

# CANADIAN CONTRACT RECORD

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

This Paper Reaches Every Week the Town and City Clerks, Town and City Engineers, County Clerks and County Engineers, Leading Civil Engineers and Contractors throughout Canada, and Purchasers of Municipal Debentures.

VOL. 18.

TORONTO, MONTREAL—AUGUST 21, 1907—WINNIPEG, VANCOUVER

No. 25

## THE CANADIAN CONTRACT RECORD PUBLISHED EVERY WEDNESDAY

As an intermediate Edition of the Canadian  
Architect and Builder.

THE C. H. MORTIMER PUBLISHING COMPANY  
of Toronto, Limited.

Subscription Price, \$5 per annum, payable  
in advance.

United States, \$5.00 per year

CONFEDERATION LIFE BUILDING, TORONTO  
Telephone Main 2696.

Branch Offices:  
Room B34, Board of Trade Building, Montreal,  
Telephone Main 2999.

750-751 Union Bank Building, Winnipeg,  
Telephone 1374.

Davis Chambers, 615 Hastings St., Vancouver,  
B. C. Telephone 2248.

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

Classified Index  
of Advertisers,  
Page 15.



## Temiskaming and North- ern Ontario Railway Commission

## TENDERS FOR OFFICE, MINING ENGINEER

Sealed tenders, addressed to the undersigned and endorsed "Tender for Office, Mining Engineer," will be received up to 3 p. m. on the 28th DAY OF AUGUST, 1907, for the erection of an office for Mining Engineer at Cobalt.

Plans and specifications may be seen at the office of the Commission, 25 Toronto Street, Toronto, and at the office of the Chief Engineer, North Bay.

A certified cheque for \$5000.00 must accompany each tender.

The successful tenderer must enter promptly into a contract and furnish security for the amount of \$5,000.00 for the due completion of same.

Cheques of unsuccessful tenderers will be returned to them.

The lowest or any tender not necessarily accepted.

A. J. McGEE,  
Secretary-Treasurer.

Toronto, July 22nd, 1907.

Papers inserting this advertisement without authority will not be paid for same.

## CITY OF FREDERICTON DEBENTURES

Sealed tenders, marked "Tender for Fredericton Debentures," will be received by the undersigned until AUGUST 25TH, 1907, for City of Fredericton Water Debentures, running for forty years from August 1st, 1907, issued in sums of \$200,000 each, bearing interest at 4 per cent, payable half yearly. Tenders to state the price and amount each applicant will take.

The City reserves the right to reject any or all bids or to accept any bid.

For further particulars apply to

I. R. GOLDING, City Treasurer,  
Fredericton, N. B.

## EXTENSION OF TIME

Town of Campbellford

## POWER DEVELOPMENT

At Middle Falls  
ON THE TRENT RIVER

Sealed tenders are required for Rock Cutting, Concrete Work, Turbine Wheels, Generators and about 2½ miles of Transmission Line. Plans and specifications may be seen after August 15th, at the office of the Engineer, JOHN S. FIELOING, C.E., CONSULTING ENGINEER, 13 Toronto Street, Room 15, Toronto. Tenders to be in by 12 o'clock noon, SEPTEMBER 5TH, addressed to W. J. DIXSEE, Esq., Mayor of Campbellford.

The lowest or any tender not necessarily accepted.  
E. C. WEST,  
Clerk of the Corporation of the  
Town of Campbellford.

## CITY OF WINNIPEG

Point du Bois Hydro-  
Electric Development

## Tenders for Bridge CROSSING WINNIPEG RIVER

Sealed tenders on prescribed forms, addressed to the Chairman of the Board of Control, Winnipeg, Canada, and marked on the envelope, "Point du Bois Hydro-Electric Development-Tender for Bridge Crossing Winnipeg River," will be received at the office of the undersigned up to noon of WEDNESDAY, FOURTH DAY OF SEPTEMBER, 1907, for the construction of a Wooden Howe Truss Bridge, consisting of ten spans of 80 feet each, and one draw span of 160 feet, including piers and cribs crossing the Winnipeg River at Lac du Bonnet Narrows.

Copies of Instructions to bidders, plans, specifications and form of tender, may be obtained at the Power Engineer's Office, Carnegie Library Building, Winnipeg.

Alternative tenders on Steel Plate Girder Bridge, designed to meet the same conditions and accompanied by Tenderer's own drawings, will also be received by the Board.

M. PETERSON,  
Secretary.

Office of the Board of Control,  
Winnipeg, Aug. 14, 1907.

## Tender for Pipe Drain

To be received by the undersigned up to SATURDAY, 24TH AUGUST, 1907, to 5 p. m., for laying about 1,674 feet of 12-inch pipe drain in Davisville Avenue, Town North Toronto, County York. Specifications, plan, etc., can be examined at office of the undersigned and at office of Peter S. Gibson, C.E. and O.L.S., Town Engineer, at Willowdale. Any tender not necessarily accepted.

W. J. DOUGLAS, Town Clerk.

Eglinton P.O.

## Notice to Contractors

## WATER WORKS PUMPS

Sealed tenders, addressed to Charles Pepper, Chairman of the Water Works Committee, Ottawa, Canada, will be received by registered post only at the office of the City Engineer, up to 5 p. m. TUESDAY, AUGUST 27TH, 1907, endorsed "Tender for Water Works Pumps," for the supply and installation of two Duplex Water Power Pumps, having a capacity of 4,000,000 Imperial gallons each per day. Specifications, forms of tender and full particulars may be obtained at the City Engineer's office, City Hall, Ottawa.

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

NEWTON J. KER,  
City Engineer.

Ottawa, August 3, 1907.

## DEPARTMENT OF RAILWAYS AND CANALS, CANADA

## TRENT CANAL

ONTARIO-RICE LAKE DIVISION

SECTION NO. 1

## NOTICE TO CONTRACTORS

Sealed Tenders addressed to Alex. J. Grant, Superintendent Engineer, Trent Canal, Peterboro, and endorsed "Tender for Trent Canal," will be received until 10 o'clock on THURSDAY, 10TH OCTOBER, 1907, for the works connected with the construction of Section No. 1, Ontario-Rice Lake Division of the Canal.

Plans and specifications of the work can be seen on and after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, at the office of the Superintendent Engineer, Trent Canal, Peterboro, Ont., and at the office of Mr. J. B. Brophy, Division Engineer, Trenton, Ont., at which places forms of tender may be obtained.

The lowest or any tender not necessarily accepted

By order,

L. K. JONES,  
Secretary.

Department of Railways and Canals,

Ottawa, 10th August, 1907.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.

[FOR ADDITIONAL ADVERTISEMENTS FOR TENDERS SEE NEXT PAGE]

Architect's Assistant, six months Canadian, twelve years English experience, desires immediate situation. BOND, 50 Pembroke Street, Toronto.

## To Contractors

Whole and separate tenders will be received by the undersigned until noon SATURDAY, AUGUST 31st, 1907, for the erection of buildings for the

### McDonald Horse Exchange, Western Cattle Market, Toronto

Lowest or any tender not necessarily accepted.

J. P. HYNES, Architect,  
Bank of Commerce Building,  
199 Yonge Street, Toronto.

### CONTRACTS OPEN.

**PORT ARTHUR, ONT.**—A break-water is to be built here at a cost of \$600,000.

**SHARBOT LAKE, ONT.**—It is reported that a new Catholic church will be built here.

**BANFF, ALTA.**—The Alpine Club of Canada are discussing plans for the erection of a club house next season.

**KENORA, ONT.**—The C. P. R. have donated the sum of \$30,000 for the construction of a railroad Y.M.C.A. here.

**ESSEX, ONT.**—The Essex Canning Co.'s plant sustained damage in the recent explosion to the extent of \$10,000.

**DOVER, ONT.**—Commissioner Carron is taking tenders this week for the construction of a steel bridge in this town.

**REGINA, SASK.**—The C. P. R. surveyors are now mapping out the railway connection with Saskatchewan and other points north.

**ST. THOMAS, ONT.**—T. S. Pool, grocer, contemplates the erection of two brick stores on the corner of Ross and Locust streets.

**KUROKI, SASK.**—G. H. Walter, Secretary-Treasurer, wants tenders up to August 31st for the erection of a brick school building.

**BATTLEFORD, SASK.**—On August 31st the ratepayers will vote on a bylaw for granting a bonus of \$10,000 to a mill company.

**NEW GLASGOW, N. S.**—Douglas Bros., contractors, are about to erect a \$25,000 brick and stone block for A. E. McCulloch & Co.

**WOODSTOCK, ONT.**—The authorities recently investigated the Thornton Springs with a view to augmenting the city's water supply.

**HALIFAX, N. S.**—The Church of England Cathedral Committee have just taken tenders for the erection of a new cathedral building.

**CLINTON, ONT.**—Votes of the ratepayers will be taken on September 30th on a by-law to raise \$53,000 for a waterworks system.

**BERLIN, ONT.**—Negotiations are under way for locating a firm who will engage in the manufacture of machinery and railroad supplies.

**DAUPHIN, MAN.**—Votes of the electors will be taken on August 24th on a bylaw providing \$14,000 for the erection of a school house.

**DELHI, ONT.**—The new cement dam of the Delhi Light & Power Co., which collapsed last week will cost nearly \$3,000 to repair.

**NEWCASTLE, N. S.**—It is reported that the Miramichi Lumber Company are making arrangements for the establishment of a shingle mill here.

**BELLEVILLE, ONT.**—A company

with a capital stock of \$100,000 is coming to this town to engage in the manufacture of brass fixtures.

**STONY PLAIN, ALTA.**—Negotiations have recently been effected by Rudolph R. Hoffman, of Chicago, for the location of a brick plant here.

**MONTREAL, QUE.**—It is reported that Thomas Morgan, late of Longue Pointe, has secured property upon which he intends to erect a new cement plant.

**PARIS, ONT.**—A by-law has been submitted for the approval of the Ontario Railway Board authorizing the expenditure of \$4,000 on waterworks extension.

**NANAIMO, B. C.**—A saw mill with a capacity of 35,000 ft. per day will be erected by the Ladysmith Lumber Company. Railway connection will be provided.

**LETHBRIDGE, ALTA.**—A \$30,000 wood-working factory is to be built here by William Oliver, who also intends to erect a \$14,000 plant for the manufacture of cement.

**HAMILTON, ONT.**—A by-law is to be submitted to the ratepayers to provide \$50,000 for the purchase of electric pumps with a capacity of 10,000,000 gallons per day.

**GODERICH, ONT.**—Votes of the ratepayers will be taken on August 24th on a by-law to raise \$27,836 by debentures for waterworks extension and improvements to electric light system.

**BRANDON, MAN.**—The Fire, Water & Light Committee were recently considering the possibility of remodelling the entire city hall and installing the fire brigade in a portion of the building.

**STRATHROY, ONT.**—The W. P. Demond Upholstering Co. have petitioned Council for a loan of \$12,000 for factory enlargements, and a by-law will shortly be submitted to the ratepayers.

**AYLMER, ONT.**—Bylaws will be submitted to the ratepayers in the near future for raising an estimated sum of \$123,000 to meet the cost of sewerage, waterworks, sidewalks and other improvements.

**WATFORD, ONT.**—The Clerk of the Works from Toronto, Thomas F. Hastings, was recently in town arranging for a site for the new \$10,000 armoury which the Government have decided to build here.

**WIARTON, ONT.**—If the newly incorporated British Canadian Distillery Co. can secure an option on the buildings of the beet sugar factory they will locate their distillery here, otherwise they will go to Owen Sound.

**KINGSTON, ONT.**—Fred. Gelinas, Department of Public Works, Ottawa, wants tenders for certain alterations at Tete du Pont Barracks. Specifications may be obtained of H. G. Smith, this city, or at the Department.

**GUELPH, ONT.**—The authorities have instructed McPhie & Mahoney to prepare plans for a four roomed school in St. Patrick's ward. Specifications will also be framed for additions to schools in St. James' and St. John's wards.

**NEW WESTMINSTER, B. C.**—At a recent meeting of the Board of School Trustees, arrangements were made for the erection of a boiler house in the public school, from which centre all buildings will be heated by pipes and radiators.

**BARRIE, ONT.**—A proposition has been made submitted to the Industrial Committee by a firm of gas and gasoline engine manufacturers to build a three-storey factory and locate here on consideration of a loan of \$20,000. The matter is in abeyance.

**EDMONTON, ALTA.**—It is reported that the Grand Trunk Pacific will

soon have the line of 1,000 miles to the coast under construction. Foley Bros., Larson & Co. have already secured the contract for the 180 mile branch from Kitamaat to Hazelton.

**WEYBURN, SASK.**—A deputation of the Weyburn School Board recently had an interview with Premier Scott at Regina, with regard to the organization of a High School in Weyburn.—The Municipal Council will likely purchase two chemical engines for the purpose of fire protection.

**TABER, ALTA.**—The Canada West Coal & Coke Co., Limited, will receive tenders up to August 31st for one steam pump capable of delivering 500 gallons per minute against a head of 400 feet; also for one 65 horse power horizontal tubular boiler.

**QUEBEC, QUE.**—The B. Y. Moyes building will shortly be converted into a theatorium, and something like \$3,000 will be spent in fitting it up for that purpose.—A by-law will shortly be submitted to the ratepayers for the issue of \$112,000 worth of debentures for sewerage and aqueduct construction.

**PRINCE ALBERT, SASK.**—The C. N. R. have accepted the proposals of the Saskatchewan Government with regard to the proposed railway and traffic bridge, and work will start immediately. The contract calls for a steel bridge on cement piers with roadways on either side for the accommodation of traffic.

**VICTORIA, B. C.**—J. Michand contractor and architect, has prepared plans for the erection of a \$4,000 bungalow on Scoresby street.—The Provincial Government have granted \$15,000 to the Jubilee Hospital authorities towards the carrying out of necessary improvements to their building. The total expenditure will be \$30,000.

**FORT WILLIAM, ONT.**—The committee of St. Andrew's Presbyterian church have selected a plan for a new building. Romanesque in style, the church will be constructed of red brick with red stone foundations, will be steam heated and have a seating capacity of 934.—A permit has been issued for a new two-storey block to cost \$60,000, and to be erected on the corner of May and Victoria streets.

**LONDON, ONT.**—It is reported that plans will shortly be taken for a new building to replace the Crystal Hall. The work of clearing away the ruins of the latter building has already commenced.—G. Craddock, architect, 451 Talbot street, is taking tenders this week for the erection of stores, corner of Talbot and Fullarton streets for L. Meredith.—A number of buildings in this city are regarded as unsafe and the provincial building inspector has been summoned.

**WELLAND, ONT.**—At a recent session of the Board of Church Extension, of the Church of the Disciples of Christ, a grant of \$15,000 was made for the erection of a new Disciples' church on Division street. The building will probably be constructed of concrete blocks, and will be commenced shortly.—The Hospital Trust have appointed a committee to consult with an architect with regard to plans for their proposed building.

