

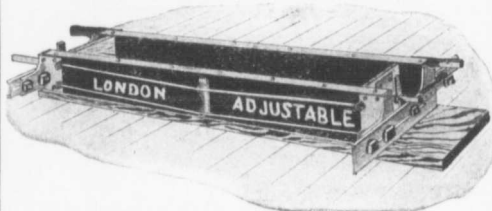
# CANADIAN CONTRACT RECORD

*A Weekly Journal of Engineering, Public Works,  
Tenders, Advance Information and Municipal Progress*

## The London Adjustable Sill, Step and Window Cap Mould

meets every requirement. This mould is adjustable to any length, width or angle, also makes water drip in all sills and window caps. No blocking required.

SEND FOR PAMPHLET NO. 16.



We also make a full line of Concrete Machinery.  
Tell us your requirements.

**London Concrete Machinery Co.**  
28 Redan Street, London, Ont.

Largest exclusive Concrete Machinery Co. in Canada.

## Canadian General Development Co. Limited

(Societe Canadienne D'Ente prises Generales, Limited)

A Canadian Company organized to promote and develop for itself or other persons all commercial and industrial enterprises; to undertake the construction of all kinds of public, municipal and private works, and especially railways, tramways, water works, sewers, hydraulic and electrical installations.

The Company is supported and backed in Europe by nine of the strongest Banks, enabling it to carry through the largest undertakings, and to financially take an interest in Canadian enterprises.

The Company has a staff of competent and experienced engineers, and invites correspondence from municipal and private corporations, and from business men who require technical or financial assistance to plan, execute or construct any private municipal or public work.

ADDRESS ALL COMMUNICATIONS TO

**BEAUDRY LEMAN, General Manager**

3 Beaver Hall Square, Montreal

TEL. UP 4515

## Hull Wall Plaster Co.

MANUFACTURERS OF

**Adamant Wall Plaster  
White Enamel Finish**

and

**Hydrated Lime**

**Hull, - Quebec**

## Structural Steel

**S**end us your specifications.

**T**ell us your requirements.

**E**very enquiry has prompt attention.

**E**very little helps.

**L**et us fill a sample order.

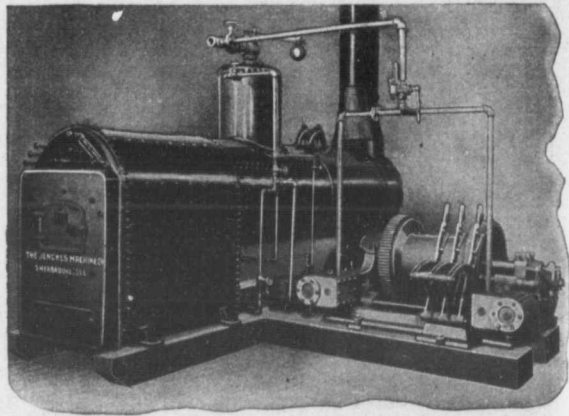
*The*  
**Hamilton Bridge Works Co.**

Limited  
HAMILTON, CANADA

## Portable Hoisting Plants

We build these in a variety of styles, adapted to various conditions. Cut shows a design which is deservedly popular. The Hoist is usually a 6 x 8, 7 x 10 or 9 x 12 with boiler of proper size.

Prices quoted on application.



## THE JENCKES MACHINE COMPANY LIMITED

General Offices: **SHERBROOKE, QUE.**

Works: **Sherbrooke, Que., St. Catharines, Ont.**

Sales Offices: **St. Catharines Rosland Vancouver Halifax, Cobalt**

PLEASE ADDRESS ENQUIRIES TO NEAREST SALES OFFICE



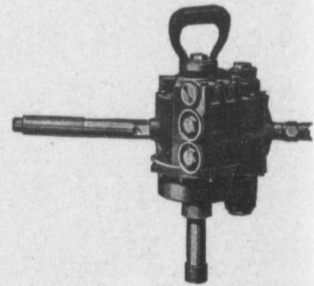
Pneumatic Sand Rammer.



Boyer Riveter.



Boyer Chipper.



Little Giant Drill.

WE HAVE IN STOCK A FULL LINE OF

## The Chicago Pneumatic Tool Co.'s Tools

INCLUDING

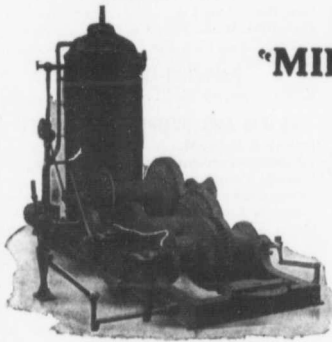
Chipping Hammers Sand Rammers Duntley Electric Drills  
Riveting Hammers, Little Giant Drills and Grinders.  
Angle Gears, Etc. Also a full line of repair parts.

## N. J. HOLDEN COMPANY, LIMITED

MONTREAL—302 St. James Street

TORONTO—42 York Street

## Hook 'er to the Pile Driver

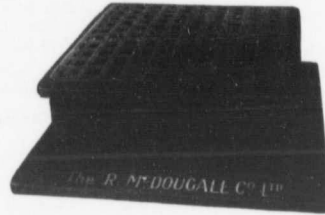


*The*  
**"MIDLAND"**  
HOISTING  
ENGINE  
We  
Mean

IT WORKS FASTER IT WORKS BETTER IT WORKS CHEAPER  
THAN ANY OTHER

**Georgian Bay Engineering Works**  
P. O. Box 425  
Midland - Ontario

## Manhole Covers and Frames



We have several designs and this shows the article in most general use. It is Heavy and Substantial, made from good materials and will stand any strain to which it may be subjected. Will be pleased to furnish particulars of these, together with

**Catch Basins, Hydrants  
Curb Boxes, Etc.**

**THE R. McDougall Co., LIMITED**  
GALT, CANADA

## Stinson-Reeb Builders Supply Co., Ltd.

Dealers in Building Materials

**CEMENT** Portland Cement, Keene's Cement.

**BRICKS** Pressed, Common and Fire Bricks.

**LIME** Common Lump Lime, White Rock Hydrated Lime.

**Sackett Plaster Board**

**Humphries' Patent Scaffolding Bracket**

Our new Wall Plaster Mill is now in running order and we are prepared to accept orders for local delivery or carload lots of

Imperial Hard wall Plaster

Phone or Write for Prices

**188 William St., Montreal**

## Neptune Meter Company

Manufacturers of the Well-known



**TRIDENT**  
**Frost-Proof**  
**Water**  
**Meters**

WRITE FOR CATALOGUE

**Main Office - 90 West Street**  
**New York City**

## CLASSIFIED INDEX OF ADVERTISERS

<b>ACCIDENT INSURANCE</b> Page	<b>DRILLS</b> Page	<b>PIPE (CAST IRON)</b> Page
Ontario Accident Insurance Co. .... 30	Canadian Rand Co. .... 1	Canada Foundry Co. .... 33
<b>BOILERS</b>	<b>DRILLING CONTRACTORS</b>	Canadian Iron & Foundry Co. .... 8
Jenckes Machine Co. .... 2	Bell, Wallace ..... 27	Gartshore-Thomson Pipe & Foundry Co. .... 6
E. Leonard & Sons. .... 3	Harvey, J. .... 34	Gaudry & Co., L. H. .... 29
<b>BRICK</b>	Peat & Sons, Jas. .... 32	Ontario Sewer Pipe Co. .... 29
Don Valley Brick Works. .... 5	<b>DEBENTURES</b>	Stanton Iron Works Co. .... 27
<b>BRIDGES (STEEL)</b>	Stimson & Co., G. A. .... 30	<b>PIPE (WOODEN)</b>
Canadian Bridge Co. .... 8	<b>ENGINEERS (CIVIL AND MECHANICAL)</b>	Canadian Pipe Co. .... 33
Canada Foundry Co. .... 33	Birds, S. B. .... 30	Dominion Wood Pipe Co. .... 33
Dominion Bridge Co. .... 34	Canadian Engineers, Limited. .... 28	Pacific Coast Pipe Co. .... 23
Hamilton Bridge Works Co. .... 1	Chipman, Willis ..... 28	<b>PAINTING MATERIAL</b>
Ontario Bridge Co. .... 29	Bowman & Connor. .... 28	Eadie Douglas Co. .... 27
Phoenix Bridge and Iron Works. .... 34	Clarke & Mond. .... 28	<b>PUMPS AND PUMPING MACHINERY</b>
<b>CASTINGS (IRON)</b>	Davis & Johnston. .... 28	Beatty & Sons, M. .... 5
Allis-Chalmers-Bullock ..... 9	Farmer, John T. .... 28	Canadian Fairbanks Co. .... 2
Jenckes Machine Co. .... 2	Fensom, C. J. .... 28	Canada Foundry Co. .... 33
<b>CEMENT</b>	Fielding, John S. .... 26	Drummond, McCall & Co. .... 8
Alsen Portland Cement Co. .... 8	Galt & Smith. .... 28	Mussens Limited. .... 10
Bremner, Alex. .... 27	Jackson, John H. .... 28	Ontario Wind Engine & Pump Co. .... 7
Canadian Portland Cement Co. .... 20	Keating & Breithaupt. .... 28	<b>REFUSE DESTROYERS</b>
DeSola, C. I. .... 26	Lea & Coffin. .... 28	Heenan & Froude. .... 27
Edison Portland Cement Co. .... 6	Leofred, A. .... 28	<b>ROOFING MATERIALS</b>
Gray & Bruce Portland Cement Co. .... 30	Macallum, A. F. .... 28	Roofers Supply Co. .... 34
Hanover Portland Cement Co. .... 34	Smith, Kerry & Chase. .... 28	<b>ROAD MACHINERY</b>
Hartranft, Wm. G. .... 32	Thomas, J. Lewis. .... 28	Cameron & Co., Hugh. .... 34
Lakefield Portland Cement Co. .... 7	Wells & Raymond. .... 28	Climax Road Machine Co. .... 34
McNally & Co., W. .... 26	<b>ENGINES</b>	Heaman, George. .... 31
Morrison & Co., T. A. .... 34	Cameron & Co., Hugh. .... 34	Morrison & Co., T. A. .... 34
Owen Sound Portland Cement Co. .... 32	Jenckes Machine Co. .... 2	Mussens Limited. .... 10
Ontario Portland Cement Co. .... 32	Sawyer & Massey Co. .... 6	<b>ROPE</b>
Stinson-Reeb Builders' Supply Co. .... 3	<b>ELECTRICAL APPARATUS AND SUPPLIES</b>	Allan, Whyte & Co. .... 34
Thorn Cement Co. .... 7	Allis-Chalmers-Bullock ..... 9	Dominion Wire Rope Co. .... 36
<b>CONTRACTORS' SURETY BONDS</b>	Canadian General Electric Co. .... 33	Greening Wire Co., B. .... 5
United States Fidelity & Guaranty Co. .... 27	Drummond, McCall & Co. .... 8	<b>SLATE</b>
<b>CONCRETE BLOCK MACHINES</b>	<b>FIRE APPARATUS</b>	Roofers Supply Co. .... 34
Canadian Concrete Machinery Co. .... 26	Cameron & Co., Hugh. .... 34	<b>STEEL BARS (CORRUGATED)</b>
Famous Machinery Co. .... 6	Laurentian Granite Co. .... 34	Corrugated Steel Bar Co. of Canada. .... 31
Ideal Concrete Machinery Co. .... 31	McGregor & McIntyre. .... 29	<b>STRUCTURAL IRON AND STEEL</b>
London Concrete Machinery Co. .... 1	Morrison & Co., T. A. .... 34	Canada Foundry Co. .... 33
Mussens Limited. .... 10	Seagrave, W. E. .... 7	Dominion Bridge Co. .... 34
<b>CONCRETE MIXERS AND MACHINERY</b>	<b>GRANITE</b>	Hamilton Bridge Works Co. .... 1
Canadian Fairbanks Co. .... 2	Laurentian Granite Co. .... 34	McGregor & McIntyre. .... 29
Dartnell, E. F. .... 35	<b>HOISTING MACHINERY</b>	Phoenix Bridge & Iron Works. .... 34
Gould, Shapley & Muir. .... 6	Allis-Chalmers-Bullock ..... 9	Reid & Brown. .... 30
Hopkins & Co., F. H. .... 36	Beatty & Sons, M. .... 5	Taunton, Richard A. .... 6
Ideal Concrete Machinery Co. .... 31	Canada Foundry Co. .... 33	<b>STONE</b>
Jenckes Machine Co. .... 2	Georgian Bay Engineering Works. .... 3	Crushed Stone, Limited. .... 32
London Concrete Machinery Co. .... 1	Jenckes Machine Co. .... 2	Doolittle & Wilcox. .... 5
Mussens Limited. .... 10	Hood & Son, Wm. .... 7	Laurentian Granite Co. .... 34
Morrison & Co., T. A. .... 34	Hopkins & Co., F. H. .... 36	Morrison & Co., T. A. .... 34
Toronto Pressed Steel Co. .... 31	Mussens Limited. .... 10	<b>SHOVELS (STEAM)</b>
Vining Bros. Mfg. Co. .... 35	<b>HYDRANTS</b>	Beatty & Sons, M. .... 5
<b>CONTRACTORS' PLANT</b>	Canada Foundry Co. .... 33	Canada Foundry Co. .... 33
Allis-Chalmers-Bullock ..... 9	Canadian Fairbanks Co. .... 2	Hopkins & Co., F. H. .... 36
Beatty & Sons, M. .... 5	Canadian Iron & Foundry Co. .... 8	Mussens Limited. .... 10
Canada Foundry Co. .... 33	Gartshore-Thomson Pipe & Foundry Co. .... 6	<b>TANKS AND STAND PIPES</b>
Canadian Rand Co. .... 1	Kerr Engine Co. .... 35	Canada Foundry Co. .... 33
Canadian Swensons. .... 23	McDougall Co., R. .... 3	Jenckes Machine Co. .... 2
Hopkins & Co., F. H. .... 36	<b>LOCOMOTIVES AND RAILS</b>	Ontario Wind Engine & Pump Co. .... 7
Humphries Bracket Scaffolding Co. .... 35	Canada Foundry Co. .... 33	<b>VALVES</b>
Jenckes Machine Co. .... 2	Gartshore, John J. .... 34	Canada Foundry Co. .... 33
Mussens Limited. .... 10	Hopkins & Co. .... 36	Canadian Fairbanks Co. .... 2
Toronto Pressed Steel Co. .... 31	Mussens Limited. .... 10	Canadian Iron & Foundry Co. .... 8
Wallington, G. P. .... 30	Sessenwein Bros. .... 30	Gartshore-Tompson Pipe & Foundry Co. .... 6
<b>CONTRACTORS</b>	<b>METERS</b>	Kerr Engine Co. .... 35
Canadian General Development Co. .... 1	Neptune Meter Co. .... 3	McDougall Co., R. .... 3
Tromanhauser, J. H. .... 30	<b>PLASTER BOARDS</b>	<b>WOOD FIBRE PLASTER</b>
<b>CONCRETE CONSTRUCTION</b>	P. W. St. George. .... 34	Imperial Plaster Co. .... 5
Ambursen Hydraulic Construction Co. .... 30	<b>PILE DRIVING</b>	<b>WHEEL SCRAPERS</b>
<b>CORRUGATED IRON</b>	Hood & Sons, Wm. .... 7	Bechtels Limited. .... 5
Galt Art Metal Co. .... 5	Russell, John E. .... 7	<b>PAYING AND PAVING MATERIALS</b>
Metallic Roofing Co. .... 30	<b>PAVING AND PAVING MATERIALS</b>	Ontario Asphalt Block Co. .... 31
Metal Shingle and Siding Co. .... 29	Silica Barytic Stone Co. of Ontario. .... 30	
Ormsby, A. B., Limited. .... 30		
Roofers Supply Co. .... 34		
<b>CRUSHERS (STONE AND ROCK)</b>		
Canada Foundry Co. .... 33		
Dartnell, E. F. .... 35		
Hopkins & Co., F. H. .... 36		
Jenckes Machine Co. .... 2		
Mussens Limited. .... 10		
Morrison & Co., T. A. .... 34		
Sawyer & Massey & Co. .... 6		
Allis-Chalmers-Bullock ..... 9		

**WOOD FIBRE <sup>HARD</sup> WALL PLASTER**

**White Rock (Hydrated) Lime**

MANUFACTURED BY  
**The Imperial Plaster Co., Limited**

**KING STREET (West of Subway) TORONTO**

*Dealers in Cement, Lime, Bricks, Fire Clay, Plaster Paris*

**Crushed and Building Stone**

For—Concrete, Roadwork and Sidewalks. Also DOLOMITE LIMESTONE for fluxing.

**Doolittle & Wilcox, Limited**  
**Dundas, Ont.**

Selling agents for Aetna Dynamite

*The Don Valley Brick Works*

ARE NOW MANUFACTURING

*Porous  
Terra Cotta  
Fireproofing*

*In Arches, Blocks and Furring*

in any required size

HEAD OFFICE: **36 Toronto Street, TORONTO**

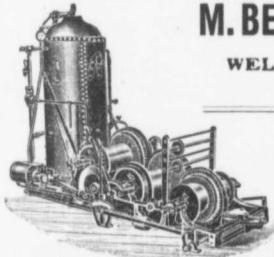
MONTREAL AGENTS:

*DAVID MCGILL, 206 Merchants Bank Chambers, MONTREAL*

*Kindly Write for Prices*

**M. BEATTY & SONS**

*Limited*  
**WELLAND, ONTARIO  
CANADA**



Dredges, Ditchers  
Derricks  
Steam Shovels

*Submarine Rock Drilling  
Machinery, Mine Hoists*

*Hoisting Engines, Centrifugal Pumps for water and sand  
Stone Derricks, Clam Shell Buckets, Steel Skips, Coal and  
Concrete Tubes, and other Contractors' Machinery.*



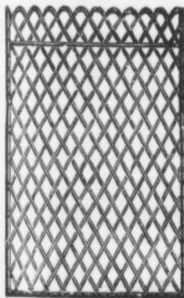
You want a

**WHEEL  
SCRAPER**

that will load easier,  
dump easier and do a bigger day's work than  
any other.

Then let us send you one of our machines. It does it.

**Bechtels, Limited**  
**Waterloo, Ontario**



**WIRE GUARDS**

For  
Factory and Mill Windows  
School and Church Windows  
School and Basement Windows  
and for all Public Buildings

**The B. GREENING  
WIRE CO., Ltd.**

HAMILTON, ONT.

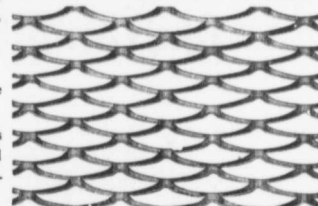
MONTREAL, QUE.

**"Galt Expanded Steel Lath"**

Strong, Economical,  
Rigid, Uniform,  
Flat, Durable.

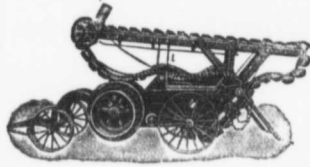
See this Lath before  
buying elsewhere.

Once used, always  
used. Samples and  
full particulars mailed  
upon request.



**The Galt Art Metal Co., Limited**  
**GALT, ONTARIO**

OR DUNN BROS., WINNIPEG, MAN., AND REGINA, SASK.



Notice to  
Contractors and  
Quarrymen  
Get prices on our  
New Solid  
Steel Frame  
CRUSHERS

Especially adapted for road making, mining and general contract work. Supplied in 4 sizes on wheels or skids, with or without elevators, etc.

**Sawyer & Massey Co., Limited**  
HAMILTON, CANADA

## EDISON PORTLAND CEMENT

85 per cent. thru 200  
98 per cent. thru 100

The Finest Ground Portland  
Cement Manufactured

Especially Useful in Fine Facings and Ornamental Work  
on Account of Finer Grinding

It is generally accepted that the coarser particles in cement are practically inert, and it is only the extremely fine powder that possesses adhesive or cementing qualities. The more finely cement is pulverized, all other conditions being the same, the more sand it will carry and produce a mortar of a given strength.  
Report of Committee on Uniform Tests of Cement,  
American Society of Civil Engineers.

