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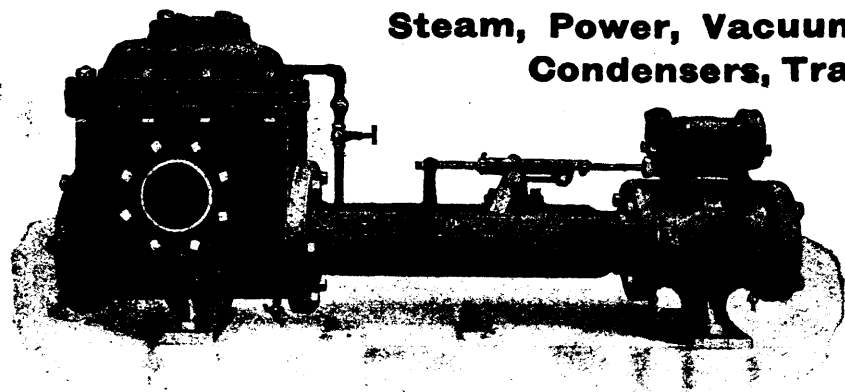
**CANADIAN MANUFACTURER**  
 AND INDUSTRIAL WORLD  
 DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

VOL. 52. TORONTO, APRIL 20, 1906. No. 8.

**B. & W. PATENT WATER-TUBE BOILERS**  
 Specially designed for the **RAPID, ECONOMICAL and SAFE** Generation of Steam up to the highest pressures.  
**Over 5,000,000. H.P. in use.**  
**BABCOCK & WILCOX, LIMITED**  
 HEAD OFFICE FOR CANADA:  
 NEW YORK LIFE BLDG., MONTREAL.  
 BRANCH—114 King St. West, - TORONTO.

**“REDSTONE” HIGH PRESSURE SHEET PACKING**  
 MAKES PERFECT JOINTS.  
 Does not blow out and requires no following up.  
 Try a sample lot and be convinced of its merits.  
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**The Gutta Percha & Rubber Mfg. Co. of TORONTO, LIMITED**  
 Head Offices—47 Yonge Street, TORONTO, CANADA  
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THE **Queen's Run Fire Brick CO.**  
 HIGHEST GRADE SHAPES A SPECIALTY  
**LOCK HAVEN, PENN.**



**Steam, Power, Vacuum and Centrifugal Pumps  
 Condensers, Travelling Cranes, Etc.**

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**The Smart-Turner Machine Co., LIMITED**  
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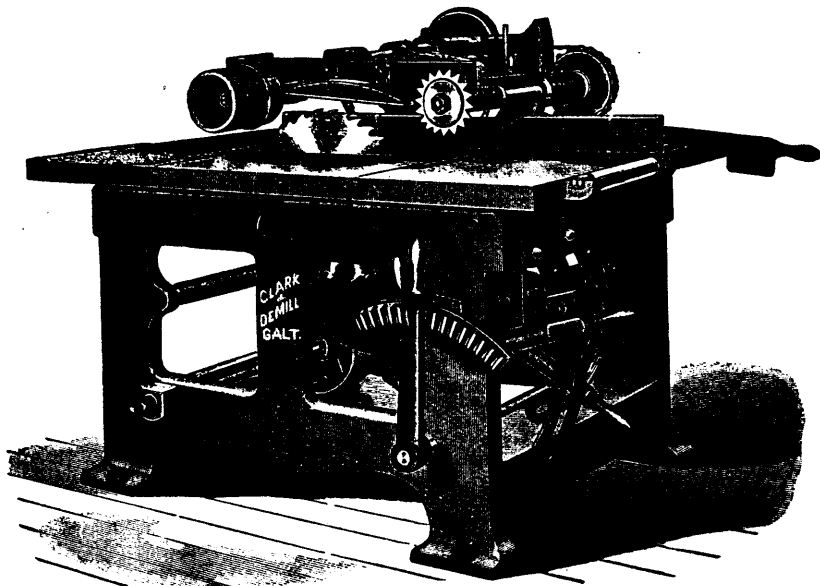
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 CAPACITY 3,000 TONS  
**McKinnon Dash & Metal Works Co., LIMITED**  
 ST. CATHARINES, - ONT.

**MAPLE LEAF STITCHED COTTON DUCK BELTING**  
**DOMINION BELTING CO. LTD.**  
 HAMILTON CANADA

**“CARRON” PIG IRON**  
 Oldest and Best Scotch Make.  
 More Popular Than Ever.  
**A. C. LESLIE & CO., MONTREAL**

**The Classified Index**  
 Beginning on page 37 of this issue of *The Canadian Manufacturer* will save our readers money, and should be consulted by them before purchasing.

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...Our No. 24 Variable Self-feed Rip Saw. A simple, substantial saw, designed for heavy work in Planing Mills, Furniture and Sash and Door Factories.

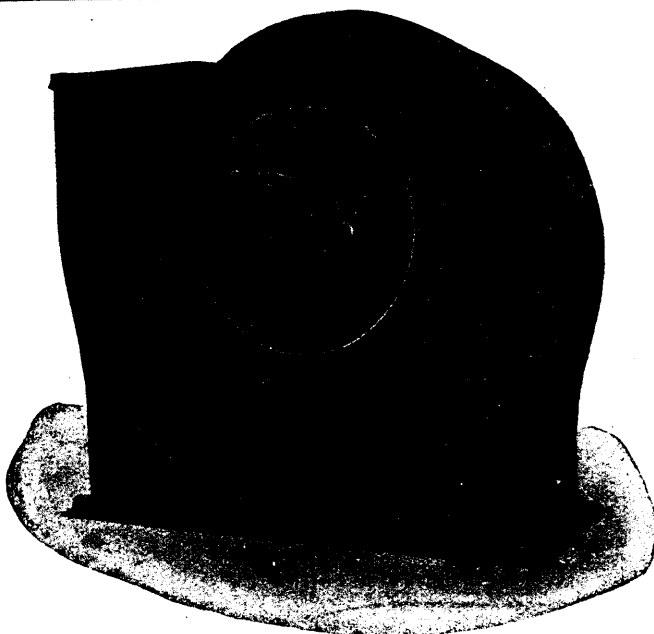
We aim to Lead in the Manufacture of New and Improved Wood Working Machinery

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**CLARK-DEMILL CO.,**  
LIMITED

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Galt, Ont.

Western Representatives  
The WATEROUS ENGINE WORKS CO., LIMITED, Winnipeg, Man.  
Agents for Manitoba, Saskatchewan and Alberta.



## HOT BLAST HEATING

### MECHANICAL DRAFT

DRYING SYSTEMS OF ALL KINDS  
FOR DRYING ANY MATERIAL

SHAVINGS EXHAUST SYSTEMS  
INSTALLED COMPLETE

Dry Kiln Trucks and Wheels, Lumber Dryers,  
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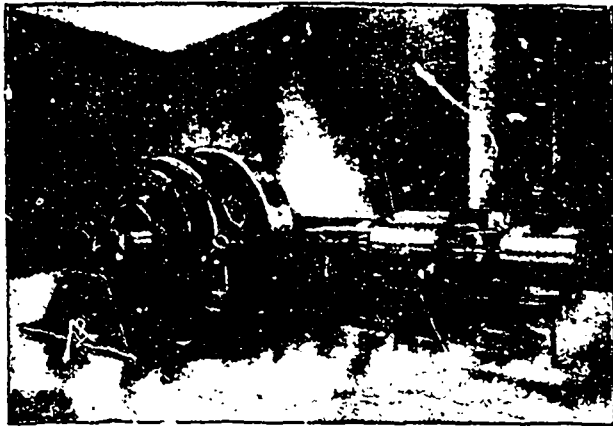
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VERTICAL AND HORIZONTAL STEAM ENGINES

## SHELDONS, LIMITED

Engineers and Manufacturers

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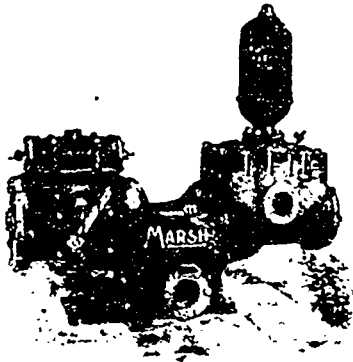
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Perfection in High Speed Engine Design,  
Noiseless Running, Perfect Lubrication,  
Accessibility, Economy.

The **GOLDIE & McCULLOCH Co., Limited**  
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WE MAKE Wheelock Engines, Corliss Engines, Ideal Engines, Boilers,  
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Meal Steam Pan Kilns, Wood Working Machinery, Iron Pulleys,  
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and Vault Doors.

SIMPLEX NOT DUPLEX  
"To be Simple is to be Great."



## MARSH AND AMERICAN STEAM PUMPS

"AMERICAN" COMPOUND PUMPS  
"AMERICAN" POWER PUMPS

Each Type at the Head of its Class.

AMERICAN STEAM PUMP CO., - Battle Creek, Michigan, U.S.A.

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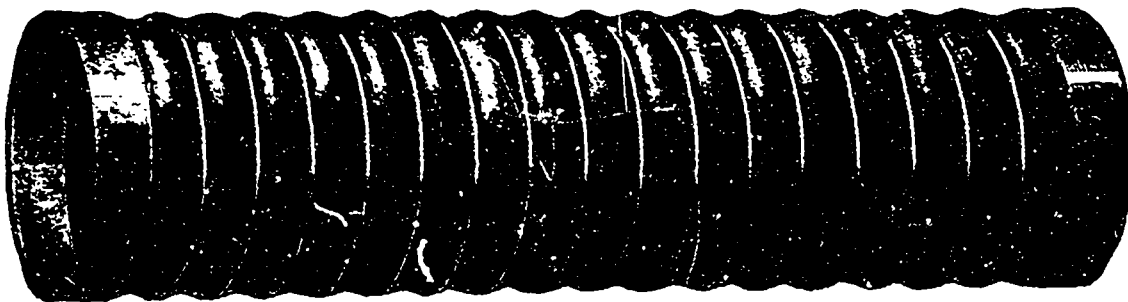


For Land and Marine Boilers

With Plain Ends or Flanged to any required shape.

Uniform Thickness, Easily Cleaned, Unexcelled for  
Strength, Unsurpassed for Steaming Capacity.

The universally satisfactory record of "THE MORISON" proclaims it the best furnace made.



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**THE CONTINENTAL IRON WORKS,** WEST AND CALVER STS., BOROUGH OF BROOKLYN, New York  
Near 16th and 23rd Street Ferries.

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SAULT STE. MARIE, ONT.

is now booking orders for

# STEEL RAILS

For delivery during the Season of 1906.

Parties intending purchasing will find it to their interests to let us have their specifications at an early date so as to ensure desired deliveries.

**DRUMMOND, McCALL & CO.,**

General Sales Agents.

OFF  
CONS.

Life Building, MONTREAL.

## CANADA IRON FURNACE CO., Limited

Montreal, Radnor and Three Rivers

Manufacturers of the well-known

**"C.I.F." Three Rivers  
Charcoal  
Pig Iron**

Suitable for Car Wheels, Cylinders  
and Fine Castings, where the ut-  
most strength is required.

UNSURPASSED IN STRENGTH BY SWEDISH, RUSSIAN  
OR AMERICAN CHARCOAL IRON.

Offices: Canada Life Insurance Building, MONTREAL.

## SCOTT'S IXL ALL High Speed Steel

- \* You cannot hurt this steel by burning it.
- \* Heat tools to an absolute white or Welding heat and then cool in oil (not Kerosene).
- \* With tools of intricate shapes or having fine edges, heat as near a White heat as possible and cool as above.
- \* Will cut at one speed faster than any other high speed steel on the market.

All sizes in stock.

THE  
BOURNE-FULLER CO.  
IRON, STEEL,  
PIG IRON,  
COKE.  
Cleveland, Ohio.

# NOVA SCOTIA STEEL and COAL CO.

MANUFACTURERS OF

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## BRIGHT COMPRESSED STEEL SHAFTING

FROM 1/2 TO 6 INCHES IN DIAMETER. GUARANTEED STRAIGHT AND TRUE TO WITHIN 1/16 OF AN INCH.

Spring, Reeled Machinery, Tire, Toe Caulk, Sleigh Shoe, Angles, Special Sections  
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RAILWAY AND ELECTRIC RAILWAY CAR AXLES

FISH PLATES, SPIKES AND TRACK BOLTS

Tee Rails, 12, 18, 24 and 28 lbs. per yard

**..HEAVY FORGINGS A SPECIALTY..**

**"SCOTIA" PIG IRON for Foundry Use**

Works—TRENTON, N.S., and SYDNEY MINES, N.S.

Head Office—NEW GLASGOW, NOVA SCOTIA

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THE CANADIAN COPPER COMPANY.

# NICKEL FOR NICKEL STEEL

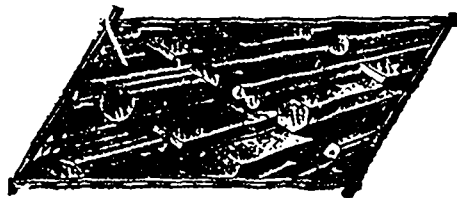
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**WRITE US FOR PARTICULARS AND PRICES.**

General Offices: 43 Exchange Place, NEW YORK.

## UNION DRAWN STEEL CO., LIMITED

**COLD DIE-ROLLED  
STEEL AND IRON**



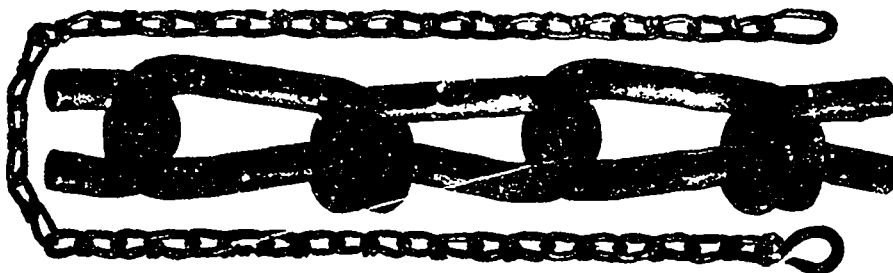
True to Size and Highly Polished.

**For Shafting, Piston Rods  
Screw Steel and  
Roller Bearing Rods**

**ROUNDS, SQUARES, FLATS AND HEXAGONS.**

**ASK US FOR PRICES.**

Office and Works: **HAMILTON, CANADA.**



## Brown's Patent Steel Wire Chain

If you are interested in Chains, examine carefully the perfect mechanical construction of the Brown's. It is the most perfect chain made. We make it in 13 sizes.

Correspondence solicited.

We send cuts with table of breaking strain, samples, etc., upon request.

**Hamilton, Ont.**

**THE B. GREENING WIRE CO., Limited.**

**Montreal, Que.**

## Make Your Money Earn More

Don't you want to invest your money to the best possible advantage?

Why put it in a bank or a mortgage at 3½, 4, 5 or even 6 per cent. when we can make it earn 20 per cent. for you.

No, this is no fake, neither is it a mining scheme.

It's simply a straight, legitimate business proposition,—a copper refinery.

And the only one in Canada.

Perhaps you don't know that copper is one of the most valuable metals used.

Well, it is, and the demand far exceeds the supply.

But we can get all we want, if we can only secure capital to increase our plant.

To do this, we're selling a limited number of shares of the stock of the Montreal Copper Co., Limited, at \$100 each.

Send for circular, it explains how 17½ per cent. was paid on the capital invested last year.

**MONTREAL COPPER CO., Limited, 332 William St., Montreal.**

# NORTHERN ALUMINUM CO., LIMITED

Shawinigan Falls, P.Q. Business Office Pittsburgh, Pa.

## ALUMINUM

INGOTS—SHEETS—TUBING, ETC.

*Aluminum Stamped, Cast, Spun Articles of any Description to Order.*

ALUMINUM WIRE and CABLES (BARE OR INSULATED) for Electrical Conductors.

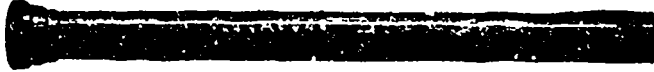
## MONTREAL PIPE FOUNDRY CO., LIMITED

SUCCESSORS TO

DRUMMOND-McCALL PIPE FOUNDRY CO.

(Limited)

Manufacturers of



"Specials," Hydrants, Valves, Etc.

Offices: - - - Canada Life Building,  
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## The Jenckes Machine Co., Limited

Mining Machinery; Pulp Mill Machinery;  
Steam and Water Power Plants.

Catalogues and Estimates on request. Correspondence Invited.

EXECUTIVE OFFICE—60 Lansdowne St., SHERBROOKE, QUE.

Sales Offices: TORONTO, ROSSLAND  
HALIFAX, VANCOUVER

Plants: SHERBROOKE, Quebec  
ST. CATHARINES, Ont.

During the fiscal year ending June 30, 1905, the imports of fuel into Canada and the value thereof were as follows:—Bituminous and Dust, **4,826,535** tons, value **\$8,346,352**; Anthracite and Dust, **2,604,137** tons, value **\$12,093,371**; Coke, **371,593** tons, value **\$807,842**; Charcoal, value **\$46,862**. Under the general tariff the duty on Bituminous Coal is 53 cents per net ton, and upon Bituminous Dust or Slack, and upon Charcoal, 20 per cent. There is no duty imposed upon Anthracite or Coke.

EVERY STEAM POWER PLANT IN CANADA USES COAL. EVERY FOUNDRY USES COKE.

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H. T. WILSON, Manager.

R. J. SINCLAIR, Sales Agent.

THOS. CHRISTIE, Canadian Sales Agent.

# THE H. T. WILSON COAL COMPANY

1321-1322 Majestic Building, - DETROIT, MICH.

## "Red Jacket" Coal

MINED IN WEST VIRGINIA.

The Best Bituminous Coal for Steam and Domestic Purposes.

Has a tough and blocky structure  
Smallest percentage of fine coal.  
Low in ash and sulphur and no clinkers.  
Not subject to spontaneous combustion.  
Nothing better for malleable iron works.  
One of the strongest steam coals.

RED  
JACKET  
THE

COMPARATIVE HEAT UNITS PER POUND OF COAL.  
Anthracite—See "Steam," published by Babcock & Wilcox Co., 13,985.  
"RED JACKET"—Determined by 50 weeks' test at Cincinnati Edison Plant, in 1901-2, the daily use of the coal tested being two hundred tons, 13,600.

BOILER TEST OF THE CINCINNATI EDISON CO., OF CINCINNATI.

Water apparently evaporated under actual conditions per pound of coal, 10½ lbs.  
Equivalent evaporated from and at 212 degrees per pound of combustible pounds, 12:33.

We also handle Pocohontas Coke. Correspondence solicited.

A Dead Man Does not subscribe Trade Paper  
for any

He does not need it. Perhaps he is also

### Busy About Other Things!

### Live Men Need Live Information

It can be had in

## The CANADIAN MANUFACTURER

It costs only \$1.50 a year

BE A LIVE MAN.

Send for Advertising Rates.

# PITTSBURGH COAL COMPANY

## Miners and Shippers

OF

## YOUGHIOGHENY GAS and PITTSBURGH STEAM COAL

Manufacturers of

### HIGH GRADE COKE

Loading and Fueling Docks at all Ports on the Great Lakes.

GENERAL OFFICES:

PITTSBURGH, PA.

H. K. WICK, President.

W. D. WARD, Secy. and Treasurer.

## H. K. WICK & CO.

(INCORPORATED)

Miners and Shippers of

## Bituminous Coals

Pittsburgh, Rooms 64 and 65  
Youghiogeny, Erie County Savings Bank Bldg.  
Brier Hill, Smithing.  
Mercer & Butler County Coals. **BUFFALO,**  
N.Y.