**VANCOUVER, B. C.**—It is reported that the proposed additions to the Hotel Vancouver, costing \$150,000 to \$200,000, will be undertaken this fall.—W. A. Bauer has purchased two lots on the corner of Hastings and Howe streets at \$60,000, upon which he proposes to erect a large business block.—The ratepayers will give their decision on September 14th on a by-law to raise \$100,000 for the provision of macadam roadways and also upon a by-law to raise \$40,000 for

miles to the  
Foley Bros.,  
secured the  
ranch from

deputation  
ard recently  
mer Scott at  
organization  
yburn.—The  
ly purchase  
e purpose of

Canada West  
will receive  
or one steam  
500 gallons  
of 400 feet ;  
r horizontal

B. Y. Moyes  
erted into a  
like \$3,000  
or that pur-  
e submitted  
e of \$112,000  
verage and

ASK.—The  
proposals of  
ment with  
y and traffic  
immediately.  
el bridge on  
s on either  
of traffic.

ichand com-  
pared plans  
ungalow on  
cial Govern-  
to the Jubilee  
the carrying  
nts to their  
iture will be

NT.—The  
Presbyterian  
n for a new  
style, the  
of red brick  
will be steam  
capacity of  
ssued for a  
ost \$60,000,  
mer of May

reported that  
for a new  
ystal Hall.  
he ruins of  
eady com-  
hitect, 461  
rs this week  
rner of Tal-  
s for L.  
dings in this  
nd the pro-  
has been

a recent  
urch Exten-  
Disciples of  
as made for  
les' church  
ilding will  
of concrete  
d shortly.—  
ppointed a  
n architect  
ir proposed

is reported  
to the Hotel  
to \$200,000,  
ll.—W. A.  
lots on the  
e streets at  
oses to erect  
ratepayers  
September  
100,000 for  
adways and  
\$40,000 for



# WIRE ROPE



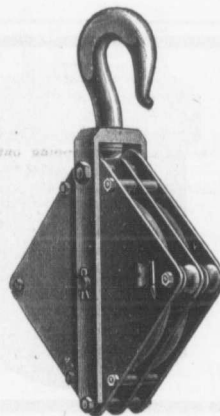
AND

## FITTINGS

IN STOCK

FOR IMMEDIATE

SHIPMENT



We Can Also Supply

**Winches, Derricks, Derrick  
Irons, Hoisting Engines,  
Manila Rope, Blocks, Etc.,  
Etc.**

# MUSSENS LIMITED

Railway, Mining, Municipal and Contractors' Supplies

Head Office: MONTREAL

Branch Offices: QUEBEC, TORONTO, WINNIPEG, VANCOUVER

school purposes.—W. Bailey, of Bailey Bros., stationers, has purchased property corner of Chesafield and Keith road upon which he intends to erect an English bungalow residence.—The old Gold House will shortly be razed and on its site will be erected a six storey brick and stone building. At the same time another storey will be added to the Dominion Hotel adjoining. The new building, together with the addition, will cost about \$75,000.—The specifications for the new college building to be erected on the University site at Point Gray call for a two-storey structure 150 x 62, and the Royal Institution propose to expend \$100,000 on the initial stages of construction. Prizes to the value of \$850 are being offered to architects by the Institution in connection with the plans. Tenders will shortly be taken for clearing eight or nine acres and building will commence in the spring.—The recently formed Terminal Construction & Investment Co. Ltd. have acquired the machinery and plant of the Vancouver Furniture Manufacturing Co. on Clark drive, near Hastings street east, and will convert the property into a sash, door and moulding factory.—Buildings permits have been granted as follows: Bushnell & Varty, frame apartment building, Alberni street, \$20,000; M. Waycroft, frame dwelling, First avenue, \$1,800; T. A. Milde, frame dwelling, Third avenue, \$1,800; T. Matsumoto, Powell street,

\$20,000; C. Vernon, Thirteenth avenue, \$5,500; E. J. Judd, Cambie street, \$2,000; S. Lawrence, Fourteenth avenue, \$2,400; W. J. Dulse, Fifth avenue, \$2,000; M. S. Boyd, Cornwall street, \$2,500; T. J. Whiteside, Fifth avenue, \$2,000; A. Mitchell, Fifth avenue, 2 brick houses at \$1,700 each; T. A. Nuide, Third avenue, \$1,800; A. Mitchell, frame dwelling, Fifth avenue, \$3,400; S. Nichols, Ontario street, \$1,800; E. Mustard, frame dwelling, Eighth avenue, \$2,000; A. E. Grubb, frame dwelling, Eighth avenue, \$2,500.—The Provincial Secretary has informed the North Vancouver Board of Trade that the Government will not undertake their propositions with regard to the erection of a combined traffic and railroad bridge.—The Otis Fensom Elevator Company of Toronto have paid \$27,000 for the site of a branch factory on Alexander street. The offices and buildings will cost \$35,000, and work will be commenced next spring.—Aemilius Jarvis recently purchased \$100,000 city debentures at 90 with accrued interest. OTTAWA, ONT.—Plans of the proposed new central depot to cost \$1,000,000, as submitted by the G. T. R., have been approved by the Government and contracts will likely be awarded in the near future.—The Church of the Sacred Heart, which was destroyed by fire, will be re-built this fall. \$20,000 has been

collected to date for this purpose.—Fred Gelinas, Department of Public Works, invites tenders up to August 27th for the construction of a public building. Specifications with James Chisholm, architect, Winnipeg, or at the Department.—Charles Pepper, Chairman of Waterworks Committee, wants tenders up to August 27th for supplying and installing two duplex water power pumps, having a daily capacity of 4,000,000 Imperial gallons. Specifications at the City Engineer's office.—The Department of Public Works will shortly take tenders for the construction of a brick wall around the Canadian branch of the Royal Mint.—It is rumored that the Canadian Pacific Railway have selected a site for the erection of a large hotel which they will connect with the central station.—Negotiations have also been in progress for the purchase of a site for a large modern hotel between Sparks and Queen street. The structure will be six storeys high and will be completed next spring.—Charles MacNab, County Clerk, wants tenders up to August 26th for building concrete bridge at Constance Creek. Plans at office of McDougall & McRae, County Engineers, Citizen Building, Sparks street.—Tenders are invited by Alex. J. Grant, Superintending Engineer, Trent Canal Peterboro, up to October 10th for construction of a section of the canal. Specifications at office of Chief Engineer, Department of Railways



You Cannot Afford to Take Chances

Poor Sewer Pipe is a menace to health and very expensive to replace. Purchase the best and get it when you want it. Ask for full information at the nearest of our three factories.

THE CANADIAN SEWER PIPE CO.  
HAMILTON, ONT. TORONTO, ONT. ST. JOHN'S QUE.



THE CANADIAN STANDARD

STAR

THE CANADIAN PORTLAND CEMENT CO., LIMITED  
502 TEMPLE BUILDING, TORONTO 203 BOARD OF TRADE BUILDING MONTREAL

We manufacture and carry in stock at all times complete lines of

Telephones Switchboards Supplies

We are the only manufacturers in Canada who can supply you with anything or everything for a telephone system.

The Northern Electric and Manufacturing Co., Limited  
WINNIPEG TORONTO MONTREAL



# PLUMBERS' AND STEAMFITTERS' SUPPLIES

**Iron Pipe 1-8 in. to 12 in. carried in stock**

**Malleable Fittings Cast Iron Fittings**

**Lead Traps and Bends**

**Valves Tools Lead Pipe Pig Lead**

**PROMPT SHIPMENT**

## Somerville Limited

**TORONTO 59 Richmond St. East**

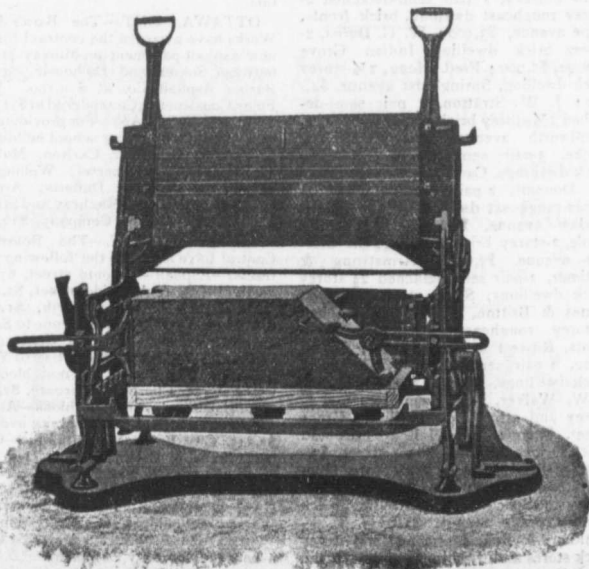
... Speaks For Itself ...

### THE MILES CONCRETE BUILDING BLOCK MACHINE

Makes 40 Different Sizes of Stone in Any Design, as well as the Specials, viz.:

Water Table, Gable, Circle, Angle, Chimney, Cornice, Pier Blocks, etc.

Catalogues and Information Cheerfully Furnished.



This Machine makes all blocks face down—"the only practical way"—allowing of a richer and finer facing, producing blocks that are perfect in appearance and impervious to moisture.

Let us tell you how the "Miles" will pay for itself over any other machine in three months' operation.

Manufactured and Sold by

**VINING BROS.**

**M'fg. Co.**

**Niagara Falls, - Can.**

Sales Agent for Quebec:  
**T. A. CHADBURN, 242 St. James Street,  
MONTREAL.**

and Canals, at the office of the Superintending Engineer, Trent Canal, and with J. B. Brophy, Division Engineer, Trenton, Ont.—New mills costing \$300,000, will shortly be erected by the W. E. Edwards Co., to replace those recently destroyed by fire. Reinforced concrete will be used in the construction, and the motive power will be electricity instead of steam.—The City Clerk gives notice that by-laws have been passed to provide \$21,620 for asphaltting on Nicholas street.—It is reported that the city will construct a three million gallon reservoir in the Bayswater Annex at a cost of \$150,000.—The City Engineer has completed a plan for building a relief sewer on Kent, Queen and Laurier avenue. The cost will be \$20,000.—The Library Bureau of Canada have purchased the property on Isabella street recently occupied by the Canadian General Electric Co. and will install machinery therein for the manufacture of library and office fixtures.—The following Municipal debentures will be sold on September 11th: Collegiate Institute extension, \$270,000; public School Board, \$207,000; both 3% year 4½ per cent; waterworks, \$160,000; electric light, \$50,000; asphalt plant, \$16,000; parks, \$5,500; terms varying from ten to forty years.

WINNIPEG, MAN.—The sanitarium which will shortly be erected at Ninnette is only for patients in the early stages of consumption. Advanced cases will be treated in another institution which it is intended to establish near Winnipeg.—The Chairman of the Board of Control, will receive tenders up to August 23rd for supply of the following lead pipe: 20 tons ½-inch; 16 tons ¾-inch, and 5 tons 1-inch, also up to same date for electrical supplies, copper wire, cedar poles, carbons, &c. Specifications at office of City Electrician.—The City authorities have come to an agreement with the town of St. Boniface concerning the proposed McDermott street bridge, St. Boniface contributing \$50,000. The bridge will be constructed of steel, with stone or concrete piers. Work will be commenced after the due confirmation of the scheme by the Legislature and after the government grant of \$125,000 is paid.—Several portions of the line from this city to Moncton, N.B., in the G.T.P. trans-continental scheme are yet to be let. Following are details: From 8 miles west of Moncton to 2½ miles west of Grand Falls, N.B., 136 miles; from the New Brunswick and Quebec boundary to the end of 150 miles east of the Quebec bridge, under contract, 54 miles; from the end of 195 miles westerly from the Quebec bridge, under contract, to the easterly end of 150 miles, under contract, let to G.T.P. Company, 237 miles; from the westerly end of 150 miles of contract let to G.T.P. Company to Superior Junction, 529 miles—total, 956 miles.—The Chairman of the Board of Control invites tenders up to August 26th for erecting a storage shed 30 feet wide by 322 feet long. Specifications at office of Eade Bros., architects, 428 Union Bank building.—Tenders will shortly be taken by the Board of Control for a \$20,000 building to house the new turbine at the waterworks.—The Finance Committee have recommended the borrowing of \$117,000 for the erection and furnishing of school buildings. The following improvements will be effected: Aberdeen school, new smoke pipes \$180; electric lights \$295; corridor furnace \$250; Victoria school, painting class rooms, \$80; Gladstone school, electric light and exhaust fan \$100; metal ceiling, \$90; plumbing \$50; painting in the Isbister school, \$250.—The Chairman of the Board of Control will take tenders up to August 28th for erection of a boiler and engine house, and chimney

for the waterworks. Specifications at the City Engineer's office.—Bids will be received by the Chairman of the Board of Control for the construction of a wooden Howe truss bridge over the Winnipeg river. Plans at Power Engineer's office, Carnegie Library building.—Carter, Halls, Aldinger Co. have the contract for the erection of a \$21,000 warehouse on Euclid street for the Massey Harris Co.—Recent building permits include W. Tebo, residence, Simcoe street, \$2,500; Controller Garson, alterations to residence, River avenue, \$2,000; J. Stockdale, residence, Chestnut street, \$3,000; Claydon Bros., residence, Chestnut street, \$3,500; H. H. Hunter, residence, College avenue, \$2,500.