Absolutely Uniform and Reliable

SALES OFFICES:  
St. James Building NEW YORK

## Ideal Concrete Mixer

Most Up-to-date Mixer on the Market



Write For Catalogue

**Goold, Shapley & Muir Co.**

Limited

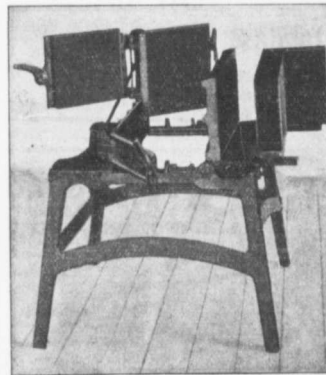
BRANTFORD

CANADA

## THE FAMOUS CEMENT BLOCK MACHINE

Winner of First Prize at Michigan State Fair

Makes a concrete face down block of 100 per cent. more strength with one-third less cement and cheaper than the sand blocks usually made by other block machines. This is how we do it. We use coarse material which means less cement. There being no core in the way a flat tamper can be used which means uniform tamping on the face and uniform strength of block. Enough water is used to make a concrete block almost equal in strength to natural stone. Pallets used are wood costing from 6 to 8 cents a piece and one size only is necessary for all sizes of blocks. No studding or lathing is required. Plaster is put right



on wall. Block made in any length from 6' to 24' long and a wall from 8' to 16" thick. Block is up-to-date in design and can be faced with granite, marble, brown stone or any material. The wall is bound every foot and every 9" making the most strongly bound wall built. No metal ties are used. It is a two piece moisture-proof wall on account of the continuous air space and non-continuous bond. The machine is rapid working, strong and durable and can be operated by a boy of 12. Each man working will turn out from 100 to 125 blocks a day.

Write for a catalogue and see cuts of the wonderful moisture-proof wall.

**FAMOUS BLOCK MACHINE CO.**

United States Office:

176 Jefferson Avenue  
DETROIT, MICH.

Canadian Office:

21 Pitt Street West  
WINDSOR, ONT.

JAMES THOMPSON, President. J. G. ALLAN, VICE-PRESIDENT, JAMES A. THOMPSON, Secretary. ALEX. L. GARTSHORE, Treasurer

## THE GARTSHORE-THOMPSON PIPE & FOUNDRY CO. LIMITED

Manufacturers of

Flexible and Flange Pipe,  
Special Castings and all kinds of  
Waterworks Supplies.



3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer  
HAMILTON, ONT.



## Portland Cement

### MONARCH BRAND

Highest quality—guaranteed to fulfill the requirements of specifications for Portland Cement approved of by the Canadian and American Societies of Civil Engineers.

Prompt shipments from mill or stock at Fort William and Port Arthur.

—The—  
**Lakefield Portland Cement Co., Limited**  
 LAKEFIELD, ONT.

## Steel and Wood Tanks



Suitable for  
**SPRINKLER SYSTEMS**  
**FIRE PROTECTION**  
**WATER SUPPLY PLANTS, ETC.**

### Steel Substructures

OF ALL KINDS  
 (Galvanized or Painted)  
**WINDMILLS**  
**GASOLINE ENGINES**  
**HYDRAULIC RAMS, Etc.**

**ONTARIO WIND ENGINE & PUMP CO. Limited**  
 TORONTO and WINNIPEG

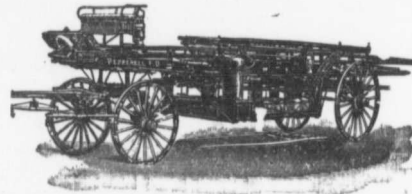


## "Lehigh" Portland Cement

Capacity 20,000 Barrels per Day

The "Lehigh Portland Cement Company, Limited," are now also building a plant at Belleville, Ont., of 750,000 barrels annual capacity. Until this plant is completed all orders can be shipped from the United States. For prices, etc., address—

**Thorn Cement Company**  
 Buffalo, N. Y.  
 SOLE AGENTS FOR CANADA



### Lightness, Strength and Economy

Seagrave Patent Trussed Ladders, Trussed Aerial, City Service and Village Hook and Ladder Trucks, Combination Hook and Ladder Trucks and Chemical Engines, Trussed Trucks, and Hand Pumps, Combination Hose Wagons and Chemical Engines, Hose Wagons, Combination Hook and Ladder Trucks and Hose Wagons, Chemical Engines, Fire Extinguishers, Hose Reels, Patrol Wagons, Ambulances, Specialty Wagons, Patent Sleigh Runners, and other Modern Fire Fighting Tools.

Prompt attention given to all enquiries. All goods built to order.

**W. E. SEAGRAVE - WALKERVILLE, ONT.**  
 LONG DISTANCE PHONES 685 and 684



## PILE DRIVING

On land and water by steam.  
 Pile Drivers or Drop Hammers.

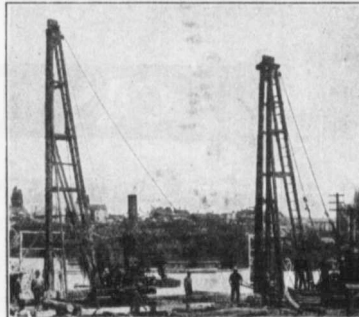
Dams, Wharves, Bridge Building, Trestle Work and General Contracting.

Submarine Diving and all kinds of Submarine Work.

We have always a stock of:—Diving Outfits, Portable Boilers, Hoisting and Pumping Machinery, etc.

**WM. HOOD & SON, 10 RICHMOND SQ., MONTREAL**

## PILE DRIVING and Foundation Work



By Eaton Automatic Steam and Pile Hammers, Water Jet or Drop Hammers, Dock Building, Submarine work and Dredging

**Building Mover and Wrecker**  
 GENERAL CONTRACTING

**John E. Russell**  
 Toronto

Residence, 1010 Queen St. E.—Phone M. 4626  
 Office and Yard 307 Logan Ave.—Phone M 2007.

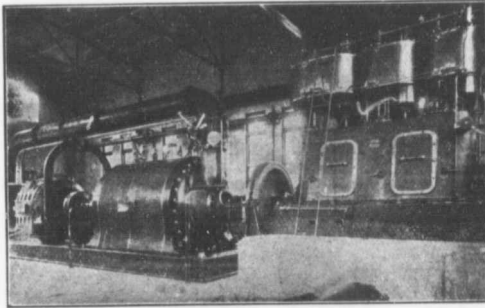
# The Canadian Bridge Co., Limited

Manufacturers

WALKERVILLE, ONT.

Locomotive Turn Tables.  
Roofs, Steel Buildings and  
Structural Iron Work of all Descriptions

## RAILWAY AND HIGHWAY BRIDGES



Stage Turbine Pump Electric Motor and High Speed Steam Engine  
Built for the Montreal Water and Power Co., to do 4,500 Imperial  
gallons a minute against 300 feet head Overall Eff. 70%.

## PATENT TURBINE PUMPS

KORTUNG TWO CYCLE GAS ENGINES,  
GRAVITY AND PRESSURE FILTERS,  
WATER SOFTENING APPARATUS,  
ELECTRICAL MACHINES.

- BUILT BY -

MATHER &amp; PLATT, LIMITED

MANCHESTER, ENG.

**Drummond, McCall & Co., Montreal**

Sold under a **guarantee** other  
portlands cannot make in **good  
faith**. That guarantee is backed  
by the **oldest** and most **respon-  
sible manufacturers** in the  
world.

AMERICAN

190,000 bbls. Key West so far. 70,000 bbls. City of Rochester Reservoir  
The best color and most **durable** for **cement blocks and sidewalks**. Write for list of other important works in all sections

"Judge a Cement by Its Works."



Selected for **PANAMA CANAL** in  
Preference at Equal Prices and has  
exceeded those severe require-  
ments.

GERMAN

# CANADIAN IRON AND FOUNDRY CO. LIMITED

Special Castings

Flange Pipe  
Branches  
Hydrants



## CAST IRON PIPE

Valves

Valve Boxes and  
General Water  
Works Supplies

SMALL DIAMETER WHEELS AND CASTINGS FOR CONTRACTORS  
CAR WHEELS. CASTINGS OF ALL KINDS.

WORKS AT: { HAMILTON, ONT. — MONTREAL, P. Q.  
ST. THOMAS, ONT. — THREE RIVERS, P. Q.  
FORT WILLIAM, ONT. — LONDONDERRY, N. S.

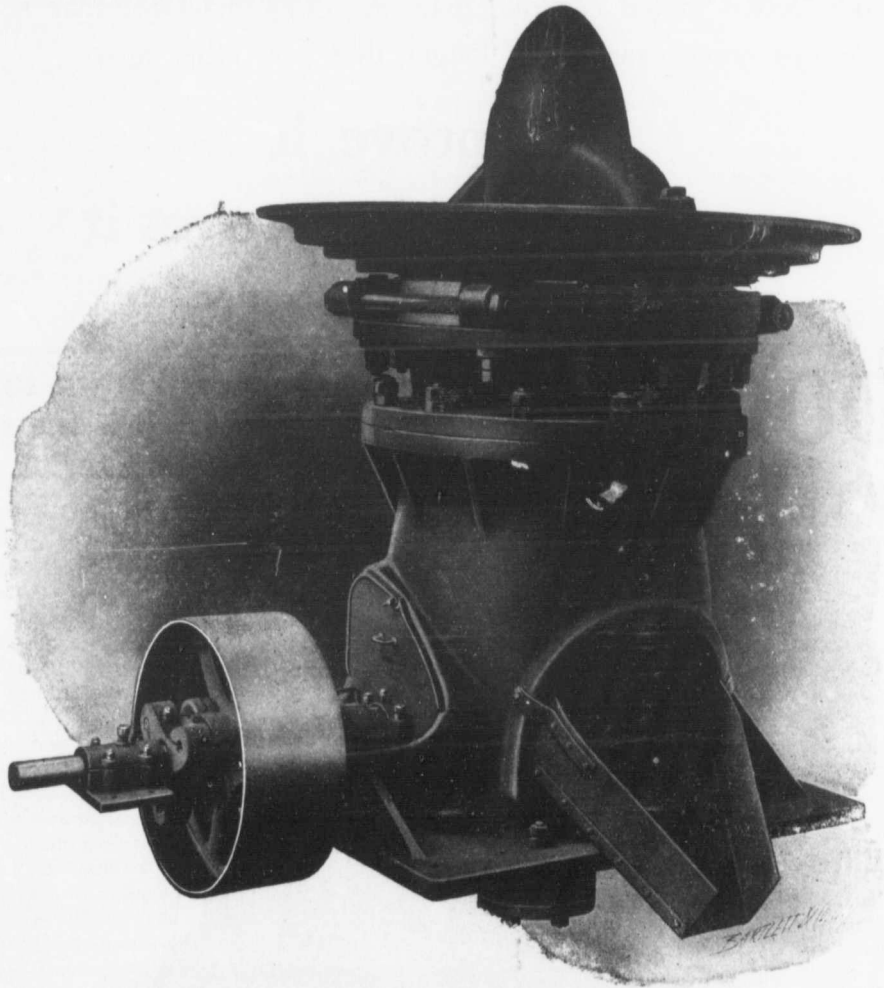
Head Office: **IMPERIAL BANK CHAMBERS, MONTREAL.**



# ROCK CRUSHING PLANTS

for

Railroad Ballast, Portland Cement, Fluxing Purposes, and "Good Roads"



## GATES "K" ROCK AND ORE BREAKER

Bulletin 1411 "Modern Rock Crushing Plants" will be sent on application to any of our Sales Offices. It contains, in addition to descriptions of the Machinery and Appliances used, sectional plans of many plants now in active operation which will prove of material assistance to customers in drawing up their own plans and specifications.

### Allis-Chalmers-Bullock, Limited

Works : MONTREAL

Sales Offices :      New Glasgow      Montreal      Toronto      Winnipeg      Vancouver

**We don't only say---**

**that the Smith Concrete Mixer**

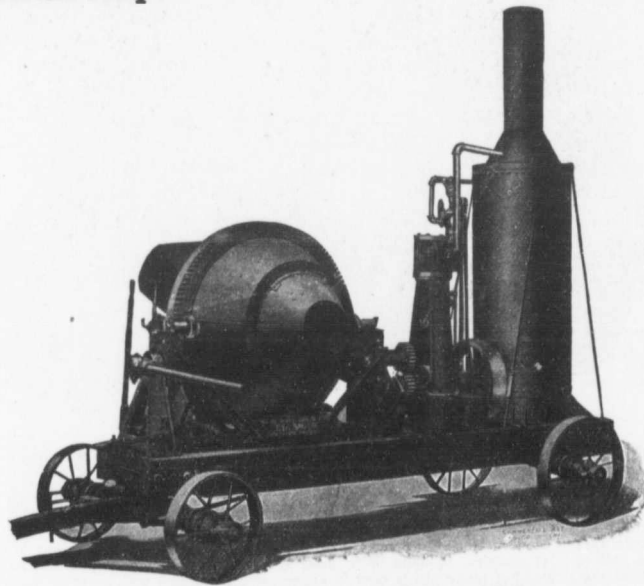
turns out better mixed concrete than any other machine, that it mixes faster, dumps quicker and lasts longer than any other mixer

**We prove it**

**and the Machine proves it**

**every day it is in operation**

**3000** in use and not one ever known to fail. Just think what that means. It is the result of better design, better material and better workmanship.



No. 1 Smith Mixer on Truck with Engine and Boiler.

CATALOGUE ON APPLICATION

**Mussens Limited**

**Montreal**

**Toronto**

**Winnipeg**

**Vancouver**

**C**

**HUC**

**C**

**Un**

**HEAD**

**MONT**

**WINN**

**VANCO**

Subsc  
give pr  
and new  
larity in

**How**

The  
a sub  
Board  
Ohio,  
gineer  
plan  
buildi  
this a  
presid  
of Ce  
Laws,  
prepar  
firepr  
which  
greate  
use, a  
to the  
render  
states  
ply to  
any to  
as to t  
quote

In v  
overtal  
questio  
town I  
whatev

# CANADIAN CONTRACT RECORD

PUBLISHED EVERY WEDNESDAY

BY

**HUGH C. MACLEAN, LIMITED**  
TORONTO, CANADA.

SUBSCRIPTION PRICE:

Canada and Great Britain, \$2.00 per annum,  
payable in advance.

United States and all foreign countries embraced  
in the General Postal Union, \$3.00.

HEAD OFFICE, Confederation Life Bldg., TORONTO  
Telephone Main 2362.

Branch Offices:

MONTREAL Tel. Main 2599 B34 Board of Trade  
D. BURNSIDE, Representative.

WINNIPEG Telephone 224 330 Smith Street  
ROLAND F. HILL, Representative.

VANCOUVER Telephone 2248 615 Hastings Street  
GEORGE A. GALL, Representative.

Subscribers who may change their address should  
give prompt notice of same. In doing so give both old  
and new address. Notify the publishers of any irregularity  
in delivery of papers.

## How to Make School Buildings Safer.

The recent holocaust at Collinwood, a suburb of Cleveland, has caused the Board of Education of Youngstown, Ohio, to call upon a fireproofing engineer of prominence to formulate a plan for rendering safe the school buildings in that city. As a result of this action William H. Ham, vice-president of the National Association of Cement Users for the Section on Laws, Ordinances and Insurance, has prepared a preliminary report on the fireproofing of school buildings, in which he points out wherein lies the greatest danger in buildings now in use, and makes recommendations as to the most economical method of rendering these structures safe. He states that his recommendations apply to the average school building in any town in the country as strongly as to the schools in Youngstown. We quote from his report as follows:

In view of the calamity that has overtaken Cleveland, there can be no question of the wisdom of the Youngstown Board of Education in taking whatever steps are necessary to make

the school buildings that are now in use safe, and to establish definitely a policy hereafter to construct no school buildings which are not absolutely fireproof. How to accomplish these results without increasing the burdens of the taxpayers unduly, is the question of the moment, and to this end the writer makes the following general recommendations:

All school buildings which are not known to be thoroughly fireproof should be examined by the School Committee, the Superintendent of Schools and the chief of the fire department of the city.

Steps should be taken to prevent rapid spread of fire, especially from the corridors to the main rooms. This can be accomplished in all old buildings quickly by the installation of a fireproof partition between the corridors and main rooms, with steel doors having wire glass transoms, or with no transoms.

If possible every school building should have an exit at the opposite end of the building from the stairways. This exit should be protected from fire by brick walls extending at least 6 feet from the building, no other opening into the space being allowed. Fire escapes should be made of steel or cast iron. The doors to these fire escapes should be unlocked every morning and opened. A fire drill should be instituted, using the fire escapes, and practice should be constant throughout the school year. In order that the children may not be frightened at the sound of alarm of fire, the practice should be carried out with regular fire alarm each week at no specified time.

Where the School Committee is limited for funds with which to build a fireproof school building, it should be impressed upon the architects that the interior of the building is the most important of all features, and that any saving that is to be made should be made in the looks of the exterior and not in the construction of the interior of the building. It often occurs that for the sake of beautifying the city an elaborate exterior is designed. This is, of course, ideal,

but where the maximum amount of space must be built for the minimum amount of money, a plain, almost severe, exterior with thoroughly fireproof floors and partitions, should be the prevailing idea of construction.

If the rooms are not too large a thoroughly fireproof building with reinforced concrete floors and columns, and a neat, brick exterior, can be constructed for approximately 10 per cent. increase in first cost over the construction of a brick and wood building. Insurance will soon bring down the cost of the investment to a point where the city cannot afford to build otherwise than fireproof. In this type of a school building, children could be actually kept at work at their desks while the furniture in one part of the building was burning — there would be nothing else to burn in the building.

## Concrete Basement Floors.

Basement floors in dwelling houses as a rule require only a moderate degree of strength, although in cases where pressure from behind has to be resisted, greater strength is required than would otherwise be necessary. The sub-foundation should be well-drained, sometimes requiring the use of tile for carrying off the water. The rules given for constructing concrete sidewalks apply equally well to basement floors. The thickness of the concrete foundation is usually from 3 to 5 inches, according to strength desired, and for average work a 1:3:5 mixture is sufficiently rich. Expansion joints are frequently omitted, since the temperature variation is less than in the case of outside work, but since this omission not infrequently gives rise to unsightly cracks, their use is recommended in all cases. It will usually be sufficient to divide a room of moderate size into equal sections, separated by 1-2 inch sand joints. The floor should be given a slight slope toward the centre or one corner, with provision at the lowest point for carrying off any water that may accumulate.

## Estimating the Cost of Concrete Work

One is frequently called on to estimate the cost of various kinds of concrete work, or at least is asked how much a certain job will cost; either for the cement alone or for the entire job, including all material and labor.

For one to figure with satisfactory results on a job of carpenter work he needs to have some data or information as to the quality of the material to be used and the dimensions of the stuff required.

For instance, if a farmer wants a floor in a barn, he must ask a carpenter for an estimate of the cost of a wooden floor, but before the carpenter could figure intelligently, he would need to know something of the purpose for which the floor was to be used and the load it was likely to be required to bear.

So it is in figuring on a concrete floor or wall, one must know something of the conditions. It is evident that a barn floor which is to support heavy loads will require different figures from those needed for a hen house, or dwelling house cellar floor.

Again, the cost of material, other than cement varies greatly in different localities. Sand and gravel may cost a few cents per load and need to be hauled but a few rods, or owing to either its first cost or the distance it must be hauled, it may be quite a large item in the expense. It is desirable that the concrete worker be able to make at least a reasonably close estimate on the cost of any given piece of concrete work. He should at least be prepared to figure out about how much cement will be required.

There are several good reasons why this ability is desirable. As a matter of professional pride one should desire not merely to understand how to do his work well but also be able to give accurate figures concerning it.

Concrete construction being a comparatively new industry, and having yet to compete with wood and stone to some extent, it is liable to suffer from prejudice, caused by its workers estimating jobs too low or to high.

If the cost is underestimated, either the contractor must lose or the work

must be slighted or the owner must pay more than he expected to.

