

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—SEPTEMBER 4, 1907—WINNIPEG, VANCOUVER

No. 27

THE CANADIAN CONTRACT RECORD

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lishers of any irregularity in delivery of papers.

**Classified Index
of Advertisers,
Page 15.**

DEBENTURES FOR SALE

TOWN OF GODERICH

Sealed tenders will be received up till THURS-
DAY, THE 19TH DAY OF SEPTEMBER, 1907,
for the purchase of Debentures:

\$11,355.00 Local Improvement.
2,000.00 Jackson Mfg. Co., Bonus.
50,000.00 Wheel Rig's Co., Bonus Loan.
25,000.00 Kensington Mfg. Co., Bonus Loan.
Particulars from undersigned.
No tender necessarily accepted.

M. O. JOHNSTON,
Town Clerk.

TO CONTRACTORS

TENDERS FOR SUNDAY SCHOOL BUILDING

Whole or separate tenders will be received by the
undersigned until 12 o'clock noon, on TUESDAY,
17TH SEPTEMBER, 1907, for the masonry, car-
pening, plastering, painting and glazing, tin-
smithing, slate and gravel roofing, plumbing and
electric wiring required in the erection of a Sunday
School in connection with Knox Church, Galt.

Plans and specifications may be seen at the office
of Messrs. Smith & Gemmell, Architects, 37 Bank of
Commerce Building, Toronto, or at the office of the
undersigned, Commercial Block, Galt.

The lowest or any tender not necessarily accepted.
FRANK HOGG,
Chairman Knox Church Building Committee.

City of Stratford

Sealed tenders addressed to Ald. H. Pauli, Chair-
man of the Board of Works, and endorsed "Tenders
for Concrete Walks," will be received up till 12
o'clock noon, MONDAY, SEPTEMBER 3TH, for
the construction of approximately forty thousand
(40,000) square feet of concrete walks.

Specifications may be seen at the City Engineer's
office and forms of tender obtained upon application.
Each tender must be accompanied by a marked
cheque payable to the City Treasurer for the amount
called for in form of tender. The lowest or any
tender not necessarily accepted.

L. MALCOLM,
City Engineer.

CITY OF FERNIE, B.C.

To Sewer Contractors and Builders

Sealed tenders will be received by the undersigned
until 8 p.m., 5TH DAY SEPTEMBER, for the
construction of a Septic Tank and Filter Beds in
connection with the City Sewerage System.

Plans and specifications can be seen and forms of
tender obtained at the City Engineer's office on and
after 21st day August.

The lowest or any offer not necessarily accepted.

R. POTTER, C.E.,
City Engineer

City Engineer's Office, 17th August, 1907.

CITY OF WINNIPEG

Point du Bois Hydro- Electric Development

Tender for

Tramway Supplies

Tenders will be received up to noon of THURS-
DAY, SEPTEMBER 5TH, 1907, for the following
supplies:

ONE new or second hand, saddle tank locomotive;
same to be about forty tons, all on drivers and not
more than 2000 lbs. per lineal foot of track; to be
wood or coal burning and equipped with Haggis or
other approved water lifter.

SIX new or second hand, standard gauge, 30 000
or 40,000 lbs. Flat Cars.

ONE new or second hand steam tug, 50 to 60
Horse Power, about fifty feet long and ten feet
beam.

Tenders shall give full description of apparatus,
stating also duration of previous service, name of
maker and date of earliest delivery. All material
shall be subject to inspection. Prices to be f.o.b.
Lac du Bonnet, C.P.R., Manitoba.

M. PETERSON,
Secretary.

Office of the Board of Control,
Winnipeg, August 23rd, 1907.

CITY OF WINNIPEG

Point du Bois Hydro- Electric Development

Tenders for Construction and Equipment

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
(here add the particular item or items as below),
will be received at the office of the undersigned up to
noon of TUESDAY, 18TH DAY OF OCTOBER,
1907, for the construction of the general works, and
for the supply and erection of the various portions of
the equipment for the Hydro-Electric Works and
station at Point du Bois, for a Transmission Line
between Point du Bois and Winnipeg, and for a
Receiving Transformer Station in Winnipeg.