TORONTO, ONT.—Tenders will be received up to August 27th by the Chairman of the Board of Control for the construction of several walks, curbs and sewers, and the following pavements: Asphalt pavements: Portland street, from King to Queen streets; Gould street, from Victoria to Mutual streets; Admiral road, from Bernard avenue to St. George street; Delaware avenue, from Shanly avenue to Hallam street; Castle Frank avenue and crescent; Mackenzie to east limit of lot No. 16. Brick pavement: Davies, from Queen to Matilda street; Burnfield avenue, from Shaw street to Ossington avenue. Asphalt brick pavement: Millstone lane 317 feet east of York street to 123 feet further east. Specifications at office of City Engineer. E. R. Clarkson, 33 Scott street, wants tenders en bloc or separately up to August 30th for the purchase of the following assets of the Blanchite Process Paint Company, Limited:—Property on King street with brick erections and storehouses, also Engine, Boiler, Force Pump and Steam Piping. Total valuation \$19,000; subject to mortgage to Landed Banking and Loan Company, Hamilton, Ont., \$7,422; Equity, \$11,578; Machinery, Tools, Shafting, Couplings, Belting, Pulleys, Office Furniture, Etc. \$12,717.07; Paints, Enamels and Dyes, Supplies, Etc. \$12,664.17.—Helfert Bros., metal merchants, will erect a new three-storey warehouse at the rear of 169 York street, costing \$9,000.—The following building permits have been issued: W. F. Slack, 3 attached 2-storey brick dwellings, Delaware avenue, \$6,000; J. W. Harris, 2-storey brick veneer dwelling, Bartlett avenue, \$2,000; John Polesky, 1 pair semi-detached 2-storey roughcast dwelling, brick fronts, Pape avenue, \$3,500; W. G. Burns, 2-storey brick dwelling, Indian Grove avenue, \$5,000; Fred. Hogg, 2½-storey brick dwelling, Springhurst avenue, \$4,000; J. W. Stratton, 1 pair semi-detached 1½-storey brick veneer dwellings, Kenilworth avenue, \$2,500; Robert Locke, 3-pair semi-detached 2-storey brick dwellings, Carling avenue, \$12,000; H. Donnatt, 2-pair semi-detached 2-storey roughcast dwellings, brick fronts, Carlaw avenue, \$5,000; Mrs. John Poole, 2-storey brick dwelling, St. Clarens avenue, \$2,600; Armstrong & Latimer, 1-pair semi-detached 2½ storey brick dwellings, Shaw street, \$5,000; James & Britton, 1-pair semi-detached 2-storey roughcast dwellings, brick fronts, Russett avenue, \$3,000; R. H. King, 1-pair semi-detached 2½ storey brick dwellings, Mitchell avenue, \$4,000; J. W. Walker, 1-pair semi-detached 2-storey and attic brick dwellings, Grace street, \$5,000; J. I. Hall, 2-storey and attic brick dwelling, Shaw street, \$3,600; S. Prest, 2-storey brick store, Dundas street, \$4,000; Mrs. B. M. Price, 2-storey and attic roughcast dwelling, brick front, Chesley avenue, \$2,500; T. P. Whitlam & Son, 4 attached 2½-storey brick stores and dwellings, corner Queen

and Caroline streets, \$14,000; Home for Incurables, alterations to dwellings, Bloor street, \$4,500; Joe. Craig, 1-pair semi-detached 2½-storey brick dwellings, Churchill avenue, \$5,000; A. Miller, 2-storey and attic brick dwelling, Sheridan avenue, \$5,000; C. R. Wreyford, 2-storey and attic frame dwelling, Leuty avenue, \$2,000; Alexander & Son, 1-pair semi-detached 2½-storey brick dwellings, Woodlawn avenue, \$7,000; J. S. Marshall, 3 attached 2-storey roughcast dwellings, Hallam street, \$5,500; J. J. Boland, 2-storey and attic brick dwelling, Bloor street, \$5,000; Dr. T. B. MacDonald, 2-storey brick dwelling, Parliament street, \$7,000; A. V. Clancy & Wm. Shollar, 1-pair semi-detached 2-storey brick dwellings, Manning avenue, \$4,500; Wm. Lightle, 1-pair semi-detached 2½-storey brick dwellings, Victor avenue, \$5,000; R. H. Smith, 2-storey brick dwelling, Bartlett avenue, \$4,000; Stanley & Coath, 3 attached 2-storey brick dwellings, Clinton street, \$6,000; William Wallace, 2-storey brick veneered front and roughcast dwelling, Ossington avenue, \$3,400; E. Johnson, 1-pair 2-storey semi-detached brick dwellings on Queen street, \$3,000; A. Waite, 1-pair 2-storey semi-detached brick veneered and roughcast dwellings, Gerrard street, \$2,500; Dowson & Chipeliare, 1-pair 2½-storey semi-detached brick dwellings, Hazleton avenue, \$5,000; James Findlay, 1-pair 2-storey semi-detached brick dwellings, Millicent street, \$3,600; C. O. Lasby, 1-pair 2-storey semi-detached brick dwellings, Pearson avenue, \$4,000; C. A. Grant, 2-pair 2-storey brick veneered roughcast dwellings, \$4,600; E. H. Keating, 2-storey brick dwelling, Elm avenue, \$8,000; General Electric Co., 5-storey brick and steel office building, King and Simcoe streets, \$180,000; Fisher Bros., 2-storey galvanized iron warehouse, Westmoreland avenue, \$3,000; Gordon Mackay Co., addition to factory, Queen and Crawford streets, \$2,500.

#### CONTRACTS AWARDED.

MEDICINE HAT, ALTA.—The authorities have awarded the following contracts:—Water works pumps: John McDougall, \$3,405; engines, Canada Foundry Co., \$7,821.

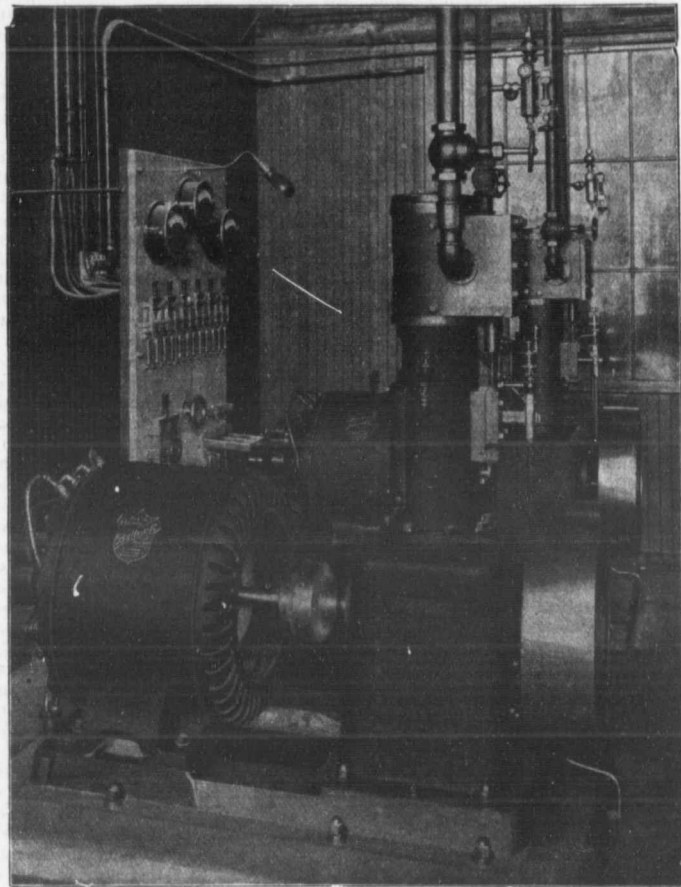
VANCOUVER, B.C.—The price at which McDonald, Snyder & Wilson secured the contract for the new Court House building was \$400,000. Haddington Island stone will be used in the construction.

OTTAWA, ONT.—The Board of Works have awarded the contract for the new asphalt pavement on Murray street, between Sussex and Dalhousie, to the Barber Asphalt Co. at \$10,100. John Foley Construction Co. tendered at \$11,192.

WINNIPEG, MAN.—For providing fire escape to the following school buildings: Gladstone, Alexander, Carlton, Mulvey, Isbister, King, Somerset, Wellington, Collegiate, Pinkham, Dufferin, Argyle, Norquay, Aberdeen, Machray and Strathcona: Manitoba Iron Company, \$12,209.

TORONTO, ONT.—The Board of Control have awarded the following contracts:—Asphalt—Toronto street, 67 feet north of King to Adelaide street, \$2,079; Car street, Yonge to North, \$1,284; Shanley street, Delaware avenue to Salem avenue, \$3,678; Godson Contracting Company, Richmond street, Bay to York, \$5,544; City Engineer.—Wood blocks—Court street, Church to Toronto, \$2,967; City Engineer.—Vitrified block—Anderson street, McCaul to University avenue, \$2,545; City Engineer.—Bitulithic—Oaklands avenue, Cottingham to 415 feet north, \$2,595; Poplar Plains road, Edmund street to St. Clair avenue, \$9,303; Gwynne avenue, King to Queen, \$7,176; Warren Bituminous Paving Company, Warren road, Schiller avenue to St. Clair avenue, \$6,660, City Engineer.

# Electric Light Plants



Two of our 11 K.W. Generators and Auxilliary Apparatus, forming the lighting plant of Dow's Brewery, Montreal. The base of each set is only 57 1/2 in. x 32 in.

- “Allis” Mining, Saw Mill and Flour Mill Machinery, Engines, Pumps, Steam Turbines, Turbine Water Wheels.
- “Bullock” Electric Apparatus.
- “Ingersoll” Air Compressors, Coal Cutters and Rock Drills.
- “Lidgerwood” Hoisting Engines.

## ALLIS-CHALMERS-BULLOCK LIMITED

Head Office and Works: MONTREAL

District Offices: { MONTREAL: Sovereign Bank Bldg.  
 NEW GLASGOW: N.S. Telephone Bldg.  
 WINNIPEG: 251 Notre Dame Ave.

TORONTO: Traders Bank Bldg.  
 NELSON: Josephine St.  
 VANCOUVER: 416 Seymour St.

Home for dwellings,raig, 1-pair dwellings, Miller, 2- Sheridan rd, 2-storey ty avenue, pair semi-dwellings, J. S. Mar-roughcast 500; J. J. k dwelling, B. Mac- ng, Parlia- Clancy & etached 2- ng avenue, r semi-de- gs, Victor h, 2-storey e, \$4,000; d 2-storey et, \$6,000; k veneered Ossington , 1-pair 2- wellings on lne, 1-pair veneered ard street, are, 1-pair dwellings, mes Find- ched brick 3,600; C. i-detached e, \$4,000; ick veneer- 0; E. H. lling, Elm etric Co., e building, 180,000; nized iron enue, \$3,- addition to rd streets,

DED.

The author- contracts: McDougall, ndry Co.,

price at Wilson sen- ew Court laddington e construc-

board of act for the ray street, ie, to the oo. John at \$11,192. oviding fire buildings: n, Mulvey, Wellington, n, Argyle, and Strath- y, \$12,209. Board of owing con- et, 67 feet et, \$2,079; h, \$1,284; ue to Salem Contracting ay to York, d blocks— nto, \$2,967, ck—Ander- ty avenue, thic—Oak- o 415 feet road, Ed- se, \$9,303; en, \$7,176, Company. to St Clair

### LIGHTHOUSE IN FRANCE.

A concrete lighthouse was recently completed on the Point De La Coubre at the mouth of the Gironde river in France. It is 225 feet high over all and is in the form of a tapered cylinder. It is 35 feet in diameter at the base and from the base to the focal plane it measures 192 feet.

It has no interior openings except a service room and the circular stair wall eleven and one-half feet in diameter.

The method of construction was quite interesting. The concrete, which was mixed by machine mixers, was brought to the foot of the tower by an endless rope incline and then hoisted in steel buckets. Six radial horizontal lattice girders, thirty-five and a half feet long, supported on the inner forms of the shaft, carried the platform. This was provided with a light conical roof with a frame work of angle iron. It supported an annular outside scaffold suspended from it and also a circular interior scaffold below the bottom of the inside form. The form was composed of four courses of steel shutters provided with interior flanges, while the external form was made of six courses of wooden shutters. As the concrete walls were built up the platform was lifted by means of a jackscrew set upon the walls.

After the concrete had set for three days the outside shutters were removed. The total settlement of the tower was less than one-half inch and the oscillation under a heavy gale was quite insignificant.

The circular main walls are 27 inches thick at the top and uniformly increased to the thickness of 5 feet 10 inches at a point 47 feet above the base, from which point they increased to 35 feet at the base. The maximum pressure is thus reduced to three tons per square foot on the sand which is  $7\frac{1}{2}$  feet above high water. Steel beams support the lantern room floor. Near the outer face, the walls of the shaft are reinforced by vertical and horizontal bars four-tenths of an inch in diameter. These are placed eight inches apart on centres embedded in six inches of rich concrete, which is surrounded by concrete made of one part cement and six parts of mixed sand and gravel.

The old light house, which has stood for a number of years, was recently threatened by erosion and the new one was built to replace it, a little further in from the shore. The cost of construction was \$90,000 and it took nine months to build it. It is supplied with two lanterns, one at the top and the other 18 feet above the base. Below the lantern is an external annular gallery, supported on radial concrete brackets.

### DUST PREVENTION.

Dust prevention and road destruction in and about Boston have been receiving the attention of the Massachusetts Highway Commission, the Metropolitan Park Commission and the Boston Park Commission, and so many experiments are being made on a large scale that before long it is reasonable to expect some valuable information will be obtained. The work is particularly interesting on account of the extensive use of automobiles in the Boston district, and the consequent destructive travel on most of the good roads in that vicinity. One of the most thorough tests is being made by the Metropolitan Park Commission on the Revere Beach Parkway. A portion of this well-known roadway was treated with tarvia last year and another portion has been similarly treated this year. The procession of motor cars along this parkway is a close one at certain times of every pleasant day, and the effect of the treatment in preventing dust and the destruction of the road is consequently being determined with unusual thoroughness. In places the roadway which was treated last year has gone to pieces, ravelling out somewhat like an ordinary broken-stone road in very dry and windy weather; the surface shows a considerable quantity of loosened stone, but even there the road is practically dustless. The later condition has been obtained without any watering, which shows the value of such applications in preventing dust, and indicates that while the first cost of an application may be large, the saving due to the omission of watering may largely counterbalance the expense of applying tarvia.

It is believed that these badly worn places are due to the effect of the heavy motor car travel, but there are other places where holes occur which are believed to be due to the presence of too much clay or loam in the binding material used in making the road or to the application of the tarvia when the road-bed contained considerable moisture. In this connection it might be stated that there is a marked difference between the methods of applying tar preparations in the vicinity of Boston and the methods which are considered most satisfactory in France. In France never more than a thin coat of grit, amounting to little more than a mere sprinkling, is applied to the treated roadway, while about Boston a heavy coat of screenings seems to be considered necessary. This and some other differences in methods result in an average cost of about 12 cents per square yard for tarring some of the Massachusetts roads as compared with about 3 cents in France.

While tarvia has been used extensively, other preparations are

being employed and some of them have already had considerable use. An experience with one of these, a preparation of Kentucky oil, in which some asphalt is dissolved at Revere Beach indicates that where the surroundings of the road have to be kept as clean as practicable, it is necessary to take special precautions to prevent their staining from the spreading of the preparation beyond the surfaces to which it is applied. In this particular case concrete gutters had been constructed and great care was taken to prevent the liquid from reaching them. This liquid leaves the roadway almost black, and an attempt was consequently made to keep any of it from the light grey gutters. This was successfully done while the material was being applied, but during the night following its application a rain occurred which washed some of it into the gutters, which were badly stained in consequence, thereby injuring one of the particularly attractive features of the roadway. An attempt will be made to restore the appearance of these gutters by cleaning. Another interesting experiment with this preparation of Kentucky oil and asphalt is being made by the Metropolitan Park Commission, in Watertown, where a long stretch of gravel road is being treated with it. If a gravel road can be made more durable and its dust reduced by such an application, the result will be decidedly important, particularly in those districts where good road gravel is abundant and broken stone is costly.

