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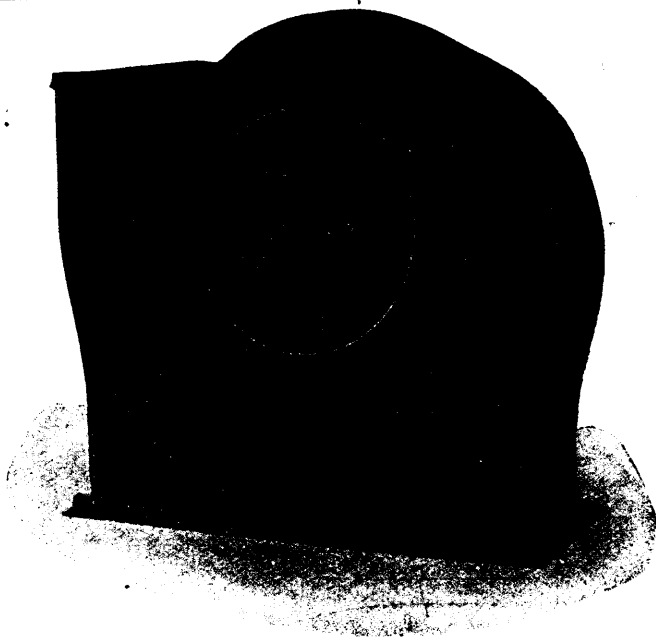
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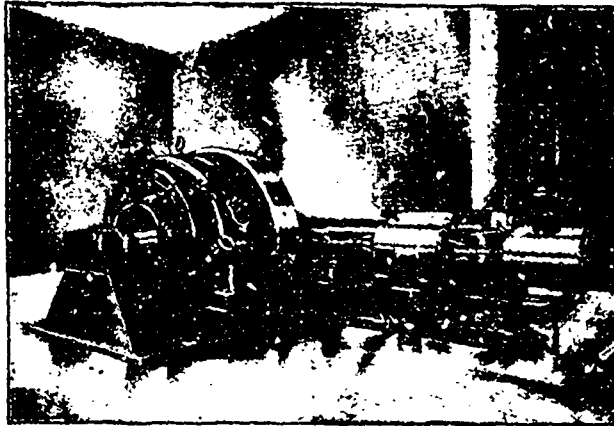
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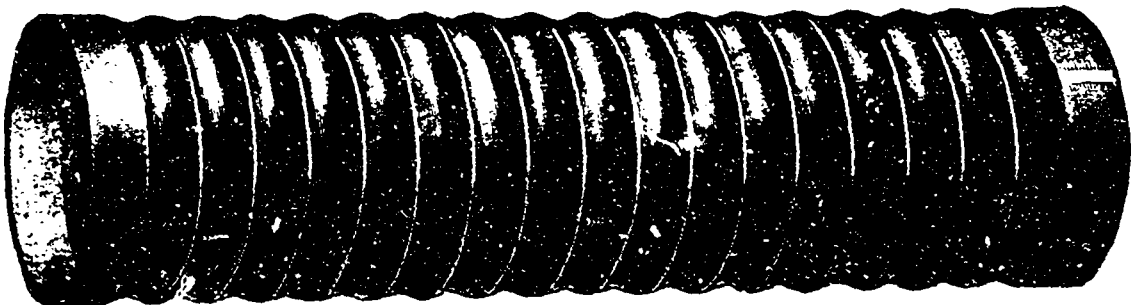
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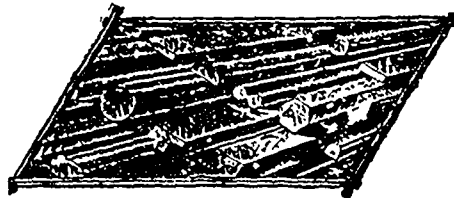
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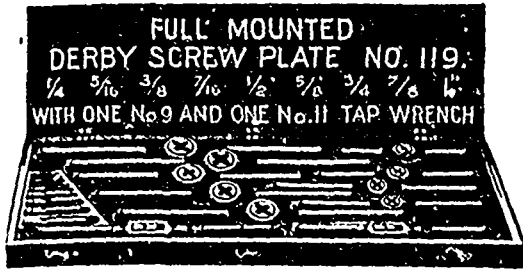
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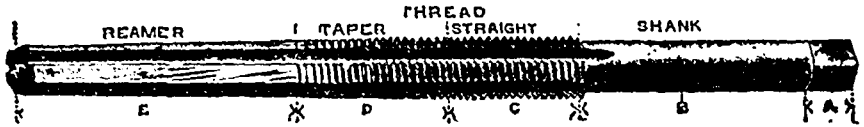
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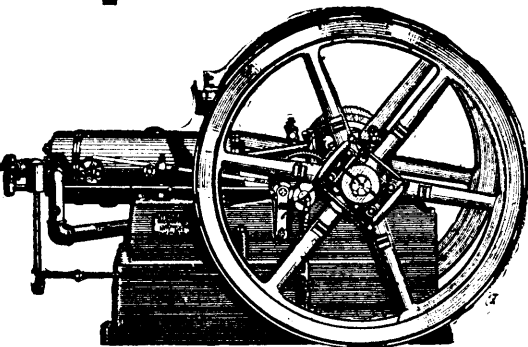
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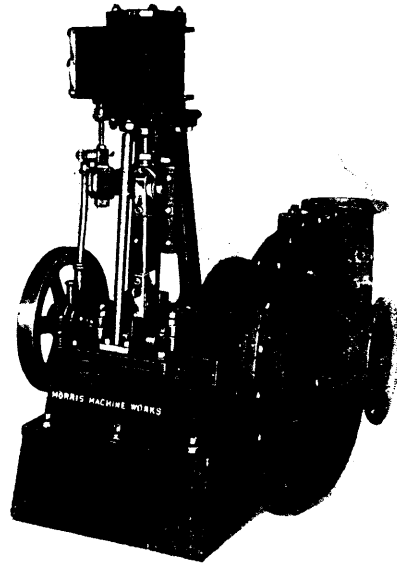
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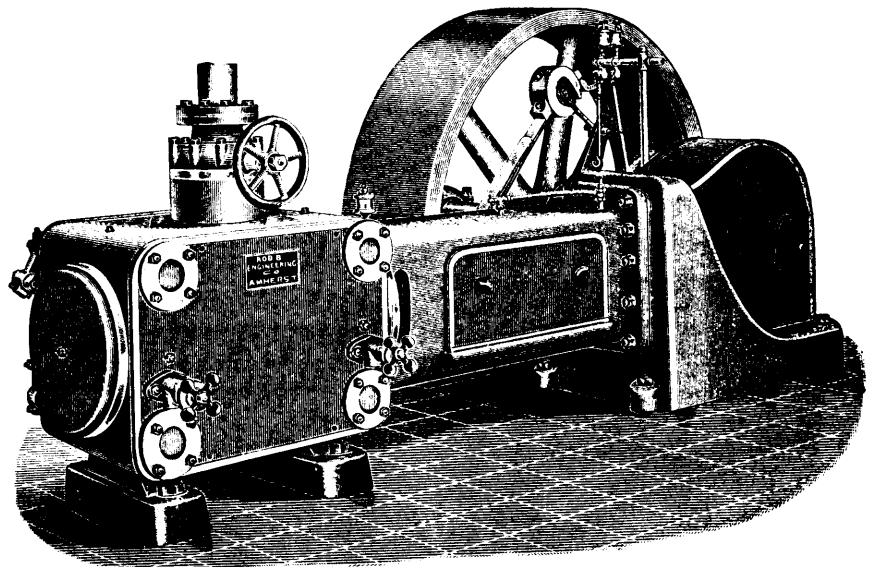
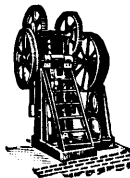
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61-69 North Jefferson St., CHICAGO, ILL.

DEEP WELL PUMPS

Steam Geared or Electrically Driven.

Deep Well Pumping Systems for Cities, Railroad, Mines, Factories, etc.

DOWNIE PUMP CO., Downieville, Pa., U.S.A.



Our Corliss engines are fitted with Robb-Armstrong Corliss valve gear, which has the following good points.

Positively Driven
Encased in Oil

Runs Noiselessly
Minimum Friction

Minimum Wear

Robb Engineering Co., Limited

AMHERST, N.S.

District Offices { 320 Ossington Ave., Toronto, **WILLIAM MCKAY, Manager.**
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The **JEFFREY MFG. CO.**

LAGAUCHETIERE AND COTE STS.

MONTREAL, CANADA

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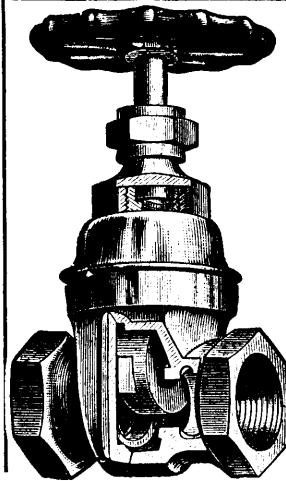
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COAL HANDLING

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DRILLING
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STANDARD AND SPECIAL CHAINS.

POWER HOUSE EQUIPMENT.



IF YOU WOULD SAVE MONEY

Pay a few cents more for a good Valve, and save Dollars in Steam-Fitter's bills.

Buy "KERR" Valves and you will find a big saving during the year.

QUALITY COUNTS

THE KERR ENGINE CO., LIMITED
Manufacturers
WALKERVILLE, - ONT.

EXPANDED

The highest type of modern fireproof construction is Concrete reinforced with EXPANDED METAL.

FLOORS - - ROOFS - - WALLS

Write for Catalogue and Prices.

EXPANDED METAL AND FIREPROOFING CO., LIMITED

100 King Street West, TORONTO.

METAL

THE CHEAPEST POWER KNOWN

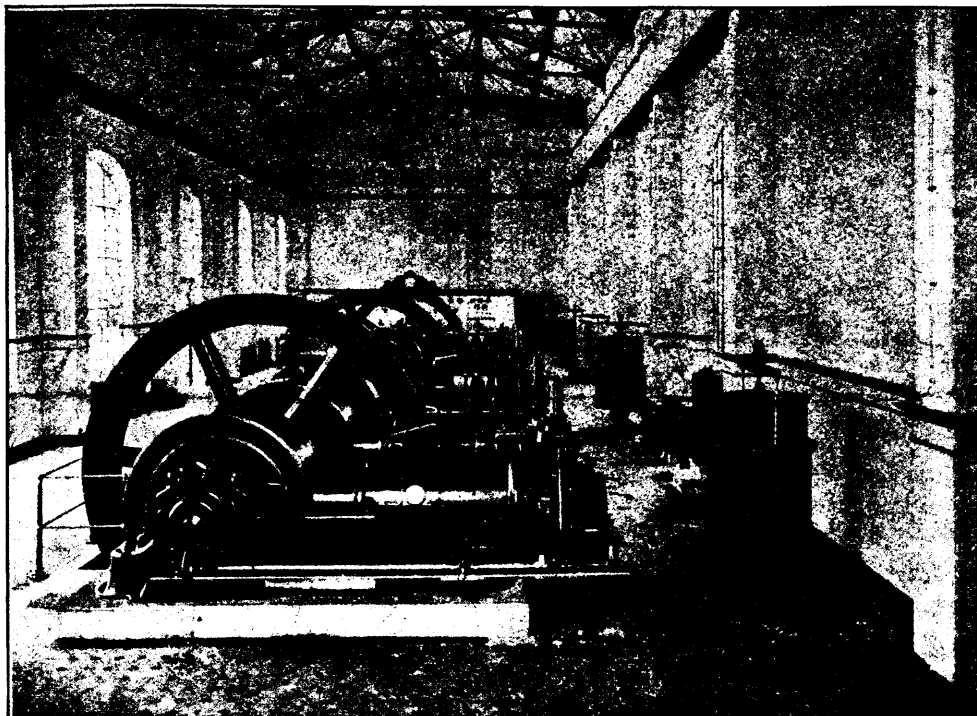
**NATIONAL GAS ENGINES
P. NTSCH SUCTION GAS PLANTS**

PLANTS

- No Smoke
- No Pressure
- No Danger
- No Leakage
- No Gas Holder
- No Noise
- No Boiler
- No Chimney

Engines in sizes from 2 to 800 B.H.P.

Suction Gas Plants in sizes from 10 to 1,000 B.H.P. in single generators.



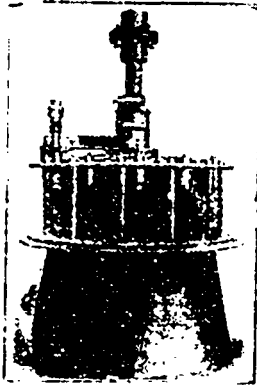
ENGINES

- Simplest
- Most Durable
- Perfect Regulation
- Small Gas Consumption
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- No Noise
- Low Cost
- Loose Liners
- Vertical Ball Governors

Total Power already installed, over **200,000 B.H.P.**

Send for Catalogue and Prices.

THE ECONOMIC POWER, LIGHT & HEAT SUPPLY CO., Limited - 40 YORK ST., TORONTO
N. J. HOLDEN CO., Limited, Montreal, Agents for Province of Quebec.

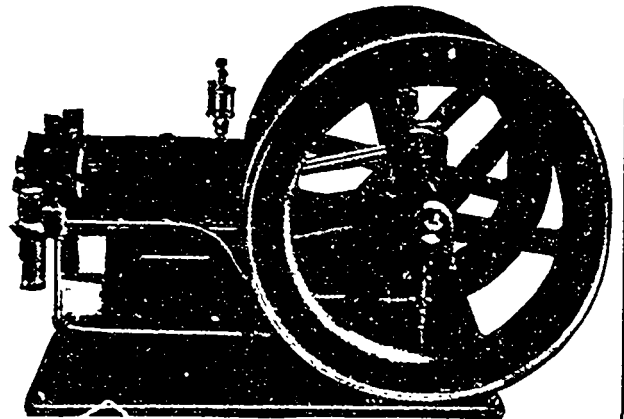


Does your water wheel develop all the power it should?

If not, put in a SAMSON wheel—it will pay.
 You will have no water going to waste if you use the SAMSON—you get all the power.
 It will work perfectly under YOUR conditions.
 Let us know your requirements, and ask us all about the SAMSON.

THE WM. HAMILTON MFG. CO. LIMITED
PETERBOROUGH, ONT.

THE FAMOUS McVICKER

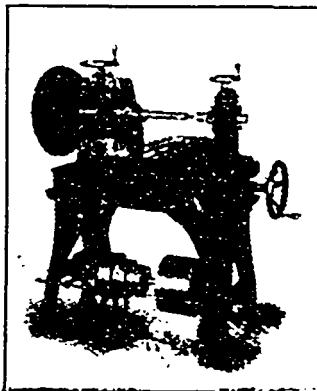


STRENGTH

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PRACTICAL



NEW MODEL No. 7—Plain Horizontal Millor

This machine is built to meet the increasing demand for a powerful miller for general manufacturing purposes, and embodies many improvements in power, stability and convenience. It is especially adapted to the manufacture of gun, sewing machine, typewriter and electrical work, bicycle and automobile parts. Write for catalogue. It will pay you.

BECKER-BRAINARD MILLING MACHINE CO.,
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 Branch Office: THE BOURSE, - - PHILADELPHIA, PA.
A. R. WILLIAMS MACHINERY CO., - Toronto, Can.
 Canadian Agents

¶One-third the number of parts.

¶The only four-cycle engine that will run either way.

¶The only improvement in gas engines for forty years.

¶Governor ten times as sensitive as any other.

¶No gears, cams, eccentrics or trigger work of any kind.

THE Canadian McVicker Engine Co. Limited
GALT ONTARIO

SADLER & HAWORTH
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OAK LEATHER BELTING
 AND **LACE-LEATHER**
HYDRAULIC & MECHANICAL LEATHERS
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Engineers and Builders of

CONCRETE STEEL GRAVEL DAMS (PATENTED IN THE UNITED STATES AND CANADA) POWER HOUSES AND GENERAL HYDRAULIC CONSTRUCTION IN CONCRETE.

- A Concrete-steel Dam is bottle tight.
- It may be inspected over every square foot of internal surface.
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- There is no possibility of static "floating" pressure on its base.
- It has more than double the factor of safety of a solid dam.
- It is indestructible by ice, water or time.
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- It costs less to build than any other permanent dam.
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- All its advantages increase with its height.



We invite your correspondence on all subjects pertaining to
 Hydraulic Developments.

Associated with the Ambursen Hydraulic Construction Co. of Boston, Mass.

Agents WANTED
 in each town of this Province to handle
SYRACUSE SMELTING WKS.
Babbitt Metal

MR. CONSUMER! This is your opportunity to minimize your babbitt bill and make money besides. We do all the advertising, which keeps your name before the public in your own respective lines free. Don't miss this opportunity. Write at once to

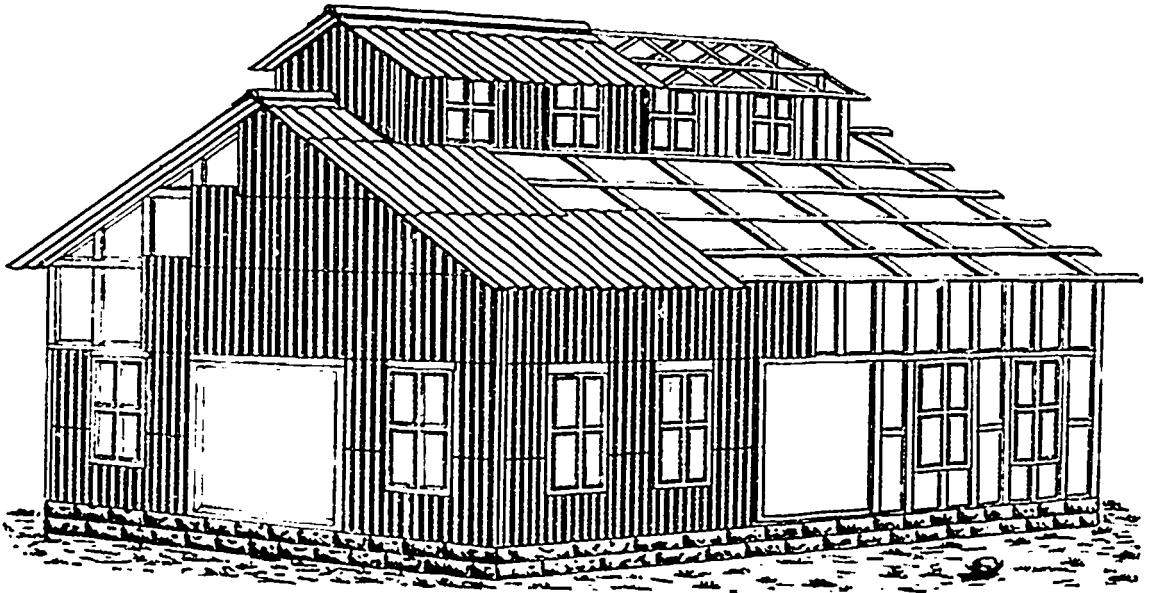
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CORRUGATED IRON

"Keeping Everlastingly at it Brings Success."



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

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

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

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

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

Send specifications to your nearest office for catalogues and prices.

The PEDLAR PEOPLE

Montreal, Que.
767-769 Craig St.