Copies of the Instructions to Bidders, Plans, Spec-
ifications and Forms of Tender may be obtained at
the Power Engineer's Office, Carnegie Library
Building, Winnipeg.

Each tender must be accompanied by a certified
cheque payable to the order of the City Treasurer
for the sum called for in the corresponding "Instruc-
tion to Bidders," which cheque will become forfeit to
the Corporation in the event of the successful tender-
er refusing or neglecting to sign a satisfactory
contract when called upon to do so.

Individual tenders will be received for:

- (1) Telephone System.
- (2) General Works at Point du Bois.
- (3) 4,000 H. P. Turbines (five).
- (4) 450 H. P. Turbines (two).
- (5) 3,000 K. W. Generators (five).
- (6) 250 K. W. Generators (two).
- (7) Indicating Motor (one).
- (8) Step-up Transformers (five).
- (9) Generating Station, Switching and Accessory
Apparatus.
- (10) Generating Station, Light, Heat and Power
Systems.
- (11) Generating Station, Oil and Air Systems.
- (12) Erection of Transmission System (75 miles).
- (13) Steel Tower.
- (14) High Tension Insulators.
- (15) Electric Transmission Cable.
- (16) Terminal Station.
- (17) Step-down Transformers (five).
- (18) Terminal Station, Switching and Accessory
Apparatus.
- (19) Terminal Station, Light, Heat and Power
System.
- (20) Terminal Station, Oil and Air System.
- (21) Testing Transformers and Apparatus.
- (22) Electric Travelling Cranes (three).
- (23) Turbine Governors (seven).
- (24) Auxiliary Apparatus.
- (25) Repair Shops.

An alternative, lump-sum tender will be received
for the entire work, including all of the above
mentioned items, together with additional work and
equipment necessary to install a complete working
plant. As a further alternative tenderer may
include or group together one or more of the above
items, providing that they have also tendered for
the individual items of such group.

The Board reserves the right to reject any or all
tenders, or to accept any tender which shall appear
advantageous to the City of Winnipeg.

M. PETERSON,
Secretary.

The Office of the Board of Control,
Winnipeg, Aug. 24th, 1907.

*These numbers are those of the different volumes
of Specifications.

[FOR ADDITIONAL ADVERTISEMENTS FOR TENDERS SEE NEXT PAGE]

REINFORCED CONCRETE

Advertiser is open for Re-Engagement as Superintendent or Foreman on Reinforced Concrete Construction or Building of any kind; can show good results at fair costs.

Box 113 CONTRACT RECORD, Toronto.

FOR SALE

One, 7 x 12, double cylinder double drum Beatty hoisting engine in first class condition; one Beatty swinging gear, also irons and timbers complete for large derricks, size, 14 inches.
THE CADWELL SAND & GRAVEL CO.,
Windsor, Ont.

Concrete Sidewalks

Tenders will be received by the undersigned up to 7 P.M. on SATURDAY, THE 14TH SEPTEMBER, 1907, for building Concrete Side Walks on at least 4 streets in Town North Toronto. Plans and Specifications, etc., can be examined at Town Hall, Eglinton.

Any tender not necessarily accepted.

W. J. DOUGLAS,
Clerk & Treas. Town North Toronto,
Eglinton Cor. York ave.

CONTRACTS OPEN.

HAVELOCK, ONT.—The ratepayers have approved of a by-law to raise \$4,000 for school extensions.

MANOR, SASK.—Tenders have just been taken for the erection of a solid brick school building here.

BROCKVILLE, ONT.—A by law to provide \$9,000 for improvements to bridges was recently defeated.

COBALT, ONT.—The Salt Lake Smelting & Refining Co. will establish a smelter plant at North Cobalt.

QUEBEC, QUE.—The ratepayers of Notre Dame gave an unanimous vote in favor of the water works by-law.