The State Highway Commission is proceeding in a conservative way to test the various methods of reducing the wear on roads, and expects to spend about \$20,000 this year in the work. For the present its experiments are confined to the use of tarvia, as it seems to give a more durable surface than other preparations which the Commission has observed in service; while the latter may be successful in laying dust, the Commission desires to obtain some material which will actually improve the surface of the road or at least reduce the rate of its deterioration. An interesting fact which has been brought out by the experience to date is that the application of preventatives of dust and wear to a new road is of little value. The surface of the new road is open and until it has been subjected to enough traffic to become consolidated and to permit the cementing action of the materials to form a compact mass, the application of tarvia and other preparations seems to be of little use.

**JOHN S. FIELDING**  
CONSULTING ENGINEER  
WATER  
POWER **DAMS**, etc.  
15 TORONTO ST. TORONTO

Augu

THE

B

As

the Q

Lawre

span l

length

3,220

note t

tion is

from

Chalm

treal.

volts

Electr

of mo

Chalm

sub-st

and th

curre

travel

work.

Thi

electri

struct

any m

exper

inter

or br

perien

power

for th

The

confu:

a vis

chiefl

stall'a

At

is dor

B

Tel



**THE QUEBEC BRIDGE BUILT BY ELECTRIC POWER.**

As many of your readers know, the Quebec bridge across the St. Lawrence river is the longest single span bridge in the world, the total length between abutments being 3,220 feet. It is interesting to note that the entire work of erection is being done by electric power from apparatus supplied by Allis-Chalmers-Bullock, Limited, Montreal. Alternating current at 2,400 volts is delivered by the Canadian Electric Light Company to two sets of motor generators made by Allis-Chalmers-Bullock and located in a sub-station on the approach span, and then goes out at 550 volt direct current to the engines on the traveler and all other motors on the work.

This being one of the first times electric power has been used on structural steel erection work of any magnitude, the outcome of the experiment has been watched with interest, and the fact that no delays or breakdowns have yet been experienced speaks well for this power for such use in general, and for this installation in particular.

The absence of smoke, noise and confusion is especially noticeable to a visitor at the bridge site, due chiefly to the admirable electric installation for handling all lifts.

All riveting drilling and reaming is done by compressed air, furnished

by two Herron and bury compressors, made by the Bury Compressor Company, of Erie, Pa., and driven by General Electric motors.

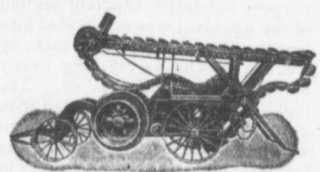
An attractive booklet describing the Quebec bridge has recently been issued by two of the engineers, Messrs. E. R. Kinlock and N. R. McLure, of New Liverpool, N.S.

The decomposition of cement in sea water is the subject of a valuable monograph by Henry Le Chatelier, in the "Annales des Ponts et Chaussees." His investigations led him to the conclusion that all hydraulic cements are decomposed by sea water, but at very unequal

rates. This decomposition is slower as the content of alumina is lower and as the hydraulic index is higher. Quick-setting cements with high sulphate of lime and a high hydraulic index give very satisfactory results. The addition of pozzolana produces a considerable increase in the resistance. A dense mortar seems to be most essential to ensure the preservation of concrete in sea water. On this account, independently of all chemical action, the addition of pozzolana is important as increasing the density of the mortar.

**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



Supplied in 4 sizes on wheels or skids, with or without elevators, etc.

**METALLIC**  
WRITE FOR PRICES  
**METALLIC ROOFING CO.**  
LIMITED  
TORONTO, CANADA  
**CEILING**

**NOTICE to CONTRACTORS and QUARRYMEN**

Get prices on our **NEW SOLID STEEL FRAME CRUSHERS**

Especially adapted for road making, mining and general contract work.

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

**FIRE BRICKS ALL BRANDS**

— Exclusive Agents for —

**"MAC," "MORAY" AND "FORTH" BRANDS.**

**BEST SCOTCH FIRE CLAY AND GANISTER**

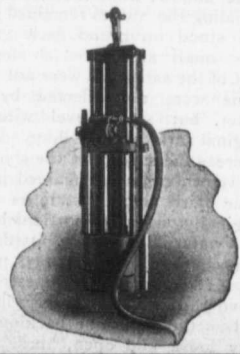
**Baxter, Paterson & Co.**

(Agents for D. M. STEVENSON & CO., GLASGOW)

Tel. Main 847. - - 102 St. Antoine St., - MONTREAL

M  
I  
D  
L  
A  
N  
D

**AUTOMATIC PILE HAMMERS**



**Reasons!**

- They drive more rapidly and more economically.
- They require less attention during driving.
- They do not shatter the Pile.
- They can drive pile when the drop hammer cannot.
- There is no wearing out of hoisting lines.
- They drive more piles in a day.
- They usually leave the pile so that it need not be cut off.
- They make sharpening of piles ordinarily unnecessary.
- Our catalog tells a whole lot more. A postal card will bring one.

**Georgian Bay Engineering Works**  
MIDLAND, ONT.

**ELDING**  
GINEER  
S, etc.  
TORONTO

## REPAIRING A LIMESTONE-CONCRETE ACQUEDUCT LINING DESTROYED BY SOFT WATER

The peculiar destroying action of soft water on a limestone-concrete is the subject of a paper by Mr. M. R. Barnett in a recent number of the "Proceedings of the Institution of Civil Engineers." The Thirlmere Aqueduct, which carries an additional water supply for the City of Manchester, England, runs for about 51 miles of its 95 miles length through a concrete lined tunnel. A portion of this tunnel is formed of a concrete with the aggregate made of the local carboniferous limestone.

The Aqueduct was first opened for use in 1894 and for a short time delivered the water as designed. In a few years the flow at the reservoir end became considerably lessened and a cursory investigation showed a leakage taking place in the limestone-concrete culvert portion at a place called Hutton Roof in a length of about three miles. For three years patching was resorted to along this section, but as no especial pains were taken to find the position of the leaks the work did not prove successful. This repairing was done with a Roman cement, on account of its quick setting properties, and the cement was placed neat without any sand. Wherever any suspicious place appeared the old concrete was picked out and a patch supplied. The ineffectiveness of this work was well shown in the latter repairing, for each one of these patches was comparatively soft and could be easily scooped out, while in many cases the water had worked itself back of the patch and into the old concrete.

Finally, in 1902, the leakage became so marked that radical action was necessary and the work of repair, noted in this article, was started. After a careful investigation of the situation Mr. Barnett, who was in charge of this new work, came to the conclusion that the leaks were caused by a deterioration in the limestone in the concrete. He based his opinion on the following circumstances:

1. The local limestone is a surface rock and entirely bare of cover, indicating that it is a very pure limestone and therefore readily soluble.
2. The water coming off this limestone is very hard, indicating the presence of a considerable amount of carbonate of lime held in solution by an excess of carbonic action.
3. A large number of stalactites, such as are usually found in limestone caverns, were present in the aqueduct, and large quantities of a similar deposit were found on the side walls of the culvert.

After the work of repairing was finished a large amount of floury

sediment was found to have been deposited on the bottom of the aqueduct. This sediment was soft and impalpable, with no feeling of grittiness and, moreover, it was again deposited in the clear water after the cleaning out had been accomplished. This proved that the water was having a chemical action upon the concrete.

When the aqueduct was first completed it was separated into small divisions by temporary bulkheads and each division was then filled with water to its high water level and allowed to stand for a few days. The entire aqueduct was at that time found to be perfectly water tight. The first step in this investigation of the leakage was to repeat this test. For this purpose the entire concrete section of the aqueduct was subdivided into lengths of about  $\frac{3}{8}$ -miles each, by wooden bulkheads reaching nearly to the top of the conduit. The bulkheads were each provided with a door near the bottom through which the water passed during the intervals when the aqueduct was in service.

The water was then let into the whole length until it had reached the top of the bulkhead in each subdivision, when it was shut off at the intake. Readings were taken on the bulkheads throughout the next 24 hours with the result that the leakages in the eight subdivisions were found to vary from 847,000 gals. to zero; the total leakage for the whole limestone-concrete portion totaling 1,235,000 gals. in the 24 hours. The next largest leakage to the 847,000 gals. was only 169,000 gals. So it will be seen that most of the trouble occurred at the former place.

As soon as the water was let out of the conduit an examination of the interior was made. It was found that in all places where the limestone aggregate in the concrete was exposed to the action of the water it was worn away into a concave shape, all the stones being quite hollow, while the mortar surrounding the stones remained good and stood up round each stone. The small stones which formed part of the sand and were not limestone were not affected by the water, but stood level with the original surface of the floor. Also, whereas the surface of the concrete above water level remained in the same fairly smooth state as when originally put in, all portions below the water line were pitted and honeycombed. In many places holes  $1\frac{1}{2}$  to 2 ins. in diameter were found through the concrete lining, and as the limestone backing was very loose and open, these holes

formed exits through which the water ran as through the vent hole of a wash bowl.

To further substantiate the theory that the limestone was being destroyed by chemical action of the water and not by the physical action of the running water a series of experiments was made upon specimen blocks of the various stones and concretes making up the aqueduct, in which each of these blocks was left in the water for a certain length of time and the effect upon it noted. Eight test blocks of limestone showed a loss in weight varying between 6.8% and 18.1% per annum in a 3-months' immersion and between 6.75% and 17.09% per annum in a 6-months' immersion. The cement and mortar blocks showed an increase, however, instead of a decrease in weight. When taken out of the aqueduct after 3 months' immersion the neat cement block had gained 5.47% and the block of mortar (1 cement: 1 sand) had gained 3.57%. The water, therefore, has no adverse action upon cement or mortar.

The water analyzed as follows:

Total Solid Matter—Grains per Imp. gallon.....	3.200
Chlorine—Grains per Imp. gallon.....	0.504
Nitrogen as Nitrates and Nitrites—Grains per Imp. gallon.....	4.000
Nitrogen as Ammonia—Grains per Imp. gallon.....	0.000
Oxygen required to oxidize organic matter—Grains per Imp. gallon.....	0.060
Degree of hardness.....	2.18
"    "    "    after boiling $\frac{1}{4}$ hour.....	2.18
Organic Carbon (parts per 70,000).....	0.091
Organic Nitrogen (part. per 70,000).....	0.010

### METHOD OF EXECUTING REPAIRS.

When it had been fully established that the leakage was due to the action of the water on the limestone in the concrete, it was decided that the entire water surface of the concrete lining in which limestone had been used should be protected by an impervious lining. It was first thought advisable to use blue bricks, but this involved too great an expenditure of time and money, so it was finally decided to reface the whole of the limestone concrete with a cement mortar lining not less than 1 in. in thickness.

Those lengths were first relined where the leakage was greatest, the water tight places being left to the last. It would have been simpler to commence the work at one end and carry it through to the other, but the way in which it was done prevented, to a great extent, an increase in the amount of the leakage and insured the stoppage of the loss of water in the shortest possible time. It was arranged at first that the water should be shut off for 36 hours, in which time three

11-hour  
3 hours  
duct.  
ed to 4  
11-hour  
ing peri  
pleted i  
was left  
the fore  
next sec

The f  
the enti  
to such  
minimum  
work; 1  
relining  
walls.  
remover  
well w  
forms e  
tering n  
not be  
in. coat  
in one li  
to apply  
water h  
conduit  
of each  
needed i

The  
placed  
the mo  
To pre  
planks  
preserv  
until th  
pieces  
wedged  
side wa  
ture, w  
sliding  
and pla  
shovels.  
made ve  
leakage  
maider  
well w  
forms,  
with th  
expel th

The v  
weeks.  
the for  
work c  
new se  
finished  
and sm  
While  
side wa  
invert f  
finished  
mortar  
surface  
inches c

The v  
at pres  
comple  
The lea  
every s  
been bu  
are bei  
along tl

The  
Foley,  
the gre  
of rail

11-hour shifts were worked, having 3 hours in which to refill the aqueduct. This was afterward increased to 48 hours, consisting of four 11-hour shifts, with a 4-hour refilling period. One section was completed in this 48-hour period and was left for two weeks to set before the forms were taken down and the next section started.

The first operation was to remove the entire surface from the side walls to such a depth as would allow of a minimum thickness of 1-in. of new work; the invert was left until the relining had been applied to the side walls. When the surface had been removed the roughened walls were well washed with water and the forms erected. The ordinary plastering methods without forms could not be used because the 1 to 1½-in. coat could not be made to stick in one layer and there was not time to apply two or three layers; also water had to be run through the conduit immediately after the finish of each section and the forms were needed for protection.

The forms consisted of 1¼-in. planed planks about 15 ft. long, placed one on top of the other as the mortar facing rose in height. To prevent the bending of the planks between the ends, and to preserve the proper mortar space until the mortar was put in, small pieces of wood were temporarily wedged between the planks and the side walls. The mortar, a 1:1 mixture, was hand mixed on boards, sliding on rails within the aqueduct, and placed with trowels or small shovels. The bottom layer was made very stiff so as to prevent any leakage at the joint. The remainder was made quite wet and well worked down back of the forms, the planks being tapped with the handle of the trowel to expel the air.

The work was then left for two weeks. When it was then resumed the forms were taken down and work commenced as before on a new section. Simultaneously the finished section was smoothed up and small cracks and pits plastered. While work was going on on the side walls of the new portion, the invert floor was resurfaced in the finished section. This is a cement mortar floor laid on the cleaned surface of the invert, two or three inches of which were first removed.

The work is not entirely finished at present, but enough has been completed to be sure of its success. The leakage has been stopped in every section where the lining has been built, and the overflow pipes are being called into service all along the line.

The death is announced of John Foley, of Foley Bros. & Larson, the great Canadian-American firm of railway contractors.

NOTES ON TAR MACADAM.\*

These notes are not intended as an argument in favor of better roads. Discussion of roadmaking problems has recently been so thorough, and the demand for an improvement is so general, that road engineers need now only consider how the desired improvement is to be effected and how paid for. The necessity has chiefly come about through the rapid development of motor traffic. Those interested in motors disclaim responsibility for the present dust nuisance and blame the roads, upon which, they say, motor vehicles have no more destructive effect than horse traffic. This, however, will scarcely be admitted by those engineers who have charge of the roads. In the opinion of the writer, the additional wear caused by self-propelled vehicles, and particularly by those fitted with non-slip devices, is considerable. Whether such vehicles ought to pay a larger contribution towards the upkeep of the highways is a question which undoubtedly will have to be fought out and settled.

One effect of the new traffic will be an extension of the paved roads leading out of the towns, and possibly a development in the direction of cheap paving. Another result will be that, where the amount of traffic and rateable value does not warrant the expense of paving, some other construction of road involving the least amount of dust will have to be adopted.

Where paving is too expensive, perhaps the best material for minimizing dust is tar macadam, which is by no means a recent introduction, it having been adopted in some of the Northern and Midland towns for at least thirty or forty years. In Sheffield it has certainly been laid nearly forty years, and it is with regard to what has been done in this direction that the following detailed observations are offered. At present there are 392 miles of roads, of which 241 miles are macadam roads; about 151 miles of the latter are repairable by the Highway Authorities, and of these nearly 10 per cent. are laid with tar macadam. The proportion may seem small, but the reason for this at once brings us face to face with one of the difficulties in the general adoption of tar macadam roads.