Ottawa, Ontario
423 Sussex Street

Toronto, Ontario
11 Colborne Street

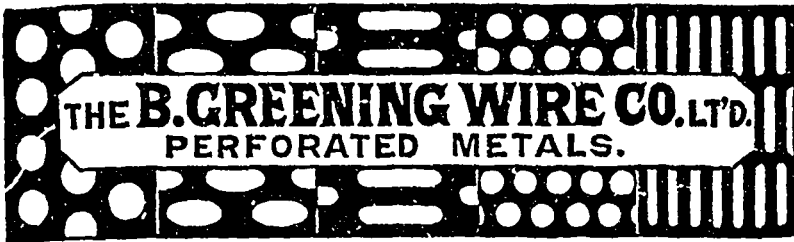
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69 Dundas Street

Winnipeg, Man.
76 Lombard Street

Vancouver, B.C.
615 Pender Street

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LARGEST MAKERS OF SHEET METAL BUILDING MATERIALS UNDER THE BRITISH FLAG

PERFORATED SHEET METALS



THE B. GREENING WIRE CO. LTD.
PERFORATED METALS.

IN BRASS, COPPER, STEEL, ETC.

ALL SIZES OF PERFORATIONS AND THICKNESS OF METALS FOR MINERS' USE. GRAIN-CLEANING MACHINERY, BEE KEEPERS, MALT KILN FLOORS, ETC.

HAMILTON, Ont. **The B. GREENING WIRE CO., Limited** MONTREAL, Que.

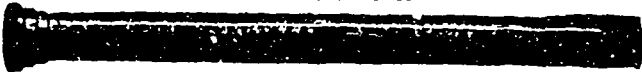
MONTREAL PIPE FOUNDRY CO., LIMITED

SUCCESSORS TO

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Manufacturers of



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LIMITED



CAST IRON PIPE

3 in. to 60 in. diameter.

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

F. W. HORE & SON, Limited, HAMILTON, ONT.
Manufacturers of
CARRIAGE, WAGGON, AND SLEIGH WOOD WORK.

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Manufacturers of... FINE GLOVES and MITTS
In every variety and style. Moccasins

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J. TURNBULL, General Manager
HEAD OFFICE, - HAMILTON, ONT.

Capital.	Reserve.	Total Assets.
\$2,500,000	\$2,500,000	\$29,000,000

90 Branches Throughout the Dominion of Canada.

Collections made in all parts of Canada on most favorable terms.



THE GRIFFIN MILL

The Greatest Pulverizing Machine in the World

Used Wherever Portland Cement Is Made

Over 50 per cent. of the Portland Cement manufactured in the United States to-day is ground in the Griffin Mill.

THE GRIFFIN MILL PULVERIZES MORE CEMENT THAN THE COMBINED OUTPUT OF ALL OTHER MACHINES USED FOR THIS PURPOSE.

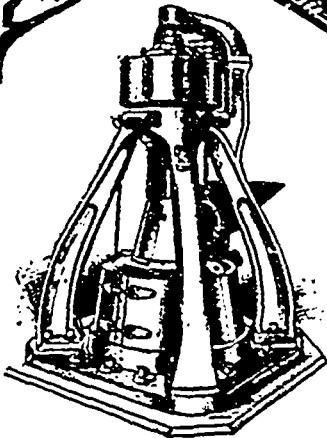
Thoroughly tested by continually successful and constantly increasing use during the past sixteen years.

Portland Cement Clinker reduced from 3/4 inch to required fineness in one operation, with no auxiliary apparatus. No other machine made will do this.

Buy the GRIFFIN MILL and get the BEST. It holds the world record from every standpoint.

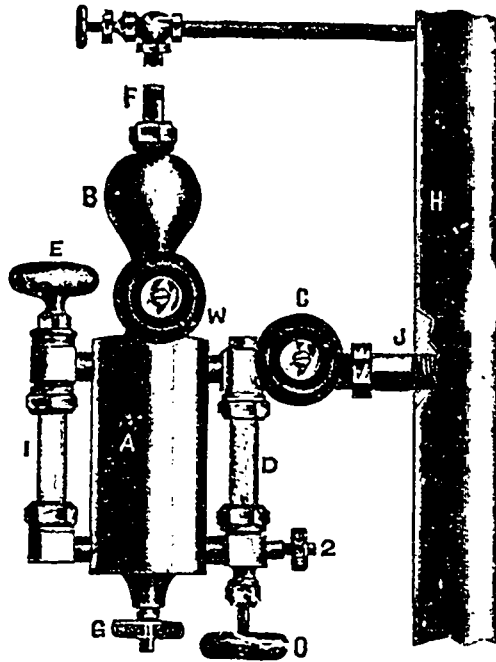
Send for Catalogue and full information.

BRADLEY PULVERIZER COMPANY, 92 State Street, Boston

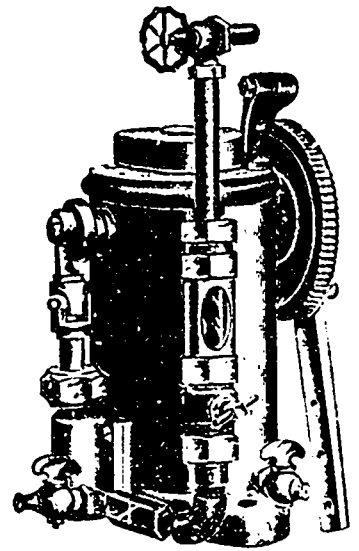




IMPROVED T. J. C. INJECTOR
No. 2.



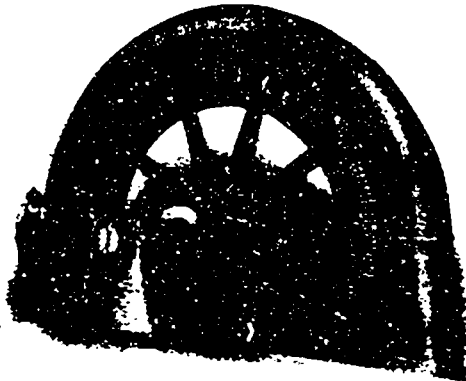
IMPROVED MICHIGAN LUBRICATOR.



THE IMPROVED HAMILTON
OIL PUMP.
with and without Slight Feed.

THE HAMILTON BRASS MFG. CO., Limited
HAMILTON, - ONT.

CROCKER-WHEELER COMPANY



ALTERNATING CURRENT GENERATORS.

Outputs—Belt Type, 25 K.V.A. up.

Engine Type, 75 K.V.A. up.

Canadian Representatives

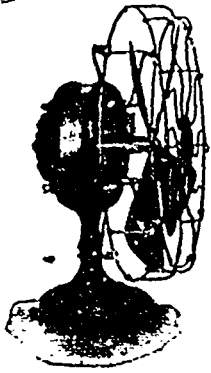
THE PACKARD ELECTRIC CO., Limited

MONTREAL.

ST. CATHARINES.

WINNIPEG.

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FAN MOTORS

ALL STANDARD TYPES AND SIZES, IN ANY FINISH

LARGE STOCK

QUICK DELIVERY OF ORDERS PLACED AT ONCE.

Canadian General Electric Company, Limited

Head Office, TORONTO, ONT.

DISTRICT OFFICES— Montreal.

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Winnipeg.

Vancouver.

Rossland.

THE EUGENE F. PHILLIPS ELECTRICAL WORKS MONTREAL, - CANADA LIMITED

TORONTO STORE, 67 Adelaide Street East

Bare Copper Wire Weatherproof Wire

LONG DISTANCE PHONE 1103.

The Electrical Construction Company of London, Limited

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Perfection TYPE **DYNAMOS and MOTORS**

Multipolar or Bipolar, Direct-Connected or Belted.

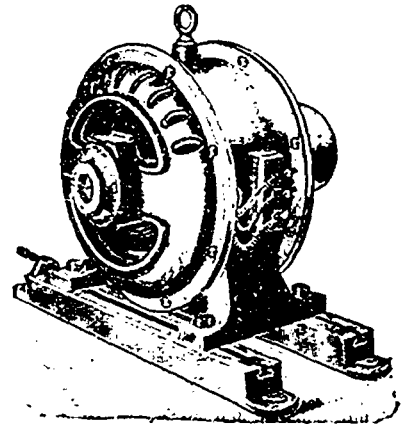
OVER 1500 OF OUR MACHINES IN USE

We contract for complete installations, including wiring of factories.

We repair machines of any make.

Descriptive matter and estimates furnished on application.

Branches at Vancouver, Winnipeg, Toronto, Montreal, Halifax



INDUCTION MOTORS

of one, two and three phases.

HIGH POWER FACTOR and EFFICIENCY

— ALSO —

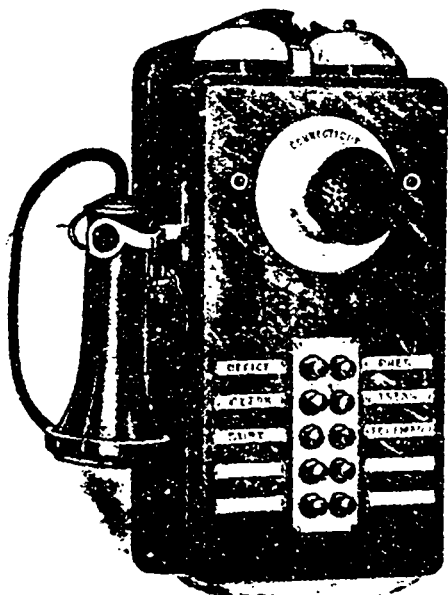
A. C. GENERATORS

IN ALL SIZES.

**TORONTO & HAMILTON
ELECTRIC CO.**

99-103 McNab North. HAMILTON, ONT

TELEPHONES OF EVERY DESCRIPTION



Telephone and Line
Supplies

JOHN FORMAN

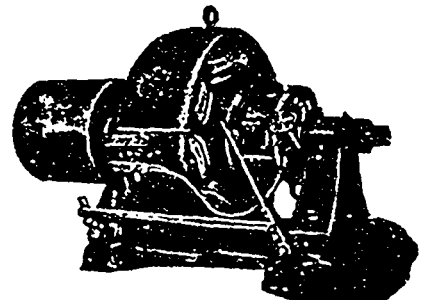
708 and 710 CRAIG ST.

MONTREAL, QUE.

The Jones & Moore

ELECTRIC CO., Limited

ELECTRICAL CONTRACTORS



DYNAMOS, TELEPHONES, SLOW
SPEED MOTORS, MOTORS, SUPPLIES,
DIRECT CONNECTED DYNAMOS.

We manufacture Direct Current Machinery in
all sizes and for any purpose.

**196 ADELAIDE WEST,
TORONTO.**

Cheap Power for Manufacturers

You need not worry about the "Trusts" getting control of the electrical energy of Canada as long as you can keep your power costs down to

Less than \$10 per H.P. per Annum

By doing what manufacturers have been doing for years in Europe, using **PRODUCER GAS**. Do you realize how much of your profit is lost by not having the most economical power.

CONSULT US FREE.

Read what the **SIMONDS CANADA SAW CO.**, of Montreal, write: "The fuel costs are only 90c. per day of 10 hours. This means that we are getting 50 h.p. for 9c. worth of fuel per hour

THE PRODUCER GAS CO. 11 Front St. East
TORONTO

NOTICE.

- Space is now being reserved in our big special Tariff Edition. Already fourteen of the best pages have been allotted.
- This issue will be the most artistic, as well as the biggest, ever sent out of this office. Its circulation will cover not only Canada from ocean to ocean but importers in all parts of the British Empire.
- There are only forty pages facing the Canadian Tariff. You can have one of these if you ask for it soon enough.
- This issue will be kept for months—probably years—by everyone who gets it—will be referred to constantly.
- You will be in good company if you advertise in it. We refuse objectionable advertising. The best firms use the paper.

THE CANADIAN MANUFACTURER McKinnon Building TORONTO



ESTABLISHED IN 1890.

PUBLISHED ON THE FIRST AND THIRD FRIDAYS OF EACH MONTH

The Canadian Manufacturer Publishing Co., Limited.

McKinnon Building, Cor. Melinda and Jordan Sts., Toronto.

J. J. CASSIDEY, - - - Editor.
D. O. MCKINNON, - - - Business Manager.

Montreal:—E. J. Chave, 439 Grosvenor St.
London, Eng.:—H. Crankshaw, 101 Loadenhall St., E.C.

Cable address: "CANAMAN." Western Union Telegraphic Code used.

SUBSCRIPTIONS:

Canada and United States \$1.00 per year. All other Countries in Postal Union ten shillings sterling, including postage.

Classified IndexPage 42
Index to AdvertisersPage 49

INDUSTRIAL CANADA.

Industrial Canada, the organ of the Canadian Manufacturers' Association, is not to be used in cultivating closer business relations with Great Britain. At the recent Winnipeg convention of the Association, in discussing the affairs of the organ, the report of the committee having it in charge being under consideration, it was resolved that hereafter British advertisements were not to be accepted nor published. The approved sentiment of the members was to the effect that as Industrial Canada was intended to advance the interests of the members, and that it would not be in such interest to have the business announcements of even British competitors appear in it, therefore all such business should be excluded. Heretofore, both British and American business cards have been accepted and published in Industrial Canada.

This policy, while it may appear somewhat selfish, is perfectly consistent. At the Halifax convention of the Association in 1902 a resolution was passed demanding a revision of the tariff. The reason given for the revision was that not only the preservation but the fuller development of Canadian industries were dependant upon increased tariff protection. Such revision should, however, give a substantial preference to the Mother Country, recognizing always that under any conditions the minimum tariff must afford adequate protection to all Canadian manufactures; and the now well-known Halifax resolution has been re-affirmed at every convention of the Association held since that time. Heeding the doctrine taught by St. Paul that "he who provideth not for his own household is worse than an infidel," the demand of the Association for adequate tariff protection for all Canadian industries is just about the correct thing and of course the products of Great Britain must be subjected to the restriction. The Association, how-

ever, make much of their advocacy for a tariff preference in favor of British goods coming into Canada, and have most assiduously endeavored to impress it upon British manufacturers that, the minimum tariff being high enough to retard if not prevent their access to the Canadian market, they would be benefitted because the maximum tariff would probably retard or prevent the access of American goods. It may be that the Association dislike the wants of Canadian consumers to be supplied from American sources, but it is also restrictive regarding supplies from British sources; and so, notwithstanding their professed desire for the British preference, they are not at all willing to encourage British trade by admitting the advertisements of British competitors to the columns of Industrial Canada.

AN OUTRAGE AND ITS REMEDY.

A press telegram from St. John, N.B., a few days ago says:

The greatest sporting organization in the whole of Canada, and one which controls the most extensive area on the continent, has just been formed. It will result in tying up from public use a million and three-quarter acres of the finest hunting lands in the province, which have in the past been open to the public, and will preserve this great area for the use of not more than a hundred men of wealth who will seek a few weeks' enjoyment here each season. It will establish a complete system of fire protection for these valuable timber areas, will arrange a chain of hunting camps, provide numbers of boats and launches, and in general make the most complete arrangements possible for hunting and fishing in comfort.

A company was formed in Montreal during Col. H. H. McLean's last visit called the New Brunswick Fish & Game Co., Limited. This company has taken over a lease of all the lands of the New Brunswick Railway Co., situated in the Province of New Brunswick, and comprising 1,700,000 acres. The lease conveys to the company all the fishing and shooting privileges. Plans for a magnificent club house have been made by Mr. Findley, architect, of Montreal. The cost of this building and the grounds will be approximately \$50,000. In addition, sporting camps to a large number will be established at all the best points. A corps of guides will be organized, and no one will be allowed to trespass on the lands, which will be kept exclusively for the use of the members and their friends. The membership fee in the company has been placed at \$1,000, and the annual assessment will be as required, the amount probably varying from \$50 to \$500. The membership is limited to 100. The officers of the club are:—Lord Strathcona, honorary president; Robert Meighen, of Montreal, president; H. H. McLean, vice-president. Alfred Zeeley, treasurer; W. T. Whitehead, manager, and on the list of provisional directors are the names of a number of New York sportsmen. The head office of the company will probably be at the club house. Letters patent have been issued in New Brunswick.

An outrage that the people of the good Canadian province of New Brunswick should be quick to resent and to repress. A club of sportsmen claiming control of more than 2,687 square miles of territory, no wonder socialism exists so prevalently throughout the land. The state should own the land, and should exercise the right to impose taxes upon it. A tax of a dollar an acre per year would provide an addition to the revenue of the province that this club of sporting millionaires should be required to contribute. The taxpayers of the country are in no mood to put up with the land grabbing outrage.

BRITISH DUTY ON IMPORTS.

Many persons suppose that because Great Britain is called a free trade country, no duty is imposed upon imports. Such, however, is not the fact, a very large portion of revenue of the country being obtained by import duties on foreign products, the policy of the government being to impose duties upon articles that are not produced in Great Britain, the policy of Canada and other countries being to impose duties upon such articles as are produced at home. Following is a list of articles all subject to duty imported for home consumption into Great Britain in the fiscal year 1905, as published in the annual statement of the trade of the United Kingdom.