400 Individual Cars.

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For 1906

### KELLY'S DIRECTORY

OF THE

## MERCHANTS, MANUFACTURERS and SHIPPERS of the WORLD

Endorsed by the British Government.

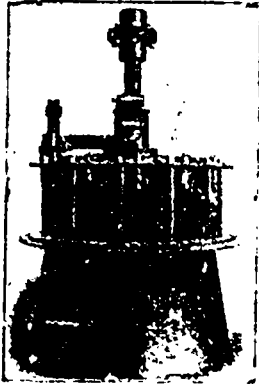
### KELLY PUBLISHING CO.,

Head Office LONDON, W.C., ENGLAND, and at New York, Paris, Hamburg, Melbourne, Sydney, Dundee, Cape Town, Bombay, Buenos Ayres, etc., etc.

Dominion Branch—70 DUNDON AVE., TORONTO



# The Samson Turbine



Can be adapted to all water power requirements, and will give the very best results under all conditions.

It is a very strong and durable wheel, and is unequalled for ease of regulation.

Develops more power per inch of diameter than any other wheel, and costs less to install per horse power developed.

Our catalogue tells all about it—send for a copy.

**THE WM. HAMILTON MFG. CO., Limited**  
350 Reid St. - Peterborough, Ont.

# JAS. H. MILNES & CO.

WHOLESALE DEALERS IN

Best Grades of **STEAM COALS.**  
Best Grades of **BLACKSMITHS' COALS.**  
Best Grades of **FOUNDRY COKES.**

Shipments made direct from Mines to any point in Canada. Write for quotations.

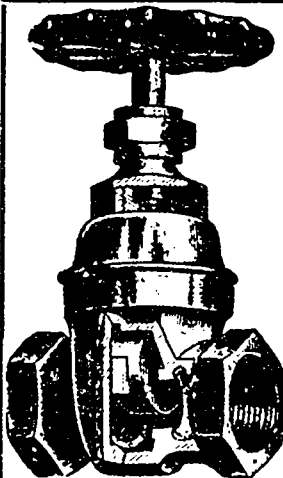
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**Docks: Esplanade, Foot of Yonge**  
**TORONTO.**

# STANDARD TELEPHONES

For Sale—**\$5.00 each**  
Slightly used, but in good order.

Apply to

**SALES DEPARTMENT**  
**178 Mountain St. Montreal, Que.**  
Or to any Local Manager of the  
**BELL TELEPHONE COMPANY OF CANADA.**



## 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.

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100 King Street West, TORONTO.

## METAL

HOISTING ROPE  
ELEVATOR ROPE  
HAULAGE ROPE  
LOGGING ROPE  
GUY ROPE  
ETC.

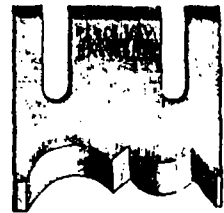
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ALL SIZES ANY LENGTH  
CARRIED IN STOCK  
**DOMINION WIRE ROPE CO. LTD.**  
**MONTREAL**

FITTINGS OF ALL KINDS  
BLOCKS  
CLIPS  
THIMBLES, ETC.  
WRITE FOR CATALOGUE  
IT WILL INTEREST YOU

# THE PETER HAY KNIFE CO., Limited



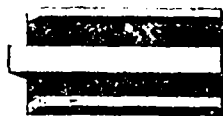
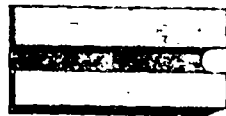
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Manufacturers of

## MACHINE KNIVES

For WOOD-WORKING,  
PAPER CUTTING and LEATHER SPLITTING  
MACHINES.



Quality Warranted.

Send for Price List.

SHEAR BLADES,

BARK and RAG KNIVES,

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ST. MARY'S, PA.

Best Fire Brick for Any Purpose.

There are none "just as good."

## Albert Manufacturing Co.

MANUFACTURERS OF THE WELL-KNOWN

"Hammer Brand" **Calcined Plaster**

AND

**PATENT ROCK WALL PLASTER.**

HILLSBOROUGH, N.B., CANADA.

# DUNBAR FIRE BRICK CO.

Manufacturers of High Grade FIRE CLAY and SILICA BRICK for Heating and Malleable Iron Furnaces, Glass Works, Cement Works--also Bee Hive and By-Product Coke Ovens, Brick and shapes of all kinds.

Pittsburgh Office : 1504 Arrott Building.

Office and Works : Dunbar, Pa.

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*Try It.*

# "Beech Creek" FIRE BRICK

STRICTLY HIGH GRADE

MADE ONLY BY

**PENNSYLVANIA FIRE BRICK CO.,**

BEECH CREEK, PA., U.S.A.

Special Mixtures for use in Rolling Mills, Malleable Iron Works, Steel Works, Blast Furnaces, Glass Tanks, Cement Kilns Locomotive Blocks, and all High Grade Uses.

*Difficult Shapes a Specialty.*

Send for Catalogue and Prices.

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 Surveys, Plans, Specifications and Supervision  
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 PAPER, PULP and SULPHITE FIBRE MILLS

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 Res., North 2239.

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 Contractors' Plant, New and Second-hand.  
 Steel Jaw Stone Crushers, all sizes.  
 Sturtevant Roll Jaw and Rotary Fluo Crushers.  
 Balanced and Centrifugal Rolls, Emery Mills,  
 Steam Road Rollers, Boilers and Engines.  
 Rock Drills, Concrete Stone,  
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**C. J. FENSOM, B. A. Sc.**

*Consulting Engineer*

ABERDEEN CHAMBERS, - TORONTO  
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 Residence, N. 2967

Machinery Designed, Supervised, Inspected and  
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First-class mills use

**LOWELL CRAYONS**

**WHY? THEY ARE WORTH THEIR COST.**

Will you try our Samples?

LOWELL CRAYON CO., - Lowell, Mass.  
 Original Manufacturers.

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 CLEVELAND, O.

**FIRE BRICK** SILICA FIRE CLAY  
 ALUMINITE  
 SILICA CEMENT

MAGNESITE BURNT MAGNESITE

Our factories are the most complete in the country. Located in Pennsylvania, Ohio, and Kentucky - and controlling the largest known bodies of Refractory materials for different work. Operated by experienced managers. We manufacture material for all heat work - second to none.

Capacity over 200,000 Brick and Special Shapes per day. Write for catalogue.

**Keystone Engineering Co.**

Limited

118 Bay Street, TORONTO, CAN.

Consulting and Contracting Electrical Engineers.  
 Complete Power Plants Designed and Equipped.  
 National Electric Code Standard Wiring.  
 Advisory Reports. Repairs, Alterations, Etc.  
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Bureau of Inspection, Tests and Consultation.

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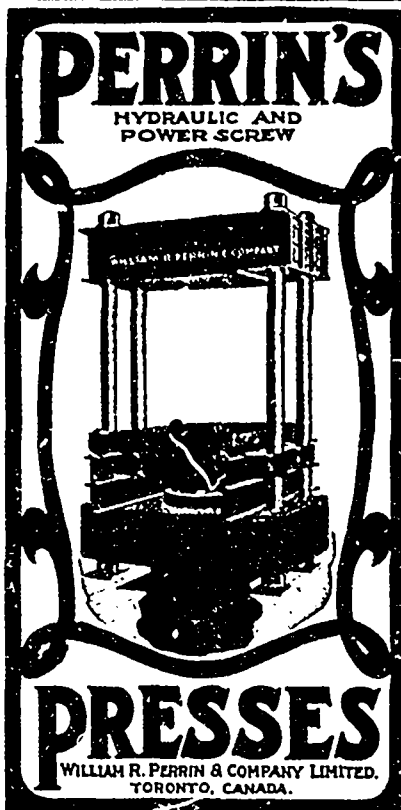
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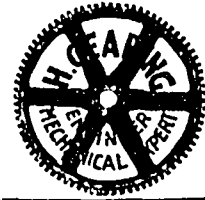
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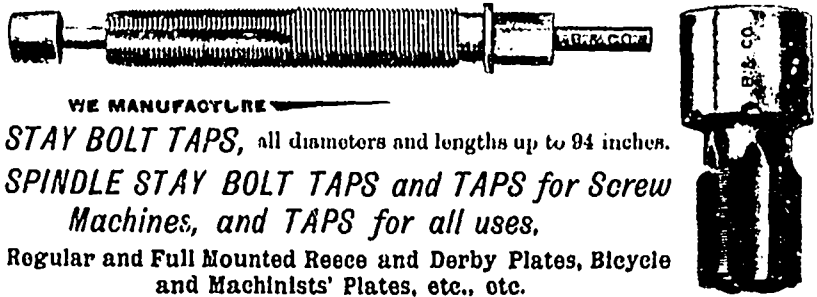
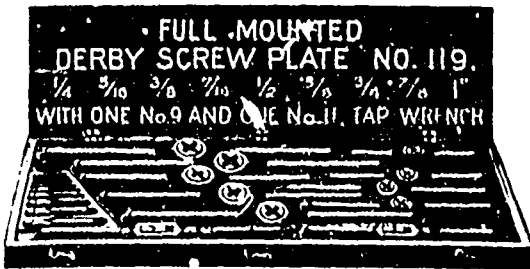
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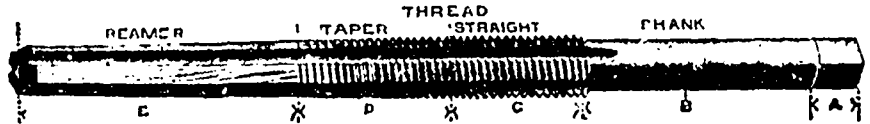
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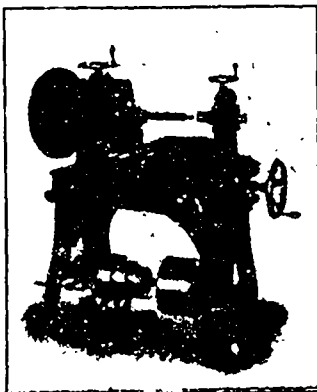
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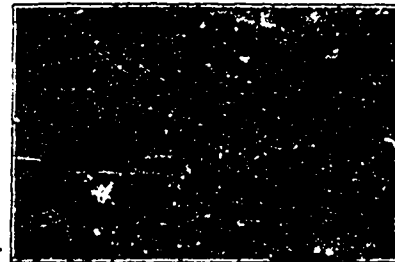
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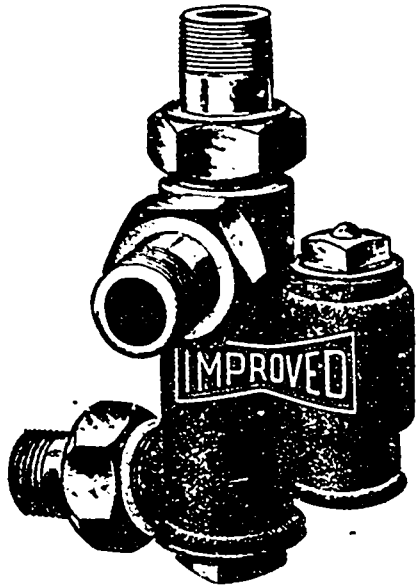
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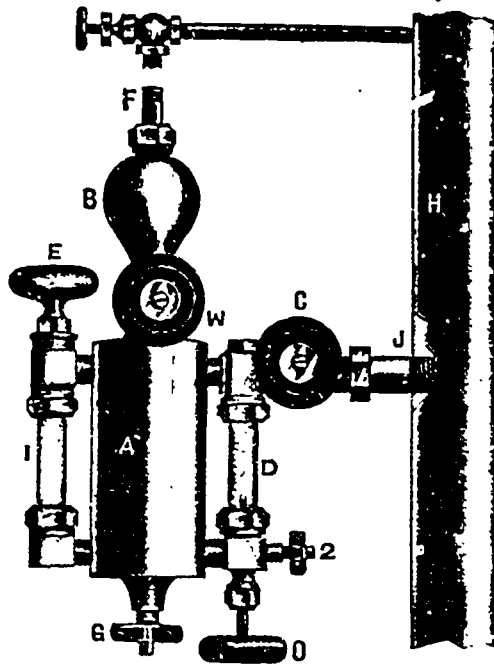
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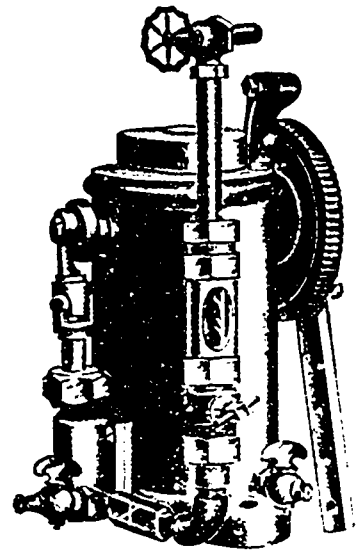
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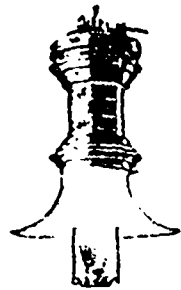


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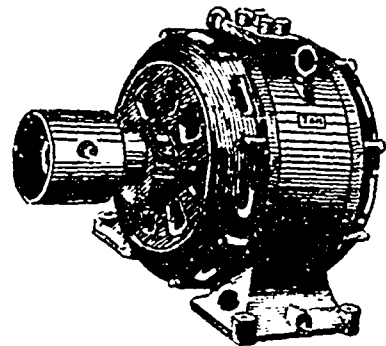
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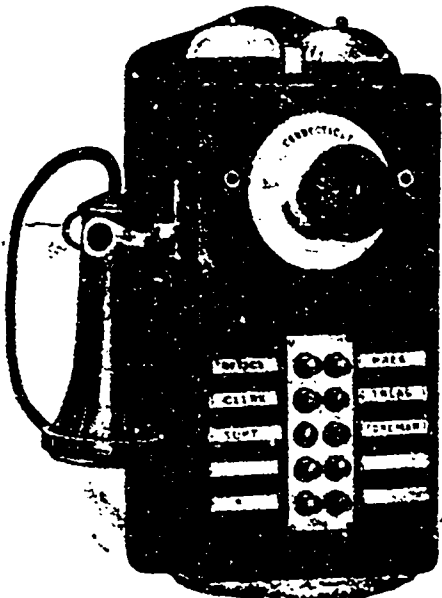
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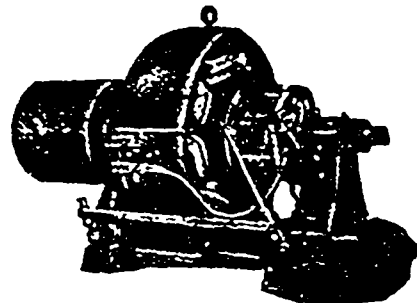
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TABLES

Manufacturing Plant Number.	Total Horse-Power.	Horse-Power to Drive Shafting.	Per Cent. to Drive Shafting.	Manufacturing Plant Number.	Total Horse-Power.	Horse-Power to Drive Shafting.	Per Cent. to Drive Shafting.
1.....	400	157	39.2	7.....	40.4	20.7	51.2
2.....	74	57	77	8.....	74.3	40	53.8
3.....	38.6	25.3	65.6	9.....	47.2	24.5	51.8
4.....	59.2	47.9	80.7	10.....	190	108	56.9
5.....	112	64	57	11.....	107	74.5	69.7
6.....	168	91	54.2	12.....	241	114	47.3
Average, heavy machine work,	.....	.....	62.3	Average, light machine work,	.....	.....	55.1

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J. J. CASSIDEY, Editor and Manager

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**IN RESTRAINT OF TRADE.—3.**

At the last meeting of the Tariff Commission at Ottawa, at which the president of the Canadian Manufacturer's Association and the chairman of its tariff committee were present, the question of preferential trade being under discussion, it was urged in behalf of the association that the tariff preference should apply only to such dutiable merchandise otherwise entitled to receive it as was imported through a Canadian port; meaning that under no circumstances should the preference be allowed if the merchandise were imported via a United States port. Since the hearing at Ottawa the executive council of the association, to emphasize their request, have again declared to the government their views in this matter as above shown.

According to the Dominion Trade and Navigation Returns the total value of all merchandise imported into and exported from Canada, from and to Great Britain through United States ports in 1905 was

Imports.....	\$12,399,326
Exports.....	25,279,117

Total..... \$37,678,443

The same authority shows that the total in-transit trade of Canada with all countries through United States ports in 1905 was:

Imports.....	\$24,642,877
Exports.....	33,446,327

Total..... \$58,089,204

The in-transit trade through United States ports between Canada and other countries is carried on under no inherent right of Canada. It is a concession granted us by the United States, the reciprocal feature of which is that a considerable portion of the trade of the United States with other countries is, under the arrangement, carried on through Canada.

In a previous article in this journal discussing this question, the hope was expressed that the Canadian Manu-

facturers' Association do not take themselves very seriously in asking the Government to disallow the tariff preference allowed by law to any merchandise imported into Canada unless through Canadian ports. The particulars of Canadian in-transit and trans-shipment trade through United States ports are not very fully explained by our statisticians, nor published in our Blue Books like they are set forth in United States publications having reference to the similar trade of that country; and much valuable information affecting Canada is contained in one of these now before us. It is entitled "In-transit and Trans-shipment Trade of the United States, by countries, from which received and to which shipped, during the year ending June 30, 1905." It includes all the principal commercial countries of the different grand divisions of the world from which and to which Canadian in-transit trade is had through United States ports; and the names of each and every United States port is given in which is shown the values of goods received into and shipped from during the year. In the schedule is shown the value of Canadian merchandise received into United States ports, transported through United States territory, and exported to Canada. Thus Canadian goods made in Nova Scotia or New Brunswick, destined for Montreal, or vice versa, transported across the State of Maine, would be included in the statistics. A recapitulation of the tables divides the different ports through which the trade is carried on as follows:—Atlantic ports, Gulf ports, Mexican border ports, Pacific ports, and Northern Border and Lake ports. As the in-transit trade through the United States is carried on chiefly with Canada, and to some extent with Mexico, they being the only contiguous countries, for the purposes of this article no reference is made to the trade via Gulf and Mexican border ports, and to no others where it is not evident that it was with Canada.

The different Atlantic ports in the United States through which Canadian trade was had are Bangor, Passamaquoddy, Portland and Falmouth, in Maine; Boston and Charlestown, Mass.; New York and Philadelphia. The Pacific ports are Alaska, Puget Sound, Wash., San Francisco, Cal., and Willamette, Ore. The Northern Border and Lake ports are Buffalo Creek, Cape Vincent, Champlain, Niagara and Oswegatchie, N.Y.; Detroit and Huron, Mich.; Duluth, Minn.; Memphremagog and Vermont, Vt.; Milwaukee, Wis., Montana and Idaho, and North and South Dakota.

The countries with which Canadian trade was done was, in Europe, Austria-Hungary, Azores and Madeira Islands, Belgium, Denmark, France, Germany, Gibraltar, Greece, Italy, Netherlands, Norway, Portugal, Russia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom. North America includes Bermuda, British Honduras, Canada and Newfoundland. The Central American States, Mexico, the West Indies—British, Cuba, Danish, Dutch, French, Haiti and Santi Domingo; South America includes Argentina, Brazil, Chile, Colombia, Ecuador, Guiana, British and Dutch—Peru, Uruguay and Venezuela. Asia includes Aden, China and Russian China; East Indies—British and Dutch, Hong Kong,



Japan and Turkey in Asia. Oceania includes Australia and other British possessions, French and German Oceania, and Philippine Islands. Africa includes all British possessions, Canary Islands, French, Portugese and Spanish possessions and Egypt.