Many of the roads in the writer's charge have steep gradients, and no one who has had experience of tar macadam will suggest that it is a desirable material for hills. Up to the present a gradient of 1 in 20 has been considered sufficiently steep, and perhaps other engineers will be good enough to give their experience as to laying tar macadam on steeper gradients.

At one time most of this work was left by contract, and this is still

\*A paper read at the annual meeting of the Association of Municipal and County Engineers by C. F. Wike, City Surveyor, Sheffield.

the case to a limited extent, but about five years ago a plant was constructed by the corporation at an approximate cost of £1,000, consisting of sheds, iron-plated floors, with flues beneath for drying the broken stone, and heating apparatus for the tar compound. During the last three years the quantity of tar macadam prepared has averaged 2,300 tons per annum, in addition to 900 tons of tarred chippings for footpaths.

The specifications to which the tar macadam is made is as follows:

First Coat.—About 2 in. in thickness of limestone, "dark" in color and of approved quality, sound, hard and free from spar, and equal to sample. The stone to be broken uniformly to a 2¼-in. gauge.

Second Coat.—About 1¼ in. in thickness, of best slag, of sound, uniform material, free from honeycomb and dirt, from approved works, all equal to sample. The slag to be broken uniformly to a 1¾-in. gauge.

Third Coat.—About ¾ in. in thickness of slag shingle to a ¾ in. and ½ in. gauge in equal proportions, free of dust, of the quality specified for the second coat, and equal to sample. The total thickness of the tarred material, after being rolled with the steam roller, to be 4 in., and the top of its surface to be ¾ in. above the level of the channels.

After rolling the roadway is to be covered with a dressing coat of granite chips (½ in. dust out) of approved quality and thickness, as may be ordered, and again rolled.

The whole of the limestone and slag must be thoroughly well dried on hot plates; a mixture of pitch and tar must then be boiled in the following proportion: For the first and second coats 90 imp. gal. tar and 125 lb. of pitch; and after boiling for two hours, 17 imp. gal. of the mixture must be mixed with 30 cwt. of the broken limestone and 1¾ in. slag.

For the third coat 14 imp. gal. of the above mixture, after boiling, to be added to each cubic yard of shingle.

The limestone and slag to be perfectly dry and warm at the time of mixing, and the whole thoroughly turned over, so that every part of the surface of the stones will receive a coating of the mixture. The above-mentioned proportions may vary according to the quality of the pitch and the strength of the tar. The prepared limestone and slag is then to be put in separate heaps, and left a sufficient time to toughen before being laid. After it has been properly toughened and freshened with a further quantity of pitch and tar (if considered requisite), it is then to be spread on the foundation in layers as specified.

The cost of slag and limestone tar macadam is about the same. If of the best quality, probably slag is

the better material, and in certain instances, it has been used for all three coats. The difficulty, however, is to get it sufficiently uniform and free from lime and other constituents which render it liable to early disintegration. This is one of its disadvantages as compared with limestone, which can be obtained of uniform hardness, and, as the use of tar macadam increases, so will the difficulty of getting sufficient slag of suitable quality increase.

Granite has not hitherto been looked upon as a suitable material for tar macadam, on account of its want of absorption. It was laid by the writer nearly twenty years ago in several streets, but for the reason given, was not a success. It has recently been laid in some districts with tarred chips for binding, and similar work is in preparation in Sheffield. If the necessary adherence could be obtained, granite would, on account of its better wearing qualities, be more economical than either limestone or slag, and perhaps, with modern methods of retarring roads at frequent intervals, the old difficulty may be got over.

With regard to the cost of tar macadam roads compared with dry granite macadam, the initial cost is about the same, about 2s. 3d. to 2s. 6d. per super. yard, exclusive of foundation, the extra expense of tarring being balanced by the fact that a cheaper material is used than the granite macadam usually employed for important main roads, when these are not paved. Statistics have been prepared with regard to a typical suburban road, taking a considerable amount of traffic, and the annual charge (including initial cost) for a period of fourteen years has averaged about 4d. per square yard; this is for a fairly flat road. In another case—a road with light traffic—the average has

been a little less than 2½d. per square yard.

If the best results are to be obtained, it is very advisable that, after the first laying, tar macadam should be kept in thorough repair, and for many years it has been the practice to tar paint the surface at intervals of three or four years, or as soon as roughness begins to show. This has been done not so much with the idea of laying the dust as to prolong the life of the tar macadam.

At present a considerable mileage of dry macadam road is being tar sprayed, and, so far as can be seen at present, it will be practicable to apply this system to gradients steeper than those upon which tar macadam has been laid. Nevertheless, there must be a limit to the gradients upon which tar can, in any form, safely be employed, as it

is a material very susceptible to heat, and slippery in hot weather.

To sum up the writer's experience, tar macadam is a very suitable and economical material for many situations, and its use is bound to increase, but it has its restrictions, the principal one being that it cannot safely be used for roads with a considerable gradient. So far, the materials used have been inferior in durability to granite or whinstone, and therefore it has not been suitable for macadam roads with the heaviest traffic. The great advantages are the comparative absence of dust, and the quietness. Tar macadam roads are also economical in the matter of cleansing. The introduction of tar-spraying apparatus has materially helped to minimize the dust nuisance, and it is through the application of tar, in

(Continued on page 14.)

## 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. DE SOLA, 180 St. James Street, MONTREAL**

## THE JOHNSON CORRUGATED STEEL BAR

FOR



REINFORCED CONCRETE

Manufactured by

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

Operating under Johnson Patent No. 91630 and by license of Sir Wm. Mather.

Office: Coristine Building, MONTREAL

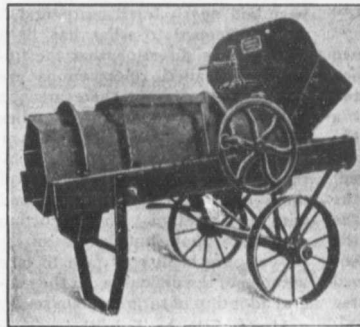
## The Hand Power Continuous Concrete Mixer

FOR

Sidewalk and Street Work, and other classes of work where but small capacity is required.

Other Mixers, Hand, Steam, Electric, Gasoline and Gravity

**E. F. DARTNELL**  
MONTREAL



## JNO. S. FIELDING

C. E.  
CONSULTING ENGINEER

**Concrete Dams**  
**Power**

BRIDGES

MACHINERY **Plants**  
**Hydraulics**

25 Years' Experience

15 TORONTO STREET - TORONTO

## THE STANTON IRON WORKS CO.

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**



OUR  
**TRENCHING MACHINES**

Excavated this week as much as seven hundred and eighty (780) c. y. in a day.

The average of our machines for last week between Edmonton, Regina and Montreal has been four hundred and ninety (490) c. y. per day. They are working in very hard ground but it can't keep them from going ahead.

Contractors should not be without it if they want to avoid trouble.

---

FOR FURTHER INFORMATION APPLY TO

**J. W. HARRIS**  
**MANUFACTURING COMPANY**  
**MONTREAL**

one form or another, that the nearest approach to a dustless road must be looked for, where paving (which, after all, creates the least dust) cannot be used.

**CANADIAN CEMENT PRODUCTION.**

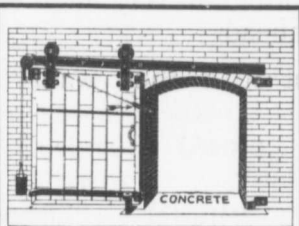
The manufacture of cement in Canada dates from the year 1801, when operations were begun in a very small way at Marlbank and Shallow Lake, both in the province of Ontario. The first year's output was 2033 barrels, which is only a little more than the daily production of one of the modern plants. In 1892 the output was 20,247 barrels and 31,924 barrels in 1893.

The next ten years in the cement industry of Canada witnessed an increase of 50 per cent. each year over the production of the preceding year. Four plants were in operation in 1901, and now there are nineteen.

In 1906 there were fifteen plants in operation, with a total daily capacity of about 10,500 barrels, and according to the published figures of the Canadian Geological Survey, during the year 2,152,562 barrels of Canadian cement were made, which represents an increase of 610,994 barrels, or 39.6 per cent. over the production of 1905.

Very little cement is exported from Canada. The consumption is due to the use each year of better and more improved machinery and equipment. An excellent example of a cement plant, whose equipment will, when completely installed, be among the best in Canada, is that of the Western Canada Cement & Coal Company, which some time ago purchased through Allis-Chal-

(Continued on page 16.)



**TO CONTRACTORS**

We save you money and take all the responsibility on

**TIN-CLAD FIREPROOF DOORS**

We make the doors, cover them, supply the hardware, use an "ADJUSTABLE HANGER," and hang the doors complete. All work strictly to the Underwriters Requirements.

We have every facility for their production, send us particulars.

**A. B. ORMSBY, Limited**

FACTORIES:  
Corner Queen & George Sts., TORONTO  
677-9-81 Notre Dame Ave., W., WINNIPEG.

**A. LEOFRED**  
(Graduate of McGill).  
**Consulting Engineer**  
**WATERWORKS** A SPECIALTY.  
39 St. John Street  
Metropolitan Ins. Bldg.  
Quebec  
Phone 346

The  
**Hanover Portland Cement Co.**  
Limited  
Manufacturers of  
**"SAUGEEN" BRAND**  
PROMPT SHIPMENT WRITE FOR PRICES  
Office and Works: Hanover, Ontario



**"Lehigh"**  
**Portland Cement**

Capacity 20,000 Barrels Per Day.

The "Lehigh Portland Cement Company, Limited," are also now 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 CO. - Buffalo, N. Y.**  
SALES AGENTS FOR CANADA

**REFUSE DESTRUCTORS**

Complete Combustion — Perfect Sanitation  
Latest Improvements.

**STRUCTURAL STEEL AND BRIDGE WORK**

**HEENAN & FROUDE, Limited**  
Manchester, England

**RICHARD A. TAUNTON, - 622 McINTYRE BLOCK WINNIPEG**

**SCHIEFLER PROPORTIONING CONTINUOUS MIXER**

Automatically measures all material and will give an absolutely perfect mixture in all classes of work.

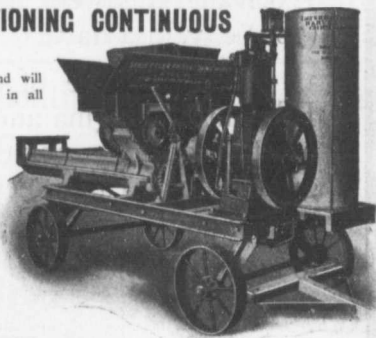
**WE DEFY COMPETITION**

**SEE OUR EXHIBIT AT THE TORONTO EXHIBITION**

south-east of Machinery Hall, facing Main Entrance to the grounds.

**THE LONDON CONCRETE MACHINERY CO.**

28 REDAN ST. - LONDON 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.

CLASSIFIED INDEX OF ADVERTISERS

ACCIDENT INSURANCE Page
Ontario Accident Insurance Co. 19

BLOWERS
Buffalo Forge Co. 8

BOILERS
McDougall Caledonian Iron Works Co., John. 19

BRICK
Toronto Fire Brick Co. 11

BRIDGES (STEEL)
Canadian Bridge Co. 19
Canada Foundry Co. 27
Dominion Bridge Co. 20
Jenks & Dresser. 16
Phoenix Bridge and Iron Works. 12

CASTINGS (IRON)
Laurie Engine & Machine Co. 16
Rogers Manufacturing Co. 24

CEMENT
Alsen Portland Cement Co. 24
Baxter, Paterson & Co. 9
Bremner, Alex. 20
Canadian Portland Cement Co. 4
DeSola, C. I. 12
Gray & Bruce Portland Cement Co. 26
Hyde & Co., F. 20
Hanover Portland Cement Co. 14
Lakefield Portland Cement Co. 14
McNally & Co., W. 16
Morrison & Co., T. A. 20
Owen Sound Portland Cement Co. 26
Ontario Portland Cement Co. 16
Raven Lake Portland Cement Co. 21
Stinson-Reeb Builders' Supply Co. 21
Thorn Cement Co. 14

CONTRACTORS' SURETY BONDS
United States Fidelity & Guaranty Co. 22

CONCRETE MIXERS AND MACHINERY
Baxter, Paterson & Co. 9
Canadian Fairbanks Co. 17
Dartnell, E. F. 12
Goold, Shapley, & Muir 23
Hopkins & Co., F. H. 28
Ideal Concrete Machinery Co. 17
London Concrete Machinery Co. 14
Mussens Limited 3
Morrison & Co., T. A. 20
Toronto Pressed Steel Co. 18
Vining Bros. Mfg. Co. 5

CONTRACTORS' PLANT
Allis-Chalmers-Bullock 7
Beatty & Sons, M. 21
Canada Foundry Co. 27
Harris Mfg. Co., J. W. 13
Hopkins & Co., F. H. 28
Jenckes Machine Co. 26
Mussens Limited 3
Rogers Manufacturing Co. 24
Toronto Pressed Steel Co. 18
Wallington, G. P. 9

CONCRETE CONSTRUCTION
Ambursen Hydraulic Construction Co. 18
Baxter, Paterson & Co. 9

CONTRACTORS' EMPLOYMENT BUREAUS
North Western Employment Agency. 16
Reliance Labor Exchange 18
Zarossi, Banco 26

CORRUGATED IRON
Metallic Roofing Co. 9
Ormsby, A. B., Limited. 14

CRUSHERS (STONE AND ROCK)
Allis-Chalmers-Bullock 7
Beatty & Sons, M. 21
Canada Foundry Co. 27
Dartnell, E. F. 12
Hopkins & Co., F. H. 28
Mussens Limited 3
Morrison & Co., T. A. 20
Sawyer & Massey Co. 16

DRILLING CONTRACTORS Page
Harvey, J. 24

DEBENTURES
Nay, Anderson & Co. 21
Stimson & Co., G. A. 19

ENGINEERS AND CONTRACTORS
British Columbia General Contract Co. 20

ENGINEERS (CIVIL)
Aitken, K. L. 23
Canadian Engineers, Limited. 22
Chipman, Willis 23
Connor, Clarke & Monds. 23
Davis & Johnston. 22
Fenson, C. J. 22
Fielding, John S. 12
Galt & Smith. 18
Jackson, John H. 23
Lea & Coffin. 23
Leofred, A. 8
Macallum, A. F. 22
McDougall & McRae. 8
Pitt & Robinson. 23
Smith, Kerry & Chase. 23
Scott, Wm. Fry. 22

ENGINEERS (MECHANICAL)
Farmer, John T. 24
Galt & Smith. 18

ENGINES
Allis-Chalmers-Bullock. 7
Cameron & Co., Hugh 20
Laurie Engine & Machine Co. 16
Rogers Manufacturing Co. 24
Sawyer & Massey Co. 16