Article.	Rate of Duty.	Duty Paid.
Beer, exceeding 1215°.	£1 17s 6d the bbl of 56 gals.	£1,794
Beer, 1055°.	8s the bbl.	21,679
Cards, playing.	3s 9d the doz. packs.	8,721
Chicory, raw.	13s 3d the cwt.	48,703
Chicory, roasted.	2d the lb.	657
Chloral hydrate.	1s 4d the lb.	1,129
Chloroform.	3s 3d the lb.	36
Cocoa.	1d the lb.	193,734
Cocoa shells.	2s the cwt.	423
Cocoa prepared.	2d the lb.	71,382
Cocoa butter.	1d the lb.	2,498
Coffee, raw.	14s the cwt.	179,566
Coffee, roasted.	2d the lb.	527
Coffee and chicory mixed.	2d the lb.	11
Collodion.	£1 6s 3d the gallon.	3
Ether, acetic.	1s 11d the lb.	243
Ether, butyric.	16s 5d the gallon.	437
Ether, sulphuric.	£1 7s 5d the gallon.	226
Ethyl bromide.	1s 1d the lb.	3
Ethyl, chloride.	16s 5d the gallon.	494
Ethyl, iodide.	14s 3d the gallon.	2
Fruits, dried or preserved—		
Currants.	2s the cwt.	107,893
Figs.	7s the cwt.	58,245
Plums, French.	7s the cwt.	21,958
Plums, n.e.s.	7s the cwt.	25,532
Prunes.	7s the cwt.	10,548
Raisins.	7s the cwt.	240,962
Soap, transparent.	3d the lb.	95
Spirits—		
Brandy	In casks 11s 4d the proof gallon; in glass 1s additional.	1,200,833
Rum.	In casks 11s 4d the proof gallon; in glass 1s additional.	2,246,000
Imitation.	In casks 11s 5d the proof gallon; in glass 1s additional.	5,751

Geneva.	In casks 11s 5d the proof gallon; in glass 1s additional.	£232,671
Unenumerated, sweetened.	In casks 11s 5d the proof gallon; in glass 1s additional.	52,528
Unenumerated, not sweetened.	In casks 11s 5d the proof gallon; in glass 1s additional.	104,736
Liqueurs, not sweetened.	In casks 11s 5d the proof gallon; in glass 1s additional	11,851
Cordials.	16s 4d the liquid gallon	3,640
Perfumed.	18s 1d the liquid gallon; in glass 1s additional	35,317
For use in arts.	4d and 5d the proof gal	75
Sugar—		
Refined.	4s 2d the cwt.	5,244,321
Unrefined.	2s the cwt n.o.p.	291,775
Glucose.	2s the cwt.	155,538
Molasses.	2s the cwt.	69,197
Saccharine.	1s 3d the ounce.	43,152
Blacking containing sweetening.	1s the cwt.	59
Candied peel.	3s the cwt.	1,269
Caramel, solid.	4s 2d the cwt.	5
Caramel, liquid.	3s the cwt.	2,639
Cherries.	2s 3d the cwt.	1,863
Chutney.	2s the cwt.	1,088
Cocanut.	2s the cwt.	32
Confectionery, more than 50 p.c. chocolate.	2d the lb.	12,157
Chocolate made with spirits.	3d the lb.	294
Chocolate—containing 50 p.c. weight.	1d the lb.	1,282
Chocolate, more than 50 p.c. weight made with spirits	1½d the lb.	1,269
Sugared almonds.	4s 2d the cwt.	1,789
A B gums.	2s the cwt.	3,573
Turkish Delight.	3s the cwt.	1,891
Confectionery, plain.	4s 2d the cwt.	65
Liquorice, sweetened	1s 3d the cwt.	4
Crystalized fruit.	4s 2d the cwt.	79
Fruit in thin syrup.	1s the cwt.	19,424
Fruit in thick syrup.	2s 6d the cwt.	102
Fruit, crystalized, glace.	4s 2d the cwt	588
Fruit, crystalized, 80 p.c. sugar	3s 4d the cwt.	148
Fruit, imitation.	4s 2d the cwt.	152
Fruit, except currants, preserved.	7s the cwt.	3,663

Fruit pulp in thin		
syrup	1s the cwt	£16
Fruit pulp jam..	3s the cwt.	3
Preserved ginger	3s the cwt.	5,301
Marmalade.	3s the cwt	346
Marzipan.	2s 6d the cwt.	367
Milk, sweetened, whole.	1s 8d the cwt.	32,073
Milk, skimmed.	2s the cwt.	37,478
Milk, condensed, sweet- ened.	9d the cwt.	45
Nestle's Milk Food.	1s 3d the cwt.	49
Soy, sweetened.	1s the cwt.	952
Tamarinds, sweetened	1s the cwt.	76
Other preparations sweetened.	(See Finance Act 1901)	1,029
Tea.	6d the lb.	7,257,205
Tobacco—Manufactured—		
Cigars.	6s the lb.	516,140
Cavendish.	4s 4d the lb.	22,300
Cavendish, in bond.	3s 10d the lb.	45,365
Cigarettes.	4s 10d the lb.	72,488
Cigarettes, other sorts.	3s 10d the lb.	5,218
Snuff.	4s 4d the lb.	16
Unmanufactured.	3s 7d the lb.	12,639,145
Wine—all kinds.	(See Act).	1,190,238
France.	"	381,267
Portugal.	"	390,010
Spain.	"	219,996
Total duties collected in 1905.		£33,565,444
Equivalent in Canadian currency.		\$16,346,371,228

Geneva, sweetened, unsweetened, British and foreign mixed, not tested, and perfumed, the total revenue produced being £3,724,000. The duties on rum produced more than two million pounds sterling. The sugar duties produced £6,399,228 in 1901-2, but this declined in 1902-4, and last year was still considerably below the figures for 1901-2. In view of the extent of the revenue thus obtained, it seems highly improbable that the duties on sugar will ever be entirely abolished. There is a remarkable increase in the imports of molasses for cattle food, 1,014,000 cwts. having been imported last year compared with 514,000 cwts. in 1903-4. The tea duty produced £6,700,000 compared with £8,440,000 during the previous year, the decline being mainly due to the alteration in the duties. The effect of the higher duties which prevailed in 1904-5 is seen in a reduction of the consumption per head of the population from 6.10 pounds to 6 pounds. During 1905-6, however, the quantity of tea retained in the United Kingdom was larger than it has ever been before. The tobacco revenue again shows an increase, having produced £13,380,000, the increase being nearly 1.5 per cent. As a result of the imposition of separate rates of duty on leaf and strips, there was a decrease in imported strips of 21,440,000 pounds, while the increase in leaf was 28,191,000 pounds. It is noted that there has been a decline in the consumption of foreign manufactured tobaccos, but the loss under this head has been considerably more than counterbalanced by the steady increase in the quantity of raw tobacco imported for home manufacture. The revenue from wine duties was £1,175,000.

Smuggling continues to be a source of trouble to the Customs authorities. The seizures of smuggled goods last year numbered 3,797, for which 2,362 persons were fined, the penalties recovered amounting to £3,790.

ADEQUATE PROTECTION AND THE PREFERENTIAL TARIFF.

Before the reorganization of the Canadian Manufacturers' Association a few years ago, from its inception under the old regime, it gave as a reason for its coming into existence the necessity of a fiscal policy for Canada which would afford adequate tariff protection for all home industries. This policy was based on the idea that the cost of carrying on industrial pursuits in Canada was, for obvious reasons, greater than in many other countries, notably in manufacturing enterprises, the "other countries" being Great Britain and the United States, as being the largest purveyors of manufactures to Canadian wants. The friends of the "national policy" who urged that its distinguishing feature should include tariff protection measured the extent to which it should extend by the difference between economic conditions prevailing in Canada and other countries. Included in these conditions were cheaper labor, cheaper money and cheaper materials abroad, and certain conditions prevailing at home. The difference between these conditions, which so vitally affected the cost of producing goods at home as contrasted with the cost of producing similar goods abroad, was considered the true measure of the

Much information of interest to exporters to the United Kingdom will be found in the recently issued report of the Commissioners of His Majesty's Customs, says the British Trade Journal. It deals with the business of that Department for the year ended March 31, 1906, and shows that although the United Kingdom is generally regarded as a free trade country, it collects more than thirty-five millions sterling annually (about \$175,000,000) by its Customs and excise. During the year referred to duties were collected on chicory, cocoa, coffee, dried fruits, spirits, beer, sugar, tea, tobacco, cigars and cigarettes and wine. There was also an export duty on coal, now abolished, by means of which more than two million pounds sterling (\$10,000,000) were raised, the figures showing a gradual increase since the imposition of the duty in 1901. Chicory produced the insignificant sum of \$48,000, and the revenue derived therefrom has been on the decrease for some years past. The income from cocoa amounted to £273,100, an increase of £14,395 on the previous year. Duties are levied not only on raw cocoa, but also on cocoa husks and shells, on prepared cocoa and chocolate, and on cocoa butter. Coffee produced a net duty of £181,167. The duty on currants produced £111,431. Figs, plums and prunes have also to pay duty if imported dried, while the duty on raisins yielded £248,000. The total dried fruit revenue last year produced £475,000. The duties on foreign spirits are sub-divided into those on brandy, rum, imitation rum,

tariff schedule which would give adequate protection to home industries. The claim of the members of the Manufacturers' Association and of manufacturers generally was that under the aegis of this protection, they were prepared to invest their capital in their respective industries. The quid pro quo that the country was to receive would be enlarged occupation for the people, home markets for home products, a general enlargement of commercial, financial and other important enterprises, and a feeling of freedom as a people from dependence upon other peoples for the necessaries of life.

At that time the question of loyalty to the Mother Country did not enter into the operation of the Canadian tariff. Great Britain was a great nation in all respects. In commerce she was, as she is now, "mistress of the seas," and her manufacturers had nothing to fear from any. Since then some have claimed that Canada was under obligation to Great Britain for the protection of her commerce, and indeed for her very existence, which could only be repaid by contributions in kind—in warships and armies and treasure, over which Canada would have no control when transferred to the Imperial Government. Others argued that the safety of the Crown depended upon Imperial federation to include some sort of tariff arrangement by which Canada's financial affairs should be, to some extent, vested in other than Canadian control. Then Chamberlainism appeared, which, at one time required that Canada should obligate itself to cease its expansion as a manufacturing community, and become a hewer of wood and a drawer of water for British manufacturers, Great Britain to abandon its so-called free trade policy and adopt a tariff policy operative against all foreign nations, but not against any possession under the British flag. Of course that sort of thing will not go with the British people, nor with Canadians for that matter. Another method of paying the indebtedness to Great Britain was through the preferential tariff, which, strangely enough is so strongly advocated by the Canadian Manufacturers' Association, provided, of course, that they may tie a string to it. But the string is not invisible.

As the recent Winnipeg convention of the Association in the retiring address of President Ballantyne, in discussing the attitude of the Association regarding the much-to-be-desired revision of the tariff, and what should be done regarding the British preference, he spoke of the visit of a number of members of the Association to Great Britain last year, upon which occasion the leaders of the party took pains to make the position of the Association known regarding the question of the preferential tariff. "We told the merchants and manufacturers of the United Kingdom," said President Ballantyne, "that it was our ambition to make in Canada everything we could advantageously produce, and that while we did not desire a prohibitive tariff against Great Britain, we would insist upon sufficient protection to at least put Canadian manufacturers on an equivalent footing with those of Great Britain, but that we were anxious to divert into British channels so far as possible, the trade we now do with foreign countries."

The ambition of Mr. Ballantyne, for our manufacturers to produce at home everything that could be produced to advantage is most laudable and proper, and the way to accomplish this is by tariff protection against the similar products of other countries, Great Britain included. What should be the measure of that protection, and what would be the effect upon it by the preferential tariff? Unless the tariff is raised to a height sufficient to afford adequate protection against British competition it is not high enough; but how can Mr. Ballantyne expect that prosperity can attend the operations of those he represented if a large discount from the tariff is allowed to British competitors? The object of any tariff is, primarily, to produce revenue for the government, not to prevent the bringing in of the products of other countries. Incidentally the tariff should be only so high as to afford adequate and proper protection to home industries, or, as Mr. Ballantyne states it, not to be prohibitive against Great Britain or any other country, but to put Canadian manufacturers on an equivalent footing with those of other countries.

Speaking of an equalizing tariff, Mr. Ballantyne, in his address, said: "We are sometimes asked what we mean when we say that Canadian manufacturers do not demand a prohibitive tariff against the United Kingdom, but that we must have at least sufficient protection to put our Canadian manufacturers on an equivalent footing with those of Great Britain." This, of course, is the correct theory and should be adhered to not only regarding Great Britain, but all countries; and it should not be departed from if Canada is indeed a nation and wishes to accord to all other nations the feature of equality and fairness in all matters which they have a right to expect; and any variation from that practice could only be considered as of a discriminatory and hostile character, only to be departed from for good and sufficient cause.

Mr. Ballantyne very accurately gives the height of adequate protection in illustrating as he did in his address. "Perhaps our meaning may be better understood," he said, "when I cite the case of a member of the Association who has large factories both in Montreal and in London, England. The difference in the wages paid in these two cities is remarkable. Figures taken from the pay rolls of the two factories shows that common labor is 82 per cent. higher in Canada than in England; gang leaders, or foremen, 70 per cent. higher; boys, 85 per cent; machinists, 64 per cent; carpenters, 40 per cent.; girls, $33\frac{1}{3}$ to $66\frac{2}{3}$ per cent. higher in Canada than in England. Are not these figures alone sufficient to show the necessity of maintaining an equalizing tariff against British goods?" Mr. Ballantyne is right in assigning this great disparity in cost of wages as a reason for tariff protection, but he might have gone much further and have shown other reasons. How far these reasons should go in fixing the height of the tariff affording adequate protection to Canadian industries is for our legislators to determine.

A matter that Mr. Ballantyne does not seem to have considered in suggesting the height of the tariff as ap-

plied to British imports, while at the same time wishing very much higher duties upon imports from foreign countries, is, how will the consumers of the goods imported view the fact? The consumer will enquire why, if an average duty of say 40 per cent. would give adequate protection to Canadian manufacturers, as against British imports, he should countenance and submit to a duty of say 80 or 100 per cent. on similar imports because they happen to come from another country? If Canada owes anything to Great Britain the debt should be paid honestly and in full. If the indebtedness is of a financial character, and requires the payment of money, let Canada pay the money. If the indebtedness is of a sentimental character, let those who so view it remember that sentiment and business do not usually run in parallel courses. The debt should not be liquidated by preferential tariffs which work injustice either to the manufacturers of Canadian goods, or the Canadian consumers of foreign goods. Let appropriations be made by the government; or if not in that way let the Mother Country remember Paardeburg and the innumerable fields in South Africa upon which so many valiant Canadians sacrificed their lives, and where their bones lie bleaching.

AUSTRALIAN BOUNTIES.

A bill has been introduced in the Australian Parliament which provides for the sum of \$243,325 per annum for a period of ten years from July 1, 1906, to be paid in bounties on the production of certain goods.

These bounties are to be payable on goods of a marketable quality and which have been produced by white labor only, and at the standard rate of wages in the district in which they are produced. The following is the schedule:

Cocoa.—Bounty period, nine years; rate of bounty, 2 cents per pound on dried beans; maximum amount for any one year, \$4,866.50.

Coffee and chicory.—Bounty period, eight years; rate of bounty, 2 cents per pound; maximum amount for any one year, \$12,166.25.

Cotton.—Bounty period, five years; rate of bounty, 10 per cent. on market value; maximum amount for any one year, \$21,899.25.

Fibers (flax, ramie, sisal hemp, hemp, New Zealand flax, pandanus, and such other fibers as are prescribed).—Bounty period, ten years; rate of bounty, 10 per cent. on market value; maximum for any one year, \$29,199.

Fish (canned or tinned).—Bounty period, five years; rate of bounty, 1 cent per pound; maximum for any one year, \$53,531.

Milk (sweetened, condensed).—Bounty period, five years; rate of bounty, ½ cent per pound, maximum for any one year, \$24,332.50.

Milk (powdered).—Bounty period, five years; rate of bounty, 1½ cents per pound; maximum for any one year, \$24,332.50.

Oils (olive, china, linseed, castor, colza, sunflower, essential, cotton-seed, and such other oils as are prescribed).—Bounty period, ten years; rate of bounty, 10 per cent. on market value; maximum for any one year, \$31,632.25.

Rice.—Bounty period, five years; rate of bounty, \$4.86 per ton; maximum in any one year, \$7,299.75.

Miscellaneous (rubber, kapok, and such other goods as are prescribed).—Bounty period, ten years; rate of bounty to be prescribed by regulation; maximum in any one year, \$34,065.50.

ANOTHER GRAFT.

At the monthly meeting of the executive council of the Canadian Manufacturers' Association held in August last a scheme was presented looking to the establishment of an office of the association in London. The details were discussed and approved of, and the matter was referred to the then approaching convention of the association in Winnipeg, where it was again discussed and approved of, and it was decided that the London office should be established. The scheme adopted was as follows:

(1) That an office in Great Britain should be opened as a general office for the work of the Canadian Manufacturers' Association, and not for the particular purpose of securing labor. Such an office would serve the following purposes: (a) To give to the association direct representation in Great Britain; (b) to investigate, answer and index all trades or other inquiries; (c) to take a careful distribution of catalogues and other printed matter; (d) to secure special information for Canadian firms respecting Government contracts; (e) to secure for the members of the association such labor as they require and cannot secure in Canada; (f) to distribute through the press and otherwise important information respecting Canada and her manufactures; (g) to secure information regarding other markets which may be open to Canadian exporters; (h) to secure information for members regarding the sources of supply of raw materials required in their industries, (i) to officially represent "Industrial Canada"; (j) to undertake such other duties as the association may from time to time direct.

(2) That the association should make an annual appropriation of \$2,000 towards the maintenance of such office.

(3) That fees to be decided upon should be charged for help supplied and other services to defray the balance of the cost of the offices.

The committee estimated the annual cost of the office to be \$6,000, to be raised as indicated, viz., annual appropriation by association, \$2,000; income from fees and charges for services, \$4,000.

The establishment of this London office means the annual payment of \$2,000 per year for rent, lighting, fuel, attendance, etc., a very moderate expense for the maintenance in that expensive city, particularly if furniture, stationery, postage and other incidentals are included. In addition to this fixed charge upon the association will be an obligation to pay for such expert service of attendants, which, if not met by anticipated fees, etc., must be made good by the association. It is estimated that \$4,000 will be realized from these fees, and upon the number of members of the association who may require the services of the office, and the nature of their requirements will depend the realization of the \$4,000.

Although the general fund of the association will surely be taxed for this \$2,000, any services which the London office may obtain will not be for the general benefit of the members but only for those who may require them. The expert staff to be employed in the office will have to be paid by the association, and the association will have to meet all proper charges for salaries, etc., and collect charges for services from those who request them. There may be a few members who might possibly be

benefitted by the establishment of the London office, but there are a large majority of them who would take no interest in the graft although they would have to support it.

AUSTRALIAN DUTIES.

The new customs duties upon agricultural machinery and implements imported into Australia, in comparison with the rates hitherto ruling, are as follows:

	Old rates. Per cent.	New rates. Per cent.
Stripper harvesters, stump jump ploughs, strippers, disc cultivators, winnowers, horse and other power. . .	12½	25
Ploughs, other, plough shares, harrows, chaff cutters and horse gear, cultivators, other than disc, scarifiers, malleable and other castings for agricultural implements.	12½	20
Combined corn sheller, husker and bagger and combined corn sheller and husker.	Various	25
Plough mould boards.	Free	25
Corn shellers and corn huskers.	Free	20
Handworked rakes and ploughs, combined hay tedders, maize harvesters, maize binders, maize planters, mould board plates in the rough and not cut into shape, potato sorters, potato raisers or diggers.	Free	Free

The net amount of the duty payable is more than is superficially expressed, for the reason that 10 per cent. is added to the invoice value of the goods before the duty is computed thereon. Thus a duty of 20 per cent. works out at 22 per cent. net and a duty of 25 per cent. actually means 27½ per cent. net.

EDITORIAL NOTES.

The Manchester, England, Guardian, thinks that it can see through the hole in a grindstone. Commenting on the convention of the Canadian Manufacturers' Association at Winnipeg, says they wish two things, substantial preference for the mother country and a minimum tariff which shall afford them adequate protection against the same mother country. "We have," it says, "no desire to question the benevolent feelings of the Canadian manufacturers towards us. We have no doubt their two aims are in their eyes as transparently honest as they are transparently simple. Still we cannot help feeling somewhat aggrieved at the Canadian manufacturers. It is flattering to us to assume that none of us can see through the gap between these two rungs of the fiscal ladder."

The Buffalo, N.Y., Express sizes things up in this way:

The Canadian Manufacturers' Association has completed its session in Winnipeg, and is now on a return trip from the Pacific Coast. Beyond passing a number of resolutions in the direction of advocating a higher customs tariff, the annual meeting was devoid of any particular interest. One of the resolutions was to the effect that the newspaper which is the mouthpiece of the association, should not accept any British advertisements. A few months ago the members of the associa-

tion were telling Englishmen in their own homes that the policy of the Canadian and British manufacturers was to work together in opposition to the foreigner. The truth is that the Canadian manufacturer is as much opposed to competition from Britain as from the United States. On their journey to and from the Pacific Coast the members of the association have been delivering addresses couched in the most patriotic and eulogistic terms of the resources of the various parts of the Dominion, and picturing in lurid colors the future that is in store for the country if the policy they advocate is adopted by the government. But the case the manufacturers are endeavoring to make out is not the only one which the tariff commissioners have now before them. The existence of outsiders and the consumers must be taken into consideration.