On the other hand, if the cost is figured too high, the owner is apt to decide on some other method of construction and so lose money by paying as much or even more than the concrete work would have cost and yet getting results quite inferior to those which would have been secured by its use.

However enthusiastic one may be on this subject of concrete construction, it is but fair and wise to remember that there are some cases where concrete is not the proper material to use, not that it is not suitable in itself, for there seems to be no place in a building from the foundation to the roof where it may not take the place of wood, but there are cases where some other material may be used for less cost and yet give nearly or quite as good results. In this section we have, in one part, an abundance of good limestone, but not much good sand or gravel, in the other part there are beds of first class sand and gravel and plenty of cobblestones, but absolutely no good building stone.

So while a farmer in this latter section could secure the same results much more cheaply by the use of concrete, since he has much of the needed material close at hand, it would not be wise for the man with good building stone on his own land to haul sand or gravel several miles to use in a concrete wall for a foundation, though of course he would want concrete floors in some or all of his buildings. The man who must haul his material some distance anyway, may take his choice and may well choose concrete.

It is not easy to compare, in a general way, the cost of concrete construction and other kinds of construction since in some sections lumber and labor are much more costly than others.

The buildings at the United States soldiers' home in Washington, D.C., are almost entirely of concrete. They were originally intended to be built of other materials as stone, brick or

wood and the cost figured on this basis, but when they were completed of concrete the final cost was somewhat less than that estimated for the other materials.

The expense for labor when using concrete, need not be as great as for some other methods of construction since much of the work can be performed by common, unskilled labor under a competent overseer.

One need not figure on the entire cost of the lumber used for the forms as much of this can be used again for some other purpose, unless it is all cut up into short lengths.

Again, the cost of erecting the forms may vary greatly on different jobs. I remember one job where some one kept track of this item and it figured up about 50 cents per cubic yard of wall. This was where carpenters were paid \$3 per day. The walls were 18 and 20 inches thick, from 12 to 15 feet high and from 50 to 100 feet long. It was necessary to do considerable bracing and also to build runways for wheeling the concrete. While this job had some unusual conditions, there were about as many things to help toward a low cost for labor as there were to make this a large item, so this price, 50 cents per cubic yard, can be taken as a safe guide for the cost of erecting forms for plain foundation walls, though in some cases it might be too much; and for a high wall having pilasters, too small.

If some forms of patented plank holders were used, the cost of building forms might be lessened, but as these few plank would need to be handled over many times, there should be some allowance made somewhere for labor. Of course, if but a few plank were used there would not be any large expense for lumber, to be figured on. The expense of mixing and handling the concrete is another item, subject to considerable variations, but it is always a factor to be reckoned on, for walls it generally bears a certain relation to that of erecting the forms, since for high, thin walls both these items would be more than for the same quantity of concrete in lower and thicker walls. Some authorities estimate this item at three cents per

cubic  
woul  
age.

Thi

foot

work

steps,

terial

ing fi

ed pa

from

a rest

later

perso

little

to hav

as the

ingre

ply fi

ones

in no

of the

cases

one p

parts

three

the re

less ir

gates,

terials

smalle

make

We

mater

will co

livered

be bou

localit

One

cents,

feet ir

a bag.

ures f

costs

and o

and ec

ment

will m

and ec

ment

will m

of con

bie fo

gate 3,

three

concre

foot.

costs 8

and th

cubic foot of finished work, and it would seem that this was a fair average.

This gives us five cents per cubic foot as the cost of the labor for such work as walls, cisterns, foundations, steps, etc. Let us see what the material is likely to cost. The following figures and estimates are gathered partly from experience and partly from the estimates made by others as a result of their own experience, these later being largely borne out also by personal experience. After even a little experience one will not expect to have as many cubic feet of concrete as the combined bulk of the different ingredients. The finer materials simply fill the voids between the coarser ones so the amount of concrete will in no case be much greater than that of the coarser aggregates, and in some cases even less. In a mixture of, say, one part of cement and four or five parts of sand, or one part of cement, three of sand and nine of aggregates, the resulting concrete will be a little less in both than the sand or aggregates, owing to the fact that the materials can be, and are packed into a smaller bulk after being wet than they make when measured dry and loose.

We will figure that sand or other material to be mixed with the cement will cost four cents per cubic foot, delivered where wanted. As cement can be bought for \$1.60 per barrel in most localities, we will figure on this basis:

One cubic foot of cement costs 40 cents, as there are nearly four cubic feet in a barrel, or one cubic foot in a bag. So we have the following figures for material: Cement 1, sand 1, costs 44 cents. This will make one and one-half cubic feet of concrete and costs 30 cents per cubic foot. Cement 1, sand 3, costs 52 cents. This will make three cubic feet of concrete and costs 17 cents per cubic foot. Cement 1, sand 5, costs 60 cents. This will make four and one-half cubic feet of concrete and costs 13 cents per cubic foot. Cement 1, sand 2, aggregate 3, costs 60 cents. This will make three and three-fourths cubic feet of concrete and costs 16 cents per cubic foot. Cement 1, sand 3, aggregates 9, costs 88 cents. This will make eight and three-fourths cubic feet of con-

crete and costs ten cents per cubic foot. Cement 1, sand 5, aggregates 9, costs 96 cents. This will make nine and one-half cubic feet of concrete and costs ten cents per cubic foot.

Some one has figured out that concrete mixed 1, 2, 3 will require one and one-half barrels of cement to the cubic yard and nine-tenths barrels if mixed 1, 3, 7 1-2. So for ordinary foundation walls we may safely figure on one barrel of cement for each cubic yard of wall. As to the prices obtained for work we have in mind a figure of \$1.85 per lineal foot for cellar walls for houses. This, of course, would mean seven to eight feet high, twelve to eighteen inches thick, would include everything and require a first class job, competing with the best work in stone and cost nearly as much where stone is abundant. To these figures we must add the cost of the needed labor of mixing and handling, also that of erecting the forms if this is a considerable item.

In actual work the following figures hold good for stable floors: One barrel of cement lays 50 to 60 square feet. For floors, walks and similar work the surface covered by a barrel of cement depends on the thickness of the work as well as on the proportions used.

Figuring mason's wages at \$4 per day, common labor at \$2, cement at \$2 per barrel, I find that stable floors may be put in for 12 cents per square foot. This includes everything, after the large stones, to make the foundation and provide drainage, are in place.

Sidewalks will cost about the same figure for material and labor, perhaps a little more, as there are more forms to build. For the sidewalks one barrel of cement will make from 30 to 60 square feet. Mixing the bottom course 1:1:6 and the top course 3:5, you may get 50 square feet of 4 inch walk, or 30 feet of 6 inch, from a barrel. For the labor you may figure at \$1.20 to \$1.80 per square foot per man, per day, depending of course on the thickness of the walk and the other conditions to be met.

The cost of concrete blocks may be figured out as follows: With a 1 to 4 mixture you will get nearly 15 cubic

feet of concrete from a barrel of cement. This material costs \$2.25, making 15 cents per cubic foot for the concrete.

A block 8 x 8 x 16 contains a little more or less than one-third cubic foot, according to the size of the air space. So figure five cents for the material. The labor cost will depend on the man and the machine, but should be about two-thirds that of the material. We figure that blocks may be made and laid up in a wall at 25 cents per cubic foot at a good profit. Common brick costs more than this.

Fence Posts.—To estimate the cost of making cement fence posts we must find the number of cubic inches in each post. As the concrete may be mixed 1:2½:3 or 4 to 5 parts of aggregates be used, we will figure on 1:2½:4. With these proportions one barrel of cement yields 20 cubic feet of concrete when it is packed into the moulds. So dividing 20 x 1728 by the cubic inches in the post gives the number of posts made from one barrel of cement. To the cost of the cement must be added the cost of the sand and gravel, also that of the reinforcement and labor. The reinforcement may cost from two to six cents. The labor will be about five cents for each post. The moulds will be still another item to be figured on. The total cost of the posts varies from 16 cents for one 5 x 3 at the large end, to 28 cents for one six inches square at the bottom and half the size at the top.—The National Builder.

#### To Renew a Worn Rasp.

After being used some time the teeth of the ordinary rasp are apt to have the tips broken off so that the whole rasp is uneven and incapable of doing good work. A rasp in this condition may be made as good as new, or perhaps even better, by slightly grinding all the teeth a very little. Hold the rasp against a fine grindstone moving from you and watch carefully that the grinding process is not carried too far. In this way every tooth becomes a fine sharp chisel and will do fine even work.

### Approximate Cost of Mill Buildings.

While the cost of buildings for manufacturing purposes must of necessity vary with their design and locality, certain fundamental relations exist between different types, which, if known, are of great assistance in the planning of new plants. To a very great extent these relations, although generally determinable by calculation, are intentionally or otherwise the professional and trade secrets respectively of the architect and the contractor. True, it may be, that conditions frequently give but little latitude for choice in design or construction, but just as truly the owner seldom finds available information which aside from the ideas of his individual architect will enable him to judge independently of relative costs.

A generous contribution to the general dearth of public knowledge on this subject has been made by Charles T. Main, well known as a mill engineer and architect of wide experience. In his paper on the "Approximate Cost of Mill Buildings," his discussion refers solely to ordinary mill construction, with brick walls and heavy timbered floors and roof. In this paper he showed as one of his conclusions that in a building of this type the minimum cost per square foot is practically reached with a four storey structure. The relation is somewhat affected by the length of the building, as well as by its width and height. A three storey building is slightly more expensive, while a one storey building is obviously the most costly. From the data presented by Mr. Main, in a number of diagrams, the accompanying individual set of curves has been prepared to show the relative cost per square foot of gross floor space for different widths. From this it is at once apparent that the difference between the costs for three, four and five storey buildings is so slight as to exert but a secondary influence in determining the height of a building. In fact, the height may be determined by

other factors, principal among which will naturally be the available ground area and the ground rent or fixed charges thereon.

The cost of elevation of material is sometimes regarded as a factor requiring consideration. But calculation will at once show the infinitesimal power expenditure for this purpose required even in the largest plant. Suppose the weight to be lifted in the course of a year through a distance of 15 feet to be 100,000 tons, the work done will be equivalent to 3,000,000,000 ft.lb. If this work were performed continuously during 300 working days of 10 hours each, the work per minute would be

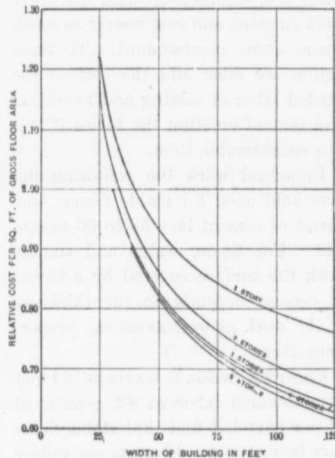


Diagram Showing the Influence of Width and Height on the Cost of a Building 300 Feet Long, of Ordinary Mill Construction.

1667 ft.lb., which is equal to only 0.05 h.p. On a basis cost of \$30 annually per horse-power, this would represent the insignificant sum of \$1.50 actually expended for this purpose during the entire year. The real cost of elevation is manifestly in the equipment and its maintenance. It is evident that the equipment provided for a two storey building will serve additional storeys with but slight increase in the cost of construction. Of course, where under the modern conditions of transportation by traveling cranes the multi-storeyed building is not permissible without excessive waste in height, the nominal single storey con-

struction must prevail. But this, as in the case of the gallery type of machine shop, may be in effect a two storey shop throughout about two-thirds of its width.

Roughly speaking, if the cost per square foot of floor in such a building is 1, it will be about 1.25 in a similar design of one storey only, and from 0.8 to 0.9 in a three storey building approaching it in structural design.

The saw tooth or monitor systems of lighting have considerable effect upon the cost of a single storey or gallery type building as compared with one of several storeys where side lighting must be depended upon. Generally speaking, for adequate lighting from the sides the height of the storeys must increase with the width of the building. The windows should run up as near the ceiling as possible. Distribution of light will be greatly improved by the use of ribbed glass, or, better still, by prismatic glass, but the latter is decidedly objectionable if subjected to the direct rays of the sun. Windows running down to the floor have but little effect upon the general lighting where lines of machines run close to the walls and cut off the light which might otherwise be diffused.

While window area may be less expensive than wall surface, it necessarily increases the cost of heating. An ordinary window is generally classed as having about four times the transmitting power of a 16 inch wall. In other words, on this basis it would require, roughly speaking, about four times the heat for a building entirely of glass as compared with one having solid 16 inch walls. Of course, the heat penetrating effect of the sun in the case of the transparent glass would greatly modify this relation.

After all is said and done, the manufacturer requires, above all, the building best suited for the manufacture of his particular product. Its construction may or may not conform to the most economical type, but if it is such as to insure the production of the maximum profit it is certainly warranted.

### A Novel Breakwater for Algoma Harbor.

The existing harbor at Algoma, Wis., is in the mouth of Wolf (or Ahnapée) river, connected with Lake Michigan by a channel protected in the usual manner by wooden piers. With the increasing draft of vessels the old harbor has become useless, cannot be deepened economically by reason of the bed of the river being rock, and if deepened would be unduly effected by wave action.

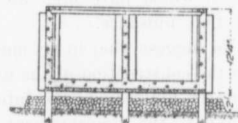
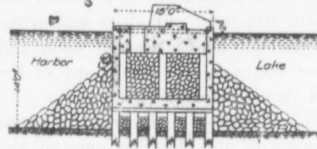
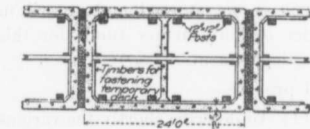
A small outer harbor is to be secured by the construction of about 928 lin. ft. of pile or plank crib pier and about 500 lin. ft. of breakwater made of reinforced concrete caissons. About 650 ft. of old pier will be removed and the harbor will be dredged to a depth of 16 feet below datum. The cost of the work, including repairs to the north pier, will be about \$144,000.

The principal feature of the work from the standpoint of engineering interest is the breakwater, which will consist of reinforced concrete caissons, resting on pile foundations, filled with meagre concrete and rip-rap stone, protected on both sides by rip-rap and capped with a superstructure of solid concrete, as shown on the accompanying diagrams. The foundation piles are to be supplied by the government; they will be driven to a minimum depth of 30 feet below datum or until a suitable resistance is developed, and then cut off below water, so as to secure a horizontal bearing for the bottom of the caissons at a depth of 11 ft. 4 in. below datum. After the pile tops have been cut off, the space between the piles and up to within 9 in. of the pile tops will be filled with small stone, care being taken that no stone shall project above the piles so as to prevent a caisson from coming to full bearing upon all its foundation piles. Before sinking the caissons, the tops of the piles will be brought to within 1-4 in. of the proper grade by recutting the piles or by the use of shims.

A cast iron bearing plate, with upper and lower surface suitably roughened to sink into the pile below and the plank above when under pressure,

will then be placed on top of each pile. This bearing plate will at the same time tend to equalize the bearing upon the piles and to increase friction between the piles and the caissons above. The caissons will then be sunk and adjusted in their proper positions.

Each caisson will be 24 feet long, 15 feet wide and 12 feet 4 inches high, rectangular in horizontal and vertical sections, with a transverse wall across its middle. The outside walls will be 12 inches thick, the transverse wall 10 thick. The walls and bottom of each caisson will be suitably reinforced with steel bars as indicated on the drawings. It is proposed to build these caissons on shore at a site where they can be conveniently launched to



CAISSONS FOR ALGOMA BREAKWATER

be towed out to the site of the breakwater. The bottom of each caisson will be laid on a timber floor 4 inches thick, through which 8 inch wire spikes have been driven to secure a firm bond between the concrete and the wood. Bolts will be embedded in the caisson concrete for convenience in handling them and short pieces of iron pipe will be embedded in the walls for the admission of water to facilitate sinking, but all bolts and pipes projecting beyond the exposed face of the concrete will be cut off flush eventually.

The caissons are to be moulded in forms made with special care to secure smooth surfaces and, so far as possible, waterproof concrete. The concrete will be a 1:2:4 mixture of

Portland cement, sand and broken stone.

A temporary timber decking will be used during the launching and towing of the caissons, and, when necessary, there will be a temporary waterproofing of their exterior surfaces by an inexpensive method.

The permanent filling for the caissons will be riprap stone surmounted by a 4 foot layer of meagre concrete. Before the riprap filling is placed, timber posts long enough to extend up to the level of the top of the riprap will be placed in each caisson as indicated on the drawing. The surface of the riprap filling will be covered with a layer of burlap on which will be deposited the concrete filling. Where the concrete filling is not covered by the superstructure a 3 1-2 inch course below the level of the finished surface will consist of a special finishing concrete made with small stones. A circular manhole 2 feet in diameter with a reinforced concrete cover will be moulded in the concrete filling of each compartment of each caisson. The space between the ends of adjacent caissons will be filled with small stones to a height of 1 foot below the top of the caissons.

The concrete superstructure will be built of 1:3:5 concrete laid in 25 foot sections with joints between adjacent caissons. The upper surface of the superstructure will be 4 feet above datum at the centre. Alternate isolated sections of superstructure will be moulded first, each section having suitable anchor bolts in each end to secure a firm bond with the intermediate sections to be laid later. A single thickness of tarred paper will extend entirely through each joint in the superstructure, thus forming distinct vertical joints between adjacent sections.

The improvements at Algoma Harbor have been designed and will be executed under the direction of Major W. V. Judson, Corps of Engineers, U. S. A., in charge of river and harbor improvements on the western shore of Lake Michigan, with offices at Milwaukee, Wis. To protect the interest of the United States, Major Judson patented the floatable reinforced concrete caisson in 1901.

## Present Day Requirements in Town and Country\*

The subject, as you will see from your program, is "Present-Day Road Requirements in Town and Country." What are those requirements? They may, I think, be classed under six different heads:

- (1) The surface must give good foothold for horses.
- (2) It must be as noiseless as possible.
- (3) It must be free from dust in summer, and free from mud in winter.
- (4) It must be of such a surface as will prevent side-slip with either motor cars or cycles.
- (5) The surface must stand the traffic of the district.
- (6) Lastly, the road must be cheap as regards first cost or maintenance, or both.

The order of importance of those requirements is somewhat difficult to give. For instance, the man who drives a horse thinks good foothold is of the greatest importance, and many people who do not drive horses will agree with him. Residents who live abutting on our main highways consider absence of noise, and freedom from dust and mud, as being of the greatest importance. Cyclists and motorists take no interest in a road being noiseless, as they ride on rubber tires, but they do demand roads free from dust and mud, and consider a surface which does not encourage side slip as being to them a "sine qua non."

No. 5, that the road must stand the traffic of the district without undue expenditure in repairs, is one which the road engineer makes it his business to try and carry out. The last requirement, No. 6, is one on which we can obtain a unanimous vote: the road must be cheap.

The "man in the street," whose opinion we are often told it is quite safe to follow, would, I have no doubt, tell you that it is easy to make a road to fulfil all these requirements. Well, the man who succeeds in that would

not stop there; his next achievement would be to discover perpetual motion or to extract gold in quantities from sea water.

I believe you will agree with me that the problem of making and maintaining the main streets and roads in our cities and counties is not an easy one, and it is rendered every day more difficult in consequence of the disinclination of the powers that be to spend more money on this object; money can be found, and has to be found, in any quantity for education, and there is not department connected with municipal and county work which is not starved and stinted in order to find further funds for this one department.

I propose—

(1) To describe shortly the various kinds of paving to be found in the main streets of our cities and urban districts, with the cost of each, and how far each type fulfils any of the six requirements.

(2) To refer to the dust nuisance generally, and describe some of the palliatives which have been used to combat that nuisance.

(3) To suggest what in my opinion is to be the construction of the urban and country highway in the future.

(4) What the improvement of roads will cost, and how the money will be found to pay for these improvements.