ELECTRICAL APPARATUS AND SUPPLIES
Allis-Chalmers-Bullock. 7
Canadian Gen. Elec. Co. 27
Drummond, McCall & Co. 20
Northern Electric & Mfg. Co. 4

FIRE BRICKS
Baxter, Paterson & Co. 9

FIRE APPARATUS
Cameron & Co., Hugh 20
McGregor & McIntyre. 18
Morrison & Co., T. A. 20
Seagrave, W. E., 16

HOISTING MACHINERY
Allis-Chalmers-Bullock 7
Beatty & Sons, M. 21
Canada Foundry Co. 27
Georgian Bay Engineering Works. 9
Hood & Sons, Wm. 19
Hopkins & Co., F. H. 28
Mussens Limited. 3
Rogers Mfg. Co. 24

HYDRANTS
Canada Foundry Co. 27
Canadian Fairbanks Co. 23
Canadian Iron & Foundry Co. 25
Gartshore-Thompson Pipe & Foundry Co. 27
Kerr Engine Co. 24
McDougall Co., R. 21

LOCOMOTIVES AND RAILS
Canada Foundry Co. 27
Gartshore, John J. 19
Hopkins & Co. 28
Mussens Limited. 3
Sessenwein Bros. 18

PLASTER BOARDS
P. W. St. George. 26

PILE DRIVING
Hood & Sons, Wm. 19
Russell, John E. 19

PAVING AND PAVING MATERIALS
Baxter, Paterson & Co. 9
Ontario Asphalt Block Co. 23
Pettypiece Silix Stone Co. 23
Silica Barytic Stone Co. of Ontario. 20

PIPE (CAST IRON) Page
Baxter, Paterson & Co. 9
Canada Foundry Co. 27
Gartshore-Thomson Pipe and Foundry Co. 27
Gaudry & Co., L. H. 18
Canadian Iron & Foundry Co. 25
Stanton Iron Works Co. 12

PIPE (WOODEN)
Canadian Pipe Co. 25
Dominion Pipe Co. 25
Pacific Coast Pipe Co. 25

PLUMBERS' SUPPLIES
Somerville Limited. 5

PUMPS AND PUMPING MACHINERY
Allis-Chalmers-Bullock. 7
Canadian Buffalo Forge Co. 4
Canadian Fairbanks Co. 17
Canada Foundry Co. 27
Drummond, McCall & Co. 20
Mussens Limited. 3
McDougall Caledonian Iron Works Co., John 19

ROAD MACHINERY
Cameron & Co., Hugh. 20
Climax Road Machine Co. 26
Heaman, George. 27
Morrison & Co., T. A. 20
Mussens Limited. 3
Sawyer & Massey Co. 9

ROCK DRILLS
Allis-Chalmers-Bullock. 7

ROPE
Dominion Wire Rope Co. 28
Greening Wire Co., B. 22

STEEL BARS (CORRUGATED)
Corrugated Steel Bar Co. of Canada. 12

STRUCTURAL IRON AND STEEL
Baxter, Paterson & Co. 9
Canada Foundry Co. 27
Dominion Bridge Co. 20
Jenks & Dresser. 16
McGregor & McIntyre. 18
Phoenix Bridge & Iron Works. 20
Taunton, Richard A. 14

STONE
Crushed Stone, Limited 16
Doolittle & Wilcox. 22
Morrison & Co., T. A. 20

SHOVELS (STEAM)
Allis-Chalmers-Bullock 7
Beatty & Sons, M. 21
Canada Foundry Co. 27
Hopkins & Co., F. H. 28
Mussens Limited. 3
Rogers Manufacturing Co. 24

SEWER PIPE
Canadian Sewer Pipe Co. 4
Dominion Sewer Pipe Co. 20

SHOVELS
Hopkins & Co., F. H. 28
Mussens Limited. 3

TELEPHONE SUPPLIES
Northern Electric & Mfg. Co. 4

TANKS AND STAND PIPES
Canada Foundry Co. 27
Ontario Wind Engine & Pump Co. 18

VALVES
Canada Foundry Co. 27
Canadian Fairbanks Co. 17
Canadian Iron & Foundry Co. 25
Gartshore-Thomson Pipe & Foundry Co. 27
Kerr Engine Co. 24
McDougall Co., R. 22

WOOD FIBRE PLASTER
Imperial Plaster Co. 26

WHEEL SCRAPERS
Bechtels Limited. 24

mers-Bullock, Limited, of Montreal, three Allis-Chalmers 1,000 k.w. steam turbine generator units for use on the company's properties, located fifty-seven miles west of Calgary, Canada, on the Canadian Pacific Railway.

The new units, which are now being erected, will generate current of 60 cycles, 3-phase, at 600 volts, and the coal to be used in their operation will be taken from the bankhead mines of the Canadian Pacific Railway and delivered at the mills.

The adoption of electrical drive for the operation of these cement mills, whose current will be derived from a steam turbine power plant which will rank among the foremost installed for industrial purposes, is a frank acknowledgement of the well recognized superiority of electrical drive over mechanical forms in the cement making industry.

The current generated from the turbo-unit will be devoted entirely to power purposes; the lighting load, consisting of some forty arc and four hundred incandescent lamps, will be carried by the exciters, also of Allis-Chalmers build, in addition to their work of exciting the turbo-alternators.

**HERRINGBONE  
LATH**  
MANUFACTURED BY  
THE METAL  
SHINGLE & SIDING CO. LIMITED  
MAKERS OF FIREPROOF BUILDING GOODS  
PRESTON & MONTREAL



**STEEL**

**HIGHWAY**

**BRIDGES**

**JENKS & DRESSER**  
SARNIA, ONT.

BUILDERS OF  
**STEEL HIGHWAY BRIDGES**  
**STRUCTURAL STEEL WORK**  
**CONCRETE ABUTMENTS**

## Portland Cement...

HIGH GRADE GERMAN BRANDS FOR GRANOLITHIC  
AND ARTIFICIAL STONE SIDEWALKS.

**Sewer Pipes,** Best English Cements. Best Belgian Cements  
**Culvert Pipes, &c.** **W. McNALLY & CO., Montreal**

## 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

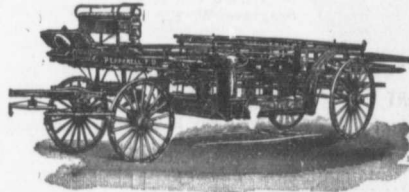
## THE NORTH WESTERN EMPLOYMENT AGENCY

We supply men of all nationalities on short notice.  
Laborers, Railway Men, Mechanics, Bushmen,  
Teamsters, etc., furnished on demand.

**378 Craig Street West, MONTREAL** TEL. MAIN 468  
We undertake all kinds of Contracts by letter or telegram

## 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 all inquiries. All goods built to order.

Long Distance  
Phones 686 and 684 **W. E. SEAGRAVE, WALKERVILLE ONT.**

## "LAURIE" POWER PRESSES

Following are a few of the lines we manufacture

"PUNCHING" "INCLINABLE" "SOAP"

"PENDULUM" "BUMPING"

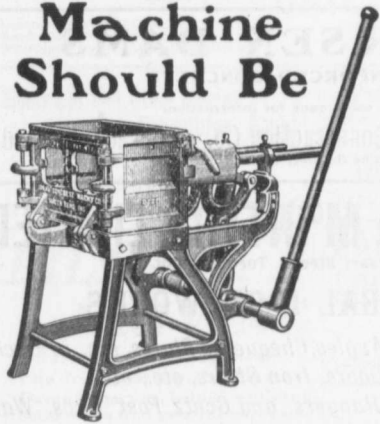
AND ALL KINDS OF SPECIAL PRESSES

**LAURIE ENGINE MACHINE COMPANY, LIMITED**  
MONTREAL

Parmelee & Nicholson, Traders Bank Building, **Toronto Agents.**  
Guilford & Son, Upper Water Street, **Halifax Agents.**



# All That a Concrete Machine Should Be



EVERY separate feature of the Ideal Concrete Block Machine has been brought to the highest possible standard of labor saving and profit making. The result is a machine of little cost, but wonderful money-making possibilities.

The Ideal "Down-Face" principle is the only practical, satisfactory and rapid process of concrete block manufacture, and is *protected by a basic patent*. No other machine on this principle can be legally made, sold or used.

The Ideal Concrete Machine is made practically universal in variety of size, shape and design of blocks by interchangeable accessories and attachments.

(INTERCHANGEABLE)  
**IDEAL CONCRETE MACHINES**  
VARIOUS SIZES

Marvelously simple, durable and strong. Not a spring, chain or gear in its construction. Can never wear out or break in use. May be operated by a boy.

"Ideal" catalogue, a practical encyclopædia of concrete block manufacture, sent free on application. Of special value to builders and dealers in building materials.

## Ideal Concrete Machinery Co.

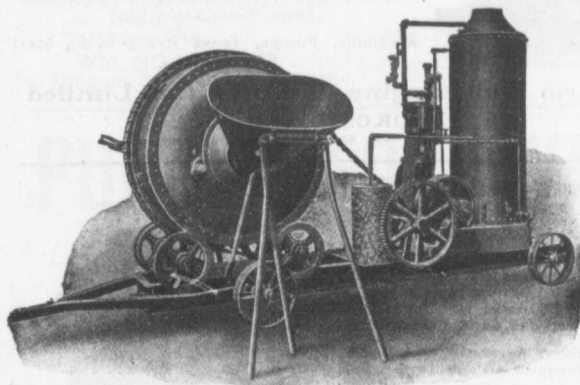
LIMITED  
Dept. A.Q., - London, Ontario

MUSSENS LIMITED  
SOLE AGENTS FOR CANADA  
MONTREAL QUEBEC TORONTO WINNIPEG VANCOUVER  
Block, Brick and Sill Machines. Mixers, Ornamental Moulds, Etc.



Ideal Block showing natural stone effect. Machines produce endless variety of designs and blocks of any size within capacity.

# McKelvey Batch Mixers



are the favourites with many Contractors.

They combine strength with many improvements for quickness of operation.

THE FOLLOWING CAPACITIES:

One Yard Three Fourths Yard  
One Half Yard One Third Yard  
One Sixth Yard One Ninth Yard

WITH

Lever on side of drum operates discharge. Drum bearing-wheels are **Cast Steel with Roller Bearings.**

All Mixers mounted on **Steel Trucks.**

**Charging Hoppers** always furnished.

**Steam, Gasoline or  
Electric Power**  
can be **Promptly Furnished**

**The Canadian Fairbanks Co., Limited**  
MONTREAL TORONTO WINNIPEG VANCOUVER

**CALT & 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**

**The Reliance Labor Exchange**  
426 St. James St., MONTREAL

Licensed to supply labor of all kinds.  
Careful and prompt attention given.

**SAUNDERS & BLACK, - Proprietors**

**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**

**43  
MILLION  
DOLLARS**

WAS SPENT  
on new  
buildings in  
Winnipeg  
alone during  
the past 3  
years. . . .

If you want Western  
Business you should  
cater for its trade by  
advertising in the

**WESTERN CANADA  
CONTRACTOR & BUILD-  
ERS GAZETTE**

Published, printed and edited  
solely for the West.

For Sample and Advt. Rates, address  
720 Union Bank, WINNIPEG.

**THE PHOENIX BRIDGE & IRON WORKS, LIMITED**  
**MONTREAL**  
**GENERAL STEEL CONTRACTORS**

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

**AMBURSEN DAMS**  
OF REINFORCED CONCRETE

Write us at once for information.

Ambursen Hydraulic Construction Co. of Canada, Limited  
Coristine Building, MONTREAL

**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

**POWER FOR CONTRACTORS and OTHERS**

A Gasoline Engine is the easiest Solution of the Power  
Problem.

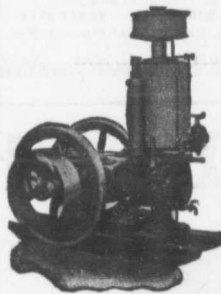
The  
**"STICKNEY" GASOLINE ENGINE**

outclasses all others, in its extreme  
Simplicity. No useless frills.

**MADE FOR HARD WORK**      **MADE NOT TO GET OUT OF ORDER**

For Cement Mixers, Hoisting, Brickyards, Machine  
Shops, Wood Yards, Etc.

Windmills, Pumps, Tanks (steel or wood), Steel  
Substructures.



**Ontario Wind Engine & Pump Co., Limited**  
TORONTO, ONT.

**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
- Waggons, Carts, Cement Mixers, Etc.

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



**Spigot 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. CAUDRY & CO.,**

Canadian Agents for  
Robt. Macfaren & Co., Glasgow

**QUEBEC AND MONTREAL**

# The Canadian Bridge Co., Limited

WALKERVILLE, ONT.

## MANUFACTURERS OF RAILWAY AND HIGHWAY BRIDGES

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

Municipal and Other Bonds  
and Debentures Bought  
Highest Prices Paid.

G. A. STIMSON & CO.  
16 King Street, West - TORONTO

### PILE DRIVING

On land and water by steam.  
Pile drivers or drop hammers.  
Dams, wharves, bridge building  
trestle work and general contract-  
ing.  
Submarine diving and all kinds  
of submarine work.



We have always a stock in hand to  
let of:  
Diving Outfits, Portable Boil-  
ers, Hoisting and Pumping  
Machinery, Etc.  
WM. HOOD & SON  
10 Richmond Sq. - MONTREAL

**The Ontario Accident  
Insurance Co.**  
ACCIDENT, EMPLOYERS, ELEVATOR  
AND GENERAL LIABILITY . . . .  
104 St. Francois Xavier St. Montreal

For Contractors, Switches, Gir-  
ders, &c.  
New and Second Hand.  
**RAILS AND CARS**  
LOCOMOTIVES  
John J. Gartshore  
85 Front St. West,  
(Opposite Queen's Hotel.) TORONTO

### ELECTRICITY

If you desire to keep posted on  
the wonderful progress that is  
taking place in the use of elec-  
tricity for an almost endless var-  
iety of purposes, you should sub-  
scribe to the

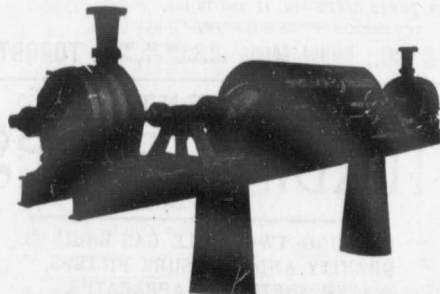
Canadian Electrical News  
and Engineering Journal  
A 44 PAGE MONTHLY.  
PRICE \$1 PER YEAR  
Write for free sample copy to  
The G. H. Mortimer Publishing Co.  
LIMITED  
Toronto Montreal Winnipeg Vancouver



### PILE DRIVING

and Foundation Work.  
By 5-ton Automatic Steam Pile Hammers  
Water Jet or Drop Hammers, Dock Build-  
ing, Submarine Work and Dredging.  
**BUILDING MOVER AND WRECKER**  
General Contracting.  
JNO. E. RUSSELL, - Toronto  
Residence, 1010 Queen St. E.—Phone M. 4626  
Office and yard 307 Logan Ave.—Phone M. 2007

# PUMPS FOR WATER WORKS



## WATER WORKS SYSTEMS INSTALLED

Boilers, (Return Tube and Water  
Tube,) Tanks, Penstocks,  
Mill Machinery.