The aggregate foreign trade of Canada, import and export, is larger, more diffused, and conducted through a larger number of American ports than most of our readers have any correct idea of; and constitutes a very substantial portion of American in-transit trade. The following recapitulation shows the entire value of the in-transit and trans-shipment trade of the United States in 1905, in all of which Canada was concerned except that which appears to have been done with Mexico and to smaller extent with Cuba.

	Received into United States.	Shipped from United States.
Europe.....	\$33,949,366	\$44,499,483
North America.....	61,657,982	50,142,070
South America.....	4,993,593	4,431,072
Asia.....	2,759,776	1,750,875
Oceania.....	295,738	1,991,178
Africa.....	8,305	850,082
Total.....	\$103,664,760	\$103,664,760
Deduct Mexico, etc.....	3,841,324	3,945,998
Net total.....	\$99,823,436	\$99,718,762

Total in-transit and trans-shipment trade of Canada with the rest of the world except the United States through United States ports:

Received into United States.....	\$99,823,436
Shipped from United States.....	99,718,762
Total.....	\$199,542,198

This large value—nearly two hundred million dollars—indicates the interdependence of Canada and the United States in the matter of in-transit trade with the rest of the world, but does not in any way refer to the trade between the two countries.

In 1905 the purchases of Canada from the United States, for home consumption, dutiable and free, and the sale of Canadian produce to the United States, were as under:

Imports from United States.....	\$162,738,571
Exports to United States.....	70,426,765
Total.....	\$233,165,336
In-transit trade.....	199,542,198
Total.....	\$432,707,534

According to the Dominion Blue Book the total value of all merchandise, dutiable and free, imported into Canada for home consumption in 1905 from all countries, and the total value of all exports of Canadian produce in that year was as under:

Imports.....	\$261,925,554
Exports.....	190,854,946
Total.....	\$452,780,500

The foregoing facts show a remarkable condition of things affecting Canadian foreign trade and Canadian prosperity. We see that the total value of the foreign trade of Canada, import and export, in 1905 aggregated \$452,780,500; and that our direct trade with the United States, import and export, was \$233,165,336—and our

in-transit trade with the rest of the world through United States ports—\$199,542,198—total, \$432,707,534—which shows a very intimate and important connection between the two countries; and that a value of only \$20,072,966 in the way of trade is done by Canada by direct imports and exports with all other countries.

There are some features of the United States tariff that, in the opinion of Canadians, work an injustice to this country, particularly to our export trade; and it is these that serve the Canadian Manufacturers' Association as an excuse—not reason—for desiring to interrupt the kindly feelings that prevail between the two countries. The American tariff was made by Americans to suit themselves, and its unfriendliness towards Canada is a condition, not a theory that we have to face and recognize. At the same time we find it to our interest to carry on a large trade with that country because we find it convenient to do so; and we also have imperative necessity to transact much of our import and export business with the rest of the world, including Great Britain, through American ports. We do not do this in-transit trade because we desire to patronize American ports, but because we find it to our interest to do so. It is no answer to our argument that the interruption or discontinuance of the in-transit trade would work injury to American ports and American routes of transportation. The fact that the in-transit trade is of vast value to Canada should be sufficient argument to the association to abandon their efforts to disrupt the pleasant relationship that exists between the two countries. Therefore we have spoken of their advice to the Government to disallow the tariff preference allowed by law to British goods imported into Canada, unless it be through Canadian ports, as unwise, unnecessary, unfair, impracticable, insincere, ill-considered, calculated to create ill-feeling among members of the association, lack of respect for the association wherever the matter may be brought to attention, and in restraint of trade. During the last few years one of the most prominent activities of the association has been to raise obstacles to the trade between Canada and the United States, and it is time that the mischief making nuisance was abated.

#### ANGLO-AMERICAN FRIENDSHIP.

The recent attendance of Earl Grey, Governor General of Canada, at the Pilgrim's banquet in New York, has given renewed interest to the unsettled questions affecting Canada and the United States. Mr. Joseph H. Choate, late United States Ambassador to Great Britain, was an active participant in bringing about the presence of Earl Grey at the banquet, at which Hon. Elihu Root, Secretary of State of the United States, was also present.

Mr. Choate, speaking to the toast to Earl Grey, said:

"We welcome him on public grounds because he is the fitting personal representative of his august Sovereign, the King of England, who, ever since he came among us as a comely youth in 1860 has been a steadfast friend of the United States, and who, since his accession to the throne, has lost no opportunity to show his appreciation of our Government, our country and our people. The

Dominion of Canada is a nation with which we should live in perpetual peace, but all remaining questions should be settled as soon as possible. She is not only our nearest neighbor, but our nearest and most important rival."

Replying to the toast to him, Earl Grey said in part:

"I am aware that this banquet is the expression of your desire to emphasize and, if possible, promote the good relations already existing between the United Kingdom, the self-governing nations of the British Empire and the United States. That same desire also possesses and completely fills my heart.

"Coming, as I do, from Canada, whose sparkling winters make her in more senses than one the brightest jewel in the British Crown, may I tell you what I know you will be glad to hear. We have safely embarked our national ship on the ocean of enormous development, and in order to enable us to realize as quickly as possible the magnificent destiny that awaits us, we hope you will allow us to continue to draw largely on your friendship and powerful assistance.

"Mr. Choate chaffed us the other day at Ottawa, with that kindly humor in which he so pre-eminently excels, for the modesty which has caused every Canadian from the Prime Minister to the youngest enfranchised citizen of the Dominion to believe that if the nineteenth century belonged to the United States, the twentieth century belongs to Canada. This is the stimulating faith of the people whom I represent. Any idea of the possible annexation of Canada by the United States is scouted by us as an impossibility as great as you would regard the annexation of the United States by Canada."

The Earl spoke of the part Canada played in the up-building of the United States, saying there are 2,827,000 persons of Canadian birth or descent in the United States, and that French-Canadians were the founders of Chicago, St. Louis, Pittsburg, New Orleans, Detroit, St. Paul, and Milwaukee.

"Just as Canada is proud to think that 2,800,000 of her stock is bringing vigor and strength to your Republic, so I feel sure you will be pleased that an ever-increasing flow of your people into the Dominion will, by the addition of the character, experience and energy which they will bring to our country, contribute to its greatness. The more Americans that come to Canada, the better pleased we shall be. We are not afraid that they will make less good and loyal Canadian citizens, than they have been good and loyal American citizens.

"Given on both sides of our boundary a continuation of the present unreserved and ungrudging respect for each other's just and legitimate rights, a heartfelt and chivalrous desire to promote each other's interests, and to meet each other's requests in the fullest degree consistent with the maintenance of our self-respect, and we shall continue to advance hand in hand and shoulder to shoulder along the path of common development and towards the attainment of a common ideal.

"To those of us who believe that in the coming solidarity and unification of the Anglo-Saxon race lie the future peace and hope of the world, the signs of the times are most encouraging.

"The forces of the world are slowly but steadily drifting in this direction. Let it be our privilege in our generation to do nothing to prevent the flow of these currents, which, if uninterrupted, will one day course together in the mingled waters of one mighty and irresistible river.

"There are several questions outstanding between the Dominion of Canada and the United States, which have

been left open too long, and which call for settlement. Both Governments desire to take advantage of the opportunity which the present feeling of amity between the two countries affords, and I am persuaded that the hearts of the two peoples on both sides of the frontier will be glad when their respective governments have given effect to their desires. You and I and my fellow Canadian guests all come from the same splendid old mother stock. We speak the same language, we are pressing towards a single goal, we are united in hope, in aspiration and faith, and if we are co-sharers in nine-tenths of the past, may we not hope that we are co-partners in the whole of the long future that is looming up on our horizon?

"It is the proud mission of the future Anglo-Saxon race to maintain in advance the cause of civilization throughout the world. England thankfully recognizes your desire to co-operate with her in this beneficial work, and the knowledge that the Stars and Stripes and the flag of England stand in the gateways of the world, as on these walls, their varying colors draped together fold within fold, as the joint emblem of freedom, righteousness and duty may make us all proud, first, that we have a big duty to perform to the world, and, secondly, that so long as we are true to each other and to ourselves, we shall have the strength as well as the will to accomplish the noble purpose of our joint and splendid destiny."

Secretary Root responded to the toast, "International Comity," in which he replied to the pleasant things Lord Grey had said, and alluded to the prospect of amicably adjusting such matters as are at issue between Canada and the United States.

The spectacle of such a love feast is fit for the admiration of the gods, the whole Yankee nation and of the Britishers, but to Canadians it looks suspicious and smells fishy. The appearance of it indicates the preparation of the way to submit all matters in dispute between Canada and the United States to the arbitration of a treaty or convention between the United States and Great Britain, with Canada playing a very small part, with Lord Alverstone casting the deciding vote. Canada regretfully remembers the Alaska boundary affair of a few years ago, when our rights were sacrificed by Great Britain to conciliate the Yankees; and in our opinion should Great Britain accede to the proposition of Secretary Root or President Roosevelt to submit the differences to such a tribunal as that in which Lord Alverstone threw his casting vote against Canadian interests, it will be the last time Canada will ever submit to such interference on the part of the Mother Country.

In England the speech of Earl Grey is regarded as marking an important point in the development of the relations between the Empire and the Republic. It is remembered that in the past there have been rifts in the lute of that intimacy that should exist between Canada and Britain, growing out of the sacrifices made by Canada at the demand of Britain, in her desire to conciliate the American government. The Alverstone business was the straw that broke the back of Canadian endurance, and we want no more such business. No wonder the Americans prefer to leave the settlement of their disputes not with Canada, who is not inclined to be imposed upon again. Canada's interests have been repeatedly sacrificed by British over-anxiety to conciliate American demands, we hope for the last time.

## NEW HANDS AT THE BELLOWS.

The Canadian Manufacturers' Association are sending out a brochure in which it is announced "What the Association is: What it Does, and What it Costs." It is very nicely gotten up, and contains some very amusing matter. The reason for its appearance is, perhaps, that quite recently a couple of new hands have been put in charge of the blowing machine, and something had to be said. What it says about "The Association" is rather more than amusing. It lacks that element of accuracy and veracity which is necessary to commend it to those who admire truth. It repeats in effect what Industrial Canada said in a recent issue regarding the growth of the association in the past six years, that in 1899 the association was little more than a name; that as an organization it was almost entirely local, centering chiefly in Toronto and a few surrounding towns; that beyond the borders of the province of Ontario it was practically unknown, that its membership numbered only 132 all told; that from a local or at most a provincial organization it had now become national, and had extended the sphere of its operations 1,000 miles to the east and 3,000 miles to the west. Of course the article consisted of a string of false statements to which the attention of the association has been directed, but which are again repeated in the brochure. If Industrial Canada had desired to be fair to the Old Guard, who organized the association in 1871, many of whom retain their membership in it until now, it would have corrected its misstatements, or at least have refrained from repeating them. If it did not know at the time that it was false to its old friends it has had the opportunity since then to learn different, and it now knows for a fact that during the decade from 1890 to 1899 inclusive, the association, which it says was almost entirely local, centering chiefly in Toronto, counted in its membership more than 350 different Canadian manufacturing concerns, many of which retain their membership until now, and that the Ontario contingent included about every important industrial concern in the province. It said that beyond the borders of Ontario the association was practically unknown; but it is now and no doubt was aware of the fact that not only Ontario, but also the provinces of Quebec, Nova Scotia, Manitoba, and British Columbia were also represented in the association. The new hands at the wind instrument are welcome to all the credit they may acquire for themselves and the association also in their untruthful assertions.

Speaking of "Legislation," the brochure tells us that during each session of the Dominion Parliament it is continuously represented at Ottawa by representatives who present the views of the manufacturers on every matter affecting their interests; and in another place, speaking of the tariff, it says that the association is in hearty sympathy with a preferential tariff within the Empire designed to bring from the other parts of the Empire such goods as we must import; and that it disapproves of the bounty system as a substitute for protection. It is to be noted that at the invitation of the Finance Minister, the president and other officers of the association waited upon him at the closing sessions of

the tariff commission in Ottawa, in January, to show why there should be an entire revision of the tariff, as demanded at the Halifax meeting several years before, and according to the report published in Industrial Canada much was said about the value of the home market, with which all agree, and why protection should be observed, regarding which there is no dispute, but not one reason for the continued encouragement of the iron industry, the most important enterprise in the country. The association knows that it is the fixed determination of the government not to increase the duty on pig iron, but to give encouragement to it in another way—by bounty on domestic production, but we are told that the association disapproves of the bounty system. The generosity displayed towards "the other parts of the Empire" in the matter of the preference is to rate duties high enough to keep British goods out of the Canadian Market.

To non-members the booklet is intended to give but a small idea of what the association is doing; and to members it is intended to serve as a reminder of the advantages of membership. The new hands at the bellows are trying to earn their salaries.

## HE SPEAKS TRULY.

Australian Hardware and Machinery, of Sydney, N.S.W., sizes up the lack of enterprise on the part of British manufacturers in conducting trade between Australia and the Mother Country. It says:

"A vigorous contribution to the question of trade with the United Kingdom was made by Mr. C. E. Webster, of Hobart, Tasmania. Speaking at a gathering of the local Chamber of Commerce specially called to meet Mr. R. F. Jeffray, the commissioner of the British Board of Trade, and addressing himself to agricultural implements and machinery, Mr. Webster pointed to the growth in recent years of business with the United States and Canada at the expense of Great Britain, which formerly held these markets.

"As to the reasons for this displacement," the speaker said, "the Americans pushed out and hustled for business. They were splendid advertisers and keen selectors of competent representatives. Moreover, they assisted and protected the agents appointed in every possible way, and showed great adaptability in meeting local requirements. To secure an opening they were ready to offer new patterns, and a demand once created they nourished it with great care. The British manufacturer, on the other hand, sat in his office, ordered a certain type of machine to be made, and sent it abroad to all markets. He did not reach out after business, but expected business to come to him. Nor did he attempt to bring his handiwork into line with the ideas of other people; because his goods suited the British market it was taken for granted that they would do for Australasia. Even when controlling the trade he made no effort to retain it."

"This is not new. It is but a forceful presentation of a contrast that has been drawn again and again. Business is diverted from Great Britain because her manufacturers are not progressive or wakeful enough

to keep or capture it, or are too busy and well off to trouble about it. The official figures indicate the value of the agricultural, horticultural, and viticultural implements and machinery, including reapers and binders, imported into the Commonwealth of Australia during the years 1903-4. In 1903 the United Kingdom supplied in round numbers 11 per cent. and Canada and the United States between them 83 per cent. of the whole, whereas in 1904 Britain claimed 16 per cent. and 'America' 82 per cent., being an increase in the one case and a decrease in the other."

#### A NEW TARIFF WEAPON.

New Zealand is waging war on a certain powerful American manufacturing concern which has set out to capture the New Zealand market in its line. It has adopted as its chief weapon in the fight a novel bonus system, and has established a new precedent in the interpretation of tariff laws which offers immense possibilities for development as a club in waging international trade wars.

It has passed an act providing that in the present emergency goods of British manufacture which compete with the American lines in question shall be deemed to be manufactured in New Zealand, and that the importers of such goods shall be regarded as their manufacturers with headquarters in New Zealand.

In other words, the British goods are imported duty free, whereas the American article is subjected to a severe duty, and 33 per cent. of the duty imposed on the American article is paid over as a bonus to the New Zealand manufacturers and importers whenever the agents of the American concern cut their prices.

This two-edged sword is expected to accomplish the undoing of the American interests and discourage their further efforts to capture New Zealand's trade. It has at least made it impossible for the Americans to do business in New Zealand for the present except at an immense loss, and the question is whether the Americans will swallow their losses and fight it out until the New Zealanders tire of the game and begin the use of the American goods because of their admitted superiority over the British article, regardless of the consideration of price.

#### RE ADVERTISING.

The New York Commercial, discussing export advertising, says that manufacturers often do themselves great injustice and condemn their advertising mediums without cause—that impatience is a common failing with them. What it says about advertising for export trade is, in most particulars, equally applicable to advertising for home consumption. It says:

Manufacturers who advertise for export trade often do themselves a great injury and condemn their advertising mediums without just cause through failing to take into consideration the element of time required for mail to be carried back and forth between American seaports and foreign countries. This is but another form of the impatience which is a common failing among would-be exporters. This particular failing is especially common among manufacturers who do a business in America on a mail order basis or who have lines of goods sold at special

seasons and which attract buyers quickly for one reason or another.

It is not uncommon for export publications to receive proposals from manufacturers to take advertising for very brief periods of time with the promise that if results are good the advertising will be continued. The manufacturer thus endeavors to test the medium and the drawing powers of his own advertising by "taking a flyer" or two and counting not at all on the influence of persistence in advertising. The idea is that if the advertisement is ever noticed it will be noticed the first time it is seen and also that no good can come from it after the first few months that it has been before the public.

While this may apply to certain magazines which circulate widely among the general public it never applies to trade advertising, and least of all does it apply to export advertising, and any advertiser who attempts to test a medium or the possibilities of a certain foreign market by placing small advertising orders of the ordinary kind for brief periods of time is doing himself a great injustice. Some export advertising mediums refuse to admit advertising in their columns for less than one year at a time, telling the advertiser that anything less than a year's effort would only be doomed to failure.

Exceptions to this rule must be made in the case of special numbers and issues devoted to special trades, and much of the most effective advertising now being placed in America is found in such publications, the usual weakness of the "one time order" being compensated for by the extra attention given the subject matter in hand.

Manufacturers endeavoring to assist the growth of their export trade by means of export mediums should remember not only that it takes a long time for foreign mail to travel back and forth, and that trade publications are not read hastily and then thrown away but are usually kept on hand indefinitely for reference purposes, particularly if they contain really necessary trade news. They should also remember that foreign merchants can hardly be expected to drop all other business on receipt of an export journal and immediately turn to its advertising pages and dispatch a large mail in reply to the advertisements. Even if they were to do this unheard-of thing, it is doubtful if they would reply first to the advertisements of total strangers. It is more likely that they would communicate with firms whose names had become somewhat familiar to them through previous advertisements. The tendency to be "penny wise and pound foolish" can be so easily gratified in the advertising business that advertisers cannot keep their inclinations too closely under observation when they are looking for foreign business. The wisest advertiser is one who reads his own advertisement through his customer's spectacles, and who tries to analyze the conditions at the customer's end of the line, and who does not expect his customer to do something that his own better judgment would instantly show him to be out of all accord with ordinary business procedure.

"If one were Czar of Canada, it would be his master stroke of policy to suspend the preference to Great Britain until the prohibition against Canadian cattle is cancelled." So said Sir William Van Horne, of the Canadian Pacific Railway, in Montreal a few days ago, referring to the regulation decreeing the slaughter of Canadian cattle shipped to British ports. What is the necessity of the preference anyway? What good has it done? It does not increase imports of British dutiable goods into Canada in proportion to imports from the United States and other countries. Are or are not British manufacturers able to compete on equal terms with other countries in the Canadian market?

