
 Heintzman & Co., Toronto.
 Heinz, H. J., Co., Pittsburgh, Pa.
 Hunt, H. W., & Co., Toronto.
 International Gas Appliance Co., Toronto.
 Imperial Varnish & Color Co., Toronto.
 Irving Umbrella Co., Toronto.
 International Stock Food Co., Toronto.

Ishikawa, K., & Co., Toronto.
 Ingersoll Packing Co., Ingersoll, Ont.
 Keith & Fitzsimons Co., Limited, Toronto.
 Kent, Ambrose & Sons, Limited, Toronto.
 Karn, D. W. Co., Limited, Woodstock, Ont.
 Kay, John, Son & Co., Toronto.
 Love, H. H. & Co., Toronto.
 Lever Bros., Limited, Toronto.
 Library Bureau of Canada, Toronto.
 Leeming Miles Co., Limited, Montreal, Que.
 Maclure & Langley, Toronto.
 Menzie Wall Paper Co., Toronto.
 Metallic Roofing Co., Toronto.
 Minto Bros., Toronto.
 Marshall Sanitary Mattress Co., Toronto.
 Mason & Risch Piano Co., Toronto.
 May, Samuel, & Co., Toronto.
 McGregor Harris Co., Limited, Toronto.
 Martin-Orme Piano Co., Limited, Ottawa.
 MacLaren, A. F., Imperial Cheese Co., Toronto.
 Malta Vita Pure Food Co., Toronto.
 Mack, C. W., Toronto.
 Morrice Sons & Co., Limited, Toronto.
 Mendelssohn Piano Co., Toronto.
 McLaughlin, J. J., Limited, Toronto.
 Nordheimer Piano & Music Co., Toronto.
 Newcombe Piano Co., Toronto.
 National Cash Register Co., Toronto.
 Ontario Lead & Wire Co., Limited, Toronto.
 Office Specialty Mfg. Co., Toronto.
 Packard, L. H., & Co., Montreal, Que.
 Patrick, W. G., & Co., Toronto.
 Peterborough Cereal Co., Limited, Peterborough, Ont.
 Pure Gold Mfg. Co., Toronto.
 Richardson, A. S., Toronto (62 Hayter St.)
 Rogers, C. & Sons, Limited, Toronto.
 Red Feather Tea Co., Toronto.
 Ryrie Bros., Limited, Toronto.
 Robertson, Jas., Co., Limited, Toronto.
 Stewart Co., Limited, Toronto.
 Strachan Bros., Toronto.
 Singer Sewing Machine Co., Toronto.
 Smith, Baggs & Heaven, Toronto.
 Scott Knitting Co., Toronto.
 Sovereign Perfume Co., Toronto.
 Stanley, Frank, Toronto, (14 Temperance).
 Standard Silver Co., Limited, Toronto.
 Sherlock-Manning Organ Co., London, Ont.
 Taylor, John, & Co., Toronto.
 Toronto Brass Mfg. Co., Toronto.
 United Typewriter Co., Limited, Toronto.
 Upton, Thos., & Co., Limited, Hamilton, Ont.
 Toronto Carpet Mfg. Co., Toronto.
 Walker, Stan., Toronto.
 Walker Parker Co., Limited, Toronto.
 Whaley Royce & Co., Limited, Toronto.
 Williams Piano Co., Oshawa, Ont.
 IMPLEMENT AND PROCESS BUILDING.
 Adjustable Axle Nut Co., London, Ont.
 Adams Wagon Co., Brantford, Ont.
 Adams Launch & Engine Mfg. Co., Penetang, Ont.
 Anherst Foundry Co., Toronto.
 Berlin Woodenware Co., Berlin, Ont.
 Bowser, S. F., & Co., Toronto.
 Biessel, T. E., Elora, Ont.
 Chamberlain Metal Strip Co., Kingsville, Ont.

Burroughs Adding Machine Co., Toronto.
 Cameron & Campbell, Toronto.
 Colwell Mfg. Co., Oakville, Ont.
 Crouse, Maud M., Denver, Col.
 Cambridge Society of Canada, Limited, Montreal, Que.
 Century Telephone Construction Co., Buffalo, N. Y.
 Columbia Phonograph Co., Toronto.
 Canada Cabinet Co., Limited, Toronto.
 Chestnut, H. & Sons, Fredericton, N.B.
 Chatham Wagon Co., Chatham, Ont.
 Dorenwend Co., Toronto.
 Dominion Sewer Pipe Co., Swansea, Ont.
 Dean, Walter, Toronto.
 Defiance Iron Works, Chatham, Ont.
 Dain Mfg. Co., Preston, Ont.
 Dominion Wrought Iron Wheel Co., Orillia, Ont.
 Davis Acetylene Co., Limited, Toronto.
 Economic Power, Light & Heat Supply Co., Limited, Toronto.
 Elliott Mfg. Co., Toronto.
 Ford & Featherstone, Hamilton, Ont.
 Fleming Aerial Ladder Co., Toronto.
 Little Giant Sprayer Co., Toronto.
 Gilmour Door Co., Trenton, Ont.
 Grimm Mfg. Co., Montreal, Que.
 Wright, A. H., Toronto.
 Hamilton Incubator Co., Hamilton, Ont.
 House, J. F., Toronto.
 Hillock, Jno., & Co., Toronto.
 Hobbs Hardware Co., Toronto.
 International Stock Food Co., Toronto.
 Intensified Light & Sugar Soda Co., Toronto.
 Jones Register Co., Toronto.
 Jackson Wagon Co., St. George, Ont.
 Johnston's, Limited, Toronto.
 Kemp Mfg. Co., Toronto.
 Le Page Door Check Mfg. Co., Toronto.
 Luxfer Prism Co., Toronto.
 Loudon Machinery Co., Guelph, Ont.
 McIntyre, D. K., Furniture Co., Tilsonburg, Ont.
 McDonald & Wilson, Toronto.
 Muir, R. Stewart, Toronto.
 Monteith-Nixon, Limited, Toronto.
 Macdonald Mfg. Co., Limited, Toronto.
 Miller Reversible Engine Co., Toronto.
 McKeough & Trotter, Chatham, Ont.
 Metal Shingle & Siding Co., Preston, Ont.
 Manson Campbell Co., Limited, Chatham, Ont.
 McGregor, W. E. & Co., Toronto.
 Nicholls Bros., Limited, Toronto.
 New-Way Motor Co., Brighton, Ont.
 Ontario Rubber Co., Limited, Toronto.
 Ontario Spring Bed & Mattress Co., London, Ont.
 Ontario Wind Engine & Pump Co., Toronto.
 Mount Forest Carriage Co., Mount Forest, Ont.
 Paris Plow Co., Limited, Paris, Ont.
 Pickford & Black, Halifax, N.S.
 Speight Wagon Co., Markham, Ont.
 Stromberg Carlson Telephone Mfg. Co., Toronto.
 Smith, Lyman C., Oshawa, Ont.
 Steel Trough & Machine Co., Tweed Ont.
 Spramotor Co., London, Ont.
 Sherman Cooper Co., Toronto.

Shurley & Dietrich, Galt, Ont.
Tobique Gypsum Co., Plaster Rock, N.B.
Weir Wardrobe Co., Mount Forest, Ont.
Wetlaufer Bros. & Sons, Stratford, Ont.

TRANSPORTATION BUILDING.

Armstrong, J. B., Mfg. Co., Limited, Guelph, Ont.
Barrie Carriage Co., Barrie, Ont.
Brantford Carriage Co., Brantford, Ont.
Campbell, John & Sons, London, Ont.
Canada Carriage Co., Brockville, Ont.
Greer, A. B., London, Ont.
Gray, Wm. & Sons Co., Chatham, Ont.
Honey, E. N., & Co., Limited, Montreal.
Loehrie, Jas., Toronto.
Munro & McIntosh Co., Alexandria, Ont.
McKue, R., Buggy Co., Plattsville, Ont.
Mitchell & Co., Ingersoll, Ont.
Simpson, I., Mfg. Co., Brantford, Ont.
Tudhope Carriage Co., Orillia, Ont.

GALLERY TRANSPORTATION.

Conboy Carriage Co., Toronto.
Canadian Rubber Co., Montreal.
Durham Rubber Co., Bowmanville, Ont.
Dewey Carbon Paint Co., Toronto.
Guelph Carriage Top Co., Guelph, Ont.
Imperial Varnish & Color Co., Toronto.
Langmuir, Jos., & Co., Toronto.
Kloepfer, C., Toronto.
Montreal Rolling Mills Co., Montreal.
Rudd, Geo., & Co., Toronto.
Saywell, S. G., & Son, Toronto.
Press, Samuel, & Co., Toronto.
Toronto Pole & Shaft Co., Toronto.
Tisdale Iron Stable-Tillings Co., Toronto.
Wire-Woven-Wood Mfg. Co., Limited, Woodbridge, Ont.
Watson, T. H., Greenwood, Ont.

STOVE BUILDING.

D. Moor Co., (Adams Furniture Co.), Hamilton, Ont.
Bowman Gas Range Mfg. Co., Toronto.
Canada Stove Works, Harriston, Ont.
Gundy Stove Co., Limited, Guelph, Ont.
Guelph Stove Works, Guelph, Ont.
Gurney-Tilden Co., Limited, Hamilton, Ont.
Joy Mfg. Co., Toronto.
Moffat Stove Co., Weston, Ont.
Pease Foundry Co., Limited, Woodstock, Ont.
Wrought Iron Range Co., Toronto.

MACHINERY HALL.

Babcock & Wilcox, Limited, Toronto.
Consolidated Electric Co., Toronto.
Canadian Fairbanks Co., Toronto.
Canada Metal Co., Toronto.
Canadian Bearings, Limited, Hamilton, Ont.
Cameron, Hugh, & Co., Toronto.
Carey Mfg. Co., Toronto.
Dunham Belting Co., Limited, Hamilton, Ont.
Dodge Mfg. Co., Toronto.
Economic Mfg. & Supply Co., Limited, Toronto.
Fisher, A. D., Co., Limited, Toronto.
Goshl, Shapely & Muir Co., Limited, Brantford, Ont.
Garlock Packing Co., Hamilton, Ont.
Gibson & McCulloch Co., Galt, Ont.
Jones & Moore Electric Co., Limited, Toronto.
Long, E., Mfg. Co., Orillia, Ont.
Morrison, Jas., Brass Co., Toronto.

McLaren, D. K., Montreal, Que.
Petrie, H. W., Toronto.
Shantz, I. E., & Co., Berlin, Ont.
Tallman, J. N., & Sons, Hamilton, Ont.
Toronto & Hamilton Electric Co., Hamilton, Ont.
United Electric Co., Limited, Toronto.
Williams, A. R., Machinery Co., Toronto.
Wilson, C., & Son, Toronto.

MANUFACTURERS' ANNEX.

Alert Portrait & "Foto" Cushion Top Co., Toronto.
English Neophone, Limited, (A. W. Bennett), Toronto.
Bach Specialty Co., Toronto.
Cooper, J. D., & Sons, Toronto.
Dunn, W. H., Toronto.
Dafoc, M. M., Toronto.
Foster Armstrong Co., Berlin, Ont.
Grimm Mfg. Co., Montreal, Que.
Giant Mfg. Co., Limited, Toronto.
Eureka Toilet Co., Toronto.
Hurley Machine Co., Chicago, Ill.
Knaggs, William, Toronto.
Lawson, E. H., Toronto.
Lyon Mfg. Co., Limited, Toronto.
MacFarlane, G. W., Toronto.
Majestic Polishes, Limited, Toronto.
Monarch Typewriter Co., Limited, Toronto.
Nugget Polish Co., Toronto.
Peace, W. L., Hamilton, Ont.
Raines & Co., Toronto.
Rice, Dr. W. S., Toronto.
Smart-Turner Machine Co., Limited, Hamilton, Ont.
Stacey, Chas. E., Toronto.
Tuschel Miller Co., Toronto.
White, Ehlhard & Co., Toronto.
White Sewing Machine Co., Cleveland, Ohio.
Williams Mfg. Co., Toronto.

SWEDISH VIEW OF ELECTRIC SMELTING OF IRON.

In a paper read before Fjarde Allmanna Ovenska Tekniker Motet or Swedish Technical Congress, in Norkoping, Sweden, and published in the Teknisk Tidskrift Technical Journal, No. 30, for the year 1906, Prof. E. G. von Odelstierna, comments as follows regarding the consequences of the electric smelting experiments made at Sault Ste. Marie under Government auspices:—

"The iron industry of Canada in certain ways resembles that of Sweden, viz., 1st: The largest number of the iron ore deposits are magnetites, very similar to certain of our Swedish ores, as shown at the Chicago exhibition in 1893, where we Swedish jurymen with some what painful feelings studied the Canadian iron ore exhibit. The exhibit consisted of only small samples, but from 70 different localities from all parts of the country. The specimens exhibited were mostly rich crystalline magnetites. 2nd: The large deposits of magnetite seem in general to be located at great distances from the coal deposits, but in localities where abundance of good wood for charcoal is available. 3rd: Canada possesses in these localities large water-powers.

"There is no doubt in my mind that Canada will develop in the near future a large iron industry, as already stated in my report on the exhibition in Chicago, and whatever doubt there was is now entirely removed when witnessing the energetic

steps taken by the Government of Canada in later years to reach this aim.

"CANADA A DANGEROUS COMPETITOR.

"I require, therefore, now to add that this expansion of the iron industry of Canada will very soon be reached, to judge from the results obtained with the electric smelting processes, with which very gratifying results have lately been obtained at Sault Ste. Marie, Ont. We have, therefore, to fear that the iron industry of Sweden can expect a dangerous competition from Canada, which not only can cut out our market in the United States, but also our market in England, if that country should adopt the proposed customs union with the colonies; also in regard to China and Japan is Canada better situated, which is clearly evident from a look at the map.

"Only in one respect, viz., the cost of labor, are we better situated than Canada, if this is to be considered as a better situation.

"The Canadian Government, which already saw the importance for the country of utilizing and smelting their rich ore deposits in the country and not only export the ore, has unconsciously given our Government a sharp lesson. As already known, this patriotic Government appointed a commission to investigate all the inventions made in Europe for the reduction of iron ores and the making of steel by the electric processes and enabled the commission to publish a standard work on this subject.

"On account of these investigations, it was considered to be of advantage of further experimenting with Canadian raw material in Canada, and the first process employed was the one invented by Heroult. The figures hereafter given are those obtained with this method and lately published in a report of the commission.

"So much can be said, however, that very important experiments have been made, and even if the greater part of our labor should be continued in the direction of direct producing steel from the ore, a very important part of the practical electro-metallurgy has been solved by the Canadian Government and the energetic members of the commission."

Railway construction in Canada at this time is being pushed vigorously. Work is being carried on on five or six thousand miles of road at a cost of about \$100,000,000. The work covered is divided up between the various roads as follows:—Canadian Pacific, 1,270 miles; Canadian Northern, 1,567 miles; Grand Trunk Pacific, 1,900 miles; and James J. Hill roads, 1,000 miles. The Grand Trunk Pacific claims that their portion of these 6,000 miles will be completed before the grain is harvested. The Dominion government have voted \$10,000,000 for construction of the Transcontinental, which sum with that previously expended brings the appropriation so far made up to \$18,000,000. The Pacific and Eastern Railway have asked for a charter to build a railway from Victoria through the Yellow Head Pass to Edmonton, thence to Fort Churchill on Hudson Bay, claiming for the project the possibility of a very short line to Liverpool. A land subsidy of \$12,800 per mile is to be granted by Parliament.