The Canadian Manufacturers' Association at their Winnipeg meeting decided to exclude from the advertising pages of their official organ, "Industrial Canada," all advertisements of British manufacturers and British wholesalers. "Pleasant tidings for the Imperial Federationist!" remarks "Bystander," in the Weekly Sun.—The Globe.

The United States Department of Agriculture is developing a new industry in the production of alcohol from corncobs, which, the Department says, promises to be of much commercial value. Investigations are being made and have proved that the large quantities of corncobs which every year go to waste can be made to produce alcohol in sufficient quantities to justify the erection of a distilling plant in connection with a corn cannery. So far the department has succeeded by simple methods of fermentation in getting a yield of 11 gallons of alcohol from a ton of green cobs, and, by similar methods, in getting 6 gallons of alcohol from a ton of green cornstalks. A department official says that these tests show that there are 240 pounds of fermentable substance in a ton of green field cornstalks, which will yield about half of their weight in absolute alcohol. In round numbers, a ton of stalks will produce 100 pounds of alcohol or 200 pounds of proof spirits. As a gallon of alcohol weighs nearly 7 pounds, there should be 15 gallons of alcohol in a ton of stalks. The addition of the corn on the cob adds further to the possibilities of alcohol obtainable from a ton of cobs, and will have its influence in bringing the quantity to a greater figure.

United States Consul-General Anderson, of Rio de Janeiro, reports a movement among Brazilians to effect a treaty of reciprocity with Great Britain by which, for benefits conferred upon Canada by Brazil in the matter of articles imported from Canada, concessions to Brazil, particularly to its sugar planters, shall be made by the Dominion. He writes:

"The indications are that sugar interests here will force the government to take up the proposal to effect a reciprocity arrangement with Canada whereby Brazilian sugars will be admitted into the Dominion free of duty or at least at greatly reduced rates in return for tariff concessions by Brazil on Canadian products. The necessity of securing wider markets for their products is

appealing to Brazilian sugar men strongly, as it appears that the markets of the United States are being effectively closed against them. In the proposed reciprocity arrangement it is expected that Canada could secure concessions on its flour and codfish. Present Brazilian duties are so high, however, that unless the concessions are very material they would not be enough to enable the Canadians to move their goods in any considerable volume. On the other hand, the arrangement would be advantageous to the Brazilian interests. A decade or so ago Brazilian sugars went to Halifax and Montreal in considerable quantities and are said to have been popular with refiners. The existence of reciprocal treaties with West Indian provinces, however, has led Canada to draw most of its sugar supply in recent years from that source. Brazilian sugar men believe that there would be a big future for their product if given proper assistance in this and some other lines."

After fighting for six years in an effort to prove their right to boycott the open shop firm of J. E. Patterson & Co., of Wilkes-Barre, Pa., John J. Casey, Peter Koser and Daniel A. Post, officers of the Building Trades Council of that city have paid into court \$841.55, costs and fines, for contempt of court. They were convicted of violating an injunction restraining them from boycotting the firm. The progress of this case has been watched with keen interest both by the advocates of the open shop and the labor unions. The defendants were supported by their national organization, which provided funds for the fight and for the fines and costs.

The fact that the British Government has sent a special commissioner to Canada to undertake this task is an indication that the Britisher is awakening to the importance of the Canadian market. Whatever else he may discover, it is certain he will ascertain that the Canadian has an inherent disposition to buy from sources within the empire when trade conditions are equal.—Ottawa Free Press.

What has become of the special commissioner to Canada sent here by the British Government? He seems to have lost himself somewhere. No one has heard of him since his advent.

The Manufacturers' List Co., Toronto, have sent us the prospectus for the 1907 edition of their Manufacturers' List, Buyers' Guid of Canada. It will be a larger and more comprehensive book than any of its predecessors, and we are informed that it may be looked for as a Christmas offering. A most important feature of the book will be a section in which figures are given showing the approximate amount of capital employed in connection with the value of the plants and real estate appurtenant thereto of about 10,000 important manufacturing concerns in Canada, which will show to what extent the manufacturing interests of Canada really are. The publishers assure us that at least 75 per cent. of the manufacturers canvassed have given the information desired. The book will give the names, address and specialties of some 10,000 Canadian manufacturers—1st. Under the

article manufactured; 2nd. Under the location of business; 3rd. Under a general list heading alphabetically arranged. The book, no doubt, will contain exhaustive authentic information to be obtained in no other way.

The 1906 edition of the Canadian Trade Index has just been issued, the last preceding Index having been published in 1903. It tells us that it is published to provide home and foreign buyers with an accurate list of the members of the Canadian Manufacturers' Association and of the goods manufactured by them. It is for free distribution. Although we are told that the Association is an organization of over two thousand manufacturers, the Index contains an alphabetical list of only 1,808 concerns in which the lines of most of the articles they produce are mentioned, but upon examination it will be found that only a little more than 1,600 are bona fide manufacturers, the balance finding their occupations in other directions. A buyer and seller of codfish and potatoes could not really be considered a manufacturer of such articles. There are more than 10,000 concerns engaged in manufacturing industries in Canada.

A definite attempt is being made by Canadian millers to systematically introduce Canadian flour to Oriental consumers. A shipment of 11,000 sacks has already gone forward to Hong Kong and Japanese centres and for some time every trans-Pacific steamer will carry a large consignment. These shipments are not entirely meant for consumption. A large part of the flour will be shown at numerous exhibitions in the two countries in an endeavor to open up trade there. Grains and meals will also be shown and it is hoped Canada will secure a large part of the trade that all countries are trying to work up with the rapidly expanding markets of the Orient.

The effect of the omission of Canada from the preferential tariff concessions to Great Britain and New Zealand by Australia are set forth in a report received by the Trade and Commerce Department from Mr. J. S. Larke, Canadian commercial agent at Sydney, N.S.W. Butter and cheese from Canada are increased in duty from six cents to eight cents per pound; oats, barley, beans, peas, and wheat, from 36 cents to 48 cents per 100 pounds; hops will pay 24 cents, instead of 12 cents; onions and potatoes are increased from 24 cents to 36 cents. Another feature of the preference which affects Canada is that which increases the duty on certain articles, except such as are imported from Great Britain in British ships. By this enactment Canadian ammunition now free, would pay 10 per cent.; woodenware is advanced from 20 to 30 per cent., bicycles from 20 to 30 per cent., boots and shoes from 30 to 40 per cent., furniture from 20 to 30 per cent., gas and oil engines from 12½ to 22 per cent., paper bags from \$1.20 to \$1.44 per hundred-weight, pickles and sauces from 12 to 15 cents per dozen.

CAPTAINS OF INDUSTRY.

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

The Montreal Smelting & Refining Co., Montreal, who are building an extensive customs smelter at Trout Lake near North Bay, Ont., for treatment of Cobalt ores, have closed a contract with the Jenckes Machine Co., Toronto, for the complete steam plant which will be required. This will consist of four 150 h.p. high pressure tubular boilers, two 250 h.p. heavy duty Corliss engines with feed water heater and boiler feed pump. The boilers are being built at the St. Catharines works of the Jenckes Co., and the balance at Sherbrooke, Que.

A four story building will be erected in connection with the Belmont Home, Toronto, at a cost of about \$45,000.

An addition will be erected to the hospital Owen Sound, Ont., at a cost of about \$30,000.

The ratepayers of Hamilton, Ont., will vote on a by-law to raise \$100,000 for the fire department.

Messrs. W. J. Pulling & Co., Windsor, Ont., have been awarded the contract to supply all the lumber needed in the construction of the tunnel under the Detroit River.

The corporation of Port Arthur, Ont., have placed contracts for an important extension to the municipal hydro-electric plant. The water wheel portion of the equipment will consist of a pair of 30 inch special Crocker turbines arranged in horizontal steel case, discharging centrally, and developing 1,300 h.p. at 450 r.p.m. under 85 feet working head, the runners being of bronze. For government there will be a type "C" Woodward water wheel governor. The contract for the turbines was placed with the Jenckes Machine Co., Toronto, which company also built the two turbine plants already embraced in the Port Arthur municipal plant. The turbine unit will be direct connected to an Allis-Chalmers-Bullock generator.

H. C. Tugwell & Co., Toronto, have been incorporated with a capital of \$60,000, to manufacture photographers' supplies, etc. The provisional directors include H. C. Tugwell, A. S. Bee and W. A. Buchanan, Toronto.

The Welland Electrical Co., Welland, Ont., have been incorporated with a capital of \$175,000, to manufacture electricity, for light, heat and power purposes. The provisional directors include W. E. Phin, M. McAuliff and W. M. German, Welland, Ont.

The Western Shoe Co., Berlin, Ont., have been incorporated with a capital of \$40,000, to manufacture boots, shoes, etc. The provisional directors include J. Killer, A. R. Lang, Berlin, Ont., and F. Killer, Toronto.

The Sunbeam Specialty Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture wood, cloth, paper, glass, etc. The provisional directors include J. R. Meredith, M. C. Cameron and R. S. Waldie, Toronto.

The Ottawa Vinegar Works, Toronto, have been incorporated with a capital of \$40,000, to manufacture vinegar, etc. The provisional directors include W. M. Wallace, P. C. Price and H. W. A. Foster, Toronto.

The International Cobalt & Silver Mining Co., Sault Ste. Marie, Ont., have been incorporated with a capital of \$500,000, to carry on a mining, milling, and reduction business. The provisional directors include G. Kemf, D. H. Jacobi and C. Frank, Sault Ste. Marie, Mich.

The Pittsburg Coal Co., Port Arthur, Ont., have been incorporated with a capital of \$100,000, to manufacture coal, wood, lumber, etc., and to construct warehouses, docks, elevators, etc. The provisional directors include J. S. Lovell, R. Gowans and W. F. Ralph, Toronto.

The Morang Educational Co., Toronto, have been incorporated with a capital of \$200,000, to carry on a printing and engraving business. The provincial directors include F. Aylesworth, H. L. Hoyles and W. Gilchrist, Toronto.

The Coates Mfg. Co. of Canada, Toronto, have been incorporated with a capital of \$1,000,000, to manufacture goods, wares, merchandise, etc. The provisional directors include S. G. Crowell, W. Gow, and W. Bain, Toronto.

The Canada Steam Pump & Machine Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture pumps, machinery, engines, tools, cranes, etc. The provisional directors include A. H. Eby, T. A. Bard and J. Bard, Toronto.

Lehigh Portland Cement Co., Thurlow, Ont., have been incorporated with a capital of \$1,000,000, to manufacture cement, lime, stone, etc. The provisional directors include H. C. Trexler, E. M. Young, Allentown, Pa., and A. W. Thorn, Buffalo, N.Y.

Chas. C. Cummings, Limited, Toronto, have been incorporated with a capital of \$40,000, to manufacture boots, shoes, rubbers, blacking, varnish, etc. The provisional directors include C. C. Cummings, J. Keeman and A. E. Knox, Toronto.

The Canadian Gas Power & Launches, Limited, Toronto, have been incorporated with a capital of \$500,000, to manufacture gas, oil, engines, launches, threshing machines, tools, etc. The provisional directors include J. Laishley, S. F. McKinnon and R. Hunter, Toronto.

Messrs. Munro & Donald, Toronto, have been incorporated with a capital of \$40,000, to manufacture garments, wearing apparel, etc. The provisional directors include J. H. Young, W. W. Law and W. J. Jones, Toronto.

The Detroit & Algoma Silver Mining Co., Windsor, Ont., have been incorporated with a capital of \$100,000, to carry on a mining, milling and reduction business. The provisional directors include A. W. Wright, Detroit, Mich.; M. Cowan and J. W. Adams, Windsor, Ont.

The Ideal Concrete Machinery Co., London, Ont., have been incorporated with a capital of \$75,000, to manufacture concrete machinery, etc. The provisional directors include F. A. Borst, South Bend, Ind., and

J. M. McEvoy and F. M. Leach, London, Ont.

The Ideal Cylinder Snow Plow Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture snow plows, etc. The provisional directors include E. D. Weber, A. H. Hough, Warton, Ont., and M. M. Heiles, Atwood, Ont.

The Temiskaming Hemitite Iron Co., Toronto, have been incorporated with a capital of \$42,000, to carry on a mining, milling and reduction business. The provisional directors include C. G. Knott, G. H. Smith and O. M. Hodson, Toronto.

The Kindel Bed Co., Toronto, have been incorporated with a capital of \$15,000, to manufacture beds, bedding, etc. The provisional directors include J. W. Abbott, Toronto; J. C. Kindel and R. Coopersmith, New York City.

The Methodist Book Room, Toronto, will erect a six-story addition to their factory at a cost of about \$30,000.

The Toronto-Niagara Power Co., Toronto, will erect shops and a transforming station on Dufferin St.

The ratepayers of Parry Sound, Ont., voted favorably on a by-law to raise \$10,000 for waterworks extension.

The Canadian Iron & Foundry Co., Fort William, Ont., will erect a large foundry.

The Smith's Falls Malleable Castings Co., Smith's Falls, Ont., will erect an addition to their plant there.

The Canadian Pacific Railway Co. will construct a line from Proten Station, Ont., to Southampton, Ont.

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

The Salvation Army, Sturgeon Falls, Ont., will erect a barracks there.

R. F. Shaw, Waterloo, Ont., invites tenders up to October 31 for the construction of an Academy building there.

Chairman of Toronto Board of Control, Toronto, invites tenders up to November 6 for Lansdowne Ave. subway superstructure.

The Argonaut Rowing Club, Toronto, will erect a new club-house on Centre Island.

The council, Chesley, Ont., will grant a loan of \$15,000 to the Chesley Bedstead Co.

Public Works Department, Ottawa, invites tenders up to October 27 for completion of the wharf at Seven Islands, Que.

The premises of the Ontario Grape Growers' & Wine Mfg. Co., St. Catharines, Ont., were destroyed by fire recently. Loss about \$150,000.

The Hamilton Terminal Co., Hamilton, Ont., will erect an electric station there.

The Empire Salt Co., Sarnia, Ont., will erect a new salt mill there.

Messrs. Clark & Clark, Toronto, will erect a new tannery at a cost of about \$75,000.

The Samuel Trees Co., Toronto, will erect a four-story warehouse on Wellington St., at a cost of about \$6,000.

The postoffice, Hamilton, Ont., will be improved.

The ratepayers of Sudbury, Ont., have petitioned the government for a new post-office building.

A new horticultural building will be erected at the Toronto Exhibition Grounds to cost about \$70,000.

The Foster Pottery Co., Hamilton, Ont. have recently ordered an automatic feed pump and receiver, from the Smart-Turner Machine Co., Limited, of the same place.

The Ontario Wind Engine & Pump Co., Toronto, are about to ship to Cairo, Egypt, two 16-foot airmotor outfits complete with irrigation pumps. This order follows a large one shipped a few weeks ago. It is interesting to note that Canadians are pushing their wares even to the land of the Pharaoh. This company are also making a good exhibit in New Zealand, which will still tend to spread the virtue of Canadian goods. This company also received lately an order for a 40-foot "Halladay" windmill (largest size made in wooden wheels) for shipment to Chili, South America, via England.

The Smart-Turner Machine Co., Hamilton, Ont., are supplying one of their automatic feed pumps and receivers, to the McMaster University, Toronto.

Symmes & Co., Niagara Falls, Ont., were awarded the natural gas franchise for Chatham, Ont., for which there has been considerable competition among local and outside firms. The gas will be brought from the Tilbury fields and the Halliday well, flowing 250,000 feet a day, which is the property of the company awarded the contract.

The Galt Lime Co., Galt, Ont., have placed an order for a side suction centrifugal pump, with the Smart-Turner Machine Co., Hamilton, Ont.

The ratepayers of Welland, Ont., voted favorably on a by-law to raise \$5,300 for the Lufreme Heating Co., and the Canada Forge Co.

The Smart-Turner Machine Co., Hamilton, Ont., have received an order from Messrs. D. Morton & Sons, that place, for a duplex boiler feed pump.

H. M. Douglas, Port Stanley, Ont., will erect a three story addition 120x30 feet to the Fraser House there.

The J. B. Armstrong Mfg. Co., Guelph, Ont., have placed an order for a single vacuum pump, with the Smart-Turner Machine Co., Hamilton, Ont.

The moulding shop of I. E. Shantz & Co., Berlin, Ont., was destroyed by fire a few days ago.

The Southampton Furniture Co. have taken over the S. N. Knechtel Chair Co., and the L. Knechtel Woodturning & Furniture Co., Southampton, Ont.

The Smart-Turner Machine Co., Hamilton, Ont., are supplying the D. F. Jones Mfg. Co., Gananoque, Ont., with one of their standard duplex pumps.

The Canadian Westinghouse Co., Hamilton, Ont., have placed an order for three jib cranes, with the Smart-Turner Machine Co., of that place.

The Toronto Office Fixture Co., Toronto, have been taken over by the Waterloo Office Fixture Co., Waterloo, Ont.

The assets including machinery and plant of the Standard Bolt & Screw Co., Toronto, are advertised for sale by auction on October 24.

The Smart-Turner Machine Co., Hamilton, Ont., have received an order from Messrs. Bennett & Wright, Toronto, for an automatic feed pump and receiver.

A waterworks system may be installed at Ridgeway, Ont., at a cost of about \$35,000.

The round house of the Grand Trunk Railway Co., Petrolia, Ont., was destroyed by fire October 10.

The Planters' Cigar Co., Peterborough, Ont., have been organized, M. E. Friedman, New York City, being one of the directors. The company have leased the opera house, and will make extensive improvements to it, also erecting an addition.

Among the firms who have given orders for Chapman bearings during the last two weeks are A. B. Whittall & Co., Montreal, for their factory; J. Vilas, for new planing mill at Cowansville, Que.; Madison Williams, for new factory at Lindsay; Penberthy Injector Co., for plant at Windsor; Berlin Button Co., for works at Berlin.

The Ostler File Co., Hamilton, are now located in new premises, a short distance from the Grand Trunk station.

The Smart-Turner Machine Co., Hamilton, Ont., have received an order for a standard duplex pump, from the Indestructible Brick Co., Toronto.

The new premises of M. Beatty & Son, Welland, Ont., are well under way, most of the structural work on the buildings being completed. When finished this plant will be one of the most up-to-date in Canada.

The London Machine Tool Co., Hamilton, Ont., are opening a sales office in the new Traders Bank building, Toronto. Mr. Uhler, who has been special sales representative for this company for some time, will make this office his headquarters. The company have the sales agency for several good lines other than those made by them.

The Smart-Turner Machine Co., Hamilton, Ont., are installing one of their automatic feed pumps and receivers, in the new factory of John Bertram & Sons, Dundas, Ont.

The London Street Railway Co. have been ordered by the Ontario Railway and Municipal Board to repair one of their bridges and have decided to ask an expert to report on the condition of the company's track and equipment.

The Chapman Double Ball Bearing Co., Toronto, have secured the contract for equipping the plant of the American Tobacco Co., Montreal, with Chapman bearings.

The Smart-Turner Machine Co., Hamilton, Ont., are building an automatic feed pump and receiver for the Eagle Spinning Co.