(1) As regards the various kinds of road paving, etc., for main street and urban roads we have (a) granite sett paving, which is a favorite type with every road engineer on account of its durability. The kind of granite depends on the position, geographically, of the town; Nottingham, in consequence of its inland position, cannot obtain cheaply either Welsh, Scotch or Guernsey granite, and is dependent on a supply from the Leicestershire quarry owners; the granite from the latter district is mainly hard and somewhat close grained, wears well, but naturally wears somewhat smooth and slippery; Norway granite is more open grained and gives fairly

good foothold, but it is therefore softer than Leicestershire granite. The finest granite for sett paving is Aberdeen granite; it is hard, but it gives as good foothold as granite from Norway.

The setts are usually from 5 inches to 7 inches deep, and are laid on a concrete foundation 6 inches to 8 inch thick; the joints are run in with pitch and tar, and made quite impervious; the cost, including concrete foundation, is about 12s. 6d. per yard super. Its advantages are that there is no paving equal to this for carrying heavy traffic; it is free to a very great extent from dust and mud; there is no side-slip. Its disadvantages are that it is exceedingly noisy, and where traffic is heavy and on steep grades requires sanding daily. I have said it will stand heavy traffic, but there is one kind of traffic which can punish this pavement, and that is the traction engine weighing 18 tons, hauling three loaded trucks, each weighing 12 tons. The steep strips on the driving wheels of the traction engine destroy the appearance of the paving and its durability, and by increasing the space between each sett makes the paving more noisy. All this could be avoided if traction engine owners would use wheels filled in with rims of hardwood, but these are rather more expensive to maintain than the steel rimmed wheels. I would stop this damage by putting a tax of £100 a year on steel shod traction engines, and £20 a year on wooden shod ones.

(b) Wood paving for busy thoroughfares is the most popular pavement; it is the pavement which every ratepayer desires to have in front of his own premises, and, curiously, it is the most expensive. The usual foundation of 6 inches or 8 inches thick of Portland cement concrete, with a finely screened surface to receive the blocks, is absolutely necessary. Almost every kind of wood has been tried, but during the past ten years Australian hardwood has been most largely used; it was greatly boomed by the Australian Government, and practically almost ousted creosoted red deal. There are two principal kinds of this hardwood, jarrah and

\* A paper read before the Royal Sanitary Institute by Mr. A. Brown, City Engineer, Nottingham.

karri; heavy than w the ed joints blocks though most e sion t drawba to say is putt some r Notting weathe times d pitch a and a s with sc sion. from l pendin ber, wh Thos roads l will, ar or aga wood; the tin well er long as serves t antisept soted r than t tinghar laid for £5 in r and not out. I could p The co about 1 Woo the mo except on the of wea rink wi peculiar this co only in is only which, night. from w in amo but the horse d



karri; the wood is very hard and very heavy, its specific gravity being higher than water, but it is rather brittle; the edges break away and cause the joints to appear wide, although the blocks are closely paved. It is, although so close-grained and hard, a most extraordinary wood for expansion and contraction; its greatest drawback, however, is its slipperiness; to say that it requires sanding daily is putting the matter very mildly; some roads paved with hardwood in Nottingham, in certain conditions of weather, have been sanded five or six times daily. The blocks are dipped in pitch and tar, and paved quite close, and a space left at the kerbs filled in with some clay to take up the expansion. The cost of jarrah paving is from 14s. to 16s. per square yard, depending upon the price of the timber, which fluctuates a good deal.

Those who have to maintain city roads believe that creosoted red deal will, and in fact it has, come into favor again. Its cost is less than hardwood; it costs less in sanding; and if the timber is good, sound stuff, and well creosoted, it will wear nearly as long as hardwood. The creosote preserves the life of the timber and is an antiseptic. No better instance of creosoted red deal paving could be given than the piece in front of the Nottingham Guildhall, which has been laid for twenty-two years, has not cost £5 in repairs, and is perfectly sound and not by any means at present worn out. No kind of uncreosoted wood could possibly show a result like this. The cost of creosoted wood paving is about 13s. per square yard.

Wood paving in dry weather gives the most perfect foothold of any road except ordinary dry macadam; and, on the other hand, in some conditions of weather it is a veritable skating rink when covered with a greasy slime peculiar to wood paving. When in this condition the sprinkling of sand only increases the trouble, and there is only one cure—a thorough washing, which, of course, has to take place at night. In very dry weather the dust from wood paving, although not large in amount, is particularly irritating; but that is caused by the pulverized horse droppings, which are more ap-

parent on wood than any other kind of pavement. In dry weather the whole area of the wood paving must on no account be watered, unless you require a skating rink; the channels only should be watered with a cart, with the spreader arranged for this purpose. A wood-paved road fulfils requirement No. 1 as to foothold, and condition No. 4 as regards side slip only in dry weather; it fulfils condition No. 2 as regards freedom from noise; it fulfils condition No. 3 as regards dust and mud to a very great extent; as regards requirements Nos. 5 and 6 it is costly to maintain and is by no means cheap.

(c) The third type of road is the ordinary, what is termed dry, macadam road. This can only be used for urban roads. The absolute necessity of a good foundation for a macadam road is as great as in the two types already mentioned, but in the case of the macadam road it is usually of hard ballast, well rolled. The granite should be of the hardest and toughest description, and from 2 to 2 1/4 inch gauge for roads of importance. Macadam's rule was that the stone should not be larger than you could put in your mouth. I would not care, myself, to trust to the accuracy of this gauge, and prefer a metal one. The stones should be rolled and rolled until they are dove tailed together as in a mosaic pavement, and no binding material should be used until this has been effected. It should always be remembered that the less binding material you use in consolidating your road the less dust and mud you will have afterwards. Road scrapings should on no account be used for binding; they have been mud and will speedily return to their original condition. Fine granite only should be used for this purpose.

This road is the ideal one for foothold, for noiselessness, and for absence of side slip. It will not carry heavy traffic, but it is cheap as regards first cost, a good road, including foundation, being made for from 2s. 6d. to 2s. 9d. per yard; but this class of road is the one which has given rise to all the troubles since the advent of the motor car, as regards dust more particularly. Where the

traffic is heavy, the process of taking off the mud and laying on the granite is almost continuous; where the ordinary traffic is light, and the motor traffic is heavy, the dust is a fearful nuisance.

(d) A paving which is just now in its early experimental stages in this country is one called Durax paving. This paving is laid on a foundation of hard ballast, or, as it is expected to take the place of the ordinary dry macadam roadway, it is suggested it should be laid on top of the existing macadam roads, when the levels will allow of this being done. The material is granite, about 3 1/2 inch cube. The peculiarity of the method of paving is that the cubes are not laid in straight courses at right angles to the central axis of the road, but in courses having a segment with a cord about 5 feet or 6 feet; thus, if the road is 30 feet wide there are five or six of these segments in the width of the road. The stones or cubes are laid as close together as possible, and are well rammed with a light rammer. The syndicate having charge of Durax paving suggest that the joints should be filled with sand, but I prefer to fill them in with pitch and tar, as in the case of ordinary sett paving. The noiselessness of this paving is certainly most extraordinary; it is quite inconsistent with one's ordinary ideas of a paved road. There is no doubt that the segmental shape of the courses conduces to noiselessness in a marked degree. The road gives good foothold, is free from dust and mud, there is no side slip, and it will stand fairly heavy urban traffic, but the cost is somewhat heavy (about 5s. 6d. per yard, exclusive of any foundation). Taking a road at 10 yards wide, this price would equal £4,840 per mile run.

The syndicate believe that this road will supersede macadam roads in the country, and solve the dust and mud problem: there are nearly 27,500 miles of main roads in the country. What will our friends who still like to drive horses say to this length of paved roads? It was a very horsey man who understands horses, but not h's, who said: "It was not the pace that killed, but the 'ammer, 'ammer, 'ammer on

the 'ard 'igh road." This class of paving may, after trial, be found to be useful on busy urban roads, where ordinary macadam is objected to on account of the dust, but its first cost will prevent its universay adoption on all main country roads.

(e) The last type of road is tar-macadam. There is nothing new in tar-macadam; it has been laid in this city for fifty years. The first piece of tarred paving in this country was laid on the London road about the year 1845.

The material most favored for use in making tar-macadam is ironstone slag, but I am certain that good results can be obtained by using certain kinds of granite. The advantage of using slag is that it is dry, and if the trucks in which it is delivered are sheeted down the material need only be slightly warmed before being treated.

I have often been asked for my prescription, which when given has sometimes been used by the patient with peculiar results. It was not the fault of the prescriber or of the patient, but the fault of the drugs used. There is nothing on earth which differs so greatly as the liquid called tar; good and poor qualities of tar are quite common, and chemical analysis, so far, does not always help you, and besides, the analysis of tar is rather an expensive matter, and unless you have every load analyzed you are not certain, and this analysis would add 50 per cent. to the cost of your material. Tar varies in quality at different gas works, hence the futility of giving prescriptions of "so much tar to so much pitch," which in another town, buying tar from another gas works, would cause failure. But the same thing applies to tar from any works; it differs at the same gas works at different seasons of the year. The tar from one gas works is quite different to the tar from another works in the same town. A different method in carbonizing the coal, using a lower grade of coal, and very often a change in the management, alters entirely the nature of the tar and renders it unsuitable for tar-macadam purposes.

(to be concluded in next issue)

### Modern Fire Registers.

In an article upon the above subject in our issue of March 11th we stated that fire was a most effective means of discriminating between good and bad protective appliances, or something to that effect. So far so good. Further, however, we stated that wired glass in the Wells-Fargo Building, San Francisco, was a complete failure in the great conflagration in that city. Referring to this particular paragraph, Messrs. A. B. Ormsby, Limited, Toronto, contractors and manufacturers of fireproof metal window frames, doors, etc., write us as follows:

"This evidently is an error, as the following will show you. After the San Francisco conflagration Mr. C. J. Grindlach, general manager of the Mississippi Wire Glass Company, New York city, visited that city to gather complete information regarding the performance of wired glass, and in many instances obtained photographs for reproduction. He made an examination of the Wells-Fargo Building in company with Architect Mr. Myers, of the firm of Myers & Ward, Kohl Building, San Francisco. In the reconstruction of the Wells-Fargo Building, this firm was commissioned to plan it, and in this reconstruction they provided for the installation of wired glass in all places where it could possibly be used to advantage. This, in our opinion, would tend to indicate that they were well satisfied with the manner in which the wired glass performed. We cannot do better than quote you from a letter received by Mr. E. S. Hand, of the Mississippi Wire Glass Company, which is dated from San Francisco, May 18, 1906:

"I wrote you some days ago in regard to wire glass used in construction of the Shreve Building here, etc. Since then I have looked over the Wells-Fargo Building. That company used wired glass on the basement storey of this building. The glass covers some four feet above the level of the sidewalk. The building was gutted by the fire, the glass was shattered, but I did not see an instance where it had fallen out except where knocked out by some solid substance.

It held together all right. I think our building commission has made it unnecessary for you to look further for testimonials as to the desirable qualities of this production.

(Signed) GILBERT J. BOOT, M.E."

The Safe Deposit & Trust Company of Baltimore, under date of April 23, 1904, write the Mississippi Wire Glass Company in part as follows:

"Replying to your favor of the 22nd inst., regarding the experience of our building during the recent fire in this city, I would say that our company has every reason to congratulate itself upon the splendid performance of the several fire protecting features introduced into the construction of the building.

"One feature of our construction proved particularly efficient. This was the large wired glass skylight 30 x 40 in size, and covering the entire centre of the large banking room. Immediately below this is a skylight of stained glass, and although this wired glass bore the brunt of the tremendous heat from without as well as the shock due to a section of falling wall from the adjoining five storey building of the Baltimore 'Sun,' it remained in place, protecting absolutely the stained glass skylight below. We deem this performance so remarkable that we have placed an order for wired glass in our iron frames for all our outside windows.

(Signed) J. J. NELLIGAN,  
3rd Vice-president."

As to the galvanized iron frames, the manufacturers state that in over twenty years' experience they have never known heat to cause warping. This satisfactory result is due partly to the construction of a hollow air space in the interior of the frames, which act as a non-conductor of heat.

Messrs. A. B. Ormsby, Limited, state that perhaps no stronger argument could be brought in favor of wired glass windows than the fact that the underwriters accept them as the next best thing to a solid brick wall, reducing insurance rates from ten to fifty per cent. where they are used.

Aginc  
The  
will er  
Bruce  
D.  
Comm  
April  
churcl  
plans  
Brand  
Dr.  
Direct  
& He  
early:  
struct  
substz  
erecte  
Birch  
A C  
erecte  
Calgar  
And  
ooo fo  
in this  
Cochra  
Cha  
er, is t  
year P  
tures.  
Chilliv  
The  
tion ar  
cold st  
Chatha  
The  
ment  
bridge  
site for  
week t  
engine  
Cote d  
F. C  
tenders  
tion c  
specific  
St. Jar  
Coquitt  
It is  
be calle  
erector  
cost \$6  
Digby,  
Tend  
Secreta

# Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

## CONTRACTS OPEN.

### Agincourt, Ont.

The Scarboro Telephone Company will erect a central station here.

### Brucefield, Ont.

D. Aikenhead, Secretary, Building Committee, will receive tenders up to April 18th for erection of a brick church in this village according to plans at office of W. Scott, Brucefield.

### Brandon, Man.

Dr. C. W. Clark, of Winnipeg, Director of the International Lighting & Heating Company, states that an early start will be made upon the construction of the city gas plant. Three substantial brick buildings will be erected.

### Birch Hills, Sask.

A Government creamery will be erected here this season.

### Calgary, Alta.

Andrew Carnegie has offered \$50,000 for the erection of a public library in this city.

### Cochrane, Alta.

Charles Grayson, Secretary-Treasurer, is taking tenders for \$5,000 twenty-year Protestant school district debentures.

### Chilliwack, B. C.

The Chilliwack Creamery Association are discussing the erection of a cold storage plant to cost \$2,000.

### Chatham, Ont.

The city council are asking Government assistance in the erection of a bridge over the Thames river, and the site for the proposed structure is this week being inspected by Government engineers.

### Cote des Neiges West, Que.

F. C. Laberge, Engineer, wants tenders up to April 8th for construction of waterworks, according to specifications at engineer's office, 71 St. James street, Montreal.

### Cooquitlam, B. C.

It is stated that tenders will shortly be called by the Government for the erection of a new asylum building to cost \$60,000.

### Digby, N.S.

Tenders are invited by Fred. Gelinas, Secretary, Department of Public

Works, Ottawa, up to April 22nd for construction of a spur pier. Plans and specifications at offices of C. E. W. Dodwell, Resident Engineer, Halifax, and E. G. Millidge, Resident Engineer, Antigonish, on application to the local postmaster and at the Department.

### Edmonton, Alta.

At a recent meeting of the city council it was finally decided to invest \$140,000 in the extension of the present power plant and \$40,500 for the Decarie incinerator. Only one unit will be installed this year.

### Eganville, Ont.

G. Michel, architect, Pembroke, wants tenders up to April 11th for all trades in the erection of a residence here. Plans at architect's office.

### Fort William, Ont.

H. Russell Halton, architect, is taking tenders this week for the erection of the St. Joseph's boarding school; plans to be seen at architect's office.

Tenders are invited up to April 6th by R. E. Mason, architect, for the erection of an eight roomed public school in the Wiley addition. Plans and specifications may be seen on application.

Tenders will be received by R. E. Mason, architect, up to April 11th for a four-roomed addition and alterations to public school, Ward 1.

The Private Bills Committee have authorized the city to guarantee bonds for \$45,000 for the erection of a hospital.

The Iron Range Railroad & Development Company are seeking incorporation for the purpose of building a telephone system. J. F. Swinburne, this city, is interested.

### Guelph, Ont.

City Engineer McArthur has closed the Eramosa bridge for all but foot traffic and the City Council will have to erect a new structure at once.

Plans have been received for an addition to the armories and tenders will be called for at once; estimated cost \$40,000.

### Goderich, Ont.

The organization of the Ontario West Shore Electric Railway Company is now complete. Plans of the route

to Kincardine have been completed, and a special meeting of the shareholders will be held in Toronto on April 7th to give the directors power to enter into contracts with contractors for the construction of this portion of the railway and also to give the directors time to issue bonds or debentures of the company to the extent of \$15,000 per mile of the track. It is expected the work of construction will commence before May 1st. H. J. A. McEwan, of Goderich, is Secretary.

### Grand Forks, B. C.

A roundhouse of 15 stalls to cost \$70,000, a passenger station and office building to cost \$49,000 and yard improvements to cost \$40,000 are the improvements planned for this town by the C.P.R. H. B. Walkem, Vancouver, B.C., is resident engineer.

### Hanover, Ont.

On April 21st the ratepayers will vote on a measure to raise \$4,500 for improvements to the waterworks.

### Hamilton, Ont.

Plans will shortly be submitted for the new edifice to be built by the congregation of St. James Presbyterian church at an estimated cost of \$10,000.

The recently incorporated Maple Leaf Amusement Company have secured the Driving Park grounds and will open up a regular summer park, replete with the latest attractions, this season. The directors include S. L. Robertson, of Niagara Falls, J. G. Gauld, James Dickson and C. V. Langs.

A company is being formed to build a brewery in this city at a cost of \$250,000 and H. Bollinger, Fulton Bldg., Pittsburg, has been instructed to prepare plans.

The city will purchase a trenching machine, to cost \$4,000, for building the sewer in the annex.

The Board of Education will ask the city council to issue debentures to raise \$250,000 for school buildings and extensions.

### Ilderton, Ont.

Tenders will be received up to April 10th for the erection of the St. George's rectory; plans and specifications on application to B. Little.

**Kingston, Ont.**

The Board of Education will expend \$4,000 in fire protection for the schools.

**Ladysmith, B. C.**

The town council have decided to engage an engineer to furnish estimates upon the cost of constructing a sewerage system.

**Lachine, Que.**

It is definitely stated that the Imperial Locomotive Works, Limited, will commence operations this spring. Col. L. Edey, of the Trust & Loan Company of Canada, is authority for the statement that \$2,250,000 will be expended on the plant alone.

**Lacombe, Alta.**

N. E. Carruthers, Secretary-Treasurer, will receive tenders up to April 8th for the construction of buildings at the Agricultural Grounds. Specifications at office of G. W. Hotson, this town.

**Lethbridge, Alta.**

The city council have passed estimates for the expenditure of over \$100,000 on the streets and sidewalks. Other projects for this season include the erection of a fire hall to cost \$25,000 and a market to cost \$3,000.

C. B. Bowman, Secretary, will receive tenders up to April 15th for \$90,000 six per cent. 30-year school district debentures.

**Lloydminster, Sask.**

A new Roman Catholic church is to be erected here. Rev. R. A. Bernier, of Vegreville, is interested.

**Listowel, Ont.**

W. Climie, Chairman of Finance, will receive tenders up to April 6th for \$15,000 five per cent 30-year town debentures.

**London, Ont.**

A. O. Graydon, City Engineer, is issuing special instructions to contractors for the masonry, brickwork and plastering for the isolation hospital; particulars on application.

A new Methodist church will likely be erected at Pottersburg. Rev. E. B. Lanceley, of Dundas street centre church, is interested.

A sum of \$6,000 has been passed in the estimates for increased facilities for the post office. The projected improvements include the installation of an elevator.

The Ontario Bridge & Pipe Company, of Yale, Mich., will establish a branch factory here.

**Manotick, Ont.**

Edward Kidd will erect a new cheese factory near this town.

**Minnedosa, Man.**

It is stated that \$20,000 will be expended this season in the erection of new schools.

**Mallorytown, Ont.**

A rural telephone company has been organized and will install a central office here and build to McIntosh Mills, Caintown, Jamestown and Lyn. F. H. Mallory is secretary.

**Midland, Ont.**

The C.P.R. are reported to be planning extensive works at Flat Point. A conservative estimate is that four million dollars will be spent in the next five years. A four million bushel elevator will be built and a large amount of dredging carried out.

**Medicine Hat, Alta.**

W. T. Williams has just taken tenders for excavation and foundations for an addition to the Cosmopolitan hotel.

The ratepayers have approved by-laws to raise \$40,000 for the extension of the gas system and \$10,000 for the erection of a market building.

