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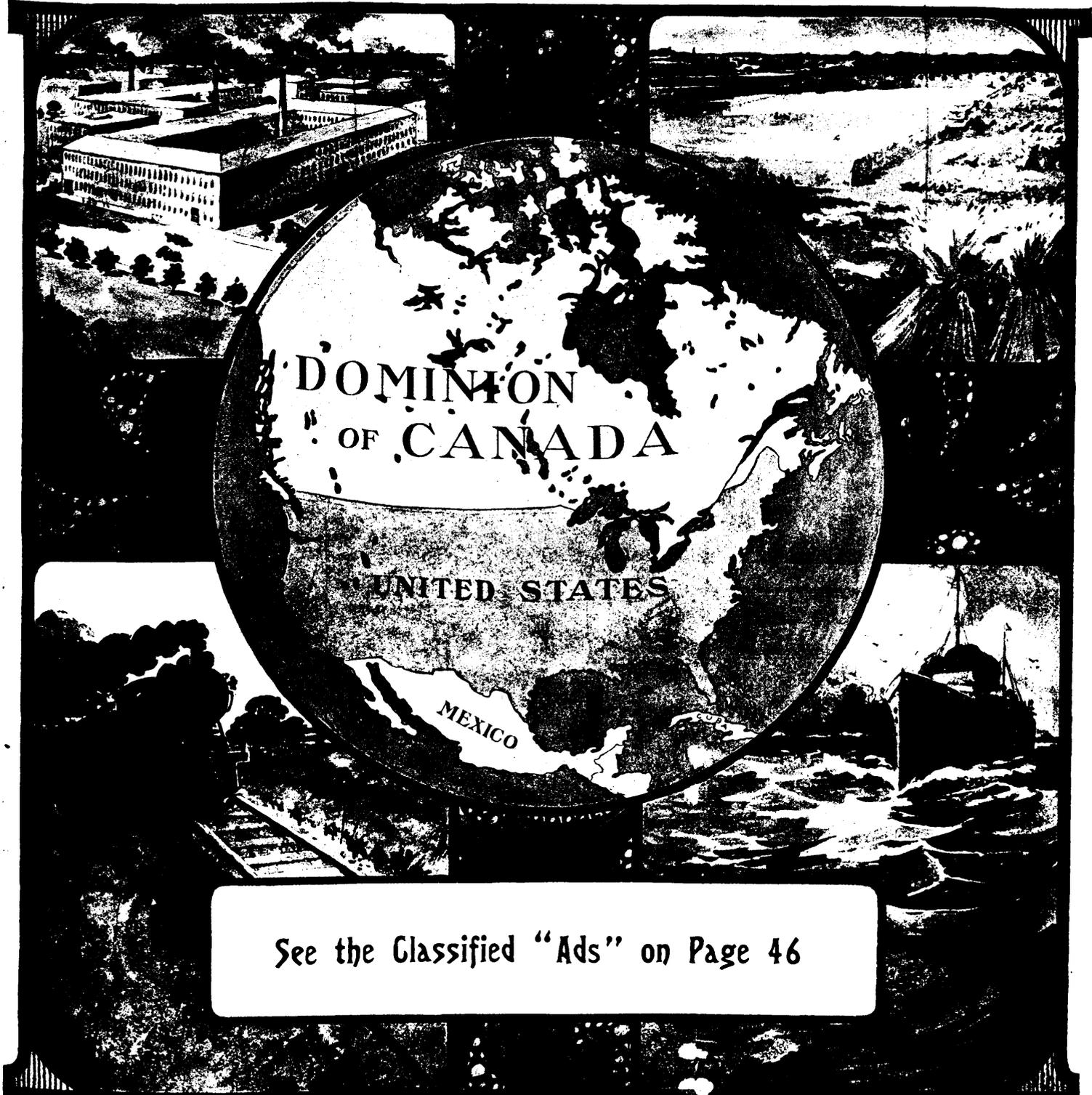
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VOL. 55. No. 3.

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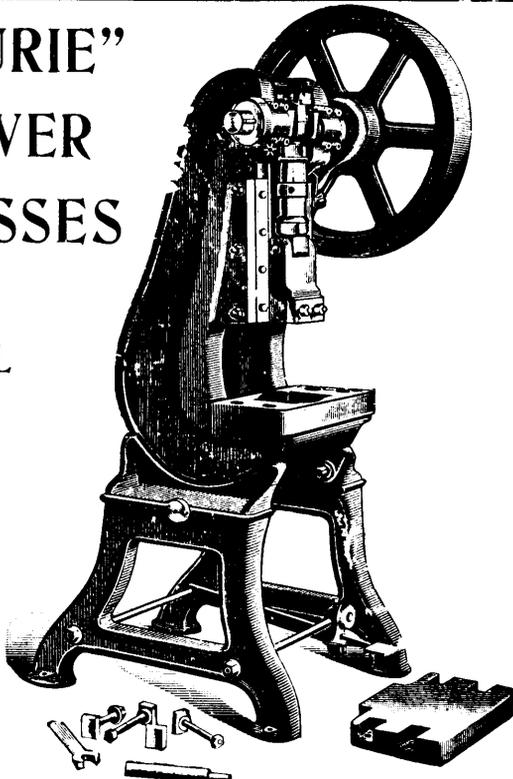
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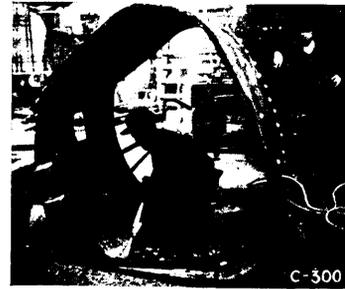


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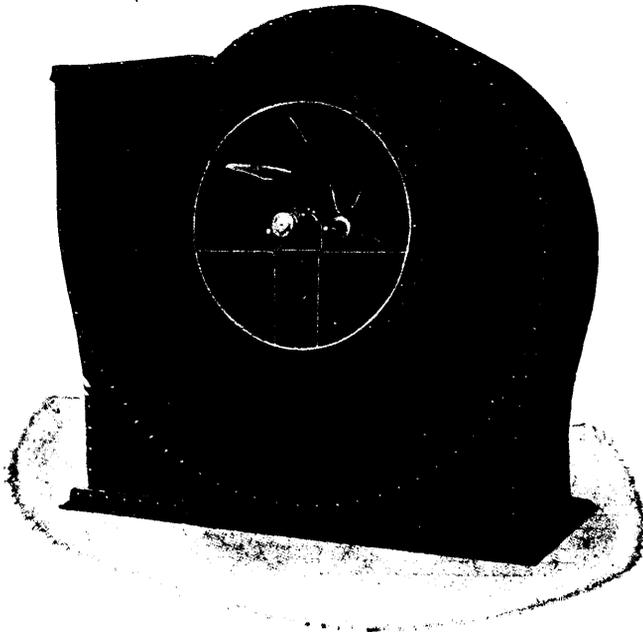
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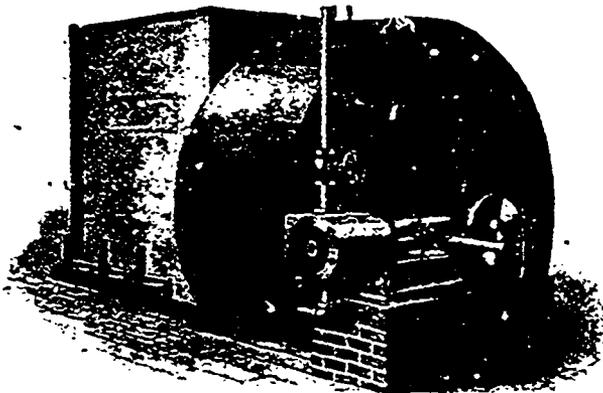
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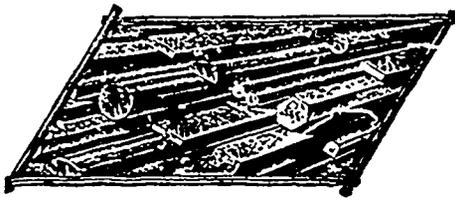
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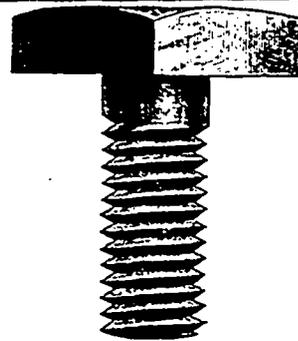
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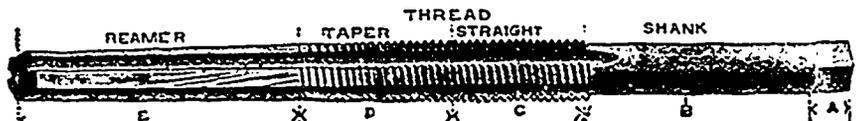


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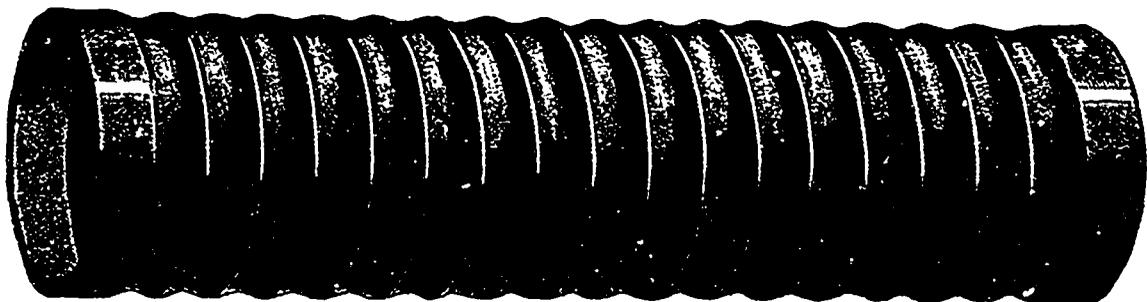
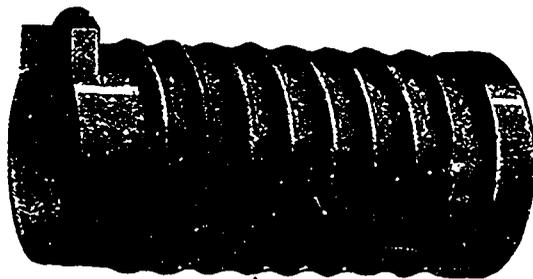
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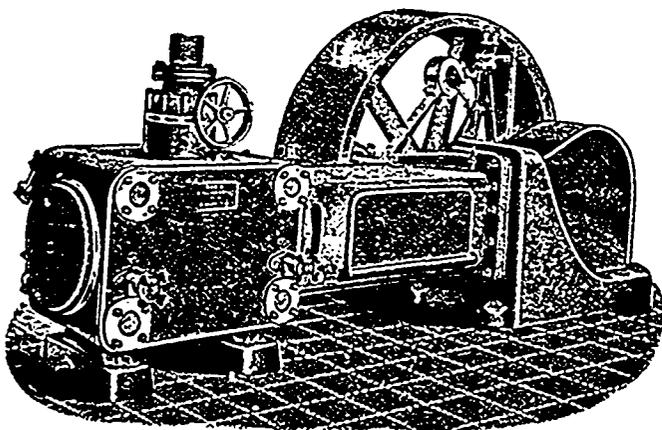
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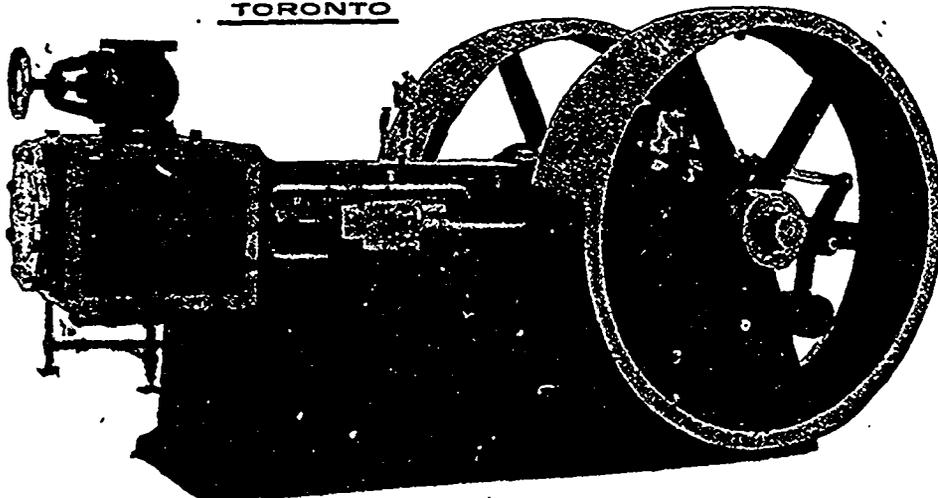
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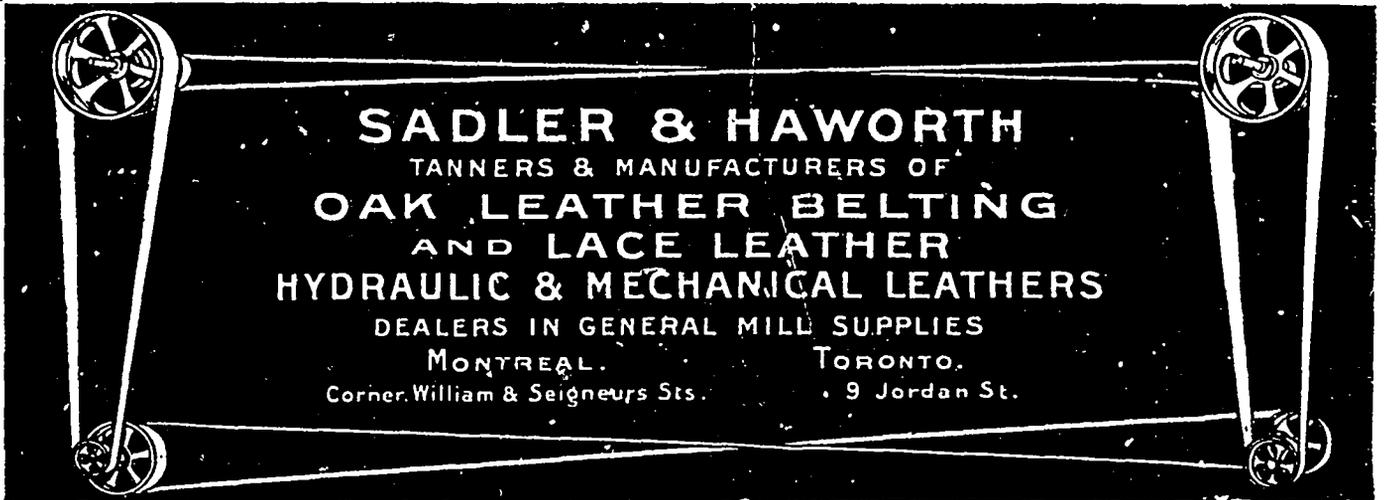
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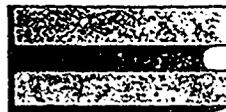


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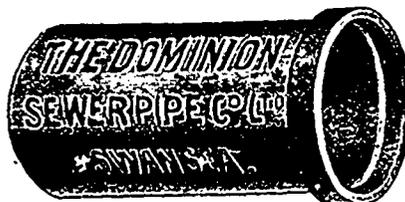
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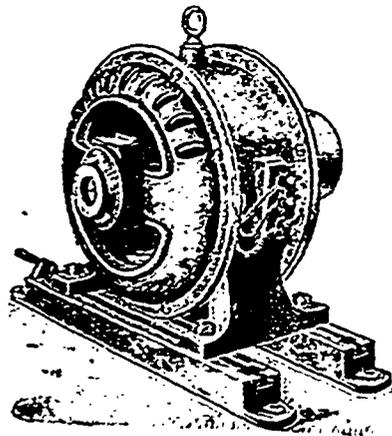
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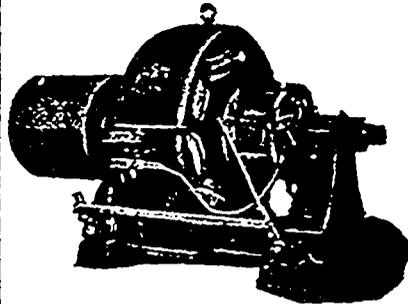
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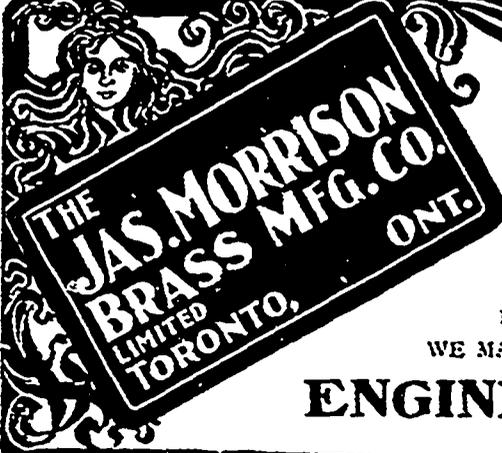
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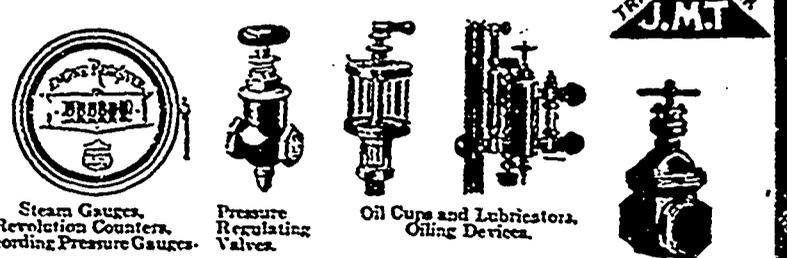
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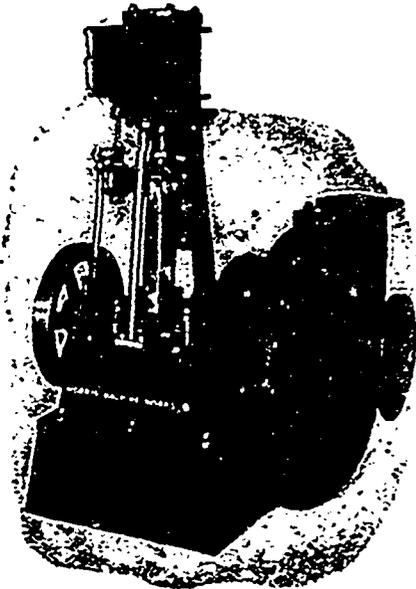
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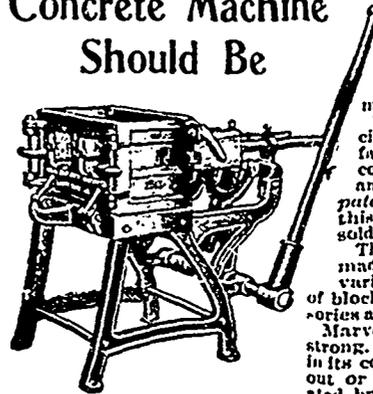
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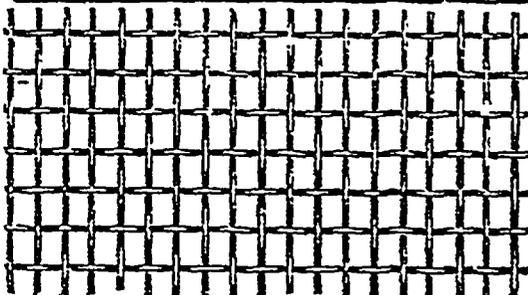
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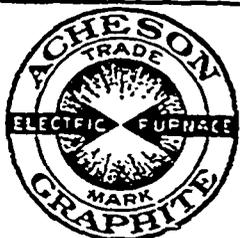
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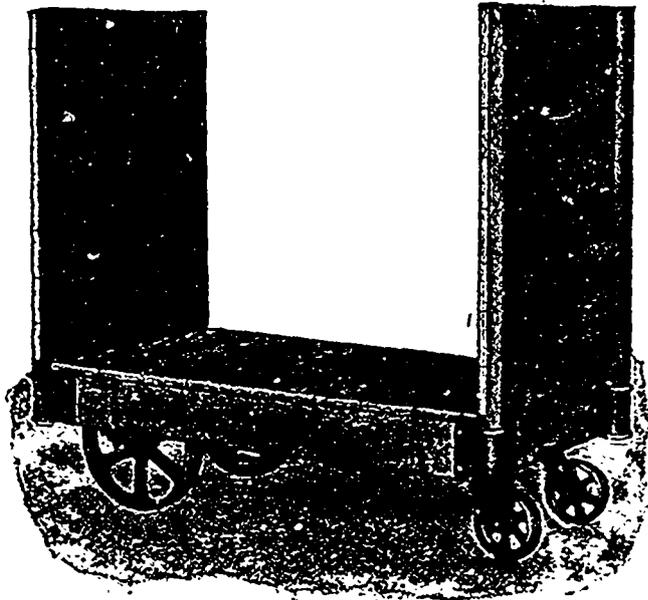
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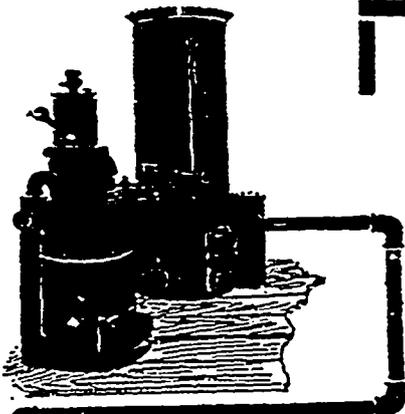


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H.P.	Hrs.	Days	Ibs.	
100	x 10	x 300	x 5	= 750 Tons
				2,000
Cost at \$4.00 =				\$3,000

100 H.P. GAS PLANT

H.P.	Hrs.	Days	Ibs.	
100	x 10	x 300	x $\frac{1}{5}$	= 112 Tons
				2,000
Cost at \$5.00 =				\$560
SAVING on Fuel alone, annually				\$2,440

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The Canadian Manufacturer Publishing Co., Limited.