The Robertson Machinery Co., Welland, Ont., who bought out Robertson Bros., Welland, Ont., about a year ago, have in that time found such a demand for their hoisting engines and conveying machinery that they have been compelled to increase their staff from three to 30 hands. They have also taxed the capacity of their plant until it is now necessary to extend. Next year they intend building new premises, including two buildings, one 150x60 feet and the other 150x40 feet, comprising machine shop, blacksmith shop, foundry and ware-

house. Alexander Robertson is president and Chas. H. Hanson, secretary of the company.

The premises of the Brantford Starch Works, Brantford, Ont., were destroyed by fire October 12. Loss about \$40,000.

An addition will be erected to the Dominion House of Commons, Ottawa.

An addition will be erected to the Supreme Court Library, Ottawa.

Ten thousand feet of cement sidewalk will be constructed at Cobourg, Ont.

The Carson Glove Mfg. Co., San Francisco, Cal., will establish a branch in Lindsay, Ont., if the citizens ratify an agreement made by the Council and Board of Trade.

The Barnard-Argue-Roth-Stearns Oil & Gas Co., Chatham, Ont., have been incorporated with a capital of \$400,000, to manufacture petroleum, gas, etc., and to carry on a mining, milling, and reduction business. The provisional directors include F. B. Barnard, H. H. Argue, P. W. Roth and J. W. Stearns, Buffalo, N.Y.

At a meeting of the Hydro-Electric Power Commission, held in Toronto a few days ago, applications for power aggregating 68,100 h.p. were approved. The municipalities requesting power were: Toronto, London, St. Thomas, Berlin, Galt, Woodstock, Guelph, Waterloo, Preston, Stratford, St. Mary's, Paris, Hespeler, Brantford, Orangeville, Brampton, Lucan, Parkhill, Leamington, Cottam, Richmond Hill, Belleville, Brockville, Ottawa.

Construction for the Canadian Iron & Foundry Co.'s new works at Fort William, Ont., has been started. By next June the company expect to be employing over 200 men in the manufacture of railway car wheels and castings and cast iron water and gas pipes. An up-to-date machine shop is also included in the plans, and this, besides being for general requirements, will also go in largely for marine engine purposes. For its purposes the foundry will be unequalled on the continent of America.

The Ontario Iron & Steel Co. have the construction of their works at Welland, Ont., well under way. When completed this firm will have two buildings, a rolling mill 300x67 feet, and an open hearth building 180x80 feet. The plant will have a capacity of 75 tons, its product being steel billets and merchant bars. Robt. Porter, formerly with the National Tube Co., Wheeling, W.Va., has the construction work in hand and will be works manager after the plant is in operation. W. H. Near, of the Page-Hersey Co., Guelph, who is president of the company, intends opening an office in the new Traders Bank Building, Toronto.

Fire did \$2,000 damage to the works of the Garlock Packing Co., Hamilton, Ont., on the 9th inst.

W. T. Bradshaw and D. K. Ridout have purchased the controlling interest in John Kay Son & Co., the big retail house and office furnishing concern, Toronto. Mr. Bradshaw will be president and managing director.

The Progress Cobalt Silver Mining Co., Cobalt, Ont., have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business. The provisional directors include M. Koch, H. Wener and H. Cohen, Montreal.

The Barron Brick Co., Toronto, have been incorporated with a capital of \$60,000, to manufacture brick, tile, etc. The provisional directors include W. W. Vickers, R. Lawyer and A. Ritchie, Toronto.

The Ottawa Cobalt & Silver Mining Co., Ottawa, have been incorporated with a capital of \$250,000, to carry on a mining, milling and reduction business. The provisional directors include R. Gorman, S. Fee and F. W. Bindon, Ottawa.

The York Pulp & Paper Co., Toronto, have been incorporated with a capital of \$200,000, to manufacture paper, pulp, etc. The provisional directors include E. M. Dumas, J. W. Coe and H. E. Pearce, Toronto.

Canadian Minerals, Limited, Toronto, have been incorporated with a capital of \$100,000, to carry on a mining, milling and reduction business. The provisional directors include W. B. Bentley, A. R. Campbell and N. K. Wilson, Toronto.

The Gordon Benson Cobalt Mining Co., Sarnia, Ont., have been incorporated with a capital of \$300,000, to carry on a mining, milling and reduction business. The provisional directors include W. Springer, C. A. Bailey and A. E. Stevenson, Port Huron, Mich.

The Nancy Helen Mines, Cobalt, Ont., have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business. The provisional directors include J. F. Black, Sudbury, Ont.; W. H. Hearst and J. McKay, Sault Ste. Marie, Ont.

The Dr. Norvall Medical Co., Peterborough, Ont., have been incorporated with a capital of \$10,000, to manufacture drugs, medicines, etc. The provisional directors include J. Lynch, A. Elliott and G. N. Gordon, Peterborough, Ont.

The Standard Gas Holder & Boiler Construction Co., Belleville, Ont., have been incorporated with a capital of \$40,000, to manufacture gas holders, boilers, steel tanks, etc. The provisional directors include L. N. Marsh, W. H. Henthorn and J. A. Marsh, Belleville, Ont.

The Modern Bedstead Co., Cornwall, Ont., have been incorporated with a capital of \$150,000, to manufacture bedsteads, springs, etc. The provisional directors include R. W. Pitts, P. E. Campbell, Cornwall, Ont.; and C. H. Fletcher, Sherbrooke, Que.

The Canadian Electrical & Motor Co., Toronto, have been incorporated with a capital of \$550,000, to manufacture electric machinery, etc. The provisional directors include R. H. Nichols, W. Vandusen and W. A. Johnson, Toronto.

The Scott Machine Co., London, Ont., have been incorporated with a capital of \$40,000, to manufacture machinery, tools, boilers, engines, automobiles, etc. The provisional directors include W. H. Braddon, G. E. Scott and W. C. Scott, London, Ont.

The Komnick System Sandstone Brick Machinery Co., Toronto, have been incorporated with a capital of \$100,000, to manufacture brick, brick-making machinery, etc. The provisional directors include R. F. Kellock, Perth, Ont.; C. T. G. Croft and G. W. Townsend, Toronto.

The Reliance Moulding Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture mouldings, picture frames,

furniture, glass, etc. The provisional directors include F. R. Phillips, Kingston, Ont.; G. P. Challenger and D. Macdonald, Toronto.

It is stated that work on the Huron-Erie Canal will be commenced shortly. The canal will be forty-two miles long and will cost about \$60,000,000.

A separate school will be erected on Hamburg Ave., Toronto, at a cost of about \$11,000.

An addition will be erected to the North Ward School, Peterborough, Ont., at a cost of about \$20,000.

The Sisters of St. Joseph, Toronto, will erect a large addition to St. Michael's Hospital.

A. Bell, Rockwood, Ont., is erecting a planing mill in connection with his sawmill there.

J. J. Cox, London, Ont., will extend the Dominion Hotel there.

The ratepayers of Thorold, Ont., will vote on a by-law to raise \$80,000 for a waterworks system.

The town of Fort Francis, Ont., is installing a waterworks and sewerage system.

The assets of the Imperial Foundry Co., Ottawa, were offered for sale on October 16.

M. J. Hogan, Montreal, has been awarded the contract for the 2,000 foot extension to the breakwater, Port Arthur, Ont., which will cost about \$375,000.

J. McLaughlin, Owen Sound, Ont., biscuit manufacturer, will erect a large warehouse at Fort William, Ont.

The Dunlop Rubber Tire Co., Toronto, will erect an addition to their factory at a cost of about \$18,500.

The Southern Hotel, Peterborough, Ont., will be enlarged and improved.

A new system of street lighting will be installed at Peterborough, Ont., at a cost of about \$50,000.

The Reverend Sisters of the Holy Family are making extensive alterations to their convent at Sherbrooke, Que., and installing a new heating system throughout. Two tubular boilers, one of 80 h.p. and the other of 40 h.p. capacity will be installed. Both are being built by the Jenckes Machine Co., Sherbrooke, Que.

Wm. Bentham, Montreal, will erect an apartment house at a cost of about \$100,000.

A high school will be erected in connection with the Laval University, Montreal.

Owing to scarcity of water at certain seasons of the year interfering with operations the Edson Fitch Co., Etchemin Bridge, Que., a branch of the Diamond Match Co., are installing an auxiliary steam plant, for which the order was recently placed with the Jenckes Machine Co., Sherbrooke, Que. It will consist of two 100 h.p. high pressure tubular boilers for Dutch oven setting, one 50 h.p. engine, 200 h.p. feed water heater, and 6x4x6 boiler feed pump.

To provide for expanding business, H. Lemay & Frere, lumber manufacturers of St. Camille, Que., have been obliged to put in a new and larger steam power plant. The Jenckes Machine Co., Sherbrooke, Que., have the order, which covers an 80 h.p. tubular boiler with a 70 h.p. sawmill engine.

The E. Leclerc Co., Montreal, have been

incorporated with a capital of \$20,000, to manufacture wood, stone, marble, etc. The charter members include E. Leclere, G. Polequin and E. Chicoine, Montreal.

L. Martineau & Co., Montreal, have been incorporated with a capital of \$100,000, to manufacture confectionery, jams, liquors, etc. The charter members include L. Martineau, J. A. Richard and H. Martineau, Montreal.

The Bell Asbestos Mines, Thetford Mines, Que., and the Asbestos Mining & Mfg. Co., Chrysotile, Que., have recently increased their hoisting plants, the former by the addition of three and the latter by the addition of two 9x12 special cableway hoisting engines, as built by the Jenckes Machine Co., Sherbrooke, Que.

The Retail Merchants Pub. Co. of Canada, Montreal, have been incorporated with a capital of \$15,000, to carry on a printing and publishing business. The charter members include E. M. Trowen, Toronto; J. A. Beaudry and G. Tetran, Montreal.

The Grand Trunk Railway Co. have placed an order with the Locomotive & Machine Co., Montreal, for 55 new Richmond compound consolidated engines.

The Montreal Steel Co., Montreal, will erect a large plant 400x300 feet, for the manufacture of manganese castings.

The Montreal Rolling Mills, Montreal, will erect a large nut and bolt factory, also a new forging mill.

F. M. Pope, Bury, Que., who operates a sawmill, almost the entire product of which consists of shims for the Canadian Pacific Railway Co., is replacing his steam plant by one of larger size. The new power plant will embrace an 80 h.p. tubular boiler for Dutch oven setting and a 75 h.p. sawmill engine, both of which were built by the Jenckes Machine Co., Sherbrooke, Que.

The congregation of the First Baptist Church, Montreal, will erect a new edifice at a cost of about \$60,000.

The Peck Rolling Mills Co., Montreal, will erect a large group of mills on the bank of the Lachine Canal for the manufacture of nails.

To consume the refuse from their extensive mills Messrs. Williamson & Crombie, Kingsbury, Que., will put up a burner. This will be 18 feet diameter by 60 feet high with semi-circular wire cloth bonnet, and the steel shell will be erected complete by the Jenckes Machine Co., Sherbrooke, Que., which firm will also furnish all the cast iron fixtures required.

The butter and cheese factory of J. A. Lapierre, Bromptonville, Que., was destroyed by fire October 4. Loss about \$5,000.

The Smart-Turner Machine Co., Hamilton, Ont., have received an order from the Locomotive & Machine Co., Montreal, for a power driven vacuum pump.

The Dominion Textile Co., Montmorency Falls, Que., will double the capacity of their plant there.

It is stated that the Morgan cement works, Montreal, have been purchased by a syndicate of New York and Montreal capitalists, who are forming a very strong combine for the manufacture of cement both in the United States and Canada. This syndicate will include some of the most prominent

capitalists in both countries, among others W. R. Warren of the Warren-Burnham Co., New York. It is proposed to immediately erect a plant in Montreal, which will have an initial yearly capacity of 600,000 barrels. The plans, however, call for laying out a plant which will have an annual capacity of 1,200,000 barrels, and which will be completed next spring.

The Canadian White Co., Montreal, have placed an order with the Smart-Turner Machine Co., Hamilton, Ont., for one of their electrically driven centrifugal pumps.

Wm. Strachan, president of the Wm. Strachan Co., manufacturers of soaps and oils, Montreal, is dead.

Mr. Wayland Williams, Montreal, who for the last two years has represented the Campbell Gas Engine Co., has now taken hold of the gas engine department of Messrs. W. H. Laurie & Co., Board of Trade Building, Montreal, the Canadian agents for the well known Crossley gas engines, suction gas producers and the Loomis-Pettibone producers.

The Saguenay Construction Co., Montreal, have been incorporated with a capital of \$20,000, to carry on a building and constructing business. The charter members include G. A. Smithers, A. A. Wilson and C. Archer, Montreal.

The Canadian Primelectro Co., Montreal, have been incorporated with a capital of \$1,000,000, to manufacture electric machinery generators, motors, automobiles, etc. The charter members include W. Robertson, B. L. Nowell, Montreal, and G. G. Roe, Ottawa.

The Mexican Production & Development Co., Montreal, have been incorporated with a capital of \$100,000, to manufacture wares, merchandise, etc. The charter members include A. T. Lawrence, D. Smith and W. Wetzel, Montreal.

The Rigaud Milling Co., Rigaud, Que., have been incorporated with a capital of \$150,000, to construct mills, elevators, factories, warehouses, etc. The charter members include A. L. Macdonald, Rigaud, Que.; H. A. A. Brault and T. Mongenais, Montreal.

The school building, St. Charles, Que., was destroyed by fire recently. It will be rebuilt.

The Silsby Lumber Co., West Burke, Vt., are putting up a large sawmill on their extensive limits recently acquired near St. George de Beauce, Que. The steam plant, consisting of a 350 h.p. duplex sawmill engine, three 125 h.p. high pressure tubular boilers for Dutch oven setting, 400 h.p. feed water heater and 7½x5½x10 Duplex boiler feed pump, is being furnished complete by the Jenckes Machine Co., the boilers being built at their St. Catharines, Ont., works, and the balance of the plant at Sherbrooke, Que.

The Maritime Railway & Power Co., Chignecto, N.B., are erecting a new power house there.

The Public Works Department are considering the construction of a bridge across the Magaguadavic River, near St. George, N.B.

The main building of the Dorchester Stone & Brick Works, Beaumont, N.B., was destroyed by fire recently. Loss about \$1,000.

A waterworks system will be installed at Dalhousie, N.B., at a cost of about \$37,500.

The Sutherland Rifle Sight Co., Westville, N.S., will erect a factory at a cost of \$20,000.

The Intercolonial Railway Co. will erect a new station at Sydney Mines, N.S.

The Maritime Coal & Power Co., Amherst, N.S., will erect a transferring station there.

The electric light station, court house, jail and about 50 other buildings, Summerside, P.E.I., were destroyed by fire October 10. Loss about \$200,000.

The Fire, Water and Light Committee, Winnipeg, Man., are asking for 7,500 feet of 3½ inch cotton rubber lined hose for the fire alarm system.

Additions will be erected and alterations made to the Land Titles office building, Portage la Prairie, Man.

The Council, Brandon, Man., are considering the erection of a new city hall to cost \$75,000.

Greenlay & Cole have succeeded Greenlay & Leckie, machinists, Carberry, Man.

The Smart-Turner Machine Co., Hamilton, Ont., are building a compound duplex pumping engine, for the town of Carberry, Man.

The Provincial Contracting Co., Winnipeg, Man., have been incorporated with a capital of \$150,000, to manufacture timber, lumber, etc., and to construct warehouses, depots, factories, etc. The provisional directors include J. Arbuthnot, D. N. Colvin and W. M. Bannatyne, Winnipeg, Man.

The Russell Gas Co., Russell, Man., have been incorporated with a capital of \$5,000, to manufacture gas, heat, light, etc. The provisional directors include T. A. Wright, A. McDonagh and D. M. Kinnaird, Russell, Man.

The Ideal Fence Co., Winnipeg, Man., have been incorporated with a capital of \$100,000, to manufacture fencing, gates, fence supplies of all kinds, etc. The provisional directors include F. C. Stevenson, Winnipeg, Man.; W. L. McGregor, Walkerville, Ont., and F. N. Prentice, Detroit, Mich.

The McKinnon grain elevator, Weyburn, Man., collapsed recently. It will be rebuilt.

The Canada Flour Exporting Co., Winnipeg, Man., have been organized and will erect a warehouse.

The lumber yards of John Arbuth, Fort Rouge, Man., were damaged by fire October 6. Loss about \$40,000.

Messrs. Bisset & Loucks, Winnipeg, Man., agents for the John McDougall Caledonian Iron Works Co., Montreal, have been awarded the contract to supply the city of Winnipeg with two turbine pumps at a cost of about \$21,063.

The Northern Brass Co., Winnipeg, Man., will erect a new building at a cost of about \$25,000.

An addition will be erected to the Children's Aid Shelter, Fort Rouge, Man.

The Canadian Northern Railway Co. will erect shops at Montreal and at Fort Rouge, Man., at a cost of about \$1,000,000.

Messrs. Crotty, Love & Co., Fort Rouge, Man., will erect a building there.

P. A. Carleton, Lowell, Mass., is considering the establishment of a tannery at Moose Jaw, Sask.

The ratepayers of Red Deer, Alta., have voted favorably on a by-law to raise \$30,000

for the construction of a sewerage system, fire hall and town hall, also the sum of \$6,000 towards a memorial hospital.

The ratepayers of Saskatoon, Sask., will vote on a by-law to raise \$39,000, for the construction of a new general hospital.

W. R. Brock & Co., Toronto, are building a branch dry goods warehouse in Calgary, Alta.

A school building will be erected at Banff, Alta.

A collegiate institute will be erected at Prince Albert, Sask.

The Berlin Rubber Co., Berlin, Ont., will establish a branch at Calgary, Alta.

A waterworks system will be installed at Moose Jaw, Sask., eight miles from the town. It will be a gravity system, consisting of 11,000 lineal feet of 12-inch wood stave water main, 29,715 ten-inch and 615 15-inch tile gallery with all necessary valves and fittings, and to construct a concrete dam, and also a reinforced steel concrete storage reservoir, near the power house.

The Prince Albert Street Railway Co., Prince Albert, Sask., are asking the council for a twenty-year franchise. They will spend \$80,000 on plant, track, and cars within three years, and will supply power to the city, so long as their franchise remains in force, at 25 per cent. less than it now costs the city.

An electric light and power system will be installed at Ladner, B.C.

The Canadian Pacific Railway Co. will construct jetties at Vancouver, B.C., at a cost of about \$1,500,000.

The Jenckes Machine Co. recently shipped from their St. Catharines works, two 60 h.p. tubular boilers to the Slough Creek Gold Mining Co., Stanley, B.C. Stanley is 250 miles back in the mountains from Ashcroft, B.C., on the Canadian Pacific, from which point the boilers will have to be transported by team. The order was secured in London, England.

An addition will be erected to the King's Hotel, Vancouver, B.C., at a cost of about \$5,000.

The Vulcan Iron Works, New Westminster, B.C., will erect an addition to their plant.

The Canadian Pacific Railway Co. will erect a sawmill at Homer, B.C.

The sawmill of E. H. Heaps & Co., Vancouver, B.C., was destroyed by fire October 6. Loss about \$200,000.

A large portion of the business section of Armstrong, B.C., was destroyed by fire October 4. Loss about \$30,000.