**Montreal, Que.**

Incorporation is being sought by L'Hospital de la Charite who will expend \$200,000 upon the acquisition of property. The petitioners include Mayor Payette, P. R. Du Tremblay, Dr. Fleury and Dr. Lalonde.

Tenders will be received by John R. Barlow, City Surveyor, up to April 2nd for construction of a sewer in Cartier square, St. Henri ward, according to specifications at City Surveyor's office, City Hall.

The Dominion Park which was burnt down last fall will be reconstructed at a cost of \$150,000. The scenic railway, which will be constructed as an electric road, will cost about \$40,000.

It is reported that an English syndicate, headed by Lord Templeton, have purchased the charter of the Bridge and Terminal Company and that a company is being formed to construct a tunnel under the St. Lawrence to Longueuil.

L. O. David, City Clerk, wants tenders up to April 16th for a complete fire alarm equipment for the new fire alarm telegraph department headquarters, Berthelet street; specifications at Superintendent's office, City Hall.

**Owen Sound, Ont.**

T. E. Vanstone will shortly rebuild his store recently destroyed by fire.

Forster & Clark want tenders up to April 3rd for erection of dwelling. Plans and specifications on application.

**Osnabruck Township, Ont.**

H. E. Hodgins, township clerk, will receive tenders up to April 11th for purchase of River aux Raisin drainage debentures. Full particulars on application.

**Ottawa, Ont.**

The Board of Control have recommended the expenditure of \$11,000 for the erection of a permanent art building at the exhibition grounds.

Application will be made for a charter by a company who propose to construct an electric belt line from this city running through Carleton, Russell, Dundas, Brockville and Prescott, making a complete belt line of some two hundred miles. Mayor Cossitt, of Brockville, is stated to be interested.

William Rea, Secretary-Treasurer, Public School Board, will receive tenders up to April 8th for erection of an addition to Elgin street school according to plans at office of W. B. Garvoek, superintendent of buildings.

E. F. Jarvis, Secretary, Department of Militia and Defence, will receive tenders up to April 14th for plumbing, material and labor required at the Petawawa camp grounds. Plans and specifications at offices of Director of Engineer Services, this city; Commanding Officer, Western Ontario Command, Toronto, and Commanding Officer, Quebec Command, Montreal.

Tenders are invited by Cecil Bethune, Secretary Treasurer, up to April 25th for heating and ventilating the Collegiate Institute. Plans and specifications may be seen at office of Horwood & Taylor, 102 Bank street.

**Port Arthur, Ont.**

Philip Labbe will erect a large business block this summer at the corner of Pearl and Court streets.

The erection of a big summer hotel in this city is mooted and it is rumored that plans are already under way for a commodious structure of 150 rooms.

**Peterborough, Ont.**

The Private Bills Committee have confirmed a bonus of \$30,000 to the William Hamilton Manufacturing Company.

**Palmerston, Ont.**

A canvas of the town is being made with a view to organizing a rural telephone company.

**Prince Albert, Sask.**

The city council have received a report from C. H. Mitchell, C. E., Toronto, upon the proposed development of power on the Saskatchewan river and it is practically certain that the project will be carried through. The cost of developing 10,000 horse power would be \$350,000.

Poi  
Lin  
\$25  
a  
mer  
of J  
Par  
T  
syst  
to E  
Pict  
T  
cour  
\$31,  
legis  
Parl  
O  
vote  
debe  
publi  
Queb  
Te  
Wat  
13th  
brass  
and  
pipes  
Rapi  
Ge  
Treat  
1st f  
cent.  
tures.  
Regis  
Th  
pany,  
Hend  
a join  
By  
tures,  
for th  
hospit  
comm  
call fe  
as to  
summ  
St. Jo  
Ald  
commi  
plan  
northe  
adhere  
620 fe  
feet.  
Stoney  
Fole  
P. cor  
supply  
here.  
St. Th  
\$5,00  
at the  
of main

**Portage la Prairie, Man.**

The Central Electric Company, Limited, propose to expend between \$25,000 and \$40,000 for constructing a new building and other improvements. Particulars may be obtained of John O'Brien, Manager.

**Parry Sound, Ont.**

The C.N.R. will install a telephone system along their line from this town to Key Harbor.

**Picton, Ont.**

The town council are asking the county council to grant \$14,000 out of \$31,000 for the completion of the Collegiate Institute.

**Paris, Ont.**

On April 7th the ratepayers will vote on a bylaw to raise \$40,000 by debentures for the erection of a new public school.

**Quebec, Que.**

Tenders are invited by J. Gallagher, Waterworks Engineer, up to April 13th for annual supplies of iron and brass castings, forge work, lead pipe and pig lead, cement, brick and drain pipes.

**Rapid City, Man.**

George McWilliams, Secretary-Treasurer, wants tenders up to May 1st for purchase of \$2,700 five per cent. 20-year school district debentures.

**Regina, Sask.**

The Western School Supply Company, of this city, and the Geo. M. Hendry Company, Limited, will erect a joint warehouse.

By the recent sale of city debentures, \$100,000 now becomes available for the erection of the new municipal hospital, and the health and relief committee are asking the council to call for plans for the new building so as to get construction under way this summer.

**St. John, N. B.**

Alderman Baxter, of the west side committee, states that the original plan concerning the berths on the northern side of the wharf will be adhered to and two berths built, one 620 feet in length and the other 400 feet.

**Stoney Plain, Alta.**

Foley, Walsh & Stewart, the G. T. P. contractors, will erect a large supply base and storage warehouse here.

**St. Thomas, Ont.**

\$5,000 will be expended this season at the gas works upon the extension of mains and electric lines. An am-

monia plant will likely be installed at a cost of \$2,000.

The Independent Oddfellows of this city are contemplating the erection of a hall.

**St. Boniface, Man.**

Northwood, Nofke & Chickens, of Winnipeg, Man., have completed plans for the proposed plant to be erected in this city for the Manitoba Linseed Oil Mills Company, of Winnipeg, at a cost of \$75,000. It is reported that bids for this work will be called for at an early date.

**Stratford, Ont.**

Plans are to be asked for the erection of a twelve-roomed two-storey public school in this city.

**Saskatoon, Sask.**

The Imperial Bank are considering a location in this town for the erection of a bank.

**Sydney, C.B.**

The Standard Car Company, Durham, Pa., capitalized at \$1,500,000, are negotiating with the city council with a view to establishing a Canadian branch here; estimated cost of plant \$400,000. J. R. Shirley, of Charlottetown, P.E.I., is president.

It is stated that representatives of an Ontario brewing company have bonded a site for a local factory and that construction will be commenced in the early summer.

**Sydney, N. S.**

It is stated that the Illinois Car-Wheel Works are thinking of establishing a Canadian branch factory here.

**Teeswater, Ont.**

W. E. Benning, architect, of Listowel, has submitted estimates for proposed renovation of Knox church; estimated cost \$9,000.

**Tillsonburg, Ont.**

The Borden Condensed Milk Company are reported to be making preparations for the construction of a large plant here.

**Toronto, Ont.**

A. W. Reeder, electrical contractor, has purchased property on Saunders avenue, where he will erect a factory for making electric fixtures.

A. W. Holmes, architect, will receive tenders up to April 6th for additions to the separate school on Manning avenue. Plans and specifications at architect's office, 10 Bloor street east.

The Home Bank have purchased property corner Queen and Victoria streets which they will remodel for a branch building.

Willis Chipman, C.E., 103 Bay St., is superintending an extension to the city waterworks at Portage La Prairie, Man., and tenders are being called in this issue for pumping machinery, water pipes, pipelaying, etc.

The Victoria Industrial School Board are applying for a grant to cover the cost of installing a sewerage system; estimated expenditure, \$2,500.

A. E. Watson, 37 Bank of Commerce Building, will receive tenders up to April 4th for alterations and additions to Windermere avenue public school, Swansea, Ont.

The trustees of Westmoreland avenue Methodist church will purchase a lot at the north-west corner of Westmoreland avenue and Hallam street, where they will erect a new church building.

The preliminary plans and sketches of the new General Hospital have been approved by the Building Committee and a model has been ordered.

Bowman & Connor, consulting engineers, 36 Toronto street, are engaged on plans for a reinforced concrete bridge for Durham, Ont.; also for a 136-foot steel highway bridge with concrete foundation for Mount Forest.

Recent building permits include: Chris. Heehn, 2-storey brick store and dwelling, College street, \$3,000; W. W. Hiltz, 1 pair semi-detached 2½-storey brick dwellings, Hogarth avenue, \$5,000; C. D. Scott, 2½-storey brick dwelling and stable, Admiral road, \$9,000; Joe Spencer, 1-storey brick store and dwelling, Queen street, \$2,000; Dominion Government, 2-storey brick addition to Post Office, on Lombard street, \$20,000; E. C. Tuckett, 2 detached 2-storey brick dwellings, Sinclair avenue, \$4,400; Wm. A. Hill, 2-storey and attic brick dwelling, Palmerston Boulevard, \$5,500; W. W. Hiltz, 1 pair semi-detached 2-storey roughcast dwellings, Carlaw avenue, \$3,000; R. W. Harrison, 1 pair semi-detached 2-storey brick dwellings, Dupont street, \$2,600; Jas. Lochrie, 2-storey brick store and dwelling, corner Bloor and Emerson avenue, \$3,000; H. B. Reesor, 1 pair semi-detached 2-storey and attic brick dwellings, Walker avenue \$6,500; A. W. Reeder, 2-storey galvanized iron workshop, Saunders avenue, \$2,500; R. E. Chad, 1 pair semi-detached 2-storey and attic frame dwellings, Woodbine avenue, \$2,900; T. W. Thompson, 2-storey brick dwelling, Dufferin street, \$2,500; D. Todd, 1 pair semi-detached 2-storey brick dwellings, corner Spencer and Springhurst avenues, \$5,000; Steinburger Hendry Co., alterations to office, Temperance street, \$3,500; R.

E. 2-storey brick veneer dwelling, Woodbine avenue, \$2,000; F. Sullivan, 1 pair semi-detached 2-storey and attic brick dwellings, Brunswick avenue, \$6,500; Baker Long, 1 pair semi-detached 2-storey and attic brick dwellings, Manning avenue, \$5,000; Hugh McMath, 3 attached 1-storey brick stores, Queen street west, \$2,000; C. B. Niles, 2-storey brick dwelling, Yonge street, \$3,500; R. C. Vaughan, 1 pair semi-detached 2-storey and attic brick dwellings, Madison avenue, \$6,000; H. H. Dunfield, 2-storey and attic brick dwelling, Lynwood avenue, \$5,000; H. Silverthorne, 1 pair semi-detached 2-storey and attic brick dwellings, Margueretta street, \$5,000; G. Brady & Son, 2-storey detached brick dwelling, Galley avenue, \$3,000; W. H. Marks, 1 pair semi-detached 2-storey brick dwellings, Emerson avenue, \$5,000; J. Carrigan, 2-storey and attic brick dwelling, near Mabel street, on W. S. Lynd avenue, \$3,500; W. M. Adams, 1 pair semi-detached 2-storey brick dwellings, Clarene avenue, \$4,000; W. W. Dunlop, 2-storey brick dwelling, Indian road, \$4,000; Hawkins & Kyle, 2 pair semi-detached 2-storey brick dwellings, Galley avenue, \$6,000; James Harrison, 2-storey brick dwelling, St. Clair avenue, \$3,000; Canada Military Institute, 2-storey brick library, University avenue, \$8,000.

#### Vernon, B. C.

E. S. Bate, Secretary, Jubilee Hospital Board, wants tenders up to April 15th for the erection of new hospital building. Specifications at secretary's office, this town.

#### Victoria, B. C.

A new wireless station will be erected here by the United Wireless Telegraph Company. C. B. Cooper, of Seattle, is general superintendent of construction for the Pacific coast.

#### Virden, Man.

James F. C. Menlove, Secretary-Treasurer, municipality of Wallace, desires tenders by May 10th for building a steel bridge over the Pipestone creek; plans at his office and at the Department of Public Works, Winnipeg.

#### Vancouver, B. C.

Engineer F. A. Coombe, of Montreal, has left for this city to prepare a report for Ross & Holgate on the water, steam and power plant.

Fred Gelinas, Secretary, Department of Public Works, Ottawa, will receive tenders up to April 25th for construction of heating system for the post office. Plans and specifications may be seen on application to W.

Henderson, Superintending Architect, Victoria, and Charles Tossell, Clerk of Works, this city.

The board of school trustees have asked the Finance Committee to submit a bylaw for the raising of approximately \$120,000 for the erection of new schools and additions.

Tenders are about to be taken by the Government for the erection of a new Normal school to cost \$100,000.

#### Welland, Ont.

It is reported that the Maple Leaf Milling Company are contemplating the erection of a mill in this vicinity.

B. J. McCormick, of the Welland Realty Company, is stated to be negotiating with a prominent English firm with a view to their establishment of a branch factory in this locality.

#### Wetaskiwin, Alta.

A bylaw has been carried to raise \$18,000 for gas boring.

#### Woodstock, Ont.

On the expiration of the present lease the building now occupied by Fullerton & Graves, clothiers, will be remodeled for a branch of the Bank of Nova Scotia.

#### West Toronto, Ont.

The bill recently passed for the incorporation of this city provided for the erection of a public school at a cost of \$25,000 and for the borrowing of \$100,000 for paving Dundas street.

A new edifice to cost \$15,000 will shortly be erected at the corner of Humberstone and Willoughby avenues by the Royce avenue Baptists.

#### Winnipeg, Man.

M. Peterson, Secretary, Board of Control, will receive tenders up to April 7th for supply of 15,000 to 25,000 barrels of cement. Specifications at office of city engineer.

J. H. Leech, barrister, acting for an estate, has called tenders for erection of ten modern cottages at Norwood to cost \$19,000.

Rugh & Riddell, architects, are stated to have plans for a 4-storey apartment block to cost \$150,000, another apartment block to cost \$40,000 and store buildings in the north end to cost \$190,000.

D. W. Bellhouse, architect, has completed plans for a business block, to be erected for McNab & Company, foot of Lombard street; also for an apartment block corner Kennedy and Qu'appelle.

Plans are being prepared by H. Rugh, architect, for an apartment block on Osborne street for Dr. Devine, to cost \$50,000.

A. Oldfield, architect, is preparing plans for eight houses to be erected this season by W. Moxam.

C. P. Walker, of the Walker theatre, states that the erection of the proposed hotel will likely start in the fall, simultaneously with the building of the opera house facade. The total estimated cost is \$140,000.

Separate tenders are being taken by Victor Horwood, architect, for the following:—2-storey warehouse, mill construction; fireproof reinforced concrete factory; reinforced concrete underground tank; heating apparatus, pumping machinery and narrow gauge rail tracks.

J. Fisher, representative of the British Consolidated Mills, of London, Eng., recently left with a report favorable to the erection of forty-two grain elevators at various western points.

The city will raise \$5,000 by debentures for the purpose of buying motors for the lighting system of the exhibition grounds.

An eight inch water main will be put in from Main street to Nassau street at a cost of \$7,000.

H. N. Ruttan, City Engineer, is figuring on the cost of installing an automatic softening plant at each well.

A bylaw will likely be submitted to the ratepayers at an early date authorizing the expenditure of \$225,000 for new buildings for the General Hospital.

A permit has been issued for the construction of a building for married men's quarters at Fort Osborne barracks; estimated cost \$40,000.

M. Peterson, Secretary, Board of Control, will receive tenders up to April 21st for construction of asphalt pavement on Main street and Higgins avenue. Specifications may be seen at office of city engineer.

While nothing definite has yet been decided in regard to the joint traffic and railway bridge over the Red river, F. B. Morse, General Manager, G. T. P., in a recent interview stated that in all probability the structure will be erected as described.

### CONTRACTS AWARDED.

#### Brockville, Ont.

The Economical Gas Apparatus Construction Company, Toronto, have been awarded the contract for installing a set of four purifier boxes for the gas works here, at \$9,520.

#### Brandon, Man.

At a recent meeting of the Board of Works, tenders were opened for the construction of the proposed First street bridge. The contract was awarded to City Engineer Shillinglaw

for  
\$48  
\$55  
stru  
to \$

Ber/  
B  
eng  
awa  
the  
fact  
pany  
Pitt  
Nati  
Dur/  
Hea  
Hes;

Braz  
Jo  
been  
roof  
the  
city.

Th  
Com  
tract  
pave  
estim

Dund  
Th  
roofi  
ceilin  
Sund  
of H.

Fe

Or

P/

for a reinforced concrete structure at \$48,250. Other bids ranged from \$55,000 to \$75,000 for a concrete structure and for steel from \$45,000 to \$65,000.

#### Berlin, Ont.

Bowman & Connor, consulting engineers, Toronto and Berlin, have awarded the following contracts in the erection of a reinforced concrete factory for the Kaufman Rubber Company: twisted steel, Jones & Laughlin, Pittsburg, Pa.; cement, 3,000 barrels, National Portland Cement Company, Durham, Ont.; heating, Dominion Heating and Ventilating Company, Hespeler, Ont.

#### Brantford, Ont.

John E. Riddell, of Hamilton, has been awarded the contract for the roofing and copper cornice work of the Bank of Hamilton building, this city.

The Warren Bituminous Paving Company have been awarded a contract for 12,000 square yards bitulithic pavement and storm sewers; total estimated cost \$50,000.

#### Dundas, Ont.

The successful tenderer for the roofing, galvanized iron and metal ceiling work for the Knox Church Sunday school was John E. Riddell, of Hamilton.

#### Grand Forks, Newfoundland.

It is reported that the Walsh Holyoke Steam Boiler Works, of Holyoke, Mass., have secured the contract to furnish and install a steel penstock with its branches for the electric power station of the Newfoundland Development Company at Grand Falls; estimated cost \$210,000.

#### Melfort, Sask.

D. A. MacDonald, of this town, has obtained the contract for building a large machinery warehouse for S. J. Green.

#### Montreal, Que.

Tenders for supplies have been awarded by the Roads Committee. The cement contract was divided between the firms of Ramsey & Langridge, W. McNally & Company, A. Bremner, and the Stinson-Reeb Builders' Supply Company. The prices vary from 55 to 63 cents per 100 pounds. The contract for the supply of bricks went to John Keegan at \$11 per 1,000 for square and \$13 for bevel bricks.

J. T. Marchand & Company secured the lumber contract at prices varying from \$29.50 per 1,000 for white pine to \$79.50 for yellow pine.

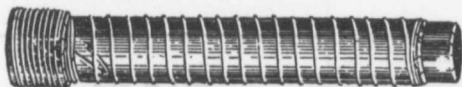
The tile pipes went to W. McNally & Company, at prices varying according to the size.

The contract for cast iron gullies was divided between E. Patenaude, H. Garth & Co., Laurie Engine Co., and P. Amesse, all for 2 3/4 cents.

The Barber Asphalt Paving Company were awarded the contract for artificial asphalt paving at prices from \$2.51 for a six-inch foundation to \$3.36 for a twelve-inch concrete foundation. The same firm were given a contract for laying the five-inch blockstone pavement on a six-inch foundation of concrete at \$2.19, at \$2.25 for a nine-inch concrete foundation and at \$3.12 on twelve-inch concrete foundation.

The Sicily Asphalt Company were given the contract for laying blockstone on sand at \$1.06 a square yard. The Sicily Asphalt Company also obtained the contract for laying the four-inch scoria blocks on a six-inch concrete foundation at \$2.07 and at \$3.05 on a twelve-inch foundation. The same company were granted the contract for laying the five-inch blockstone pavement on a six-inch concrete foundation at \$2.11, on a nine-inch concrete foundation at \$2.61 and on a twelve-inch concrete foundation at \$3.11. To the Sicily Company also went another contract for laying the four-inch scoria blocks on a six-inch foundation at \$2.06, on a nine-inch foundation at \$2.51 and on a twelve-inch foundation at \$3.01.