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F. S. KEITH,		
D. O. MCKINNON,	-	Business Manager.
A. B. FARMER,	-	Subscription Representative.

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Index to AdvertisersPage 49

NEW MARKETING CONDITIONS.

The large increase of population and the remarkable expansion of Canada have created conditions entirely different from those which prevailed in this country a few years ago. Not only are there many more concerns engaged in all branches of productive industry, but their methods of doing business are, of necessity, materially changed. And well it should be so, for the man and his business must either go ahead or fall to the rear. He must be aggressive and up-to-date if he wants to be at the front of the procession. Under the new conditions a man cannot possibly look after all the details of a large, progressive and expanding business. He may and should have a keen, intelligent supervision of the work generally, and know how and why things are being done, but there are many problems involved, each of which demand the utmost care and attention, otherwise the business cannot prosper as it should unless the proprietor calls to his aid all helps that are necessary and available. It is one thing to purchase supplies—to know where, and when and how to buy. It is an equally important matter to watch and oversee the conversion of the raw materials into finished products; and, after the materials are well bought—after the finished products are well and truly made, and equal the best on the market, the success of the enterprise depends upon the selling of them. No manufacturer can possibly look after all these details of his business—it would be folly for him to attempt to do so. If a competitor can buy his supplies more cheaply—if he has a better equipped factory—if he uses more up-to-date machinery—if he has better salesmen in his warehouse or on the road, our laggard, no matter how

smart and experienced he believes himself to be, cannot possibly come out at the head of the poll on election day.

One of the most potent and effective assistants that a manufacturer can have in these days of fierce competition—a safe and silent councillor, is his trade paper. Other assistants may be of the utmost importance, but his trade paper should be his steady companion and friend. It will tell him who and where his wants may be supplied—who makes the very machines and machinery that he wants, and where the best possible markets are for selling his products; and above all things he should make liberal use of space in his trade paper in telling what he has to sell. Do not neglect to be in constant touch with it. Any respectable, enterprising trade paper will always have pleasure in corresponding with its friends. Up-to-date manufacturers should be always on the alert in giving his trade paper information regarding the appliances or articles they have to offer.

A CENSUS BULLETIN.

A bulletin has been issued by the Census Bureau at Ottawa dealing with the number of wage earners and salaries paid to all classes of employes in manufacturing establishments in Canada in the years 1900 and 1905. The number of wage earners in 1900 was 344,035, and in 1905 there were 391,487, an increase of 47,452. Where there are less than three or more works the figures are grouped under the head of "All Other Industries."

The number of employes includes officers, clerks, workers, etc., who are paid salaries or wages for service. The salaries paid in 1900 were \$113,249,350, and in 1905, \$164,394,490, an increase of \$51,145,140. There was a increase in the average wage per employe of \$90.74. The employers increased in the five years by 12 per cent.; the total wage by 45 per cent., and the average wage per employe by 27 per cent. The value of product per employe in the year 1900 was \$1,398, and in 1905 it was \$1,832, being an increase of \$434, or 31 per cent. For 1890 the average wage per employe was less than in 1905 by \$128.66, and the average product less by \$477.

The salaries and wages in the agricultural implement industry was \$3,778,804, an increase of over \$700,000, and an increase in the number of employes of over 600; boots and shoes, \$4,644,171, a decrease of about \$1,000 over 1900, and a decrease in the employes of over 800, the number employed in 1905 being 12,940.

Bread, biscuits and confectionery shows an increase of over \$600,000 in wages; butter and cheese, \$280,000; carriages and wagons about \$200,000; car repairs, \$2,000,000; clothing, men's factory over \$600,000; clothing, women's factory, from \$719,000; to \$2,812,000.

There was a decrease in clothing, men's custom, of about \$700,000, in women's custom clothing, over \$300,000, and in cottons of about \$100,000. Electric apparatus and supplies show an increase in wages from \$950,551 to \$2,498,905; electric light, from \$591,089 to \$460,418; fish, preserved, from \$1,700,106 to \$2,879,137; foundry and machine shop products paid an increase of over three millions and a half in wages; furniture, etc., over \$600,000.

Log products, with a decrease of over 1,000 in employes, paid out in wages \$21,038,919, as compared with \$13,755,357 in 1900. Lumber products show an increase of 5,000 in employes and of nearly three million dollars in wages.

In printing and bookbinding there were 5,902 employes in 1905, double over 1900, with an increase in wages from \$1,135,341 to \$3,032,926 in 1905.

In printing and publishing there were \$5,540,855 paid in wages for 1905 to 9,680 employes, as compared to \$4,671,413 in 1900 to 9,481 employes.

For smelting there was paid in salaries \$6,648,400 in 1905, for 9,849 wage-earners, as compared with \$1,331,553 in 1900 for 2,113 wage-earners.

Woollen goods show a decrease to \$1,508,143 paid in 1905 for 4,647 employes, as compared to \$2,066,320 for 6,795 wage-earners in 1900.

There are in the log industry 59,954 employes; lumber products, 13,336; preserved fish, 18,449; foundry and machine shops, 17,928; cottons, 10,450; smelting, 9,849, and furniture and upholstering goods, 8,141.

AMERICAN EXHIBITORS AT THE TORONTO FAIR.

At a meeting of the executive committee of the Canadian Manufacturers' Association recently held in Toronto, the most interesting matter discussed was that of admitting articles from the United States free of duty for exhibition at the Toronto Exhibition. A complaint had been made by certain members of the Association that whereas Canada admits United States goods intended for exhibition purposes free of duty, on the understanding that they were to be shipped out of the country again, the United States had steadily refused to accord Canadian exhibitors the same privilege. The Association, they said, would consult the directors of the Toronto Exhibition before doing anything in the matter.

We regret very much that any such transaction should have been taken by the executive committee, and that it should have been made public. It can do the Association no good, because it is a virtual admission of fear of American competition which we are certain does not exist, thus putting Canadian manufacturers in an unenviable light, and it is calculated to create a false impression abroad concerning the exhibition. If the Manufacturers' Association have a deciding voice in who should and who should not make displays at the Toronto exhibition, the exhibition board might have refrained from inviting American manufacturers from making exhibits. But such is not the case. The exhibition grounds, buildings and all in connection with the exhibition are the property of the people of Toronto, as represented by the City Council; and it ill becomes the Manufacturers' Association for any cause whatever, to desire to restrict the exhibition of anything because it comes from the United States, simply because the government of that country do not make their laws to accord with the view of the Manufacturers' Association.

Ever since the organization of the Toronto Industrial Exhibition Association many years ago, the policy of

the management of the exhibition was to invite exhibits from American manufacturers, and it has always been acknowledged that such exhibits, year after year, added greatly to the attractiveness of the exhibition. Then why should the hundreds of thousands of visitors to the fair, citizens of Toronto and visitors from all parts of the world, be deprived of seeing the displays of American machines, machinery and artistic handiwork?

As we mentioned some weeks ago, Dr. Orr, the efficient manager of the Toronto Exhibition had informed us that in addition to the displays of Canadian exhibitors, arrangements had already been made for quite a number of American exhibits at the forthcoming fair, and now the Manufacturers' Association executive propose that he stultify himself by shutting them out.

It will not be done.

THE THINGS THEY NEED.

Britain does not suffer through an open door to immigrants, because she also keeps an open door for their food, clothing, and all the things they need.—The Globe.

Another sophism of the free trade Globe. According to the financial statement, or budget for the year 1906-1907, introduced in the British Parliament by the Chancellor of the Exchequer, it was shown that the national income from customs during the year 1904-05 was £33,730,000, and in the next year, 1905-06 it was £34,475,000—about \$172,375,000. The contributory articles, and the amount of duty derived therefrom were as follows:—

Coal, exported.....	£2,183,973
Beer, imported.....	22,708
Chicory.....	48,363
Cocoa.....	273,100
Coffee.....	181,166
Currants.....	111,431
Plums, dried.....	47,498
Figs.....	57,240
Prunes.....	10,626
Raisins.....	248,390
Spirits.....	3,724,356
Sugar, etc.....	6,177,953
Tea.....	6,814,908
Tobacco.....	13,380,878
Wine.....	1,175,789

The Globe is, or professes to be, a truthful journal, that would not willingly prevaricate or mislead its readers, except in the matter of free trade. How, therefore, can The Globe truthfully say that Great Britain keeps an open door for all the things the people of that country need, when last year they paid duty on the articles enumerated to the amount of \$172,000,000? The duty on exported coal increased the cost to domestic consumers to the extent of more than \$10,000,000. The British people, like the people of Canada, are great consumers of cocoa, coffee, dried fruits, etc., and last year they paid duty to the extent of more than \$100,000,000 on sugars, teas and tobacco alone.

The Globe should not indulge in such utterances.

CANADA WANTS A TRADE BALANCE.

High political circles in the United States report that there will be no tariff revision till after the Presidential

campaign. Protection has humbugged the Americans a long time, but they are finding it out.—Toronto Globe.

The protection that the Americans now have is not a new thing that they are only now finding out—they have known all about it ever since it became law and went into effect July 24, 1897, ten years ago. If the Americans are humbugged by it, it is the sort of humbugging they like, and are not very likely to abandon it for a long time to come, as The Globe predicts. Why should they abandon it? The country is in a most flourishing condition—probably more flourishing than any other country in business.

Figures have been given out by the bureau of statistics at Washington showing the total imports and exports of the United States for the fiscal year 1907. The grand total of exports forms a banner record in the history of the country, the figures being \$1,880,851,024.

There was also a new record in imports of foreign goods, the grand total being \$1,434,401,092, or more than \$200,000,000, more than in the record-breaking year 1906. This is the third year that American imports have exceeded \$1,000,000,000. The gain in exports as compared with the fiscal year 1906 was nearly \$137,000,000.

The record of exports and imports during the fiscal year recently closed and last year is as follows:

	1907.	1906.
Imports.....	\$1,434,401,092	\$1,226,562,446
Exports.....	1,880,851,524	1,743,864,500
Trade balance....	\$446,449,932	\$517,302,054

A trade balance to the good of more than a half billion dollars is a good thing, to have, due to protection. Will The Globe kindly say in what year Canada ever had a trade balance in her favor? Canada would very much like to be humbugged by such trade balances.

PROSPERITY WITHOUT PRECEDENT.

Sir Wilfrid Laurier, premier of Canada, returned home a few days ago, after a sojourn abroad of several months, having been a prominent figure at the conference of premiers in London. His arrival at the city of Quebec was the signal for much rejoicing, his friends and admirers having assembled there in large numbers, and Sir Wilfrid made a speech in which he rendered to his constituency an account of his goings and transactions. He told of the Imperial Conference, his loyalty to Canada and the Empire, the proposed "all red line" and spoke of the tariff preference of Canada to the mother country. Speaking of this preference Sir Wilfrid said:—

"Ten years ago the government of which I am the chief introduced this new policy. It was often criticized, but never seriously attacked. Our opponents in parliament spoke against it, but they never challenged a vote. And you see the fruit of that policy in an era of prosperity without precedent in Canada."

This journal, in common with all the people of Canada, and of many other countries gives thanks to Sir Wilfrid for the pointer. We are aware that "an era of prosperity without precedent" has prevailed throughout and over Canada for at least ten years, the impression being

that the thanks were due to Almighty God for His blessings, served by circumstances common to all the world; but Sir Wilfrid tells us we are mistaken—that it was and is the tariff preference to Great Britain that turned the trick, and that the era of prosperity was, like a heathen Chinee, a little trump card that he carried up his sleeve. We let it go at that.

Singularly enough, on the very day of Sir Wilfrid's arrival in Quebec a bulletin was issued by the Census Bureau at Ottawa in which is given the official figures which show a gain of 27 per cent. in the last five years in an enumerated list in the manufacturing industries of Canada. The bulletin shows the number of wage earners in and amount paid for salaries to all classes of employes in the manufacturing establishments of Canada in the calendar years 1900 and 1905, as shown by the census returns of the following years. The number of employes are given only where there are three or more works of each kind of industry; the number of employes in these works or establishments, including officers, clerks, workers, etc., who are paid salaries or wages for services. For all Canada the number of wage earners in 1900 was 344,035, and in 1905 the number was 391,489, an increase of 47,454—or less than 10,000 per year. The bulletin also shows the figures for the principal industries with comparisons between 1900 and 1905.

The published list enumerates 86 lines of manufactures as being in operation in Canada in 1906—three more than in 1900.—and the facts regarding these three industries are erroneous to our certain knowledge. The production of asbestos is one of the oldest industries in Canada, but the bulletin gives it absolutely no existence in 1900; so, too, with chewing gum, our knowledge being that it was a valuable Canadian manufacturing industry for years prior to 1900; so too the manufacture of silk goods, an industry that has furnished neckties and similar articles ever since the incoming of the national policy, for in the days of Sir John Macdonald no good tory would be seen abroad without a red necktie, that being Sir John's favorite color, yet the bulletin gives no statistics for the manufacture of silk goods in Canada in 1900, and but 707 persons employed in the industry in 1905.

We tabulate from the bulletin the names of some of the more prominent industries and the number of wage earners in them in the years 1900 and 1905 in which there was a decrease in the number of such employes; another tabulation showing other industries in which increases of employes appear :

Industries.	DECREASES.		
	Wage earners.	1900.	1905.
Clothing, men's custom.....	9,818	6,578	3,240
Clothing, men's factory.....	13,028	8,812	6,216
Clothing, women's custom.....	5,948	4,396	1,552
Cottons.....	12,029	10,450	1,579
Furnishing goods, men's.....	5,385	4,088	1,297
Textiles, dyeing and finishing.....	565	544	21
Woolen goods.....	6,795	4,642	2,153
Boilers and engines.....	4,028	2,500	1,528
Boots and shoes.....	13,743	12,940	803
Boxes, wooden.....	2,002	1,507	495

Industries.	Wage earners.		Decre.
	1900.	1905.	
Brass castings.....	901	649	252
Brick, tile and pottery.....	6,705	6,490	215
Butter and cheese.....	6,886	5,956	930
Carriages and wagons.....	5,466	5,241	225
Coffins and caskets.....	601	509	92
Harness and saddlery.....	2,509	2,277	232
Leather.....	3,981	3,640	341
Log products.....	55,802	54,954	848
Matches.....	488	299	189
Fruit, etc., canning.....	4,087	3,787	300
Glass.....	1,438	1,418	30
Patent medicines.....	598	554	44
Picture frames.....	608	452	156
Sewing machines.....	637	461	176
Ships and repairs.....	2,528	1,672	856
Stationery.....	593	582	11
Tobacco, chewing.....	2,351	2,249	102
Wood pulp.....	3,301	2,456	845

INCREASES.

	Wage earners.		Inc.
	1900.	1905.	
Agricultural implements.....	6,834	7,478	644
Axes and tools.....	1,053	2,128	1,075
Boats and canoes.....	191	317	126
Boxes, bags, paper.....	1,539	1,866	327
Bridges, iron and steel.....	874	1,370	496
Car works.....	3,147	7,755	4,608
Cement, Portland.....	558	1,414	856
Clothing, women's factory.....	2,889	8,024	5,135
Drugs.....	623	903	280
Electrical apparatus.....	2,021	4,806	2,785
Hats, caps and furs.....	3,894	4,459	565
Hosiery, knit goods.....	3,896	4,804	908
Iron and steel products.....	4,316	5,580	1,264
Liquors, distilled.....	586	854	268
Lumber products.....	8,365	13,336	4,971
Electric light and power.....	1,082	2,418	1,336
Flour, milling.....	4,251	5,619	1,368
Foundry and machine shops.....	12,947	17,928	4,981
Furniture.....	7,212	8,141	929
Gloves and mittens.....	1,060	1,629	569
Musical instruments.....	2,553	2,818	265
Paints and varnishes.....	638	878	240
Paper.....	2,935	4,974	2,039
Printing and binding.....	2,836	5,902	3,066
Printing and publishing.....	9,481	9,686	205
Rubber goods.....	351	753	202
Cigars and cigarettes.....	4,631	5,384	753
Wine.....	637	1,222	585

The bulletin shows that for all Canada the wage earners in 1900 were 344,035, and the salaries and wages amounted to \$113,249,350, and that in 1905 there were 391,489 wage earners to whom \$164,394,490 wages were paid. This was an increase of 47,451 earners and \$51,145,140 in wages. The average rate of pay in 1900 was \$329 per year and in 1905 it was \$419, an increase of \$90 per year. In other words the cost of production to the manufacturer was \$90 per year per employe in 1905 more than in 1900, an increase in wages of 27½ per cent.

To the manufacturer the increase of 27½ per cent. in wages in five years is not the only burden we had to bear. Raw materials advanced in cost very largely, also taxes, insurance and other unavoidable charges, to say nothing of the comparatively narrower market caused by the increased British imports under the preferential tariff of which Sir Wilfrid speaks so approvingly. If the cost

of production to the Canadian manufacturer in 1900 and the prices that he obtained for his products were on a fair parity, under the circumstances we have shown—increased cost of labor, raw materials and other charges, and the unfair competition of British manufacturers, it is not surprising that many of them had to curtail production or quit business. The following reductions in wages paid in 1905 from wages paid in 1900 appear in the census bulletin as follows:

Industries.	Salaries paid.	
	1900.	1905.
Boilers and engines.....	\$1,845,574	\$1,360,285
Boots and shoes.....	4,645,007	4,644,171
Boxes, wooden.....	592,864	486,974
Brass castings.....	404,466	330,840
Clothing, men's custom.....	3,387,344	2,658,891
Clothing, women's custom....	1,494,368	1,143,388
Coffins and caskets.....	252,667	230,144
Cottons.....	3,547,748	3,416,412
Furnishing goods, men's.....	1,426,601	1,239,850
Glass.....	549,211	522,082
Sewing machines.....	300,362	215,845
Ships and repairs.....	835,517	766,272
Textiles, dyeing and finishing	237,092	220,546
Tobacco, chewing, etc.....	791,066	731,958
Wood pulp.....	1,179,807	1,023,720
Woolen goods.....	2,066,320	1,508,143

Of the 86 industries enumerated in the census bulletin 17 or 20 per cent. show that the amount of wages paid in 1905 was actually less than in 1900—rather a poor showing it will be admitted.

It can scarcely be admitted that there are only 86 manufacturing industries in Canada that do not comply with the rule of the Census Bureau, that to entitle it to enumeration in the bulletin there must be three or more of such works. There are hundreds of them comprised in the 25,000 or more different manufacturing establishments in Canada, in which five or more workers are employed.

In this matter one of two conclusions must be arrived at—that the manufacturing industries of Canada are not in as flourishing a condition as Sir Wilfrid Laurier is led to believe, when 20 per cent. of them, notwithstanding an increase of 27½ per cent. of wages in five years, show that 20 per cent. of them actually paid less wages in 1905 than in 1900; or that the bulletin is unreliable and not worth the paper it is written on.

MR. KEIR HARDIE AND FREE TRADE.

At the invitation of the Toronto Canadian Club a few days ago, Mr. Keir Hardie, a member of the British House of Commons, delivered an address before the Club in Toronto. Mr. Hardie is chairman of what is called the Labor party in the British Parliament, and the tenor of his address in Toronto was to explain that party's socialistic programme.

Mr. Hardie said several things about conditions in Great Britain that should concern Canadians. The Labor party, he said, is an alliance between the socialistic and the trade union movements, the programme of which, for immediate purposes, is concerned with the provision of work for the unemployed, free meals at the public cost for hungry children, old age pensions, and the

protection of trade unions. . . It is an admitted fact that thirteen millions of people in Great Britain, when fully employed, and during a period of good trade, are in constant poverty. Land is locked up in the possession of a mere handful of land owners. Trusts are a growing factor in British industry, and protection is a menace not to be overlooked. The working classes of England are practically against any form of protection. He ventured to predict that the labor vote would go on until the people had become supreme, and privilege and monopoly in government and in industry has been swept away. . . There are, said Mr. Hardie, 35,000,000 acres of land in the United Kingdom upon which the surplus population could be placed. The most of this is grazing land held by the big landlords. About 10 per cent. of this land is reserved for hunting, and there is no reason why this should not be taken over for the benefit of the masses of the people.

Mr. Hardie is not consistent; he is a free trader notwithstanding which he wants to improve the social conditions of the British poor. He says that one cause of their suffering is that the land is owned, in large part, by the aristocracy and privileged classes, who are also free traders. He knows that the poorer classes have been and are being driven from the land, and forced to the congestion of manufacturing cities, where, if they find employment, it is at starvation wages, or find no employment and no wages.

"Free trade 'ud save fer you," sez he, "on food and cloes' an' rent."

Sez I. "meat's dear 't a cent a pound, if ye haven't got the cent."

Mr. Hardie lives in a fool's paradise. If it were not for the free trade they have in England there would not be millions of starving poor; no emigration en masse, no necessity of special provision for work for the unemployed, no necessity for free meals at the public cost for hungry school children.

EDITORIAL NOTES.

The Midvale Steel Co., an American concern, has been awarded a Government contract for 2,230 tons of armor, while the Bethlehem Co., a similar concern, gets 3,602 tons and the Carnegie Co. gets 3,545 tons. One of the new 20,000-ton battleships will be built by the Newport News Shipbuilding Co., and the other by the Fore River Shipbuilding Co., of Massachusetts. All of this armor plate for American battle ships is made of Harveyized, or nickel-steel, and is valued at from four to five hundred dollars per ton. Yet all the nickel that makes armor plate so valuable, is produced in Canada: and the American tariff imposes a duty of six cents per pound on refined nickel. When our nickel deposits are exhausted that will be the end of it as far as Canada is concerned, —when Canadians will have holes in the ground as souvenirs of a national crime in allowing our American friends to carry away our nickel wealth without a protest in the way of a prohibitive export duty. Shame.