CAPTAINS OF INDUSTRY.

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

The telephone system, Port Arthur, Ont., will be extended at a cost of about \$17,000.

A new central fire station will be erected on Adelaide Street, Toronto.

Rose Avenue fire hall, Toronto, will be extended at a cost of about \$10,000.

The Fairgrieve Co., Toronto, are being supplied with a duplex pump, built by the Smart-Turner Machine Co., Hamilton, Ont.

It is stated that the Canadian Pacific Railway Co. will build a line to connect Peterborough and Port Hope.

The Bank of Commerce, Peterborough, Ont., will be enlarged.

The Dominion Bank will erect a branch building at Chatham, Ont.

E. J. Rodd, London, Ont., will erect a machine shop there.

Messrs. Gourlay, Winter & Leeming, Toronto, will erect a piano factory at that city.

H. B. Dawson, Fort William, Ont., will erect a business block at that place.

The Ontario Bank, Port Arthur, Ont., will erect an addition to their building there.

The congregation of the Simpson Avenue Methodist church, Toronto, will erect an edifice at a cost of about \$33,000.

The Smart-Turner Machine Co., Hamilton, Ont., are supplying the Port Arthur Sand, Lime & Brick Co., Port Arthur, Ont., with a standard duplex pump.

The Consumers' Gas Co., Toronto, will erect a coal shed at a cost of about \$70,000.

The Hobbs Mfg. Co., London, Ont., have established a branch at Winnipeg, Man., where they will do all classes of leaded glass work.

The town of Steelton, Ont., invites tenders for installing a waterworks system.

The saw mill of the Goderich Lumber Co., Goderich, Ont., which was destroyed by fire recently, will be rebuilt.

The Canada Plate Glass Co., Toronto, will erect a factory there.

The estate of Tanner Bros., Waubauskene, Ont., invites tenders for timber limits on Georgian Bay.

The Lloyd-Thompson Co., Toronto, are negotiating with the town of Strathroy, Ont., with a view to locating there to manufacture spring beds, baby carriages, etc.

Messrs. Hunt Bros., London, Ont., have been incorporated with a capital of \$48,000, to carry on a general milling business. The provisional directors include C. B. Hunt, J. I. A. Hunt and C. R. Hunt, London, Ont.

The Cannon Granite Co. have ordered a 10 ton hand power travelling crane from the Smart-Turner Machine Co., Hamilton, Ont.

The Traders' Bank of Canada have opened a branch at Kenora, Ont.

The Department of Public Works, Ottawa, invite tenders up to September 10, for the construction of a concrete lock and dam at St. Andrew's Rapids, Red River, Man.

The ratepayers of Exeter, Ont., voted

favorably on a by-law to grant the Exeter Canning & Preserving Co. a loan of \$10,000.

The Indestructible Fibre Co., Massena, N.Y., will establish a pulp and paper mill at Ottawa.

The Minister of Public Works, Ottawa, will invite every architect in Canada to put in competitive plans for the new departmental building to be erected there.

Messrs. Holland & Graves, Byng Inlet, Ont., have purchased from the Sarnia Bay Lumber, Timber & Salt Co., five townships, each containing 36 square miles, or 180 square miles in all. The price paid was \$1,500,000.

The Davis Dry Dock Co. have ordered a duplex pump from the Smart-Turner Machine Co., Hamilton, Ont.

The ratepayers of Gravenhurst, Ont., voted favorably on two by-laws, one, to spend \$48,000 to install a waterworks system, and the other \$60,000 for a power plant.

The Canada Furniture Manufacturers, Limited, Toronto, will erect a large furniture manufacturing plant at Woodstock, Ont.

The Collingwood Shipbuilding Co., Collingwood, Ont., will build a large steel freight steamer for the Farrar Transportation Co., Collingwood. The ship will be 406 feet long, 50 feet beam, and 28 feet deep. The machinery consists of a 21-inch triple-expansion marine engine, 42-inch stroke, with two Scotch marine boilers, 14½ feet diameter by 12 feet long, carrying 180 pounds steam working pressure.

The Smart-Turner Machine Co., Hamilton, Ont., have received an order for a side suction centrifugal pump, from Messrs. C. Winger & Sons, Springvale, Ont.

It is stated that a planing mill will be established at Goderich, Ont. J. Lawson, Goderich, is interested.

Work has been commenced on the new warehouse for the Peterborough Shovel & Tool Co., Peterborough, Ont. The structure will be 100 feet long by 40 feet wide.

The ratepayers of Dresden, Ont., will vote on a by-law to grant a bonus of \$25,000 to the Keystone Sugar Co., Toronto.

The Real Estate Security Co., Toronto, will erect an apartment house there at a cost of about \$90,000.

The offices of the Grand Trunk Railway Co., at Bridgeburg, Ont., were destroyed by fire, August 7.

The Hamilton Bridge Works, Hamilton, Ont., have ordered a standard duplex pump from the Smart-Turner Machine Co., Hamilton, Ont.

The Waterhouse Mfg. Co., Ingersoll, Ont., have been incorporated with a capital of \$20,000, to manufacture wool, cotton, silk, etc. The provisional directors include T. Waterhouse, J. A. Neff and E. F. Waterhouse, Ingersoll, Ont.

The Charles B. Heath Co., Stratford, Ont., have been incorporated with a capital of

\$40,000, to manufacture clothing, men's furnishings, etc. The provisional directors include C. B. Heath, W. Miller and A. J. McPherson, Stratford, Ont.

The Town of Napanee, Ont., are installing a Smart-Turner independent jet condenser and duplex boiler feed pump, in their electric light plant.

The Steel Fence Post Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture wire, fence, machines, etc. The provisional directors include H. Buckel C. A. Brink and D. Malloy, Toronto.

The Reardon Rifle Sight Co., Toronto have been incorporated with a capital of \$100,000, to manufacture rifle sights, firearms, etc. The provisional directors include R. E. Reardon, Ottawa, F. A. Fleming and W. Montgomery, Toronto.

The Canada Metal Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture metals, metallic compounds, etc. The provisional directors include W. G. Harris, S. Harris and F. Harris, Toronto.

The Smart-Turner Machine Co., Hamilton, Ont., have received an order from the Corporation of Port Elgin, Ont., for their water works pumps, consisting of compound duplex pumping engine, boiler feed pump, piping, etc.

The Maple City Oil & Gas Co., Chatham, Ont., have been incorporated with a capital of \$40,000, to manufacture oil, gas, etc., and to carry on a mining, milling and reduction business. The provisional directors include T. K. Holmes, J. W. Aitken and W. E. Rispin, Chatham.

The North Bay Brick & Tile Co., North Bay, Ont., have been incorporated with a capital of \$50,000, to manufacture brick, tile, etc. The provisional directors include T. A. Drummond, T. R. Purvis and H. E. Brasier, Toronto.

The Fred. Armstrong Co., Toronto, have ordered an automatic feed pump and receiver from the Smart-Turner Machine Co., Hamilton, Ont.

The Commercial Brick Co., Toronto, have been incorporated with a capital of \$50,000, to manufacture brick, cement, lime, etc. The provisional directors include J. H. Woods, M. J. Evans, and J. L. Richardson, Toronto.

The Fremes & Rosenberg Co., Toronto have been incorporated with a capital of \$40,000, to manufacture jewellery, watches, etc. The provisional directors include S. Fremes, P. Rosenberg and R. B. Young, Toronto.

The Dominion Carriage Co., Toronto, have been incorporated with a capital of \$250,000, to manufacture carriages, sleighs, wagons, etc. The provisional directors include H. Hornsman, Toronto, A. G. Howse, London, Ont., and C. W. Nash, Flint, Mich.

The Brant-Wood Flour Mills, Brantford, Ont., have been incorporated with a capital of \$200,000, to carry on a milling and warehousing business. The provisional directors include J. Ruddy, M. H. Robertson and F. M. Foster, Brantford, Ont.

The Smart-Turner Machine Co., Hamilton, Ont., are supplying the Lake Simcoe Dredging Co. with a duplex outside packed plunger pump.

The Berlin Machine Works of Canada, Hamilton, Ont., have been incorporated with a capital of \$500,000, to manufacture ma-

chinery, tools, etc. The provisional directors include J. Patterson and S. D. Biggar, Hamilton, Ont.

The Page-Hersey Iron Tube & Lead Co., Guelph, Ont., have been incorporated with a capital of \$2,000,000, to manufacture iron, steel, lead, etc. The provisional directors include S. P. Grosch, R. C. Donald and A. E. World, Toronto.

Messrs. Grau & Co., Toronto, have been incorporated with a capital of \$20,000, to manufacture jewellery, watches, etc. The provisional directors include G. Grau, T. Maier, and C. Heinz, Toronto.

The Multi-Scale Co., Guelph, Ont., have been incorporated with a capital of \$40,000, to manufacture iron, brass, machinery, implements, etc. The provisional directors include D. Bailey, W. Wright and G. Taylor, Guelph, Ont.

The John Inglis Co., Toronto, have ordered a duplex pump from the Smart-Turner Machine Co., Hamilton, Ont.

The Indiana Steel Rolling Mills, Newcastle, Ind., will establish steel rolling mills at Peterborough, Ont.

The Friends' College, Newmarket, Ont., which was destroyed by fire some time ago will be rebuilt.

The congregation of the Central Presbyterian church, Hamilton, Ont., will erect an edifice at a cost of about \$100,000.

J. M. Brooks, Peterborough, Ont., will erect a hotel at a cost of about \$20,000.

Jos. Cohen, Toronto, will erect a hotel at a cost of about \$26,000.

The Monarch Brass Mfg. Co., Port Colborne, Ont., will double the size and capacity of their plant at that place.

Messrs. Taylor & Bate, St. Catharines, Ont., are erecting a new brewery at a cost of about \$75,000.

The steamer Erindale was destroyed by fire August 9, at Newcastle, Ont. Loss about \$25,000.

The ratepayers of Southampton, Ont., voted favorably on a bylaw to loan S. Knechtel \$10,000 to erect a foundry and machine shop; also to grant Chas. Williams \$5,000 towards erecting a grist mill.

The J. Coulter Co., Toronto, will erect showrooms, offices and a large workshop.

The premises of the Nixon House, Little Current, Ont., were destroyed by fire, August 11. Loss about \$20,000.

J. W. Gray, Confederation Life Bldg., Toronto, invites tenders up to August 27, for the construction of Knox Church, Toronto.

The post office and general store of J. A. McGugan, Cowal, Ont., were destroyed by fire August 9. Loss about \$3,000.

The Canada Metal Co., Toronto, have been granted an Ontario charter with a capital of \$100,000, to manufacture metals, etc. The directors include W. G. Harris, F. Harris and A. G. Harris, Toronto.

The Renwick Co., Toronto, have been incorporated with a capital of \$40,000, to construct steamers, elevators, warehouses, etc. The provisional directors include A. W. Mackenzie, D. B. Hanna and L. W. Mitchell, Toronto.

The knitting factory of Messrs. J. Cart-

ledge & Son, Guelph, Ont., was destroyed by fire August 9. Loss about \$10,000.

The ratepayers of Oakville, Ont., voted favorably on a by-law to install a waterworks system at a cost of about \$50,000.

The flour mill and elevator of Messrs. Baker & Morrison, Wallaceburg, Ont., were destroyed by fire August 12. Loss about \$20,000.

The Grand Trunk Railway Co. call for tenders for the galvanized iron work required on the new elevator at Depot Harbor, Ont.

The Marks-Clavet-Dobie Co., Prince Arthur, Ont., will erect another large warehouse there.

The Ivor Match Machine Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture slot machines, matches, etc. The provisional directors include R. L. Starr, T. E. Wilson and W. H. Phelan, Toronto.

The Boston Mines, Toronto, have been incorporated with a capital of \$50,000, to carry on a mining, milling and reduction business. The provisional directors include F. Rielly, G. Verney and J. Ross, Toronto.

The Niagara District Telephone Co., Jordan, Ont., have been incorporated with a capital of \$10,000, to carry on the business of a telephone company. The provisional directors include C. Wismer, A. Culp, South Township, Ont., and E. Werner, Clinton Township, Ont.

The Hamilton Mirror Plate Co., Hamilton, Ont., have been incorporated with a capital of \$40,000, to manufacture mirrors, glass, picture frames, etc. The provisional directors include W. S. Jackson, Hamilton, E. C. Berkinshaw, and H. M. English, Toronto.

The Perth Bolt & Forging Co., Perth, Ont., have been incorporated with a capital of \$50,000, to manufacture bolts, nails, screws, etc. The provisional directors include J. A. Stewart, A. W. Dwyre and J. H. Mendels, Perth, Ont.

The Model Paint Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture paints, oils, varnishes, etc. The provisional directors include G. H. Fairles, J. Waring and J. Hill, Toronto.

The ratepayers of St. Mary's, Ont., will vote on a by-law to loan \$400,000, to the St. Mary's & Western Ontario Railway Co., St. Mary's, Ont., to build a line from Ingersoll to Embro, thus giving St. Mary's direct connection with the main line of the Canadian Pacific Railway.

The Hamilton Steamship Co., Hamilton, Ont., have awarded the contract to the Canadian Shipbuilding Co., Toronto, for a large steamer capable of carrying 2,000 passengers.

The Canadian Steel Post & Fence Co., Toronto, have been incorporated with a capital of \$50,000, to manufacture steel posts, gates, fences, etc. The provisional directors include W. Galbraith, A. A. Laurie and W. W. Munns, Toronto.

A large bridge will be built across the St. Lawrence River to connect Montreal with the south shore. The structure will be a double decker and will afford accommodation for three railway and two trolley tracks, two roadways and two sidewalks.

The Canadian Pacific Railway Co. purpose sending out surveyors with a view of having

a line constructed through the Quebec section of the Temiskaming district.

The Dominion Steel Car Co., Blue Bonnet, Que., have just completed the first steel car built in Canada. This company have an order from the Canadian Pacific Railway Co. for 500 of these steel cars.

The Coleraine Asbestos & Exploration Co., Coleraine, Que., have been incorporated with a capital of \$50,000, to manufacture metal, machinery, implements, etc. The charter members include W. J. Henderson, A. W. G. Macalister and J. Rockwell, Montreal.

The tannery of Messrs. Clement & Marchand, Quebec City, was destroyed by fire August 12. Loss about \$15,000.

The station of the Grand Trunk Railway Co., Ste. Madeleine, Que., was destroyed by fire August 8. Loss about \$1,500.

The Beauharnois Navigation Co., Beauharnois, Que., have been incorporated with a capital of \$20,000, to manufacture steamers, vessels, etc. The charter members include C. A. Carter, Montreal, J. A. A. Desrochers, and F. Hebert, Beauharnois, Que.

Alfred Prendergast, Limited, Montreal, have been incorporated with a capital of \$20,000, to manufacture boots, shoes, clothing, etc. The charter members include A. Prendergast, S. Munroe and A. Poulin, Montreal.

The Kemp Mfg. Co., Montreal, will erect a four story warehouse at a cost of about \$30,000.

An addition, 65x25 feet, will be erected to the Presbytery of the Roman Catholic church, St. Louis parish, Montreal.

The storehouse of the St. Laurent Tobacco Co., St. Laurent, Que., was destroyed by fire July 20. Loss about \$40,000.

The Smart-Turner Machine Co., Hamilton, Ont., are supplying Mr. W. K. Lowdon, St. Lambert's, Que., with an automatic feed pump and receiver.