The Britannia West Copper Mining Co., Vancouver, B.C., are getting two 50 h.p. locomotive type boilers from the Jenckes Machine Co., Sherbrooke, Que.

H. C. BAIRD, SON & CO., LIMITED.

Among the companies incorporated this week is H. C. Baird, Son & Co., Limited, Parkhill, Ont. This company succeeds H. C. Baird & Son, manufacturers of machinery for making brick, tile, pottery, sewer pipe and other building materials. The company is capitalized at \$100,000. The directors are Oliver Baird, W. J. Mitchell, David N. McLeod, Peter Lindsay and F. J. Hutchins.

FINANCIAL.

The Standard Bank have opened a branch at the corner of Yonge and Charles streets, Toronto, also at Belleville, Ont.

Canadian bank clearings show a remarkable expansion in western centres. Victoria, B.C., leads for the week ending Saturday, October 13, with an increase of 66 per cent. Winnipeg, Man., next, with an increase of 58 per cent.; Vancouver, B.C., 49 per cent.; Calgary, Alta., 26 per cent., and Edmonton, Alta., 25 per cent. There is a considerable expansion in Eastern centres, but with the exception of St. John, N.B., where there is an increase of 30 per cent. expansion, it will not compare with that of the West.

The Bank of Commerce intend opening a branch in Kingston, Ont., next week, having leased a prominent building there.

The Dominion Bank is considering an increase in its capital to \$5,000,000.

The annual report of the Molsons Bank shows net profits for the year ending September 30, 1906, to be \$434,668.34, which, together with \$31,417.93 brought forward from profit and loss account of 1905, make a total of \$466,086.27 available for distribution, leaving at the credit of profit and loss account the sum of \$26,987.23.

The Union Bank of Canada have opened a branch at Alfred, Ont.

The Bank of Ottawa have opened a branch at Campbell's Bay, Que.

The Bank of Ottawa are erecting a bank building at Ottawa.

The Union Bank and the Bank of Toronto will open branches in Brandon, Man.

The American Bank Note Co., Ottawa, will open a branch office in Halifax, N.S.

The Imperial Bank of Canada have opened a branch at Hamilton, Ont.

The Northern Bank have opened a branch at Glen Ewen, Sask.

The Royal Bank of Canada are opening a branch at Moose Jaw, Sask.

The Bank of Toronto are opening a branch at Quill Lake, Sask.

The Bank of Toronto are opening a branch at Rossburn, Man.

Winnipeg bank clearings continue to show remarkable expansion. For the week ending October 4, they totaled \$11,366,560, against \$8,850,664 for the same week last year and an increase of \$5,699,492 or considerably over 50 per cent.

The Northern Bank are erecting a building at Lloydminster, Sask., which will cost about \$15,000.

The Royal Bank will open branches at Moose Jaw, Sask., and Calgary and Edmonton, Alta.

The Imperial Bank will erect a large building in Calgary, Alta.

The Bank of Hamilton are erecting a bank building at Battleford, Alta., at a cost about \$4,000.

The Bank of Montreal are erecting a large building at Lunenburg, N.S.

The Royal Bank of Canada will erect a bank building at St. John, N.B.

The Bank of Toronto have opened a branch at Parry Harbor, Ont.

PUMPING PLANT TESTED.

In view of the high efficiency reached by the new pumping plant installed for the city of Montreal on McTavish Street, the report of the recent official 24 hour test will be found of interest. The plant consists of a 14-inch 3-stage Worthington centrifugal pump built by the John McDougall Caledonian Iron Works Co., Limited, direct connected to a 400 h.p. induction motor built by Allis-Chalmers-Bullock, Limited. The test was conducted by Mr. George Janin, Superintendent of the Waterworks Department, and Prof. L. A. Herdt, of McGill University, who reported as follows:—

"As the test was to be made in conformity with clause nine of the contract, on the capacity of the said pump, which was to be five million imperial gallons per 24 hours against 110 pounds pressure, this condition was amply fulfilled, the total number of gallons pumped being 5,470,000. The said clause also specified that the test should show that the temperature of the motor working under a full load for at least 12 hours should not be more than 40 degrees C. above the temperature of the room. The results on this test showed that the temperature never rose beyond 30 degrees C. above the temperature of the room.

"In accordance with clause 10, the ordinary working of the pump and motor was not to cause any notable noise or vibration. During the test, as also during the trials preceding the test, this condition was perfectly fulfilled.

"Clause 11 specified that the pump was to attain an overall efficiency of not less than 65 per cent. The test showed that during normal working, that is to say, with a discharge of five million imperial gallons per 24 hours, this efficiency was attained, and during the period when five and three-quarter million gallons were being pumped, an efficiency as high as 67 per cent. was attained."

In consequence of the satisfactory nature of the report the committee decided to make the first payment due on the plant of \$3,547.

SUCCESSFUL AIR DRYING.

"There is an element in successful air drying which is of the highest importance, but which is apt to be totally neglected by those not conversant with the principles of the subject. This is the velocity with which the air passes over the surface of the material. Experiment shows that the rate of transmission of heat communicated to a surface by a gas passing over it varies with the square root of the velocity, so that the higher the velocity the more rapidly will the evaporation take place. This effect is probably similar in some respects to scour on the beds of streams, though the equations in the two cases are unlike. The actual velocity is limited, on the other hand, by the fact that the power varies with the cube of the velocity; so that there will be found a certain velocity of maximum efficiency where these two elements balance. In the designing of the drying-room care should be taken that the proper volume of air not only passes through, but that it passes over the surface of the material at the most economical velocity; which necessitates in turn that the empty space in the drying room or chamber shall not be too great."—George Wetmore Colles in Stevens Institute Indicator.

BRADSTREET'S LIST OF FAILURES IN CANADA.

Canadian failures for nine months, as reported to Bradstreet's, number 901, involving \$6,803,125 of liabilities, a decrease of 11.6 per cent. in number and of 36.2 per cent. in liabilities from a year ago. Failures, assets and liabilities in Canada in nine months for a period of years past follow:

	Number.	Assets.	Liabilities.
1906.....	901	\$2,983,773	\$6,803,125
1905.....	1,020	5,162,992	10,676,595
1904.....	832	3,238,256	7,696,688
1903.....	712	2,887,323	6,274,132
1902.....	851	2,759,989	6,300,413
1901.....	1,041	4,160,670	9,376,495
1900.....	1,002	3,017,784	7,441,667
1899.....	975	3,501,274	8,585,901
1898.....	1,091	3,271,772	7,592,510
1897.....	1,501	4,141,860	10,653,212

TERMINAL DOCKS AT QUEBEC.

A despatch from Quebec says that the Dominion Government have decided to subsidize extensive docks and railway terminals in connection with the new Quebec bridge and the Grand Trunk Pacific Railway, and have instructed the Transcontinental Railway Commission to confer with the various interests concerned on the question. These new docks will comprise the construction of a retaining wall from the Point au Carey wharf close by the breakwater, to Point au Pizeau, a distance of four miles along the river front, in line with Champlain Street. The facilities and natural formation of the river front are so well laid out and adapted for the projected terminal docks, railway yards, etc., that the contract should be completed in three years, in time for the completion and opening of the new bridge, and even before the completion of the Grand Trunk Pacific Railway.

ECONOMY OF MECHANICAL VENTILATION.

For the purpose of comparing the cost of installing heating and ventilating plants in Chicago public school buildings at two different periods, Mr. J. T. Waters, chief engineer of the Board of Education recently selected two 3-story school buildings. They are represented by two different types of installation, the costs of which were as follows:

School.	Built.	Cost of Installation.	System.
Horace Mann	1889	\$13,715 00	Direct and indirect radiation.
Fulton.....	1894	6,080 00	Indirect radiation.

In the former building there was installed what is technically known as the direct and indirect system of heating, with mechanical ventilation. The cold air is introduced through galvanized iron ducts in the basement by means of a disc fan, which is operated by steam power to points where indirect radiators are located; thence through the radiating surface to class rooms.

The latter building is equipped with modern heating and ventilating apparatus, which has been installed in every public school building in the city of Chicago since 1894, and consists of sections of vertical radiators located in the basement, erected in such a

manner that the air is drawn from the outside by means of a fan or blower, which is operated by an engine. The air is forced through the radiating surface to a warm air distributing chamber; thence through individual ducts to each class room. At the central point of distribution air at two different temperatures is manipulated automatically by the combined influences of a thermostat and damper, the former located in the class room and the latter in the duct leading thereto. The maximum temperature in top chamber is 160 degrees Fahr., and the minimum temperature in lower chamber is 68 degrees Fahr.

When the temperature of a room reaches 70 degrees the thermostat automatically changes the position of the damper in the duct to an intermediate position, so that a sufficient amount of air at the maximum and minimum temperature is admitted to maintain the required temperature in class room. The somewhat startling result is shown of an initial expenditure in the well ventilated building less than one-half of that in the old type.

ROBB COMPANIES MAY UNITE.

An Amherst, N.S., despatch says that negotiations are now pending that may lead to the amalgamation of the Robb Engineering Co., of Amherst and the Robb Mumford Boiler Co., of South Framingham, Mass. D. W. Robb is managing director of both concerns. A meeting of shareholders has been called for October 23 to consider the proposition and the general impression is that the shareholders will vote for amalgamation. As is well known the Robb Engineering Co. occupies a leading place among the manufacturers of the Dominion in their special lines of boilers and engines. The products of its workshops go to every part of Canada and to many foreign countries.

JUDGMENT, ECONOMY AND SYSTEM ALL FACTORS.

Ability to recognize a market going begging was the first element in the success of a young Indiana firm. Three or four years ago C. M. Gregg was simply a good salesman bitten by desire to quit the road and break into business for himself. While he took orders, therefore, he cast about for his "chance." The manufacture of butchers' skewers presented the first opening. While he was trying to figure a profit on the operation, he encountered in a country store some clumsy "husking gloves" of cotton cloth reinforced with leather.

The gloves weren't pretty, but they appealed to him. He bought a pair, ripped them apart—studied them as an entomologist dissects a brand new beetle.

He was face to face with opportunity. It was weeks later, however, after he had gathered prices on machines, power, cotton flannel, thread, labor, that he recognized it and branded it for his own. He decided that he could make a better glove than the farmers were getting at a radical reduction in price and a respectable profit.

He had the idea-germ of a business—nothing more. He needed capital, a satisfactory machine operator, a selling organization—for the margin on ten-cent gloves required him to sell hundreds of thousands

to make money. He was not without factory experience, but he had charted sales and purchasing as his jobs, and he interested O. R. Coutant to look after the making. Crawfordsville was selected as the factory site because shipping facilities and rates were excellent and girls to run the machines were plentiful—if they could be hired.

The town was almost without women factory-workers, but "long" on unemployed high-school and grammar-grade graduates. To interest these the factory must be central of location and have an atmosphere beyond cavil. So the lecturers and basketball teams were ousted from the Y.M.C.A. gymnasium and ten sewing machines, shaft driven by an electric motor, were installed. The first ten operators were chosen from among 30 applicants. The leather-glove factories were looted of processes and ideas. Dies for the three shapes each glove required were purchased. So a power press was put in and the dies sheared down through four dozen thicknesses in the drop of an eye-lash. With the press one man and a boy supply "shapes" to 70 sewing-girls now, cutting up a carload of cotton fabrics every four days.

Division of labor was the first important economy worked out in the factory. Week by week new economies and "short cuts" were discovered.

Costs were cut to the lowest level. A system of factory reports traced every lot of six dozen gloves from the cutting press to the packers. Piece work was the factory rule, but the reports showed daily what each operator was doing.

Quality and demand were the controlling factors in the making scheme. Experiments determined what grade of cloth was best adapted to each of 55 kinds of gloves and mittens—there is one kind of glove for the housewife to dust in and another kind for her husband, the furnace-tender—but the prejudices or prepossession of consumers are never forgotten. The farmers of "Egypt," for instance, like their gloves with the fleece outside because the tar or axle-grease with which they smear them to make them "wear" sticks better that way. Indiana fancies a glove with a knitted wrist. Michigan defends a gauntlet and Minnesota is partial to a padded mitten which would impress any one as a generous dime's worth. And each community is given exactly what it wants, as reflected by the dealer's experience.

This intimate touch with dealers and consumers is one virtue of the selling plan worked out before the first machine was installed.

Because the industry was based on a dormant public demand, selling was a simple matter of covering promising territory and demonstrating the new line. The gloves were so obviously cheap and useful they almost sold themselves. A trial order was the unfailing wedge to a permanent market whether the dealer was a grocer or hardware man, a clothier, dry goods merchant, general store-keeper or druggist. No matter what a retailer sold, he could handle the gloves as a "side-line."

How has the business grown? The gross sales for the first year ending October 1, 1904, were \$28,000. The second year they trebled, reaching \$88,000, while the figures

for the current year, with the last six weeks estimated, go beyond \$160,000—600 per cent. increase in two years. At the same time the selling field has been extended from Indiana and Illinois to take in the entire country and the lands beyond the seas. Fifty dozen pairs were shipped to a Dublin importer in July and the Russian moujik has developed a taste for the same padded mitten Minnesota farmers like.

This is the three-years' history of a typical "young business"—one among the thousands of small industries which escape notice in the shadow of the giant corporations. It was sane in conception and sound in execution. It was based on that best of markets, popular, permanent, national demand. Its raw materials, its special machinery, could be bought in competitive markets. Skilled operatives could be trained in two weeks, experts developed in six months. The product sold almost without argument, the middleman was eliminated, the dealer who gave a trial order became a permanent customer. Yet if sound judgment, economy and system had not marked every stage of its growth, this successful industry might easily have proved a melancholy failure.

THE CANADA FORGE CO., LIMITED.

The Canada Forge Co., Limited, Welland, Ont., have been incorporated to manufacture forgings for marine and stationary engines, transmission machinery, etc. The Canadian firm, which is a branch of the Titusville Forge Co., Titusville, Pa., has a capitalization of \$100,000 and has been given a free site in an extremely favorable location at Welland, Ont. The directors are Thos. J. Dillon, Chas. Burgess and John L. Emerson, the first mentioned being president.

In addition to the economic advantages of mechanical draft, there are others which relate primarily to the convenience of installation and operation. Prominent among these is the feature of adaptability. The fan which is usually of steel plate, may be constructed in any shape to meet specific requirements, may be located as desired with regard to the position of the boilers and without expensive foundations, may be used for either forced or induced draft, and because of its portability may be relocated or exchanged for another of different capacity. In its operation the fan is perfectly flexible, may be run at high or low speed, independently of the chimney temperature, and is always susceptible of instantaneous change in response to sudden demands. A mere change in engine cut-off produces an effect only secured with a chimney by adding to its height at great expense.

The Bristol Co., Waterbury, Conn., have established a branch office at 753 Monadnock Building, Chicago, Ill., where they will be able to fill rush orders, particularly for instrument supplies, thus saving several days' delivery.

Coates Bros., a large Scottish carpet manufacturing concern, have agreed to establish in Peterborough, Ont., exceptionally large carpet works if certain concessions are given them. It is expected that the concessions will be given.

OFFICE METHODS AND APPLIANCES.

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

FOLLOWING UP TRAVELLERS' CALLS.

A successful manager made the statement a few days ago that few travellers are systematic and often the least systematic are among the best salesmen.

The more attention one gives to the thought the more one sees the naturalness of this condition. The traveller, while on the road, finds that the profitable way to spend his time is to use the greatest possible proportion of it in getting after business. Often it is necessary to spend every moment in one town in the hustle for orders and then to "pull out" to the next town without opportunity for report.

Consequently reports, if made out at all, are made out after a second or even a third town has been visited.

Many travellers maintain that the best reports they can give, and the only reports that should be asked of them are their orders.

Experience has shown, however, that it is to the advantage of the average manufacturer to maintain a system of reports which will serve to show where they are losing business, where new customers are found and where an old customer is increasing his orders.

The method of following up such reports must, to be most serviceable, vary according to the nature and needs of the business. In the next issue of the paper devoted to "Office Methods and Appliances" we will have illustrated descriptions of the system of reports used by two of the most progressive firms we are acquainted with.

FOUR POINTS IN SELLING.

By W. O. HOLMAN.

There are four things that a salesman generally has to do in selling a man a product. He has to show him the product, or a sample of it. He has to explain its nature, or principles, or make-up, or workings. He has to give reasons or arguments why the prospect should buy it. He has to add a final touch or push of persuasion, as a climax to his arguments, to get the prospect to sign the order.

He may do these four things in different orders of succession. Sometimes he may omit one of them or two of them. But usually the salesman will find, when he walks out with the order, that he has done all four of these things—if the prospect was not previously familiar with the thing the salesman offered him.

Every salesman speedily learns that nine times out of ten, before he can make a sale he must let the prospect see for himself the thing the salesman wants to sell him, unless the prospect is already absolutely familiar with the product.

The prospect's desire to see what he is buying is the cause for the necessity of samples. The prospect's first question, the moment he is in the slightest degree interested in what you are selling, is always "let me see it," whether it be a threshing machine or a piece of dress goods, a book or a filing

case. He wants to behold it with his own eyes.

Seeing the article has a great effect upon him. A salesman has gained a great point when he gets the prospect to look over his line of samples or come down to his office to see his line.

Adding machine men know that a salesman has made a great step toward selling a machine if he can actually get a machine into the prospect's office—let him see for himself how it looks in the place where it will stand. It is an old adage in the cash register business, that if you can get the cash register on the prospect's counter the sight of it there will go a long way toward selling it to him.

The business getting letter writer cannot afford to ignore this principle. He is not able to include in his letter a sample of the thing he is writing about, nor can he always send a circular giving an adequate illustration of it, even when he does include a circular with some kind of a picture. But if he is a master of his art, he knows how to call up in the prospect's mind, as he reads the letter, a vivid image of how the thing he is selling looks. In other words, he knows how to use description.

There are many kinds of description. A long catalogue of detail is a description, but it is a mighty poor kind of description to use in a business-getting letter. The clever correspondent understands suggestive description. He is a master of the art of calling up a picture of the article in the prospect's mind by a few carefully chosen phrases. He has learned something of the principles of the great prose writers and poets, who can convey a vivid idea of how a man or a building, or a sun-set, a street, a tree, or a city or a great naval review looks, in the space of only a few lines—often with a single well selected phrase.

Giving a prospect an idea as to how an article looks, then, is one of the four great strings that should be pulled by the business getting letter writer.

But one string alone is not enough to pull. Many letter writers make the mistake of thinking that it is. Instead of condensing their description into a single paragraph, they fill the entire letter with it, and neglect to pull the other three strings that move a prospect to action. Of course such a letter is only one-fourth as strong as a properly written letter would be.

The same necessity that forces a salesman, when calling upon a prospect, not only to show the prospect the article he is selling, but to go further and explain it to him—this necessity is also upon the business-getting letter writer.

UNITE ARGUMENT AND PERSUASION.

A well-written business letter pulls all four strings in seeking to move the prospect to action. No one of these strings alone will ordinarily move him—that is, if the proposition is new to him. Of course, if a letter is one of a series; you may pull your four strings in two or three of four different letters. Or if the prospect is already fa-

miliar with the thing you are selling, it may not be necessary to pull all four strings in your letter. But ordinarily an advertisement or a letter is stronger if it contains all four elements. Description and explanation alone do not ordinarily make a strong appeal to the will. They arouse interest and may excite desire, but they do not carry conviction as argument does. And none of these three prompts a man to pick up his pen and sign the order as persuasion does at the end of an argument. The commonly used, direct, closing commands of a letter, "Do it now," "Act to-day," and "Send your money immediately"—these are the final touches of persuasion that secure the signature.