The Globe's Mechanics-Wanted columns call for an average of over a hundred mechanics daily. All the

MEETING OF THE SHAREHOLDERS OF THE CANADIAN MANUFACTURER PUBLISHING CO., Limited

The Shareholders of the Canadian Manufacturer Publishing Co., Limited, are hereby notified that a General Meeting of the Company will be held on Monday, the 26th day of August, 1907, at the hour of 11 o'clock in the forenoon, at the Head Office of the Company, Room 408, McKinnon Building, corner Jordan and Melinda Streets, Toronto, for the purpose of receiving and considering a report from the Directors upon the affairs of the Company, to elect a Board of Directors for the ensuing year, and to consider, generally, such business of the Company as may be presented.

ETHEL CASSIDY,

Secretary.

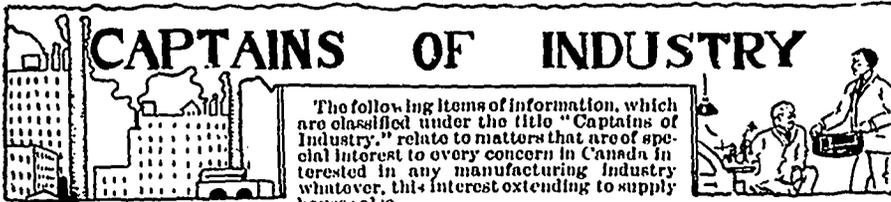
Dated at Toronto this 2nd day of August, A.D. 1907.

iron and allied industries seem to be very active.—The Globe.

A fearful stream of imports from other countries is flowing into Canada, uninterrupted by any adequate tariff protection against it, and the whole country is being drained of money to pay the bill. At the same time Canadian manufacturers are handicapped in their efforts to supply the demand for their products for want of skilled mechanics. It is true that the iron and allied industries, and all other industries, are quite as active as they can be considering the dearth of workmen. It is the policy of the Dominion Government to bring into the country all the unskilled labor available, but are opposed to any influx of skilled labor.

An English clergyman, Rev. Robert Walker, of Silloth Rectory, Carlisle, England, was in Toronto a few days ago from a visit to the Canadian West. Asked as to his opinion of the condition of immigrants who have settled in the West, Mr. Walker was most enthusiastic. "Why," said he, "I met men from my own parish who could only earn from 14 to 20 shillings a week at home up to a few years ago. They have emigrated to the West and now they are independently comfortable." Fourteen to twenty shillings English money would be about \$3.50 to \$5 in Canada, which would be very small weekly wages indeed for a Canadian workman, but, according to Rev. Mr. Walker, his parishioner, no doubt a first-class man, could only earn starvation wages in free trade England. The man is "independently comfortable" in Canada.

One of the domestic industries of Birmingham, in free trade England, is that of placing hooks and eyes upon cards preparatory to their sale. It takes about ten hours for a woman, assisted by several children, to finish a gross of these cards. For that ten hours' work she will receive, after expenses are paid, anything from sixpence halfpenny to a shilling. For a week of sixty hours she and her children may thus earn three shillings and three pence. These in outline are the facts related to the Select Committee of the House of Commons by the Chief Factory Inspector for Birmingham. One or two cases mentioned by him were worse than this. One mother and her five children, of ages three to twelve, earned two shillings and seven pence in a full week. Here, however, as the inspector explained, the mother probably did not work quite continuously, but allowed household duties to interfere. Other cases are, of course, better than the average. The highest weekly earnings known to the inspector and his assistants in this occupation go up to as much as four and threepence a family.



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

The additions which the Kensington Furniture Co., of Goderich, Ont., are making to their plant will increase by 21,000 square feet their floor space, and will make this factory one of the most up-to-date of its kind in Canada. The extension is in three wings which unite with the old premises in forming a square with a court in the centre, thus giving ample light to all parts of the building. This arrangement of the premises make it possible to send the lumber from the new 60x40 feet dry kiln on trolleys to the room where it is machined and sent by elevator to the second floor, progressing as work is done on it until it is ready to be sent down to the ground floor where are the warehouse, storage and shipping rooms. Power for the enlarged premises will be supplied by a Leonard Corliss, 125 h.p., engine and the heating will be by vacuum system, thus making use of exhaust steam from the engine for this purpose.

The Carleton Gold & Silver Mining Co., New Liskeard, Ont., have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include H. Fortier, H. Simon and L. Lewis, Montreal.

The Guelph Oil Clothing Co., Guelph, Ont., have been incorporated with a capital of \$50,000, to manufacture oil clothing, tents, awnings, etc. The provisional directors include G. McPherson, J. A. McPherson and G. A. McPherson, Guelph, Ont.

The Elgin County Council are considering the rebuilding of the 120 foot span bridge at Vienna, Ont. It is proposed to erect a steel structure, with concrete abutments and deck, at a cost of about \$10,000.

J. Rielly, St. Catharines, Ont., has been awarded the contract for the construction of section 2 of the canal from Holland Landing to Newmarket, Ont.

Peter Arnott, Toronto, has been awarded the contract for the construction of the crib work opposite the exhibition grounds, Toronto.

The Watford Milling Co., Watford, Ont., have been incorporated with a capital of \$40,000, to carry on a general milling business. The provisional directors include A. Dunlop, G. A. Dunlop and S. Rivers, Watford, Ont.

The Don Valley Brick Works, Toronto, have been awarded the contract for fireproofing the new building of the Royal Bank on King Street, Toronto.

The Crown Oil Refining Co., Hamilton, Ont., have been incorporated with a capital of \$40,000, to refine and manufacture oil, petroleum, etc. The provisional directors include E. Hull, W. Perkins and J. A. Hull, Hamilton.

The William Hamilton Co., Limited, Peterborough, Ont., have been incorporated with a capital of \$300,000, to manufacture machinery, contractors' and builders' supplies, etc., The provisional directors include W. G. Fer-

guson, A. Hall and A. E. Coulthard, Peterborough, Ont.

Hall Mark Silver Mines, Cobalt, Limited, Toronto, have been incorporated with a capital of \$300,000, to carry on a mining, milling and reduction business. The provisional directors include A. F. Lobb, G. A. Young, Toronto, and E. B. Wyman, London, Ont.

The Polson Iron Works, Toronto, are building a dredge for the Pacific Coast at a cost of about \$150,000. It will be shipped West on fifteen flat cars.

The Woodstock, Thames Valley & Ingersoll Electric Railway Co., intend constructing a line between Ingersoll and Woodstock, Ont.

The Grand Trunk Pacific Co., have purchased a block of land in Port Arthur, Ont., on which will be erected a station and freight house.

Weston Tool & Novelties, Limited, Weston, Ont., have been incorporated with a capital of \$40,000, to manufacture tools, cutlery, novelties, etc. The provisional directors include H. E. Irwin, Weston, Ont., C. M. Colquhoun and L. Glass, Toronto.

Plans for the new station of the Grand Trunk Railway Co., and the large hotel in Ottawa have been filed with the Railway Committee of the Privy Council. The plans contemplate a terminal station on the site of the present Central station to cost \$250,000. The hotel will be erected north of the station and will cost about \$1,000,000.

A new public school will be erected at Beachville, Ont.

The Automatic Products, Limited, Orillia, Ont., have been incorporated with a capital of \$40,000, to manufacture studs, nuts, screws, etc. The provisional directors include E. D. Cleghorn, Jno. Millson and E. A. Cleghorn, Orillia, Ont.

The Onaping Iron Ore Co., Limited, Toronto, have been incorporated with a capital of \$200,000, to carry on the mining, milling and reduction business. The provisional directors include Frank Denton, A. R. Cochran and G. J. Valin, Toronto.

Forbes Co., Limited, Hespeler, Ont., have been incorporated with a capital of \$1,000,000, to manufacture woolen, cotton and linen goods. The provisional directors include G. D. Forbes, W. H. Weaver and D. N. Pannaker, Hespeler, Ont.

Port Elgin, Ont., has received \$8,000 from Mr. Andrew Carnegie for a public library.

Several buildings, including the Commercial Hotel and the Bowen House, Winchester, Ont., were destroyed by fire July 19. Loss about \$50,000.

Webbwood Copper Mines, Limited, Toronto, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include A. E. H. Creswicke, C. E.

Hewson, Barrie, and A. M. Macdonell, Toronto.

The North Canadian Gold Mines, Limited, Toronto, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include H. S. Pritchard, C. A. Thomson and H. H. Lankin, Toronto.

The Grand Trunk Railway Co. are erecting a new station at Eastwood, Ont.

The power house at Kingston, Ont., was damaged by fire July 16. Loss about \$1,000,000.

The Wilcox Mfg. Co., Chelsea Green, London, Ont., are contemplating the installing of a large moulding plant.

The Wolverine Brass Goods Mfg. Co. Grand Rapids, Mich., have secured a site in Chatham, Ont., and will erect a large factory. The main building will be three stories 100x50 feet, while the boiler room will be 20x20 feet, and the foundry 72x38 feet.

A party from Chatham, Ont., including Mayor Stone, City Engineer Jones and W. H. Westman, Chairman of the Industrial Committee, have investigated the sand supply along the river for the purpose of glass making and they report their search as successful, a large supply of sand being located quite near the city. It is expected that an American glass concern will locate a factory in Chatham in the near future.

Messrs. R. Riddell & Sons, Chatham, Ont. have been awarded the contract for the construction of fire escapes at the Central school and the Collegiate Institute.

The Berlin Machine Co., Hamilton, Ont. will erect a factory at a cost of about \$150,000.

The International Snow Plow Co., Stratford Ont., will manufacture steel box and flat cars.

The Hayne Milling Co., Brigidon, Ont., will have their mill remodelled.

Messrs. MacKenzie & Mann, are considering the establishment of a large smelter and other industries on Ashbridges Bay, Toronto, at a cost of about \$3,000,000.

The new Rideau rink being erected at Ottawa, will cost in the neighborhood of \$50,000.

The Grand Trunk Railway Co., will erect a station at St. Mary's, Ont.

A new Y.M.C.A. building will be erected at Ottawa, at a cost of about \$220,000.

A large reduction and refining works will be erected on the property of the La Rose Mine, Cobalt, Ont.

The Hustler Smelting Co., New York, purpose erecting an electric smelter at Port Arthur, Ont.

Messrs. Hunter, Rose & Co., Toronto will erect a four story brick warehouse at a cost of about \$40,000.

The new moulding shop of the Stevens Co. Galt, Ont., is in full operation. The company are now doing jobbing work in cast-iron as well as making all necessary for their own requirements.

The Canadian Westinghouse Co., Hamilton, Ont., are equipping extensive additions to their plant in Hamilton with Chapman double ball bearings.

The Canadian Locomotive Co., Kingston, Ont., have placed an order with the Chapman

Double Ball Bearing Co., Toronto, for the complete equipment of their plant at Kingston, with double ball bearings.

Messrs. Helpert Bros., Toronto, will erect a three story warehouse, 60x60 feet, at a cost of about \$9,000.

The new brick factory of the Canadian Brass Co., Galt, Ont., is almost completed. Most of the machinery and power equipment has been purchased and is now on its way to the plant.

The Doherty Mfg. Co., Sarnia, Ont., have for some time been doing a great deal of experimental work on gas engines for automobiles and for stationary power. They have completed a four cylinder automobile engine which only weighs 220 lbs. yet gives 22 break horse power. They have also near completion an upright 4-cylinder, 4 cycle producer gas engine built on lines somewhat similar to an automobile engine, which is consequently much lighter and more compact than the ordinary gas engine for stationary power.

The Rogers Mfg. Co., Goderich, Ont., are making large extensions to their plant. They have installed a Jones & Lamson turret lathe and have several other high grade tools on order, including Becker-Brainard milling machine, boring mill and slotter from London Machine Tool Co., and a Warner & Swasey automatic screw machine. They are also about to erect a new malleable iron plant and boiler works at a cost of over \$25,000. The power for the enlarged plant will be supplied by a Weber gas producer and engine.

The Doty Engine Co., manufacturers of marine engines, Goderich, Ont., are erecting a new 110x50 foot foundry, also new office and warehouse, and are making a 110x40 foot extension to their machine shop. Several new machine tools, as well as labor saving foundry equipment, including Rand compressor and sand blast and Buffalo blower, are to be installed.

The McLaughlin Carriage Co., Oshawa, Ont., are equipping their new automobile factory with Chapman double ball bearings. This company was one of the first in Canada to install these bearings, and has had them in use over three years.

The plant at well No. 5 of the city's water system, Fort William, Ont., which is in course of construction, was destroyed by lightning July 23. Two motors and the compressed air engine, which cannot be replaced on the continent, were reduced to scrap iron. The loss will be about \$12,000.

The Chapman Double Ball Bearing Co., Toronto, received the contract for the complete equipment of the new plant of the Standard Valve & Fitting Co., Guelph, Ont.

The Department of Railways and Canals, Ottawa, invites tenders up to August 7 for the works connected with the construction of Section No. 5, Ontario Rice Lake Division, of the Trent canal.

A new bridge is to be erected across the creek on Charlotte Street, Peterborough, Ont.

The waterworks system, Niagara Falls, Ont., is to be extended at a cost of about \$35,000.

The Farmers' Telephone Co., Sombra, Ont., have been organized for the purpose of erecting a telephone line between Sydenham River and Sombra, Ont.

The Niagara, St. Catharines & Toronto

Railway Co., purpose extending their lines from St. Catharines to Niagara-on-the-Lake, and Welland and Grimsby Park, Ont., also from Niagara Falls to Fort Erie.

The Grand Trunk Railway Co., will make extensive additions to their yard at Brockville, Ont.

The Ontario Bridge Co., have been awarded the contract for building the steel bridge over the Aux Sable River between Stephen and McGillivray, Ont.

The breakwater to be built at Port Arthur, Ont., will be topped with concrete, and will cost about \$600,000.

The Dominion Heating & Ventilating Co., Hespeler, Ont., are installing complete heating and shavings exhaust systems as well as a dry kiln for the Deseronto Furniture Co., Deseronto, Ont.

Messrs. Adams & Waddell, 44 Colborne Street, Toronto, have taken over the jewelry business of A. H. Dewdney & Bros.

The plant of the Standard Chain Co., at Sarnia, Ont., will cost about \$40,000.

The Canadian Cutlery Co., are asking a loan of \$25,000, to build a plant at Grimsby, Ont.

The Canada Steel Goods Co., Hamilton, Ont., will erect a new factory at a cost of about \$75,000.

The Dominion Heating & Ventilating Co., Hespeler, Ont., have supplied the Elmira Interior Woodwork Co., Elmira, Ont., with shaving pans and dust collector as well as a number of lumber trucks, transfer cars, etc., for their dry kiln.

The Brockville Malleable Iron Co., Brockville, Ont., are being organized with local capital. The company purpose establishing a plant capable of reducing five or ten tons of castings daily.

The Dominion Heating & Ventilating Co., Hespeler, Ont., have lately installed a complete brick drying plant for Messrs. Watson & Sons, Orillia, Ont.

An hotel is to be erected at Kenora, Ont., at a cost of about \$225,000.

The Mortimer Co., Ottawa, are erecting an addition to their premises at a cost of about \$25,000.

A mining company will be formed at Sturgeon Lake, Ont., to operate the Wyndego mine, near Kenora, Ont.

The ratepayers of Fort William, Ont., voted favorably on the following by-laws to raise \$68,000 for the purchase of land to be used for industrial sites; \$94,000 to extend the water, light and telephone systems; \$18,000 for a fire hall and police station at Westfort; \$3,750 to enlarge the central fire hall; and \$20,000 to purchase a site for the Imperial Steel & Wire Co.

It is stated the Canadian Pacific Railway Co., have under consideration the erection of a coal handling plant at Fort William at a cost of about \$1,250,000.

The Silver Queen Mining Co., Cobalt, Ont., have under consideration the erection of a smelter.

The Collegiate Institute, Ottawa, Ont., will be enlarged and remodelled.

Several buildings, including the lumber mill of the W. C. Edwards Co., Blackburn's mica factory, No. 6 fire station, and the

Rideau Hotel, Ottawa, were destroyed by fire July 25. Loss about \$350,000.

The Lake Silver Mining Co., Cobalt, Ont., have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include C. Reinhardt, R. F. Kellock, Cobalt, Ont., and K. G. Robertson, Haileybury, Ont.

The Markdale Furniture Co., Markdale, Ont., have been incorporated with a capital of \$40,000, to manufacture furniture, woodenware, etc. The provisional directors include W. H. Knack, R. H. Anderson and H. H. Jackson, Collingwood, Ont.

The Load-Star Mining Co., Toronto, have been incorporated with a capital of \$3,000,000, to carry on a mining, milling and reduction business. The provisional directors include A. Fitzpatrick, New Liskeard, Ont., D. M. Robertson and A. A. Adams, Toronto.

The Art Tailoring Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture clothing, overalls, umbrellas, etc. The provisional directors include W. B. Campbell, E. Craven and W. Foster, Toronto.

Orlando Vickery, Limited, Toronto, have been incorporated with a capital of \$40,000, to manufacture plumbers' and steamfitters' supplies, etc. The provisional directors include O. Vickery, A. J. Jackson and T. H. Barton, Toronto.

O'Keefe-Sanford, Limited, Toronto, have been incorporated with a capital of \$40,000, to manufacture grates, mantels, tiles, furniture, etc. The provisional directors include W. Webb, M. Whalen and T. Main, Toronto.

The Erie Knitting Co., Dunnville, Ont., have been incorporated with a capital of \$40,000, to manufacture knitted goods, etc. The provisional directors include J. H. Rowe, W. Kerr and R. E. Culp, Dunnville, Ont.

The Spanish River Navigation Co., Massey, Ont., have been incorporated with a capital of \$40,000, to build ships, vessels, barges, tugs, etc. The provisional directors include J. Errington, J. Sheets and J. S. Lowe, Massey, Ont.

The Blenheim & South Kent Telephone Co., Blenheim, Ont., have been incorporated with a capital of \$10,000, to carry on the business of a telephone company. The provisional directors include G. Taylor, J. Rutherford and C. H. Echlin, Blenheim, Ont.

The R. Forbes Co., Hespeler, Ont., have been incorporated with a capital of \$1,000,000, to manufacture woolen, cotton, linen, etc. The provisional directors include G. D. Forbes, W. H. Weaver and D. N. Panabaker, Hespeler, Ont.,

The Martin Corrugated Paper & Box Co., Toronto, have been incorporated with a capital of \$30,000, to manufacture boxes, paper, pulp, pulpwood, etc. The provisional directors include S. Martin, H. Martin and W. H. Crispin, Toronto.

Taylor's Wardrobe, Limited, Toronto, have been incorporated with a capital of \$10,000, to manufacture clothing, wearing apparel, etc. The provisional directors include H. C. Sparling, H. J. Smith and S. McLeish, Toronto.

The Finnish Publishing Co., Port Arthur, Ont., have been incorporated with a capital of \$40,000, to carry on a printing and publishing business. The provisional directors include J. Rinne, S. Alanne and G. Justin, Port Arthur, Ont.

General Industries Construction Co., Toronto, have been incorporated with a capital of \$100,000, to carry on a contracting and construction business. The provisional directors include A. McKenzie, J. A. Patterson and W. H. Templeton, Toronto.

The Senator Mill Mfg. Co., Galt, Ont., are building twenty Griffin mills for the new factory of the Lehigh Portland Cement Co., Belleville, Ont., They will be in use about the beginning of the year.

The Toronto Tilbury Oil & Gas Co., Toronto have been incorporated with a capital of \$750,000 to manufacture oil, gas, etc. The provisional directors include R. W. Eyre, E. E. Wallace and H. C. Macdonald, Toronto.

The C. Turnbull Co., Galt, Ont., are adding an extension to their knitting mill which will be 75x60 feet and will contain four floors.

Surveys are being made with a view to developing a water power on the Madawaska River, near Arnprior, Ont.

E. Harvey, Limited, Guelph, Ont., have been incorporated with a capital of \$40,000, to manufacture builders' supplies, etc. The provisional directors include E. Harvey, Guelph, Ont. and J. S. Harvey, Rockwood, Ont.

The Cooper-Tilbury Oil & Gas Co., London, Ont., have been incorporated with a capital of \$100,000, to manufacture oil, gas, petroleum, etc. The provisional directors include B. V. Hole, London, Ont. and J. T. O'Keefe and T. A. Drew, Chatham, Ont.

The North Ender Publishing Co., Toronto, have been incorporated with a capital of \$50,000, to carry on a printing and publishing business. The provisional directors include C. A. Wilson, H. T. Hambly and S. C. Smoke, Toronto.

Oxford Linen Mills, Limited, Brantford, Ont., have been incorporated with a capital of \$200,000 to manufacture textiles, etc. The provisional directors include W. Berry, S. P. Davies and J. T. Atkinson, Brantford, Ont.

Tecumseh & Walkerville Oil & Gas Co., Walkerville, Ont., have been incorporated with a capital of \$40,000, to manufacture oil, petroleum, gas, etc. The provisional directors include R. J. Colloton, H. C. Walker and H. A. Walker, Walkerville, Ont.

Messrs. Bain & Cubitt, Toronto, have been incorporated with a capital of \$40,000 to manufacture paper, boxes, envelopes, printers machinery, etc. The provisional directors include D. Bain, W. C. Cubitt and J. S. Denison, Toronto.

The Dominion Wheel Co., Lindsay, Ont., have been incorporated with a capital of \$40,000, to manufacture carriage and vehicle wheels, etc. The provisional directors include J. D. Flavelle, J. Carew and T. Stewart, Lindsay, Ont.

The Crown Gas & Oil Co., Ottawa, have been incorporated with a capital of \$250,000 to manufacture oil, gas, etc. The provisional directors include A. C. Budd, R. N. Bates and A. Ryan, Ottawa.

The New Liskeard Clock Co., New Liskeard, Ont., have been incorporated with a capital of \$40,000 to manufacture clocks, dies, tools, etc. The provisional directors include J. Armstrong, M. McLeod and J. Redpath, New Liskeard, Ont.

The Algoma Co-operative Co., Sault Ste. Marie, Ont., have been incorporated with a capital of \$40,000 to manufacture crockery, hardware, oils, paints, furniture, gasoline, coal, etc. The provisional directors include D. Donald, Sault Ste. Marie, Ont., W. Stringer and D. Robertson, Steelton, Ont.