The warehouse and docks of T. Marion, near Bryson, Que., were destroyed by fire July 26. Loss about \$100,000.

The Canadian Pacific Railway Co. will erect a hotel at Blue Sea Lake, Que.

A post office will be erected at Iberville, Que., at a cost of about \$3,000.

Messrs. McKenzie & Mann will extend a branch from the Great Northern to St. Leon Springs, Que., and will erect a hotel there.

The Quebec Gas Co. have ordered a coke crusher from the Smart-Turner Machine Co., Hamilton, Ont.

The St. Lawrence Canadian Navigation Co., Montreal, have been incorporated with a capital of \$1,000,000, to manufacture steamships, vessels, etc. The charter members include W. Paul, Sorel, Que., L. Lacouture, and C. Robitaille, Montreal.

British Columbia Timbers, Limited, Montreal, have been incorporated with a capital of \$100,000, to construct piers, bridges, docks, etc. The charter members include A. L. MacLaurin, G. A. Forbes and R. H. Fulton, Montreal.

The Church of Nativity, Hochelaga, Que., will be enlarged at a cost of about \$39,500.

The Monarch Motor Co., Montreal, have been incorporated with a capital of \$250,000, to manufacture automobiles, motor boats,

etc. The charter members include L. D. Robertson, J. S. MacKenzie and J. T. Warrington, Montreal.

The Grand Trunk Pacific Town & Development Co., Montreal, have been incorporated with a capital of \$5,000,000, to construct elevators, factories, warehouses, etc., and to carry on the business of an electric light, heat and power company. The charter members include C. M. Hays, F. W. Morse and W. Wainwright, Montreal.

The Dominion Orchard Co., Montreal, will erect a large cold storage plant there.

Messrs. Henry Morgan & Co., Montreal, have been incorporated with a capital of \$30,000, to manufacture machinery, mechanical devices, etc. The charter members include J. Morgan, F. C. Morgan and K. C. Campbell, Montreal.

The Unit Wardrobe & Fixture Co., Montreal, have been incorporated with a capital of \$40,000, to manufacture wardrobes, furniture, etc. The charter members include C. F. Nelson, H. Beatty and A. Wood, Montreal.

The Canadian Pacific Railway Co. will erect extensive yards at Cote St. Paul, Que.

The saw mill of Messrs. Goulin & Therrien, St. Edwidge, Que., was destroyed by fire recently.

The mills of the Gres Falls Lumber Co., Three Rivers, Que., were damaged by fire July 23.

The Dominion Wire Mfg. Co., Montreal, will establish at Dominion, near Montreal, a furnace and rod mill at a cost of about \$500,000.

Plans have now been completed for the construction of the new shop to be erected at Moncton, N.B., by the Intercolonial Railway Co. In all there are to be a dozen or more buildings, the six principal mechanical shops to be under one roof. These are the tool room, brass shop, bolt shop, etc., 355x44 feet; machine shop, in two bays, 355x135 feet; smith shop, 300x75 feet; engine shop, 375x80 feet; boiler erecting shop, 300x50 feet; bolt shop, 300x50 feet; the latter four buildings heading into the machine shop. In addition there is to be a car repair shop, 360x100 feet; passenger car paint shop, 360x100 feet; freight car repair shop, 360x132 feet; planing mill and carpenter shop, 200x80 feet; storehouse and office building, 200x50 feet, and several accessory buildings.

Messrs. R. Chestnut & Sons, Fredericton, N.B., will erect a three story building, 150x23 feet.

The St. John Railway Co., St. John, N.B., will erect a large car barn 200x100 feet.

Chief Commissioner of Public Works, Fredericton, N.B., is having plans prepared for the construction of a steel bridge at Pokiok, N.B., at a cost of about \$60,000.

Geo. Green, Carleton, N.B., will erect a saw mill there.

The big mill of the Snowball Co., Chatham, N.B., has been making some records in the way of cutting recently. Working ten hours per day with three gangsaws going the mill turned out from July 2 to 7, 916,212 superficial feet and from July 9 to 14, 942,207 feet, a total for twelve days of 1,858,419 feet. This makes an average daily cut of nearly 160,000 feet. A record for a single day's cut was

made on June 28, when this mill turned out the total of 210,750 superficial feet.

The saw mill of the St. George Pulp & Paper Co., St. George, N.B., was destroyed by fire August 2. Loss about \$25,000.

The Miramichi Lumber Co., Chatham, N.B., will erect mills there.

The saw mill of Wm. Burchill, Tynemouth Creek, N.B., was destroyed by fire recently. Loss about \$1,500.

The Manual Training School, St. John, N.B., will be renovated at a cost of about \$3,800.

The York & Sunbury Milling Co., Gibson, N.B., will erect a saw mill 140x40 feet, which will have a capacity of about 45,000 feet per day.

Messrs. Finlay & Son, Norwood, N.B., will enlarge their factory at Peterborough, Ont.

The Sydney Steamship Co., Sydney, N.S., have been incorporated with a capital of \$40,000, to manufacture barges, boats, steamers, etc. The provisional directors include R. Harrington, H. W. Black and H. Ross, Sydney, N.S.

The Sanderson Mfg. Co., Sydney, N.S., have been incorporated with a capital of \$45,000, to manufacture roofing material, tarred paper, coal tar, etc. The provisional directors include A. E. Collas, A. A. Saunderson and R. E. Harris, Halifax, N.S.

Messrs. A. Rhodes and W. A. Fillmore, Truro, N.S., will erect a business block there.

P. McLelland, Sydney, N.S., will erect a large hotel there.

The St. James Presbyterian church, Whitney Pier, Cape Breton, N.S., was destroyed by fire recently. Loss about \$6,000.

The Smart-Turner Machine Co., Hamilton, Ont., have received an order from the Amherst Malleable Iron Works, Amherst, N.S., for ten tumbling barrels.

The woodworking factory of Messrs. Mattington & Son, Thompson Station, N.S., was destroyed by fire recently. Loss about \$14,000.

The Intercolonial Railway Co. will erect a large round-house at Halifax, N.S.

Public Works Department, Ottawa, invite tenders up to August 24 for the construction of a breakwater at Charlo's Cove, Guysboro' County, N.S.

The Harmsworth pulp mills, Grand Falls, Newfoundland, were destroyed by fire recently. Loss about \$30,000.

A. C. Gibson, Winnipeg, Man., invites tenders up to August 27, for the supply of two turbine pumps with electric motors for the city waterworks.

Messrs. James & James, Winnipeg, Man., will erect a planing mill at that place.

The Tenby & District Milling Co., Tenby, Man., have been incorporated with a capital of \$20,000, to carry on a milling and warehousing business. The provisional directors include T. J. Hare, R. Robbins and J. Lorimer, Tenby, Man.

The Bank of Hamilton have opened a branch at Darlingford, Man.

The grain elevator of the Rathwell Farmers Elevator Co., Rathwell, Man., was destroyed by fire July 31.

Messrs. Randall & Greenshaw, Shoal Lake, Man., ask the municipality for a loan of \$15,000 to erect a grist mill and elevator.

The Peavy Elevator People, Minneapolis, Minn., have organized the British American Elevator Co., Winnipeg, Man., and will erect about 25 elevators along the line of the Canadian Northern Railway.

Messrs. Foley, Lock & Larson, Winnipeg, Man., wholesale grocers, will erect a branch warehouse at Calgary, Alta.

The Union Warehouse Co., Winnipeg, Man., will erect a three story warehouse, 330x132 feet.

A large bridge will be built across the Red River to connect Elmwood and Winnipeg, Man., at a cost of about \$175,000.

A municipal power plant will be installed at Birtle, Man., at a cost of about \$20,000.

The Lamb-Watson Lumber Co., Winnipeg, Man., have been incorporated with a capital of \$850,000, to manufacture timber, lumber, doors, shingles, etc. The provisional directors include G. D. Minty, G. C. McTavish and H. W. Hollis, Winnipeg, Man.

The Western Canada Milling Co., Winnipeg, Man., will erect an elevator at Creelman, Sask.

J. G. Watson, Calgary, Alta., will erect a stone cutting factory there.

The Alberta Milling Co., Edmonton, Alta., will erect an addition to their warehouse, 60x25 feet.

A town hall will be erected at South Qu'Appelle, Sask.

The Bank of Toronto have opened a branch at Wolseley, Sask.

Messrs. N. W. Jobbing & Co., Lethbridge, Alta., will erect a cement block and warehouse at a cost of about \$25,000.

The ratepayers of Arcola, Assa., will vote on a by-law to expend \$40,000 for a waterworks system.

The citizens of Moosomin, Sask., will vote on a by-law to expend \$30,000 for the purpose of installing a waterworks system.

A school building will be erected at Camrose, Alta., at a cost of about \$5,000.

The Merchants' Bank will erect a bank building at Camrose, Alta., at a cost of about \$15,000.

The Calgary Milling Co., Calgary, Alta., will erect a 1,000 barrel mill at a cost of about \$22,000.

The citizens of Battleford, Sask., will vote on a by-law to expend \$30,000 for installing a waterworks system.

The Bell Telephone Co. will erect a bank building at Calgary, Alta., at a cost of about \$100,000.

L. R. Rix, Wetaskiwin, Alta., will erect a two story block there.

It is stated that the Canadian Pacific Railway Co. will erect a hotel at Moose Jaw, Sask., at a cost of about \$150,000.

The premises of the Calgary Cement Co., Calgary, Alta., were destroyed by fire recently. Loss about \$100,000.

A new post office, 67x50 feet, will be erected at Fernie, B.C.

The Royal Bank of Canada will erect a branch at Vancouver, B.C., at a cost of about \$50,000.

The British Columbia Electric Railway Co., Vancouver, B.C., will erect a branch station at Ladnor, B.C.

A sewerage system will be installed at Kamloops, B.C., at a cost of about \$45,000.

W. H. Edmunds, Kamloops, B.C., will erect a school building there.

C. R. McLaughlin, Columbus, Ohio, will erect a saw mill near New Westminster, B.C.

The premises of the East Kootenay Lumber Co., Cranbrook, B.C., were destroyed by fire recently. Loss about \$50,000.

The furniture store of J. W. Jones, and the printing office of F. H. McCarter, Grand Forks, B.C., were destroyed by fire recently. Loss about \$30,500.

The British Columbia Marine Railway Co., Esquimalt, B.C., have been awarded the contract by the Canadian Government for a hydrographic steamer to be used on the Pacific Ocean. The price is \$143,000.

The Pacific Coal Lumber Co., Vancouver, B.C., will erect a large refuse burner at their mill there.

Messrs. Galbraith & Sons, New Westminster, B.C., will erect a large saw mill on Lulu Island. Machinery will be installed to cut 50,000 feet per day.

The Elk Lumber Co., Fernie, B.C., will erect a dry kiln and machine shop there.

The Shawinigan Lake Lumber Co., Victoria, B.C., are shipping large cargoes of lumber to the Yukon Consolidated Gold Field Co., Dawson, to be used in the construction of dredges, which will be used on the Yukon River.

PUBLICATIONS.

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

Immedial Deep Green G.—Supplement No. 18 to book on "Cotton Dyeing," giving samples of cotton yarn and fabrics. Cassella Color Co., Montreal.

Dyestuffs.—The July issue of this publication, containing articles on "How to Dye Woolen Furniture Plush," "Printing Lustrous Colors on Fabrics," "Printing Stubbing for Ladies' Cloth," "After-chroming Dyes on Wool," "Black Wool Dyes for Mixtures," "Dyeing Wool White," also information re new colors, color cards, etc. The Cassella Color Co., Montreal.

A Day in New York.—An interesting booklet giving general information re the topography, main thoroughfares, points of interest, churches, etc. A unique feature, and one which will appeal to the visitor whose time for sight-seeing is limited, consists in plans for one-hour, two-hour, three-hour, half-day, evening and whole-day tours of the city. The routes are carefully planned and remarkably comprehensive. Hints for saving time and trouble, rates for cab and coach hire and a list of subway stations complete the book. Can be had on request from the Joseph Dixon Crucible Co., Jersey City, N.J.

"The Machine Tool Pocket List," a publication formerly owned by Angus Ballard Co., has been purchased by the Geo. H. Gibson Co., Park Row Bldg., New York. This firm are combining with their journal, "Manufacturing," and are increasing it from 6x3½ inches to 9x4 inches. The mission of the new

journal will be the exchange of valuable ideas in engineering and mechanics, while the list will contain names of over 1,000 firms and 2,000 articles and types of tools used in machine shops.

Recorders.—Bulletin No. 41, giving with brevity and in convenient size descriptions with illustrations of the voltmeters, ammeters, wattmeters, gauges in portable and standard forms, thermometers, water level gauges, etc. The Bristol Co., Waterbury, Conn.

PERSONALS.

C. Word, president of the Canadian Cobalt Co., Cobalt, Ont., a concern connected with the Canadian Government, spent the past week in Pittsburgh purchasing hydraulic machinery for the operation of the mines there.

EXPECTS MANY VISITORS.

H. W. Petrie is making arrangements for an exhibit of many of the lines carried by him, in "Machinery Hall" at the Toronto Exhibition. At the same time he anticipates visits from manufacturers and other buyers from all over Canada to his warehouse, which is so near the station that all visitors to Toronto can visit it without inconvenience or loss of time.

To this end Mr. Petrie is making preparations for the presence of a great many buyers during the Exhibition. His warehouse is, at the moment, well stocked with machine tools, special machinery, power equipment, pumps: in fact with everything needed in the machinery line.

It is probable that many visitors will be interested in the "specials," which Mr. Petrie has been advertising for some time. While the reputation of the firm is sufficient guarantee to old customers it is probable that others will desire to examine the engines, forges, hoists, etc., which have been offered at special prices.

Needless to add Mr. Petrie and his staff will be at the service of any buyers visiting either his exhibits at the Fair or at his warehouse.

NEW FEATURES IN POWER PLANT.

Long-distance transmission is becoming more and more a factor in the electrical supply of Montreal. The Montreal Light, Heat & Power Co., who draw power from the Lachine Rapids, four or five miles away, the Chambly Rapids on the Richelieu, about 17 miles, and the Shawinigan Falls, on the St. Maurice, 86 miles, are now engaged in making the St. Lawrence, about 40 miles away, tributary to the needs of the city.

At Sotlanges the company will have, in the hydraulic development for which Allis-Chalmers-Bullock, Limited, of Montreal, have the contract, the first plant of such capacity and class to be designed and built on this continent.

The principal turbines, three in number, will each be capable of delivering 5,350 brake h.p. on the shaft, under a head of 50 feet. Each of them will drive a 3,750 k.w. generator and will be provided with oil governors for the regulation of the speed. There will also be two smaller turbines developing each 300 h.p. to operate the electrical exciters.

Heretofore it has been necessary to go to Europe for such high-class work. The company is making provision in the power house for the installation of a fourth unit of the same capacity, when it will be required.

In another respect, also, the plant will be unique, as the draft tubes for the larger units will be moulded in concrete. It will be the first construction of this kind in the country. The wheel chambers will be built in concrete and the roadway along the canal will pass over them. It is claimed that with concrete the necessary curves in the tubes can be made so as to cause less friction than with the ordinary steel or iron penstocks and that, therefore, greater power can be developed from the fall at the command of the company.

IRON IN CANADA.

The American Iron & Steel Association has received direct from the manufacturers the statistics of the production of pig iron in Canada in the first six months of 1906. The figures show a large increase as compared with either of the two halves of 1905.