## CANADIAN TRADE.

The prosperity which prevails throughout Canada is well illustrated by the trade returns for the nine months ended March 31. These figures reveal a total foreign trade of \$396,859,305, or fifty-five and three-quarter millions more than for the same period of the previous fiscal year. The imports for consumption amounted to \$207,202,084, being a gain of nearly eighteen and one-half millions. Imports of dutiable goods showed an increase of almost sixteen millions and free goods a betterment of over seven millions. The latter is an indication of brisk manufacturing. In regard to exports the showing is better. We shipped abroad domestic products to the amount of \$176,394,495, an increase of thirty-one and a half million dollars. The most significant gain in exports is that in agriculture, which totals nearly sixteen millions. The other increases are:—Products of the mine, \$2,608,440; fisheries, \$4,117,016; forest, \$3,245,644; animals and their produce, \$3,504,473; manufactures, \$2,139,697. The following are the imports and exports in detail:

## Imports for Consumption—9 months:

	1905.	1906.
Dutiable goods.....	\$108,343,276	\$124,171,278
Free goods.....	70,925,678	78,039,659
Total.....	\$179,268,954	\$202,210,937
Coin and bullion.....	9,515,855	4,991,147

Grand total.....	\$188,784,809	\$207,202,084
Duty collected.....	30,750,154	33,857,798

## Domestic Exports—9 months:

	1905.	1906.
Products the mine.....	\$22,907,006	\$25,515,446
“ fisheries.....	2,484,529	12,601,545
“ forest.....	23,231,452	26,477,096
Animals and their produce....	50,496,852	54,001,355
Agriculture.....	24,484,114	40,374,626
Manufactures.....	15,230,354	17,370,051
Miscellaneous.....	28,601	54,376

Total merchandise.....	\$144,862,908	\$176,394,495
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## EDITORIAL NOTES.

Despite the decision to postpone the consideration of the tariff until the next session of Parliament special legislation in that direction is asked for on behalf of the Atikokan Iron Co., by Mr. J. J. O'Connor, of Port Arthur, who was in Ottawa some days ago, urging that a bounty of \$3 per ton should be given on pig iron made from Canadian ore, and that the present duty on pig iron be raised from \$2 to \$3 per ton. We are not advised whether the Atikokan Iron Co. are members of the Manufacturers' Association, but it may depend upon their application being opposed by the association, which disapproves of the bounty system.

A press despatch from London a few days ago says that the storm aroused by the Natal affair has in no way subsided. The newspapers are full of despatches from the colonies protesting against the action of Lord Elgin and sympathizing with the Natal Government, and the prominent men connected with the colonies who have been

interviewed all deprecate what they term the Government's hasty and ill-advised action. Even the Government's supporters appear to find themselves hard pressed to justify Lord Elgin's action. It is pleasing to learn that the British Government receded from its hastily assumed position, and that the convicted murderers were duly executed. Lord Elgin seems to have lost sight of the events that lost the allegiance of the thirteen American colonies in 1776.

In his speech at New York the other day Lord Grey uttered the highly original remark, "Canada is Britain's Brightest Jewel." We would advise his Excellency not to patent that remark, because it isn't true. Canada may be a jewel, but it is not Britain's jewel. It is owned by the people of Canada. Britain does not own one rood of land in Canada, not even the drydock at Halifax. Then what is the use of talking "rot!"—Eastern Chronicle, New Glasgow, N.S.

The manager of the "Made in Canada" Educational Campaign, conducted by the Canadian Industrial League, a graft of the Canadian Manufacturers' Association, has sent us some samples of a British Empire preference stamp, to be attached to letters, etc., which was designed for use in connection with the "Made in Canada" stamp published by the League. The legend upon the older stamp is "Keep your money in circulation at home by buying goods made in Canada;" and upon the other, "When you can't get what you want at home, buy within the British Empire." The manufacturers and consumers of Canada followed this advice last year by importing for home consumption to the value of \$261,925,554, of which \$60,342,709, or 23 per cent. was from Great Britain and \$162,738,571, or 62.2 per cent. from the United States.

A combine of lawyers to keep us from getting our wills drawn by honest men who are not lawyers; a combine of doctors to keep us from taking pills or syrups or plasters prepared for the common herd; a combine of druggists to keep us away from the drug counters of the departmental stores; a combine of nurses to shoo away all unregistered angels of mercy; a combine of undertakers to lay us out in regulation coffins at regulation charges; a combine of parsons to make the proper prayer over what remains of us after all other combines have had their turn! That is what we are coming to. And one wonders if life under such conditions is worth while. Surely Parliament will leave some chance for people to make mistakes, and to learn by experience, and to exercise gumption, without being pestered at every turn by legislative interferences. Protection is bad enough in the large matters of trade, but when it comes down to the everyday details of life it becomes an insufferable nuisance. The Legislature had better adjourn, when its chief business is playing pater to grown folks.—Toronto Globe.

The Globe has been dieting on green persimmons. Protection is good enough for Canada. Under it Canada is prospering and will prosper. Don't throw brickbats at the best policy Canada ever had. Let it scold the other fellows if it wants to, but no back wash about protection.

# MACHINERY AND ENGINEERING.

## SUCTION-GAS PROPELLED BOAT.

An English correspondent of the Scientific American, writing of a suction-gas propelled boat in Germany, says:

"The utilization of the suction gas engine for certain classes of marine work, such as the propulsion of barges, as designed by the well-known Otto Gas Engine Co., of Deutz, is being extensively developed in Germany for freight carrying traffic between the inland industrial centers and cities and the principal seaports on the coast. This movement is due to the greater economy that is proved to be derivative from the employment of this system of propulsion, since it enables the craft to be operated much more cheaply than is possible with steam or any other type of traction, while the work can be carried out much more expeditiously and efficiently than by towage either with animal, tug-boat, or other power.

"The Otto Gas Engine Co. have up to the present fitted their suction gas system upon eleven vessels, the power of the various engines ranging from 35 h.p. to 90 h.p. In these craft the design of the engine has followed the well-known horizontal arrangement, the number of cylinders in the case of the 35 h.p. engine being two, while for others developing the greater powers four cylinders are employed, in order to obtain a more perfect balancing of the engine. In the case of the 90 h.p. boat the engine has a running capacity up to a maximum of 325 revolutions per minute.

"Recently, however, the company have carried out another installation upon similar lines, which possesses especial interest, inasmuch as it is one of the largest installations of this type of plant for river traffic that has yet been designed. The craft in question, known as the 'Lotte,' is a flat-bottomed barge such as is generally used for this class of work, measuring 139 feet, 6 inches in length with a beam of 15 feet, and having a draft of 6 feet 6 inches with a load of 240 tons. The engine, which is of the four-cylinder horizontal type, develops a maximum of 100 h.p. It was originally designed for service upon the River Elbe, but when it was completed by the engine builders it was retained by them for their own river traffic between Cologne, Antwerp and Rotterdam, a total distance of about 190 miles.

"The engine, together with its necessary equipment comprising the producer, scrubber, etc., occupies but little space, being very compact and with the integral parts placed conveniently together. The gas producer is placed in front of the engine room and separated therefrom by a bulkhead with sliding doors, which may be closed during the time the grate of the gas producer is being cleaned and the ashes and clinker removed. In the opposite corner is placed the scrubber, while over the engine is carried the gas equalizing box. The engine is placed athwart the vessel, so that the crankshaft extends centrally, and in the same longitudinal plane as the propeller shaft, to which it is connected. The flywheel is placed between the sets of

twin cylinders, is about five feet in diameter, and of heavy proportions.

"For facilitating starting there is a small single-cylinder motor developing 6 h.p., and driven by benzine fuel, which sets the main engine in motion by means of a frictional connection with the flywheel, this coupling being continued until the ignition in the cylinders of the larger engine commences, and the latter has attained sufficient momentum to run without further assistance, when the small motor is thrown out of gear. This benzine engine also drives through belting and shafting a small fan-blower that is brought to bear upon the fuel in the producer, after the engine has been standing stationary for some time, thereby enlivening the combustion of the fuel within the gas producer.

"The power exerted by the engine varies from 80 to 100 h.p., and at the latter maximum power the engines are capable of driving the boat with a full load of 250 tons, at a speed of 3½ miles per hour against the current in the river, which at some places is somewhat swift and powerful. The total space occupied by the engines and necessary generating plant is approximately 14 feet in width by 20 feet in length.

"Propulsion is carried out by a single screw 4 feet 3 inches in diameter, fitted with four blades which are made reversible in direction by a rack-and-pinion motion. The reversing gear constitutes an interesting feature of the vessel. The rod which carries out the reversing motion ends in a series of toothed racks which gear with corresponding pinions on the axes of the reversible propeller blades. There is a combination comprising a friction coupling, differential gear wheels, toothed clutches, and helical gearing, through which the power requisite for reversing is taken from the main engine shaft, and the action of this combination causes the reversing rod to be moved backward or forward as the case may be. To operate the mechanism the clutch is thrown either into the forward or back gear by the manipulation of the frictional coupling with the main engine shaft. It is also possible to vary the pitch of the propeller blades in accordance with the action of the engine, there being a divided scale, and by varying the pitch in consonance with this it can be gradually increased until the maximum load is attained.

"This vessel has proved highly economical in operation. The distance between Cologne and Rotterdam is 187½ miles, and the time occupied on the round trip, including all stoppages, with an average load of 200 tons, occupies fourteen days, giving an average daily run of 27 1-7 miles under all conditions, thereby enabling twenty-six round journeys per year to be accomplished. The cost of the vessel is approximately \$11,250, and the annual expenses of operation, maintenance, etc., work out as follows:

Depreciation on hull, 5 per cent. on \$5,000.....	\$250 00
Depreciation on engines, 10 per cent. on \$6,250.....	625 00
Interest on capital, 5 per cent. on \$11,250.....	562 50
Insurance.....	11 25

Navigation dues, 26 round trips..	\$975 00
Fuel—anthracite at \$5 per ton—burned at the rate of 1.32-pounds per horse-power hour for 75 hours per round trip, 50 hours upstream and 25 hours downstream—117 tons.....	585 00
Lubricating oil, etc.....	243 75
Wages.....	1,750 00

Total annual outlay..... \$5,002 50

"During the year, 5,200 tons were carried, representing 1,950,000 ton miles, which corresponds to a cost of about 0.25 cent. per ton. Had the material been transported from Cologne to Rotterdam by the ordinary steamboats, the tariff for transport would have been about 50 per cent. higher, while the lowest rate by the railroad would have been five times as much. On the Saarbrücken-Muhlhausen canal there is a barge of 240 tons fitted with a similar engine, and in this case the round trip of 170 miles occupied thirty days, including nine days detention, and nine days with light load. Under these disadvantageous conditions the cost of the transport by the suction-gas propelled craft is 33 per cent. lower than that of horse traction, while the boat during the year makes eleven round trips as compared with seven complete journeys which were possible by animal traction before the introduction of the present system."

## IMPROVED SMELTING FURNACE.

A report from Vancouver, B.C., states that the Feonan smelter at Pilot Bay, Kootenay Lake, is being equipped with a new 120-ton Blanchard furnace as the result of an extended trial with a 40-ton plant. It says that the Blanchard furnace uses coal instead of coke at about one-half the cost, and when smelting the sulphide ores the sulphur is used in combustion, thereby making a still further reduction in expenses. It is stated that this furnace does not require crushing and roasting of the ores, which means a very considerable saving. The following description of the furnace and the method of its operations has been published:

"The new furnace is a double one placed side by side, having connection through the bottoms. Fuel is placed with the charge only in the first. The top of the first is sealed, that of the second is left open. Air is admitted through a double row of pipes, tuyeres, instead of a single row. The tuyeres are placed in the middle of the furnace instead of at the bottom for the purpose of obtaining a perfect combustion, another saving. The gases generated by the first pass in flames through the bottom of the first into the second, where there is no fuel but where, nevertheless, the experiment has shown the heat to be far fiercer than in the first, and where two to five charges are reduced while one is being put through the first, according to the amount of sulphur, etc., in the ore used."

The Blanchard furnace is the invention of a gentleman residing at Spokane, Wash., and a Spokane company is manufacturing the machinery and installing the plants.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

## 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.

Mr. H. C. Minnett, Gravenhurst, Ont., has placed an order with the Smart-Turner Machine Co., Hamilton, Ont., for one of their centre, outside packed duplex plunger pumps.

The flour and saw mills of John E. Ratz, Gadshill, Ont., were destroyed by fire April 4. Loss about \$10,000.

The grain elevator of W. D. O'Leary, Wallaceburg, Ont., was destroyed by fire, April 12. Loss about \$25,000.

Messrs. Wilson Bros., Collingwood, Ont., will enlarge their planing mill and erect a saw mill at that place.

The saw mills of Jas. Davidson, Fort Coulonge, Ont., were destroyed by fire April 9. Loss about \$25,000.

The London Machine Tool Co., London, Ont., who have a capital of \$200,000 are erecting a factory in Hamilton, Ont.,

Messrs. Seaman, Kent & Co., Toronto, will erect a wood-working factory at Port Arthur, Ont.

A Roman Catholic Church will be erected in Toronto at a cost of about \$27,000.

The tower of the new wing of the Parliament Buildings, Ottawa, connecting the Railway and Inland Revenue Departments with the Marine and Customs Departments collapsed April 5, causing a loss of about \$25,000.

The Sharples Separator Co., an American concern, will erect a factory in Toronto for the manufacture of cream separators.

The Smart-Turner Machine Co., Hamilton, Ont., have recently supplied the Magnetawan Tanning & Electric Co. with one of their side suction centrifugal pumps.

The quarantine steamer Alice, of the Dominion Government, was launched at the yards of the Canadian Shipbuilding Co., Toronto, a few days ago. The steamer is built of steel, her length over all being 128 feet, with an extreme breadth of 26 feet 11 inches. She will have an average speed of about twelve knots an hour, and will be ready for service about the middle of June. She is equipped with an up-to-date disinfecting plant.

The Smart-Turner Machine Co., Hamilton, Ont., have received an order for a side suction centrifugal pump from the John Whitfield Co., Toronto.

The Jenckes Machine Co., Sherbrooke, Que., are building the turbines and Allis-Chalmers-Bullock, Limited, Montreal, the generator for addition to the lighting plant at Parry Sound, Ont. The turbine plant is made up of a pair of special 38 inch Crocker turbines set in steel case with quarter turn elbow and developing 750 h.p. at 200 revolutions under 25 feet head. They will be direct connected to a 425 k.w. 3-phase alternating current Bullock generator.

The City Treasurer's return of receipts for March from the Toronto Railway Co. shows that the traffic of the company still continues to increase rapidly. The receipts for last month were \$27,000 higher than in March, 1905, and the city received over

\$6,000 more than in the corresponding month of last year, as the percentage becomes greater with the increased receipts. The following are the figures for the past five years:

	Receipts.	Percentage.
1906.....	\$234,448 20	\$26,851 70
1905.....	207,618 23	20,781 82
1904.....	184,444 13	18,444 41
1903.....	161,379 45	15,791 61
1902.....	141,765 00	11,341 20
1901.....	125,192 63	10,015 41

The following is a comparative statement of the permits issued by the city architect, Toronto, in the first three months of this year and last:

	1905.	1906.
Approximate value of buildings Jan. 1 to March 31.....	\$1,188,768	\$1,918,238
Approximate value of bldgs. for Mar. Permits issued Jan. 1 to March 31.....	594,025	1,081,841
Number of buildings for which permits were issued March	402	529
Number of buildings erected from Jan. 1 to March 31.....	257	350
	402	627

The Central Railway of Canada, formerly the Ottawa River Railway Co., have purchased the Irondale, Bancroft & Ottawa Railway, planned to run from Kinmount to Ottawa, 150 miles, fifty of which are completed. The same company have also purchased the Ottawa River Navigation Co., together with their thirteen miles of road from Carillon to Grenville.

The Dominion Office & Store Fitting Co., London, Ont., are applying for incorporation with a capital of \$40,000, and propose erecting a new factory. The directors include D. H. Gillies, C. W. A. Woodburne, and J. W. McDermod, London.

The Kerr Lake Mining Co., Cobalt, Ont., are installing a 60 h.p. 54 inch by 14 foot tubular boiler, purchased of the Jenckes Machine Co., Sherbrooke, Que.

A fifteen-inch suction dredge is being built for the city of Toronto at Polson's Iron Works.

The Canadian Pacific Railway Co. have given a contract to Polson's Iron Works for two 200 foot stern wheel steamers.

The Canada Tin Plate & Sheet Steel Co., Morrisburg, Ont., are installing a new plant at that place.

The Smart-Turner Machine Co., Hamilton, Ont., have recently supplied Messrs. Geo. Roberts & Sons with one of their standard duplex boiler feed pumps.

The Keystone Sugar Co., Warton, Ont., will erect a new factory at Whitby, Ont., at a cost of about \$500,000.

A hydraulic dredge for the Dominion Government is being constructed at Polson's shipbuilding yards, Toronto.

The Neepawa Hotel, Neepawa, Ont., was destroyed by fire April 9. Loss about \$8,000.

A High School building will be erected at Wingham, Ont., at a cost of about \$15,000.

A Presbyterian church will be erected at McDonald's Corners, Ont.

Messrs. Hiram Walker & Sons, Walkerville, Ont., will erect a new warehouse.

A waterworks system will be installed at New Liskeard, Ont.

A railroad Y.M.C.A. building will be erected at Kenora, Ont., at a cost of about \$20,000.

The Jones Underfeed Stoker Co., Toronto, have been incorporated with a capital of \$150,000, to manufacture stokers, engines, boilers, etc. The provisional directors include C. E. A. Goldman, A. C. Craig and G. McConkey, Toronto.

The American Cereal Co., Peterborough, Ont., will double the capacity of their flour mill at that place.

The City Architect, Toronto, has received an application for a five story addition to the Manning Arcade, to cost about \$45,000.

A large deposit of valuable silica sand has been discovered on the property of H. J. E. Willcox, Niagara Falls, Ont.

The Board of Education, Renfrew, Ont., will erect an addition to the Collegiate Institute at that place, to cost about \$10,000.

The Burrill Foundry Co., Brantford, Ont., will erect a new factory.

The Empire Elevator Co., Port Arthur, Ont., have awarded the contract for a new elevator with a capacity of 3,000,000 bushels.

The steamer, Kaministikwit, Fort William, Ont., was destroyed by fire April 1. Loss about \$8,000.

The Grand Valley Flour Mills, Grand Valley, Ont., were destroyed by fire April 4.

A Baptist church will be erected at Welland, Ont.

The Model Incubator Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture incubators, poultry supplies, etc. The provisional directors include C. A. Cyphers, Buffalo, N.Y.; C. J. Daniels, and E. P. Brown, Toronto.

The Bartle Sugar Co., Toronto, have been incorporated with a capital of \$1,000,000, to manufacture sugar, syrup, etc. The provisional directors include F. A. Mulholland, J. C. Wilgar and T. H. Wilson, Toronto.

The congregation of the Talbot Street Baptist Church, London, Ont., will erect a new edifice at a cost of about \$60,000.

The Alphasduct Mfg. Co., Toronto, have been incorporated with a capital of \$40,000, to manufacture electricity, electrical supplies, etc. The provisional directors include F. B. Johnston, C. W. Bongard and A. J. Thomson, Toronto.

The Dominion Lumber Co., Webbwood, Ont., have been incorporated with a capital of \$100,000, to manufacture lumber, shingles, posts, etc. The provisional directors include W. Holmes, J. M. Thompson, Menomine, Mich., and C. G. Forster, Milwaukee, Mich.

The Mines Publishing Co., Toronto, have been incorporated with a capital of \$40,000, to carry on the business of a book-binding and lithographing company. The provi-

sional directors include J. M. Ferguson, J. J. Harpell and E. V. O'Sullivan, Toronto.

J. R. Booth, Ottawa, has placed an order with the Jenckes Machine Co., Sherbrooke, Que., for a water-wheel plant to run his new paper mill. The plant will consist of a pair of 48 inch special graduating gate-type crocker turbines to develop 875 h.p. under 20 feet head, running at 155 revolutions per minute. The turbines will be mounted on a cast iron draft chest, set in concrete flume. The same company are also building two Port Henry pulp grinders in addition to seven already furnished Mr. Booth.