The Western Navigation Co., Fort William, Ont., have been incorporated with a capital of \$500,000 to build steamships, vessels, etc. The provisional directors include J. Murphy, W. C. Lillie and C. H. Jackson, Fort William, Ont.

The R. I. Contract Engineering Co. of Providence, R.I., have the contract for a large new concrete plant for the Eagle Knitting Co., Hamilton, Ont.

H. Levy & Sons, Montreal, have been incorporated with a capital of \$199,900, to manufacture goods, wares and merchandise. The provisional directors include H. Levy, D. Levy and A. N. de Tilly, Montreal.

Dillons, Limited, Montreal, have been incorporated with a capital of \$49,000, to manufacture chemicals, drugs, dyestuffs, etc. The provisional directors include G. A. Dillon, Sylva Dore and R. Genest, Montreal.

Missisquoi Marble Co., Limited, Phillipburg, Que., have been incorporated with a capital of \$500,000, to manufacture marble, granite, stone, concrete, clay, tile, slate, terracotta, calcine lime, etc. The provisional directors include J. T. Shearer, J. Dale and S. H. Ewing, Montreal.

Standard Coal & Shipping Co., Limited, Montreal, have been incorporated with a capital of \$150,000, to carry on the coal business. The provisional directors include F. M. Dixon, A. Ross and A. Darling, Montreal.

Car Scale Co., Limited, Windsor Mills, Que., have been incorporated with a capital of \$100,000, to manufacture cars, scales, weighing machines, etc. The provisional directors include A. O. Watts, Leeds, Que., J. W. Quinn, and Jno. A. McCabe, Windsor Mills, Que.

The Dominion Bridge Co., Montreal, have been awarded the contract for the construction of five steel bridges on the eastern Quebec section of the National Trans-ontinental Railway. The contracts total about \$150,000.

S. Levinson, Son & Co., 324 Notre Dame Street west, Montreal, clothing manufacturers, will move next spring to premises now under construction at 313 Notre Dame Street west.

The Canada Trading Co., Montreal, have recently opened an office in the Board of Trade Building, where they will carry on business as steamship agents and ship brokers, They represent Harrison & Co., Byrites Mines, and are also agents for mica, stone, wood pulp and steel wire rope.

The Hull Electric Co., Hull, Que., are erecting an addition to their power plant.

A company to be known as the Canadian Polished Stone Brick & Tile Co., Montreal, have secured rights to manufacture the Stehm brick machine in Canada. This is a new invention which turns out enameled brick of any color, size or shape. The machine has a capacity of 40,000 bricks per day. Negotiations are under way for the purchase of a site and the erection of a plant in Montreal.

The Aetna Biscuit Co., Limited, 245 Delorimier Ave., Montreal, will build a large addition this fall, doubling their whole plant. The new building will be 240x60 feet, two stories

and basement, brick on concrete foundations. Two 100 h.p. boilers will be installed, in addition to the present plant.

The James McCreedy Co., Limited, Montreal, have just added a basement 300x50 feet to their factory. This has relieved pressure and allowed an increase of about 15 per cent. in capacity.

The Garth Co., Limited, Montreal, have enlarged their premises on Craig Street West, by the addition of a three story building 90x30 feet. A 120x90 foot addition to the foundry was commenced a month ago.

R. Moncel, 157 Craig Street, Montreal, is commencing the manufacture of electrical switch boards.

J. R. Walker & Co., Montreal, are installing new dryers in their paper plant at the Sault au Roquet, Que., with a view to increasing the output. The firm are also building a 40x40 stone addition to their leather board mill (formerly belonging to the Dominion Leather Board Co.), and will install new machinery, doubling its capacity. This work will be completed next spring.

The Corinthia Mfg. Co., Limited, incorporated a few months ago to manufacture pharmaceutical and technical specialties, have established a plant at 99 Common Street, Montreal. F. Hankin, Board of Trade Building, Montreal, is the general sales agent for the company.

W. S. Barstow & Co., engineers and general contractors, of Montreal, New York and Portland, Ore., have been awarded the contract for the extension of the terminal station of the Shawinigan Water & Power Co., at Maisonneuve (Island of Montreal), work on which is now under way.

Best Steel Casting Co., Verdun, Que., have been incorporated with a capital of \$299,000, to manufacture castings, machinery, builders' and plumbers' supplies, etc. The charter members include L. H. Henault, T. J. Best and J. A. A. Leclair, Montreal.

The Standard Automatic Fire Sprinkler Co., Montreal, have been incorporated with a capital of \$75,000, to manufacture sprinklers, fire appliances, etc. The charter members include H. W. Glassford, J. J. Robson and R. Lee, Montreal.

Canadian Railway & Contractors Supply Co., Montreal, have been incorporated with a capital of \$100,000, to carry on a contracting and constructing business. The charter members include J. J. Herbert, W. E. Short and H. V. Shaw, Montreal.

A new jail will be erected at Back River, Montreal, at a cost of about \$1,250,000. The structure will be of steel, stone and brick, and when complete will be perfect in every department as respects accommodation, light, heat and sanitary arrangements.

The directorate of the Montreal Street Railway Co., Montreal, has been increased from five to seven, the new members being Paul Galibert and George Caverhill.

The Mark Workman Co., Montreal, have been incorporated with a capital of \$1,000,000, to manufacture dry goods, clothing, etc. The charter members include M. Workman, A. S. Workman and C. A. Workman, Montreal.

The Page Wire Fence Co., Limited, will enlarge the offices of their branch in Montreal this summer, fitting up one floor 60x20 feet, for office and showroom. C. Z. Matthieu,

Montreal, is the contractor. The firm have also arranged for the addition of another building next year to their Montreal warehouse, increasing its capacity 25 per cent.

The Wingate Chemical Co., Maple Ave., Montreal, are installing electric power equipment.

The Syracuse Smelting Works, Montreal, are adding five new furnaces for babbitt metal, type metal and phosphor tin. These furnaces are expected to be in operation before the end of August, and will give an increased capacity of ten tons of white metal per day.

The Montreal Copper Co., have lately received large export orders for copper from Germany and the United States.

Brandram-Henderson, Limited, formerly Henderson & Potts, Montreal, are building a plant for the manufacture in Canada of Brandram's White Lead, the same as has made in England for 200 years. The new factory will be near the Mile End station, Ville St. Louis, where the firm have secured 166,000 square feet of land, having a frontage of 1,000 feet on the Canadian Pacific Railway track. The white lead works and the paint and color works will be included in a main building 300x150 feet, two stories and basement. This will be a fire proof building of pressed brick, mill construction. A warehouse 100x50 feet, and a power house 80x40 feet are also included in the plans. Jos. Perrault, Montreal, is the architect. This plant is expected to be in operation by January 1 next, and will make an important addition to the growth of St. Louis.

The E. & T. Fairbanks Co., St. Johnsbury, Vt., have decided to construct a branch at Sherbrooke, Que., for a branch of their scale business.

The new exchange for the Bell Telephone Co. at Westmount, Que., is almost completed.

The Canada Loose Leaf Co., Limited, Montreal, are installing machinery for the manufacture of all kinds of loose leaf systems. The factory is at 115 Youville Sq., Montreal, where the firm have secured 5,000 square feet of floor space. This is the first factory in its line in Montreal.

Frankel Bros., proprietors of the Toronto Mill Stock & Metal Co., Toronto, have secured the premises formerly occupied by Drysalters, Limited, Montreal, which will be added to their Montreal warehouse, which will then include Nos. 84, 86, 88, 90 and 92 Wellington Street, Montreal.

J. & R. Weir, Montreal, are building two Decarie incinerators, one for Edmonton, which will be shipped in August, and one for Regina, which will be ready for shipment a little later. A Decarie Incinerator made by this firm was shipped to Winnipeg in March.

The entire plant of the Gloucester Cold Storage Co., Gloucester, P.E.I., was destroyed by fire recently. Loss about \$150,000.

The Caspasia Trading Co., of the United States, will locate in Dalhousie, N.B., if they can secure a free site. It is the intention of the company to erect a saw, pulp and shingle mill at a cost of about \$1,000,000.

It is reported that the New Brunswick Southern Railway Co., will be taken over by the Canadian Pacific Railway Co.

The Massey-Harris Co., Toronto, will erect a new office and warehouse in St. John, N.B.

The Lordly School Desk & Furniture Co., Limited, St. John, N.B., have been incorporated with a capital of \$9,900, to manufacture desks, furniture, etc. The provisional directors include D. McArthur, Wm. Pugsley and H. R. McLellan, St. John, N.B.

A new wing is being erected to the Hotel Dieu Hospital, Campbellton, N.B., at a cost of about \$40,000.

The Chestnut Canoe Co., Fredericton, N.B., are erecting a new factory at a cost of about \$13,000.

The Public Works Department, Fredericton, N.B., have under consideration the erection of a cantilever bridge to carry two tracks for electric cars and a highway for street travel over the St. John River at its mouth to replace the present suspension bridge.

The waterworks system, Moncton, N.B., will be extended at a cost of about \$18,000.

Messrs. B. Mooney & Sons, St. John, N.B., will erect a large storage plant in the near future.

The Canada Woodenware Co., whose factory at Hampton, N.B., was destroyed by fire recently, have decided to locate at Chatham, N.B.

The waterworks system, St. John, N.B., will be extended at a cost of about \$30,000.

Water meters will be installed in every house in Halifax, N.S., at a cost of about \$50,000.

F. O. Werther, Sydney, N.S., has been granted both United States and Canadian patents for his improved fireproof stove lining.

A. F. Woodman and R. S. Burgess, Torbrook, N.S., are considering the establishment of a plant at Wolfville, N.S., for the manufacture of washboards and other household articles.

The Lindsay Construction Co., Halifax, N.S., have been awarded the contract for building steel bridges for Mackenzie & Mann on the Halifax & Southwestern Railway line.

The J. McDiarmid Construction Co., Winnipeg, Man., have been awarded by the Canadian Pacific Railway Co., the contract for the construction of roundhouses at Cranbrook, B.C., Swift Current, Sask., Coleridge, and Strathcona, Alta., and for additions to the car shop at Winnipeg, Man. The cost of the work will be about \$125,000.

Oakland, Man., is inviting tenders for a new steel bridge.

J. Petke, 651 Sherbourne Street, Winnipeg, Man., is receiving tenders for the works in connection with the construction of the First German Church.

A sewer pipe line will be laid and a concrete ejector chamber built at Portage la Prairie, Man.

The Canadian Pacific Railway Co., intend double tracking their main line from Winnipeg to Brandon, Man.

The Bank of Montreal will erect a branch at Portage la Prairie, Man., at a cost of about \$55,000.

The Brandon Construction Co., Brandon, Man., will erect a new pavilion in connection with Brandon's winter fair at a cost of about \$24,497.

The warehouse of the Imperial Oil Co., Brandon, Man., was destroyed by fire recently

The Public Works Department, Ottawa, will erect a steel superstructure over the Assiniboine River at Shellmouth, Man.

A site has been secured at Morden, Man., on which to erect the new municipal electric light plant.

Messrs. Carley & Wellard, Winnipeg, Man., have established a plant for the manufacture of furniture, cabinets, etc.

An addition will be erected to the Court House, Winnipeg, Man.

The James McCready Co., Limited, Montreal, will build an eight storey warehouse, 130x100 feet, in Winnipeg, Man., commencing work either this fall or next spring.

A town hall will be erected at Rosthern, Sask., in the near future.

The corporation of North Battleford, Sask., will shortly call for tenders for buildings, machinery and electrical equipment for the waterworks and sewage systems.

The ratepayers of Moose Jaw, Sask., will vote on a by-law to raise \$90,000 to extend the power plant. A boiler house will be built and two new boilers installed immediately. Next year it is proposed to add two more boilers, a 500 kw. steam turbine feed water heater, a boiler feed pump and condenser, with the necessary foundations and piping.

The Municipal Council of Morden, Man., have passed a by-law to borrow \$20,000 for the purpose of constructing or purchasing an electric light plant.

The Ontario Wind Engine & Pump Co., Toronto, have secured the contract for constructing a 120,000 gallon steel tank, 140 feet high, in connection with the waterworks system, Wetaskiwin, Alta.

The ratepayers of Medicine Hat, Alta., voted favourably on a bylaw to provide \$20,000 for the natural gas system.

A new armoury will be erected at Medicine Hat, Alta.

The new four story stone and brick warehouse of the James McCready Co., Limited, of Montreal, at Calgary, will be completed about October.

A traffic bridge will be erected at the foot of Third Street, MacLeod, Alta.

The Alberta Wheat, Coal & Oil Railway Co., will build a line from Pincher Creek to the oil wells in the south-western part of the province, where are established the Rocky Mountain Development Co., and the Western Oil & Coal Consolidated Co.

The Edmonton Steam Laundry Co., Edmonton, Alta., are erecting an addition to their premises at a cost of about \$2,000.

The Governments of Alberta, Saskatchewan and British Columbia, are considering the question of establishing a large university in one of the three provinces.

The Society of Equity, MacLeod, Alta., have decided to erect a 215,000 barrel mill, at a cost of about \$30,000.

The Lethbridge Electric Co., Lethbridge, Alta., are installing in their plant a Babcock & Wilcox watertube boiler.

The ratepayers of Cardston, Alta., voted favorably on a by-law to raise \$20,000 for water mains and electric lighting.

The Waterton Land & Power Co., will erect a saw and planing mill at Lethbridge, Alta., at a cost of about \$40,000.

The city of Strathcona, Alta., and the Radial Tramway Co., are considering the construction of a street railway system at Strathcona.

Nearly \$500,000 will be spent in Regina, Sask., on granolithic sidewalks, pavements, and sewerage, waterworks and electric light systems.

When the Public Works Committee, Calgary, Alta., opened the tenders for the new city hall it was found that the lowest tender was \$208,000, which is \$68,000 higher than the estimate. The committee believe that the tenders are too high and will open tenders to contractors in other parts of Canada.

Messrs. McDonald & Ray, have been awarded the contract for the construction of the new high school at Calgary, Alta., at a cost of about \$68,000.

An addition is being erected to the German Baptist Church, Namao, Alta., at a cost of about \$2,850.

The congregation of St. Patrick's Church, Lethbridge, Alta., will build a new edifice at a cost of about \$100,000.

The ratepayers of Estevan, Sask., have submitted a by-law to raise \$82,000 for electric light and water works systems.

The James McCreedy Co., Limited, Montreal, are building an addition to their warehouse in Edmonton, doubling its capacity.

Oil gas has been discovered at a depth of 350 feet at Morinville, Alta., the present northern terminus of the Canadian Northern Railway line. A pipe has been sunk to a depth of 312 feet and is being rapidly added to in order to thoroughly exploit the gas.

The Rosthern Flour Mills, Limited, Rosthern, Sask., are erecting a 100 barrel flour mill 56x32 feet with an engine room and annex 34x32 feet, at a cost of about \$18,000.

A new Roman Catholic Church is to be erected at Halbrite, Sask.

The British Columbia Electric Railway Co., have purchased a site in New Westminster, B.C., on which to erect an exchange building.

The sewage system, Victoria, B.C., will be extended at a cost of \$50,000.

The Canadian Pacific Railway Co., are erecting a pier at Vancouver, B.C., which will be 670 feet long and 166 feet wide. Each side of the pier will be dredged to a depth of thirty feet in order to accommodate the largest Pacific boats. The total cost of the pier will be \$300,000.

The premises of the Nye Canning Co. and the Cotton Shingle Mill Co., Vancouver, B.C., were destroyed by fire recently. Loss about \$10,000.

The Vancouver Structural Steel Works, J. Caughlin & Sons, proprietors, have been organized in Vancouver, B.C., A site has been secured and a new factory will be erected at once.

A steel draw bridge will be erected in Vancouver, B.C.

Ald. Cook, New Westminster, B.C., will erect a ten story office building at a cost of about \$200,000.

The Canadian Pacific Railway Co., are opening up a coal mine at Mosher, B.C.

The British Columbia Electric Railway Co. are extending their system at Fort Langley, B.C.

Work has been commenced on the ten acre reservoir in connection with the waterworks system, Vancouver, B.C.

A waterworks system is being considered for Richmond, B.C.

Mr. Hildegrass of Seattle, is making arrangements for the construction of large railway car shops at New Westminster, B.C.

The Canadian Fairbanks Co., Montreal, have secured the contract to supply Lloydminster, B.C., with a gas producer electric light plant of 100 h.p. capacity.

The San Francisco Dry Dock Co. will erect a large dry dock at Hunter's Point, four miles south of Vancouver, B.C. The dock will be 1,050 feet long over all. At the coping it will be 144 feet wide, and at the bottom 92 feet wide. It will have a depth over the sill below the coping of 39 feet 10 inches, or 34 feet 6 inches at high water, which, it is claimed, will make it the most commodious dry dock in the world.

A large part of the City of Victoria, B.C., was destroyed by fire July 23. Loss about \$250,000.

Cecil Doutre, superintendent of wireless telegraph stations for the Dominion Government, has gone to the west coast of Vancouver Island to inspect the sites at Pachena Point and Estevan, where it is proposed to erect stations.

The Albion Stove Works, Victoria, B.C., are extending their foundry.

The shingle mill of G. Le Clair, Hastings, B.C., was damaged by fire to the extent of about \$25,000.

T. Merrill, Duluth, B.C., will build a sixteen mile logging railway through his lumber claims.

The total cut of logs on the coast of British Columbia for the fiscal year ending June 30, was 339,343,662 feet. The cut for June alone was 39,199,946 feet. It is estimated that the entire cut of British Columbia, including that from Dominion and interior lands, was just double the coast output, or a total cut for the entire province of 678,687,324 feet.

PERSONALS.

The report of K. L. Aitken, C.E., on electrolysis in Hamilton, has been received by the Fire and Water Committee, and referred to the City Engineer and the City Solicitor for consideration.

Mr. L. W. Jones resigned, July 8, as president and also from the board of directors of the Pittsburgh Filter Manufacturing Co. Mr. Jones has been connected with the above company since 1903, during which time some of their largest and most successful plants were installed. Mr. Jones contemplates, in the near future, opening an office in Pittsburgh as consulting engineer, taking up the line of municipal and industrial filtration plants, water softening and sewage disposal plants.

The Montreal Street Railway Co. have elected two additional directors. They are Mr. George Caverhill of the firm of Caverhill, Learmont & Co., and president of the Board of Trade, and Mr. Paul Galibert, chairman of the Montreal Turnpike Trust, and a member of the firm of Galibert & Son. At the last annual meeting the matter was put before the stockholders and they approved of the plan of increasing the board from five to seven.

PUBLICATIONS.

THE TYPICAL FACTORY.—A catalogue has just been issued by the Trussed Concrete Steel Co., of Detroit, Mich., showing the advantages of the Kahn System of reinforced concrete for factory buildings. It describes in detail, with numerous illustrations, the typical factory of the Geo. W. Pierce Automobile Co., of Buffalo, N.Y. The plant was built of reinforced concrete in exactly one half the time that contractors would undertake to complete the work using ordinary methods.

BUSINESS COLLEGE EDUCATION.—All young men and women who intend entering a business college this fall are invited to write to the Elliott Business College, Toronto, for their handsome catalogue. This school is classed among the best business colleges in Canada.

RESULTS THAT COUNT.—A folder describing in a striking way the objects, scope and accomplishments of the Sheldon School, Chicago. The Sheldon system is described as a practical, complete and national system of developing the science of selling and business building. The school has 23,000 students scattered throughout the world, over 85 per cent. of whom are veteran salesmen in all lines of business—managers, proprietors and executive heads of great institutions. The Sheldon method is the scientific selling of goods. The folder enumerates specific points taught, and besides other interesting information, copies of enthusiastic letters received from some who have taken a course in the Sheldon School.

PROTECTIVE APPARATUS.—Folder No. 4013 is being sent out by The Canadian Westinghouse Co. describing electrical apparatus to ensure protection against lightning. These lightning arresters are designed to prevent the formation of an arc thus the life of the arrester is increased and the protection multiplied. Various kinds of both direct and alternating current arresters are described.

FIFTEEN YEARS OLD.—With the issue of July 11, the Maritime Merchant celebrated its fifteenth birthday and announces the commencement of a series of articles on Moncton as a place with a future. The "Merchant" has attained a position of influence in Eastern business circles that goes to account for its present prosperity and assures it of even greater success in the future. Many prosperous returns.

A. B. C. of Toronto.

TORONTO, CANADA.—The Annual Report of the Board of Trade of Toronto is a handsome publication containing 104 pages of reading matter with illustrations. The front cover is a handsome three color design showing a silhouette of the harbor front by moonlight. The president's address is one of optimism and characteristic of the growth and expansion of the city and country generally. Special articles in the report are devoted to the Canadian National Exhibition, The Foreign Trade of Canada, The Hospital for Sick Children, The Commercial Significance of the Cobalt Mining District, by Frank C. Loring, E.M., Cobalt Silver Region by Thos. W. Gibson, Deputy Minister of Mines, and the Report of the delegates to the Sixth

Congress of the Chambers of Commerce of the Empire, together with the secretary's report, list of members, etc. The A B C of Toronto arranged by the secretary is included.

Area of the city, 17.17 square miles, not including portions of land covered by water.

Banks—22, chartered by the Dominion, do business in Toronto.

City Hall—one of the finest in America.

Distributing Centre for the Dominion.

Educational facilities unexcelled.

Fine Public Parks, numbering 34, with an area of nearly sixteen hundred acres.

Grand Harbor—steamer connections to all points.

Health Record—17.46 deaths per 1,000.

Improved Streets, 197.24; total street mileage, 277.46.

Journalism in Toronto is represented by 6 Daily Papers, 50 Weekly, 20 Semi-Monthly, 76 Monthly, and 8 quarterly.

King and Yonge Streets—busiest corner in Canada.

Land Values steadily increasing.

Manufacturers find the natural advantages of Toronto a greater incentive to location than a bonus elsewhere.

Niagara Falls power.

Ontario Law System centres here.

Population, 300,000.

Queen City is universally recognized as the Hub of the Dominion.

Railways, three great systems focus in Toronto—Grand Trunk, Canadian Pacific, and Canadian Northern—branches in all directions.