The total production in the first half of 1906 amounted to 282,010 tons, against 257,797 tons in the last half of 1905 and 210,206 tons in the first half of that year. The production in the first six months of 1906 was the greatest in any half year in the history of the Dominion, exceeding by 24,213 tons that of the last half of 1905, the next highest half year. It was also greater than the production of any whole year prior to 1902.

The production of Bessemer pig iron in the first half of 1906 amounted to 79,051 tons, against 85,418 tons in the last half of 1905, a decrease of 6,367 tons. In the first half of 1905 the production was 63,785 tons. The production of basic pig iron in the first half of 1906 amounted to 135,298 tons, against 103,724 tons in the last half of 1905, an increase of 31,574 tons. In the first half of 1905 the production was 68,378 tons.

On June 30, 1906, Canada had 15 completed blast furnaces, of which 12 were in blast and three were idle. Of this total 11 were equipped to use coke and four to use charcoal. In addition one coke furnace was being built on June 30. Three coke furnaces were also partly erected on the same date, work on which had been suspended for some time. One coke furnace was also projected at the close of June, ground for the foundations of which is to be broken at once.

During the first half of 1906 the total number of furnaces in Canada actually in blast for the whole or a part of the period was 13, of which 10 used coke and three used charcoal. The number of furnaces that were idle during the whole period was two, of which one used coke and the other used charcoal when last in blast.

Cast-iron columns should never be used where they have to resist either bending or tension, but there are many warehouses, several hundred feet square, and of low height, where the columns have to carry only a compression load, and in such cases the use of cast iron seems to be perfectly permissible. In many cases cast-iron columns can be had in very much less time than steel columns, and this renders their use desirable, even if difference in price is not considered.

OFFICE METHODS AND APPLIANCES.

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

He Got the Position—and Held It.

The head of a great wholesale house said recently, to a writer in the New York Commercial: Naturally, you look for one thing above all when you're searching for a cashier, and that is honesty. A dishonest cashier is just as impossible as a blind man in a photograph gallery. While of course we desire and expect honesty on the part of all of our employees from the office boys up to the office manager, it must be admitted that we don't succeed always in filling the pay roll with men who scrupulously are honest. But we do succeed in getting honest cashiers; we make it our business to know that a man is strictly honest before we put him in the position. Besides this, we pay enough to make it worth almost any man's time to be honest with us.

Of course the cashier is bonded, so it would not cost us a cent if he absconded with every cent of cash intrusted to him, but a dishonest man can make so much trouble for a firm if he begins to exercise his dishonesty that, despite all that may be said to the contrary, honesty is the great thing to be considered in the selection of a cashier. It doesn't make any difference how capable a man is, if he is dishonest he can't make a good cashier. A dishonest man can't make any kind of a cashier for this house.

But it must not be supposed that I picked this fellow for the place simply because I knew that he was honest. A man may be as honest as the sun and still be a fool. There are plenty of honest men in this office who fell short of the requirements of our cashier's position. Capability and experience form a combination only a short way behind honesty in the qualities necessary in a good cashier. Besides being honest the man had to be efficient. He had to be a well rounded character in every way, sober, reliable, efficient and honest. It is not easy to find all these things in one man, even in so large an office as this. We had trained nobody up to take the place at the time our cashier suddenly left us, so it was a case of look around and pick one out among the employees of the office.

If a half-dozen of our brightest young men had known that we were picking a cashier that week they probably wouldn't have conducted themselves in the evenings as they did. We investigated each possible candidate thoroughly, not only as to his connections with the office, but in his personal life. I was surprised to find out how many of our young men were living in a manner absolutely to unfit them for a position of importance with us.

Booze! That was the great trouble. There were five fellows, good men in every way, who did not get a chance at the place simply because they spent their evenings in seeing how many saloons they could take in without getting drunk. I'm not an advocate of teetotalism, but I can't stand for drinking among young men in

my employ. I don't care what they may be before they start in to drink, they are something quite different and quite useless to me after they have gone the rounds for a few years.

Then, several of those we looked over had the habit of backing the ponies or of playing poker. I don't believe in putting temptation in a young man's way, and this certainly is what it would have been to put these fellows in the cashier's cage. So they were passed up. Others went the same way for a score of reasons, but booze, loose living and gambling were the three principal elements in disqualifying those we investigated. Then we came to the young fellow who got the job.

He was a rate clerk in the traffic department at this time, and he had been overlooked among the first selections because there were so many clerks ahead of him both in length of service and importance. When I let it be known that I considered him a possibility for the vacant post the head of the traffic department demurred.

"Why don't you think so?" I demanded.

"Well, he's the only man in my department that I absolutely can depend upon."

"You can depend on him, eh?"

"As I can upon myself," he answered.

That was saying a good deal for the head of that department, for he was a crusty old railroad man who seldom praised anybody.

"Well," I said, "I'm afraid you've recommended your man too well for your own good. Send him in to me."

After that conversation, the first I ever had with the young man, I knew that I had my cashier if the outside investigation was satisfactory. There was that about him that bespoke his integrity in a way that no one could mistake. He was just about the sort of a young fellow a man would pick out for a son if he had to pick his sons.

When it came to looking him up it was quite a different affair from looking up the others. The young fellow was studying law nights. Three nights every week he went to school. The rest of the nights he read—when he did not work overtime. He smoked pretty hard; but he was saving money.

"What do you intend to do with your future?" I asked him.

"Well, sir, I was figuring on getting into the legal department here as soon as I get through with my law course," he said.

"You want to stay with the house, then?"

"I guess I can do as well here as with anybody else," he said. "I want to stay as long as the house uses me as square as I use it."

I got up and shook hands with that young man then. I don't know whether he appreciated that as a privilege, but I know I did.

"Quite right, my boy," said I. "And now as we need a cashier you get into the cage and get the hang of the cashier's work. Keep on with your law reading. You'll get into the legal department when the time is ripe—if you want to."

I don't think he'll want to, as a matter of fact. He's made himself so indispensable to us that he's drawing twice the salary paid the old cashier. I'm afraid he'll be worth too much to start in again in the legal department. He'll be away beyond that if he lives up to his start.

WETTING LEAD PENCILS.

The act of putting a lead pencil to the tongue to wet it just before writing, which is habitual with many people, is one of the oddities for which it is hard to give any reason, unless it began in the days when pencils were poorer than now, and was continued by example to the next generation, says Graphite. A lead pencil should never be wet. It hardens the lead and ruins the pencil. This fact is known to newspaper men and stenographers. But nearly every one else does wet a pencil before using it. The fact was definitely settled by a newspaper clerk away down East. Being of a mathematical turn of mind, he ascertained by actual count that of 50 persons who came into his office to write an advertisement or a church notice, 49 wet a pencil in their mouths before using it. Now, this clerk always uses the best pencils, cherishing a good one with something of the pride a soldier feels in his gun or his sword, and it hurts his feelings to have his pencils spoiled. But politeness and business considerations require him to lend his pencil scores of times a day. And often, after it had been wet till it was hard and brittle and refused to mark, his feelings would overpower him. Finally he got some cheap pencils and sharpened them, and kept them to lend. The first person who took up the stock pencil was a drayman, whose breath smelt of onions and whiskey. He held the point in his mouth and soaked it several minutes, while he was torturing himself in the effort to write an advertisement for a missing bulldog. Then a sweet-looking young lady came into the office, with kid gloves that buttoned half the length of her arm. She picked up the same old pencil and pressed it to her dainty lips preparatory to writing an advertisement for a lost bracelet. The clerk would have stayed her hand, even at the risk of a box of the best Dixon pencils, but he was too late. And thus that pencil passed from mouth to mouth for a week. It was sucked by people of all ranks and stations, and all degrees of cleanliness and uncleanness. But 'twere well to forbear. Surely no one who reads this will ever again wet a lead pencil.

Frank C. Roberts & Co., Philadelphia, Pa., are preparing plans for the new blast furnace to be erected for the Hamilton Iron & Steel Co., Hamilton, Ont. The new stack is expected to be ready for blast in the spring of 1907.

Ability in Choosing the Working Force.

By JAMES LOGAN in System.

The processes of modern business are like the functions of a complicated machine, and the executive must organize every part of his establishment as carefully and as thoroughly as the inventor.

Business as conducted to-day is a vast machine; and management simply means running the machine with all its parts in harmony.

The management of the large corporation is organized thought, exactly as a machine is the organized thought of the inventor.

The executive must be a specialist along lines which make for efficiency in administration. He must have that God-given quality,—capacity for invention in organization,—for we need to remember that there is just as real invention in the field of organization and administration as in the field of mechanics, and to this field, which has been sadly neglected, we must look for the economies in production which are to mark the present decade.

The mechanical inventor studies out a machine in which all the parts are to work together to produce a given result. In doing this he deals with inanimate material; his work is wrought out along fixed mechanical lines; he knows in advance just how each gear, spring, cam, pulley, and lever will do its work. Its power to do is a mechanical certainty. The mechanical inventor does not give to any part of his machine any latitude whatever, and all the initiative must come from him; he thinks, so to speak, for every part of the machine.

THE MACHINE MUST ALLOW SCOPE FOR PERSONAL INITIATIVE.

The true executive is also an inventor; he too studies out a working machine where all the parts are to work in harmony to produce a given result, but he deals, not with inanimate material, however cunningly devised and put together, but with men with wonderful possibilities of initiative to help or hinder the working of the great organization.

To men working as parts of one harmonious whole must be given a certain amount of latitude in which to exercise their power of initiative. They must be given intelligent direction, and then left, in large measure, to work out their problem in their own way. No code of rules and regulations that was ever drafted can take the place of intelligence. The organizing executive must have a knowledge of men, exactly as the mechanical engineer must have a knowledge of material and mechanics. The right men must be selected, trained and fitted into their proper places in this vast machine.

The success of every business man hinges on one thing—ability to select men. The efforts of any one man count for so very little. It all depends upon the selection and management of men to carry out the plans of the chief. In every successful concern, whether it be bank, school, factory, steamship company or railroad, the spirit of one man runs through and animates the entire institution. The success or failure of the enterprise often turns on the mental, moral and

spiritual qualities of this one man. And the leader who can imbue an army of workers with a spirit of earnest fidelity to duty, an unanswering desire to do the necessary thing, and to do it always with animation, kindness, courtesy and good cheer, is entitled to rank with the large men of earth.

THE PARTS OF THE MACHINE GAIN EFFICIENCY THROUGH RESPONSIBILITY.

It used to be said by some: "Do not tell your business aims or plans; what you know and the other man does not know is your best asset." That may have been good advice once, but it will not do now. Business has grown so large that a manager is by necessity forced to explain his plans, for other men must be entrusted to work them out. In industry as in war, the fighting formation has been changed. Modern methods have abolished the idea that men must be mere machines. In industry as in war, the officers are no longer able to control their men as formerly, because the fighting formation covers so much more ground and therefore the men in the ranks as well as the line officers must have a higher standard of industrial intelligence and self reliance and the power of leadership must be on a proportionately higher level to carry the twentieth century industrial burdens.

The industrial battle is not won by the skill of the Captain of Industry alone; the plan of campaign may be his, but the results are wrought out by the line officers and men in the ranks—that great army of unnamed, unnumbered and often unrewarded sergeants, corporals, and privates, the sum total of whose work spells "Success."

Therefore the next great step in productive efficiency will be the education of the sub-executive, the foreman, in the principles of business. In the selection of an executive I would place tact, courtesy and those God-given qualities which bring out the love and loyalty of the operatives, far above mechanical skill or commercial efficiency. And I am persuaded that half the labor troubles could be avoided by tact and courtesy on the part of managers, superintendents, and foremen, always mindful of the fact that to them has been given a wider horizon and therefore they should be more considerate, fair minded and patient.

ATTENTION TO DETAILS IS FOR LIEUTENANTS —NOT FOR THE EXECUTIVE.

Captains of Industry must have capacity for detail, though they must not devote too much time to that. For while it is the intimate knowledge of details which will enable them wisely to decide the larger problems, yet, if too much attention be given to detail, the danger is that they will become so absorbed in the petty details that they cannot get far enough away from them to see the larger problems, which can only be seen by having the proper perspective. Executives must not try to do too much themselves; their power will lie in duplicating themselves by the selection of lieutenants to carry out their plans, and having made the selection, giving to them latitude to work into their particular problems their own personality.

Executives of to-day and of the future must have the faculty to manage men—which is a more difficult problem than running a machine, for the human element in industry to-day is larger than the mechanical element, and employers, managers, superintendents and foremen often lose, or rather deliberately throw away their largest asset by failing utterly to create and develop that friendly relationship with their subordinates, which makes for the highest success.

The Captain of Industry of the future must, through his own personality, create a spirit of loyalty, not to himself alone, but to the vast organization of which he for the time being is the head, and of which his lieutenants are all important parts. When this has been done, we have the most powerful invention of this wonderful century.

Well might Andrew Carnegie say: "Take away all our factories, our trade, our avenues of transportation, our money, but leave me our organization and in four years I shall have re-established myself." But the man who laid the foundations for this matchless organization was the lovable Captain Jones. Mr. Carnegie's statement is perhaps stronger than the facts would warrant, for it was probably easier then to clip off ten dollars per ton on steel rails than it would be now to reduce it by fifty cents. But the great truth holds good that the efficient organization is the asset which counts for commercial and industrial success more now than it ever did before.

ADVICE FROM MANY QUARTERS.

It's the man behind the wheel that brings the ship into the haven of profit. It's not the system alone, but intelligent direction of it, that produces results.—System.

The business of an advertiser is to implant a thought, or as we say in psychology, a suggestion; if an advertisement throws off no positive suggestion to do something and to do it now, it is a failure; a salesman is an advertisement that can talk, a walking, talking advertisement.

The reward of business has ever been to the man who will dare to act on his own judgment.

Are you applying your own intelligence to stopping the leaks of time, energy and of trade in your business? Remember, the way to secure a profit in these days of close competition is to manufacture and sell at a greater economy than your competitors.

After you read that article on "The Care of Matters Pending," what did you do about it? Was the system suggested better than your present one? Then the logic thing to do is to adopt it; and the wise thing is to do so before the matter slips away from your memory. One reader at least saw the sound sense of Mr. Regan's article that he wrote at once for an outfit and instituted the system in his business.

You can't set the helm of your business barge in one fixed direction and expect it to guide you into the harbor of success. The shoals and rocks of unexpected conditions rise up in every mile of the sea. Only the skillful piloting that meets each danger as it arises can steer you safely through.—System.

You cannot attain business success by merely following the lead of others without regard to the particular needs of your particular business.—From an "Ad."

What Does Vacation Do to You?

What is your vacation going to do for you? It is going to be a help to you; or is it going to be a drawback? It can be either. It can be just as big a drawback as a help. It all depends upon yourself and your way of spending it.

The average worker, bound down to desk, counter or office for fifty weeks of the year, has one formulated idea of just what the vacation period is going to mean for him.

"It's going to give me a chance to get away from the confounded grind, that's what it's going to do," says he. "No more getting up at 7 o'clock in order to get to the office by 8, no more worrying for two whole weeks. Me for a good time!"

Well and good. That is what a vacation is for, partly—to give a man two weeks' surcease from the trials and worries incident to a business position.

But it is meant for other things, too. It is meant to give the worker a chance to recuperate from the year's hard grind and come back to desk, counter or office refreshed and strengthened and able to dig in for another eleven months and a half. It is meant to give him an opportunity to prepare himself for doing better work upon his return. Otherwise there would be no vacations.