WRITE FOR CATALOGUE  
FULL PARTICULARS AND ESTIMATES FURNISHED



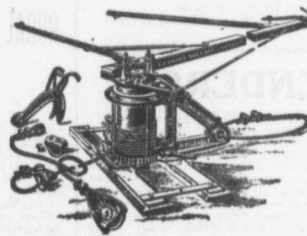
## Machine Banded Wood Stave WATER PIPE

For city and town Water Systems, Fire Protection, Power Plants, Hydraulic Mining, Irrigation, Etc.

One-half the cost of Iron Pipe—and better.

**PACIFIC COAST PIPE CO., LIMITED**

P.O. BOX 563 VANCOUVER, B.C.



## Stump Pullers, Tree Pullers, House Movers, Etc.

Contractors will find it very much to their interest to investigate the celebrated Swenson Malleable Stump Machines which are sold on a guarantee that they will work faster, be easier, and more convenient than any other machine on the market. These are made in 5 different sizes so that it does not matter whether your contract is through the heavy fir in B.C., the big pines in Ontario or the small bush, we have machines adapted for the purpose.

FOR FULL PARTICULARS ASK FOR THE NEW CATALOGUE

Address:

**CANADIAN SWENSONS, Limited**  
Lindsay, Ont., Can.

# TENDERS AND FOR SALE DEPARTMENT

## RURAL MUNICIPALITY OF WALLAGE

### Tenders for Debentures

The undersigned invites offers for debentures of \$50,000, bearing date July 1st, 1907, with interest at 4 per cent. per annum. Said debentures are guaranteed by the Province of Manitoba. Offers to be net payable at Virden or Elkhorn and to be filed not later than 12TH DAY OF APRIL, 1908. All particulars may be obtained from

J. F. C. MENLOVE, Sec-Treas.  
Virden, Man.

### FOR SALE

#### CONTRACTOR'S GRADING OUTFIT

Large Contractor's outfit comprising 150 teams, mules and horses, with harness, camp equipment and complete grading outfit.

Mules and horses located at Fishing Lake, six miles south of Kuroki, on the Canadian Northern Railway. Grading outfit at Touchwood Hills.

Bids will be received for all or part.

H. A. CASSIL,  
232 St. James Street, Montreal, Quebec.

## County of Wellington

### Bridge Tenders

Tenders will be received by the County Clerk, James Beattie, Esq., Fergus, Ont., until APRIL 18TH NEXT for the construction of the Mount Forest Bridge.

1. Steel Superstructure and Concrete Floor.
2. Concrete Abutments, about 600 cubic yards.

For all information apply to the Engineers,

BOWMAN & CONNOR,  
36 Toronto Street, Toronto.

## TENDERS

will be received until noon on MONDAY, APRIL 6TH, for Additions to a Separate School building on Manning Avenue. Each tender must be accompanied by a marked cheque equal to ten per cent. of its amount, payable to the order of the Secretary-Treasurer of the Separate School Board, which cheque will be forfeited if the parties tendering fail to carry out the contract when called upon to do so. Tenders to be addressed to J. Cadaret, Esq., Chairman Sites and Building Committee of Separate School Board, 28 Duke Street. Plans and specifications may be seen at the office of the architect, A. W. Holmes, 10 Bloor Street E. The lowest or any tender not necessarily accepted.

### TENDERS

#### Town of Palmerston, Ont. WATER WORKS

Sealed tenders will be received by the Town Clerk until 8 p. m. TUESDAY, APRIL THE 14TH, 1908, for the following CONTRACTS:—

##### CONTRACT A

- Subdivision (1). Labour, etc., for constructing water works system.
- Subdivision (2). Cast iron water pipe valves and hydrants.

##### CONTRACT B

The supply and erection of a steel Stand Pipe. Plans and specifications may be seen and forms of tender obtained at the office of the Town Clerk, Palmerston, or at the office of the Consulting Engineers.

The lowest or any tender not necessarily accepted.  
Messrs. Galt & Smith, J. H. HYNDMAN, Esq.,  
Consulting Engineers, Town Clerk,  
23 Jordan St., Toronto.

## CHESLEY WATER WORKS

Tenders will be received until April 15th for Gas Engine and Producer, Oil Engine, Power Pump, also for excavating and pipe laying.

For all information apply to

BOWMAN & CONNOR, Consulting Engineers,  
14 Court House, Berlin, Ont.

## Street Railway

The Council of the City of Calgary is open to receive offers for the installation, construction, equipment and operation of a Street Railway in said City for a limited period of franchise.

Companies making applications for same will please state time required under franchise and other particulars. For particulars apply to the undersigned.

H. E. GILLIS,  
City Clerk.

Dated at Calgary, March 15th, 1908.

## Debentures For Sale

### VILLAGE OF ELMIRA

Sealed tenders will be received by the undersigned up to 7 o'clock p.m. on the 6th DAY OF APRIL, 1908, for the purchase of \$2,500 4½ per cent. Debentures. Payable in twelve years, re loan to "Elmira Interior Woodwork Company, Limited," and \$25,000.00 4½ per cent. Debentures payable in thirty years re. Waterworks.

Particulars from the undersigned.

No tender necessarily accepted.

14 JOHN H. RUPPEL, Clerk.

## RURAL MUNICIPALITY OF WALLAGE

### TENDERS

Sealed Tenders addressed to the undersigned and marked "Tenders for Steel Bridge" will be received up till noon on the 10TH DAY OF MAY 1908, for the building of a Steel Bridge with Stone Masonry Abutments, together with necessary Excavations, etc., to be erected at Section 4 Tp 10 Rge 29 W. over the Pipestone Creek, for the Rural Municipality of Wallage.

Plans and specifications may be seen at the office of the Secretary-Treasurer in the Town of Virden, or Department of Public Works, Winnipeg.

An accepted cheque of an amount equal to five per cent. of the tender must accompany the tender.

The lowest or any tender not necessarily accepted.

JAMES F. C. MENLOVE,  
Secretary-treasurer.

## City of Prince Albert

The City of Prince Albert has for sale:—

One Horizontal Tandem Compound Corliss Engine with Shafting, Pulleys, Belting, etc.

One Warren Alternator, 60 K.W.

One Westinghouse Generator, 60 K.W.

Switchboards with all necessary attachments.

One Surface Condenser, Pumps, Valves and all the necessary equipment of a first-class Electric Light Plant, in good condition, now in operation and giving a service which cannot be surpassed.

Also one 12" by 14" Doty Automatic Engine and one 30 K.W. C.G.E. Generator.

Reason for selling is that it was found necessary to install a larger plant to meet the increased requirements of the city.

Offers will be received up to 15TH APRIL.

Complete inventory and description will be furnished on application to

C. O. DAVIDSON,  
Secretary-Treasurer,  
City of Prince Albert, Sask.

## ROYAL MUNICIPALITY OF WALLAGE

### TENDERS

Sealed tenders, addressed to the undersigned and marked "Tenders for Telephone Lines," will be received up to NOON OF 10TH DAY OF MAY 1908, for the building of such telephone lines and the installation of such telephones as will be required in the telephone system in the Rural Municipality of Wallage.

Plans and specifications may be seen at the office of the Municipal Secretary in the Town of Virden or at the offices of the Department of Telephones and Telegraphs, Parliament Buildings, Winnipeg.

An accepted cheque of an amount equal to five per cent. of the tender must accompany same.

The lowest or any tender not necessarily accepted.

(Signed)

JAMES F. C. MENLOVE,  
Secretary-treasurer.

## CITY OF PORTAGE LA PRAIRIE PROVINCE OF MANITOBA

### Notice to Contractors

Tenders addressed to the Secretary-Treasurer will be received until 8 p. m. on

WEDNESDAY, APRIL 15th, 1908

for Pumping Machinery, Water Pipes, Pipelaying, etc., as an auxiliary to the existing City Waterworks System. The work is to be fully completed within two months and machinery delivered from stock.

Plans may be seen at Toronto and at Portage la Prairie.

For further information apply to the Chief Engineer,  
103 Bay Street, Toronto, Ont.

F. W. CLAYTONG, Esq.,  
Edward Brown, Esq., Secretary-Treasurer,  
Mayor, Portage la Prairie, Man.

Willis Chipman, C.E., Chief Engineer,  
103 Bay Street, Toronto, Ont.



Sealed Tenders addressed to the undersigned, and endorsed "Tender for Toronto Island Breakwater Extension," will be received at this office until FRIDAY, APRIL 24, 1908, inclusively, for the construction of an Extension to the Breakwater on the South Shore of Toronto Island, in the County of York, Province of Ontario, according to plan and specification to be seen at the office of J. G. Sing, Esq., Resident Engineer, Confederation Life Building, Toronto; Charles Desjardins, Esq., Clerk of Works, Post Office Building, Montreal, and at the Department of Public Works, Ottawa.

Tenders will not be considered unless made on the printed form supplied, and signed with the actual signatures of tenderers.

An accepted cheque on a chartered bank, payable to the order of the Honorable the Minister of Public Works, for four thousand five hundred dollars (\$4,500.00), must accompany each tender. The cheque will be forfeited if the person tendering decline the contract or fail to complete the work contracted for, and will be returned in case of non-acceptance of tender.

The Department does not bind itself to accept the lowest or any tender.

By order,

FRED. GELINAS,  
Secretary.

Department of Public Works,  
Ottawa, March 11, 1908.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department.



**To Sewer Pipe Manufacturers**

Sealed tenders, addressed to the undersigned, will be received up to noon, MONDAY, APRIL THE 20TH NEXT, for the supply of 21,000 lineal feet of 24-inch Sewer Pipe. Specifications may be obtained from Davis & Johnston, Engineers, Berlin, Ontario.

J. J. HACKNEY,  
Manager Guelph Water Works.

16

**Tenders Wanted**

Sealed tenders (marked "Tenders for Town Hall) in whole and part will be received by the Town Clerk, Meaford, up to and including APRIL 15TH, for the several trades required in the erection and completion of a Town Hall. Plans and specifications may be seen at the Clerk's Office, Meaford, also at the Architects' Office, Toronto. No tender necessarily accepted.

ELLIS & CONNERY, Architects,  
Manning Chambers, Toronto.  
GEO. ALBERRY, Town Clerk,  
Meaford, Ont.

15

**To Heating Contractors  
Tenders**

Sealed tenders will be received until APRIL 25TH, 1908 at noon, for the works required in Heating and Ventilating the Collège Institute at Ottawa.

Plans and specifications can be seen at the office of Horwood & Taylor, Architects, 102 Bank Street, Ottawa.

A marked cheque equal to 5 per cent of tender to accompany each tender as a guarantee of tender.

The lowest or any tender not necessarily accepted. Tenders to be addressed to Thomas Birkett, Esq., Chairman of Building Committee, Room 11, Central Chambers, Ottawa.

CECIL BETHUNE, Secretary-Treasurer,  
Ottawa Collegiate Institute Board.

14

**NOTICE**

Sealed bids will be received at the office of the City Clerk of Vancouver, British Columbia, up to noon of SATURDAY, APRIL 4TH, 1908, for the manufacture and erection of the Superstructures of the new Bridges over False Creek at Westminster Avenue and Granville Street. Estimated weight of structural steel, about 2,800 tons.

Plans and specifications will be on file at the City Engineer's office, Vancouver, on and after SATURDAY, MARCH 14. Copies of all the papers may be secured from Waddell and Harrington, Consulting Engineers, Kansas City, Mo., upon the receipt of a deposit of twenty-five dollars, which will be refunded upon return of the plans and other papers in good order.

**NOTICE**

The date for receiving bids at the office of the City Clerk of Vancouver, B.C., for the manufacture and erection of the superstructures of new bridges over False Creek, at Westminster Avenue and Granville Street has been extended to noon of FRIDAY, MAY 1ST, 1908.

18

**TENDERS FOR  
CAST IRON PIPE AND  
SPECIALS**

Sealed tenders will be received by the City Clerk of the City of Prince Albert until 8 P.M. ON THURSDAY, APRIL 16TH 1908 for the following:

- 3736 feet 8" Cast Iron Pipe.
- 6044 " 6"
- 800 lbs. Special Castings.
- 4"-8" Valves.
- 2"-6" Valves.
- 17 Hydrants.
- 16 Valve Boxes.

Specifications, conditions and form of tender may be obtained at the Office of the City Engineer, or at the Office of the City Clerk, City Hall, Prince Albert. No tender necessarily accepted.

R. S. COOK Mayor. F. A. CREIGHTON, City Engineer.  
C. O. DAVIDSON, City Clerk.

16

**Tenders Wanted**

Sealed tenders (marked "Tenders for Factory") in whole or part will be received by the undersigned up to and including SATURDAY, APRIL 11TH, for the several trades required in the erection and completion of a factory on Queen Street West, Toronto. Plans and specifications may be seen at the office of the Architects. No tender necessarily accepted.

ELLIS & CONNERY, Architects,  
Manning Chambers, Toronto.

15

**Town of Listowel  
DEBENTURES FOR SALE**

Sealed tenders addressed to the undersigned will be received up till noon of MONDAY, APRIL 6TH, for the purchase of Debentures of the Town of Listowel for \$15,000, authorized by Chap. 86, R.S.O., 1860, "An Act to consolidate the debt of the Town of Listowel," repayable in thirty years in equal annual payments of principal and interest, bearing interest at five per cent.

W. CLIMIE, Chairman of Finance,  
Listowel, Ont.

14

**Tenders for  
DRILLING WELL**

Tenders addressed to the undersigned marked "Tender for Drilling Well," will be received up to APRIL 15TH at 6 p.m. for drilling an 8 inch Test Well for the Clinton Waterworks system, also for a second well in same vicinity if required.

State price by the foot and lump sum and also whether tenderer guarantees to find water or not.

D. L. MACPHERSON, Town Clerk,  
Clinton, Ont.

15

**Fire Alarm Telegraph**

**Tenders**

Sealed Tenders addressed to the undersigned, and endorsed tender for new fire alarm system, will be received at the City Clerk's office, City Hall, up to NOON ON THURSDAY THE 16TH APRIL NEXT, for a complete new Fire Alarm Equipment and installation of same, necessary for the new Fire Alarm Telegraph Department headquarters, Berthelot Street.

Specifications and any information concerning the above installation can be obtained at the office of the Superintendent of the Fire Alarm Telegraph, City Hall. A certified cheque of \$2,000, shall be deposited with the City Treasurer payable to his order. Each tenderer shall receive a certificate of such deposit, and this certificate shall accompany the tenders delivered to the City Clerk.

The tenders will be opened by the City Clerk in the presence of the interested parties at the first meeting of the Fire and Light Committee following the reception of tenders.

The Committee does not bind itself to accept the lowest or any tender submitted.

L. O. DAVID,  
City Clerk.

City Clerk's Office, City Hall,  
Montreal March 27th 1908.

14

**NOTICE**

**Drainage Contract**

Sealed tenders will be received by the undersigned up to 12 o'clock noon of MONDAY THE FIRST DAY OF JUNE, A.D. 1908, for the construction of the Grantley Creek Drain in the northwest part of the Township of Osnaburk and northeast part of the Township of Williamsburg (about six miles from Chusterville, on C.P.R.) Engineer's estimate of total work, \$14,106.77.

Parties tendering will please state whether dredge or team work is intended. An accepted cheque for one-tenth the amount of tender will be required as a deposit.

Tenders for culverts in the Township of Osnaburk will be accepted at the same time and subject to the same conditions, but need not necessarily accompany tender for excavation. Plan, profile, etc., can be seen with the undersigned or with Magwood & Walker, Engineers in charge, Cornwall, Ont.

(The Township of Williamsburg build all culverts in the said township by arrangement.)

The lowest or any tender not necessarily accepted.

H. E. HODGINS, Clerk,  
Osnaburk Centre, Ont.

20

**CITY OF BRANTFORD**

**Tenders for Sewer Pipe  
and Paving Brick**

Sealed tenders addressed to Samuel Suddaby, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received up to 12 O'CLOCK NOON ON THURSDAY, APRIL 23RD, 1908, for the supply of Sewer Pipe and Paving Brick required by the City of Brantford for 1908. Instructions to bidders and forms of tender may be obtained on application to the City Engineer. Each tender must be accompanied by a marked cheque payable to the order of the City Engineer for the amount called for in form of tender.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,  
City Engineer.

City Hall, Brantford, Ont., March 31st, 1908. 16

**Bids.**

**Montreal, Que.**

The Water Committee recently opened tenders for the supply of the 12,000,000 gallon pump and will shortly award the contract. Noticeable features were the number and variety of the tenders, and the prominence the new turbines occupy with all the large makers of pumps. Five different prices were quoted by the John McDougall Company, the Montreal agents for the Worthington pump. To supply a duplicate of the pump put into service last summer the price submitted was \$71,597; for a Holly pump, \$22,979; for a Snow pump, \$63,858; for a Worthington turbine, driven by a vertical engine, \$29,465; another Worthington turbine, driven by a different type of engine, \$38,360. Drummond, McCall & Co., representing Mather & Platt, Birmingham, England, offered a turbine driven by a Bellis engine for \$36,400; the Canadian Buffalo Forge Company offered a turbine for \$37,247; John Inglis & Co., of Toronto, offered their triple expansion pump for \$72,300, and the same pump of a different type for \$66,700; the Allis-Chalmers Bullock Company tendered on a Robb-condensing engine and Worthington turbine at \$37,235; the Montreal Light, Heat & Power Company offered a steam driven turbine at \$64,400, and an electric turbine pump at \$34,000. Alfred Collyer, representing Watson, Stilman & Co., of Philadelphia, offered one of their turbines at \$34,700; and Peacock Bros., representing Hawthorn, Davey, of Leeds, England, offered a pump for £10,850, and another at £10,775; the Dolier Engineering Company, of Philadelphia, offered a de Laval steam pump at \$29,700; and Glenfield, Kennedy, of Kilmarnock, Scotland, offered a pump at \$59,200.

The Housser-Armstrong Lumber Company, Limited, Willow Range, Man., have disposed of their business to J. H. Stewart.

**Concrete Smokestacks.**

Iron smokestacks have been replaced by concrete in a novel manner at the plant of the Canadian Portland Cement Company, at Marlbank, Ontario. At this plant four stacks, each 60 feet high and 14 feet in diameter, lined inside with one thickness of fire brick, recently showed signs of corrosion in the plates. Instead of replac-

ing with iron or steel, it was decided to coat the outside of each stack with a four inch layer of concrete. For this purpose a plate iron cylinder, 56 inches in diameter and 48 inches high, was used as a form, and moved up the stack as the concrete, which was deposited within it, had set. Circumferential reinforcement of No. 7 wire was placed every vertical six inches

in the middle of the 4 inch thickness. It is estimated that about \$1,200 was saved in the construction by concrete covering, above the cost of new iron or steel stacks.

**JOHNS. FIELDING**

Mem. Soc. C.E. West Penn. 87  
Mem. Engineers' Club, Toronto

**CONSULTING ENGINEER**

**Expert on Bridges and Machinery**  
Room 2, 15 Toronto Street, TORONTO, ONT.

**Josson Cement**

Is the Highest Grade Artificial Portland Cement and the Best for High-Class Work. Has been used largely for Government and Municipal Works.

TO BE HAD FROM ALL CANADIAN DEALERS OR FROM

**C. I. DeSOLA, 180 St. James Street, Montreal**

**Portland Cement**

High-Grade German Brands for Granolithic and Artificial Stone Sidewalks, SEWER PIPES, CULVERT PIPES, ETC. Best English Cements. Best Belgian Cement.

**WM. McNALLY & CO. - MONTREAL**

**Well Drilling Contractors**

Equipped with the most modern machinery for drilling Water, Oil, Gas or Salt Wells, to 50 or 5,000 feet in depth, any diameter from 4 to 12 inches.

Tests made for foundations, such as—Building Bridges, Trestle Work, Canals, etc.

**WALLACE BELL**  
273 Laval Ave., MONTREAL, CAN.

References from the largest Manufacturing Companies, and Financial Institutions in Canada.

**Steam Heating Boilers**

OF ALL SIZES

**For Public Buildings**

manufactured as a specialty

Quotations and Information given by

**E. Leonard & Sons**

Engine and Boiler Manufacturers

LONDON, ONTARIO



THE CANADIAN STANDARD

**STAR**

THE CANADIAN PORTLAND CEMENT CO., LIMITED

502 TEMPLE BUILDING  
TORONTO

203 BOARD OF TRADE BUILDING  
MONTREAL

**THE STANTON IRON WORKS COMPANY**

Near NOTTINGHAM ENG.