Street Railway carried 76,958,488 passengers in 1906.

Tax Rate for 1907, 18½ mills on the dollar. Total amount of assessment for 1907, \$185,713,845.

University of Toronto and affiliated colleges have annually over 5,000 students from all parts of the world.

Value of Building Permits issued for 1906 totalled \$13,160,398.

Wholesale jobbing and manufacturing centre of Canada.

X Rays cannot locate a finer Annual Exhibition.

Yachting, rowing, lacrosse, cricket, football, baseball, golf, motoring, bowling, polo, tennis, horse racing, curling and hockey, are amongst our recreations.

Zone of prosperity—Toronto is in it.

NEW FACTORY.

Frankel Bros., proprietors of the Toronto Mill Stock & Metal Co., Toronto, are erecting a large warehouse and smelting plant Don Improvement Road and Eastern Avenue. The main building will be 600x80 feet, built of pressed facing brick on concrete foundations. Most of this will be one story, but part will consist of two stories and basement. The warehouse floors will be four feet above the railroad track. Five shipping entrances will enable five cars to be handled at once. Electric power will be used wherever possible. and the most approved labor saving devices will be installed in all departments. Theo. Telier, Toronto, is the contractor.

This firm began business in 1886 with 4,800 square feet of ground. In 1888 they moved to 116 George St., where they had 15,000. This was added to in 1890, 1892 and 1901 till it now includes 250,000 square feet. The firm deal in all grades of stock—

woolen waste, cotton rags, rubbers, metals, etc.

GAS ENGINES AND NATURAL GAS.

The two 125 h.p. gas engines made by Struthers & Wells, Warren, O., installed in the new power plant of the Brantford Screw Co., Brantford, Ont., about Jan. 1, have been running since then on natural gas. Records show the consumption to be about 12 cubic feet of gas per h.p. hour, which comes well under the guarantee of the makers.

CONTRACT FOR BRITISH FIRM.

The Cleveland Bridge & Engineering Co., Darlington, England, was given the contract for the Toronto Lansdowne avenue subway steel superstructure. The Darlington tender was the only one which covered the entire work. The amount of the tender was \$53,443.38, and this was to cover the erection as well as the supply, of girders. There was two other tenders, both from old country firms. The City Engineer stated that the work would be begun without delay. Controller Hubbard expressed regret that none of the Canadian steel manufacturers had tendered for the work.

CANADIAN PATENTS.

Below will be found a list of patents recently granted to Canadian inventors in Canada and United States, which is furnished by Fetherstonhaugh & Co., patent barristers and solicitors, head office, Bank of Commerce Bldg., Toronto, from whom all information may be readily obtained.

E. Baudette, Montreal, Que., incandescent lamp supports. Van. Bergh, Winnipeg, Man., electric medical appliances. E. Waiker, Toronto, Ont., games. C. H. Bartley, Red Bay, Ont., pinafors. T. Parker, London, Ont., car heating systems. H. J. Ponton Hamilton, Ont., railway lamps. F. T. Goodwin, Toronto, Ont., wardrobe slides or fixtures. R. H. Tyne, Goderich, Ont., trouser hangers. J. G. Locke, Westmount, Que., horse shoe creasers. A. Merner, Waterloo, Ont., exhaust nozzles for steam engines. J. D. Shipton, Vancouver, B.C., safety devices for the protection of electric railway section. G. Trottier, Montreal, Que., street cars. F. O. Werther, Sydney, N.S., fire proof lining for stoves or furnaces. The Standard Paper Co., Limited, apparatus for the production of half-stuff from peat issue. T. A. C. Banting, Cookstown, Ont., acetylene gas machines. D. M. Culver, Simcoe, Ont., areator for milk. W. G. Glenn, Toronto, Ont., heaters. L. Frechette, Montreal, Que., combs. W. C. Barnes, Quebec, Que., bayonet joints. R. Warren, Kearney, Ont.

AN IMPORTANT DECISION.

In the United States Circuit Court for the Northern District of New York, Judge Ray handed down an opinion in the case of the General Electric Co. vs. Wilbur F. Corliss et al., trading under the name of Corliss-Coon & Co. upon Eickemeyer patent No. 677,308, granted June 25, 1901. This suit was brought by the General Electric Co. to restrain Corliss, Coon & Co., of Cohoes, N.Y., from further infringement of Eickemeyer patent No. 677,308 in the use of

some induction motors manufactured by the Allis-Chalmers Co. The feature of these motors which formed the basis of the suit was the relation between the number of slots in the field and the number of slots in the armature whereby all dead points or locking positions are eliminated from the motor. This feature is believed to be essential to all commercial induction motors of any size. The Court holds that the patent is valid and infringed by the defendants.

WANTS CANADIAN AGENT.

P. F. Brittain, 110 Cannon St., London, England, is desirous of entering into correspondence with a first class firm in Canada who are in a position to handle all classes of electrical specialties of English manufacture.

PORT ARTHUR BLAST FURNACE.

The new blast furnace of the Atikokan Iron Co., Port Arthur, Ont., was blown in a few days ago. The furnace and plant of this company is one of the most modern in America, having every known labor saving device for the handling of ore and pig iron by electrically operated machinery.

An idea of the magnitude of the Atikokan Iron Co.'s plant which has been under construction during the past two years, may be gleaned from the fact that it involved a capital expenditure of \$1,300,000 dollars. It entailed some 15,000 feet of filling from the shoreline, in which operation a gravel train was employed during two seasons in carrying the material from Slate River. The present expanse of water between the coal and ore docks and the furnace will in time be filled in solid by the slag running into it.

In and around the plant are nearly three miles of steam railway tracks; and three quarters of a mile of elevated railway tracks. There are over 30 steam cylinders and the plant contains pumping machinery together with a standpipe of sufficient size to handle 5,000 gallons of water per minute.

The pump and the engine house located on the south side of the plant, contains two mammoth engines of 600 h.p. each made by the Southwark Foundry & Machine Co., of Philadelphia; a 200 h.p. electrical generator, made by the Westinghouse Co.: a blowing engine to pump air into the furnace at a pressure of about 10 pounds to the inch and also pumps and condensers.

The steam to operate these engines is carried overhead from the stove or boiler house across the track.

This building, which is 90x60 feet in size, contains four boilers of 1,000 h.p. boiler capacity each, and the three mammoth stoves previously mentioned, each 18 feet in diameter, and 70 feet in length.

The incline railway to the top of the furnace is 130 feet above the lake and the top on the smoke stack is 160 feet above the water.

The imports into Great Britain from Canada during June were:—Cattle, 15,667, £280,078; sheep and lambs, 956, £1,537; wheat, 1,806,100 cwts., £689,274; wheat, meal and flour, 215,320 cwts., £103,092; peas, 20,410 cwts., £7,554; bacon, £150,621 cwts., £395,693; hams, 57,899 cwts., £167,347; butter, 156 cwts., £143; cheese, 151,600 cwts., £473,129; two horses, £100.

Producer Gas Plant at Cobalt.

REDUCING THE COST OF POWER AT A SILVER MINE.

Although taking untold wealth from old mother earth, the Nancy-Helen Mines Limited, of Cobalt, Ont., Canada, decided to reduce their cost for power to the lowest possible minimum, and have recently installed a producer gas plant, of Weber make. The engine is of 100 h.p. capacity, and of

support the fuel, and with a water jacket around the top. Two large doors are provided for each producer, through which the ashes are removed. Small openings, closed by flap-hinge covers are provided in each door, so that the fire may be stoked whenever necessary, and in addition to this, six

with air and supplies the hydrogen necessary in the production of the gas. From the boiler, the gas enters the bottom of the scrubber, passing up through a bed of coke, which is constantly sprayed with water. In passing over the moistened surfaces of the coke, the gas is cleansed of all dust and impurities which may have been carried over from the producer. The temperature of the gas is also reduced to a low point so that it is now ready to pass to the receiver, shown in Figure 1, and thence to the engine cylinders.

The receiver is cylindrical in form, built of steel plate, and has only sufficient capacity to act as an equalizer on the gas supply between the scrubber and the engine.

A Deming triplex single-acting power pump, driven by belt from jack shaft, as shown in Figure 1, pumps water from the lake near by and furnishes an adequate supply of same for the scrubber and also for circulating water in the cylinder jackets of engine; after passing through the scrubber, this water is drained to the sewer.

In Figure 2 is shown a small centrifugal blower, the purpose of which is to furnish a forced draft to producers in starting fires. The arrangement of this blower can be seen from Figure 2, and from Figure 1 it will be noted that the jack shaft which drives the blower receives its motion from a 6 h.p. gasoline auxiliary engine, shown in engine room.

ENGINE ROOM.

In Figure 1 is shown the main engine, arranged for driving by means of a friction clutch pulley, a large air compressor which furnishes air to the various drills about the mine. The 6 h.p. gasoline engine, previously mentioned, is arranged to perform a number of services, its primary purpose is to drive the duplex air compressor shown, delivering air at a pressure of 160 pounds, to the air storage tank, from whence it is piped to the air starting valve on main engine. It will be

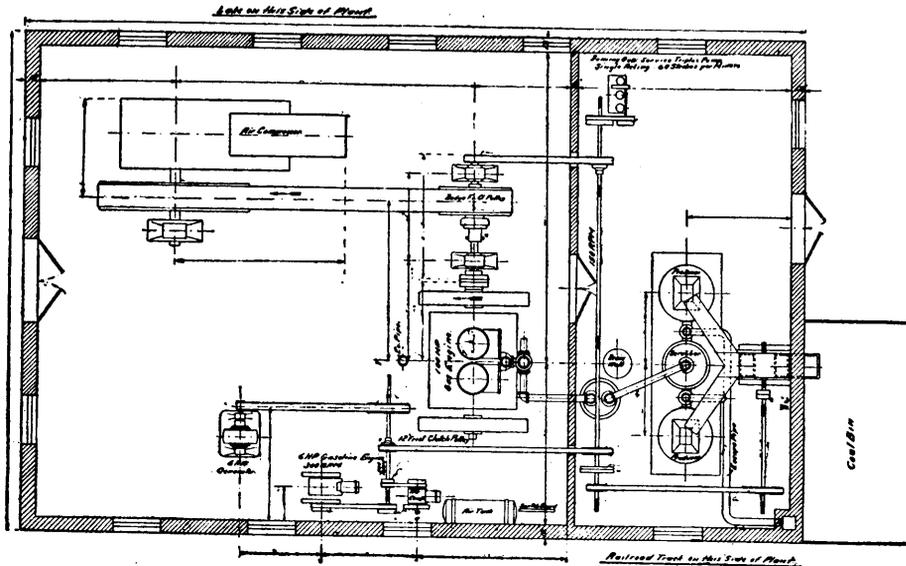


FIG. 1—PLAN OF POWER PLANT NANCY HELEN MINE, SHOWING LOCATION OF ENGINE AND PRODUCER.

the vertical twin-cylinder type. Since the plant is intended for continuous operation, the engine is furnished with a twin producer set, the arrangement being such that either of the producers can be cut out of service at any time for cleaning or repairs, without interfering with the operation in any way.

From Figure 1 it will be noted that the power plant is a rectangular shaped building 58-feet long by 36 feet wide, with a partition wall between the engine and producer rooms; the idea being to keep the dust and dirt away from the engine and air compressor.

HANDLING OF COAL.

Anthracite pea coal is delivered to coal bin Figure 1, outside of the producer end of the building, and is raised to the proper level by a small bucket elevator, shown in plan in Figure 1, and in elevation in Figure 2. This elevator is driven by a belt from jack shaft, as shown in Figure 2, and discharges the coal through spouts or nozzles shown, directly into the producer hopper, and from here, by the manipulation of the lever, the coal is delivered through the hopper valves to the top of the fuel bed in producers; this arrangement very effectually reduces the cost of fuel handling, since manual labor is not necessary, except to deliver coal to the coal bin.

THE PRODUCERS, AS SHOWN IN FIGURE NO. 1.

The producer plant consists essentially of two producers mounted on a firm concrete foundation, a single scrubber being placed between the two producer units; while a gas receiver of ample capacity is provided and placed a little to the left of scrubber. The producer is simply a steel plate cylinder lined with fire brick, with a grate below to

small stoke holes are provided at the level of the grates, while numerous other stoke holes are placed in the top of the producers for vertical stoking purposes. On top of the producers, and extending from one to the other, is a charging platform, which facilitates the handling of the hopper valve and the stoking of the fires. This platform

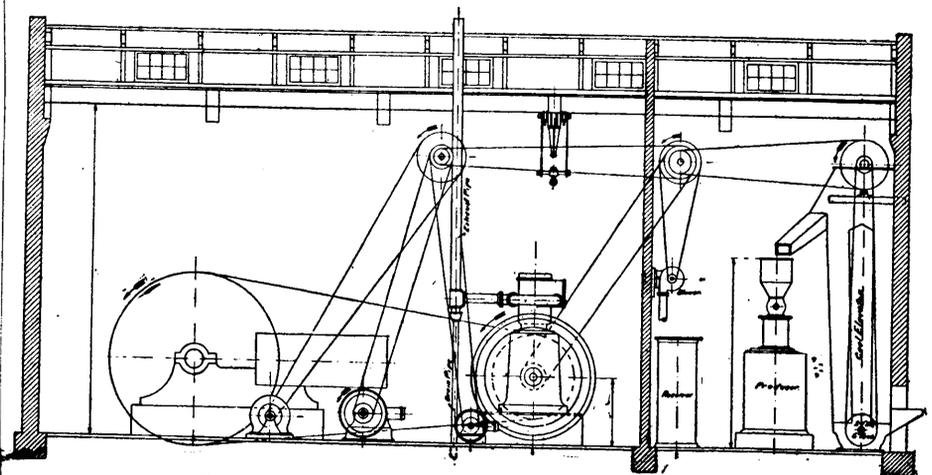


FIG. 2—ELEVATION OF POWER PLANT, NANCY HELEN MINE.

is 9 feet 6 inches from the floor, and is reached by a flight of stairs, when it is necessary for the operator to replenish the coal or stoke the fires.

Gas is drawn from the producers by the suction of the engine, and first passes into the boiler, where it gives up the greater part of its heat in generating steam, the steam passing into the producer at a point a trifle above the grates, where it is mixed

noted that this small compressor is driven from a jack shaft, and from this jack shaft a belt connects to jack shaft, shown in producer room. Power is taken from this second jack shaft to drive the producer blower, so that by the time air is compressed to a pressure sufficient to start main engine the producer blower has brought the fires in producer into condition to immediately supply gas to the engine. By this plan the

engineer is enabled to start plant with a minimum of delay.

The 6 h.p. auxiliary engine also furnishes power to a small electric generator, shown in Figure 1, which furnishes current for a number of incandescent lights around the plant.

with a drip pocket and drain so that if too much water is coming over from the valve stems, it will be discharged into sewer and not cause trouble in the exhaust pipe. No muffler is installed in the exhaust, as the water which is delivered to the exhaust pipe very effectually silences all noise.

any attention, and a large part of the engineer's time can be devoted to other work around the mine.

Of the Nancy-Helen Mines, Limited, Mr. J. F. Black is secretary and treasurer, and it was as a result of his investigations and recommendations that the plant was installed.

The plant was designed and equipped by the Weber Gas Engine Co., Kansas City, Missouri.

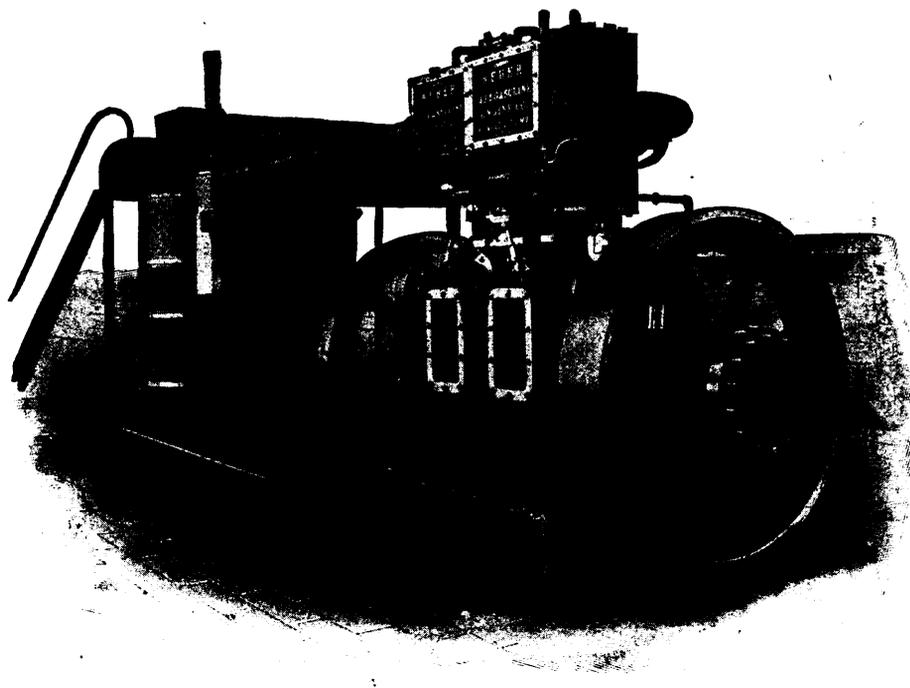


FIG. 3—WEBER 100 H.P. GAS ENGINE AND PRODUCER PLANT IN NANCY HELEN MINE, COBALT, ONT.

It will be apparent, from Figures 1 and 2, that the engine is of the usual type made by the Weber Co., the crank cases enclosed so that splash lubrication is depended on. An ordinary fly-ball governor, geared to a secondary shaft, controls the supply of gas and air, and the mixture is ignited by the make and break system. Cylinders and cylinder heads are water jacketed, as well as

Ignition current is obtained from a small dynamo driven from the main engine.

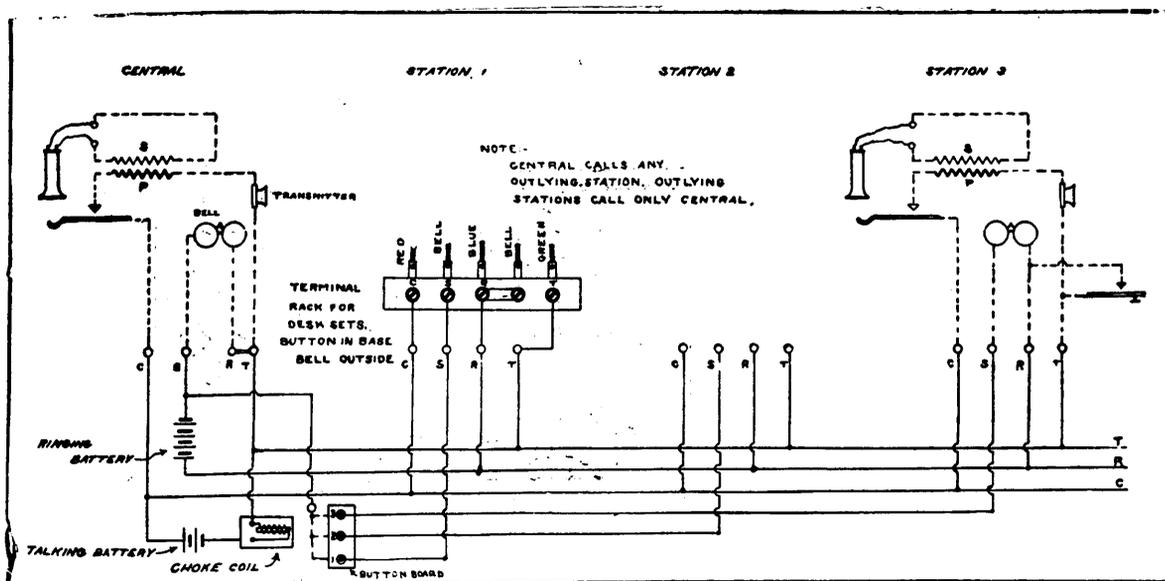
Although no exhaustive tests have been made on the plant as yet, the engineer has kept track of the coal used and finds that the consumption is well within the manufacturer's guarantee of 1 1/4 pounds per brake h.p. hour. These figures represent good efficiency, and the mine management express

TELEPHONE IN ELEVATOR.

The latest adaptation of the telephone is for elevator service. An elevator telephone system has been installed by the Norton Telephone Co. in the elevators of the J. F. Brown Bldg., 193 Yonge Street, Toronto. This system allows of speaking to the elevator men from any office or department in the building.

The diagram shows the wiring used in connection with this installation and illustrates the method adopted for accomplishing the desired result. This system provides that one, or, if desirable, two central stations may call one or more other stations, termed outlying stations, and that the outlying stations may call but one central station. As in Systems B1 and B2 the speaking circuit of all stations is common to one pair of wires, so that it will be understood that in so far as conversing from one outlying station to another is concerned it is only necessary to signal central first, give the number of the outlying station wanted and request central to signal it, which central does by simply pressing the corresponding call button.

The central station is equipped with as many call buttons as there are stations to be called therefrom, and it may be either a desk or wall instrument. The outlying stations



WIRING DIAGRAM SHOWING CONNECTIONS FOR ELEVATOR TELEPHONE.

the exhaust chamber, and the exhaust valves are internally cooled by flowing water.

From the stems of the exhaust valves, water discharges into a one-fourth inch tube, which empties into the 6 inch exhaust pipe, shown in Figure 2. This pipe runs straight up through the engine room, and is equipped

themselves as highly pleased with the performance shown.

It is only necessary to feed the producer four times a day, and usually one stoking per day to break up the clinkers in the fuel bed is all that is required.

The engine and producer require scarcely

have but one call button, which is used to signal central. It is not necessary to have a visual indication of the station calling, because the removal of the receiver at central or any other station establishes a talking circuit with any station already on the line.

Making Repairs with Thermit.