The Silver City Mining Co., Toronto, have been incorporated with a capital of \$350,000, to carry on a mining, milling and reduction business. The provisional directors include A. B. Harlan, H. S. Pritchard, and J. Lewis, Toronto.

The Canada Coating Mills, Georgetown, Ont., have placed an order with the Smart-Turner Machine Co., Hamilton, Ont., for four of their centrifugal pumps.

The Wonder Land Silver Mining Co., Windsor, Ont., have been incorporated with a capital of \$250,000, to carry on a mining, milling and reduction business. The provisional directors include E. Peabody, W. Stone and E. Sellers, Detroit, Mich.

The Port Arthur Sand Lime Brick Co., Port Arthur, Ont., have been incorporated with a capital of \$60,000, to manufacture brick, lime, cement, etc. The provisional directors include R. C. George, W. F. Fortune and J. M. Tennant, Port Arthur, Ont.

The Sterling-Silver Cobalt Mining Co., Toronto, have been incorporated with a capital of \$600,000, to carry on a mining, milling and reduction business. The provisional directors include J. G. Beam, J. Robertson and J. P. Esten, Toronto.

The Chatham Motor Car Co., Chatham, Ont., have been incorporated with a capital of \$50,000, to manufacture automobiles, carriages, etc. The provisional directors include W. W. Logan, W. G. Taylor, and R. L. Bracken, Chatham, Ont.

The Florence Mining Co., Toronto, have been incorporated with a capital of \$100,000, to carry on a mining, milling and reduction business. The provisional directors include J. Hobson, J. A. Meldrum and F. Watt, Toronto.

The Galt Malleable Iron Co., Galt, Ont., have been incorporated with a capital of \$100,000, to manufacture iron, steel, copper, etc. The provisional directors include M. N. Todd, J. H. Fryer and H. McCulloch, Galt, Ont.

The Montreal-Cobalt Mining Co., Toronto, have been incorporated with a capital of \$500,000, to carry on a mining, milling and reduction business. The provisional directors include H. B. Wills, J. C. Colling and W. D. Scott, Toronto.

The Shakespeare Development Co., Sault Ste. Marie, Ont., have been incorporated with a capital of \$300,000, to carry on a mining, milling and reduction business. The provisional directors include J. Miller, H. W. Evenden and W. H. Hearst, Sault Ste. Marie, Ont.

The Turner Novelty Mfg. & Galvanizing Co., Chatham, Ont., have been incorporated with a capital of \$40,000, to manufacture

washing machines, galvanized ware, etc. The provisional directors include S. R. Turner, R. T. Asher and S. I. Turner, Chatham.

The Owen Sound Brick Co., Owen Sound, Ont., have been incorporated with a capital of \$40,000, to manufacture brick, tile, lime, etc. The provisional directors include J. Leslie, R. Wyllie and J. Legate, Owen Sound.

A. E. Walton, Limited, Toronto, have been incorporated with a capital of \$40,000, to manufacture drugs, etc. The provisional directors include A. E. Walton, H. H. Warren and T. G. Patterson, Toronto.

The Imperial Carpet Co., Toronto, have been incorporated with a capital of \$50,000, to manufacture oil cloths, carpets, etc. The provisional directors include A. C. McMaster, T. H. Barton and F. D. Byers, Toronto.

The E. Long Mfg. Co., Orillia, Ont., have ordered a standard duplex pump from the Smart-Turner Machine Co., Hamilton, Ont.

The British & French Motor Car Co., Toronto, have been incorporated with a capital of \$50,000, to manufacture automobiles, bicycles, carriages, etc. The provisional directors include J. C. Palmer, H. N. Baird and A. Mearns, Toronto.

L. N. Poulin, Limited, Ottawa, have been incorporated with a capital of \$250,000, to manufacture commercial goods, merchandise, etc. The provisional directors include L. N. Poulin, J. P. McMullen and T. R. G. Warren, Ottawa.

The Continental Manufacturers' Syndicate, Toronto, have been incorporated with a capital of \$40,000, to manufacture millinery, dry goods, etc. The provisional directors include J. R. L. Starr, J. H. Spence and T. E. Wilson, Toronto.

The Dwyer-Stevenson Co., Ottawa, have been incorporated with a capital of \$50,000, to manufacture lumber, timber, etc. The provisional directors include W. H. Dwyer, J. R. Osborne and H. D. Dwyer, Ottawa.

The Silverland Development Co., Toronto, have been incorporated with a capital of \$1,000,000, to carry on a mining, milling and reduction business. The provisional directors include J. H. Pauley, F. A. Fenton, Toronto, and E. R. Clarkson, Hamilton, Ont.

The Canada Mineral Waters, Ottawa, have been incorporated with a capital of \$100,000, to manufacture mineral waters, bottles, corks, etc. The provisional directors include A. H. Brown, Montreal, L. N. Bate and O. J. Rochon, Ottawa.

The Montreal & Great Lakes Steamship Co. have been incorporated with a capital of \$90,000, to manufacture steamships, barges, etc. The provisional directors include R. Bickerdike, H. Munderloh, Montreal, and J. H. Hall, Ottawa.

The McKinnon Dash & Metal Works Co., St. Catharines, Ont., have doubled the capacity of their works for malleable iron castings and inform us that business is very satisfactory. They make a specialty of tinned castings of all kinds.

The Pembroke Electric Co. have recently awarded contracts for the machinery for their new power plant on the Black River, a few miles from Pembroke, Ont. The hydraulic plant consists of two 900 h.p. units, each composed of one special 30 inch cylinder gate crocker turbine operating under 120 feet head. Each wheel will be enclosed in a

steel case 7 feet diameter, made of  $\frac{1}{2}$  inch plate, filled with heavy cast iron discharge elbow, both units substantially mounted on steel girders, and complete with draft tubes, etc., and two Lombard type "B" water wheel governors. The water will enter both cases from underneath, a gate valve being placed in each inlet pipe. The water wheel runners will be made of bronze, and each wheel will be direct connected to a 600 k.w. alternating current 3-phase Westinghouse revolving field generator. For driving the exciters there will be provided two 15 inch turbines, each enclosed in steel case and each developing about 50 h.p. These wheels are also built with bronze runners. Under 120 feet head they run 900 revolutions per minute, and will be direct connected to the exciters. The hydraulic machinery is being furnished complete by the Jenckes Machine Co., Sherbrooke, Que., and the order for the generators and exciters has been placed with the Canadian Westinghouse Co., Montreal.

The Toronto Canning Co., Toronto, will erect a factory at London, Ont.

The congregation of the Stewarton Presbyterian Church, Ottawa, will erect a new church building at a cost of about \$35,000.

The Silverhorn Mining Co., Toronto, have been incorporated with a capital of \$50,000, to carry on a mining, milling and reduction business. The provisional directors include A. Bicknell, L. C. Todd and J. E. Riley, Toronto.

The Cobalt Townsite Mining Co., North Bay, Ont., have been incorporated with a capital of \$100,000, to carry on a mining, milling and reduction business. The provisional directors include A. J. Young, North Bay, Ont.; A. Santerre, Cobalt, Ont.; and G. Taylor, New Liskeard, Ont.

The Belleville Fruit & Vinegar Co., Belleville, Ont., have been incorporated with a capital of \$40,000, to manufacture vinegar, canned fruits, etc. The provisional directors include R. J. Graham, W. C. Springer and H. C. Hunt, Belleville, Ont.

The Sarnia Match Co., Sarnia, Ont., have been incorporated with a capital of \$300,000, to manufacture matches, match boxes, etc. The provisional directors include J. M. Diver, E. C. Barre and A. S. Burnham, Sarnia, Ont.

The Mann Brass Mfg. Co., London, Ont., have been incorporated with a capital of \$50,000, to manufacture brass, plumbers' supplies, etc. The provisional directors include A. W. Mann, C. Dunn and J. Howard, London.

Messrs. Northway Bros. & Winger, Toronto, have been incorporated with a capital of \$300,000, to manufacture dry goods, fancy goods, etc. The provisional directors include J. A. Northway, A. H. Winger and J. B. Ratcliff, Toronto.

The Trimble Mfg. Co., Toronto have been incorporated with a capital of \$40,000, to manufacture novelties, etc. The provisional directors include E. F. Trimble, W. Douglas and A. V. Trimble, Toronto.

The Douglas Milling Co., Douglas, Ont., have been incorporated with a capital of \$40,000, to manufacture electricity, heat, power, etc. The provisional directors include T. M. Thrasher, A. McEachern and O. Enright, Douglas, Ont.

The Silver Bell Mining Co., North Bay,



Ont., have been incorporated with a capital of \$250,000, to carry on a mining, milling and reduction business. The provisional directors include J. W. Richardson, T. C. Begg and E. Brandon, North Bay, Ont.

The Cobalt Silver Queen, Limited, Cobalt, Ont., have been incorporated with a capital of \$1,500,000, to carry on a mining, milling and reduction business. The provisional directors include F. R. Latchford, Ottawa; F. L. Culver, North Bay, Ont., and F. Pottage, Toronto.

The Temiscaming Sterling Mining Co., Milberta, Ont., have been incorporated with a capital of \$40,000, to carry on a mining, milling and reduction business. The provisional directors include J. M. Barnard, J. W. Jarvis and F. D. Ramsay, Kerns township, Ont.

The Green Silver Mines Co., Toronto, have been incorporated with a capital of \$300,000, to carry on a mining, milling and reduction business. The provisional directors include C. L. Hanson, A. E. J. Blackman and J. W. McDonald, Toronto.

The Brussels Oil Co., Brussels, Ont., have been incorporated with a capital of \$100,000, to manufacture petroleum, oil, gas, etc. The provisional directors include D. Ross, J. Ferguson and G. Edwards, Brussels, Ont.

The new island ferry boat, Bluebell, of the Toronto Ferry Co., was launched a few days ago at Polson's shipbuilding yards, Toronto.

The Transcontinental Railway Commission, Ottawa, will shortly call for tenders for the supply of 50,000 tons of steel rails.

The New Jerusalem congregation, Toronto, will erect a new church building at a cost of about \$7,000.

A jail will be erected at Cobalt, Ont., at a cost of about \$3,000.

The new freight and passenger steamer, Meaford, Ont., was launched a few days ago.

The congregation of St. Andrew's Presbyterian Church, Berlin, Ont., will erect a new church building at a cost of about \$25,000.

The Canada Foundry Co., Toronto, will erect blast furnaces on the Niagara peninsula, at a cost of about \$1,000,000.

The Canadian Pacific Railway authorities have decided to adopt the port of Quebec, not only for the terminus of their passenger steamship service, but the whole of their Liverpool service as well. At first it was planned that only the new big passenger ships Empress of Britain and Empress of Ireland would stop at Quebec, the smaller vessels proceeding on to Montreal, as usual, but later it was decided that all vessels on the Liverpool service should make the port of Quebec the summer terminus. In order to meet the requirements the company have entered into a scheme for vast improvements at Quebec, which have already been commenced and several hundred workmen are engaged in making the roadway for necessary railway tracks, constructing crib stringers, driving piles for the trestle work, etc. The company expect to complete this big undertaking, apparently, to meet the accommodation of their steamship service, by the first week of August.

Messrs. Drummond, McCall & Co., Montreal, agents for the Algoma Steel Co., Sault Ste. Marie, Ont., have secured the contract

for 50,000 tons of rails for the Grand Trunk Pacific Railway Co.

Ross-Harris Co., Limited, a new firm of Montreal contractors, of which John Ross, of Ross & McCrea and J. W. Harris, are principals, have secured from the Canadian Pacific Railway a contract to build fifty miles of complete railway from Parry Sound to Byng Inlet, this season, which will form part of the Toronto-Sudbury branch. The contract calls for immediate construction. The line will run through a rough country, and the work will involve considerable rock cutting.

A telegram from St. Paul Minn., says that Vice-President L. W. Hill has confirmed the report that the Great Northern will build a third transcontinental road through Canada from the Atlantic to the Pacific. Work will commence at once, and all possible speed will be observed in pushing it to completion.

Messrs. Kerr & Foss, Sherbrooke, Que., have placed an order with the Smart-Turner Machine Co., Hamilton, Ont., for one of their standard duplex pumps.

S. Carsley, Limited, Montreal, have purchased the large departmental store of W. H. Scroggie, Limited, that city.

The contract for the eastern section of the Grand Trunk Pacific which has been granted to Hogan & McDonald, runs from the north end of the Quebec bridge, Quebec, to a point near La Tuque, on the St. Maurice River, 150 miles. The contract price is \$5,950,000.

The Dominion Bridge Co., Montreal, have been awarded the contract by the Grand Trunk Pacific Railway Co., for a steel viaduct about 3,000 feet long across Cap Rouge Valley, near Quebec, for \$250,000.

The Canadian Chrome Co., of Thetford Mines, Que., are installing an additional 10 stamps in their stamp mill, which will bring it up to 20-stamp capacity. Since commencing operations about a year ago, this company have met with excellent success in marketing their product, which is of an especially fine grade of chrome iron concentrates, hence the present increase of plant. The additional equipment was furnished complete by the Jenckes Machine Co., Sherbrooke, Que., who were also contractors for the first 10 stamps.

Messrs. Charles Church & Son, of Lobell, Que., have placed an order with T. McOuat & Son, Lachute, Que., for one of their celebrated Duncan resaws for their mill at Lobell, by which they expect to double their output.

The hoisting engine equipment of the Asbestos & Asbestic Co., Asbestos, Que., near Danville, has been increased this spring by the addition of four 12x9 special cable way hoisting engines, as built by the Jenckes Machine Co., Sherbrooke, Que. This hoisting engine was designed especially for cableway service, having one drum for hoisting purposes, and a separate independent drum for operating the carriage on the cable. It has been extensively adopted by the Asbestos Mines in the Province of Quebec, also to considerable extent by the Coal Mines in Alberta. The Johnson's Co., of Thetford Mines, have lately installed two of these engines.

Among recent sales of economizers made by the B. F. Sturtevant Co., Boston, Mass., was one to the Hamilton Powder Co., Beloeil Station, Que.

Messrs. John Millen & Son, Montreal, have

been incorporated with a capital of \$100,000, to manufacture automobiles, bicycles, gasoline, oil, etc. The charter members include J. Millen, W. Strachan and W. Sharp, Montreal.

The Ross & Harris Co., Montreal, have been incorporated with a capital of \$200,000, to carry on a warehousing and contracting business. The charter members include J. Ross, Toronto, J. W. Harris and W. B. Powell, Montreal.

The Northwestern Brass Co., Montreal, have been incorporated with a capital of \$200,000, to manufacture brass castings, metals, etc. The charter members include J. T. Ostell, F. H. Hewitt and T. Davidson, Montreal.

Among the orders for Farrel bacon crushers built by the Jenckes Machine Co., Sherbrooke, Que., during March was one for a 16x10 crusher shipped R. C. Mosher, Plaster Rock, N.B., and one of 24x13 size shipped to Coast Quarries, Limited, Vancouver, B.C. The former was sold through W. H. C. Musseen & Co., Montreal, and the latter through the Vancouver office of the Jenckes Machine Co. The Canadian Pacific Railway made a record run on the Vancouver shipment, taking the car from Sherbrooke to Vancouver in fifteen days.

The grain warehouse of Messrs. Michaud Freres & Co., Montreal, was damaged by fire, April 10, to the extent of about \$10,000.

The Sisters of the Holy Cross, Montreal, will erect a school at a cost of about \$50,000.

A Catholic school will be erected in Montreal at a cost of about \$28,000.

A ten story hotel will be erected in Montreal, at a cost of about \$100,000.

The congregation of Fairmount Ave., Methodist Church, Montreal, will erect a new church building.

Work on the new Municipal Electric Lighting plant for Drummondville, Que., is about to commence. The Standard Construction Co., Montreal, have the contract. The contract for the hydraulic machinery has been sublet to the Jenckes Machine Co., Sherbrooke, Que., and the contract for the generator has been sublet to the Canadian General Electric Co., Toronto. The water wheel plant will be composed of one 55 inch special crocker turbine vertically set in steel case and complete with gearing, bridgetrees, shafting, etc. Under 11 feet head the turbine will develop 240 h.p. at 90 revolutions a minute. The generator will be of 150 k.w. capacity.

The corporate name of the Yucatan Power Co., Montreal, has been changed to that of the Mexican Consolidated Electric Co.

The D. B. Martin Co., Montreal, will install abattoir machinery to the value of \$25,000.

The premises of the Q. & C. Bonzans Rail & Joint Co., Montreal, were damaged by fire April 4. Loss about \$5,000.

The box factory of Messrs. Gingras & Methot, Warwick, Que., was destroyed by fire recently. Loss about \$7,000.

The Kingsbury Footwear Co., Maisonneuve, Que., have been incorporated with a capital of \$300,000, to manufacture boots, shoes, etc. The charter members include W. F. Martin, Montreal, A. Blanchard and F. X. Lanthier, Maisonneuve, Que.

The Eastern Townships Mfg. Co., Montreal, have been incorporated with a capital of \$125,000, to manufacture collars, neckties, etc. The charter members include J. O. Gareau, L. A. Dubrule and O. Lemire, Montreal.

Messrs. N. Quintal & Fils, Montreal, have been incorporated with a capital of \$250,000, to manufacture wines, liquors, etc. The charter members include J. E. Quintal, J. Dandurand and W. Whissell, Montreal.

The Quebec Transportation & Forwarding Co., Quebec, Que., have been incorporated with a capital of \$140,000, to carry on the business of a transportation and forwarding company. The charter members include J. S. Thom, M. J. Hackett and H. L. Thom, Quebec, Que.

Among the boiler contracts at present being filled by the Jenckes Machine Co., Sherbrooke, Que., is one for a new boiler plant which the A. Gravel Lumber Co., Etchemin Bridge, Que., are installing. This plant will consist of four 125 h.p. 72 inch diameter by 16 feet long high pressure tubular boilers, complete with all fixtures and fittings, smoke breeching and 600 h.p. feed water heater. Mr. A. S. Gravel, manager of the A. Gravel Lumber Co., has recently returned from a business trip to Europe.

The Amherst Foundry Co., Amherst, N.S., have placed an order for a 2½ ton single beam travelling crane, with the Smart-Turner Machine Co., Hamilton, Ont.

The Marconi Wireless Telegraph Co. have ordered from the Robb Engineering Co., Amherst, N.S., two 150 h.p. Robb-Mumford boilers for their station at Glace Bay, C.B.

United States Consul Worman reports that a deposit of graphite has been discovered at French Vale, Cape Breton. Samples analyzed were found to contain 70 per cent. of graphite, an unusually high percentage. The Intercolonial Railway passes within four miles of the property, while at a distance of six miles a splendid harbor on the Bras d'Or Lakes is found.

An additional 20x14 single drum hoisting engine has been ordered from the Jenckes Machine Co., Sherbrooke, Que., by Dominion Coal Co., Glace Bay, C.B.

The corporate name of the Maritime Coal & Railway Co., Cumberland County, N.S., has been changed to that of the Maritime, Coal, Railway & Power Co.

The Robb Engineering Co., Amherst, N.S., have received an order through Mr. E. A. Wallberg, Montreal, for two 200 h.p. Robb-Mumford boilers for the new Intercolonial Railway round house at Truro, N.S.

The contract for the western section of the Grand Trunk Pacific, which has been granted to J. D. MacArthur, begins at Winnipeg, Man., and ends at Peninsula crossing near the junction point of the Fort William branch, 245 miles, the price being \$13,300,000.