Builders in Canada of

### "WORTHINGTON" TURBINE PUMPS

Two Worthington 3-Stage Turbine and McCormack  
Water Wheels, built for Port Arthur, Ont., Water  
Works, 1440 gal. per minute against 350 ft. head.

## The John McDougall Caledonian Iron Works Co., Limited.

Estimates Cheerfully Furnished HEAD OFFICE AND WORKS: Montreal.  
DISTRICT OFFICES:  
MONTREAL, 82 Sovereign Bank Building. TORONTO, 810 Traders Bank Building. WINNIPEG, 251 Notre Dame Avenue  
VANCOUVER, 416 Seymour Street. NELSON, Josephine Street. NEW GLASGOW, N.S., Telephone Building.

### ARTIFICIAL STONE PAVEMENTS

**SIDEWALKS A SPECIALTY**  
**CORPORATIONS** Will do well to consider our work and prices before letting contract.  
**The Silica Barutic Stone Company of Ontario, Limited.**

**WALTER MILLS** General Manager. **Head Office: INGBERSOLL, ONT.**

### The British Columbia General Contract Co. Limited

Telegraphic Address: "Dredging"

Suite 5, Crewe & Wilson Block, 441 Seymour Street VANCOUVER, B. C.

### ENGINEERS AND CONTRACTORS

MUNICIPAL WORKS AND BUILDINGS  
 DREDGING AND RECLAMATION  
 CONCRETE CONSTRUCTION  
 RAILWAYS, BRIDGES  
 HARBOR WORKS

Stone Crushers and Grinders.  
 Steam Road Rollers.  
 Fire Engines Steam and Gasoline.  
 Bricks Pressed and Enameled.  
 "Roman" building stone.



### "Tamco"

Crushed Stone for Concrete Roofing and Macadam.

**T. A. Morrison & Co.**  
 204 St. James Street, Telephone Main 4532. **MONTREAL.**

Please mention **CONTRACT RECORD** when corresponding with advertisers.

## 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.

## PORTLAND CEMENT



SEWER PIPES

FIRE BRICKS

FIRE CLAY

**ALEX. BREMNER**

50 Bleury Street, MONTREAL



### SEWER PIPES

CHIMNEY TOPS  
 FLUE LININGS  
 WALL COPING



Salt Glazed and Vitrified.

TRUE TO SIZE  
 IMPERVIOUS TO WATER  
 WILL NEVER DISINTEGRATE

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

Ask for Price List and Discount.

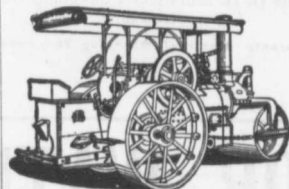
Telephone (Toronto Connection): Park 1809.

Post Office: SWANSEA.

**THE DOMINION SEWER PIPE CO., LIMITED**  
 (THE INDEPENDENT COMPANY)

WORKS AND OFFICE  
**SWANSEA**  
 (NEAR TORONTO)

## "WATEROUS" ROAD MACHINERY AND FIRE APPARATUS



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

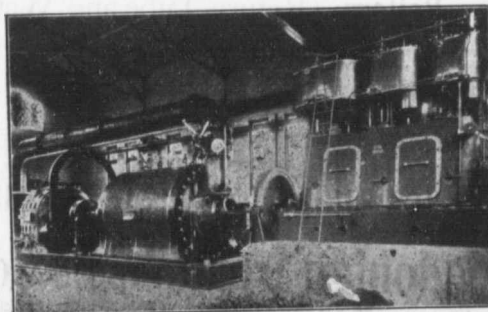
We Rebuild other makes of Fire Engines with our patent Boiler.

### BRANTFORD PITTS DOUBLE ENGINE STEAM ROAD ROLLER

IN THREE SIZES—10, 12 and 15 ton.

CORRESPONDENCE SOLICITED.

**HUGH CAMERON & CO.,** Selling Agents 77 Queen St. West, Manning Chambers. **TORONTO**



Six Stage Turbine Pump Electric Motor and High Speed Steam Engine. Built for the Montreal Water and Power Co., to do 4500 Imperial gallons a minute against 300 feet head. Overall H.P. 70 per cent.

PATENT

## TURBINE PUMPS

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

— BUILT BY —

**MATHER & PLATT, LIMITED**  
 MANCHESTER, ENG.

CANADIAN AGENTS:-

**Drummond, McGill & Co., Montreal**

### Prices of Building Material

**PRESSED BRICK, For M.**

**TORONTO PRESSED BRICK AND TERRA COTTA WORK**  
F.O.B. Milton, Ont.

Red No. 1	\$15.00
" 2	11.50
" 3	10.00
Buff No. 1	17.00
" 2	13.00
Brown	25.00
Roman Red	30.00
" Buff	35.00
" Brown	40.00
Hard Building	8.00
" Sewer	8.00
" Backing	7.00

Mosaic and Ornamental from \$2.00 to \$4.00 per 100.  
Terra Cotta Sizing Courses and Friezes, from 50c. to \$2.00 per ft. run.  
Roofing Tiles, \$20.00 per 1,000.

**DON VALLEY BRICK WORKS.**

Nos. 1, and 2, Red Pressed Bricks	.....
Nos. 1 and 2 Buff Pressed Brick	.....
No. 1 Brown Pressed Brick	.....
Pompeian Red, Buff and Brown Pressed Bricks	.....
Ornamental Bricks of all kinds for Mantel purposes	.....
Enameled Bricks of all Colors	.....
Porous Terra Cotta Fireproofing of all Descriptions	.....
Vitrified Street-Paving Bricks	.....
Semi-Vitrified Foundation Bricks	.....
Common stock Red and Grey Bricks	.....
Sewer Bricks	.....
Stone or Macadamized Roadways	.....

Please write to head office, 34 Toronto St., Toronto, for catalogue and prices.

**BEAMSVILLE BRICK AND TERRA COTTA CO.**  
F.O.B. Beamsville.

Red Peerless Facing	.....	\$26.00
" No. 1	.....	14.00
" No. 2	.....	13.00
" No. 3	.....	10.00
Superior Peerless Facing	.....	20.00
" No. 1	.....	18.00
Buff Peerless	.....	20.00
" No. 1	.....	18.00
" No. 2	.....	15.00
Moulded and Ornamental Brick from \$3 to \$5 per C	.....	
Roman Red (Size 12 x 4 x 1 1/4 in.)	.....	30.00
" Buff	.....	30.00
" Brown	.....	25.00
Vitrified Paving Brick No. 1	.....	18.00
" No. 2	.....	15.00
Sewer	.....	8.00
Roofing Tile	.....	22.00

Sackett Plaster Board, 32" x 36" in size, sold at about 2c. per square foot.

**LUMBER**

**CAR OR CARGO LOTS, F.O.B. TORONTO.**  
Per M. Ft.

1 inch No. 1 Pine cuts and better	\$49.00 to \$51.00
1 1/2 to 2 inch No. 1 cuts and better	54.00 58.00
2 inch No. 2, Pine cuts and better	48.00 50.00
1 1/2 to 2 inch No. 3 cuts and better	42.00 46.00
1 inch Pine Dressing and better	28.00 30.00
shorts	27.00 28.00
1 x 4, 4 and 8 Common	30.00 36.00
1 x 2 and 2 Common	28.00 29.00
1 inch mill run sidings	22.00 23.00
1 x 10 and 12 mill culls	15.00 16.00
1 inch dead cut sidings	32.00 34.00
1 1/4 inch Flooring	19.00 20.00
Hemlock, 1 x 4 to 8 inch	22.00 23.00
2 x 4 to 10 inch, 12 feet	25.00 26.00
1 1/2 inch No. 1 4 ft. Pine Lath	4.75 5.00
1 1/2 inch No. 2 4 ft. Lath	4.25 4.50
1 1/2 inch No. 1 4 ft. Hemlock Lath	4.00
XXXX Pine Shingles	3.50 3.75
XX Cedar Shingles	2.50 2.75
B.C. Shingles:	
XXX 6 Butts to 2 inch	3.84
XXXX 6 to 2 1/2 inch	4.07
XXXXX 5 to 2 inch	4.50

**HARDWOODS—PER M. FEET CAR LOTS.**

Ash, white, 1sts and 2nds, 1 to 2 inch	\$36.00 to \$38.00
Ash, black, 1sts and 2nds, 1 to 2 inch	33.00 35.00
Birch, M. R. 1 inch	21.00 22.00
" 1 1/2 inch to 2	23.00 24.00
Basswood, Common and better, 1 to 1 1/2 inch	25.00 26.00
Basswood, 1 1/2 to 2 inch	26.00 28.00
Him, soft, mill run, 1 to 1 1/2 in.	23.00 24.00
Him, rock, mill run, 1 to 1 1/2 in.	25.00 28.00
Maple, common and better, 1 to 1 1/2 inch	22.00 23.00
Oak red plain, 1sts and 2nds, 2 to 4 inch	46.00 50.00
Oak, white, 1sts and 2nds, 1 to 1 1/2 inch	44.00 46.00
Oak, quartered, 1sts and 2nds	70.00 80.00

**We are the largest buyers of Western School Debentures in the British Empire**  
School Trustees will do well to communicate with us when having debentures to offer for present or future delivery.  
**HIGHEST PRICES PAID. PROMPT SETTLEMENT**

NAY & JAMES  
SUCCESSORS TO  
**NAY, ANDERSON & CO.**  
Sask. Regina Sask.

# Lafarge (NON-STAINING) Cement

PORTLAND CEMENT  
FIRE BRICKS  
DRAIN PIPES  
FIRE CLAY  
CULVERT PIPES  
SEWER BRICK  
SEWER BOTTOMS

**F. HYDE & CO.,**

King, Queen and Wellington Sts. MONTREAL

## M. BEATTY & SONS, LIMITED

WELLAND, ONTARIO, CAN.

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 Tubs, and other Contractors' Machinery.

# Portland Cement

STRICTLY HIGH GRADE

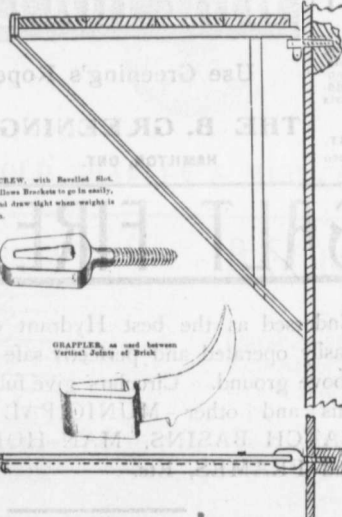
Ask Us for Prices



RAVEN LAKE PORTLAND CEMENT CO., Limited  
VICTORIA ROAD P.O. ONT.

## Interesting and Important

**"HUMPHRIES' Patent Scaffold Brackets for brick or wood buildings, plasterers, painters, plumbers, and carpenters.** They are easily fixed to brick or wood, and are perfectly safe and reliable. They almost save their cost on the first job, and last a life time. First cost only cost. Write for pair of sample brackets, with screw eyes for wood and two Grapplers for brick work.



**Agents Wanted for the Province of Quebec.**

**Stinson-Reeb Builders' Supply Company, Limited**  
188 William St., Montreal.

**DAVIS & JOHNSTON**  
CIVIL ENGINEERSWATER WORKS, SEWERAGE  
AND SEWAGE DISPOSALWm. Mahlon Davis, Herbert Johnston, C. E.  
M. Can. Soc. C. E.  
Offices: BERLIN and GALT**JOHN T. FARMER**MECHANICAL and  
HYDRAULIC ENGINEER

418 Coristine Bldg. - MONTREAL

**C. J. FENSOM, B. A. Sg.**  
CONSULTING ENGINEERAberdeen Chambers - Toronto  
Machinery designed, supervised,  
inspected and contracted for.TESTS - REPORTS  
Electric Light Plants, Power Plants,  
Pumping Plants.**CANADIAN ENGINEERS, LIMITED**  
CIVIL AND CONSULTING ENGINEERSElectric, Hydraulic Plants,  
Waterworks, Sewerage, Bridges.

33 Bank St. Chambers, OTTAWA.

**Andrew F. Macallum**Consulting and Constructing Engineer  
Steam and Electric Railways, Hy-  
draulic, Industrial and Mining Plants.Rooms 512-14  
Continental Life Building - TORONTO  
Telephone Main 4654.**McDOUGALL & McRAE**  
ENGINEERSElectric Light and Power Plants.  
Electric Railroads.  
General Consulting Work.

Citizen Building - OTTAWA

**WILLIAM FRY SCOTT**  
STRUCTURAL ENGINEERConsultation or Design: Buildings, Building  
Construction, Foundations, Walls, Roofs,  
Bridges, Masonry, Fireproof, Reinforced Con-  
crete, Reinforced Brick, Steel, Timber, Specifi-  
cations, Examinations, Valuations, and Reports  
for Investment.Aberdeen Chambers Cor. Adelaide  
and Victoria Streets, TORONTO, ONT.  
Main 4724 North 4260

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**Use Limestone Screenings**for Concrete Blocks. Being free from loam, it makes a  
stronger, cheaper, and better block than any other material.  
Write to-day for sample and prices; it means money to you.**Doolittle & Wilcox, Limited, Dundas, Ont.**Advertise-  
ments  
in the  
CONTRACT  
RECORD  
bring  
results

**THE UNITED STATES FIDELITY AND GUARANTY Co.**

Acts as Sureties on  
Contractors' Bids or Tenders  
and on Final Bonds

Rates Reasonable. See our Agent  
in your town or write direct to us  
Head Office for Canada:  
6 Colborne Street, Toronto  
A. E. KIRKPATRICK, MANAGER

WE WILL BOND YOU

**WIRE ROPE****WIRE ROPE****"AGME" BRAND**HIGHEST GRADE OF HOISTING ROPE MADE.  
EXTRA TENSILE STRENGTH FOR HEAVY WORK.

Use Greening's Rope Grease for Lubrication.

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

HAMILTON, ONT.

MONTREAL, QUE.

**THE GALT FIRE HYDRANT**Endorsed as the best Hydrant on the market,  
easily operated and perfectly safe against damage  
above ground. Circulars give full information of  
this and other MUNICIPAL SUPPLIES,  
CATCH BASINS, MAN-HOLE COVERS  
and FRAMES, Etc.**The R. McDougall Co., Limited,**  
Galt, - Canada.