In recent issues of the technical papers there have appeared brief accounts of the welding of stern frames of passenger steamships, the welding of locomotive frames and the making of other important repairs by the thermit process. These accounts, however, did not enter into the details of the operations, hence readers will be interested

to be welded and into a large riser. The gate should not allow the thermit steel to impinge directly upon the casting. The mold must allow for a band or a collar, of thermit steel, to be cast around the defective parts of the ends of the pieces to be welded. The thermit steel flowing through this space in the mold will dissolve the metal with which it comes

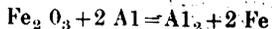


FIG. 1—WELDING BROKEN LUG ON MOTOR CASING. THESE REPAIRS CAN BE MADE AT AN EXPENDITURE OF FROM \$5.00 TO \$15.00 AND SAVE SCRAPPING MOTOR CASES VALUED AT FROM \$80.00 TO \$100.00.

in knowing the methods pursued in making repairs of this character.

The repair of so large a section as the stern frame of a passenger steamship is, in itself, an achievement of note, but to make such a repair in three days or less was entirely out of the question until Dr. Hans Goldschmidt, of Essen, Germany, invented his compound "Thermit" and made it possible to produce superheated liquid steel in half a minute.

"Thermit" is a mixture of finely divided aluminum and iron oxide, which may be ignited by a special ignition powder. The chemical reaction, so started, causes the aluminum to unite with the oxygen of the iron oxide, forming aluminum oxide and setting free the iron, which separates out in the form of mild steel. The following formula shows how this reaction takes place.



The chief feature of the reaction, however, is the intense heat generated (5,400° F.), which makes it possible to produce a steel in half a minute which is twice as hot as ordinary molten steel and which will, therefore, melt the surface of any metal with which it may come in contact and amalgamate with it, forming a single homogeneous mass when cooled.

In making repairs by the thermit process, the parts to be welded are first thoroughly cleaned and any scale or poor metal cut away. (In the case of a crack, if the section is thick, the metal should be cut away along the fracture, leaving a space for the free flow of thermit steel between the parts to be welded). The flaw or fracture must then be surrounded with a mold.

CHARACTER AND SHAPE OF MOLD.

The principle guiding the construction of the mold is that the thermit steel must run through a gate to the lowest point of the mold and rise through, and around, the parts

in contact and amalgamate with it, forming a reinforcement which adds to the strength of the original casting. In cases where the break may have occurred through lack of strength in the original casting, it acts as a reinforcement and should not be machined off.

The shape of this band or collar must resemble, in cross section, approximately the segment of a circle, the thickest part being directly over the fracture and sloping off gradually towards the edges. It should overlap the edges of the fracture at least an inch. The thicker the metal to be repaired, the thicker must be the band of thermit steel and the dimensions in general must make allowance for the nature of the repair.

The matrix or pattern of the part to be repaired with the reinforcing band around it,

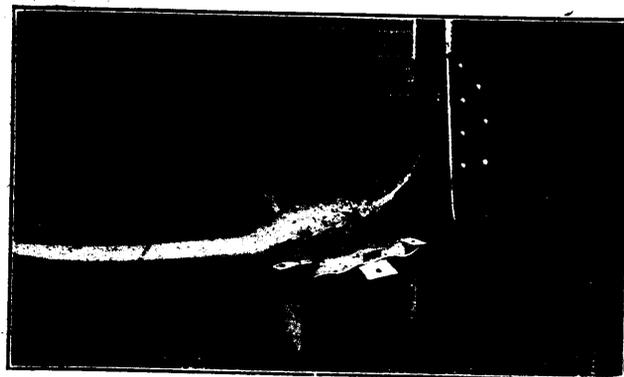


FIG. 2—S. S. "APACHE"—FINISHED WELD ON STERN-FRAME, SHOWING LOWER HALF OF MOLD BOX IN POSITION AND PORTION OF GATE, RISERS HAVING BEEN REMOVED.

is first made, and from this a mold is constructed.

A good material for making molds is two parts of sharp sand and one part of good fire clay, mixed dry and moistened just enough to pack well.

As practically no two repairs are alike, the time and cost of making wooden patterns is considerable. A convenient way to make the molds for this class of work is to use yellow wax as a matrix. The parts to be welded are first laid together and a wax pattern of the exact form desired in the final weld is shaped about them. After this is done, the molding sand, which consists of fire clay and sand, is tamped around the matrix in the usual manner, except that a small hole is left at the very lowest part of the mold.

The pattern for runner and riser are best made of wood. Their volume should equal the volume of the reinforcement or collar which is cast around the fracture, as the first steel running out of the crucible into the mold becomes chilled when coming in contact with the casting, which—even when pre-heated—has a considerably lower temperature than the Thermit steel. This chilling effect can only be overcome by sufficient quantity of Thermit steel, so that the chilled portion is driven up into the riser and is replaced in the reinforcement

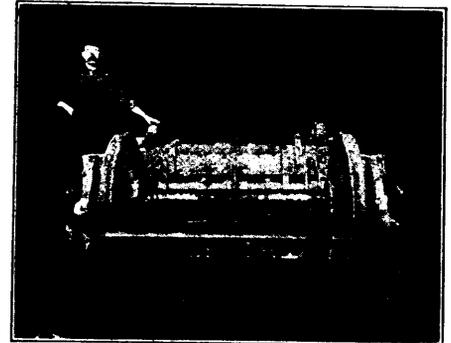


FIG. 3 TROLLEY TRUCK FRAME WELDED WITH THERMIT.

by metal which has practically the full temperature it received during the reaction.

When the mold box is completely filled, the wooden runner and riser are withdrawn. Then, instead of taking off the mold and drying it, a torch is directed into the riser, directly on the green sand. The heat melts the wax, which runs out of the hole at the bottom. The heating should be continued

until the mold is thoroughly dried and the sections are brought to a bright red heat. The hole at the bottom can then be closed up with a sand core and backed up with a little sand, after which the mold is ready for casting.

If a wooden pattern is used and the mold made and dried in the ordinary manner, the joints of the mold box or flash should be sealed with a little fire clay to avoid leakage. Asbestos wick may also be used for this purpose.

Particular care should be taken to make the mold strong enough to withstand the weight and scouring action of the super-heated Thermit steel.

is recommended. In fact, it is quite possible and often advisable, to introduce small quantities of manganese, nickel, chromium, vanadium or other metals into the Thermit steel in making certain classes of repairs.

The Thermit reaction takes place in a magnesia-lined crucible, which has at the bottom a hard burnt magnesia stone. The latter, again, has a tubular opening, into which a small magnesia stone or so-called

Thermit steel from running out prematurely. The tripod is then placed firmly in position, care being taken that the legs may not be displaced by accident. The crucible is then placed in the ring, care again being observed to see that it sets quite firmly and that it will not be likely to move under the action of the tapping operation described later.

The Thermit powder is next poured into the crucible and in the middle is placed a pinch of ignition powder. This may be ignited by applying a storm match or a small bundle of parlor matches immediately after they have been struck. By this the chemical reaction is started and continues throughout the rest of the mass. The resulting super-heated liquid steel sinks to the bottom of the crucible, from whence it is tapped into the mold by giving the tapping pin a sharp knock upwards.

Care should be taken to neutralize as much as possible the strains caused by the contraction of the liquid metal while cooling. This can be done by heating up and expanding the surrounding parts previous to welding. The operator will usually be able to tell which parts it will be necessary to heat to give the desired results.

It will be seen from the above description that Thermit steel welds by fusion and that no pressure or hammering is used to force the metal together. It is on this account that the collar, or reinforcement, is provided and should be left around the weld, making the section actually stronger than it was originally.

DON'T HESITATE.

It behooves every man to remember that there is nothing that can prevent him from the attainment of success but his own un-

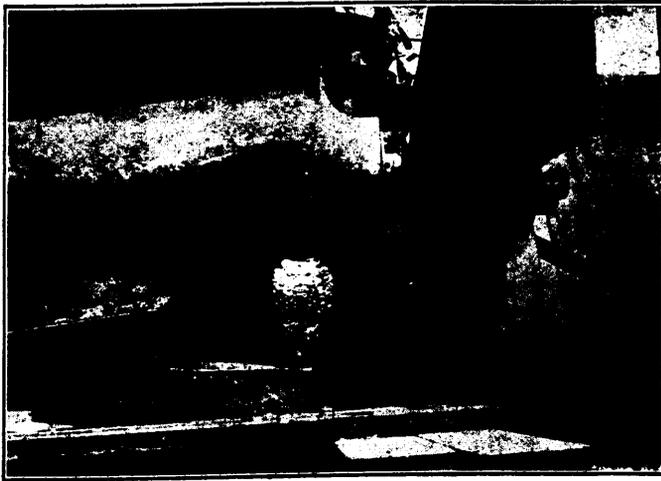


FIG. 4—S. S. "PURITAN"—WELD OF BROKEN STERN-POST, SHOWING REINFORCEMENT.

QUANTITY OF THERMIT REQUIRED.

One cubic inch of steel weighs 4½ ounces. To produce 4½ ounces of liquid steel requires 9 ounces of Thermit. Therefore, to calculate the amount of Thermit to use for any repair, first find as closely as possible the number of cubic inches in the reinforcement to be cast about the defective part. Double this to allow for metal in runner and riser.

This number multiplied by nine gives the number of ounces of Thermit to use.

A simple method of determining the amount of thermit necessary, when wax is used for a pattern or matrix, is to weigh (in ounces) the quantity of wax on hand before and after building up the matrix. The difference multiplied by two gives the weight of the Thermit in pounds.

THERMIT ADDITIONS.

It is necessary, when more than 10 pounds of Thermit are to be used, to mix steel punchings or particles of steel, free from grease, into the Thermit Powder. The intensity of the heat of the reaction will be moderated thereby without interfering with the efficiency of the weld. In all cases the punchings should be pre-heated before mixing with the Thermit. For 10 pounds or more of Thermit, a proportion of 10 per cent of punchings should be added. For quantities of over 50 pounds of Thermit, as much as 15 per cent. of small, mild steel punchings may be mixed in. With very large pieces, where, through the ignition of several hundred pounds of Thermit, the intensity of the reaction is enormously increased, 20 to 25 per cent. of punchings (depending on the quantity of Thermit) of larger dimensions, such as plate punchings, rivets, etc., should be used. The reaction will then take more time and care should be taken not to tap the crucible too soon. An addition of 2 per cent. of manganese

"thimble" of conical form is made to fit. This thimble provides the channel through which the liquid Thermit steel is poured.

The crucible is closed before charging with "plugging material," consisting of a tapping pin, asbestos washer, metal disk and refractory sand. First the tapping pin is suspended by its scarfed end, inside the "thim-



FIG. 5—MOLD AND CRUCIBLE IN POSITION FOR WELDING LOCOMOTIVE FRAME.

ble." It must be cut down so that the end will project below the bottom of the crucible, in order that it may be driven up when the crucible is to be tapped. With the pin in place, close the top of the thimble—first with asbestos washers and then with the metal disk. Ram firmly into place with the handle of a hammer, then cover with refractory sand. This is done to prevent the

worthiness. These are the times of opportunity and of reward to every person who will grasp the one and struggle for the other. There is no such word as fail in the vocabulary of the great; and any man may be truly great even though he never leaves the borders of his own county line.—Business Monthly Magazine.

When Business Tires.

MARK TWAIN ON ADVERTISING.

"It pays to advertise," said Mark Twain, at an advertisement writers' banquet.

"When I was editing the Virginia City Enterprise, writing copy one day and mining the next, I tried to force this truth home in many ways.

"A superstitious subscriber once wrote and said he had found a spider in his paper. Was this good or bad luck? I replied to him in our Answer to Correspondents column, as follows:

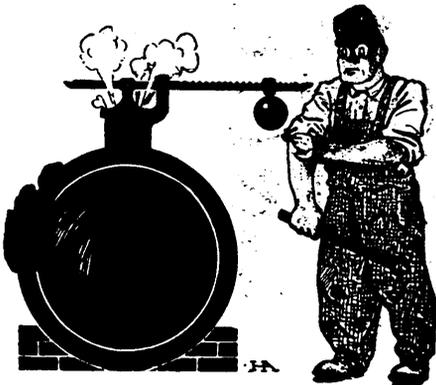
"Old Subscriber—The finding of a spider in your copy of the Enterprise was neither good luck nor bad. The spider was merely looking over our pages to find out what merchant was not advertising, so that it could spin its web across his door and lead a free and undisturbed existence forever after."—Ex.

SUCCESS.

He has achieved success whose intercourse with others has been a mutual pleasure and an inspiration, who has spread laughter rather than tears, and who has thus won the esteem of those with whom he has come in contact; who has left a legacy of high purpose and unconquerable resolve; who has added his mite to the sum of the world's accomplishments, whether it be a picture or a song, a pile of architecture or a humble handful of clay moulded by the potter's art; who has never been lacking in appreciation for things beautiful, and who has always found in these his purest and highest enjoyment; who has looked only for the best in others, and has always been ready to give the best he had.—Shoe Leather World.

AN ELECTRICAL IDEA.

A miller once on steam relied—
But soon the story ceases—
The "safety" stuck, the miller tried
To "ease it up" but it replied,



And spread him o'er the country side
In several hundred pieces.
If he had put a motor in
He had not quite so s'attered been.—Electric City, Chicago.

THE DEAD ONE.

Breathes there a man with soul so dead,
Who never to himself hath said:
"My trade of late is getting bad,
I'll try another ten-inch ad?"

If such there be go mark him well;
For him no bank account shall swell—
No angels watch the golden stair,
To welcome home the millionaire.
The man who never asks for trade
By local line or ad. displayed,
Cares more for rest than worldly gain,
And patronage but gives him pain.
Tread lightly, friends; let no rude sound
Disturb his solitude profound;
Here let him rest in calm repose,
Unsought except by men he owes.
And when he dies go plant him deep
That nought may break his dreamless sleep,
When no rude clamor may dispel
That quiet that he loved so well.
And that the world may know its loss
Place on his grave a wreath of moss
And on the stone above, "Here lies
A man who did not advertise." —Ex.

CHICAGO NEWS EPIGRAMS.

Go to law to-day and go broke to-morrow.
The art of living consists in not being a dead one.

Get busy occasionally and dust off your conscience.

Always keep to the right and you won't go wrong.

Many a man walks and runs a risk at the same time.

Remember the poor; the rich never forget themselves.

An easy-going man is sometimes difficult to get rid of.

Look well to the start—then keep looking to the finish.

Don't hope to please others if you can't please yourself.

Don't get critical when your boss tells you to do things.

Any man who buys a mule is sure to have a kick coming.

After all, the easiest way to do a thing is to do it right.

If you want to see a man act silly hunt up one who is jealous.

Beware of the man who is envious of the happiness of others.

What the world needs just now is men who talk less and say more.

We are told that man is made of dust—and yet dust always settles.

Many a good man's credit isn't good because he is unable to make good.

Telegraph operators do business on a sound basis even if it is on tick.

There is no man so ignorant that you can't learn something from him.

A man never goes around looking for trouble in the guise of a creditor.

The worst thing about a bore is that it's almost impossible to insult him.

Many a man becomes weary from trying to dodge people who make him tired.

Many a man talks as though he considered himself chief adviser to the Almighty.

Even a graceful man looks ridiculous when he attempts to pat himself on the back.

Every time a large man shrinks from his duty a small man rises to the occasion.

There is no cure for the indigestion caused by being compelled to eat your own words.

Wise men ascertain what is on the other

side of the hurdle before jumping at conclusions.

It is generally wise, when a man attempts to jolly you, to keep your hand on your pocket book.

All heroes are good and all villains are bad on the stage, but it is often otherwise in real life.

The under dog gets a lot of sympathy, but the upper canine collars most of the gate receipts.

Men guess at a thing and if it happens to come out their way they boast of their good judgment.

Show us a man who thinks he knows it all and we will show you the personification of ignorance.

When a man is requested to foot a bill it always hurts his dignity worse than it hurts his corns.

While money may not make a man great it enables people to recognize what little greatness he has.

No, Alonzo, men and hogs are not in the same class. Hogs sometimes know when they have enough.

Isn't it strange that men who brag always brag about something that doesn't interest you in the least?

Death is a welcome relief to the man who is forced to hustle eighteen hours a day in order to keep the premiums on his life insurance policies paid up.

Country youths sow wheat and raise corn, but some of their city cousins sow wild oats and raise Cain.

But few people are able to appreciate the fact that their troubles and misfortunes do not all come in a bunch.

Most men believe in the honesty of their fellow men until after they have endorsed a few notes for their friends.

No sooner does the average man discover that he has made a mistake than he gets busy and manufactures an explanation.

EIGHT GREAT SECRETS OF SUCCESS.

A man with a mania for answering advertisements has had some interesting experiences. He learned that by sending \$1.00 to a Yankee he could get a cure for drunkenness. And he did. It was to "take the pledge and keep it."

Then he sent fifty cents to find out how to raise turnips successfully. He found out: "Just take hold of the tops and lift."

Being young, he wished to marry, and sent thirty-four one cent stamps to a Chicago firm for information as how to make an impression. When the answer came it read: "Sit down on a pan of dough."

Next advertisement he answered read: "How to double your money in six months." He was told to convert his money into bills, fold them, and thus double his money.

Next he sent for twelve useful household articles and got a package of needles.

He was slow to learn, so he sent \$1.00 to find out "how to get rich." "Work hard and never spend a cent." That stopped him.

But his brother wrote to find out how to write without pen and ink. He was told to use a lead pencil.

He paid \$1.00 to learn how to live without work, and was told on a postal card: "Fish for easy marks, as we do."—Stove and Hardware Reporter.

Wages Greatly Increased.

CANADIAN MANUFACTURERS PAY MUCH MORE FOR HELP.

The latest bulletin from the Bureau of Census and Statistics gives a comparison of the number of wage earners in Canada and the amount earned by them in the different industries during the years 1900 and 1905. In 1900 the number of wage earners in Canada was 344,035 and the wages earned \$113,249,350, and in 1905 391,487 employes earned \$164,394,490, an increase of 12 per cent. in the number employed and 45 per cent. in the amount earned. The total increases were 47,452 in the industrial workers and \$51,145,140 in the extra earnings.

In the table below figures of employes and wages are given only where there are three or more works of each kind of industries. Where there are less than three the figures are grouped under the head of all other industries. The number of employes includes officers, clerks, workers, etc., who are paid salaries or wages for service. The value of product per employe in the year 1900 was \$1,398, and in 1905 it was \$1,832, being an increase of \$434 or 31 per cent. For 1890 the average wage per employe was less than in 1905 by \$128.66 and the average product less by \$477.

Name or kind of industry	1900		1905	
	Wage earners	Salaries and wages	Wage earners	Salaries and wages
	No.	\$	No.	\$
Canada.....	344,035	113,249,350	391,487	164,394,490
Abrasive goods.....	111	58,074	282	158,361
Aerated and mineral waters.....	693	287,046	1,012	496,813
Agricultural implements	6,834	3,057,930	7,478	3,778,804
Aluminum and aluminum ware.....	.....	.....	137	65,220
Artificial feathers and flowers.....	103	18,603	71	8,305
Artificial limbs and trusses.....	29	11,808	49	24,493
Asbestos.....	.....	.....	1,669	623,567
Awning tents and sails	359	148,038	567	238,196
Axes and tools.....	1,053	448,275	2,128	1,078,229
Axle grease.....	.....	.....	22	16,260
Bags, cotton.....	391	142,509	63	22,156
Baking powder and flavoring extracts.....	216	102,317	475	202,978
Baskets.....	351	73,499	322	98,596
Batting.....	87	33,590	54	25,450
Belting and hose, leather	109	63,887	232	115,140
Bicycles.....	512	232,017	256	132,057
Bicycle repairs.....	45	16,962	40	13,886
Billiard tables and materials.....	38	22,408	86	51,482
Blacking.....	93	33,852	81	39,412
Blacksmithing.....	75	42,152	306	145,941
Blanket and sweat pads..	.....	.....	116	41,800
Boats and canoes.....	191	75,170	317	152,839
Boilers and engines.....	4,028	1,845,574	2,500	1,360,285
Boots and shoes.....	13,743	4,645,007	12,940	4,644,171
Boot and shoe supplies..	344	89,572	340	148,527
Boxes and bags, paper...	1,539	387,734	1,866	545,035
Boxes, cigar.....	334	109,332	145	54,898
Boxes, wooden.....	2,002	592,864	1,507	486,974
Brass and iron beds.....	.....	.....	729	318,216
Brass castings.....	901	404,466	649	330,840
Bread, biscuits and confectionery.....	6,831	2,522,089	8,241	3,180,352
Brick, tile and pottery..	6,705	1,327,533	6,490	2,044,495
Bridges, iron and steel..	874	391,696	1,370	849,846
Brooms and brushes....	857	317,754	910	353,981
Butter and cheese.....	6,886	1,464,110	5,956	1,743,116
Buttons.....	336	76,212	164	40,980
Carbide of calcium.....	.....	.....	161	80,332
Cardboard.....	115	34,461	269	84,035
Carpets.....	524	173,423	760	274,183
Carriages and wagons...	5,466	2,256,456	5,241	2,451,505
Carriage and wagon materials.....	987	403,454	976	448,893
Car repairs.....	5,811	2,835,508	8,957	4,845,897
Cars and car works.....	3,147	1,286,129	7,755	3,746,219