Railway construction work projected in western Canada for this season aggregates 2,250 miles, and the extension of the telegraph system will be in proportion. The Canadian Pacific Railway will construct 610 miles of new pole lines along their system, and stretch 4,068 miles of wire, 1,966 of which will be copper. A copper wire will be erected from Montreal to Winnipeg, which will be worked duplex (two circuits). This will

make four double circuits in use between these points. A copper wire from Montreal to Toronto, worked quadruplex (four circuits), will make four quadruplex wires (sixteen operators at each end) between these cities, in addition to railway and way wire. An iron wire from Montreal to Ottawa will be worked quadruplex, in addition to the one now in use, and a cable will be laid between Prescott and Ogdensburg for the railway service.

The Chapman Double Ball Bearing Co., of Canada, Limited, Toronto, have shipped a large order of bearings to the Western Canada Flour Mills Co., St. Boniface, Man. This mill is one of the largest and most modern equipped flour mills, using every modern appliance.

The Brandon Flour Mills, Brandon, Man., will rebuild and enlarge their mills.

The Prairie Lumber Co., Winnipeg, Man., will open a branch in Portage la Prairie, Man.

The Standard Brick & Tile Co., Winnipeg, Man., have increased their capital from \$40,000 to \$200,000.

The American Piano Co., Winnipeg, Man., have been incorporated with a capital of \$20,000, to manufacture pianos, organs, etc. The provisional directors include W. E. McLeod, W. D. Cameron and T. V. Mallory, Winnipeg, Man.

The Lake of the Woods Milling Co., Montreal, will erect a large oatmeal mill at Portage la Prairie, Man. They will also erect 30 new elevators throughout Manitoba and the North-West.

The Alberta Railway & Irrigation Co., Lethbridge, Alta., have ordered two 175 h.p. Robb-Mumford boilers from the Robb Engineering Co., Amherst, N.S. When these are installed this company will have nine of these boilers in use.

A water works system will be installed at Indian Head, Sask.

The city of Calgary, Sask., has ordered a 400 h.p. cross compound Corliss engine from the Robb Engineering Co., Amherst, N.S. This is a duplicate of an engine installed by this city a few months ago.

A sewerage system will be installed in Edmonton, Alta., at a cost of about \$306,000.

The town of Strathcona, Alta., has ordered a 200 h.p. Robb-Mumford boiler from the Robb Engineering Co., Amherst, N.S.

A new company has been formed at Phoenix, B.C., to be known as the Phoenix Amalgamated Copper Mines, with a capital of \$5,000,000. C. H. Fletcher, Sherbrooke, Que., is interested.

The Hamilton Powder Co., Northfield, B.C., will erect an addition to their plant at that place.

The Baker Lumber Co. have been incorporated at Cranbrook, B.C., with a capital of \$300,000. The promoters include V. H. Baker, C. D. McNab and J. Ryan, Cranbrook.

The 250 h.p. electric hoist which was built for the Granby Smelter, at Phoenix, B.C., by the Jenckes Machine Co., Sherbrooke, Que., has recently been shipped. The fact that this hoist has been built by a Canadian firm is noteworthy, as heretofore electric hoists of large size have been regularly imported from the United States. The hoist has two conical drums, each 8½ feet diameter

at large end, 5 feet diameter at small end and 5½ feet long, both drums being capable of independent operation through the medium of powerful friction clutches. The capacity of the hoist is a load of 10,000 pounds on either drum at 500 feet per minute, and the shipping weight in the vicinity of 50,000 pounds.

## ELECTRICITY.

Electrical machinery and appliances of all kinds, electrical power plants and other progress in the electrical industries will be noted here.

A million dollar order was entered on the books of the Westinghouse Electric Co. a few days ago. It was for a long distance power transmission plant in South America and will require some of the best machinery the company produces. Another big order, from the Metropolitan to West Side Elevated Railway Co., Chicago, calls for 100 motors of 160 h.p. each, and 50 equipments of unit switch control. The public service corporation of Camden, N.J., placed an order for 379 electric railway motors to be used in the equipment of some of the Camden suburban car lines. During last month the Westinghouse Machine Co. entered orders for 22 steam turbine units, aggregating 56,500 h.p. or an average of 2,500 h.p. per turbine. Among some of the largest of the purchasers were the United Electric Light & Power Co., New York City, for 15,000 h.p., and the New York, New Haven & Hartford Railway Co. for 15,000 h.p.

Although standard Sturtevant motors are built for independent service, a specialty is made of attaching them to fans which demand special combinations of speed and power. These motors are built in a line of bi-polar, four-pole and eight-pole types, dependent upon size and requirements. The enclosed type prevails for fan propulsion where there is considerable dust. They range in output up to 125 h.p. The rigid specifications of the United States Navy Department, under which many fan motors have been constructed, have established an exceptionally high standard which is maintained in all work.

Sturtevant marine generating sets built by the B. F. Sturtevant Co., Boston, Mass., are installed upon the Canadian Government yacht, "Speedy," the Dominion Government Toronto dredge and the Toronto Ferry Co.'s new boat, "Bluebell," built by the Polson Iron Works, Toronto.

### ELECTRIC FANS.

The Westinghouse Machine Co. have sent us a timely illustrated circular having reference to electric fans—all sorts of electric fans:

As summer approaches the electrical supply trade instinctively turns its attention to electric fans which have in a few years become an article much in demand. At first regarded as luxuries to be enjoyed only by the favored few, electric fans are now considered almost a necessity in thousands of business offices and factories as well as in private houses. The restaurant, barber shop or other public place which is not now provided with electric fans during the warm weather is an unat-

tractive place indeed, and the proprietors of few establishments of this sort find any economy in depriving their customers of the comforts supplied by this extremely useful device.

The 1906 crop of electric fans displays a distinct advance over previous years, chiefly in the matter of mobility. The old paddle-like affair, attached to the ceiling and revolving round in one position only, is now a back number compared with the versatile modern apparatus which may be placed in any part of the room and counted upon to throw out a breeze in almost any direction. All sorts of ball and socket joints, oscillating devices, swivels and trunnions are now in use to regulate the general direction of the artificial breeze which the fans create.

The general endeavor is to create the maximum of breeze with the minimum of noise, and some of the new fans are so complete than one of them placed in the corner of a room can make its presence felt throughout the entire room.

The Westinghouse Co. have given special attention this season to the shaping of the blades, which are constructed upon exact mathematical principles with the result that the fan will give an even air pressure across its entire front. The use of these new blades makes possible what the makers call an extremely high air delivery, or in other words a much more pronounced disturbance of the atmosphere than has been produced by older types. The fans can be operated at almost any angle and by means of a simple device the types used for desk and bracket can be interchanged, making it possible for the user to attach the fan in the most convenient location without disconnecting the wires.

Another type of fan for desk use is the swivel type or swivel and trunnion type or the oscillating variety as may be desired. Without attempting a detailed description of this fan it may be said that electric fans are made so that they can be operated almost anywhere either on a desk or counter, a bracket or on the wall itself and throw out a breeze in almost any direction.

The improved Sturtevant steam trap, although especially designed to use with Sturtevant heaters, is equally well fitted for operation with steam heaters or radiators of any construction. The body of the trap contains a pot, which floats and closes the connection between the interior and exterior, until sufficient water accumulates in this space to overflow into the pot and sink it. Free passage for the water is thus afforded from the pot up to the outer air, which continues until the levity of the pot becomes sufficient to cause it to rise and close the outlet. The periodic delivery continues as long as there is water to discharge or sufficient steam pressure to cause the trap to act.

The Dewey floating dry dock, the largest floating dry dock ever built, has so far withstood the raging storms at sea, and is now aground on its way to Cavite, Philippine Islands, where it is intended for service. A somewhat novel feature of this huge structure is the complete lighting plant. The essential factor in this installation is a generating set furnished by the B. F. Sturtevant Co., Boston, Mass.

## FUEL.

For names of fuel dealers see "Coal and Coke" in Classified Index.

The fuel supply question is a most important one to Canadian manufacturers. The information published in this department will keep the readers posted on sources of production.

Important experiments are being carried on by the British naval authorities at Portsmouth to ascertain the extent of the value of steaming properties of Welsh coal which has been stored in the sea. Eighteen months ago iron crates, each containing two tons of coal, were sunk in a big basin in the dockyard. At the same time a similar quantity of coal was stored in the open air sheltered by tarpaulins. At intervals of six months two-ton samples of each storage have been carefully burned. The results have shown conclusively that by the submarine storage of coal its calorific value steadily increases, while by storage in the open air a decided decrease is shown. The Admiralty is satisfied with the physical and financial advantages of submarine storage, and has now directed that experiments be made to ascertain its practicability on a large scale.

The second annual convention of the Western Ontario Retail Coal Association was called to assemble in London, Ont., this week. The meeting is called "in the interest of every retail coal dealer whether a member of the association or not," and also that "matters of material interest to every coal dealer will be considered at this meeting." Addresses were promised to be given by Mr. Robt. Lake, Jackson, Mich., vice-president of the International Association and president of the Michigan and Indiana Coal Association; Mr. Delos Hull, one of the Retail Coalmen, of Chicago, one of the best known retailers in the United States; and President J. C. Hay, who will explain the objects of the association and of the International Association.

### PEAT AND COAL FUEL.

Consul Diederich, of Bremen, reports recent experiments made for the purpose of using by-products for cheapening fuel. The results have been far more successful than was believed possible by the parties making the experiments. An interesting feature of the fuel's work is found in its effects in brick-making. The consul writes:

"A number of interesting experiments have been made recently in using compressed peat and coal mixed for fuel in a brickyard, and the result has been so favorable that it is worthy of note, inasmuch as it will no doubt open a new field for the use of peat as fuel in the manufacture of bricks. In the neighborhood of Jever, Oldenburg, an excellent, heavy, blue clay is found which, according to its chemical composition, was considered to be suitable for the manufacture of hard clay bricks which are used in that country to pave roads. All efforts to manufacture such bricks from this clay proved unsuccessful until the proprietor of a certain yard, much against his own conviction, followed the advice of a friend and used for fuel a mixture of one part of peat and ten parts of coal. The result was surprising. Instead of the light-red brick, which had been produced

formerly, a hard and brown brick was obtained. The experiments were repeated and the fuel was mixed in various proportions until, at last, with a mixture of equal parts of peat and coal, a first-class brick was produced.

"The cause of this very surprising result is theoretically evident at once. Peat, which contains much tar, has a very large and long flame of gas which intensifies the burning of the coal, leaving the smallest possible amount of ashes and slag, and hence a much greater heat. Again, the spaces between the bricks, as they are piled up in the kiln in order to be baked, will be more thoroughly heated by the long flames, and the lower as well as the upper layers of the bricks will also be baked more evenly. It is claimed that besides the advantages mentioned, this mixture of fuel will prove to be very cheap in all countries where peat is found, and that it can be profitably used under steam boilers in locomotives, etc., as the good quality of peat leaves only 1½ to 2 per cent. ashes, and the coal being almost completely consumed in this combination, will leave but little refuse or slags."

## PUBLICATIONS.

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

We have just received a copy of the new edition of Kelly's Directory of Merchants, Manufacturers, and Shippers of the World, published annually by Kellys Directories, Limited, London, England. This directory contains classified lists of the merchants and manufacturers, importers and exporters of every known country in the world, covers nearly 4,000 pages, and contains about a million names. The firm also publish the Post Office London Directory (first issued by them in 1799) also Trade and County and City Directories for Great Britain, Australia, New Zealand and South Africa. Mr. W. P. Dent, 70 Dunn Ave., Toronto, is the Canadian representative.

Bulletin No. 131, entitled Horizontal Engines, has been issued by the B. F. Sturtevant Co., Boston, Mass., in their engineering series. It very fully illustrates this series of engines, ranging from 20 to 200 h.p. capacity, which has recently been entirely redesigned. All engines are now completely enclosed, provided with watershed partitions and equipped with forced lubrication. Although primarily designed for direct connected driving of Sturtevant generators, these engines are peculiarly adapted for all classes of work where high speed, efficiency and perfect regulation are desired. The positive system of forced lubrication relieves the engineer of anxiety and insures continuous operation with the minimum of care.

The Goldschmidt Thermit Co., 43 Exchange Place, New York, have issued a special bulletin containing instructions for welding wrought iron and steel pipes by means of thermit. The method described in the present bulletin is an improvement upon the old method, in that cast iron instead of sheet iron moulds are used for the work which has considerably simplified the operation.

The Standard Welding Co., Cleveland, Ohio, have issued a number of pamphlets dealing with their products. These describe Standard steel rims for automobile wheels, seamless steel tubing, seamless steel rings and various automobile parts electrically welded.

The Trussed Concrete Steel Co., Detroit, Mich., have issued a publication entitled, "Tests and Other Facts Concerning the Kahn Trussed Bar." It includes the records of a large number of tests made on a Kahn trussed bar and on floors constructed with the Kahn system of reinforced concrete. A large number of buildings built on this system are described and illustrated.

The Cobalt portion or Part II., of this year's report of the Ontario Bureau of Mines has been exhausted, and Prof. Miller is busy with the proofs of a second edition. This edition is to have some additions, one of which in the appendix is a description of the cobalt ores of Saxony. Another is a copy of the French map of Canada, published in 1744, showing Ance a la Mine, on the east shore of Temiskaming. The original is in possession of the Survey Department at the Provincial buildings.

#### WATER FILTRATION.

The Pittsburg Filter Mfg. Co., Pittsburg, Pa., have sent us a series of pamphlets, all bearing upon the matter of filtration and purification of water.

The first of these brochures is entitled "Scientific Aspect of Water Purification," by Freeland Howe, jr., Sanitary Chemist and Bacteriologist, of Pittsburg, in which he presents his ideas which make water purification comprehensible and plain.

"Water Filtration and its Relation to Municipal Health and Prosperity," with some statistics of typhoid fever epidemics is another similar pamphlet by F. B. Leopold, in a short discussion in connection with reprint of a paper read by him at the recent convention of the American Waterworks Association.

"The Efficiency of Mechanical Filters" is a compilation of data from many reliable sources by Freeland Howe, jr., to illustrate the efficiencies that are accomplished by the method of mechanical filtration.

"The Purification of Water from a Sanitary Standpoint," by Freeland Howe, jr., which tells what pure water is, and how impure water may be detected, and how it may be made potable.

"Pure Soft Water for Boilers, Railroad Water Stations, Laundries and all other Purposes," and how it may be obtained by gravity filters, pressure filters and water softening plants is another valuable contribution to the subject.

Another of the pamphlets relates to "Gravity Filters, Pressure Filters and Water Softening Plants," for hotels, public institutions, residences, paper mills, dye works, railroads, cities and towns. The subject is exhaustively treated and the methods described.

"Municipal Filtration Plants" is a book which appeals to engineers and contractors, in which a number of plants in successful operation in different cities are illustrated and described.

The Pittsburg Filter Mfg. Co. are engineers and contractors for such plants, and are manufacturers of all such apparatus and machinery.

## PERSONALS.

Winn & Holland, Limited, Montreal, announce the incorporation of their company under a Dominion patent, to take over and continue the business of Winn & Holland. There will be no change whatever in resources or management. This old and well-known house was established in business in Montreal in 1844. The present personnel of the concern include Messrs. P. H. Holland, president, W. J. Michaud, R. A. Holland and G. A. Holland.

The fifty-third meeting of the American Society of Mechanical Engineers will be held at Chattanooga, Tenn., May 1-4. On the evening of the first day a social reunion will be held giving an opportunity for members to meet each other to renew old acquaintances and to form new ones. It will be an informal gathering at which the ladies will be welcome. Beside the routine business, reading papers, etc. there will be receptions, carriage drives, trolley rides, etc. galore, including a visit to the National Military Park, on the Chickamanga Battle Field, when the Twelfth United States Cavalry will give a regimental drill in honor of the visitors. The annual meeting of the society will be held in New York City, December 4-7 next.

At the recent annual meeting of Toronto Chapel, Ontario Association of Architects, the following officers were elected:—Chairman, George W. Gouinlock; secretary, C. E. Moore; treasurer, A. H. Gregg.

The Wagner Electric Mfg. Co., of St. Louis, Mo., have completely outgrown their present quarters and have bought 15 acres of land just out of the city. They have engaged Dodge & Day, of Philadelphia, to make the layout, design buildings and select the necessary equipment. The preliminary layouts have been submitted and the buildings decided upon. Work will be started at once and about one-third of the ground will be covered by buildings before the end of the present year.

The Pennsylvania Fire Brick Co. inform us that they have discontinued their office at Lock Haven, Pa., and that their address is now at Beech Creek, Pa.

On account of the rapid expansion of the business of the Westinghouse Machine Co., the Board of Directors have decided to enlarge the executive organization by increasing the number of vice-presidents from two to four, and have elected Mr. E. H. Sniffin and Mr. Arthur West to fill the new offices of third and fourth vice-president, respectively. Mr. Sniffin will be in charge of the sales department, as heretofore, his field of work not being altered in assuming the new title. Mr. West, who has been chief engineer of the company, still retains that title and position. Mr. William A. Bole, in consequence of his election to the vice-presidency of the Westinghouse Foundry Co. has resigned his position as manager of works of the Westinghouse Machine Co., in order that he may better serve the interests of the Foundry Company, of which he assumes the entire management. The Westinghouse Machine Co., however, retain Mr. Bole as consulting engineer, availing themselves of his services and counsel on important work, which his ripe experience has made peculiarly valuable. Mr. Henry L. Barton, formerly general superintendent of

the East Pittsburg Works of the Westinghouse Machine Co., has been appointed manager of works.

A. P. Lowe, Ottawa, has been appointed director of the Geological Survey of Canada.

Dr. Robert Bell, of the Geological Survey of Canada, will receive the Royal Medal of the Royal Geographical Society.

The annual meeting of the Canadian section of the Society of Chemical Industry was held in Toronto a few days ago. The officers elected were:—Chairman, Prof. W. H. Ellis, Toronto; vice-chairmen, H. van der Linde, Toronto, M. H. Hersey, Toronto, A. McGill, Ottawa; committee, James H. Bowman, London, Ont., W. R. Lang, J. P. Murray, Charles Heys, W. H. Van Winckel, W. L. Miller, Prof. W. P. Cohoe, and Dr. F. J. Smale, Toronto, Prof. M. A. Parker, Winnipeg, Man., Prof. R. F. Rattan, Montreal, and E. B. Chadsey, Hamilton, Ont.; honorary local treasurer, J. W. Bain; honorary local secretary, Alfred Burton.

At a meeting of the Board of Directors of the Westinghouse Electric & Mfg. Co., held April 10, Mr. L. A. Osborne, formerly third vice-president of that company, was elected second vice-president to succeed Mr. Frank H. Taylor, resigned. Mr. Taylor, who is also a director of the company, will retain his seat on the Board. Mr. Osborne, as third vice-president had the direction of the engineering and manufacturing activities of the company. As second vice-president he will assume the direction of the commercial activities of the company while retaining those of the engineering department. The new second vice-president is a graduate of Cornell University. He entered the employ of the Westinghouse Electric & Mfg. Co. in 1891 and has successively held the positions of assistant superintendent, assistant to the vice-president, manager of works, fourth vice-president and third vice-president.

Mr. E. N. Foss, general manager of the B. F. Sturtevant Co., Boston, Mass., and prominently identified with many other large interests throughout the country, sailed March 17, on steamer Romanic, for the Mediterranean, to be absent two or three months. Primarily the trip is for a much needed rest, but Mr. Foss will, during his absence, make a careful study of foreign industrial and commercial conditions as related to trade with the United States.