SASKATCHEWAN, SASK.—The ratepayers have again rejected a by-law for the installation of a telephone system.

SASKATOON, SASK.—It is reported that a large Minnesota milling concern will shortly establish a roller mill in this city.

PORT MOODY, B.C.—Peers Bros. are erecting a new saw mill at this place, and it is reported that several others are contemplated.

STRATFORD, ONT.—Negotiations are being considered for the establishment in this city of a cutlery firm from Bradford, Pa.

PRINCE RUPERT, B.C.—It is reported that George Brown of San Francisco, will shortly clear a site and erect a lumber mill here.

BRANDON, MAN.—A permit has been issued to P. MacInnon for the erection of a brick residence on Fifteenth street to cost \$3,500.

ALBERNIS, B.C.—30,000 acres of timber land have been purchased by the Red Cliffe Lumber Company, of Duluth, who will erect a large saw mill here.

TORONTO JUNCTION, ONT.—The Town Clerk has been authorized to take tenders for a new fire hall towards the erection of which \$5,000 has been granted.

ESTEVAN, SASK.—The Town Council have unanimously approved of Engineer Chipman's scheme for the installation of a water system at a cost of nearly \$100,000.

KINGSTON, ONT.—It is proposed to replace the old wooden bridge over the Cataract river between the City and Barriefield by a new modern steel and concrete structure.

LONDON, ONT.—Recent developments indicate that votes of the ratepayers will shortly be taken on a by-law to issue debentures for the proposed tuberculosis hospital.

NIAGARA FALLS, ONT.—The Ontario Railway & Municipal Board have received an application from the city to authorize a by-law to provide \$11,940 for waterworks improvements.

COLLINGWOOD, ONT.—The Royal Gas Engine Co. has made the following proposition to the town: To erect a \$10,000 factory and equip it with plant and machinery at a cost of \$35,000.

TREHERNE, MAN.—A meeting of the Railway Commissioners was recently convened to discuss matters connected with the proposed new station.—A new Presbyterian church is in course of construction.

NELSON, B.C.—A new theatre will likely be built on the northeast corner of Stanley and Victoria streets by the Nelson Theatre Co., which is yet to be incorporated. Architect Carrie has the work in hand.

ST. THOMAS, ONT.—The ratepayers in the western part of the Township of Ashfield have approved of a by-law to guarantee the bonds of the Ontario West Shore Electric Railway Company to the extent of \$125,000.

NEW EDINBURGH, ONT.—The new firm of Thackeray & Sproule will shortly erect a building on the corner of Beechwood avenue and McKay street in which they will manufacture office fixtures, interior finishings, &c.

BEN ALLEN, ONT.—The erection of an 800-barrel cement plant at a cost of \$100,000 is projected. The company undertaking the scheme claim that there is enough marl here to keep a 1,500-barrel mill going for 80 years.

BRANTFORD ONT.—The Bank of Nova Scotia will likely spend several thousand dollars in altering their new premises.—Schultz Bros. have obtained a permit for the erection of the new Bank of Commerce building, approximate cost, \$25,000.

PICTON, ONT.—The Government will shortly erect an observatory tower on the Glenora road about two miles from here. Reginald Neelands, of the Dominion Observatory, together with a party of surveyors, was recently in town selecting a site for the building.

WELLAND, ONT.—J. R. Wilson, architect, of Niagara Falls, N.Y., has just prepared plans for the rebuilding of the Methodist church.—In return for certain taxation immunities, the Bemis Bag Co., of Boston, have entered into an agreement with the Corporation to erect a factory at a cost of \$1,500,000.

EDMONTON, ALTA.—Arrangements are being made by the C.P.R. for the construction of a main line from Kamloops, B.C., to this city. It is reported that the work will cost \$20,000,000 owing to the amount of rockwork in the undertaking.—G. B. Buhler, of San Francisco, was recently in the city in connection with the establishment of a glass, tile and sewer factory.