Largest Makers of Cast Iron Pipe in the World

LIMITED

Annual Output  
100,000 Tons



CAST IRON PIPE

SIZES: 1½ in. to 72  
in. diameter, 9 ft. and  
12 ft. lengths.

Irregular Castings for Gas, Water, Sewerage Work, Steam, Hydraulic and Pump Installations. Also makers of Cast Iron Tanks, Columns, Girders, Etc.

**W. BEVERLEY ROBINSON**

AGENT FOR CANADA  
Board of Trade Building

**MONTREAL**

## Damp Cellars

In almost every city in Canada the above condition exists. By using "Esco" Waterproofing this trouble can be done away with. It is also just as valuable for new work.

Agents Wanted

**Eadie-Douglas Company, Montreal**

## PORTLAND CEMENT



SEWER PIPES  
FIRE BRICKS  
FIRE CLAY



**ALEX. BREMNER**

50 Bleury Street - - MONTREAL

## REFUSE DESTRUCTORS

Complete Combustion  
Perfect Sanitation  
Latest Improvements

Structural Steel and Bridge Work

**HEENAN & FROUDE, Limited**

Manchester, England

**RICHARD A. TAUNTON,**

512-514 McINTYRE BLOCK. WINNIPEG.

## GUARANTEE BONDS

of all kinds for all trusted officials

Administrators' Bonds

Contractors' Bonds

We are specialists in this business  
(Do not do Accident Insurance)

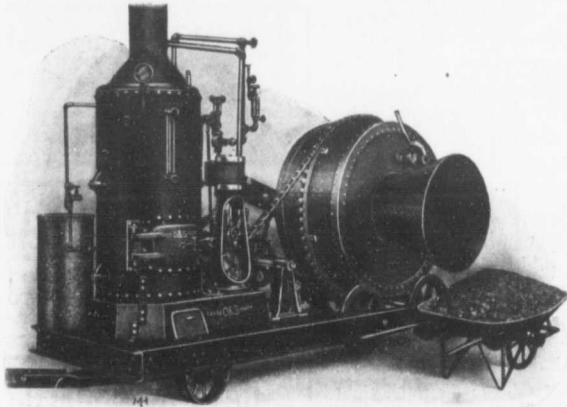
5/6

**UNITED STATES FIDELITY CO.**  
of Baltimore, Md.

3,500 Agents in United States and Canada  
Cash Resources over \$3,500,000.00

HEAD OFFICE for Canada 6 Colborne, St., Toronto  
**A. E. KIRPATRICK, Manager**

# McKELVEY CONCRETE MIXERS



Combined with Gasoline,  
Steam or Electric Power.

Batch Mixers, Continuous  
and Hand Power Mixers.

Concrete Buckets,  
Contractors' Buckets.

We carry a full line of Railway and Contractors' Supplies

**The Canadian Fairbanks Co., Limited**

Montreal, Toronto, St. John, Winnipeg, Calgary, Vancouver.

**WILLIS CHIPMAN**

Hon. Grad. McGill University  
M. Can. Soc. C.E. M. Am. Soc. C.E.  
Mem. Am. W. W. Ass'n.  
**Waterworks, Sewerage Works, Gas  
Works, Electric Light and  
Power Plants.**  
Reports, Surveys, Construction, Valuations  
105 Bay Street - TORONTO

**DAVIS & JOHNSTON**  
CIVIL ENGINEERS

WATER WORKS, SEWAGE  
AND SEWERAGE DISPOSAL  
Wm. Mahlon Davis, Herbert Johnston, C.E.  
M. Can. Soc. C.E.  
Offices: BERLIN and GALT

H. J. Bowman, M. Can. Soc. C.E.  
A. W. Connor, B.A., C.E., A.M. Can. Soc. C.E.

**Bowman & Connor**

Consulting Municipal and Structural Engineers  
WATERWORKS, SEWERAGE AND ELECTRIC PLANTS  
CONCRETE AND STEEL BRIDGES AND BUILDINGS  
**CEMENT TESTING**  
36 Toronto St. TORONTO Tel. Main 5744  
Branch Office, Berlin. Tel. 122 B.

**LEA & COFFIN**  
and H. S. FERGUSON  
ENGINEERS

Waterworks, Sewerage, Water Powers, Pulp and  
Paper Mills. Reinforced Concrete Structures of  
Every Description.  
Coristine Building - MONTREAL

**A. LEOFRED**

(Graduate of McGill)

**CONSULTING ENGINEER**  
WATERWORKS A Specialty

Metropolitan Bld., 36 St. John Street, QUEBEC  
Phone 545.

**JOHN T. FARMER****MECHANICAL and  
HYDRAULIC ENGINEER**

418 Coristine Bldg. - MONTREAL

**Smith, Kerry & Chace**

CONSULTING AND CONSTRUCTING ENGINEERS  
Hydraulic, Electric, Railway,  
Municipal, Industrial

Rooms 124-127 Confederation Life  
Building, TORONTO  
W.U. Code used. Cable Address "Smithco"  
Cecil B. Smith J. G. G. Kerry W. G. Chace

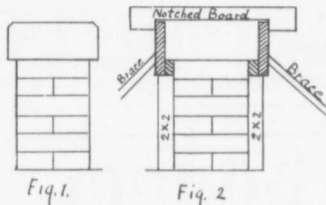
**Canadian Engineers, Limited****CIVIL AND CONSULTING  
ENGINEERS**

Electric Hydraulic Plants  
Waterworks, Sewerage, Bridges

33 Bank Street Chambers OTTAWA

**Building a Cement Coping.**

Fig. 1 shows a section of brick wall with a cement stone coping on top. Fig. 2 shows how to make the form for the coping. The coping should be about 4 inches thick to look well. Take two 6 inch boards and nail on a 1 by 2 strip on the bottom to form the projection of the stone. The strips can be put on to show any thickness of stone desired, but 4 inches thick is a good thickness for 8 and 12 inch brick walls. Under the side boards put 2 by 2 strips, perpendicular to the ground, or any strips sufficient to hold the form at its proper height. Next, brace the form as shown, in order to keep the form from spreading when the cement is put in. Short forms will not need bracing, but any form six to eight feet long should have at least one brace each side to hold it firmly to the wall.



Sometimes, when it is difficult to get a brace in, a board notched just right to fit over the top of the mould as shown will answer, but this is not as good as the braces, for it has a tendency to make the mould pull away from the wall at the bottom. After the mould is put in place take some thick cement mortar and go over the bottom and stop all cracks in the mould, for there will be some places where the mould will not fit the brick wall close enough. It should be made tight with thick cement mortar, well troweled, so that water will not drip through and deface the brick work. The mould can be made water-tight in a few minutes, and very little mortar will be required for this. As soon as the mould is ready mix the sand and cement in proportions of 1 part cement to 2 parts of sand, according to how good you want the stone. One to three will make a good job, but 1 to 2 will be extra good. Mix the sand and cement dry first before put-

E.H. Keating, M.Inst. C.E. W.H. Breithaupt, C.E.,  
M. Can. Soc. C.E. M. Can. Soc. C.E.  
M. Am. Soc. C.E. M. Am. Soc. C.E.

**Keating & Breithaupt**

Consulting and Constructing Engineers  
Waterworks, Sewerage, Power Develop-  
ments, Bridges, Railway Work.  
Examinations, Estimates and Reports.  
Cable Address: Keating, Toronto. Tel.: Main 6718

**C. J. FENSOM, B.A.Sc.**  
CONSULTING ENGINEER

Aberdeen Chambers - Toronto  
Machinery designed, supervised, inspected and  
contracted for. TESTS—REPORTS  
Electric Light Plants, Power Plants,  
Pumping Plants.

**John H. Jackson**  
CIVIL ENGINEER

Water Power, Electric Railways,  
Structural Steel  
NIAGARA FALLS, CANADA  
Associated with Charles H. Mitchell, C. E.,  
Hydraulic Engineer.

A. F. Wells, B.A.S., O.L.S. A.M. Can. Soc. C.E.  
D. C. Raymond, B.A. Sc. A.M. Can. Soc. C.E.

**Wells and Raymond**  
CIVIL ENGINEERS

Sewers, Sewage Disposal, Pavements, etc. Rein-  
forced Concrete Structures of all kinds. Bridges,  
Buildings, etc. Designs prepared for Contractors,  
to comply with Architects' specifications.  
PHONE M. 3056. 217 STAIR BUILDING, TORONTO

**Clarke & Mond**

ENGINEERS and CONTRACTORS  
36 Toronto St., TORONTO

Our equipment is complete to handle any size of  
Reinforced Concrete Structures

**J. LEWIS THOMAS**

CIVIL ENGINEER  
London - Ontario

Consulting Engineer for Municipal and County  
Work. Electric Railways, Bridges, Water-  
works, Sewerage, Wharves, Docks, etc.  
Special attention to Valuations and Arbit-  
rations.

**Andrew F. McCallum**

Consulting and Constructing Engineer  
Steam and Electric Railways, Hydraulic,  
Industrial and Mining Plants.

Room 612-14  
Continental Life Building TORONTO  
Telephone Main 465a.

**GALT & SMITH**

CONSULTING CIVIL AND  
SANITARY ENGINEERS

Specialties: } Waterworks, Sewerage  
and Electric Lighting.

JOHN GALT, C. E., OWEN W. SMITH,  
Mem. Can. Soc. C.E. Assoc. Mem. Can. Soc. C.E.

25 Jordan Street. TORONTO



WE ARE NOW PREPARED TO FURNISH YOU WITH

**"MIMICO"**  
**SEWER PIPE and FITTINGS**

THE BEST THAT CANADA PRODUCES

Prices and Freight rates are right too. Ask for Catalogue.

**The Ontario Sewer Pipe Co., Limited**  
MIMICO, ONTARIO

Long Distance Telephone  
Parkdale 422

**McGREGOR & McINTYRE**  
LIMITED

67 to 91 Pearl Street, Toronto, Ont.

**Structural Iron Works**

*Beams, Channels, Tees, Angles, Chequered  
Plates, etc., in stock. Fire Escapes, Sidewalk  
Doors. Iron Stairs. etc., etc.*

Sole Agents for  
Duplex Hangers and Goetz Post Caps, Wall Boxes, Etc.

PHONES: 7248  
7249

ESTIMATES FURNISHED

**SEWER PIPES**

Salt Glazed and  
Vitrified.

TRUE TO SIZE  
IMPERVIOUS TO WATER  
WILL NEVER DISINTEGRATE

Sizes manufactured and  
always in stock:  
4-inch to 24-inch.



CHIMNEY TOPS FLUE LININGS WALL COPING. *Ask for Price  
List & Discou.*  
Telephone (Toronto Connection): Park 1809. Post Office: SWANSEA.

**THE DOMINION SEWER PIPE CO., LIMITED**  
(THE INDEPENDENT COMPANY)  
WORKS AND OFFICE SWANSEA (NEAR TORONTO)

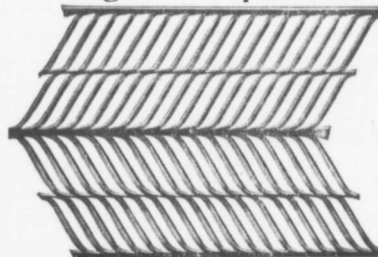


CONTRACTORS FOR  
**STEEL HIGHWAY  
BRIDGES,  
CONCRETE ABUT-  
MENTS,  
REINFORCED CON-  
CRETE FLOORS,  
ETC.**

**ONTARIO BRIDGE COMPANY**

34 Victoria Street, TORONTO

**"Herringbone" Expanded Steel Lath**



is positively the  
most rigid ex-  
panded metal  
lath on the mar-  
ket. It is the  
easiest to apply  
on the studding,  
and the easiest  
to plaster. Takes  
fewer studs and  
less plaster than  
any other lath.  
Its edges are  
absolutely  
uniform, and  
there is no waste  
from overlap-  
ping. Write for  
our Literature  
and free Samples

**THE MEAL SHINGLE & SIDING CO., Limited**  
MONTREAL - PRESTON - TORONTO

**Splgot and Faucet Pipe**

**Flanged Pipe**

**Turned and Bored Pipe**

MADE IN 12' 0" LENGTHS  
3 TO 48 INCHES DIAM.



MADE IN SEVERAL WEIGHTS  
PROVED FROM 100 TO 700 LBS

**AND SPECIAL CASTINGS**

"THE WORLD'S STANDARD FOR ACCURACY, QUALITY AND FINISH."

Write for Our Pocket Edition: The most complete catalog in this line published.

**L. H. GAUDRY & CO.,**

Canadian Agents for  
Robt. MacLaren & Co., Glasgow

**QUEBEC AND MONTREAL**

**S. B. BIRDS, A. R. I. B. A.**  
CONSULTING ARCHITECT  
STRUCTURAL ENGINEER

will render temporary assistance to Architects in  
Competitive Designs Planning Calculations  
Steel Skeleton Construction  
Reinforced Concrete Construction  
Special terms for Competition Work  
Phone North 207 90 Wellesley St., Toronto

**G. A. Stimson & Co.**  
16 KING ST., WEST, TORONTO  
MUNICIPAL DEBENTURES AND  
CORPORATION BONDS

BOUGHT AND SOLD  
Special lot at present to yield 7 per cent

**FOR SALE**

44 Steel Flat Cars in perfect condition  
suitable for Lumber or Mining. Standard  
Gauge. Capacity 5 to 7 tons. Will sell  
cheap to a quick buyer. For further  
particulars apply to

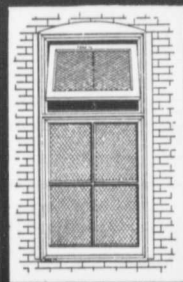
**SESSENWEIN BROS., MONTREAL**

METALLIC  
**SKYLIGHTS &  
VENTILATORS**  
METALLIC ROOFING CO.  
LIMITED  
TORONTO, CANADA.

**J. H. Tromanhauser**  
ARCHITECT and BUILDER.

**FIREPROOF GRAIN ELEVATORS**  
MILL WAREHOUSE, DOCK, PIER and  
BREAKWATER CONSTRUCTION, IN  
CONCRETE, STEEL, BRICK or WOOD.  
604 TEMPLE, TORONTO.

STANDARD  
**METAL WINDOWS**



GLAZED  
WITH  
FIREPROOF  
GLASS  
—  
PREVENT  
AND  
RETARD  
FLAMES  
—  
REDUCE  
YOUR  
INSURANCE  
PREMIUMS  
—  
CLOSE  
AUTO-  
MATICALLY

RECOMMENDED AND ENDORSED  
BY FIRE UNDERWRITERS

WRITE FOR CIRCULARS OR CATALOG

**A. B. ORMSBY, LIMITED**

FACTORIES: 161, 163, 165 QUEEN ST. EAST, TORONTO  
1 67, 679 NOTRE DAME ST. W., WINNIPEG  
MANUFACTURERS AND CONTRACTORS OF  
FIREPROOF WINDOWS, DOORS AND SKYLIGHTS  
METAL STUDING FOR FIREPROOF PARTITIONS  
CORNICES, CORRUGATED IRON, METAL CEILINGS  
CORNER IRON, ETC. SLATE, FELT & GRAVEL ROOFERS

ting any water with it, and mix it  
thoroughly.

Good cement work depends much  
on good mixing, and this point should  
never be neglected. After mixing the  
cement put it in the mould and with  
a trowel work it down along the sides  
of the mould until it is solid and  
without air holes, and fill the mould  
as you go, and rather quickly. After  
the mould is full level it off on top  
and trowel it to an even surface. Let  
it set a little and trowel again. After  
it has set sufficiently to stand with-  
out running, then, with a trowel, you  
can clip the top corners and trowel  
them down smooth, thus avoiding the  
sharp edges on top of the coping  
which are always getting chipped off  
more or less, giving the stone a rag-  
ged edge. The corner cut out a little  
obviates this and takes but a very  
little bit of time and insures a job  
that will look better and last longer.

The sand and cement should be  
mixed to a good stiff mortar, not so  
that it is sloppy. Use the trowel to  
force the mortar down in the mould  
and make it fill. Troweling brings  
the water to the surface, and if mor-  
tar is too wet it floats the cement off  
the top of the stone, showing sand  
patches. Watch the troweling closely,  
and if too wet to trowel well you can  
soon learn to turn out first-class jobs  
in cement work.—J. P. Hicks in  
"Cement World."

**Japan's Labor System.**

Some writers have expressed aston-  
ishment that the Japanese laborer and  
artisan should so eagerly rush to the  
ports of the Pacific islands, Canada  
and California. In such places he  
is scarcely ever treated as an equal.  
Sometimes he is outraged and ill-  
treated, and never anything more  
than tolerated. Yet still the stream  
of immigrants pours on from the Asi-  
atic to the American shores of the  
"Peaceful Sea." There is something  
startling in the persistent way in  
which a fertile land, filled with indus-  
tries, and not at present over-  
populated, allows the blood and sin-  
ews of its people to seek life and work  
abroad. Japan's development along  
industrial lines is one of the most re-  
markable features of her recent pro-

**JNO. S. FIEDING**  
CONSULTING ENGINEER

**Hydraulics, Dams  
ETC.**

WATER POWER DEVELOPMENT  
16 TORONTO STREET TORONTO

**ARTIFICIAL STONE PAVEMENTS**  
SIDEWALKS A SPECIALTY

CORPORATIONS will do well to consider our work  
and prices before letting contract

The Silica Barytic Stone Company  
of Ontario, Limited

WALTER MILLS Head Office:  
General Manager. INGERSOLL, ONT

**Reid & Brown**  
ROOF TRUSSES and GIRDERS

Steel Beams, Channels, Angles,  
Plates, Column Sections, etc.,  
Always in Stock

OFFICE AND WORKS:  
Phone M 2341. 63 Esplanade, E. TORONTO

**THE PRIESTMAN EXCAVATOR  
AND DREDGER**

is used throughout the world. Will do more work  
with less labor, at a less first cost than any Excavator  
at present in use in Canada. For particulars write

G. P. WALLINGTON,  
Canadian Representative,

11 Front Street East, Toronto

**The Ontario Accident  
Insurance Co.**

ACCIDENT, EMPLOYERS, ELEVATOR  
AND GENERAL LIABILITY . . . .

104 St. Francois Xavier St. Montreal

**THE GREY AND BRUCE PORTLAND  
CEMENT COMPANY**

of Shallow Lake, Limited.

Manufacturers of  
**"HERCULES" BRAND OF  
PORTLAND CEMENT**

Very finely ground. Unsurpassed for Sidewalks  
Floors and all work requiring the highest grade  
of Portland Cement. For prices address

A. D. CRESSOR, Sec.-Treas.  
Head Office: Owen Sound, Ont.



**AMBURSEN**  
HYDRAULIC CONSTRUCTION  
CO. OF CANADA, LIMITED  
519 CORISTINE BLDG.  
MONTREAL, P.Q.

The  
purp  
any b  
The l  
allow  
Ou  
Spinc  
U. S.  
IDE

Pat  
B E  
mech  
parts,  
cator



Note the Artistic Effect of "Ideal" Blocks in Residence Construction.

## For all Construction

Profit to the owner of an Ideal Concrete Block Machine is a matter of mathematical certainty. The popularity and practicability of the Ideal Block is PROVED by the thousands of buildings all over the world. Every character of building is included, from residences, at once artistic and everlasting, to massive manufacturing plants, covering acres of floor space.

# IDEAL Face Down Interchangeable Concrete Machines

IDEAL CONCRETE BLOCK MACHINES  
TWO SIZES:  
MODEL "A" 16 IN. LENGTH.  
MODEL "E" 24 IN. LENGTH.  
INTERCHANGEABLE TO  
4, 6, 8, 10 and 12 IN. WIDTHS  
4, 6 and 8 IN. HEIGHTS.