"It pays to give your people vacations," said one of the largest employers in the United States a short time ago. And if it did not pay from the standpoint of the employer few people would get vacations save those in a position to take them without seeking anybody's favor in the matter. But not only is the vacation meant to pay from the standpoint of the employer, but it is meant to "pay" the worker as well. "Go slow if you want to make haste" has long been relegated to the past, but "go a little slower and get a little further" has taken its place and universally is accepted.

The vacation season is the season for helping man "last a little longer." Such is the theory of its inception. It is meant as a stimulus to ambition, energy and ability. But how many of the thousands who yearn for the advent of the season make such use of it? How many vacationers are there not who actually make their vacations a source of harm to themselves and their work?

Said the head of an office that each year makes up a vacation schedule of 600 names, in speaking of vacations:—"I really wish that it could be arranged to give vacations only to such people as can stand it. For their own good and for the good of the office I would like to curtail or abolish altogether the vacations of certain men—a liberal number of them—in our office. These men are the ones who cannot stand to have vacations. There actually are such men.

"We give two weeks of vacation with full pay to every man who has been here over a year. Of the 600 who qualify on an average annually there probably are 100 who should not have vacations. I do not mean by this that their work has been such that they do not merit any rest, although as a matter of fact it usually happens that the fellows who can't stand a

vacation are the ones who are inclined to loaf their way through their work. But even admitting that they are entitled to their two weeks of rest, the same is bad for them. It would be better for them, looking at the matter in a business light, not to have any vacation at all.

"I'm sure I don't know where they go when they are on their vacations, or what they do when they get there. But I know this, they come back to the office in no better shape physically than they went away, and as a handicap they bring with them a disposition to loaf, and it is like pulling teeth for them to break away from it. For weeks and weeks after their return their efficiency instead of being increased is below par. Instead of coming



ROTARY NEOSTYLE DRIVEN BY WESTINGHOUSE POWER MOTOR

back rested, with increased energy and ambition, they come back full of lassitude and errors. For these fellows the vacation is a bad thing. It doesn't pay either for them or for us."

"One such instance came before me last year in a man who had advanced by hard work to the position of floor manager," said the superintendent. "He was a good man until he got his first vacation that lasted a month. When he came back from it he had lost for the time being his love for work, was indolent and careless and generally loose in his work. He lost his position here through it. He couldn't get back to his old gait. That vacation spoiled him, at least for the time being. He would have been better off had he worked through that season without any."

is clearly illustrated by the accompanying sketch.

These motors are made in all sizes from one-twentieth to one-eighth h.p., making possible a great economy in power as well as simplicity and durability of operation. These motors can be connected to a lamp socket by means of a flexible cord and plug, and started and stopped by the ordinary snap switch.

These motors follow very closely the design of the well known Westinghouse fan motors. They are built for both alternating and direct current circuits, either 115 or 230 volts. The direct-current motors are either shunt or series wound, and the alternating current motors are wound for 25, 60 or 133 cycles. The efficiency of all machines is exceedingly high.

ELECTRICALLY DRIVEN NEOSTYLE.

The rapid extension of the field of the electric motor is a matter of current discussion. One of the most interesting developments of recent years is the manufacture of small power motors for various purposes, such as the running of sewing machines, coffee grinders, grinding wheels, sign flashers, slot machines, stamping and marking apparatus, addressing machines, and a host of other applications. The Canadian Westinghouse Co., Hamilton, Ont., issue a special circular, No. 1128, devoted to these small power motors.

An application of interest to office men is the operation of a rotary neostyle for this purpose. The purpose of the neostyle, as is well known, is to rapidly produce duplicate copies of typewritten or handwritten letters. The method of application of a small motor

The base of the motor consists of a separate casting, the frame being drilled and tapped so that the feet may be fastened in any one of four different positions. This construction adapts the motor for mounting in any position. The screw holes in the base are slotted to allow belt adjustment. A two step grooved pulley, suitable for a cord or round belt, is supplied with each motor. The speed obtained by driving from the larger step is about twice that of the smaller.

The bearings are self-oiling and similar in construction to those of the fan motors. They are provided with vertical oil cups with a wick which effectually lubricates the shaft, and a suitable return channel prevents the dripping of oil from the bearings. The leads are brought out through hard rubber

bushings, and connection to the motor is easily made. All motors are finished in black enamel with the trimmings of brass, allowing them to be installed where neat appearance is essential.

The alternating current motors are of the single phase induction type with open end frames and split phase winding, the starting coil of which is automatically cut out as the motor comes up to speed. A self-acting friction clutch engages the load after partial speed has been attained. The direct current motors are enclosed and are supplied either series or shunt wound, and are so constructed that no starting device is necessary. When desired, grooved pulleys of other sizes are furnished.

Does it Pay to Advertise when Orders are Plenty?

By GEORGE H. GIBSON,* IN THE SELLING MAGAZINE.

Does it pay? Judging by solicitors' reports, many manufacturers do not think it pays to advertise extensively when orders are thick. But is their position well taken?

As the purpose of advertising is to bring in orders, it may look foolish to invite more orders when the factory is working at full capacity. It would not only be foolish but dishonest to continue to sell tickets to a show after the house was crowded and so some manufacturers reason that when they hang out the "S. R. O." sign, they should stop all advertisements. Will this reasoning hold water? I doubt it. When a factory has reached the limit of its capacity, and advertising is still bringing in orders, my idea would be to increase the advertising. You have then convinced the buying public that you have a good article, and, possibly after years of effort, your advertising is beginning to bear fruit. It takes such a long, hard pull and so much time to start a heavy train that every stop not absolutely necessary is carefully avoided. The man who stops advertising because he is prosperous is like the engineer who shuts off steam because he is going.

ADVERTISING MEASURES THE MARKET.

The time to increase the advertising is when times are good. Why? In reply I will ask, who does not wish to increase his business permanently? Only the short-sighted manager tries to throttle prosperity the moment she appears. Only an egotist thinks he has so good a product that it will advertise itself and that the world will search him out in the wilderness to buy it. This might, perhaps, be the case were it not for two facts: First, there is usually some keen competitor who, so far as merit goes, is not far behind, and, second, new buyers are born daily to make their first purchase. Advertising will serve to tell them about your goods. But still the objector objects: "Of what use is it to drum up more orders by advertising if you can't fill those you have already?" The use is just this—further advertising will

test the extent of the market and prove or disprove the wisdom of enlarging your factory. If you cease to advertise when orders come in or advertise in a meagre manner, you may never feel justified in providing for a greater business, or, on the other hand, you may foolishly enlarge when there is not enough business to be had to warrant it.

More advertising when a factory is full of orders will serve to sound the market, and, in fact, I know of no other way of sounding it. Every other way is a mere hazard. The cost of such advertising is slight, just as the cost of a diamond drill to test the thickness of an ore body is slight; but only the cents-wise and dollars-foolish man will not test his market or his ore body—only such a man will save a dollar to guess away a thousand.

HUMAN NATURE TO WANT THE THINGS MARKED "SOLD."

Still it may be argued that a manufacturer has so many worries in keeping customers good-natured when goods are overdue that he should not add to his worries by having to "turn down" a lot of orders resulting from increased advertising. This additional worry can, however, be borne with fortitude when one perceives that every order "turned down" in the present is probably a customer made for the future. Nothing makes one so anxious to buy an article as to see it marked "sold." We want just the things we can't have. I entered a department store the other day, and saw people jammed in rows to a depth of fully six feet back from the counter—all fighting for a chance to spend their money. The very sight of the crowd brought others. It reminded me of one of those old-fashioned woven wire fly traps. The more flies inside, the faster others crawled in. And, so long as that is human nature, the astute manufacturer will take advantage of it. He won't wait until the crowd is gone; but, once he has drawn a crowd, he will do all in his power to hold and increase it.

KILLING THE GOOSE THAT LAID THE GOLDEN EGG.

This is not a mere convenient theory. I know several manufacturers who are doing this very thing—increasing their advertising

space, in spite of the fact that orders are coming in faster than they can be handled. Incidentally, they are increasing their factories, also. It takes an optimist to be really great. Your pessimist will open each morning's mail, saying to himself, "Well, if business keeps on like this, I don't see what we will do, but such prosperity can't possibly last." Then he thinks he'll save money while it's plenty and goes out and kills the goose that laid the golden egg. He cuts off the advertising. Some other fellow advertises to get more business, and he gets it, and he continues to get it. He enlarges his factory, and still the business comes.

TAKES SIX MONTHS FOR ORDERS FROM ADVERTISING TO REACH THE SHOP.

Does it pay to advertise when your books are full of orders? Do you want your business to continue its growth and to stay young? Or do you believe it is time for your business to grow old and take to an easy chair? When a man feels that way he is already on the toboggan slide. Don't promise yourself that you will begin advertising when orders slacken. You won't, you will feel too poor, and, besides, it will be too late. The time to advertise for work for the rainy day is now. Orders from advertising rarely get into the shop in less than six months and it never hurts your reputation nor your profits to have to turn away orders. Some customers are always willing to wait longer or pay more than others and the opportunity to sell to many such people is to be prized. While demand is great you take the pick or skim the cream and when demand naturally slackens you will still have plenty to do. Advertise as long as you expect to remain in business.

CANADIAN AIRMOTORS FOR THE ORIENT.

The Ontario Wind Engine & Pump Co., Toronto, are now preparing an order for shipment to the Levant of 30 Canadian air-motor outfits; also a shipment of two 16-foot air-motors for Egypt. That this firm's goods are giving satisfaction may be judged from the following extract from a journal, printed by the Imperial Government in one of the Crown Colonies of the East. "The satisfaction that these air-motors have given is great, and up to this time no complaints have been heard. This company by issuing such a good article have experienced a steady growth in their business every year for the last 10 years. They are more-over again, extending their factory in order to better carry out their large trade." It is interesting to note that these air-motors are used largely to supplant water wheels worked by mule power, for irrigating purposes.

The corporation of Fredericton, N.B., have awarded to Allis-Chalmers-Bullock, Limited, Montreal, the contract for the municipal pumping engine. It will consist of an "Allis" high duty, horizontal, double acting, crank and flywheel plunger pump, driven by a cross-compound "Reynolds"-Corliss engine. The pump will have a capacity of 1,500,000 gallons for ordinary service and of 4,000,000 for fire service. Both pump and engine will be built at the works of Allis-Chalmers-Bullock, Limited, in Montreal.

* Mr. Gibson is recognized as one of the best authorities on Mechanical Advertising in America. The imprint of Geo. H. Gibson Co., New York, now appears with much of the strongest and most forceful advertising one sees in the United States trade papers.

MACHINERY AND ENGINEERING.

A Review of New Machinery, Power Appliances and Factory Equipment of all Kinds.

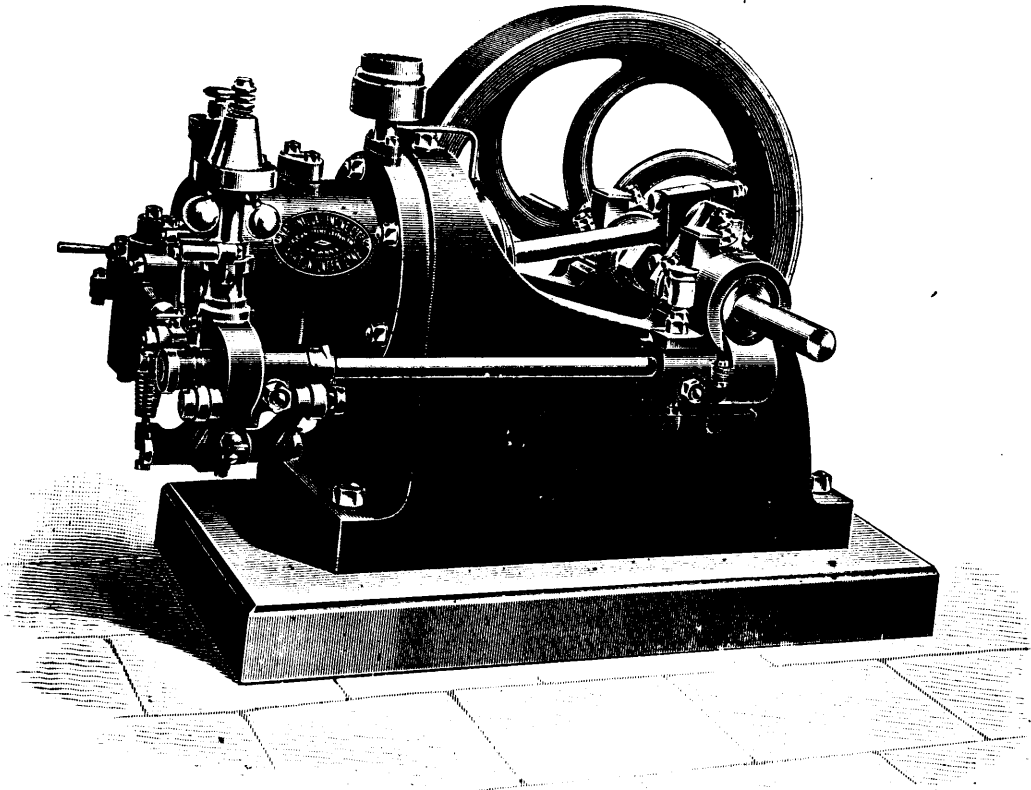
ENGLISH GAS PRODUCER TESTS.

The Royal Agricultural Society of Great Britain a short time ago conducted a series of tests at Derby, England, of plants consisting of suction gas producers and engines capable of developing from 15 to 20 h.p. maximum. The various English builders were invited to compete, and the results of the trials have been interesting. This society has in the past conducted similar tests of interest to its members, with a view to obtaining knowledge concerning the value of the machines tested in the agricultural arts. Some 30 years ago such a series of tests was made at Cardiff of steam engines, and again in 1887 a similar series of trials was made. Later, with the introduction of the oil engine, an exhaustive test of this prime mover

The trials involved a full load run lasting nine hours, when the plant was shut down for the night and started up again the next morning, and a no load run of two hours made. Following this the engines were required to take the full load as quickly as possible and to run with it for one hour. The load was then reduced to about quarter full load, and another run of one hour made, followed by an hour at half load, the day finishing with from one and a half to two hours at full load again. At the conclusion of the competition a gold medal and a silver medal were awarded by the society to the makers of the plants named by the judges to be the first and second best, on the basis of the following considerations:—Attendance required, the general design with respect to accessi-

from the fire below, passing through the angular space between the two, parts with some of its heat to this casting. The internal cylinder of the vaporizer is surrounded by an external cylinder, which when lifted off exposes the whole of the inside of the vaporizer. This arrangement is particularly valuable, because it frequently happens that hard water only is available for use in these plants, and the effective cleaning of the vaporizer becomes a most important matter, as otherwise the plant fails to work.

The method of distributing the water over the available heating surface of the vaporizer is also a special feature. An open cup is formed at the top of the vaporizer, and V-shaped notches are cut in this cup at intervals. Practically all of the notches



THE NATIONAL GAS ENGINE

was undertaken. It was only natural therefore that the society, appreciating the general favor which suction gas producers are now meeting, should undertake a thorough test of their capabilities. Among the gas producers tested were those made by Kynoch, Limited, Birmingham; the Railway & General Engineering Co., Limited, Nottingham; the Dawson Economic Gas & Power Co., Limited, London; the Mersey Engine Works Co., Liverpool; the Dudbridge Iron Works, Limited, Stroud; Davey, Paxman & Co., Limited, Colchester; the Campbell Gas Engine Co., Limited, Halifax; Crossley Brothers, Limited, Manchester; Fielding & Platt, Limited, Gloucester; E.S. Hindley & Sons, Bourton; the National Gas Engine Co., Limited, Ashton-under-Lyne, and Newton Brothers, Derby.

bility and compactness, regularity of working, fuel and water consumption, price, relative proportions of producer and engine, and ratio of the volume swept by the piston to the brake horse power. The gold medal was won by the National Gas Engine Co., and the silver medal by Crossley Brothers, but in justice to the other competitors it should be stated that all of the equipments gave such excellent performances that it was a difficult task for the judges to decide between them.