Many a poor business letter contains nothing but persuasion. The writer fills paragraph after paragraph with such sentences as: "We are unable to understand why we have not yet received your answer. May we not hear from you immediately?" "Will you not tell us why you have not written us," etc., etc. Such sentences are good when combined with other matter, but, when used without support, they are not strong.

Some poor letters are full of explanation, but lack argument. A man from a repair department can give a good explanation of how a machine works, but he could not necessarily sell that machine. The repair man, strong in explanation, lacks the salesman's ability to use argument and persuasion.

Other poor letters are composed of nothing but argument. Unless the prospect already knows the product, these are weak, because he will have only a confused idea of the appearance and the real nature of the thing that the salesman or correspondent is so strenuously urging him to buy.

Four incitements to action working on a man have more power than one. Four strings will pull more strongly than one.

One of the best series of advertisements I have ever seen owed its strength to its splendid use of all four of the strings I have mentioned—description, explanation, argument, persuasion. This fully exemplifies the principles I have laid down, although the writer told me he did not know it at the time. Its power is proven by the fact that it has pulled tens of thousands of subscribers for the magazine advertised. I ascribe its power to its combination of four strong elements, no one of which alone, in my opinion, would have done the work.—System.

The Goldschmidt Thermit Co. are about to vacate their present manufacturing premises at 179 Christopher Street, New York City, as they are insufficient for the largely increased business. They have bought ground at the corner of Cornelison and Bishop Streets, Jersey City, N.J., and have erected there a large and commodious factory building, 165x75 feet, within easy reach of their downtown offices, and intend moving their manufacturing plant to the new location about October 1. The company are represented in Canada by Wm. Abbott, St. James St., Montreal.

A Basis for a Cost Accounting System.

BY HENRY ABBOTT, PRESIDENT OF THE CALCULAGRAPH CO.

In these days of professional "systemizers," "systematizers," "systematists," "methodizers" and "business organizers," I shall not waste words in urging the importance of knowing the costs of manufactured products, especially since several magazines of more or less wide circulation have been for several years, and are still, exclusively devoted to advocating that proposition, and to exploiting the merits of particular "systems" of cost accounting. I believe that any manufacturer worthy the name will admit without further argument that such knowledge is useful.

Nor is it the purpose of this paper to approve or criticize any of the many such "systems" of segregating and classifying labor, material and expense items to insure that each be charged against the appropriate individual product, but to direct attention to the importance of a matter which in the humble opinion of the writer is too often underestimated or entirely neglected.

I refer to the original or first record made of labor expended upon the several separate operations involved in the process of manufacture, and I assert that it is of the utmost importance to the success of any system of cost accounting that such original entries or records shall be truthful, and that the usefulness or worthlessness of the figures resulting in working out such a system of accounts depends wholly upon the question whether or not the beginning was made with accurate records.

A few years ago I visited a large manufacturing plant in which some thousands of persons were employed and saw in the cost accounting department thirty odd persons busily employed at desks working over stacks of time cards, books, papers, etc.

As the purpose of the visit was to learn something, and as I was particularly interested in systems and tools for cost accounting, I employed the small boy method and asked questions. The conversation with the chief cost clerk was about as follows:

"How do you get the working time of the men on the separate jobs or operations?"

"The men write it down on the time cards, you see. The cards are ruled and spaces are made for them to write in the time opposite each job number."

"Do the men have many different jobs in a day?"

"Some of them have as many as ten or twelve; very few have less than two or three."

"Do they write the time of commencing and again the time of stopping, on each job?"

"No, they just write the hours and minutes they spend on each job."

"Do they ever make mistakes?"

"My Lord, yes; they all make mistakes. Why, what could be expected? Our men are mechanics and good ones, but they are not bookkeepers. Some of them can hardly write. They do the best they can, I suppose, but sometimes a man will turn in a time card at the end of the day on which the total job time foots up 13 hours, when the time recorder at the factory entrance

shows that he was in the building only 9 hours. And some of the cards show less than 7 hours total labor, when we know the man worked full time."

"What do you do with such records that appear to be inaccurate?"

"Oh, we fix 'em. Sometimes we talk it over with the workman, but if he can't remember about the distribution of time, and he generally doesn't, we change the figures on some of the jobs so as to make the record agree with the pay roll record. It takes a lot of time to go over all the cards and adjust the differences, but our auditor insists that the two accounts must agree, so we make them agree before we enter a figure in the books."

"Do your workmen ever make corrections on their cards before handing them in?"

"Oh, yes; I have often seen the men erasing the figures and writing them over two or three times when they have found the total time wrong."

"What percentage of the records your workmen make of their job time do you suppose are inaccurate?"

"I should say about 90 per cent. of them are wrong in the beginning, but we straighten them out. We make the accounts agree, that is a part of the work of this department."

RECORDS WORSE THAN USELESS.

At this point the inquisition was discontinued. It mattered very little what system was employed in the distribution of the items to the several accounts, how simple or how complex it might be, or who designed and put it in operation. The results showing the alleged "cost" of the several products of the plant would be equally worthless in any case. In my view, the entire department might have had an indefinite leave of absence without pay, and their voluminous records, etc., put into the furnace under the factory boilers with profit to the owners.

Instead of conducting the department with a view to supplying reliable data that would be of use in fixing the selling price, so that each article manufactured would be sold at a profit, there appeared to be no certainty that any of the entries represented the actual working time, there was a strong probability that more than 90 per cent. were inaccurate, and many of these were further mutilated by the "cost clerks" for the purpose of forcing their accounts into agreement with the pay roll records.

Dollars might safely be wagered against doughnuts that some products of that factory would be sold for less than actual cost, while others might have a limited sale at an excessively high selling price by reason of the misinformation supplied through the department or errors and corrections.

I confess to a certain admiration for the factory manager, who, with the nerve of a gambler, examines one of the products of his plant, "hefts" it, decides that the material in it probably cost about 75 cents, mentally "calculates" that the labor must have amounted to about three dollars, entirely ignores the matter of "expense," and decides that "we can afford to sell that for ten

dollars." He is willing to take a chance on a few hundred at that figure, and, of course, if competition arises, the selling price is cut to meet it—in the same gambling spirit.

But a limited vocabulary fails to supply words suitable to express my appreciation of the manager who would deliberately take a set of records known to be erroneous and further falsify and mutilate them to force balances, then use such records in building up an elaborate system of accounts, paying salaries to 30 clerks to help do it, in an effort to deceive himself into the belief that he was thus learning the cost of his products.

EXPERIENCE OF MANY SHOPS.

The purpose of my visit was served, however. I had learned something. And my experience since the occasion mentioned has convinced me that such practice is not uncommon. I have visited many large manufacturing plants where the mechanics and other workmen are required to write down on cards or in pass books the time they are at work upon each task or operation. I have also corresponded with some hundreds of other factory managers who frankly admit such practice in their plants. Many, however, stoutly maintain that their workmen do not make mistakes in their records of working time. Such, it would appear, have the "ignorance and bliss" combination, with the addition of a fear to "get wise." They manifest a wish to conceal from themselves the disagreeable knowledge of the unreliable character of their own factory records.

Who, among the readers of this paper, familiar with the interiors of factory work-rooms, has not many times observed, toward the end of the workday, the familiar picture of a mechanic at his work-bench bending over a time card, while with a puzzled expression of countenance he scratches his head with a pencil, vainly trying to dig out of it a faint remembrance of how many hours and minutes he spent upon job No. 513, which he finished earlier in the day? Who, having seen the picture a few hundred or a few thousand times repeated, imagines for one moment that what is finally written upon the card is accurate or even approximately so in the majority of cases?

The same remedy is available to the manufacturer. The same machines are made suited to his purpose. And when he has taken time keeping out of the hands of his mechanics and given it to a machine, which by the simple operation of levers is capable of computing and recording the actual working time, as well as the time of day, he will have made a proper beginning and will have laid the foundation for a reliable system of factory cost accounting.

GOING AFTER FOREIGN TRADE.

Not a great many years since, while foreign firms were establishing branches in Canada, the Canadian concerns who were doing business outside the Dominion could be numbered almost on one's fingers. All this is materially changing, and every day one hears of Canadian firms opening branches in all parts of the world.

One of the latest Canadian firms to do this is Business Systems, Limited, Toronto, who have recently opened up in the British Isles at 32 Cheapside, London, England. Mr. H. J. King, the general manager of this concern, went over to the Old Country some

months ago, and spent considerable time investigating the opening in the British market for his goods. The result is the opening of a London office completely equipped with a strong selling force.

The progress made by Business Systems Limited is especially noteworthy in view of the fact that although this concern has only been in existence one year, they are already so thoroughly organized as to be able to extend after foreign trade.

The English manager of Business Systems Limited will always be glad to welcome Canadian business men who are visiting in the Old Country. The London office is equipped with writing-rooms and stenographers for the use of Canadian business men who are invited to make this their headquarters while in the Old Country and to have their mail addressed in care of Business Systems, Limited, 32 Cheapside, London, E.C., England.

THE "BUSINESS SHOW" AT NEW YORK.

Many managers of Canadian manufacturing concerns will be interested in the National Business Show in the Madison Square Garden, New York, from October 27 to November 3.

General office appliances will be the feature of the exhibition. The demand for space by manufacturers has become so great that the immense building has to be practically remodelled to accommodate all.

The United States Government of Commerce and Labor has officially recognized and endorsed the Fifth National Business Show by engaging space for a government exhibit. This is the first time in the history of private expositions that the United States Government has taken such an important and significant step.

There will be numerous conventions, among the most notable of which will be that of the National Association of Manufacturers, which is the greatest organization of its kind; the meeting of the typewriter salesmen; the New York Boost Club, made up of the members of the stationery trade; that of the manufacturers and dealers in adding machines and a number of others of which full particulars have not yet been received.

There will also be separate nights devoted to special lines, such as Stationer's Night; Chamber of Commerce Night; Stock Exchange Night; Railroad and Express Company Night; City Department Night; Government Night; Insurance Night, and last but by no means least, Office Appliance Night, when it is expected that the special features will be such that they will be long remembered.

Space has been engaged for the exhibition of practically everything ever known, and many devices absolutely new in office appliances and the strong rivalry between exhibitors will result in some novel displays and demonstrations during the week.

The B. F. Sturtevant Co., Boston, Mass., have sold metal-to-metal joint fuel economizers to the Brinton Carpet Co., Toronto; direct-connect electric fans to T. Eaton & Co., Toronto, and mechanical draft apparatus to the Locomotive & Machine Co., Longue Point, Montreal.

Dominion Henderson Bearings, Limited, Toronto, are removing to Niagara Falls, N.Y.

Introducing a System of Shop Management.

By JAMES A. DODGE, PHILADELPHIA.

In the following address and discussion before the American Society of Mechanical Engineers our readers will find a most illuminating reference to one of the great problems of manufacturing to-day.

After nearly three years' experience introducing into the establishment with which I am connected the system of shop management, identified with the name of Fred W. Taylor of this society, I feel that a brief recital of the moving causes which influenced our company to take up this work would be of interest. I think also it will form a historical recital of the steps and results of broad lines.

The works consist of a machine shop, with its usual accompaniment of store-room, tool-room, pattern shop and power plant, together with the required shop, offices, accounting departments, drawing-room and engineering forces and the selling organization. There is also quite an extensive department devoted to construction and erection in iron and steel. There is no duplicate work done and no package article made or sold as would be the case in large duplicated lots.

At the time we first considered the Taylor system, we prided ourselves on having a thoroughly equipped shop, operated by the best methods known to us as respects general management, general accounting and shop accounting. We thought we were decidedly in advance of others in our particular line of business and even of other machine shops. While we felt that we were not intensely progressive, also in a satisfied mood, feeling that it would be rather presumptuous for anyone to suggest that our method and general way of doing things could be improved.

AN AWAKENING.

It was in this frame of mind that we received word of the surprising work done at the shop of the Bethlehem Steel Co. with a grade of tool steel to which the names of Taylor-White was attached. I myself made the trip personally to the shop where it was in use and saw tools of this material ripping heavy nickel steel faster than we were in the habit of turning off brass. I also saw under the shadow of a screen over the point of the cutting tool that it cooled with a dull red heat. I found on computation it was turning off a good big chip at a rate of 140 feet a minute and after 20 minutes there was no let up. It was something of a shock to me to discover that the wonderfully mechanical training I had had and my 20 years of experience would have to be regarded as obsolete from that moment onward.

An inspection of my own shop the following day made it apparent that we were hopelessly behind and that it would be necessary for us to rearrange our whole establishment if we were to keep up with the standards that my previous day's experience had forced upon me. This carried with it the sickening feeling that I was going to spend a fortune, was to reduce dividends for several years, was to make an expenditure of a large amount which would give no result in anything to be properly inventoried as an asset, and one-hundred-and-one other financial and

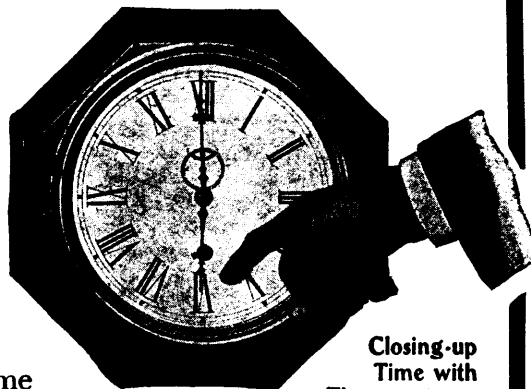
mechanical obstacles. To convince my own tool-maker, who, like so many other tool-makers, was the best in the country, we took down some of his best achievements in tool-making to the Bethlehem shops and the instant failure of our samples alongside of the Taylor-White product resulted in our negotiating in a few days later for a shop right.

THE RIGHT TOOLS NEEDED.

Considerable time was spent in getting tools of the right sort for working on cast iron, with the result that we had one lathe and a few tools to fit it which would do from three to four times as much work on cast iron as we had ever been able to do before. This, however, was only the beginning. When we went further the old machine tools had to be either discarded or new ones of special design substituted, or the old tools rebuilt. Electric driving became necessary and finally our machine shop, which had been run most successfully with a 50 h.p. engine, was absorbing over 150 h.p. and calling for more. Then it became quite evident that the piece-rate would have to be revised. For instance, if 50 pieces could be made per day on a tool, an error in rate either for or against us would be multiplied by 50, whereas if the same tool could turn out 200 pieces a day our error in rate fixing would be multiplied by 200. Mr. Taylor's answer to our question was that a scientific time study would be necessary. We were left to accept this because we were following what we regarded as a much quicker and better method which was that of "guess" and we had in our business a number of men who could guess perfectly. Time soon began to show that these wonderful but unscientific guessers were far from infallible, and the guessing was decidedly inaccurate. We were shocked that our perfectly appointed and well-managed tool-room was becoming nervously prostrated and needed "jacking-up." What looks like a simply jacking up process took 18 months of hard work, but when we were through we were more than satisfied with the expenditure. Increased output reflected glaringly upon the heretofore considered perfect system of store-keeping and accounting. The receiving-room had to be reorganized to fit the store-room. The routing of material through the shop which had been very satisfactory and simple—we were having from six to 20 men remembering hundreds of details—came also to show signs of mental decay. The instruction of our men, the strain of having their lathes speeded, the changes in personnel were all consequences of our first step.

The final result was that we called in the man who had been instrumental in getting us into our difficulties and asked him to get us out. The more we worked under the able direction of Mr. Taylor and the assistance of his Carl G. Barth, also a member of the society, the more we were impressed with

The Office Clock Story



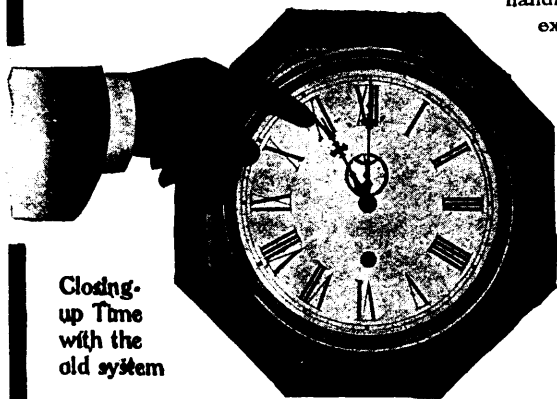
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the fact that Mr. Taylor in formulating his system had taken good points of management from the various sources and had skillfully combined them in a harmonized whole. It took over two years for our organization to surrender fully, and so change our mental attitude that we became really receptive. I mean by this that I found no difficulty at all in having the heads of various departments agree that the introduction of the Taylor system would be most desirable, but in every case it was for everybody else in the establishment, but entirely unnecessary for him.

THE MANAGER MUST ASSIST AS WELL AS GUIDE.

I might illustrate a cardinal feature of Mr. Taylor's system by asking you to consider the policy of operating a Fall River steamer with a crew of 200 men, all of whom were in such authority that they were entitled to make suggestions, raise objections and insist on the whole group proceeding with great caution. Obviously the vessel would be in the greatest peril all the time. The one method is to have this entire crew of 200 all functionalized, each man doing his own work under general and specific directions, with a trained pilot steering the boat. If the pilot, for his own glory, insisted upon being illumined so that every one could see him, his usefulness would immediately become impaired. I am fully convinced that the successful perpetuation of a business becomes the more certain the further away we get from the old military idea of having all the brains owned and controlled by one man. We have all seen prosperous concerns come to grief because the person who had the brains and ability to build it up had not been broad-minded enough to see that brains and ability were left behind when he died to conduct the business successfully. In an epigram: "Under the old military system every one was supposed to help the boss. Under the Taylor system the boss is obliged to help and assist the others who are under him." Under this each individual is unconsciously training his successor and working himself out of a job! This "working ourselves out of a job" by the ability and training of a successor makes it possible to promote anyone of the works without a loss of efficiency to the whole. The boss is promoted just as much as anyone else and his promotion comes to him in the form of perfected organization, releasing him from detail and giving him a greater opportunity to devote his brains and his experience to the development and extension of his business.

I have endeavored to make plain that my individual mental attitude and that of my associates was and is in no way unusual. The whole question resolves itself to this. The high-speed steel called for and made necessary a better system than existed in its entirety in any one machine shop. One shop might have a splendid store system, another an unimpeachable accounting system, another a perfect shipping system, and another a superlative system for routing work. Mr. Taylor's endeavor has been to harmonize the good points of management so as to avoid variations in efficiency with high-grade products and compute valuations in the curve in which we illustrate it. The horizontal line, practically straight, would represent uniform harmony.

That improvements will be made in the Taylor system no one can gainsay, so that modifications fitting it to various lines of manufacture may be made. But its underlying principles of efficient planning, task-setting, functional foremanship, which shall not make laborers out of machinists and errand boys of foremen with a full use of the slide-rule in computations, the proper routing of materials through the works, correct record keeping, pre-determined shipping dates and other features of the system will have to stand until better means have been tried out. I am convinced that the systematic study of conditions in a manufacturing plant can best be done by the enthusiastic and intelligent outsider. It is absolutely impossible for any man to be thoroughly posted in every detail of the works with which he is connected.

MEN DO NOT WORK HARDER BUT BETTER.