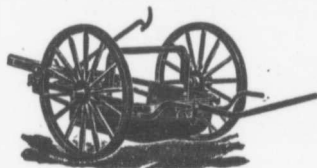
The interchangeable features of the Ideal Machine allow the rapid and profitable production of concrete blocks for every building purpose, from the most massive construction to the most daintily beautiful styles of architecture. The same machine makes blocks of any length within capacity, any angle, 4, 6, 8, 10 and 12 inch widths, 4, 6 and 8 inch heights, and any desired design of face. The interchangeable and adaptable features found in the "Ideal" alone save the cost of a great number of special machines, and allow the establishment of a profitable manufacturing business on a moderate capital.

Our catalogue shows a complete line of concrete machinery, including Mixers, Brick Machines, Sill and Lintel Machines, Column, Spindle, Hall, Sidewalk, Step and Sill Molds.

It is a reliable guide to success in the concrete industry, and is sent FREE on application.  
**IDEAL CONCRETE MACHINERY CO., Ltd., 211 King Street, London, Ont., Can.**  
Canadian Sales Agents: **MUSSENS, LIMITED, Montreal, Toronto, Winnipeg, Vancouver**

## THE TORONTO PRESSED STEEL CO., LIMITED

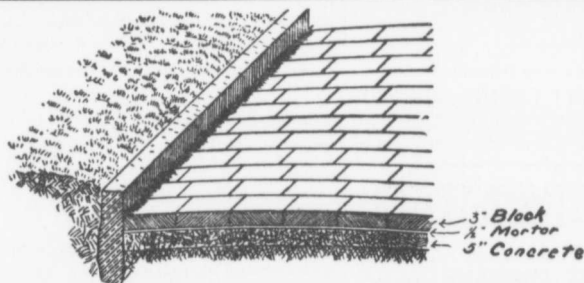
Toronto and Winnipeg  
Manufacturers



**Drag Scrapers** (solid pressed bowl) **Wheel Scrapers** (pressed or square bowls) **Dump Cars**, from 1 to 3 yards, **Wheelbarrows**, **Wood or Steel Trays**, **Wagons**, **Carts**, **Cement Mixers**, Etc.



Prompt delivery from stock at Toronto and Winnipeg.  
Send for complete catalogue. Write nearest office.



## A Scientific Pavement

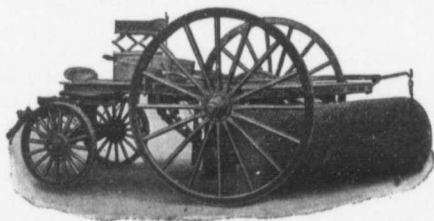
Must Be

Durable and Non-Abrasive.  
Non-Absorbent and Nearly Noiseless.  
Unaffected by Extremes of Temperature.  
Sightly and Sanitary.  
Easily Repaired and Easily Cleaned

These Requirements are Met by

# ASPHALT BLOCK PAVEMENTS

SEND FOR DESCRIPTIVE LITERATURE  
**THE ONTARIO ASPHALT BLOCK COMPANY, LIMITED - WINDSOR, ONT.**



Stackpole Patent Improved **Street Sweeping Machine** Is the Standard of Perfection

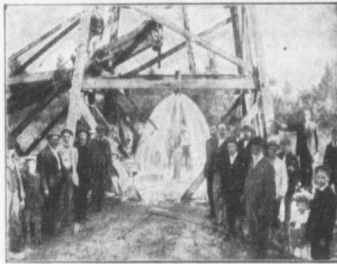
BECAUSE no sweeper so effectually does the work for which it is designed as "The Studebaker." It sweeps clean. No sweeper is constructed with the same degree of care and mechanical precision. It wears well. "The Studebaker" has the smallest number of working parts, and has less gearing than any other sweeper made. It is free from all unnecessary complications. With reasonable care it does not get out of order. Send for complete descriptive catalogue.

**GEO. HEAMAN, Manufacturer - LONDON, ONT.**



## Studebaker Sprinkler

(PATENT IMPROVED)  
Does not clog or get out of order. Greatest width of spray.  
Can be graded from driver's seat to any volume.  
We also make an **IMPROVED VERTICAL SPRAY** for pavements



Flowing Water Well at Barrie, Ont.

## Drilling Contractors

**WATER, SALT, OIL AND GAS WELLS.**  
to any depth from 100 to 3000 feet.  
Contracts taken in any part of Canada.  
Excellent references. Estimates, Geological reports. Expert Drillers and Complete Drilling Rigs Furnished.

Established 1865.

**JAMES PEAT & SONS**

Petrolia, Ontario

## Crushed Stone, Limited

**STONE**

of any Size and in any Quantity on hand for Sidewalks, Roadwork or Concrete Work

Works:  
KIRKFIELD, ONT.

Head Office: 47 Yonge St. Arcade, **TORONTO**  
Phone Main 4516  
G. W. Essery, Manager.

## Blue Lake Cement

MADE BY

**THE ONTARIO PORTLAND CEMENT CO. LIMITED**  
HEAD OFFICE: BRANTFORD, ONT. LONG DISTANCE PHONE 194



### VULCAN Portland Cement

DAILY CAPACITY 2500 BARRELS

Will be ready for shipment about June 1st. Our location, accessible to three railroads and the St. Lawrence River, gives excellent shipping facilities and ensures against car shortage in times of famines, embargoes, etc.

**WILLIAM G. HARTRANFT CEMENT COMPANY**

Sole Selling Agent

Room 55, Bank of Ottawa Building, **Montreal**  
Real Estate Trust Building, **Philadelphia**

## SAMSON CEMENT

MANUFACTURED BY

**THE OWEN SOUND PORTLAND CEMENT COMPANY, LIMITED**  
Owen Sound, Ont.  
Works at **SHALLOW LAKE, ONT.** Write us for prices.

## Dominion Bridge Co., Ltd.

P. O. Address, **MONTREAL, P.Q.**  
Works at **LACHINE LOCKS, P.Q.**

## STEEL BRIDGES

For Railways and Highways  
Piers, Trestles, Water Towers,  
Tanks, Buildings, Roofs, Girders,  
Beams and Columns.

Toronto Agent: **GEO. E. EVANS,**  
38 Canada Life Bldg., **Toronto, Ont.**

## THE JOHNSON CORRUGATED STEEL BAR

FOR

**REINFORCED CONCRETE**



Manufactured by

**THE CORRUGATED STEEL BAR CO. OF CANADA, LIMITED**

TORONTO REPRESENTATIVES:  
Office: **Coristine Building, MONTREAL**  
The Concrete Engineering & Construction Co., Ltd. - 217 Starr Building, Toronto

gress. In thirty years the Japanese have leapt from simple arts and handicrafts to the employment of the most elaborate machinery. This fact has attracted attention in that large manufacturing centre of England, Manchester, and the Manchester "Guardian" recently dispatched one of its correspondents to inquire into the labor conditions in the factories, mills and dockyards of Nippon. At once this correspondent, whose impressions are published in the paper he represented, was struck by the distress and discontent of the laboring classes whom machinery has put on the shelf. This writer says:

"The sudden and drastic effect of the new system was extremely oppressive to the old artizan class, who, together with their ancient patrons, went down with the fall of feudalism, and the process of the upheaval in society then begun has not yet run its course. In Japan the handicraftsman and the local artist succumbed to the era of machinery with a suddenness unknown to the West. Consequently her industrial advance has been marked by a growing element of disaffection that now, like a smoldering fire, is at any moment ready to be fanned into flames. There is probably no country in the world where industrial disquietude is more general and menacing than in Japan today."

The wage system in Japan is oppressive and starvation wages are the general rule. At Tokyo, where the highest wages in the empire are paid, a cotton-ginner at best can make only 24 cents a day, and over most of the country he has to be content with less. Thousands of female factory employes obtain no more than 12 cents a day. The highest wages a carpenter can command are 48 cents a day; tilers get 40 cents, plasterers 46 cents, boot-makers 24 cents, and laborers 20 cents.

The entire labor situation is a standing menace to the safety of the Japanese empire.

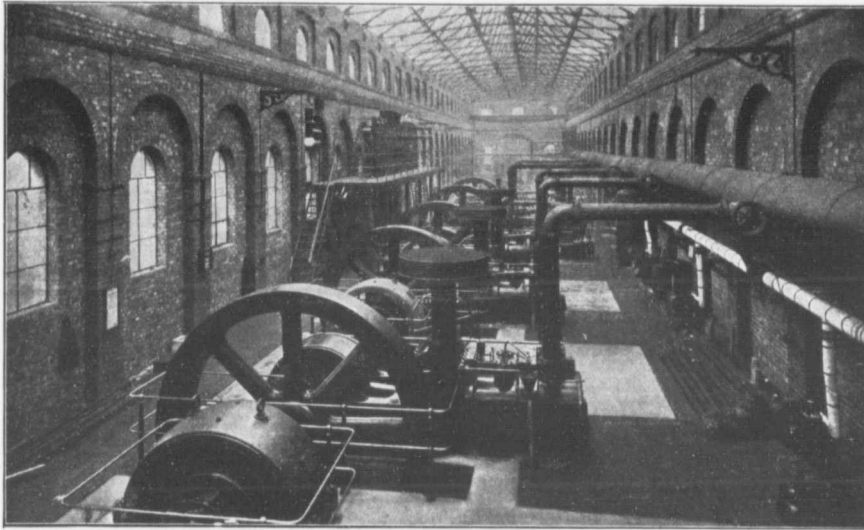
**JOHN S. FIELDING**  
CONSULTING ENGINEER

WATER POWER **DAMS, etc.**

15 TORONTO ST. — TORONTO



**GAS PRODUCER PLANTS FOR POWER PURPOSES**



200 H.P. "Premier" Gas Engines and D. C. Generators  
SOLE CANADIAN LICENSEES

**CANADA FOUNDRY COMPANY, Limited**

Head Office and Works: TORONTO, ONT.

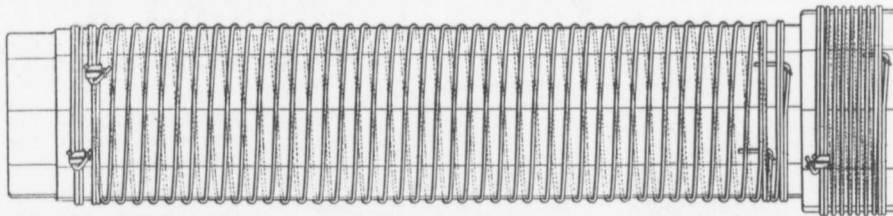
District Offices: Montreal Halifax Ottawa Winnipeg Vancouver Rossland



Manufacturers of GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE for Waterworks Systems

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

During 1906 we manufactured and sold 614,336 feet of Pipe.



**The Dominion Wire Wound Wood Water Pipe**

Showing special method of winding with two independent parallel wires. The great advantage of this is that in event of one wire becoming damaged the pipe still retains a factor of safety of 2.5. Made only by

**THE DOMINION WOOD PIPE COMPANY, Ltd.**

NEW WESTMINSTER, B. C.

Also Manufacturers of Continuous Stave Pipe for Irrigation and Power Purposes.

Write for Catalogue.



End View of Pipe and Coupling.



**FOR SALE**  
 "TAMCO" Crushed Stone in all sizes, for all purposes.  
 "Roman" building stone.  
 "Milton" pressed bricks.  
 Sanitary flooring, stone crushers, fire engines, &c.  
 T. A. MORRISON & CO.  
 204 St. James Street,  
 Tel. Main 4532. Montreal.

**RAILS** For Contractors, Switches, Girders, &c.  
**LOCOMOTIVES AND CARS**  
 New and Second Hand.

John J. Gartshore

87 Front St. West,

Opposite Queen's Hotel.) **TORONTO**

**SACKETT PLASTER BOARDS**

Great time saver. Fire and sound proof  
 Cheaper than wooden and metal lath construction. In stock at Montreal and Toronto. Address

PERCIVAL W. ST. GEORGE,

80 St. Francois Xavier St., MONTREAL

R. B. H. BUCKNER, Ontario Lime Association,  
 Toronto.

JAS. J. MURPHY, 85 St. Peter Street, Quebec.

TELEPHONE MAIN 6805

**THE ROOFERS SUPPLY CO., LIMITED**

DEALERS IN

SHEET METALS, ROOFING MATERIALS, ROOFERS  
 SUPPLIES, ROOFING SLATE

Bay and Lake Sts., Toronto, Canada

*The*  
**Hanover Portland Cement Co.  
 Limited**

Manufacturers of

"SAUGEEN" BRAND

PROMPT SHIPMENT WRITE FOR PRICES

Office and Works: Hanover, Ontario

**J. HARVEY  
 CONTRACTOR  
 GREENSVILLE, ONT.**

Driller of Oil, Gas, Salt or Artesian

Wells. Deep Wells a Specialty.

20 YEARS' EXPERIENCE IN CANADIAN OIL FIELD



Contracts taken in any part of Canada.  
 Several years' experience in Artesian Wells  
 for Municipal Water Works. Estimates or  
 geological information cheerfully furnished

REFERENCES GIVEN

Contractors to H. M. Governments

**ALLAN, WHYTE & CO.**

Clyde Patent Wire Rope Works, Rutherglen, Glasgow, Scotland

**WIRE ROPES** for Cableways, Aerial Ropeways, Elevators,  
 Cranes, Derricks, Pile Driving, Drilling, etc

Large stocks carried by **DRUMMOND, McCALL & CO.,**  
**MONTREAL AND TORONTO**

*The* **Laurentian Granite Company, Limited**

MANUFACTURERS OF

**BUILDING GRANITE, GRANITE SETTS, CURBING, ETC.**

SAMPLES FURNISHED AND PRICES QUOTED ON APPLICATION

Rose and Pink Granite Quarries at STAYNERVILLE, P. Que. Co. Argenteuil, on C. P. R.

Bell Tel. Main 4334 - Rooms 27-28, 55 St. Francois-Xavier Street, MONTREAL

*The* **Phoenix Bridge & Iron Works, Limited**

Montreal

**GENERAL STEEL CONTRACTORS**

Large Stock I BEAMS, CHANNELS, ANGLES, TEES, ZEES,  
 and PLATES always on hand.

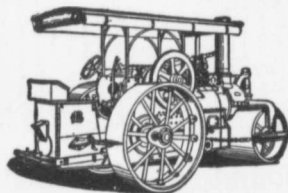
**Contractor's Hoist**

This hoist is designed for use with our vertical engines and is intended for general contractor's use where a double platform elevator is employed, one platform descending as the other ascends. It is equipped with winch head on one side which can be used for elevating beams or other material that cannot be taken up on regular elevator. The drum sheave over which the elevator cable runs is placed on the other side of hoist. This sheave and the winch head are interchangeable so that they can be placed on either side desired. Can be operated by steam, gasoline or electric power.

**Climax Road  
 Machine Co.**

46 Merrick Street, Hamilton, Ont

**"WATEROUS"  
 ROAD MACHINERY AND  
 FIRE APPARATUS**



**FIRE ENGINES** in five sizes,  
 with a full line of fire-  
 fighting goods.

We Rebuild other makes of  
 Fire Engines with our  
 patent Boiler.

**BRANTFORD PITTS DOUBLE ENGINE STEAM ROAD ROLLER**

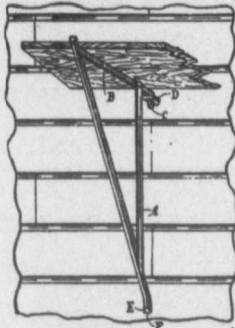
IN THREE SIZES—10, 12 and 15 ton.

CORRESPONDENCE SOLICITED.

**HUGH CAMERON & CO.,** Selling Agents 72 Queen St. West,  
 Manning Chambers, **TORONTO**

**SCAFFOLDING REVOLUTIONIZED**  
**Humphries' Patent Scaffold Bracket**

Made in sizes and styles to suit all classes of Construction and Repair work. Confers a boon to all interested in the Building Trade. They save their cost on the first job and last a lifetime.



Small Grappler as used between Vertical Joints of Brickwork.



Small Grappler as used on Frame Buildings

Write any of our Agents for prices and Catalogues.

PROVINCE OF QUEBEC: STINSON-REER BUILDERS' SUPPLY CO. LTD., MONTREAL  
 ONTARIO AGENTS:

OTTAWA FIREPROOF SUPPLY CO., 514 SUSSEX ST., OTTAWA.  
 MCINTYRE & TAYLOR, 503 QUEEN ST. WEST, TORONTO.  
 W. A. FREEMAN CO., LIMITED, HAMILTON.

MANITOBA: THE ALSIP BRICK, TILE & LUMBER CO., WINNIPEG.  
 NEW BRUNSWICK AND NOVA SCOTIA: THOS. NAAGLE, ST. JOHN, N. B.  
 Agents wanted in unrepresented provinces. Liberal terms.

**HUMPHRIES' PATENT BRACKET & SCAFFOLD CO., LIMITED**  
 BUILDERS' EXCHANGE, MONTREAL

*The* **Portable Gravity Concrete Mixer**



High Grade Concrete at low cost.

Capacity 10 to 60 cubic yards per hour according to method of feeding.

Continuous in action.

No skilled labor.

PRICE REDUCED

Send for Catalogue and Prices

**E. F. DARTNELL**  
 Montreal



**KERR'S GLOBE AND GATE VALVES**  
 STRICTLY HIGH GRADE.  
 TESTED & PACKED

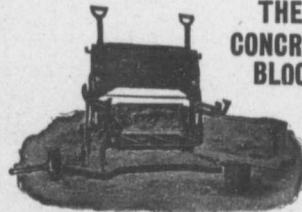
WE CATER TO THE wants of Steam Fitters who buy high class goods and to Water Works Contractors and Corporations installing Hydrants and Valves.

Get our Catalogue by writing us to-day.



**THE KERR ENGINE CO. LIMITED**  
 VALVE AND HYDRANT MANUFACTURERS  
 WALKERVILLE, ONT.

**THE MILES CONCRETE BUILDING BLOCK MACHINE**



MANUFACTURED BY  
**VINING BROS. MFG. CO.**  
 Niagara Falls  
 Canada

Seven Good Reasons for using THE MILES

It makes all blocks FACE DOWN.

It makes all sizes of blocks from 4 to 24 inches long, in 5 widths of wall, including Circles, Gables, Watertables, Octagon, Chimney and Pier blocks, all on the one machine, and one sized pallet.

It has nine different sized Cores, all interchangeable without changing the back plate on pallet, which allows you to make a heavy or light block, as desired.

It can be changed from one sized block to another in less than two minutes.

Our FACE DOWN patents antedate all others, and have never been questioned.

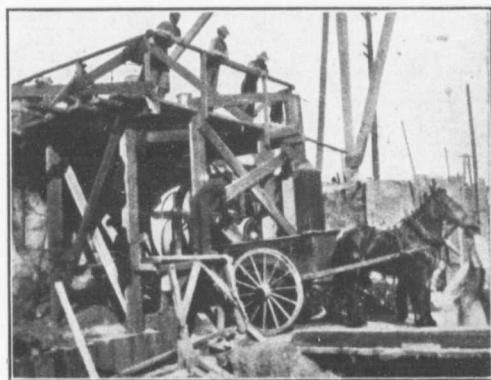
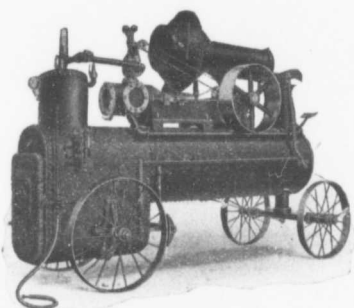
We give you a thorough demonstration before you buy.

If you are going into the block business you want a machine that will make blocks to meet the Architects' specifications.

Write to-day for Catalogue and Prices.

**T. A. CHADBURN**  
 242 ST. JAMES STREET MONTREAL  
 SALES AGENT FOR QUEBEC.

# Just a Word On Concrete Mixers



We carry a full stock of Ransome Concrete Mixers, with or without power—all capacities.

We know there is no better mixer to be obtained. When buying a machine you might as well have the best in the first place. So, just let us send you our proposal on a Ransome Machine.

*Our Concrete Handbook Upon Request.*