Name or kind of industry	1900		1905	
	Wage earners	Salaries and wages	Wage earners	Salaries and wages
	No.	\$	No.	\$
Cement blocks and tile.....	.....	.....	405	177,586
Cement, Portland.....	558	221,514	1,414	703,079
Chewing gum.....	.....	.....	161	58,368
Church decorations.....	40	22,725	140	77,728
Clothing, men's, custom	9,818	3,387,344	6,578	2,658,891
Clothing, men's, factory	13,028	2,523,273	8,812	3,380,594
Clothing, women's, custom.....	5,948	1,494,368	4,396	1,143,388
Clothing, women's, factory.....	2,889	719,115	8,024	2,812,679
Cocoa and chocolate....	92	32,396	106	39,829
Coffees and spices.....	551	263,618	487	275,672
Coffins and caskets.....	601	252,667	509	230,144
Coke.....	.....	.....	317	208,658
Combs.....	.....	.....	83	33,146
Condensed milk.....	118	41,772	197	82,379
Confectioners' supplies..	.....	.....	83	42,678
Cooperage.....	929	337,514	1,617	581,197
Cordage, rope and twine	970	283,513	993	314,404
Corks.....	119	47,024	97	39,659
Corsets and supplies....	704	202,285	920	258,817
Cottons.....	12,029	3,547,784	10,450	3,416,412
Cutlery and edge tools..	320	141,234	105	52,993
Dies and moulds.....	30	16,020	81	40,251
Drugs.....	623	297,855	903	445,442
Dyeing and cleaning....	240	88,058	519	213,614
Electrical apparatus and supplies.....	2,021	950,551	4,806	2,498,905
Electric light and power.	1,082	591,089	2,418	1,460,418
Elevator.....	177	86,600	349	217,989
Enamelware.....	.....	.....	248	158,739
Evaporated fruits and vegetables.....	1,605	129,738	920	128,753
Explosives.....	164	93,400	197	84,076
Fancy goods.....	177	53,442	92	34,341
Featherbone.....	.....	.....	475	146,044
Fertilizers.....	63	19,878	104	45,491
Fish, preserved.....	17,059	1,700,106	18,449	2,879,137
Flax, dressed.....	1,071	156,207	755	144,396
Flouring and grist mill products.....	4,251	1,985,991	5,619	3,078,167
Foundry and machine shop products.....	12,947	5,584,767	17,928	9,145,512
Fringes, cords, tassels..	189	47,400	220	73,295
Fruit and vegetable canning.....	4,867	504,664	3,787	658,894
Furs, dressed.....	.....	.....	222	84,052
Furnishing goods, men's	5,385	1,426,601	4,088	1,239,850
Furniture and upholstered goods.....	7,212	2,547,827	8,141	3,260,573
Gas, lighting and heating.....	961	503,867	969	628,768
Gas machines.....	29	11,776	79	36,737
Glass.....	1,438	549,211	1,418	522,082
Glass, stained, cut and ornamental.....	81	42,436	149	90,016
Gloves and mittens....	1,060	285,289	1,629	539,473
Glue.....	51	16,048	170	44,702
Grindstones and pulpstones.....	106	22,047	121	39,015
Hairwork.....	99	33,188	146	66,364
Hardware, carriage and saddlery.....	493	149,802	697	320,575
Harness and saddlery...	2,509	980,772	2,277	1,083,599
Hats, caps and furs....	3,894	1,392,302	4,569	1,746,754
Hosiery and knit goods..	3,896	1,059,912	4,805	1,572,180
Incubators.....	.....	.....	33	14,668
Ink.....	24	17,756	70	49,127
Interior decorations....	232	124,002	405	229,738
Iron and steel products..	4,316	1,924,732	5,580	2,567,914
Jewelry cases.....	63	17,709	107	40,357
Jewelry and repairs....	794	383,011	1,737	797,904
Ladders.....	24	8,662	11	6,320
Lamps.....	70	30,954	49	29,761

Name or kind of industry	1900		1905		Name or kind of industry	1900		1905	
	Wage earners	Salaries and wages	Wage earners	Salaries and wages		Wage earners	Salaries and wages	Wage earners	Salaries and wages
	No.	\$	No.	\$		No.	\$	No.	\$
Lasts and pegs.....	146	54,213	101	43,066	Scales.....	226	115,871	181	96,073
Lead bar and pipe.....	94	45,993	55	27,540	Screws.....	266	111,879	....	....
Leather goods.....	84	21,075	307	124,560	Seed cleaning and preparing.....	585	128,243	424	135,561
Leather, tanned, curried finished.....	3,981	1,630,285	3,640	1,730,965	Sewing machines.....	637	300,362	461	215,581
Lime.....	747	218,727	986	537,824	Ships and ship repairs..	2,528	835,517	1,672	768,422
Liquors, distilled.....	586	364,062	854	489,152	Shoddy.....	75	28,680	117	51,981
Liquors, malt.....	2,473	1,354,902	2,584	1,516,552	Shooks, box.....	225	59,655	285	97,071
Liquors, vinuous.....	158	57,715	107	55,500	Show cases.....	....	....	161	90,071
Lock and gunsmithing..	110	47,046	223	87,819	Signs.....	28	15,376	104	55,621
Log products.....	55,802	13,755,334	54,954	21,028,919	Silk and silk goods.....	....	....	707	227,311
Lumber products.....	8,365	3,420,357	13,336	6,256,997	Silversmithing.....	483	254,536	522	292,661
Malt.....	77	27,998	147	82,953	Skates.....	....	....	31	16,701
Matches.....	488	87,331	299	91,943	Slaughtering and meat packing.....	2,416	1,020,164	2,915	1,486,171
Mats and rugs.....	75	21,082	79	24,475	Slaughtering, not including meat packing.....	....	....	229	145,621
Mattresses and spring beds.....	446	172,563	487	200,570	Smelting.....	2,113	1,331,553	9,849	6,648,491
Metallic roofing and flooring.....	172	74,488	343	221,268	Soap.....	629	317,966	676	423,651
Mica, cut.....	264	55,494	403	63,689	Spinning wheels.....	....	....	10	250
Mirrors and plate glass.	140	74,420	224	121,297	Stamps and stencils.....	....	....	96	55,791
Monuments and tombstones.....	986	434,896	1,187	587,853	Starch.....	390	134,460	374	111,091
Musical instruments ..	2,553	1,176,668	2,818	1,391,946	Stationery goods.....	593	228,115	582	266,662
Musical instrument materials.....	293	94,368	352	172,250	Stereotyping and electrotyping.....	69	43,400	61	43,321
Oils.....	669	331,241	903	498,924	Stone, cut.....	71	30,675	1,759	800,661
Oil clothing.....	292	102,404	386	175,505	Stove polish.....	....	....	27	11,731
Optical goods.....	168	71,748	163	79,447	Sugar, refined.....	1,264	747,280	1,858	1,109,481
Painting and glazing....	105	44,357	148	91,333	Tallow, refined.....	....	....	87	16,621
Paints and varnishes....	638	332,521	878	422,010	Textiles, dyeing and finishing.....	565	237,092	544	220,581
Paper.....	2,935	1,191,038	4,974	2,208,526	Thread.....	....	....	176	62,171
Patent medicines.....	598	279,348	554	283,586	Tobacco, chewing, smoking and snuff	2,351	791,066	2,249	731,981
Patterns.....	....	....	47	25,092	Tobacco, cigars and cigarettes.....	4,631	1,813,670	5,384	2,111,581
Photographic materials..	140	63,600	221	99,956	Typewriter supplies.....	....	....	22	11,661
Photography.....	59	32,869	33	22,298	Umbrellas.....	162	46,012	154	42,481
Picture frames.....	608	209,291	452	220,965	Vinegar and pickles.....	373	123,295	386	153,581
Pipe and boiler covering	46	26,485	47	22,471	Wall paper.....	389	200,667	403	238,651
Plaster.....	100	37,132	35	16,064	Washing compounds..	18	8,476	14	6,581
Plaster and stucco.....	....	....	15	7,580	Washing machines and wringers.....	178	58,178	171	69,581
Plumbers' supplies.....	468	206,365	1,258	650,695	Watch cases.....	503	202,936	149	84,901
Plumbing and tinsmithing.....	4,757	1,855,445	6,807	3,316,817	Wax candles.....	30	16,250	34	20,501
Printing and bookbinding.....	2,836	1,135,341	5,902	3,032,926	Window blinds and shades..	304	117,805	239	131,501
Printing and publishing	9,481	4,671,413	9,686	5,540,885	Wire.....	637	254,861	1,222	544,431
Printing presses.....	315	126,424	133	80,092	Wire fencing.....	200	88,678	367	204,581
Pulleys.....	182	68,562	233	122,545	Woodenware.....	....	....	452	187,931
Pumps and windmills..	565	263,268	490	213,845	Wood pulp, chemical and mechanical..	3,301	1,179,807	2,456	1,023,791
Railway supplies.....	405	188,668	265	108,169	Woodworking and turning.....	912	304,764	785	316,621
Refrigerators ..	124	35,702	182	88,456	Wool, carding and fulling	16	2,640	78	16,451
Regalias and Society emblems.....	....	....	37	17,225	Woolen goods.....	6,795	2,066,320	4,642	1,508,161
Roofing and roofing materials.....	154	81,146	525	306,423	Wool pulling.....	28	13,138	68	33,711
Rubber clothing.....	202	99,068	426	201,227	Woolen yarns.....	68	18,377	84	24,891
Rubber and elastic goods	551	229,704	753	418,073	All other industries..	4,120	1,436,659	3,557	1,182,281
Safes and vaults.....	181	104,760	236	121,560					
Salt.....	208	86,444	169	79,215					
Saws.....	262	117,639	291	155,043					

PRINCIPLES OF SELLING.

The first principle of salesmanship is never to actively antagonize a customer. Show him the fallacy of his ideas, but do not do so by reflecting in any way upon his own personal intelligence. If he is set in his opinions, try and get around them by careful strategy. Don't smash straight into them with bungling frontal attacks. Never forget that half of your power consists in what you say, the other half in the way you say it.

Always remember that when you are talking to a prospective customer you are

like a man walking around in a dynamite factory—the slightest misstep is likely to blow you out through the roof—so far as any chances of landing a sale are concerned. Your customer isn't a bag of sand or a load of rock. He is a man made up of a lot of combustibles; pride, prejudice, vanity, sensitiveness, conceit. Be careful not to touch a match to any of these; avoid friction—it throws out sparks. Walk gently—make your advances with caution, as a man who feels his way in the dark. And at every stage of the proceedings remember that a spoonful

of smile is worth a gallon of good cheerfulness, courtesy and tact in a salesman's work are like oil on a machine: they help every wheel go round. Discourtesy and gloom are like sand on the axle; they block everything back. A grouch never sold any goods; a smile thrown in with an explanation costs nothing and wins trade. Some salesmen have customers who could be not be drawn away with a club—it's safe to gamble that they didn't get them by growling at them. Cultivate the smile that won't come at it pays.—Macey Monthly.

Patents and Inventions.*

By GEORGE OTIS DRAPER.

The great majority of patents are taken out by individuals in the hope of profiting by royalty charges or sale to other individuals or corporations, for the average inventor has not sufficient capital to manufacture and introduce his invention himself. The patents that are retained by the inventors rarely produce any profit at all. While a great number of patents are acquired by corporations, it is really surprising how few corporations make a specialty of patent purchase, and how few patents are purchased compared with the number issued. Recent investigation seemed to show that the Draper Co., with which I am connected, was acquiring more patents per year than any other individual or corporate organization, outside the electrical field, in which the General Electric Co. came first and the Westinghouse companies, considered as a unit, came second. This would seem to show that cotton machinery inventions have been concentrated under one management to a greater extent than in any line outside electrical development. The cotton manufacturers of this country are therefore peculiarly interested in the relation of patents to their business, since they are not only users of cotton machinery, but of electrical devices as well.

THREE CLASSES.

In any great line of machine application, there are usually three classes of manufacturers. One makes a specialty of patented improvements, since there is more chance for profit in this line, if successful. Another class springs up, attracted by the profits of the first, to produce copies made as near as the law allows, usually coming a little nearer than the law allows in the eagerness to avail itself of the true merits in the new ideas. The third class, which includes the great majority, makes the standard trade forms of machine such as are open to general competition, not seeking necessarily for patented improvements, and yet not avoiding such improvements if they come to hand without special search. Concerns in this class sometimes acquire valuable new ideas accidentally and specialize some particular part of their output. Those of the first class must necessarily devote a great deal of time and expense in experimenting with new ideas. This preliminary loss on one simple machine can easily run into hundreds of thousands of dollars. Since those of the second class are ready to compete for the profit of the successful ideas without having contributed to the experimental losses, it is necessary for those in the first class to defeat their intentions, so far as possible, by the use of legal assistance to keep them strictly within the lines of imitation allowed by law.

HINDRANCES TO DEVELOPMENT.

Concerns which introduce patented improvements naturally appreciate the importance of legal protection. In the warfare with competitors, it is not always necessary to use up all available ammunition in the

first conflict. The defendant in a patent suit often gains nothing from a favorable decision, but the labor of defence in further litigation, while loss of any one suit often means failure and dissolution. There is a lot of misplaced sympathy from small competitors, simply because they are small. Any man is entitled to profits from his own labor and his own brains, when using his own capital, whether it be small or large; but his circumstances or his necessities do not warrant him in profiting from the labor, brains, or capital of others, unless he renders a suitable equivalent.

The introducer of a patented improvement not only has to encounter the competition of infringers, but he has to overcome the prejudices of the possible purchasers. The average man does not like to change a process or a machine that he is used to, any more than he likes to change the style of his clothing or the hours of his meals. He can be convinced of the necessity for change if there be sufficient proof of a profit; but his help also dislike to change their habits, and they are not so sure of sharing the profit. Many a good idea is killed because the operatives will not assist in getting possible results from new machinery, and the very operatives who have become efficient by long practice with the old machinery, are less likely to encourage adoption of the new ideas. We have found that we sometimes get better results with new machinery where help is used that never knew the old machinery. They have got nothing to unlearn.

It is comparatively easy to introduce a new idea when the machine is undoubtedly better, and sells at the same or lower price. If the improvements necessitate complication, and include patented ideas so that a higher price is demanded from the purchaser, the task of introduction becomes herculean. The prospective buyer wants proof that they are worth the extra cost, assurance that no one else shall ever get them for less cost, assurance that the competitors will not offer duplicates at a lower price, and assurance that the introducer will not bring out a better device to profit a later purchaser. It took years of effort to prove that a power loom was better than a hand loom, and the doubter can figure losses by depreciation, extra interest, and patent expiration, in a way that could have prevented the introduction of any new process ever conceived. While the figurers are figuring, however, others more promptly adopt the new ideas and get years of profit before the mathematicians change their minds.

Certain manufacturers are hindered in the adoption of labor-saving machinery, by the antagonism of their help. Organized labor is often opposed to labor-saving improvements because it believes that such machinery increases the numbers of the unemployed. The fallacy in this line of reasoning has been too often exposed to need attention here, but the proof does not always reach those affected by the proof.

Although speaking to a national organization, I recognize that the majority of

those present are from the Southern manufacturing section of this country. Although the labor of the South has averaged to be cheaper during the twelve years in which this comparatively new industry has grown up, the South is prompter to adopt labor-saving machinery than its Northern competitors, very possibly because of its freedom from domination by labor organizations. In our own experience, we have found that Southern operatives, which are mainly of native American ancestry, show a very gratifying pride in being employed on superior machinery, and in getting the best possible results from such machinery.

VALUE OF INVENTIONS.

The value of inventions is not proportionate to the brain power expended on them. One inventor may produce a machine after years of effort, having countless members, each of which must be separately perfected to co-operate with the others, while another inventor may instantly conceive a simple idea of far greater value.

The profitable inventions are nearly all simple in character; and successful simplicity illustrates a much higher order of mind than do complex devices performing the same purpose. The great artist produces desired effects with a few suggestive strokes. The great author condenses thoughts into a few words. The Rabbeth spindle, the most marked improvement in its line, depends on novelty for the mere substitution of a loosely held bearing for a tight one. The Sherman spindle, which made a distinct advance in the art, simply substituted a metal contact for the Rabbeth fibrous packing. The popular Draper spindle combined the advantages of the Sherman metal contact at the top of the bolster, with the fibrous packing at the lower end. The greatest royalty ever received by a spindle inventor, was given for a mechanical device to prevent a loose bolster from turning, though any mechanic could devise a dozen such mechanisms, after the need for such an invention was obvious. It took twenty-four years for one to discover that two rows of temple teeth on the old horizontal wheel temple were better than one row. The idea of making a spinning ring reversible controlled that particular art for years. Spinning rings were strained out of true in hardening for fifty years or more before one thought of hardening them on a round plug. The Northrup loom depends fundamentally on the grasp of a ridge by grooves in a spring, and the placing of a self-threading shuttle eye in position to allow the thread to be drawn into place by the motion of the shuttle.

While logical inventions are usually made by practical men in constant touch with the machinery perfected, the revolutionary changes are often brought about by men who are not experienced in either seeing or handling the machines that they improve. Dr. Cartright, who invented the power loom, had not even seen a hand loom when applying for his first patent, though he made several marked improvements later by adapting some of the hand loom devices to his own construction. Most of the Northrup loom inventions were devised by men whose experience with looms was very limited, as our Hopedale companies had not for many years been working on loom improve-

* Read at the Convention of the American Cotton Manufacturers Association, Boston.

ments, outside of temples, before the filling-changing experiments were started.

The invention made by men lacking practical experience in the running of the machines to which their inventions are applied, must be modified by practical men in the majority of instances, before they are fit for commercial use. It is usually advisable to have inventors carefully advised by practical men during the development of their ideas. This was well illustrated by an attempt to develop an idea at long range, in our earlier loom experimenting, when a most ingenious and highly educated designer worked for three years in his own shops, to develop a mechanism which we needed. His inventions were covered by ten patents; but not one of them ever went into practical use, and the ten patents have not apparently related in any way to any of the mechanisms which have gone into use. Other inventors, more in touch with the practical necessities, invented the necessary devices at short notice, when the problem was turned over to them.

Inventors often lose possible profits because they are not willing to wait for slow returns, and possibly sometimes because they lack the necessary faith in their own ideas. Several noted inventors were actually urged by us to stick to a royalty basis, which would have given them returns considered large even in these days of high figures; but they insisted on cash.

The risk in development and introduction of inventions is well illustrated by the scarcity of corporations engaged in the business. There are so many chances for loss that the profits are few and far between. No one knows when purchasing or developing an idea, that there may not be some patent application already in the Patent Office which covers the same. The public does not know any of the facts regarding such patent applications. We were once made liable by the issue of a patent nine years after its application, and we had been manufacturing the infringing device made under a patent of our own granted much earlier. We had to compromise with the owners of the new patent, since it antedated ours; in fact, we had to buy the right of use at a very substantial figure. With the hundreds of thousands of patents existing in all civilized countries, it is impossible for anyone to get accurate knowledge of the state of the art as shown even by granted patents, and some of the old ideas often turn up unexpectedly to utterly destroy the value of a re-invented device.

Many patents are made absolutely worthless by the incompetency of cheap patent attorneys, who merely try to get a patent without any thought of the real value of the claims. One French inventor, with a limited knowledge of English, had a patent prepared to cover his idea of cutting a thread on the blade of a spindle, to assist in its lubrication. He tried to explain to his attorney that he had invented the idea of putting a thread on the spindle and the learned counsel therefore procured him a patent which covered the use of a thread on the spindle, particularly specifying that the said thread could be either cotton, wool, worsted or other fibrous material.

PROFITS EXAGGERATED.

The profits of patented machinery are

often greatly exaggerated. The first patent spindles produced no profit at the price sold, until machinery was developed which could produce them economically. Some of the machinery that starts off with a good margin between price and cost is gradually made more expensive by continued improvements and additions, while the base price remains the same. I could easily refer to machinery wholly unprotected by patents, which often sells with a higher margin of profit than some of the most carefully protected types, because there is a chance for profit in making a standard trade machine that has no element of change to consider, and where the multiplied duplication allows use of the most economical processes. Introducing patented machinery are compelled, by the very haste of its evolution, to continually perfect and change, resulting in an enormous loss through drawings, jigs, and patterns, thus made useless, to say nothing of the interruption in manufacture and the expense of developing the changes.

FIELD FOR THE FUTURE.

The successful machinery inventions of the future will continue to lessen labor per product, make better product or cheaper machinery or processes. The possible field is necessarily narrowing all the while, since in many departments the operatives now do nothing but correct the faults in the material being treated, or merely assist in removing product or supplying material. There are some possibilities in higher speed, and also possibilities in spreading help over more machinery. When we note a spinner tending 1,500 spindles, or a weaver running 40 Northrup looms, we realize that it may be necessary to invent new types of human beings, if we require them to cover so much space; unless we adopt some transportation system, a suggestion by no means impracticable.

The surprising development of American ingenuity, which has placed us far ahead of any other inventive nation, is primarily due to the protection afforded by our American patent system. There are those who consider patents monopolistic and tyrannical, causing much of nuisance to the public at large. They think that without the patent system we should have as many improvements, and make greater progress, since all could use the improvements without pay. We know by our own experience that even if inventors were to develop ideas without profit—a most improbable theory—the public would by no means promptly grasp their advantages, but rather decline to consider them at all, in view of the change in habit necessary. People must be forced by persuasion and without the chance for profit there is no incentive to stir the possible persuader.

There are valuable ideas in the line of machinery improvements, which are not introduced, since the controlling patents have expired, or because their own patents were imperfect. No one will take the trouble to introduce them since they merely educate a competitor who can copy without the expense of designing and testing. An investigator of street railway improvements recently printed similar evidence by showing how the trolley system in foreign countries eliminated a great per cent. of our trolley accidents by use of certain protective de-

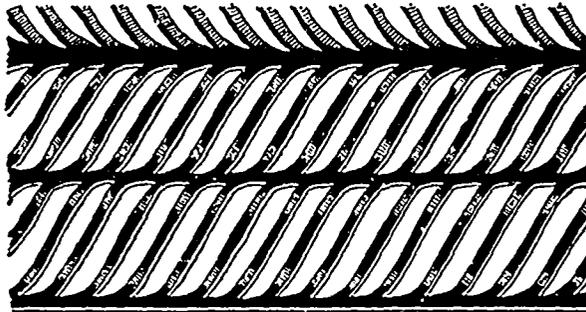
VICES. On his return to this country, he endeavored to get American managers to adopt these devices, as they were not patented, but with no success. So long as business is done on a business basis it will be done with a careful reckoning of costs, and improvements must be proved of value by those who can be assured of a share in the value. A patent is merely a policeman protecting the rights of ownership; and while some may question the rights of individuals as to possession of property which they did not create, there is no logic that can justly deprive one of a primary right to the creations of his own brain.

WEAVERS FOR CANADA.