GUELPH, ONT.—It is reported that there is a strong likelihood of an American Co. of agricultural implement manufacturers locating a branch in this city.—H. F. McNaughton, Secretary, Department of Public Works, Toronto, wants tenders up to September 6th for the construction of a coal bin at the Agricultural College.

NEW WESTMINSTER, B.C.—President Hill, of the Great Northern Railway, is submitting plans to Mayor Keary for the proposed depot which the company will erect.—It is announced that the Government are about to erect a \$200,000 asylum on the site of the Government farm at the Junction of the Coquitlam and Fraser river. Plans of the building, which is to be constructed of white brick, are being prepared.

SAULT STE. MARIE, ONT.—It is reported that the Canadian Smelting & Refining Co., of Toronto, are going to build a large smelter here.—H. F. McNaughton, Secretary, Department Public Works, Toronto, wants tenders up to September 10th for the erection of registry offices in this town and Port Arthur. Plans at office of Department and at the local registry office.

TANCOOK ISLAND, N.S.—Tenders are invited by Fred. Gelinis, Secretary Department of Public Works, Ottawa, up to September 17th for construction of a breakwater at this place. Plan at offices of E. G. Millidge, Resident Engineer, Halifax; on application to Postmaster at Tancook Island, and at the local registry office.

VICTORIA, B.C.—The Chief Commissioner of Lands and Works, invites tenders up to September 9th for the erection of buildings for the Industrial school, Vancouver. Specifications at office of T. E. Juliet, Vancouver, and at the Department here.—The Jordan River Logging Co. will likely erect at Jordan river next season a large saw mill with a cut of about 150,000 feet of lumber per day.

CHATHAM, ONT.—Four propositions have recently been made for the location of new industries in this city, including a large American concern from Cleveland.—Recent building permits include: T. W. Piggott, 3-storey brick building, Stone street, \$16,000; W. H. Taylor, one-storey brick building, Colborne and Adelaide streets, \$4,500; D. J. Sullivan, 2-storey frame building, Park street, \$3,000.

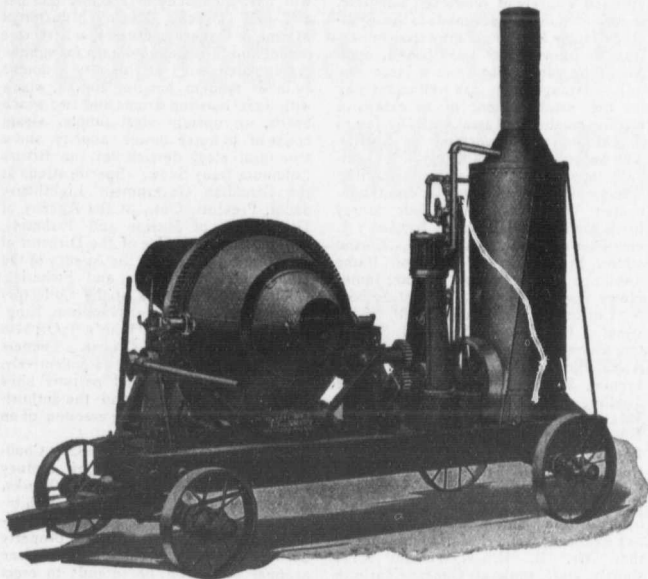
BRETON COVE, N.S.—Fred Gelinis, Department of Public Works, Ottawa, wants tenders up to September 18th for the construction of an extension to the landing pier. Plan at offices of E. G. Millidge, Resident Engineer, Antigonish, N.S.; C. E. W. Dodwell, Resident Engineer, Halifax; on application to Postmaster, Breton Cove, or at the Department of Public Works, Ottawa.

MONTREAL, QUE.—It is necessary arrangements can be made with the railway authorities the Live Stock Exporters' Association will likely expend \$1,000,000 on the construction of commodious buildings in the west end of the city.—Brown & Vallance, architects, prize winners in the recent Parliamentary competition, are preparing plans for a large factory which the Canadian Cotton Spool Co. will erect at Riverside Park.