The National producer, being of a new pattern involving certain novel features, supplied an engine having a single cylinder 10 inches in diameter by 18 inch stroke, designed to give 20 b.h.p. at 190 revolutions per minute. The producer is fitted with a vaporizer in the shape of a ribbed casting, A, surrounding the coal hopper, and the hot gas

must be in operation to convey away the requisite water for vaporization, with the result that when the water is poured into the cup-shaped trough at the top, a portion overflows through each notch and then drops to the ribs immediately below. The water spreads horizontally along the ribs, and as these are made of different widths, the widest being at the bottom, it is impossible for the water to drop directly from the top to the bottom of the vaporizer. It must either trickle down the sides or drop from rib to rib. In practice this proves to be a most effective arrangement and greatly adds to the efficiency of the vaporizing arrangement.

It is naturally advisable to work the generator on the regenerative principle as far as possible, and, further, the successful working of a plant, apart from efficiency,

depends upon an ample quantity of steam passing into the fire along with the incoming air. In order that the air may always carry this requisite amount of steam in suspension it is desirable to preheat it. In the present plant this is done by utilizing the waste heat of the outlet pipe from the generator to the scrubber. The part has vanes cast on it and is incased by an outside cylinder. The vanes are so shaped that the air has to pass round and round the passages, so that when the air reaches the vaporizer its temperature has been raised considerably. To facilitate the steam raising the feed water is first passed downward through the ribbed pipe, which is placed inside of the outlet pipe already referred to, and thereby heated to a high temperature before it enters the vaporizer.

The fan is attached to the generator in a novel way, which greatly increases the convenience of starting up. The fan is attached to a junction piece on the pipe, which conveys air and steam from the vaporizer to the ash pit. In starting, the deflector is moved into one position, while in working it occupies another, so that the usual cocks and blank plates are done away with. The gases are cleaned and cooled by being passed through an ordinary coke scrubber, and are taken direct from the top of the scrubber to the engine. No steps are taken to reduce the supply at low loads, it being the experience of the company that this is unnecessary.—Iron Age.

EXIT EMERY: ENTER ALUNDUM.

The potency of an influence that will cause an old and well-established firm like the Norton-Emery Wheel Co., Worcester, Mass., to change its name must be great indeed. Such is the force of alundum, the new abrasive material.

Not only does this important commercial commodity completely displace emery, the natural abrasive so extensively used in the past in the manufacture of grinding wheels, says the Worcester Telegram, but it conspicuously emphasizes the progressiveness of one of Worcester's largest and most essential industries.

Norton grinding wheels are no longer made of emery, hence the necessity for a change in corporate name.

The process of grinding has almost revolutionized shop practice, and in much the same way as the old-fashioned emery wheel replaced the grindstone, the Norton alundum wheel is replacing the emery wheel. The manufacturer who must use the most effective grinding wheels can no longer afford to consider emery.

Before the invention of the electric furnace, artificial abrasives suitable for grinding wheels were unknown. Wheel manufacturers necessarily depended upon natural products, chiefly corundum and emery.

As emery occurs in considerable quantities in various parts of the world, it came to be recognized and used as the chief raw material for wheels, and other products, employed in grinding metals. On this account, the modern grinding wheel made of any abrasive has come to be popularly known as the emery wheel.

Alundum, the cause of this important change, is an artificial abrasive made in electric furnaces by the Norton Co. at Niagara Falls, N.Y.

The Norton Co., in its constant aim to develop the most efficient grinding wheels and materials, has, during the last few years, been operating an electric furnace plant at Niagara Falls. Here has been brought to a high state of development the manufacture of the artificial abrasive, alundum. The Niagara Falls plant has been doubled during the last year to supply the Worcester works exclusively.

Very little has been published in regard to the process of making alundum.

This process consists in taking the purest amorphous oxide of aluminum found in nature, known as the mineral bauxite, purifying it and melting it in the electric furnace in a large, homogeneous uniform bath. Upon cooling, this molten fluid solidifies and crystallizes in solid masses of alundum of great purity and absolute uniformity throughout, and of a hardness greater than any known substance except the diamond.

Bauxite, the raw material from which alundum is made, was discovered at Baux, France, from which it derives its name, but purer forms are now attainable in the United States. The highest quality only is used in the manufacture of alundum. This ore also is the chief source of the metal aluminum.

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

The Norton Co. was one of the first to engage in the manufacture of vitrified wheels, and it is now generally recognized that the most successful grinding wheels are produced by this process.

In the vitrified process the abrasive materials are mixed with various clays and other substances, and, after being formed, are placed in kilns, or ovens, and subjected to high temperatures: in some cases nearly 3000 degrees Fahrenheit. It is only the best and purest abrasives which will stand this severe heat successfully, and it has been found that there is no abrasive material which works to better advantage under these conditions than alundum.

The process of manufacturing alundum is patented both in the United States and abroad. It was awarded the grand prize at the St. Louis exposition and is recognized as one of the most important developments in electro-chemistry.

It is believed by the officers of the Norton Co. that the dropping of the words emery from the corporation name will cause little confusion on the part of the public, as Norton grinding wheels and Norton Co. have been familiarly referred to in this way many years.

ADVANTAGES OF MECHANICAL DRAFT.

In the summary of advantages of mechanical draft presented in the treatise on that subject published by the B. F. Sturtevant Co., it is stated that to a great extent they are inter-dependent, and the possession of one advantage is evidence of the possession of others of similar character. In a brief summary, however, these may be more readily brought into accord. Thus the

very adaptability of mechanical draft is indicative of the fact that it is more flexible than that produced by the chimney, is more readily controlled, and less influenced by climatic changes; while the apparatus for its production is more readily transported and has a higher potential value than a chimney. To a considerable extent these stand out as the conveniences of this method, regardless of their economies. When it is shown that increased efficiency can be secured by a method that is more convenient, the advantage of mechanical draft is established.

The actual omission of the chimney is sometimes of far greater importance than would at first appear, while the readiness with which the rate of combustion may be increased is doubly appreciated when it is shown that under proper conditions the efficiency of combustion may be increased thereby. The purely economic features are presented most prominently in the ability to utilize low grade fuels, the resultant economy being shown in numerous examples here presented. The economy in the quantity of fuel consumed has, in its relation to the use of mechanical draft on shipboard, an advantage which is closely allied to that resulting from the decreased space occupied.

The economic results which may be secured through the introduction of mechanical stokers and devices for utilizing the waste heat of the gases are rendered more evident under the conditions of mechanical draft production, as is also the great advantage of preventing smoke and the blessings of good ventilation as they are exemplified on shipboard. The facts that the size of a boiler plant required for a given output can be reduced when a fan is substituted for a chimney, that the cost of the mechanical draft plant is usually far less than that of the chimney draft plant, and that its operating expense is likewise less under proper conditions, all point most conclusively to the purely economic advantages of the method.

Among the recent orders for boilers secured by the Jenckes Machine Co., Toronto, to be built at the St. Catharines works of the company are the following:—Three 70 h.p. 60-inch diameter by 14 feet long high pressure tubular boilers for Adam Clarke, Hamilton, Ont.; one 60 h.p. 54-inch diameter by 12 feet long boiler for Dominion Radiator Co., Toronto; one 40 h.p. 44-inch diameter by 12 feet long tubular boiler for the Superior Brewing Co., Port Arthur, Ont.; one 70 h.p. 60-inch by 14 feet high pressure tubular boiler, one 25 h.p. 42 inch by 10 feet tubular boiler and one 50 h.p. locomotive type boiler for the Stuart Machinery Co., Winnipeg, Man., and one 45 h.p. 48 inch by 14 feet horizontal tubular boiler for Stevenson & Malcolm Co., Guelph, Ont.

The wave of reform that has been sweeping over the country and closing up the saloons on Sunday may be hurting the liquor trade a little, but it is sending more men to work on Monday morning with clear heads and more money in their pockets than usual, and incidentally it gives some promise of indirectly assisting and solving part of the labor problem, by reducing facilities for breeding dissension and strife.—The Clay Worker.

ARE INCREASING POWER SUPPLY.

The Quebec Railway, Light & Power Co., Quebec City, have decided on increasing to a considerable degree their power supply. This company have hitherto derived their power from the Montmorency Falls, but now have secured a site for an additional power station half a mile above these Falls, where a large natural basin is formed.

The company have erected there, according to the plans of Mr. E. A. Evans, chief engineer and general manager, a dam 84 feet high, the highest in Canada, for such a purpose. It is 67 feet 4 inches wide at the base and 12 feet wide at the crest, and will hold back 52,000,000 cubic feet of water.

The contract for the plant to develop this power has been awarded to Allis-Chalmers-Bullock, Limited, Montreal, who build both the electrical and the mechanical portions of a hydro-electric development. It will consist of a 1,500 k.w. alternating current generator, driven by a 2,225 h.p. turbine water wheel. Both generator and turbine will be built in the shops of this firm in Montreal. The plant is fully expected to be in operation by December 1, 1906.

To provide for future demands, the Quebec Railway, Light & Power Co. have also under consideration a further development at the Three Falls, two miles up the river.

LESSON OF A MACHINE TOOL AUCTION.

The auction sale of more than \$100,000 worth of machine tools at Lowell, Mass., last week, demonstrated that the builders of this class of machinery are by no means above the market in their prices and that the demand not only continues strong, but promises to remain so for a long time to come. Users of machine tools will do well to take a lesson from the result of this sale. When second-hand tools sell at auction at a premium above the quoted prices of new tools, and very much above the prices at which they were bought scarcely a year ago, it seems hopeless to wait for a turn in the market before making contemplated purchases. To be sure the machines sold had been operated but a short time, yet a machine which has been set up in a factory and has been used possesses for the new owner a certain element of risk. While many of the tools did not bring the current quoted prices, they brought under the hammer more money than they had cost in a lower market. It was agreed by those who followed the auction, among whom were many of the most successful users of machine tools, as well as builders and dealers, that the prices received were without precedent for a forced sale. Hence they reason that wise buyers will realize the conditions thus brought to the surface.—Iron Age.

LOW SUMMER TOURIST RATES WEST.

During the entire summer the Chicago & North-Western Railway will have in effect very low round trip tourist rates to Colorado, Utah, California, Oregon, Washington and British Columbia points. Choice of routes going and returning with favorable stopovers and time limits. Very low excursion rates to the Pacific Coast from June 25th to July 7th. For further particulars, illustrated folders, etc., write or call on B. H. Bennett, General Agent, 2 East King St., Toronto, Ont.

READY TO MOVE TO NEW PLANT.

About September 15 the new plant which the Schofield-Holden Machine Co., Toronto, are erecting in connection with their shipyard at the foot of Carlaw Avenue, will be completed and the plant now A. P. Holden's machine shop on Adelaide Street, will be removed to the new premises. Here they will make a specialty of rush orders of special nature, a complete equipment for this class of work being installed.

NEW SAFETY STAMPING PRESS.

A machine which many manufacturers will be much interested in will be shown in the display of the A. R. Williams Machinery Co., in Machinery Hall during the Toronto Exhibition. This is a new safety stamping press recently brought out by J.B. Hall, machine builder, 112 Adelaide Street West, Toronto. The ease with which a boy can set this press to any desired incline or level and also the perfect safety in operating it are invaluable features of this press.

I. H. C. ENGINES FOR FACTORIES.

It is not surprising that the International Harvester Co., 7 GG Monroe Street, Chicago, have found a demand for their small power engines among manufacturers engaged in various lines. This great company have but recently taken up the building of gas and gasoline engines. Their reputation would not permit them to turn out anything but high class machines. When put to the test, their engines fully meet all expectations. First of all, they are dependable. That fact will be greatly appreciated by small power users. They cannot all connect with line shifting operated from central stations. Individual steam powers for them are too slow and expensive. The I. H. C. engines furnish ready power. They are reliable. They furnish power at a moment's notice. They stop the instant the work is done, and all expense stops also.

A good example of the use to which an I. H. C. engine can be put is given by John Dittrock, Perth, Ont., who generates power with this engine to run his machine shop by day and to light his home with electricity in the evening.

An important fact in view of the attention now being given in Canada to denatured alcohol, is that the I.H.C. engine is adapted to use alcohol as well as gas or gasoline. This enables power users to operate with greater economy than ever, now that the tariff is off of denatured alcohol.

The I.H.C. engines are made in various sizes in portable and stationary horizontals and in uprights or verticals, thus adapting them in size and style to almost any use.

An advertisement of these engines is now running in this paper. Power users would do well to read it and procure the I.H.C. book on the power question before placing orders.

CANADIAN FURNACES IN BLAST.

The Dominion Iron & Steel Co., of Sydney, N.S., had three of their four furnaces running on June 30. The idle furnace is being relined. The company are preparing to erect Bessemer converters for the purification of metal for their open-hearth furnaces.

The Algoma Steel Co., of Sault Ste. Marie,

Ont., has discontinued the manufacture of charcoal pig iron and its two completed furnaces are now using coke alone.

At the experimental electric furnace at Sault Ste. Marie, Ont., 55 tons of pig iron and 125 tons of ferro-nickel pig iron were made during the first half of 1906.

The Hamilton Steel & Iron Co., Hamilton, Ont., had its coke furnace in operation for 180 days in the first half of 1906. The company expects to commence work at once on a new coke furnace, to have a daily capacity of about 300 tons. The new furnace will probably be finished next spring.

The Atikokan Iron Co., of Port Arthur, Ont., expects to have its new coke furnace ready for operation by October 1.—The Bulletin.

Steam turbine blades are usually made of cheap brass, containing 16 per cent. of copper and 3 per cent. of tin, says the Iron Age. Alloys containing zinc are said to be extremely unreliable at the high temperatures used with superheated steam, but blades containing large quantities of copper, up to as high as 98 per cent., have been found very satisfactory. A new material, containing 80 per cent. of copper and 20 per cent. of nickel, has recently been adopted as the most satisfactory blade metal which has yet been discovered. Steel blading, drawn in the same way as the usual brass section, has been used with fairly good results. The process of drawing turbine blades gives an extremely tough skin to the metal, increasing the tensile strength and also decreasing the effects of erosion. In the latest designs the calking strip has been omitted in favor of a shroud over the ends of the blades, the latter affording much better security against stripping.

In his own practice Foster Crowell has specified as follows: "Such (steel) plates, and other steel members which are to be entirely imbedded in the concrete, must be carefully washed with acidulated water of sufficient strength to remove all grease and rust, and be well scrubbed; they shall then be washed with a hose jet of clean water neutralized with limewater, and painted with a thin coat of neat cement just before the final covering with the concrete, which must be mixed and disposed so as to insure complete contact throughout with the steel. Steel members only partly imbedded in concrete, or in situations exposed to moisture acting through the concrete, must be treated, before leaving the shop, with two coats, after having been thoroughly cleaned, as specified above."

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How to Arrive at Actual Costs.

BY CHARLES E. WILLIAMS.