MUNICIPAL ENGINEERS, CONTRACTORS AND MATERIALS

**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  
**103 BAY STREET - TORONTO**

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

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

"THE NIAGARA BAR"

**PITT & ROBINSON**  
**ENGINEERS**

411 MANNING CHAMBERS, TORONTO, CANADA  
PHONE MAIN 6307  
Offices also at Niagara Falls, Canada

A. W. Connor, B.A., C.E. E. R. Clarke, B.A. Sc.  
W. Monds, B.A. Sc.

**CONNOR, CLARKE & MONDS**  
CONSULTING ENGINEERS

Hydraulic, Municipal and Railway Work; Long  
Distance Power Transmission; Machinery  
Pumps; Complete Industrial Plants; Fire-  
proof Steel or Reinforced Concrete Office and  
Mill Buildings; Bridges, Towers, etc.  
**CEMENT TESTING LABORATORY**  
16 TORONTO ST. TORONTO, ONT.

**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.

**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

Please mention CANADIAN CONTRACT  
RECORD when corresponding  
with Advertisers.

**John H. Jackson**  
CIVIL ENGINEER

WATER POWER, ELECTRIC RAIL-  
WAYS, STRUCTURAL STEEL.  
Niagara Falls, Canada  
Associated with Charles H. Mitchell,  
C. E., Hydraulic Engineer.

**K. L. AITKEN**  
CONSULTING ELECTRICAL ENGINEER

1003 Traders Bank Building  
TORONTO, ONT.  
Long Distance Phones: Office - Main 148a  
Residence - North 311

**More Men Employed in the Paving Business**

by the Pettypiece Silex Stone Co.  
than by any other firm in Ontario.

*There is a Reason.*

**Pettypiece Sidewalks are Good Sidewalks**

We also manufacture Cement Building Blocks, Brick, Tile, etc.

**THE PETTYPIECE SILEX STONE CO.**  
AMHERSTBURG, ONT.

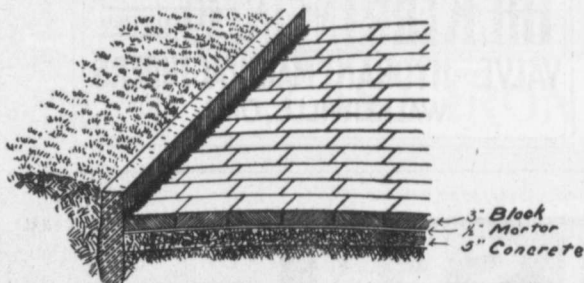
**"IDEAL"**  
**CONCRETE MIXER**



Most  
up-to-date  
Mixer  
on the  
market.

Write For  
Catalogue.

**GOULD, SHAPLEY & MUIR CO., LIMITED, BRANTFORD**



**A Scientific Pavement**

Must Be

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

*These Requirements are Met by*

**ASPHALT BLOCK PAVEMENTS**

SEND FOR DESCRIPTIVE LITERATURE

**THE ONTARIO ASPHALT BLOCK CO., LIMITED**

**WINDSOR, ONT.**

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

Driller of Oil, Gas, Salt or Artesian Wells. Deep Wells a Specialty.  
 20 YEARS' EXPERIENCE IN CANADIAN OIL FIELDS



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**

**STEAM SHOVEL**  
**HEAVY CASTING**  
**DINKEY AND**  
**HOISTING ENGINE**

Air Compressors - Contractor Supplies  
**The Rogers Mfg. Co., Limited** FOUNDRY AND WORKS:  
 Goderich, Ont.

We Manufacture

**Wheel Scrapers**

FOR THE CONTRACT TRADE

Write for our Catalogue

**BECHTELS LIMITED**

Waterloo, Ontario

DO YOU WANT TO BUY

DO YOU WANT TO SELL

**SECOND-HAND**  
**CONTRACTORS'**  
**PLANT**

The best results can be obtained at small cost by an advertisement in the CANADIAN CONTRACT RECORD. The rate is 10 cents per line, twelve lines to an inch.

Replies to advertisements may be addressed in care of this paper and will be forwarded without extra charge.

The Canadian Contract Record  
 Confederation Life Bldg., TORONTO  
 BRANCH OFFICES:  
 MONTREAL - WINNIPEG - VANCOUVER

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

WHEN INSTALLING a water works system get Kerr Valves and Hydrants. They give satisfaction every time.



Mail us your Specifications.

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

"Judge a Cement by its Works."

Is sold under a guarantee other portlands cannot make in good faith. That guarantee is backed by the oldest and most responsible manufacturers in the world.

**AMERICAN**



48 BROADWAY, NEW YORK

Selected for PANAMA CANAL in Preference at Equal Prices and has exceeded those severe requirements.

**GERMAN**

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.



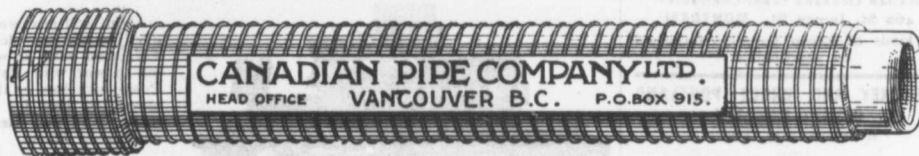
# PACIFIC COAST PIPE CO., LIMITED, - P.O. BOX 563 VANCOUVER, B.C.

Machine Banded  
Wood Stave  
Water Pipe



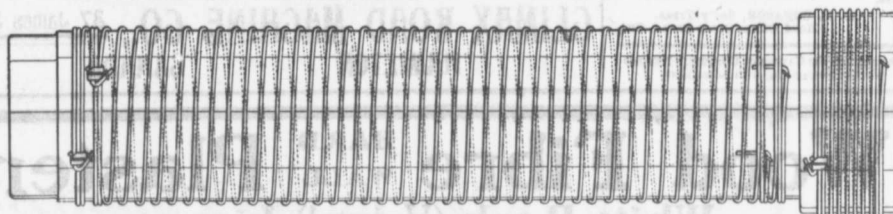
Last year we made 75 miles of pipe of various sizes; one line alone being over 10 miles of high pressure 8-inch pipe for a pumping plant for the C.P. Ry. Co.

WRITE FOR CATALOGUE  
FULL PARTICULARS AND ESTIMATES FURNISHED



## GALVANIZED WIRE WOUND WOODEN PIPE

No frost breaks, no corrosion. No electrolysis. It is easily and cheaply laid.  
Its carrying capacity is never decreased by rust.



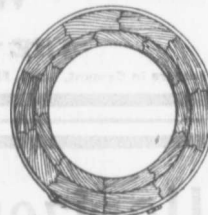
## The Dominion Wire Wound Wood Water Pipe

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 CO.,**  
NEW WESTMINSTER, B. C. LIMITED

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

WRITE FOR CATALOGUE.



End view of Pipe and Coupling

Please mention the CANADIAN CONTRACT RECORD  
when corresponding with advertisers.

# CANADIAN IRON AND FOUNDRY CO. LIMITED

Special Castings  
Flange Pipe  
Branches  
Hydrants  
Valves



## CAST IRON PIPE

Valve Boxes  
and  
General  
Water  
Works  
Supplies

SMALL DIAMETER WHEELS AND AXLES FOR CONTRACTORS.

CAR WHEELS. CASTINGS OF ALL KINDS.

Works at:

HAMILTON, ONT.  
ST. THOMAS, ONT.  
FORT WILLIAM, ONT.

MONTREAL, P. Q.  
THREE RIVERS, P. Q.  
LONDONDERRY, N. S.

HEAD OFFICE: - IMPERIAL BANK CHAMBERS - MONTREAL

**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,** 65 St. Peter Street, Quebec.

**BANCO ZAROSSI**

Italian Licensed Labor Contractor  
460 St. James St., MONTREAL  
All kinds of Italian Laborers furnished on short notice.

**THE GREY AND BRUCE PORTLAND CEMENT COMPANY**

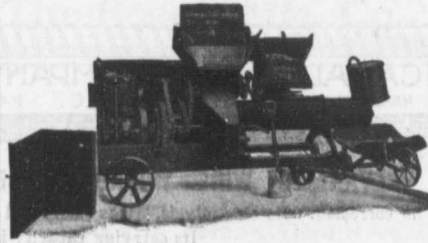
of Shallow Lake, Limited.  
Manufacturers of  
**"HERCULES" BRAND OF PORTLAND CEMENT**  
Very finely ground. Unsurpassed for Sidewalks, Floors and all work requiring the Highest Grade of Portland Cement. For prices address,  
**A. D. CREABOR,** Sec'y-Treas.  
Head Office, Owen Sound, Ont.

Please mention the CANADIAN CONTRACT RECORD when corresponding with Advertisers.

**SAMSON CEMENT**

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

**THE EUREKA CONCRETE MIXER**



is right, will mix wet or dry just as you please. Furnished with or without power with Rotary Pump, with two or three measuring bins for Cement, Sand and Gravel or Crushed Stone.

SUITABLE FOR  
General Concrete Work,  
Brick, Block and Tile  
Pipe Makers.

FOR CATALOGUE AND PRICE WRITE

**GLIMAX ROAD MACHINE CO.,** 37 James South  
HAMILTON - CANADA

**Wood Fibre** HARD WALL **Plaster**  
**White Rock (Hydrated) Lime**  
MANUFACTURED BY  
**THE IMPERIAL PLASTER CO., Limited**  
Dealers in Cement, Lime, Fire Brick, Fire Clay, Plaster Paris. King St. (West of Subway) TORONTO

**Horizontal Tubular Boilers**  
For Stationary  
**Power Plants**

High Pressure Tubular Boiler.  
Medium or High Pressure.  
All Sizes.  
High Pressure Tubular Boilers from 80 to 250 h. p., a specialty.  
Write for Bulletin.

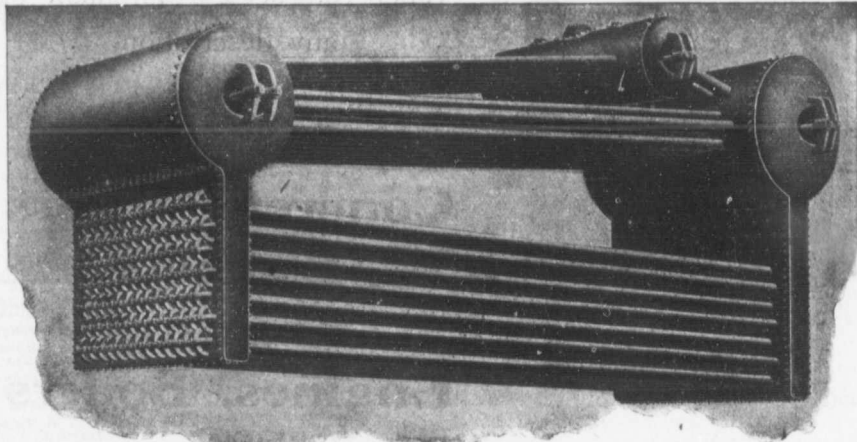
We also build Vertical Tubular and Locomotive Type Boilers and contract for complete Steam Power Plants.

**THE JENCKES MACHINE COMPANY LIMITED**

Sales Offices: St. Catharines, Roseland, Halifax, Cobalt.  
Executive Office: 62 Lansdowne St., SHERBROOKE, QUE.  
Plants: Sherbrooke, Que., St. Catharines, Ont.

Augu  
CA  
Puri  
Supe  
Ca  
Distric  
JAMES 1  
TH  
MAN  
I  
Speci  
Wate  
Stackpole  
Patent in  
Because no  
It sweeps C  
cision. It  
less gearing  
a reasonable

# CANADA WATER TUBE BOILERS



### SAVE COAL

Purify Feed Water  
Superheat Steam

Clean Easily  
Give Perfect Combustion

Send for Bulletin No. 32.

## Canada Foundry Company, Limited

HEAD OFFICE AND WORKS: TORONTO, ONT.

District Offices: MONTREAL, HALIFAX, OTTAWA, WINNIPEG, VANGOUVER, ROSSLAND

JAMES THOMSON, President. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary. ALEX. L. GARTSHORE, Treasurer.

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

Manufacturers of

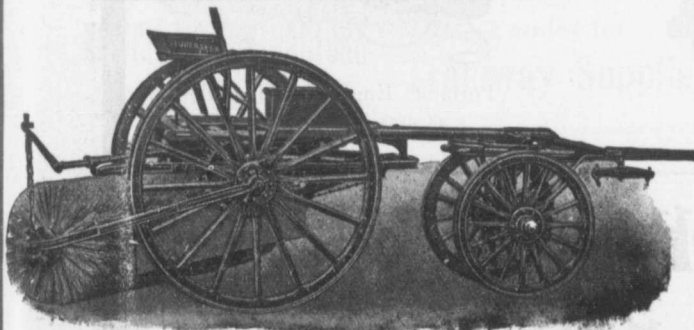
Flexible and Flange Pipe,  
Special Castings and all kinds of  
Waterworks Supplies.

### CAST IRON PIPE

3 inches to 60 inches diameter.

for Water, Gas, Culvert and Sewer

HAMILTON, 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 wearing parts, and has less gearing than any other sweeper made. It is free from all unnecessary complications. With a reasonable care it does not get out of order. Send for complete descriptive catalogue.



### Studebaker Sprinkler

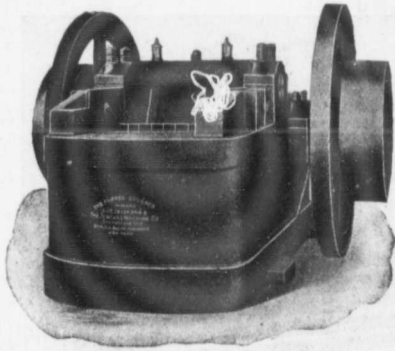
(PATENT IMPROVED.)

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

Geo. Heaman, Mfr., London, Ont



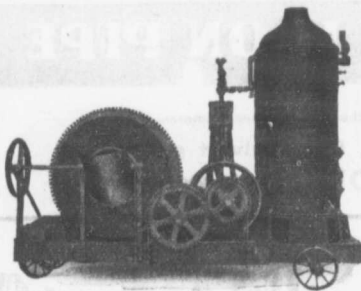
When you need Equipment of  
any description

Such as

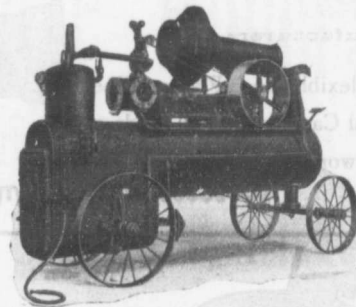
**Rock Crushers**  
**Concrete Mixers**  
**Buckets**  
**Barrows**  
**Engines, Boilers**  
Etc.

Let us have your enquiry

## Concrete Equipment



Ransome Concrete Mixers  
in all styles and capacities.



Portable Engines and Boilers  
all sizes—prompt shipment.



**F. H. Hopkins & Co**  
Montreal