PORT STANLEY, ONT.—It is rumored that the South-Western Traction Co. have an option on a site at New Orchard Beach upon which they will likely erect a fine summer hotel next season, also that they are negotiating for the purchase of the Fraser house property and that they will convert the hotel into a sanatorium, taking sulphur water from Pollock's spring.

FRASER, B. C.—Following the building of the new electric tram line from Eburne to New Westminster has come a great demand for sites for saw mills and other industries, and it is reported that a large Manitoba lumber interest has purchased a site near the B. C. Cattle Co.'s abattoir, and that the building of another big mill just east of Eburne by the North Arm Lumber Co. has commenced.

OTTAWA, ONT.—The Premier has endorsed the plans of the proposed new G.T.R. Hotel on Major's Hill.—F. Gourdeau, Deputy Minister of Marine and Fisheries, invites tenders up to September 12th for supplying and delivering at Vancouver, B.C., a double cylinder tandem hoisting engine, winch with four hoisting drums and two winch heads, an upright steel tubular steam boiler of 30



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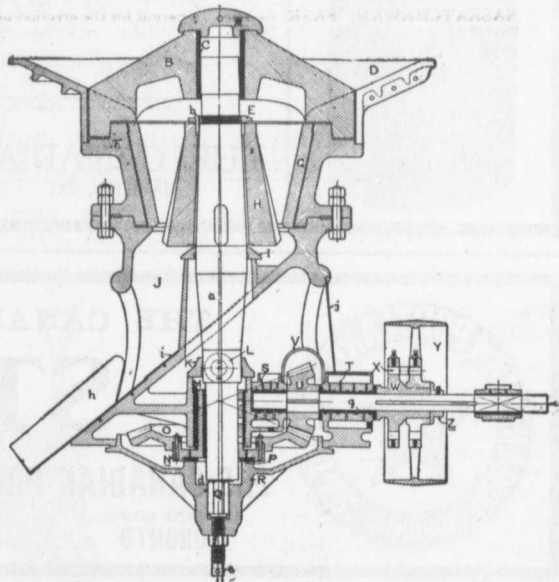
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SECTIONAL VIEW AUSTIN GYRATORY CRUSHER

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horse power capacity, and a structural steel derrick for the British Columbia Buoy Scow. Tenders may be sent separately or collectively.—G. H. Wilson, Chairman Finance Committee, wants tenders up to September 11th, for the purchase of debentures amounting to \$1,052,653. Particulars on application to City Treasurer.

WINNIPEG, MAN.—E. L. Drewry is expending \$50,000 in the erection of a new solid brick structure 66 feet x 200 feet as an addition to his bottling plant.—At a recent meeting of the Retail Butchers' Association a resolution was passed urging the city to provide a public cattle market and abattoir.—Tenders are invited up to September 7th by M. Peterson, Secretary Board of Control, for supplying metal lockers for the new police station. Specifications at offices of Hooper & Walker, architects, McIntyre Block.—It is reported that a six-storey solid brick warehouse will be erected this fall on Portage avenue by the Ottawa Fruit & Produce Exchange, at a cost of \$100,000.

VANCOUVER, B.C.—S. H. Friedlander, General Manager of the United States Amusement Co., has been negotiating for a site for a new building which he intends to erect within the next few months.—Grant & Henderson have recently completed plans for a new and up-to-date laundry. The building will be

90 feet x 105, two storeys high and constructed entirely of reinforced concrete.