The new "system" (cost accounting) in manufacturing business is much greater than a few years ago. Now, in all companies, especially the large ones, routine details must be handled expeditiously, and while managers should be conversant with detail statistics and know that they are correctly assembled, the system should be such that a manager's time is not absorbed with the multitudinous matters which make the perfect whole.

Details will make or break almost any business; therefore, eliminate all detail statistics where the cost of assembling is more than the value to be derived.

Sometimes there is so much system that it is worse than a lack thereof. I have known instances where too much system needed a system to systematize itself.

When appointed treasurer of my company some eight years ago, I decided that a modern accounting system was absolutely necessary, and the foundation was then laid for our present accounting department. Having held all positions from office boy to treasurer (at that time), no one appreciated better the necessity of knowing where we stood, and of knowing it at any and all times.

Opposition appeared everywhere, as it always does when an innovation is instituted, but nobody would care to go back to the old method now. While, naturally, first results were rather unreliable, we can now, after grafting and pruning, "bank" on costs arrived at. The constant changes in business methods, which should always be betterments, are naturally followed by an increase of efficacy in any system. The millennium has not been reached; when it is there will be no need of system.

The company manufactures principally steam and hot water heating boilers, "The Dunning," of steel construction, also tanks of all kinds, specially plate work, operates a foundry and a machine shop, and, as the larger portion of the output is exclusive, when beginning the formation of the system, nothing published could be found whereby the "other fellow's" knowledge could be used; so methods had to be evolved to fit the requirements.

Orders as soon as received are entered in triplicate. On the original is full description with all details, and this is the official record. The duplicate is for the superintendent and shipping clerk, and is only seen by them, and gives shipping directions and descriptions of goods. The triplicate is the acknowledgment of the order to the consumer.

All goods are built on production orders. These "pro" orders are made in triplicate; the original for office use, the duplicate for the superintendent, the triplicate for the department foreman, and describe fully the goods to be furnished thereon, when wanted, and whether for stock or for a shipping order. If for stock, the order shows what account is to be charged; if for a shipping order, the number thereof. When work is started, each part is plainly marked by the "layer-out," with the order number in white paint; this shows all workmen the order on which they are working.

The one uncertainty which is always pre-

sent in a manufacturing business, where each order should show its cost, is the "labor." While this system in this regard subdivides the labor as accurately as possible without time clerks, there is still to be explained why orders for some article will vary when built a week apart.

All workmen report their own time on cards, which are daily checked by department foremen. For instance, a man works on several different orders in a day. For each order a time card must be furnished, and show order number, hours worked, and the operation or kind of work performed. The total hours on all cards for any one man show his day's work in hours.

All time cards are sent daily to the office, where they are entered in the pay-roll book by the departments, so that production by departments can be ascertained. After each man's time is on the pay-roll book, the time cards are referred to the cost department, where the cards are re-sorted as to orders and entered by order number and process on a pay-roll analysis sheet, which is distinct and separate from the pay-roll book. The analysis sheets and the pay-roll are balanced each week and must agree.

All materials are in charge of a storekeeper, who furnishes them on proper requisition signed by the superintendent of the department foreman. These requisitions are sent to the cost department daily, where they are handled as follows:

First: Sorted as to kinds of material.

Second: Priced (carrying the cost on to the requisition and crediting proper material account on the cost department books).

Third: Re-sorted as to order number and filed to await the receipt of completed production order.

When a production order is reported as complete, any requisitions accompanying it are priced and attached with all filed requisitions. The total value of material thereon is entered on the original "pro" order, becoming a debit to the "pro" order account and a credit to the material used. The order is then held for labor.

After the pay-roll analysis sheets have been balanced, as heretofore mentioned, each production, shipping or standing order account is charged with its proportionate labor and the general ledger credited by the entering of the labor cost, thus showing the flat cost thereon, and in addition, for statistical reasons these production orders are charged with their respective percentage of operating and maintenance, distribution and general charges.

The non-productive materials are handled on standing orders in the same method as production orders, and these are balanced monthly to proper expense account.

At the close of the month the cost accountant charges the various sales accounts on the general ledger with the cost value of the sales for the month. Thus the gross profit of each department is shown and a perfect balance maintained between the general and cost ledgers.

Briefly stated, some of the many advantages in connection with cost department, are that it has perfect check:—

1. On shipping department; no goods can be shipped without detection.
2. On production; cannot make ten articles on an order calling for eight, or vice versa.
3. On pay-roll; cannot be "padded" in any manner whatever.

4. On storekeeper; any shortages must be explained.

5. On all purchases; all goods received must be reported by storekeeper without his having any knowledge of amount or quantity ordered.

6. In case of loss by fire complete and correct damages could be quickly ascertained.

Now, officers and directors should know each month the results thereof, and so a balance is taken from the general ledger as of the last working day of each month, and these balances are properly assorted into a statement book, which consists of a

BALANCE SHEET.

DEBITS:

The assets of the company in classified accounts.

Balance.

CREDITS:

The liabilities in classified accounts.
Book profit or loss.

Balance.

MANUFACTURING STATEMENT.

DEBITS:

In freights.

To profit and loss account.

Balance.

CREDITS:

Sales accounts (by name).

(The obtaining of these credit balances is explained in the foregoing).

Less allowances.

Balance.

PROFIT AND LOSS STATEMENT.

DEBITS:

Operating and maintenance (includes such accounts).

Distribution (such as), branch offices, outfreight, travelling agents, cash discount, advertising, travelling expenses, cartage, commissions, general charges (such as), interest and discount, exchange, office expense, salary, telephone and telegraph, light, law, books, postage and stationery, balance. Insurance expired, taxes, water, expenses,—department, fuel, engineer, firemen, general. Repairs—Machinery, tools, patterns, air tools.

CREDITS:

Balance from manufacturing statement.

Cash discounts.

Rents.

"Book" profit "red."

"Book" or loss "black."

Balance.

In conclusion, all corners which interfere with the expeditious obtaining of reliable, accurate results are cut. All books are original entry, column ruled, loose-leaf where advantageous, and the sales book records and invoices are completed in one operation.

At the close of each fiscal year (December 31) an inventory, complete, in every way, is taken. Cost ledger and inventory balances are adjusted, reserves written off, machinery, tool, fixture and supply accounts corrected, depreciation considered, all books closed, balances brought down, and, as of January 1, a new correct start for another year is made.—American Industries.

A Good Job Requires Good Tools

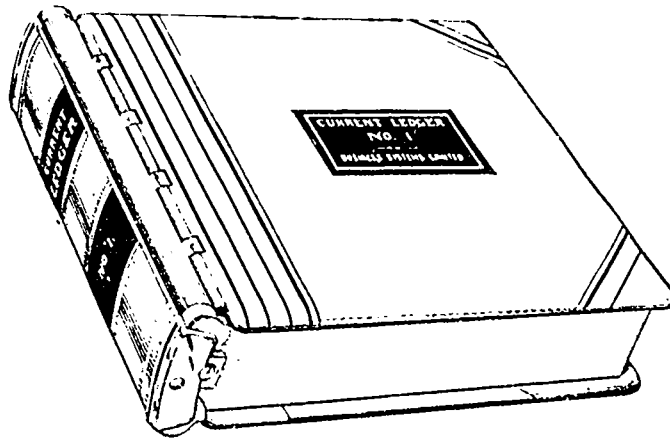
If you started to build a house by day labor you would not employ a carpenter who had not the right tools.

It would take him too long to do his work. Besides, it would not be a workmanlike job when it was done.

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Do you apply the same principle to your office work, or is your bookkeeper hammering with the back of a monkey-wrench?

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The round back of this Ledger causes it to rotate as the leaves are turned, thus keeping the same level writing surface at all times.

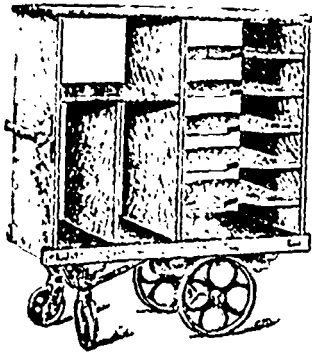
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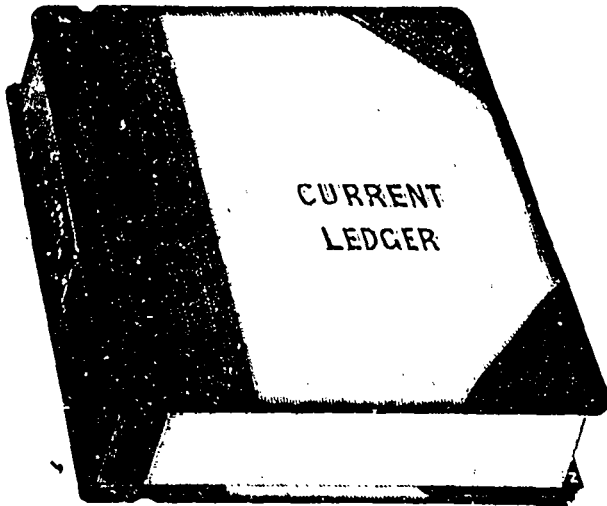
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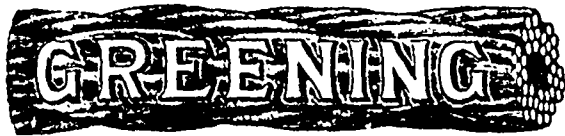


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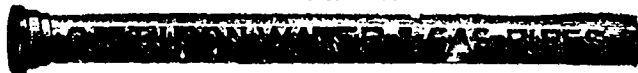
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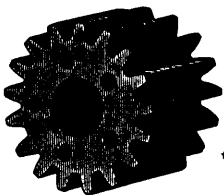
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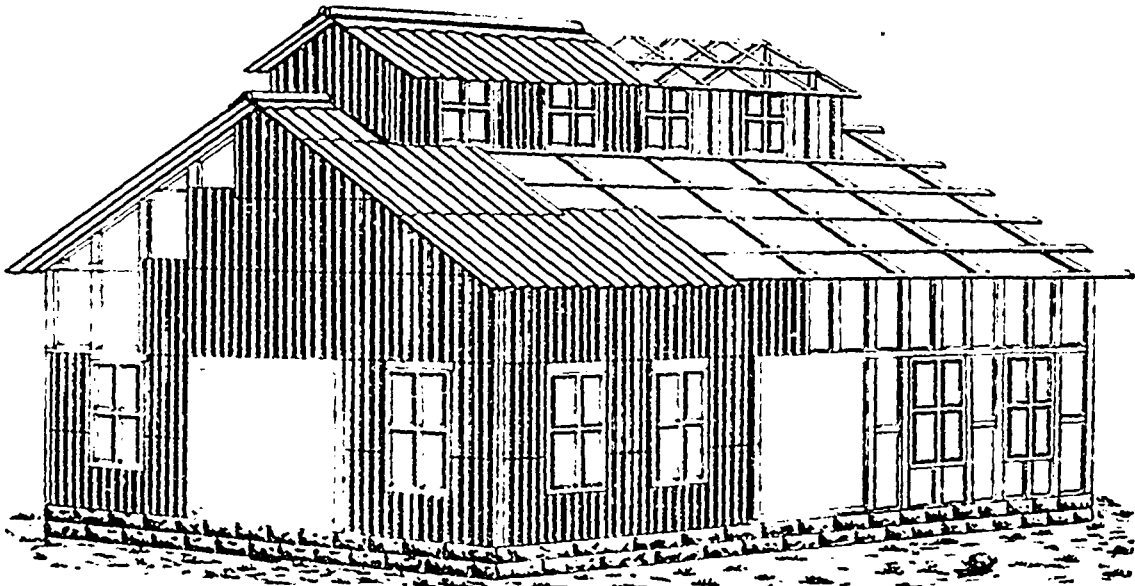
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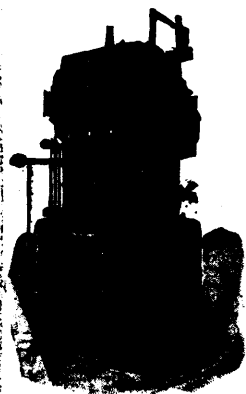
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Acids

Canada Chemical Co., London, Ont.
Canada Process Co., Toronto.
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

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.
Hopkins, F. H. & Co., Montreal.
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.
Canada Process Co., Toronto.
Casella 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

Hopkins, F. H. & Co., Montreal.
Leslie, A. C. & Co., Montreal.

Architects

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

Automatic Gear Cutting Machines

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

Axles

Hopkins, F. H. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Babbitt Metal

Petrie, H. W., Toronto.
Syracuse Smelting Works, Montreal.

Banks

Bank of Hamilton, Hamilton, Ont.

Bar Iron and Steel

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

Belt Dressing

McLaren, J. C. Belting Co., Montreal and 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.
Williams, A. R. Machinery Co., Toronto.

Belting (Cotton)

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

Belting (Leather)

McLaren, D. K., Montreal and Toronto.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

CLASSIFIED INDEX.

(CONTINUED).

Belting (Rubber)

Gutta Percha & Rubber Mfg. Co., Toronto.
McLaren D. K., Montreal and Toronto.
Petrie, H. W., Toronto.

Belting and Supplies

Bristol Co., Waterbury, Conn.
Dominion Belting Co., Hamilton, Ont.
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., Pittsburgh, Pa.
Pennsylvania Fire Brick Co., Beech Creek, Pa.
Queen's Run Fire Brick Co., Lock Haven, Pa.
Stowe-Fuller Co., Cleveland, Ohio.

Blowers

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

Boiler Compounds

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

Boiler Inspection

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

BOILERS (See Engines and Boilers)**Bolts and Nuts**

London Rolling Mills, London, Ont.
Morrow John Machine Screw Co., Ingersoll, Ont.

Brass Founders

Hamilton Brass Mfg. Co., Hamilton, Ont.

Building and Paving Brick

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

Building Iron and Steel

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

Builders' Materials

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

Cables

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

Canada Plates

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

Canoes

Peterborough Canoe Co., Peterborough, Ont.

Caps

McCullough-Dalsell Crucible Co., Pittsburg, Pa.

Card Clothing

McLaren D. K., Montreal and Toronto.

Cast Iron Pipe

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

Castings (Grey Iron, Malleable Iron and Brass)

Jenckes Machine Co., Sherbrooke, Que.
Kerr Engine Co., Walkerville, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
McKinnon Dash & Metal Works Co., St. Catharines, Ont.
Maxwell, David & Sons, St. Mary's, Ont.
Smart-Turner Machine Co., Hamilton, Ont.

Cement Machinery

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

Centrifugal Pumping Machinery

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

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.
Canada Process Co., Toronto.
Nichols Chemical Co. of Canada, Montreal

Chemists

Heys, Thomas & Son, Toronto.

Clay Working Machinery

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

Coal, Coke and Charcoal.

Bourne-Fuller Co., Cleveland, Ohio.
Hamilton Facing Mill Co., Hamilton, Ont.
Milnes, James H. & Co., Toronto.

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.

Concrete Mixers

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

Condensers

Smart-Turner Machine Co., Hamilton, Ont.

Conduits (Interior)

Conduits Company, Limited, Toronto.

Contractors' Machinery

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

Contractors' Plants

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

Conveying Machinery

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

Copper Materials

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

Corrugated Iron

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

Covers

McCullough-Dalsell Crucible Co., Pittsburg, Pa.

Cranes (Electric and Hand Power)

Smart-Turner Machine Co., Hamilton, Ont.

Crayons

Lowell Crayon Co., Lowell, Mass.

Crucibles

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

Crucible Caps

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

Crucible Covers

McCullough-Dalsell 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.