Mr. Louis Leopold, a representative of the Canadian Manufacturers' Association, who is visiting various Lancashire towns in search of weavers for the Valleyfield Mills, Montreal, is anxious that there should be a clear understanding as to the purpose of his visit to these parts. Questioned by our representative during his visit to Blackburn on Tuesday evening, he denied very strongly that the Canadian manufacturers were in any way antagonistic to their Lancashire brethren: on the contrary they had nothing but the most fraternal feelings towards them. It had been urged that it was unfair to take weavers from Lancashire at a time when their full services were demanded by the masters at home; but he would like to point out that it was not their intention to gather all the weavers he required from one particular centre. On the contrary, he took quite a minimum number from various towns, which could have little or no effect on the conditions prevailing there.

Still, Mr. Leopold held that Canada offered far more advantages to the weaver of ordinary ability than did the old country. At Valleyfield, for instance, a weaver's earning capacity was 37s. 6d. per week, while a first rate weaver for lawns and satens could reach 40s. per week. The average cost of living was much cheaper, and all the conditions were superior. Of course the system was slightly different from that prevailing in Lancashire. Most of the machinery had been prepared by Messrs. Henry Livesay, Limited, of Blackburn, and provided for fewer picks per minute, thus enabling the weaver to give his attention to more looms. Mr. Leopold mentioned the interesting fact that there had been no dispute at Valleyfield since October, 1900; and during the last seven years he, personally, had been responsible for sending some seven thousand people to the Dominion! He incidentally mentioned to the audience which gathered in the Exchange Hall that while in England the general complaint among the workers was that there was nothing but the workhouse for their old age, that spirit was not prevalent over in Canada. Quite a number of men and women were present who had experienced the actual conditions at Valleyfield, and they added their testimony. Mr. Leopold said the company were quite agreeable to meet a family's travelling expenses and would take no more than the actual cost from their earnings each week in reasonable instalments.—Textile Mercury.

"HERRINGBONE" EXPANDED STEEL LATH



Is the best lath made for both interior and exterior construction.

It is **STRONG AND RIGID**, consequently easier to erect and plaster than any other metal lath on the market. Being self-furring there is no danger of plaster "peeling" where the lath crosses the face of the furring. It has a flat, even surface, free from any tendency to twist or buckle, and is the only expanded metal lath which makes even joints without wasting material by overlapping or taking up uneven edges. That means economy in both labor and material.

"HERRINGBONE" LATH IS ESPECIALLY ADAPTED FOR

Partitions, Ceilings, Column Work, Cementine Construction, Skeleton Sheathing of Cement Air-Ducts, Sluice-Ways, Cisterns, Elevator Roofs AND KINDRED CONSTRUCTIONS

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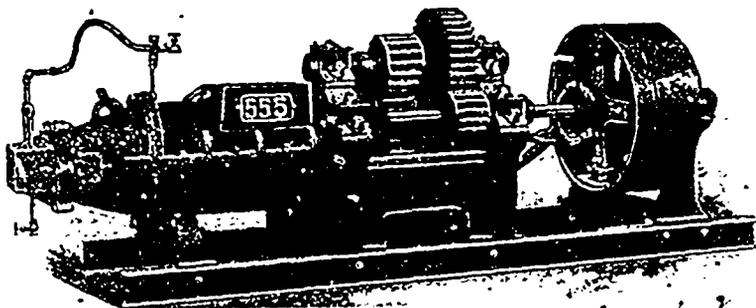
Is invested in manufacturing plants in Canada, according to the Dominion Census Bureau.

¶All these works must be kept in repair; their machinery must be up-to-date, their power equipment must be maintained at highest efficiency; they must be supplied with raw materials.

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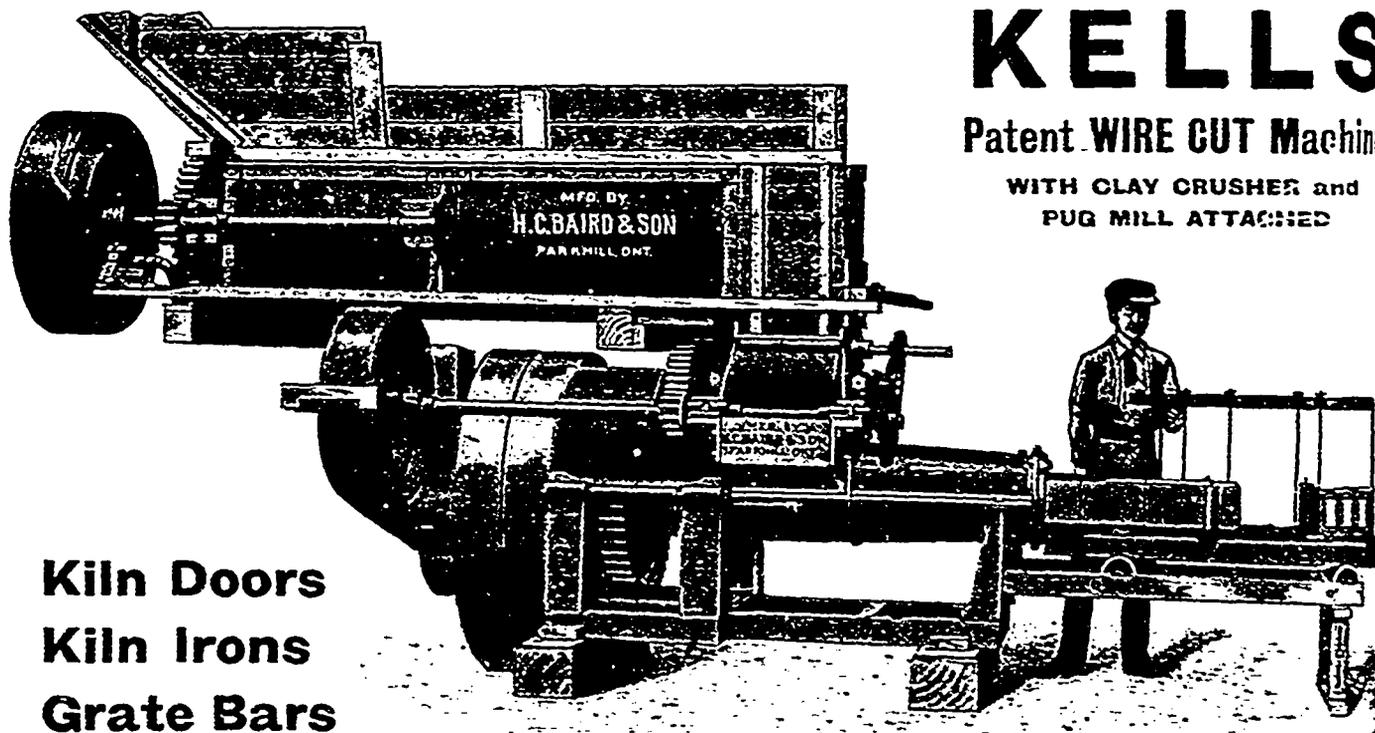


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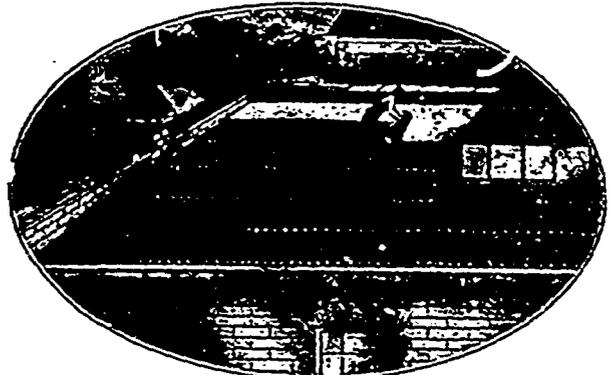
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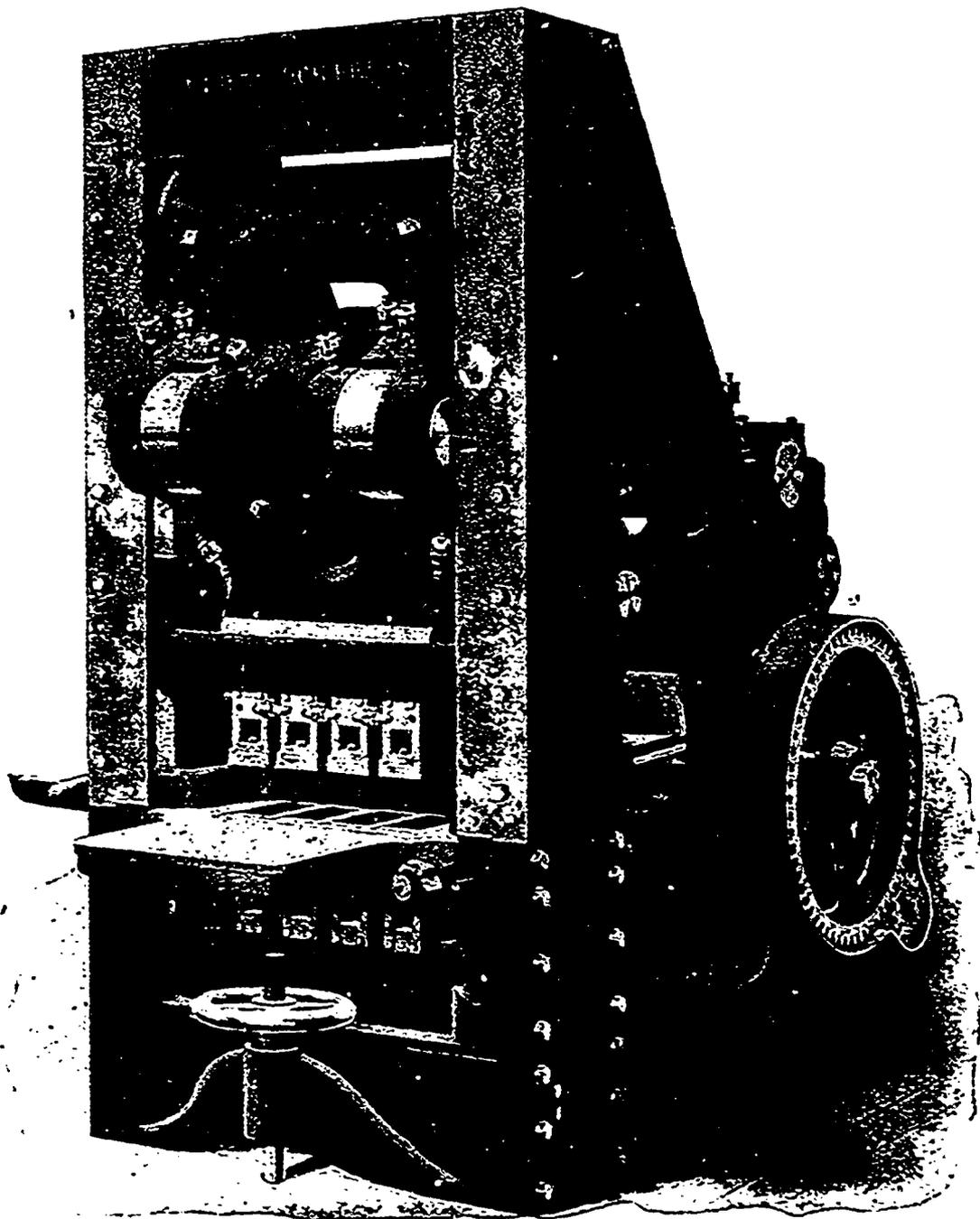
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The BERG is built for work; long work; hard work, steady work—and it never fails to do its work, day after day, year after year.



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Blast Furnace Linings, Stove Brick and Shapes. Open Hearth Furnace Refractories, Cupola Linings, Brick for Rolling Mill Furnaces, Brick for Copper, Nickel, Brass and other Smelting Furnaces.

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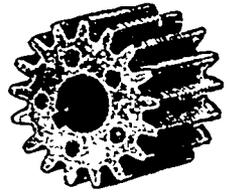
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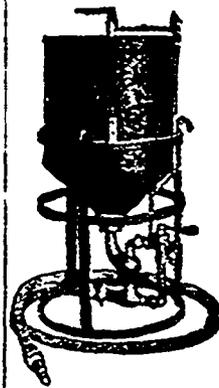
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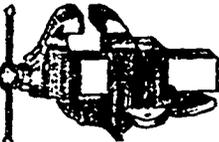


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Specially designed for the
RAPID, ECONOMICAL AND SAFE

Generation of Steam up to the
highest pressures.

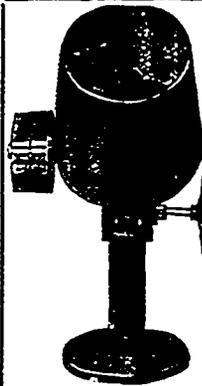
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KNUCKLE
JOINT AND
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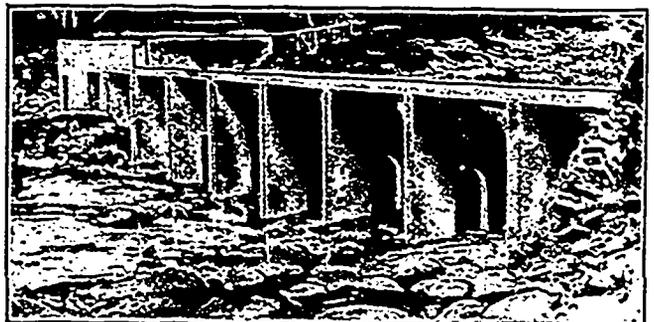
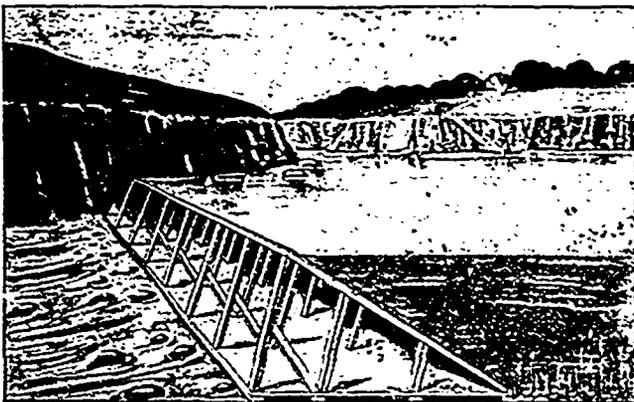
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INDEX TO ADVERTISEMENTS (Continued).

I		PAGE		PAGE		PAGE	
Ideal Concrete Machinery Co., South Bend, Ind.	17	McDougall, John, Caledonian Iron Works Co., Montreal.	50			R	
Imperial Oil Co., Petrolea, Ont.	44	McGuire, W. J. Limited, Toronto and Montreal	16			Remington Typewriter Co., Toronto.	
International-Acheson-Graphite Co., Niagara Falls, Ont.	17	McKinnon Dash & Metal Works Co., St. Catharines, Ont.	obc			Robb Engineering Co., Amherst, N.S.	8
International Steel Co., Montreal	7	McLaren, D. K., Limited, Montreal and Toronto.	48			S	
J		N					
Jeffrey Mfg. Co., Columbus, Ohio.	8	National Typewriter Co., Toronto.	46			Sadler & Haworth, Montreal.	10
Jones & Moore Electric Co., Toronto.	13	Neff, A. C. & Co., Toronto.	14			Senator Mill Mfg. Co., Galt, Ont.	14
Jones, J. L. Engraving Co., Toronto.	47	Nichols Chemical Co., of Canada, Montreal.	45			Sheldons, Limited, Galt, Ont.	ifc
K		Northern Aluminum Co., Shawinigan Falls, Que., and Pittsburg, Pa.	6			Smart-Turner Machine Co., Hamilton, Ont.	obc
Kahn, Gustave, Toronto.	14	Northern Electric & Mfg. Co., Montreal	39			Smith's Falls Malleable Castings Co., Smith's Falls, Ont.	obc
Kelly's Directories, Toronto and London Eng.	11	Nova Scotia Steel & Coal Co., New Glasgow, N.S.	4			Spence, R. & Co., Hamilton, Ont.	46
Kerr Engine Co., Walkerville, Ont.	16	O				Stamp, W. H., Devonport, England.	46
L						Standard Bearings, Limited, Niagara Falls, Ont.	11
Laurie Engine & Machine Co., Montreal.	ifc	Oakey, John & Sons, London, England.	45			Stevens Mfg. Co., Galt, Ont.	47
Leslie, A. C. & Co., Montreal.		Ontario Lime Association, Toronto.	46			Storey, W. H., & Son, Acton, Ont.	14
Loignon, A. & E., Montreal.	14	Ontario Wind Engine & Pump Co., Toronto.	46			Stowe-Fuller Co., Cleveland, Ohio.	43
London Rolling Mill Co., London, Ont.	49	Orford Copper Co., New York, N.Y.	16			Syracuse Smelting Works, Montreal and New York.	10
Lowell Crayon Co., Lowell, Mass.	14	Otis-Fensom Elevator Co., Toronto.	50			T	
Lysaght, John, Limited, Bristol, Eng., and Montreal.	obc	P				Tippett, Arthur P., & Co., Montreal.	44
M		Packard Electric Co., St. Catharines, Ont.	13			Toronto & Hamilton Electric Co., Hamilton, Ont.	12
Marion & Marion, Montreal.	14	Park Bros., Chatham, Ont.	46			Toronto Paper Mfg. Co., Cornwall, Ont.	46
Metal Shingle & Siding Co., Preston, Ont.	39	Parke, Roderick J., Toronto.	14			Toronto Pottery Co., Toronto.	15
Mica Boiler & Covering Co., Montreal.	46	Pennsylvania Fire Brick Co., Beech Creek, Pa.	15			Trussed Concrete Steel Co., Toronto.	14
Mitchell, Charles H., C.E., Toronto.	14	Perrin, William R., & Co., Toronto and Chicago, Ill.	49			Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.	47
Monongahela River Consolidated Coal & Coke Co., Buffalo, N.Y.	15	Phillips, Eugene F., Electrical Works, Montreal.	13			U	
Morris Machine Works, Baldwinsville, N.Y.	17	Producer Gas Co., Toronto.	18			Union Drawn Steel Co., Hamilton, Ont.	6
Morrison, James, Brass Mfg. Co., Toronto.	16	Pullan, E., Toronto.	46			V	
Morrow, John, Screw, Limited, Ingersoll, Ont.	6	Q				Viau, Henri, Montreal.	14
Mc		Queen City Oil Co., Toronto.	obc			W	
McArthur, Corneille & Co., Montreal.	obc					Weber Gas Engine Co., Kansas City, Mo.	ibc
McCullough-Dalzell Crucible Co., Pittsburg, Pa.	43					Williams, A. R. Machinery Co., Toronto.	9
						Winn & Holland, Montreal.	44

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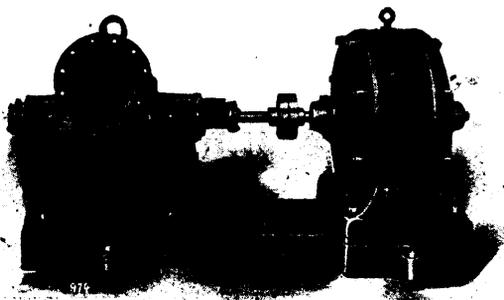
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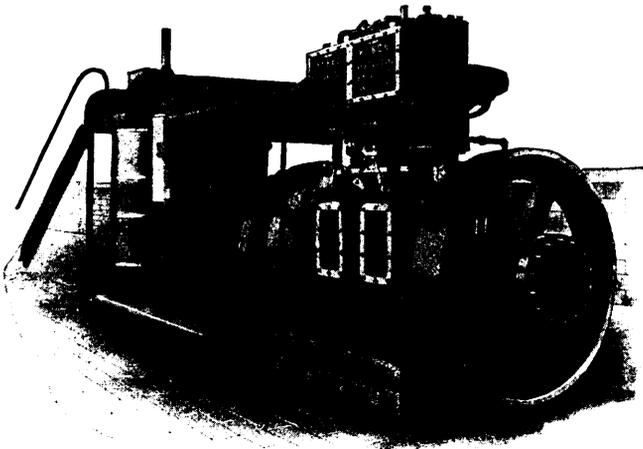
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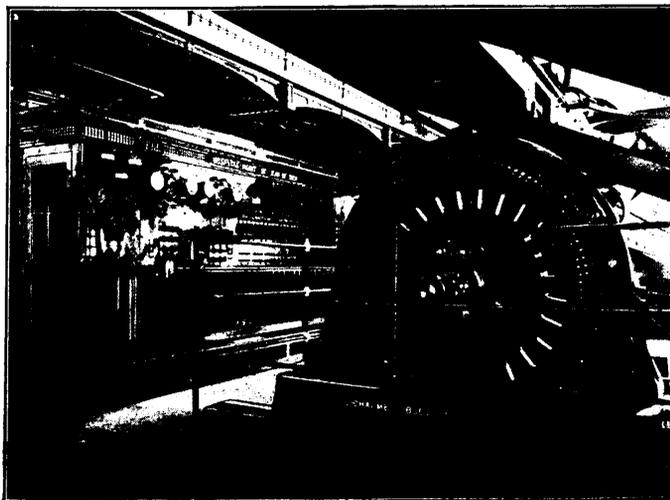
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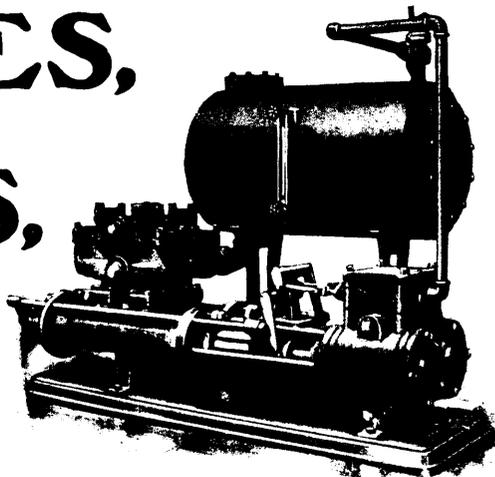
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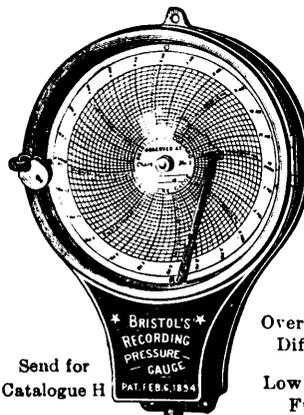
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