#### GRANITE IN ONTARIO.

Mr. S. J. Ritchie, of Toronto, who had much to do in the development of the nickel deposits of the Sudbury region of Ontario, and who is financially interested in the Central Ontario Railway, and who knows a good thing when he sees it, tells of the value and extent of the granite deposits in the neighborhood of Bancroft, Ont., adjacent to that railroad. He says:

"The discovery of these deposits of granite, marble and sodalite, were made in a rather romantic way. The story is that when the Princess of Wales was in Canada, a table of sodalite, which is a beautiful bluestone, almost like an amethyst when polished, was presented to her. She was much interested in the stone, so much so, that she is fitting up a room in Sandringham Palace with sodalite. The Princess Victoria, too, desired a

specimen of this stone, and the Duke of Argyll promised to obtain it for her. A column will be sent to her from the deposit near Bancroft.

"These deposits were brought to the attention of Thomas Morrison, an Aberdeen man, who has had large experience in granite and marble work of all kinds. He is at present working a sodalite mine near Bancroft, and his output is going at present almost entirely to London, England. When Mr. Ritchie heard of the deposit he visited the ground and was so impressed with the possibilities that he wrote Mr. Morrison stating that what he saw around Bancroft was a revelation to him. Understanding Mr. Morrison to be a man of long experience in the working of granite quarries in Scotland, he asked him to give him a statement of what his experience had been in the production and use of these materials, and his familiarity with the quality and cost of materials of this kind imported by Canada and the United States from Scotland and other countries.

"I specially desire to know," the writer said, "as to the relative quality of the red and gray granites and the marbles of Bancroft as compared with like articles imported from Scotland, and the relative cost of the two articles laid down in the cities of Toronto and Ottawa. In making this estimate the freight in either case would be about \$2 per ton from Bancroft to Toronto or Ottawa."

Mr. Morrison promptly answered Mr. Ritchie, dealing first with the granites occurring within a radius of five miles of Bancroft.

"These granites vary in color and texture," Mr. Morrison states in his letter, "and are equal to some of the best Aberdeen red

and gray granites which are imported in the shape of monuments to Canada and the United States. Of course, before large blocks could be quarried suitable for monolith columns, large building work and heavy material suitable for bridge construction, etc., considerable developing work would have to be done, but there is no doubt about the material being here, and with very little work it could be quarried in sizes suitable for ordinary monumental purposes.

"The red granites could be classified into three grades, according to their grain and color, and if two polished samples were placed alongside the two Scotch granites, namely, Corrennie and Hill o' Fare, any practical mason or engineer would have to admit that for polish and color the granites from Bancroft were equal to the Scotch granites above named.

"This material, royal blue pearl, is shipped in rough blocks from the quarries in Norway to Aberdeen, manufactured into monuments and shipped to this country, and I may here mention that I am at present quarrying granite which has the same orthoclase or pearl specks from which it gets the name 'Royal Blue Pearl.' The price of this Norwegian granite in the rough block at Aberdeen is about \$1.75 per cubic foot, against \$1.25, the price at which the Bancroft granite can be delivered to Toronto and Ottawa.

"The above comparison of prices would also apply to the red granites in the rough at Aberdeen, and red Bancroft granite delivered to Toronto and Ottawa.

"There are several granites in this district which could be used for interior decoration, one in particular having spots of blue soda-

lite and spots of sun-stone or orthoclase intermixed upon a grey ground, making an ornamental stone of a unique character. This material takes a very high polish, which adds to its value as a decorative stone.

"There are other granites of a similar character, which vary in texture more or less, several of them having the sun-stone and sodalite effect, but in different forms of figuring.

"I do not see why, with the railway and water power facilities so handy, a large granite industry could not be run very successfully, as I am certain if it were known that we had such material a large market would be found in Canada and the United States, and the sun-stone granite would command a market all over the world, as there is really nothing approaching it on the market at present.

"Regarding the crushing strain of these different materials, I should judge that on an average they would take the same weight as the Aberdeen granites.

"In dealing with the marbles and dolomites which occur around Bancroft I shall speak of the materials in the language of the architect and marble mason—i.e., that all stones are called marble which are harder than alabaster or gypsum, and which are capable of receiving a good polish.

"The materials available in marble decoration include, besides various kinds of marble, granite, porphyry and serpentine, several varieties of spar and alabaster, and I have no hesitation in saying that a treatment suitable for marble decoration can be produced from the material around Bancroft, which for a

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combination of colors and finish cannot be surpassed anywhere.

"At present I am operating the only blue stone or sodalite quarries in the world, and I am now installing a plant specially constructed for the manufacture of this material for ornamental and decorative purposes."

Mr. Ritchie himself, aside naturally from the fact that the deposits are on the line of his railroad, has no personal interest in these granite properties. They are simply farm lands that anybody can purchase at the price, and are lying there undeveloped.

To give an idea of the enormous quantity of marble that is there, Mr. Ritchie stated there was a vein 1,200 feet by 400 feet. How far it ran he did not know. In constructing the road there, making the cuts, they blow out good granite. There is no doubt in his mind that this granite can be landed in Toronto at a less price than that for which the Scotch granite can be put on shipboard at Aberdeen, so that the development of these deposits would open a field for Canadians to supply granite not only in our own country but in the markets of the United States. The principal deposits are in a radius of three or four miles round Bancroft.

**A NEW TEST OF DIXON'S FLAKE GRAPHITE.**

MADE BY PROF. GOSS, OF PURDUE UNIVERSITY, AND DEMONSTRATING ITS VALUE AS A LUBRICANT AND ITS MECHANICAL AFFINITY FOR METAL SURFACES.

The Lubricating Mixture.—In considering the manner in which the graphite under test should be applied in lubricating the rubbing surfaces of the testing machine, it was deemed desirable to use as light an oil as was available, since by so doing but little lubricating effect would be realized from the vehicle and the maximum service would be secured from the graphite. An attempt to use water proved unsatisfactory because of the tendency of the rubbing surfaces to corrode under its influence, and kerosene was finally adopted as the most convenient and the most satisfactory vehicle. Throughout the test the lubricant employed has been either kerosene, or mixtures of kerosene and Dixon's Flake Graphite.

Kerosene as a Lubricant.—Before attempting any work with graphite the value of the vehicle was first determined. That this might be done, the machine was operated under kerosene lubrication for a considerable period, the pressure between the rubbing surfaces

being gradually increased as they became more worn in service, the effect of the process upon the co-efficient of friction being noted. This process of wearing down rubbing surfaces in the presence of kerosene involved more than 600,000 revolutions of the test machine. The heaviest pressure that could be sustained by the rubbing surfaces under this lubrication was fifty pounds per square inch of surface, and the lowest co-efficient of friction developed was .00547. This record was accepted as representing the performance of kerosene as a lubricant.

After the 633,287 revolutions involved by the process described in the preceding paragraph, a mixture, by weight, of two parts kerosene and one part Dixon's Flake Graphite was made. This mixture had the consistency of thin paste when stirred, but the flakes of graphite quickly settled when permitted to stand at rest. The immediate effect of applying this mixture as a lubricant was to increase the co-efficient of friction, but this in its maximum effect was momentary. Without change or any modification of the lubricating mixture, the co-efficient of friction rapidly fell, first to the value given by the kerosene alone, and then to still lower limits, so that after 10,000 revolutions, occupying a period of something less than thirty minutes, the co-efficient of friction, under the influence of the mixture of kerosene and Dixon's Flake Graphite, became 83.9 per cent. of that obtained from the use of kerosene alone. Conditions thus secured were continued during more than 400,000 revolutions of the test machine, for the purpose of determining beyond doubt the minimum co-efficient of friction under the conditions stated, subsequently the pressure between the rubbing surfaces was increased by increments of ten pounds, until a maximum of 110 pounds per square inch had been secured. Beyond this limit lubrication failed. The observations show that as the pressure was increased, the co-efficient of friction diminished, the minimum value being .00296. The immediate effect, therefore, of adding Dixon's Flake Graphite to the kerosene was, first, to permit an increase of load from 50 pounds per square inch to 110 pounds per square inch, that is, an increase of 120 per cent.; and, second, a reduction in the co-efficient of friction from .00547 to .00296, that is, a reduction of 45.9 per cent.

Endurance of Flake Graphite.—Having secured these results, it was next sought to ascertain the endurance of the graphite as a lubricant. This was done by removing all graphite from the machine and by rinsing all

parts involved, including the rubbing surfaces, with kerosene, after which the machine was operated under a pressure of 100 pounds per square inch in the presence of kerosene alone. Under these conditions, the lubrication was aided by such particles of flake graphite as naturally adhered to the rubbing surfaces. It was expected, however, that these particles of flake graphite would sooner or later disappear and that the conditions would return to those originally found for the kerosene alone. Each morning the rubbing surfaces were removed from the machine and all parts carefully rinsed for any particles of graphite, and the work of the day proceeded, usually to the extent of 150,000 revolutions. After eight day's running and 978,000 revolutions, no diminution in effect could be discovered. Both the capacity of the bearing and the co-efficient of friction developed remained unchanged. A microscopic inspection of the surfaces showed the presence of flake graphite upon them. Whether the amount was sufficient to account for the results obtained, or whether in the earlier stages the presence of the graphite served to control the finishing of the metallic surfaces to permit them to give highly satisfactory results, are questions which can not be determined. The probability is, however, that without the graphite the results would not have been secured.

**A CONCRETE SKY-SCRAPER.**

The first concrete sky-scraper, an affair of 16 stories, occupies a business corner in Cincinnati, Ohio. It has a total height of 210 feet, and differs from the ordinary sky-scraper in that it lacks the interior riveted steel skeleton framework. The building is, in fact, a concrete box, having 8 inch walls, concrete floors and roof, concrete beams, concrete columns and concrete stairs. The exterior is covered with marble for the lower floors and glazed gray brick for the upper stories, and terra cotta cornice, so that the principle upon which the building is constructed is entirely different from that of the now familiar sky-scraper.

The concrete is made to do the work usually assigned to the steel framework of such buildings. It is true the concrete columns and floors are re-inforced with steel bars imbedded therein, but these are comparatively small, and the structure is in no way maintained by them, their chief function being to take up tension stresses.

The compression stresses are mostly take

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up by the concrete. For instance in the columns stiffening bars were placed on two opposite sides near the centre by round bars of various sizes. In the basement stories these are from two and a half to three and a half inches in diameter, diminishing in size and number in succeeding stories until reduced to one inch at the tenth floor, above which they are entirely dispensed with, the concrete having sufficient strength apparently to do all the work required.

The floors are continuous slabs, five inches thick, reinforced with a mesh of three-quarter-inch square twisted steel bars, from 18 to 20 inches on centres in both directions, strengthened by a beam or rib across the centre of the column bay about 16 to 20 inches, dividing this into two panels, each 16 foot square.

Walls of the lower story are 8 inches thick, while the other walls, particularly curtain walls in the interior, are only three or four inches thick, reinforced by a network of bars, placed three or four feet apart, both vertically and horizontally.

The building has been up sufficiently long to have demonstrated that it is capable of withstanding the highest winds and so far, it

is claimed, has developed no appreciable shrinkage cracks.

The Dawson Yukon Transportation Co., Dawson, Yukon, have been incorporated with a capital of \$25,000, to manufacture tugs, steamships, etc. The provisional directors include J. H. Holme, D. J. Longstaff and W. M. Painter, Dawson.

During the first two weeks in February the Westinghouse Machine Co. took some of the largest orders that were ever awarded to the East Pittsburg, Pa., works since the Westinghouse-Parsons steam turbine has been introduced.

#### NIAGARA POWER.

The annual report of the Commissioners for the Queen Victoria Niagara Falls Park, laid before the Ontario Legislature, includes an exhaustive review of the position of affairs in connection with the development of electrical power at the Falls and the effect of the withdrawal of the necessary water upon the appearance of the cataract. The total

amount of water required for the full operation of the hydro-electric works already completed or in process of construction will necessitate the withdrawal of 23 per cent. of the present flow over the Canadian and the American Falls. In all probability many years must elapse before this maximum will be required, and the withdrawals will be very gradually made.

On the whole, the commissioners are of the opinion that the resultant effect will not seriously detract from the scenic beauty of the twin cataract to any great degree.

But in addition to the several companies whose works of development are in a more or less advanced state, there are no fewer than six charters on the American and four on the Canadian side of the boundary, in respect of which work has not yet been commenced. It is important, therefore, that all rights granted for prospective operation and which if not forfeited or annulled may be proceeded with at any time, should be kept in view. The following memorandum has, therefore, been prepared giving in condensed form the charters granted on each side of the river as far as the commissioners have been able to ascertain, viz.:

In choosing crucibles it is an advantage to have yours at least as good as your competitors'. McCullough-Dalzell Crucibles will give you the advantage in a dozen different ways. Write for prices.

**MCCULLOUGH-DALZELL CRUCIBLE CO., Pittsburg, Pa.**

# The Power & Gas Machine Company

LIMITED


GALT - - ONTARIO

On the American Side.		
Name.	Date of authorization.	Cubic feet per second.
The Niagara River Hydraulic Power & Mfg. Co.....	1879	Not defined.
Lockport Water Supply Co.....	1886	Unlimited.
Lewiston Water Supply Co.....	1888	Unlimited.
Niagara Falls Power Co.	1889	Ap'x 17,200.
Buffalo & Niagara Power & Drainage Co.....	1889	Unlimited.
Chicago Sanitary Dis't.	1889	10,000.
Niagara County Irrigation & Water Supply Co.....	1891	Unlimited.

Niagara Power & Development Co..... 1894 Unlimited.  
 Niagara, Lockport & Ontario Power Co..... 1894 Unlimited.  
 In addition to these franchises, the International Paper Co. at Niagara Falls and the Niagara Falls Waterworks Co. each use considerable quantities of water.  
 Under agreement with the Queen Victoria Niagara Falls Park Commissioners:

On the Canadian side.		
Name.	Date of authorization.	Cubic feet per second.
Canadian Niagara Power Co.....	1892	Ap'x 8,600.
The Ontario Power Co...	1900	Ap'x 11,700.
Elec. Development Co...	1903	Ap'x 10,750.

The Ontario Power Co. has a franchise for taking water from the Welland River, in addition to its Niagara River rights. Chartered by the Dominion of Canada.  
 The Niagara - Welland Power Co..... 1894 Unlimited.  
 The Jordan Light, Heat & Power Co..... 1895 Unlimited.  
 Erie-Ontario Power Co.. 1903 Unlimited.  
 In addition the Cataract Power Co. at DeCew Falls obtains a comparatively small supply from the water of the Welland Canal, and the Niagara Falls Park and River Branch of the International Railway Co. the water necessary to operate its road.  
 Should all of the ten non-developing companies which have been granted authority to use Niagara water on both sides of the river, and which are not limited in respect to



## Sturtevant Generating Sets

require no attention. Forced lubrication under 15 lbs. pressure keeps all bearings supplied and the oil-tight case is the acme of cleanliness. The generator is good for 25 per cent. overload for two hours' time without sparking or undue heating.

Send for Bulletin 63.

### B. F. STURTEVANT CO., Boston, Mass.

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Designers and Builders of Heating, Ventilating, Drying and Mechanical Draft Apparatus; Fans, Blowers and Exhausters; Steam Engines, Electric Motors and Generating Sets; Fuel Economizers; Forges, Exhaust Heads, Steam Traps, etc. 489

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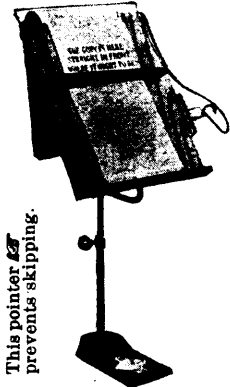
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quantity they may take, carry out their undertakings upon anything like the scale adopted by the companies whose works are now in course of construction, there can be no question, say the commissioners, that the Falls of Niagara as a scenic spectacle would be most seriously impaired, if not entirely destroyed.

The commissioners therefore offer the following suggestions:

(1) That the whole subject, involving the further diversion of water from Niagara River for power development in excess of the charters now being exercised be referred to an international commission, appointed by the governments directly interested, territorially or otherwise, in order that an agreement may be arrived at between such governments as to further withdrawals of water on both sides of the river.

(2) That a careful inquiry be made by the governments indicated respecting the charters already granted, but in regard to which no works whatever have been commenced, with a view to the cancellation of the same.

The adverse criticisms which have appeared in newspapers and magazines in Canada and the United States are adduced by the commissioners for the full treatment of the waterpower question which occupies the report. The magnitude of the proposition of the Niagara, Lockport & Ontario Power Co. to generate 400,000 h.p., which was vetoed by the Governor of New York State, directed attention to the danger of withdrawing one-sixth of the total outflow from Lake Erie in this way.

The sources of the Niagara reaching into seven States of the Union, besides the Province of Ontario, with other considerations, make the question an international one. As the relative drainage area in each country into the great lakes and through the Niagara River is approximately the same, the withdrawals of water on each side of the line should in theory be approximately equal.

The flow over the Canadian Falls, however, is about 90 per cent. of the entire waters of the river. The average outflow has been determined by United States engineers to be 222,400 cubic feet per second, which will produce, with 210 feet estimated head, a theoretical energy equivalent to 5,300,000 h.p. Under the most favorable circumstances, however, only about two-thirds of the nominal power could be available. The Chicago drainage system, withdrawing 600,000 cubic feet per minute from the lake supply, has also to be considered. The actual heads under which the several companies work must also be regarded.

A comparative statement of this is shown in the following summary, viz:

	American side.	Feet.
Chicago Drainage Canal.....	32	
Niagara Falls Power Co.....	136	
Niagara Falls Hydraulic & Mfg. Co....	210	
Canadian side.		Feet.
Canadian Niagara Power Co.....	136	
Electrical Development Co.....	136	
Ontario Power Co.....	180	

The Niagara Falls Hydraulic & Mfg. Co. is the only one using the available head. The other companies, therefore, require a greater quantity of water to produce an equivalent amount of power. There will ultimately be required for the various franchises the following quantities of water:

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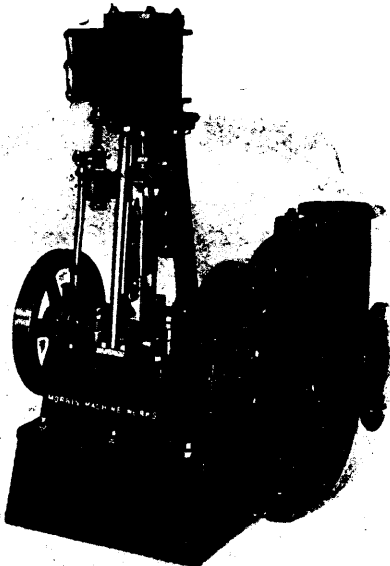
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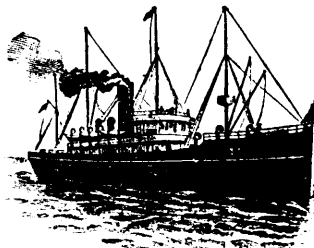
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7. Export Sections of London and Provinces (separate towns), giving names of exporters, places of shipment and class of goods shipped.
8. Index to class of Goods Shipped with names of Shippers.
9. Trade Mark Section.
10. Manufacturers Trade Directory (Buyers' Guide).



Date of Publication of 1906 Edition,

FEBRUARY 28th.

London:

THE CARTER PUBLISHING CO., 8, NEW BRIDGE STREET, E.C.