Drills

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

Drills (Pneumatic and Rock)

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

Drop Forgings

Globe Machine & Stamping Co., Cleveland, Ohio

Drop Forging Dies

Globe Machine & Stamping Co., Cleveland Ohio.

Dry Kiln Apparatus

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

Dust and Shavings Separators

Sheldon & Sheldon, 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.
Canada Process Co., Toronto.
Cassella Color Co., New York City.
McArthur, Corneille & Co., Montreal.
Nichols Chemical Co. of Canada, Montreal.
Winn & Holland, Montreal.

DYNAMOS (See Motors and Dynamoes)**Electric Meters and Transformers**

Allis-Chalmers-Bullock, Limited, Montreal.
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.

Electrical Repairs

Keystone Engineering Co., Toronto.

Electrical Supplies

Allis-Chalmers-Bullock, Limited, Montreal.
Bristol Co., Waterbury, Conn.
Canadian General Electric Co., Toronto.

CLASSIFIED INDEX.

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Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jones & Moore Electric Co., Toronto
Keystone Engineering Co., Toronto.
Packard Electric Co., St. Catharines, Ont.
Toronto & Hamilton Electric Co., Hamilton, Ont.

Elevators and Conveyors

Allis-Chalmers-Bullock, Limited, Montreal.
Darling Bros., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.

Elevator Insurance

Canadian Casualty & Boiler Insurance Co., Toronto.

Emery and Emery Wheels

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

Engineers (Chemical)

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

Engineers (Civil)

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

Engineers (Consulting)

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

Engineers (Contracting)

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

Engineers (Electrical)

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

Engineers (Mechanical)

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

Engineers (Mill and Hydraulic)

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

Engineers (Mining)

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

Engineers and Contractors

Jeffrey Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.
Smart-Turner Machine Co., Hamilton, Ont.

Engines and Boilers

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

Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Hopkins, F. H. & Co., Montreal.
Jenckes Machine Co., Sherbrooke, Que.
Morris Machine Works, Baldwinville, N.Y.
McDougall, John, Caledonian Iron Works Co., Montreal.

Petrie, H. W., Toronto.
Robb Engineering Co., Amherst, N.S.
Sheldon & Sheldon, Galt, Ont.
Smart-Turner Machine Co., Hamilton, Ont.
Sturtevant, B. F. Co., Boston, Mass.
Williams, A. R. Machinery Co., Toronto.

Engravers

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

Exhaust Fans

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

Exhaust Heads

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

Exhausters

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

Factory Sites

(See Factory Locations, page 31.)

Feed Water Heaters

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

Feed Water Purifiers

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Files

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., Pittsburgh, Pa.
Pennsylvania Fire Brick Co., Beech Creek, Pa.
Queen's Run Fire Brick Co., Lock Haven, Pa.
Stowe-Fuller Co., Cleveland, Ohio.

Fire Escapes

Darling Bros., Montreal.

Fireproof Partitions

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

Flour Mill Machinery

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

Forges and Blowers

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

Founders

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

Foundry Facings and Supplies

Hamilton Facing Mill Co., Hamilton, Ont.

Fuel Economizers

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

Furniture (Lodge, Opera and School)

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

Galvanizing

Ontario Wind Engine & Pump Co., Toronto.

Galvanizing and Tinning Machinery and Furnaces (Wire)

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

Gas and Gasoline Engines

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.

Gauges (Steam)

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

Gauges (Water)

Babcock & Wilcox, Limited, Montreal

Generating Sets

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

Generators

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

Gloves, Mittens and Moccasins

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

Government Notices

Factory Inspectors.
Minister of Agriculture.

Graphite

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

Hames.

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

Hardware

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

Heating and Ventilating Apparatus

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

Hoisting Engines

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

Hoists (Chain and Pneumatic)

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

Hose (Fire and Pneumatic)

Gutta Percha & Rubber Mfg. Co., Toronto.

Hydrants

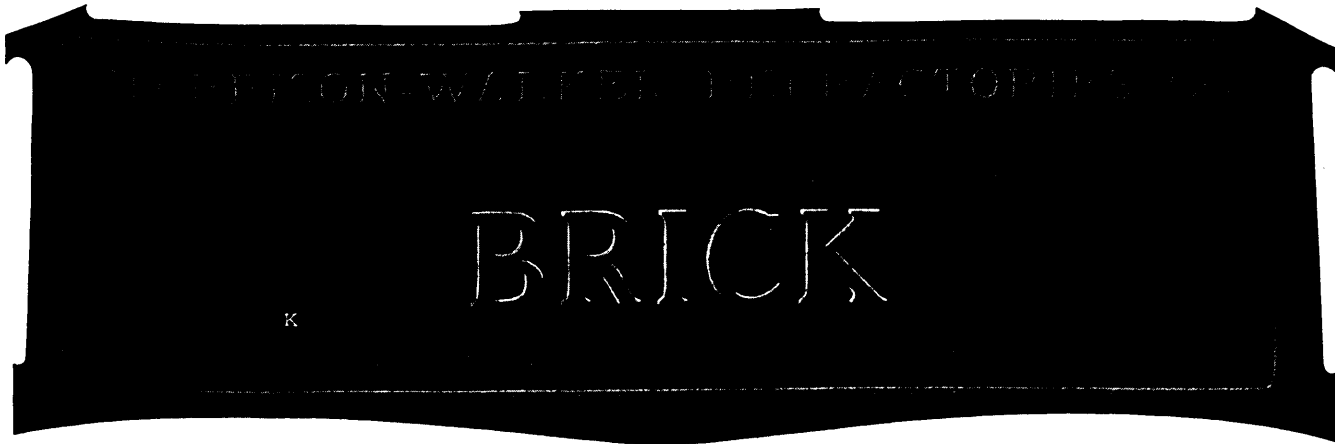
Kerr Engine Co., Walkerville, Ont.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.

Hydraulic Accumulators

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

Hydraulic Machinery

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



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(CONTINUED).

Insulated Wires and Cables

Phillips, Eugene F., Electrical Works, Montreal.

Iron and Steel Specialties

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

Injectors

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

Iron and Steel Inspection

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

Lamps—Electric

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

Lathes

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

Lathes (Wood-working)

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

Lubricators

Hamilton Facing Mill Co., Hamilton, Ont.

Machinists

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

Machinists' Supplies

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

Machine Tools

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

Malleable Castings

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

Metal Doors

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

Metal Stamping

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

Metallurgists

Mills, S. D., Toronto.

Mill Machinery and Supplies

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

Milling Cutters and Machines

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

Miners' Lamps

Allis-Chalmers-Bullock, Limited, Montreal.

Mining Machinery

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

Motors and Dynamos

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

Moulding Sand

Hamilton Facing Mills Co., Hamilton, Ont.

Moulders Supplies.

Hamilton Facing Mill Co., Hamilton, Ont.

Municipal Filtration Plants (Water)

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Nickel

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

Nozzles

McCullough-Dalsell Crucible Co., Pittsburg, Pa.

Office and Bank Fittings

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

Oils and Lubricants

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

Oil Cloth

Dominion Oil Cloth Co., Montreal.

Paints and Colors

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

Paper Manufacturers

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

Patents

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

Patterns (Wood and Iron)

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

Perforated Metals

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

Personal Accident

Canadian Casualty & Boiler Insurance Co., Toronto.

Phosphorizers

McCullough-Dalsell Crucible Co., Pittsburg, Pa.

Piano Action and Key Machinery

H. Gearing, Toronto.

Pig Iron

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

Pipe (Elvated, Iron and Steel)

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

Pipe Threading Machines

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

Pipes and Tubes

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

Plaster

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

Plates

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

Plumbago

Hamilton Facing Mills Co., Hamilton, Ont.
 McCullough-Dalsell Crucible Co., Pittsburg, Pa.

Pneumatic Tools

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

Pointer Rolls (For Rods and Wire)

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

Power Plants—Equipments

Allis-Chalmers-Bullock, Limited, Montreal.
 Babcock & Wilcox, Limited, Montreal.
 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.
 Hamilton, Wm. Mfg. Co., Peterborough, Ont.
 Jeffrey Mfg. Co., Columbus, Ohio.
 Jones & Moore Electric Co., Toronto.
 Keystone Engineering Co., Toronto.
 McDougall, John, Caledonian Iron Works Co., Montreal.
 Packard Electric Co., St. Catharines, Ont.
 Perrin, Wm. R. & Co., Limited, Toronto.
 Petrie, H. W., Toronto.
 Phillips, Eugene F., Electrical Works, Montreal.
 Robb Engineering Co., Amherst, N.S.
 Smart-Turner Machine Co., Hamilton, Ont.
 Sturtevant, B. F. Co., Boston, Mass.
 Toronto & Hamilton Electric Co., Hamilton, Ont.

Presses (Tile, Sewer Pipe, Nozzles and Sleeves)

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

Pulleys

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

Producer Gas Plants

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

Pumps and Pumping Machinery

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

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

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

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

Purifying and Softening Systems (Water)
 Babcock & Wilcox, Limited, Montreal.
 Darling Bros., Montreal.
 McDougall, John, Caledonian Iron Works Co., Montreal.

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

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

Reamers
 Butterfield & Co., Rock Island, Que.

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

Rock and Ore Crushers
 Allis-Chalmers-Bullock, Limited, Montreal.
 Bradley Pulverizer Co., Boston, Mass.

Rolling Mill Engineers
 Bourne-Fuller Co., Cleveland, Ohio.

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

Rubber Goods
 Gutta Percha & Rubber Mfg. Co., Toronto.

Rubber Packing
 Gutta Percha & Rubber Mfg. Co., Toronto.

Rubber Washing Tubs
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Rural Mail Boxes
 Globe Machine & Stamping Co., Cleveland, Ohio.

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

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

Sewer Pipes.
 Dominion Sewer Pipe Co., Swansea, Ont.

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

Shear Knives
 Hay, Peter Knife Co., Galt, Ont.

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

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

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

Shovels.
 Hamilton Facing Mill Co., Hamilton, Ont.

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

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

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

Speed Recorders
 Bristol Co., Waterbury, Conn.

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

Stamps and Stencils
 Globe Machine & Stamping Co., Cleveland, Ohio.

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

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

Steam Shovels
 Allis-Chalmers-Bullock, Limited, Montreal.

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

Steam Valves
 Babcock & Wilcox, Limited, Montreal.
 Darling Bros., Montreal.
 Kerr Engine Co., Walkerville, Ont.
 Petrie, H. W., Toronto.
 Williams A. R. Machinery Co., Toronto.

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

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

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

Stoppers
 McCullough-Dalsell Crucible Co., Pittsburg, Pa.

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

Sulphate of Alumina
 Nichols Chemical Co. of Canada, Montreal.

Suspension Furnaces
 Continental Iron Works Co., New York City.

Tanks (Oil and Water)
 Canada Foundry Co., Toronto.
 Goldie & McCulloch Co., Galt, Ont.
 Hamilton, Wm. Mfg. Co., Peterborough, Ont.
 Jenkes 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.

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

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

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

Trucks (Railway)
 Canada Foundry Co., Toronto.

Trucks (Wire Mill Supplies)
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Tubs (Cleaning and Coating Wire)
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

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

Turbines
 Canada Foundry Co., Toronto.
 Hamilton, Wm. Mfg. Co., Peterborough Ont.
 Jenkes Machine Co., Sherbrooke, Que.

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

Valves (Rubber)
 Gutta Percha & Rubber Mfg. Co., Toronto.

Varnishes
 Berry Bros., Walkerville, Ont.

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

Wagon and Carriage Wood Work
 Hore, F. W. & Son, Hamilton, Ont.

Washers or Hollinders (Cleaning Rubber)
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Water Power Development
 Vogel, C. H., Ottawa.

Water Purifying Chemicals
 Canada Chemical Mfg. Co., London, Ont.
 Canada Process Co., Toronto.

Water Softening Plants
 Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Wheelbarrows.
 Hamilton Facing Mill Co., Hamilton, Ont.

Windmills
 Ontario Wind Engine & Pump Co., Toronto.

Wiping Rags for Waste
 Schienman, I. L. & Co., Detroit, Mich.

Wire Mill Supplies
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

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

Wire Rope Fittings
 Dominion Wire Rope Co., Montreal.

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

Wire Drawing Machinery
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

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

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

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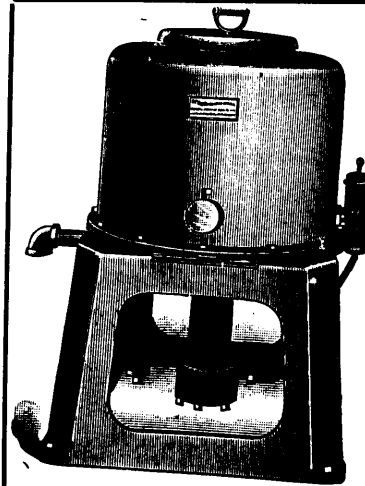
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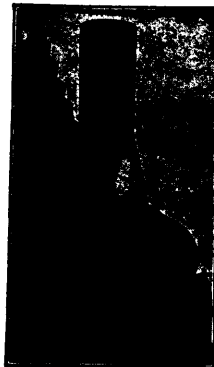
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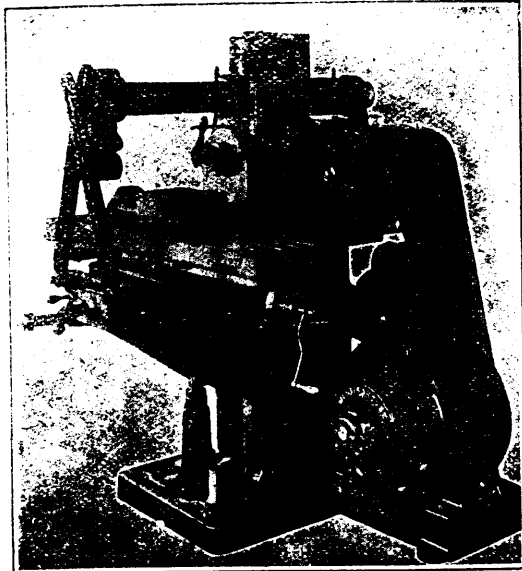
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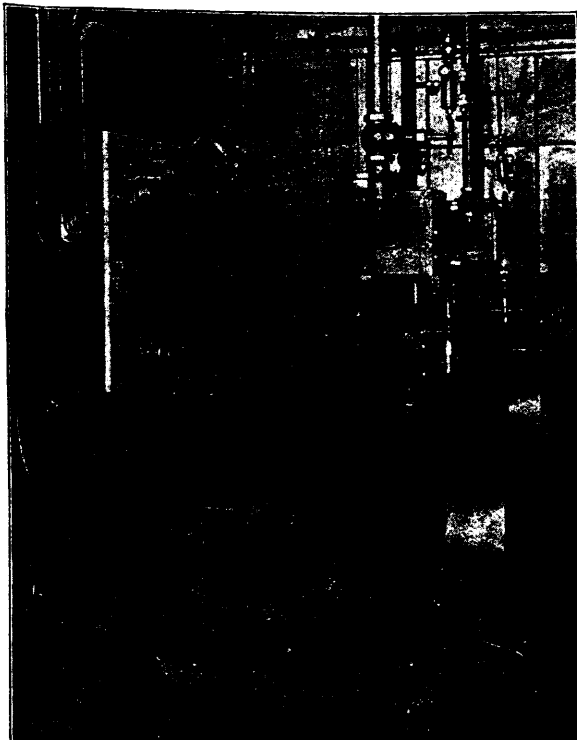
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