The Taylor system is not a method of pay, a specific ruling of account books, nor the use of high-speed steel. It is simply an honest, intelligent effort to arrive at the absolute control in every department, to let tabulated and unimpeachable fact take the place of individual opinion, to develop "team play" to its highest possibility. In past years numerous instances have come to my notice of machine work having been done more quickly than formerly, but such achievement was rather like the high speed of a hundred-yard dash, or the lowering of a record on the track, interesting, but bringing about no broad spirit of emulation. Under the system to the actual observer, the trained workman with his vastly increased output is working no harder than when his output was much smaller. He is simply working to his best advantage without distraction and with every possible aid that can be rendered him. The work for him to do is conveniently placed without his knowing how it got there; the tools with which he is to work are brought to his hands. Finished pieces are removed promptly. By simply following his instructions he finds his pay very much increased and does not suffer undue fatigue, and is relieved of all mental strain and worry. In other words, the man who is the most wonderful and complex machine in the shop is treated with every possible consideration from the viewpoint of increasing his efficiency without harm to himself. Good management without high-speed steel will show handsome returns, but the combination of high-speed steel and the Taylor system or its equivalent in management, will show the highest possible gain, because of the scientific combination of brain and brawn, which in a shop, as in an individual, represents the highest commercial development.

MINIMUM SHOP FOR SUCH A SYSTEM.

George Hill—I would like specially to inquire concerning the opinion of either Mr. Dodge or Mr. Taylor, as to the minimum size of shop to which the system referred to can wisely be applied? Is the limit 150 or 100 men when account is taken of the cost of introduction?

Fred W. Taylor—Mr. Hill has asked a most pertinent question, if put in the form "In how small a shop can the whole of the mechanism which we approve be applied?" I have in Philadelphia been recently systematizing a shop employing about 120 men and

my present opinion is that this is practically the minimum shop. We were turning out about \$10,000 worth of work a month and that was the limit under the plan formerly in use. For the last three months that shop has been doing a business represented by \$25,000 a month instead of \$10,000 and at the same time the pay roll is \$300 a week less than it was a year ago. In my opinion, the equipment of that shop could turn out \$35,000 worth of work per month, if they had to, with the same force that it had a year ago. On the other hand, if the volume of business in the shop cannot be increased, then I should say that 120 men were too small a number to justify the applying of the system.

WHERE WILL THE SYSTEM WORK?

H. L. Binsee—I would like to ask also if this system is applicable to a wide range of machine-shop practice? Anybody who has been in a locomotive shop must have noticed that the methods are widely different than those in a shop where delicate and accurate machine work is called for.

Mr. Taylor—I would say that the limit in certain departments is from one one-thousandth to one-ten-thousandth, and if the same amount of planning be put into accuracy in one place which is put into quantity in another, the result will be as satisfactory. I think that careful study is the keynote, and careful study can bring good results in accuracy as well as in hustling.

A Member—Suppose the manufacturer has not the demand for the output, could he cut the cost by the application of the Taylor system after it was once in, so that his 50 men, if he had to reduce that number, would still bring in a profit through saving?

Mr. Taylor—My judgment would be that if the working force were cut down to 50 men, the cost of the planning, organization, would eat up the profit if the work was complicated. If the work was simple it would not be so.

APPLICATION TO PATTERN MAKING.

A Member—I would like to inquire how Mr. Taylor works out his planning system for a new and difficult piece of work, say the pattern work job which requires ingenuity and thought.

Mr. Taylor—The gentleman has hit upon the most difficult class of work to be done in any establishment. I used to be a pattern maker myself and I have never yet attempted to do pattern work under this system. Patterns are necessarily all fresh designs.

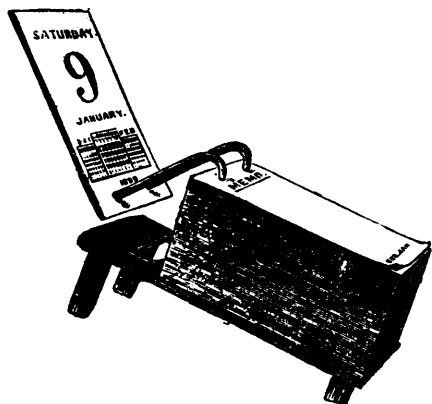
Gus C. Henning—Is not the system as applicable to pattern work as any other, since the fundamental idea is to determine the time that it takes to do any particular operation, so that if the work to be done is known, the rate, the time expense and every detail can be determined in advance so that it is all thought and planned before the work is undertaken?

Mr. Taylor—You are right, but in pattern work it hardly pays to put a special man on the study for one pattern maker until you have done everything else. I can point you, however, to a number of shops where pattern work is done under that plan, although I personally have never tried it.

THE DEFINITION OF AN "ORDER."

F. R. Hutton—While Mr. Taylor is explaining the details of his system I think it

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would be illuminating to have him differentiate between the meaning of the word "Order" on the Taylor system and that same word as ordinarily used in shops where his system is not in use.

Mr. Taylor—This is one of the most important and radical questions which can be asked regarding our system of management. Under the ordinary system and the ordinary training of workmen and foremen, an order from any authority means in a general way, "This is what I wished to accomplish; I want that result!" The man who receives that order, if he has anything in him says, "Well, now I have got that order and it is 'up to me' to do a little better if I can. While he told me such and such a thing, he really means 'I want the best that he can do.'" In the Taylor system with standards adopted through whole works and the same thing done exactly the same way in a hundred places, it is as bad to do better in one place, from our point of view, as it is to do worse. If one man makes an improvement locally, he throws the other ninety-nine men out of the one hundred out of gear as to time, price and the routine of planning. Unless the orders of the man in authority are obeyed the returns are false. On the other hand, we plan a distinct system for improvements with the idea that such improvements shall benefit not alone the one man, but the other ninety and nine. It is almost better not to introduce an improved steel for drills in one place, unless you are ready to introduce that faster steel in all places.

SUGGESTIONS ARE FREELY MADE BY MEN.

Mr. Henshaw—I would like to ask Mr. Dodge in his establishment what is the method of handling improvements such as Mr. Taylor has spoken of? How does the works get the benefit of an improvement suggested by an employe?

James M. Dodge—I called our system "the use of underground telegraph." We give a man \$25 and sometimes \$50 for an improvement which he has made and which we have put in use. It makes the men compete with each other in making suggestions. If a man has improvement on his mind and he knows that there is a channel through

which it may be developed, he is sure to go there with it. Under the old days improvements were suggested to the foremen; if he was not feeling in good humor the foreman would turn the man down or possibly discharge him for fear that the ability of the suggestion would work him out of his job. As a matter of fact, the working of the system has been, instead of continually changing the working force, they have become more permanent. The temptation to the foreman to discharge a man because he was endearing himself to the management is no longer present.

SOME TROUBLE WITH NEW MEN.

Mr. Sanquinetti—Does the employment of the Taylor system require an appreciable time with new men for them to learn the system?

Mr. Taylor—We do not get new men all at once, but as they come in the various functional foremen required under our system give such new men more attention than the old ones. Their learning is according to their special ability, some learning faster and others slower.

NO TROUBLE WITH UNIONS.

A Member—I would like to ask whether Mr. Taylor has experienced any difficulty in applying his system to shops under union control. It happens so often that when improvements are tried a delegation appears and a compromise in the form of a partial backdown is the result. I would like to know Mr. Taylor's experience under these conditions.

Mr. Taylor—I have never had a strike in my life through the introduction of my system when it was handled right. The shop I have spoken of previously in Philadelphia was completely dominated by unions when we began. If the steps of an introduction are taken not too fast and in the proper order, going slowly at the start, and making no blunders requiring reconsideration, it will not result in driving out the union, but a large number of union men will be converted to the new method. I had several visits from the representative of the Machinist's Union, but as there was nothing doing that

any union could take exception to there was no strike ordered and the union would not have sustained him if he had. We never asked a man to do more work than he was doing before. If the operator objects to increasing the feed from one-sixty-fourth of an inch to one-eighth, he is told to obey orders! If he objects to the shape of the tool, he gets the same answer. There is no issue which any labor union can raise. No labor union will ever step into the shop and say that your men must not take a given feed, if the tool will stand it. The responsibility for turning out good work does not rest on the man, but on the inspector who comes after. The quality is attended to in exactly the same way as the quantity is by a special man. The important matter is, first, that the "boss" shall have a carefully and thoroughly laid plan of action and shall follow that just as fast as he can go, so as not to fall down himself or make other people fall down.

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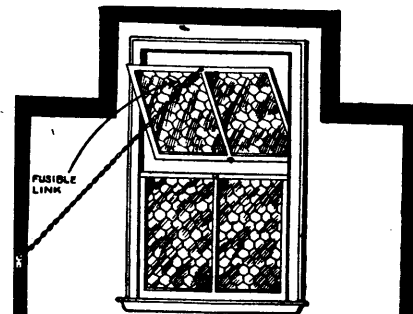
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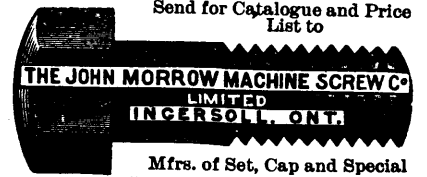
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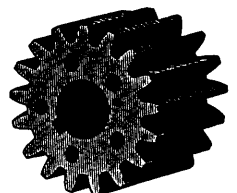
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THE Canadian Rand Drill Co.
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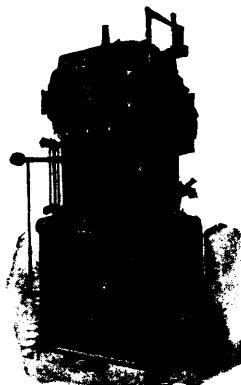
ECONOMY IN BELT PRESERVATION

Belt economy does not end with the purchasing. The belt is worth its cost price only so long as its original condition which fixes the price is maintained.

Shop conditions always affect the elasticity and "life" of the belt. Dixon's Solid Belt Dressing counteracts these evil effects, preserves efficiency, and keeps the belt at "par value." Get sample 33-O.

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DO YOU WASTE WHAT OTHERS ARE SAVING OR SAVE WHAT OTHERS ARE WASTING ?



THIS is the day of by-products. In many important lines of business the profit now lies in what used to be thrown away.

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Classified Index for Lines Sold by Advertisers

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

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

CONTRACTORS

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1591 ONTARIO STREET EAST, MONTREAL

CLASSIFIED INDEX.

(CONTINUED).

Blowers

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

Boiler Compounds

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

Boiler Inspection

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

BOILERS (See Engines and Boilers)

Bolts and Nuts

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

Brass Founders

Hamilton Brass Mfg. Co., Hamilton, Ont.

Building and Paving Brick

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

Building Iron and Steel

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

Builders' Materials

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

Burlap (Decorative)

Hamilton Oil Cloth Co., Montreal.

Business Methodizers

Vau, Henri, Montreal.

Cables

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

Canada Plates

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

Caps

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Card Clothing

McLaren D. K., Montreal and Toronto.

Cast Iron Pipe

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

Castings (Grey Iron, Malleable Iron and Brass)

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

Cement Machinery

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

Centrifugal Pumping Machinery

Kerr Machine Works, Baldwinville, N.Y.
Smart-Turner Machine Co., Hamilton, Ont.

Chain Making Machinery (Welded Coil Chain)

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

Channels

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

Charcoal Pig Iron

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

Chemicals

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

Chemists

Hoys, Thomas & Son, Toronto.

Clay Working Machinery

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

Coal, Coke and Charcoal.

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

Coal Cutting Machines

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

Coal Tipples

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

Coil Chains

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

Coke Oven Brick

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

Collection Agency

Petrie, H. D., Hamilton, Ont.

Concrete Mixers

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

Condensers

Smart-Turner Machine Co., Hamilton, Ont.

Conduits (Interior)

Conduits Company, Limited, Toronto.

Contractors' Machinery

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

Contractors' Plants

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

Conveying Machinery

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

Copper Materials

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

Corrugated Iron

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

Covers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Cranes (Electric and Hand Power)

Smart-Turner Machine Co., Hamilton, Ont.

Crayons

Lowell Crayon Co., Lowell, Mass.

Crucibles

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

Crucible Caps

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

Crucible Covers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Cutter Grinding Machines

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

Dashes

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

Dies (Socket, Sewer Pipe and Tile)

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

Directories

Kelly's Directories, Limited, Toronto

Draw Benches (Wire)

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

Dredges

Allis-Chalmers-Bullock, Limited, Montreal.

Drill Chucks

Krug & Crosby, Hamilton, Ont.

Drills

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

Drills (Pneumatic and Rock)

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

Drop Forgings

Globe Machine & Stamping Co., Cleveland, Ohio

Drop Forging Dies

Globe Machine & Stamping Co., Cleveland, Ohio.

Dry Kiln Apparatus

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

Dust and Shavings Separators

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

Dye Stuffs and Chemicals

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

DYNAMOS (See Motors and Dynamos)

Electric Motors and Transformers

Allis-Chalmers-Bullock, Limited, Montreal.
Packard Electric Co., St. Catharines, Ont.

Electric Mine Locomotives

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

Electrical Repairs

Keystone Engineering Co., Toronto.

Electrical Supplies

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

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

CLASSIFIED INDEX.

(CONTINUED).

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

Elevators and Conveyors

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

Elevator Insurance

Canadian Casualty & Boiler Insurance Co., Toronto.

Emery and Emery Wheels

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

Engineers (Chemical)

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

Engineers (Civil)

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

Engineers (Consulting)

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

Engineers (Contracting)

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

Engineers (Electrical)

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

Engineers (Mechanical)

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

Engineers (Mill and Hydraulic)

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

Engineers (Mining)

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

Engineers and Contractors

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

Engines and Boilers

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

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

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

Engravers

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

Exhaust Fans

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

Exhaust Heads

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

Exhausters

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

Factory Sites

(See Factory Locations, page 31.)

Feed Water Heaters

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

Feed Water Purifiers

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Files

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

Fillet (Pattern)

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

Filters (Oil)

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

Filters and Filtering Systems (Water)

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

Financial

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

Finials

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

Fire Brick and Clay

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

Fire Escapes

Darling Bros., Montreal.

Fireproof Partitions

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

Flour Mill Machinery

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

Forges and Blowers

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

Founders

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

Foundry Findings and Supplies

Hamilton Facing Mill Co., Hamilton, Ont.

Fuel Economizers

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

Furniture (Lodge, Opera and School)

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

Galvanizing

Ontario Wind Engine & Pump Co., Toronto.

Galvanizing and Tinning Machinery and Furnaces (Wire)

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

Gas and Gasoline Engines

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

Gauges (Recording Pressure)

Bristol Co., Waterbury, Conn.

Gauges (Steam)

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

Gauges (Water)

Babcock & Wilcox, Limited, Montreal.

Generating Sets

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

Generators

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

Gloves, Mittens and Moccasins

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

Government Notices

Factory Inspectors.
Minister of Agriculture.

Graphite

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

Hack Saws

Krug & Crosby, Hamilton, Ont.

Hammers

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

Hardware

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

Heating and Ventilating Apparatus

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

Hoisting Engines

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

Holsts (Chain and Pneumatic)

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

Hose (Fire and Pneumatic)

Gutta Percha & Rubber Mfg. Co., Toronto.

Hydrants

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

Hydraulic Accumulators

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

Hydraulic Machinery

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


HARRISON-WALKER REFRACTORIES CO.
PITTSBURGH, PA.

Fire Clay Silica Magnesite Chrome

BRICK


K
Regular Customers 1,100,000 Daily Capacity

Sole Agents
for
Carl Späcter
Magnesite
—
Importers of
Chrome Ore



OUT of every 100 Steel Crucibles in America, 75 show the McCullough-Dalzell trade-mark. A pretty good vote, but McCullough-Dalzell Crucibles were elected on MERIT. Write for prices.

MCCULLOUGH-DALZELL CRUCIBLE COMPANY, PITTSBURG, PA.



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TO THE VARNISH BUYER

the most serious considerations are quality, reliability and uniformity, and these qualifications are of special importance to the dealer who is trying to build up a permanent varnish trade.

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 Union Drawn Steel Co., Hamilton, Ont.

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 Petrie, H. W., Toronto.

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Bollers

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Leslie, A. C. & Co., Montreal.
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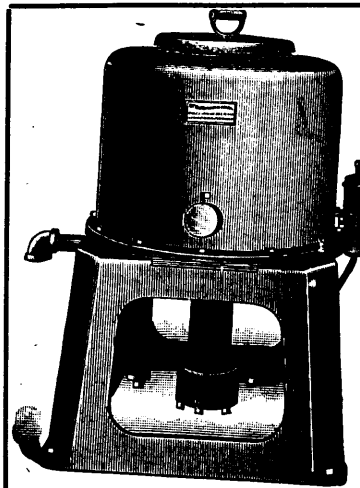
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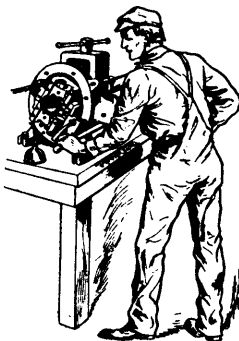
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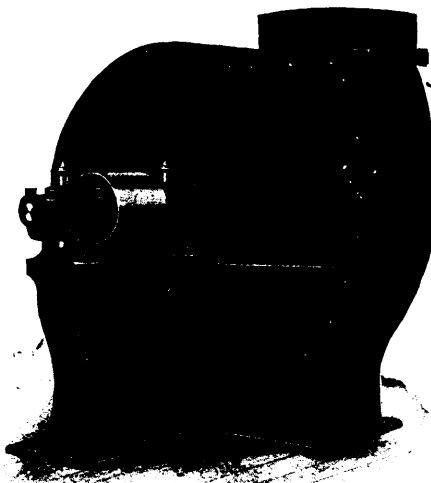
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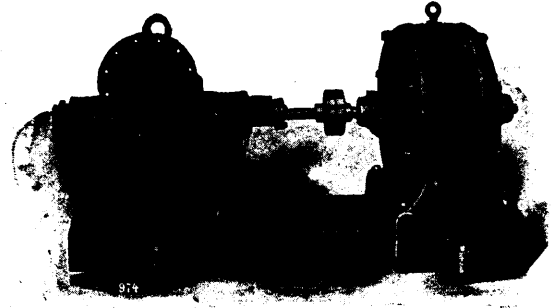
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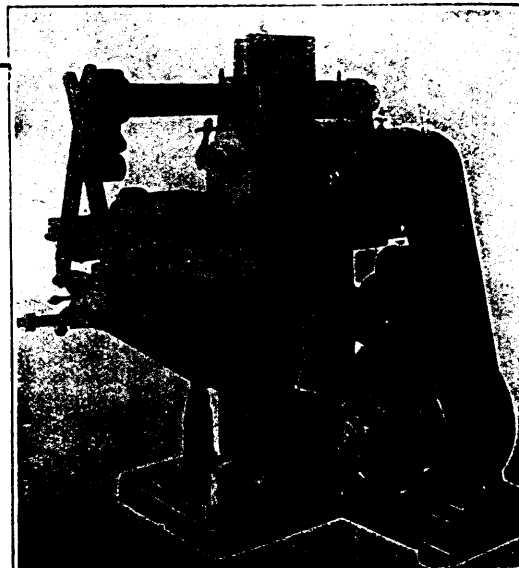
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