American side.	Electrical h.p.	Ap'x water requir'd cu. ft. per second.
Chicago Drainage Canal...	27,000	10,000
Niagara Falls Power Co...	200,000	17,200
Niagara Falls Hydraulic & Mfg. Co.....	100,000	5,600
Canadian side.		
Canadian Niagara Power Co.....	100,000	8,600
Electrical Development Co.	125,000	10,750
Ontario Power Co.....	180,000	11,700

The volume of water flowing over the two Falls has already been reduced from 222,400 to about 205,000 cubic feet per second, or about seven per cent., and this has had no appreciable effect on the Falls, but as already noted, over three times as much is under requisition.

It is obvious, think the commissioners, that the public agitation for restriction in the further abstraction of Niagara River water is well founded. Should the governments interested decide upon such restrictions, the commissioners believe the attention of capitalists will be drawn to the great possibilities for power development presented by the lower rapids and the fall in the river both above and below the whirlpool.

Having briefly outlined the circumstances and conditions which led the commissioners to recommend the granting of franchises, the report passes on to the financial considerations, the amount received in yearly rentals up to the present time from franchises coming to upwards of \$400,000. The companies have met the views of the commission in the artistic nature of the structures erected within the park limits, and the sundry improvements in outlying parks at Fort Erie, Niagara Glen and Queenston Heights are referred to with satisfaction. A broad boulevard from Fort Erie and Niagara Falls is considered desirable as a magnificent approach to the Falls from the south. The entrance to the park at Clifton House has been improved.

The construction of the agreement with the Intercolonial Railway Co. relative to their right to generate power from the river has been referred to the government for decision.

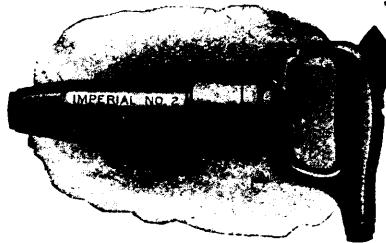
The death of Mr. W. B. Rankine of the Canadian Niagara Power Co. is referred to sympathetically.

The financial statement shows an overdraft of \$26,734 at the end of the year, the revenue from various sources reaching \$76,099, while the expenditure, including a previous overdraft of \$22,460, was \$102,833.

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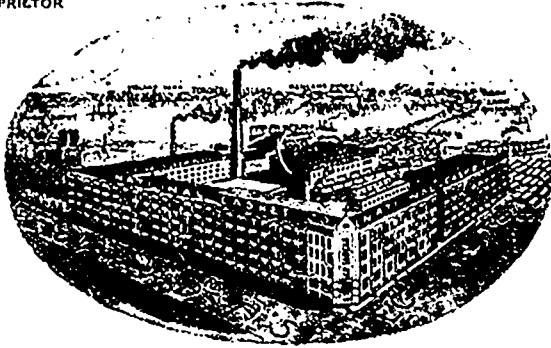


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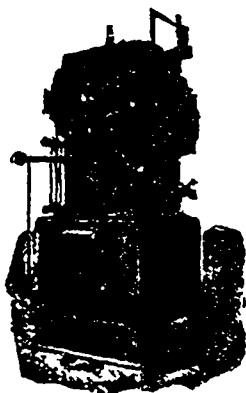
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Canada Process Co., Toronto.  
Nichols Chemical Co. of Canada, Montreal.
- Air Compressors**  
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Canada Foundry Co., Toronto.  
Canadian Rand Drill Co., Sherbrooke, Que.  
Darling Bros., Montreal.  
Smart-Turner Machine Co., Hamilton, Ont.
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- Aluminum**  
Northern Aluminum Co., Pittsburg, Pa.  
Syracuse Smelting Works, Montreal.
- Angles, Beams and Girders**  
Bourne-Fuller Co., Cleveland, Ohio.  
Canada Foundry Co., Toronto.  
Hopkins, F. H. & Co., Montreal.  
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
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Sadler & Haworth, Montreal and Toronto.  
Williams, A. R. Machinery Co., Toronto.
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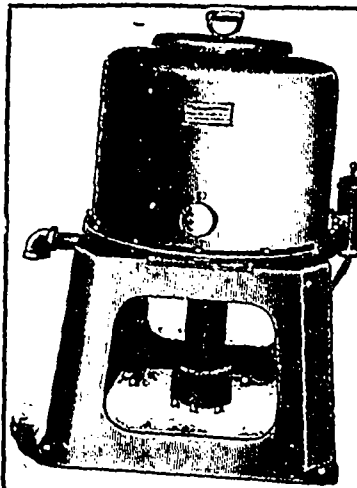
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Dominion Belting Co., Hamilton, Ont.  
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Montreal Belting Co., Montreal.  
McLaren, D. K., Montreal and Toronto.  
McLaren, J. C., Belting Co., Montreal and Toronto.  
Petrie, H. W., Toronto.  
Williams, A. R. Machinery Co., Toronto.

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Dunbar Fire Brick Co., Pittsburgh, Pa.  
Elk Fire Brick Co., St. Mary's, Pa.  
Hamilton Facing Mill Co., Hamilton, Ont.  
Harbison-Walker Refractories Co., Pittsburgh, Pa.  
Pennsylvania Fire Brick Co., Beech Creek, Pa.  
Queen's Run Fire Brick Co., Lock Haven, Pa.  
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### Boiler Inspection

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### BOILERS (See Engines and Boilers)

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

### Building Iron and Steel

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

### Builders' Materials

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

### Cables

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

### Canada Plates

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

### Canoes

Peterborough Canoe Co., Peterborough, Ont.

### Caps

McCullough-Dalsell Crucible Co., Pittsburg, Pa.

### Card Clothing

McLaren, D. K., Montreal and Toronto.  
McLaren, J. C. Belting Co., 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)

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

### Cement Machinery

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

### Centrifugal Pumping Machinery

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

### Chain Making Machinery

#### (Welded Coil Chain)

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

### Channels

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

### Charcoal Pig Iron

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

### Chemicals

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

### Chemists

Heys, Thomas & Son, Toronto.

### Clay Working Machinery

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

### Coal, Coke and Charcoal.

Bourne-Fuller Co., Cleveland, Ohio.  
Hamilton Facing Mill Co., Hamilton, Ont.  
Milnes, James H. & Co., Toronto.  
Wick, H. K. & Co., Buffalo, N.Y.  
Wilson, H. T. Coal Co., Detroit, Mich.

### Coal Cutting Machines

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

### Coal Tipples

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

### Coil Chains

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

### Coke Oven Brick

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

### Collection Agency

Petrie, H. D., Hamilton, Ont.

### Concrete Mixers

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

### Condensers

Smart-Turner Machine Co., Hamilton, Ont.

### Conduits (Interior)

Conduits Company, Limited, Toronto.

### Contractors' Machinery

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

### Contractors' Plants

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

### Conveying Machinery

Allis-Chalmers-Bullock, Limited, Montreal.  
Babcock & Wilcox, Limited, Montreal.  
Canada Foundry Co., Toronto.  
Jeffrey Mfg. Co., Columbus Ohio.  
Link-Belt Engineering Co., Philadelphia, Pa.  
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.

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(CONTINUED).

**Corrugated Iron**  
Metallic Roofing Co., Toronto.  
Pedlar People, Oshawa, Ont.

**Cotton Banding and Rope**  
McLaren, J. C. Belting Co., Montreal.

**Covers**  
McCullough-Dalsell Crucible Co., Pittsburg, Pa.  
Pittsburg Crucible Works, Pittsburg, Pa.

**Cranes (Electric and Hand Power)**  
Smart-Turner Machine Co., Hamilton, Ont.

**Crayons**  
Lowell Crayon Co., Lowell, Mass.  
McLaren, J. C. Belting Co., Montreal.

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

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

**Crucible Covers**  
McCullough-Dalsell Crucible Co., Pittsburg, Pa.  
Pittsburg Crucible Works, Pittsburg, Pa.

**Cutter Grinding Machines**  
Becker-Brainard Milling Machine Co., Hyde Park, Mass.

**Deep Well Engines**  
American Steam Pump Co., Battle Creek, Mich.

**Dies (Socket, Sewer Pipe and Tile)**  
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

**Directories**  
Kelly's Directories, Limited, Toronto

**Draw Benches (Wire)**  
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

**Dredges**  
Allis-Chalmers-Bullock, Limited, Montreal.

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

**Drills (Pneumatic and Rock)**  
Allis-Chalmers-Bullock, Limited, Montreal.  
Canadian Rand Drill Co., Sherbrooke, Que.  
Jeffrey Mfg. Co., Columbus, Ohio.

**Drop Forgings**  
Globe Machine & Stamping Co., Cleveland, Ohio.

**Drop Forging Dies**  
Globe Machine & Stamping Co., Cleveland, Ohio.

**Dry Kiln Apparatus**  
Sheldon & Sheldon, Galt, Ont.  
Sturtevant, B. F. Co., Boston, Mass.

**Dust and Shavings Separators**  
Sheldon & Sheldon, Galt, Ont.  
Sturtevant, B. F. Co., Boston, Mass.

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

**DYNAMOS (See Motors and Dynamos)**  
**Electric Meters and Transformers**  
Allis-Chalmers-Bullock, Limited, Montreal.  
Packard Electric Co., St. Catharines, Ont.

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

**Electrical Repairs**  
Keystone Engineering Co., Toronto.

**Electrical Supplies**  
Allis-Chalmers-Bullock, Limited, Montreal.  
Bristol Co., Waterbury, Conn.  
Canadian General Electric Co., Toronto.  
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.  
Link-Belt Engineering Co., Philadelphia, Pa.

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

**Engineers (Contracting)**

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

**Engineers (Electrical)**

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

**Engineers (Mechanical)**

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

**Engineers (Mill and Hydraulic)**

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

**Engineers (Mining)**

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

**Engineers and Contractors**

Canadian White Co., Montreal.  
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.

## FACTORY LOCATIONS.

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

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

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Ottawa, Ont.	Quebec, Que.
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Goldie & McCulloch Co., Galt, Ont.  
Hamilton, Wm. Mfg. Co., Peterborough, Ont.  
Hopkins, F. H. & Co., Montreal.  
Jenckes Machine Co., Sherbrooke, Que.  
Morris Machine Works, Baldwinsville, N.Y.  
McDougall, John, Caledonian Iron Works Co., Montreal.  
Petrie, H. W., Toronto.  
Robb Engineering Co., Amherst, N.S.  
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.)  
Central Ontario Power Co., Peterboro Ont.  
Hutcheson, S. M., Paisley, Ont.

### Feed Water Heaters

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

### Files

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

### Fillet (Pattern)

Hamilton Facing Mill Co., Hamilton, Ont.  
McLaren, J. C. Belting Co., Montreal.  
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.

### Financial

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

### Finals

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

### Fire Brick and Clay

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

### Fire Escapes

Darling Bros., Montreal.

### Fireproof Partitions

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

### Flour Mill Machinery

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

### Forges and Blowers

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

### Founders

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

### Foundry Facings and Supplies

Hamilton Facing Mill Co., Hamilton, Ont.

### Fuel Economizers

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

### Furniture (Lodge, Opera and School)

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

### Galvanizing

Ontario Wind Engine & Pump Co., Toronto.

### Galvanizing and Tinning Machinery and Furnaces (Wire)

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

### Gas and Gasoline Engines

Morrison, T. A. & Co., Montreal.  
Smart-Turner Machine Co., Hamilton, Ont.

### Gauges (Recording Pressure)

Bristol Co., Waterbury, Conn.

### Gauges (Steam)

Penberthy Injector Co., Windsor, Ont.  
Petrie, H. W., Toronto.  
Williams, A. R. Machinery Co., Toronto

### Gauges (Water)

Babcock & Wilcox, Limited, Montreal  
Penberthy Injector Co., Windsor, Ont.

### 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.  
Pittsburg Crucible Works, Pittsburg, Pa.

### 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 & Sh 'don, Galt, Ont.  
Sturtevant, B. F. Co., Boston, Mass.

### Hoisting Engines

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

### Hoists (Chain and Pneumatic)

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

### Hose (Fire and Pneumatic)

Gutta Percha & Rubber Mfg. Co., Toronto.  
McLaren, J. C. Belting Co., Montreal and Toronto.  
Sadler & Haworth, Montreal and Toronto.

### Hotel

Gallatin Hotel, New York City.

### 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 Leather

McLaren, J. C., Belting Co., Montreal.  
Sadler & Haworth, Montreal and Toronto

### 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.  
Wilson, J. C. & Co., Glenora, Ont.

When writing to Advertisers kindly mention THE CANADIAN MANUFACTURER.

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(CONTINUED).

## Insulated Wires and Cables

Phillips, Eugene F., Electrical Works, Montreal.

## Iron and Steel Specialties

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

## Injectors

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

## Iron and Steel Inspection

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

## Lamps—Electric

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

## Lathes

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

## Lathes (Wood-working)

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

## Loom Reeds

McLaren, J. C., Belting Co., Montreal.

## Lubricators

Hamilton Facing Mill Co., Hamilton, Ont.

## Machinists

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

## Machinists' Supplies

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

## Machine Tools

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

## Malleable Castings

International Harvester Co., Hamilton, Ont.  
Smith's Falls Malleable Castings Co., Smith's Falls, Ont.

## Marine and Stationary Engines and

### Boilers

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

## Mechanical Draft

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

## Metal Doors

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

## Metal Stamping

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

## Metallurgists

Mills, S. D., Toronto.

## Mill Machinery and Supplies

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

## Milling Cutters and Machines

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Jones & Moore Electric Co., Toronto.  
Keystone Engineering Co., Toronto.  
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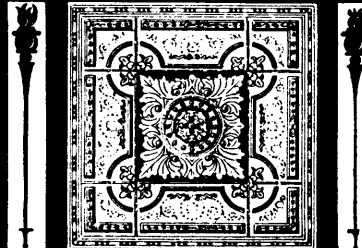
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McDougall, John, Caledonian Iron Works Co., Montreal.  
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Globe Machine & Stamping Co., Cleveland, Ohio.

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Engineering Review (Fieldens)	London	Monthly	3 05	3 25	Review of Reviews	London	Monthly	2 00	2 25
Everybody's Magazine	New York	Monthly	1 50	1 75	Scientific American	New York	Weekly	3 00	3 25
Field and Stream	New York	Monthly	1 50	1 75	Scribners' Magazine	New York	Monthly	3 00	3 25
Forest and Stream	New York	Weekly	4 00	4 25	Sporting Times	London	Weekly	3 00	3 25
Four Track News	New York	Monthly	1 00	1 25	Street Railway Journal	New York	Monthly	3 00	3 25
Gentleman's Magazine	London	Monthly	4 00	4 25	Toronto Saturday Night	Toronto	Weekly	2 00	2 25
Girl's Own Paper	London	Weekly	1 75	2 00	Toronto Sunday World	Toronto	Weekly	2 00	2 25
Good Housekeeping	Toronto	Monthly	1 00	1 25	Youth's Companion	Boston	Weekly	1 75	2 00
Good Road's Magazine	New York	Monthly	1 00	1 25	Weldon's Ladies' Journal	London	Monthly	1 25	1 50
Hardware Dealers' Magazine	New York	Monthly	1 00	1 25	Winnipeg Free Press	Winnipeg	Daily	3 00	4 25
Harpers' Magazine	New York	Monthly	4 00	4 25					
Harpers' Weekly	New York	Weekly	4 00	4 25					

**The Canadian Manufacturer Publishing Co., Limited,**  
**TORONTO, CANADA.**

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Orders promptly filled.

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**London Rolling Mills**  
London, Canada.



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During the fiscal year ending June 30, 1905, the imports of fuel into Canada and the value thereof were as follows:—Bituminous and Dust, 4,826,535 tons, value \$8,346,352 Anthracite and Dust, 2,604,137 tons, value \$12,093,371; Coke, 371,593 tons, value \$807,842; Charcoal, value \$46,862. Under the general tariff the duty on Bituminous Coal is 53 cents per net ton, and upon Bituminous Dust or Slack, and upon Charcoal, 20 per cent. There is no duty imposed upon Anthracite or Coke.

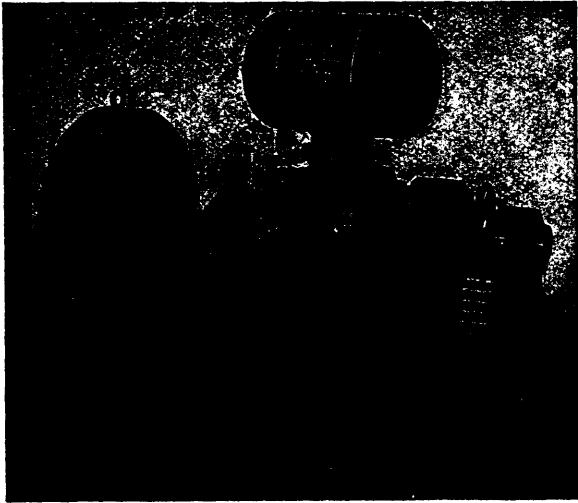
EVERY STEAM POWER PLANT IN CANADA USES COAL

EVERY FOUNDRY USES COKE

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**Canadian Manufacturer**  
REACHES THEM.



# Westinghouse Motors



Noted for their

High Efficiency

Cool Running

Overload Capacity

Strong Construction

Westinghouse Type CCL Induction Motor Driving  
Goulds Three Nozzle Rotary Fire Pump

## Canadian Westinghouse Co., Limited

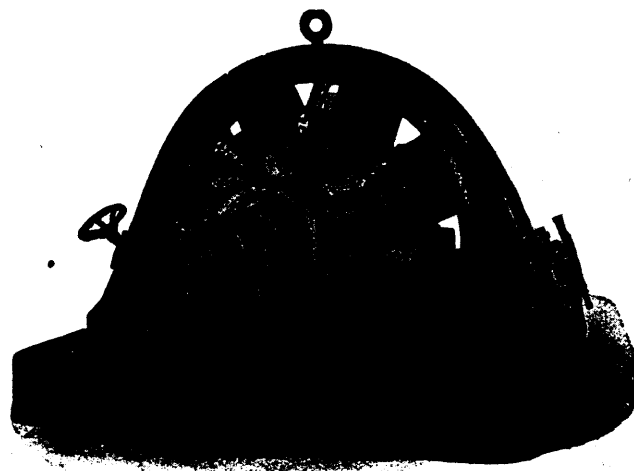
General Office and Works, HAMILTON, ONTARIO.

Lawlor Bldg., King and Yonge Sts.,  
TORONTO.  
152 Hasting Street,  
VANCOUVER.

For particulars address nearest office:  
HAMILTON.  
922-928 Union Bank Bldg.,  
WINNIPEG.

Sovereign Bank of Canada Bldg.,  
MONTREAL.  
184 Granville Street,  
HALIFAX.

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One of four 800 K.W. rotary converters built for the Shawinigan Water & Power Co., Montreal.

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Waxes, Gums, Shellacs,  
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## THE BOILER INSPECTION and INSURANCE CO. of CANADA

CANADA LIFE BUILDING  
TORONTO

Thirty Years' Experience as Consulting Engineers

Toronto, October 12th, 1904.

THE BOILER INSPECTION & INSURANCE CO.  
OF CANADA,

Toronto, Ont.

Gentlemen:—

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Yours very truly,

TORONTO BOLT & FORGING CO., LIMITED,  
T. H. Watson, Sec.-Treas.

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SUCCESSORS TO

The Richmond Conduit and Mfg. Co.  
Limited

Sole Manufacturers

Under U.S. and Canadian Patents

**GALVADUCT**

AND

**LORICATED**

**CONDUITS**

For Interior Construction

TORONTO, CANADA

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Office and Works, Queen's Wharf, BATHURST STREET, TORONTO

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WATERBURY, CONN.

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MANUFACTURERS  
OF

**MALLEABLE  
IRON  
CASTINGS**

Smith's Falls, Ont., Can.

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