—Application has been made to the Council by Hugh McDonald for water connection to property on Lulu Island, upon which he intends to erect a large saw mill.—Arrangements are well under way for the establishment of an extensive electric smelter and steel works by James A. Moore and associates of Seattle. The business of the company will eventually be extended to manufacturing iron works.—Recent building permits include: Walter Hepburn, four storey brick block, Randall Street, \$22,000; J. G. Thomas, frame dwelling, Cotton street, \$1,000; F. W. Eristol, frame dwelling, Fourth avenue, \$4,000; James Howe, frame dwelling 14th street, \$2,000; A. Cotton, frame shingle mill, Birch street, C.P.R. reserve, \$3,000; I. S. Burton, frame dwelling, Fifth avenue, \$2,000; A. E. Thompson, frame dwelling, Fifth avenue, \$2,000; A. S. Lovich, frame dwelling, First street, \$4,900; Osmond McDonald, frame dwelling, Third street, 1,800; Peter Schippers, frame dwelling, Fourth street, \$1,800; J. A. Crawford, frame dwelling, First street, \$1,800; Coffin & McLennan, frame dwelling, Eighth street, \$5,500; J. A. Glendenning, frame store and dwelling, Howell street, \$1,800.—It is announced that Mr. B. F. Graham will shortly start work at Queen Charlotte

Islands, on the erection of a mill, which will have a capacity of 200,000 feet per day.—F. Gordeau, Deputy Minister of Marine & Fisheries, Ottawa, will receive tenders up to September 12th for supplying and delivering at this city a double cylinder tandem hoisting engine, winch with four hoisting drums and two winch heads, an upright steel tubular steam boiler of 30 horse power capacity, and a structural steel derrick for the British Columbia Buoy Scow. Specifications at the Canadian Government Lighthouse depot, Prescott, Ont., at the Agency of Department of Marine and Fisheries, Montreal, at the office of the Director of the Sorel Ship yard; at the Agency of the Department of Marine and Fisheries, Quebec, at the offices of the Collectors of Customs at Toronto, Hamilton, Kingston, Ont., and at St. John's, P.Q.; also at the Department, Ottawa. Tenders may be sent separately or collectively.—Applications for school permits have been abnormally large and the authorities are contemplating the erection of an additional building.

TORONTO, ONT.—The City Council have been authorized by Sydney Fisher, Acting Minister of Public Works, to erect a sea wall in front of the Exhibition Grounds.—L. C. Sheppard, of Adelaide street east, has purchased property between Dufferin street and Gladstone avenue, on which he intends to erect



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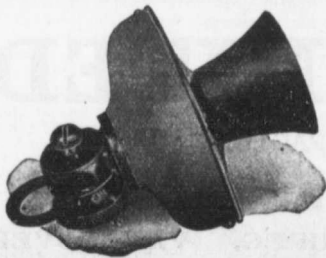
THE CANADIAN STANDARD

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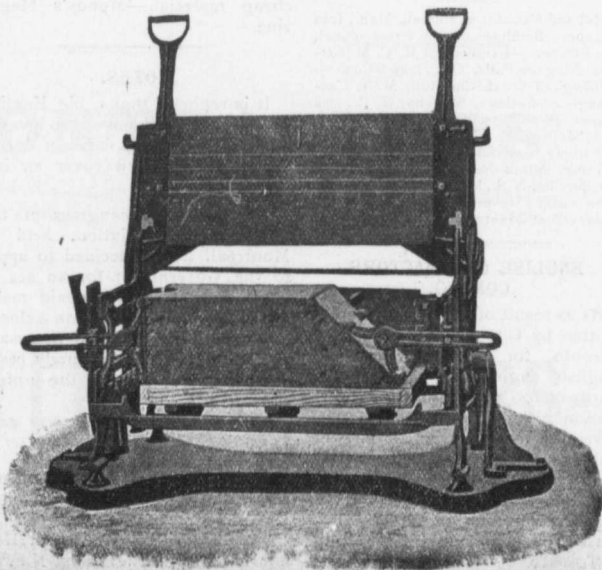
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M'fg. Co.
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 MONTREAL.

about 30 houses ranging from \$2,400 to \$4,000. Twenty permits have already been issued in this connection, totalling \$50,000.—Recent building permits include:—W. J. O'Reilly, 3 attached 2½-storey back dwellings, Crawford street, \$8,000; H. J. Reynolds, 3 attached 2-storey and attic brick dwellings, Clinton street, \$10,000; Davis & Moore, pair 2-storey semi-detached brick veneered dwellings, Lansdowne avenue, \$4,000; Wilkins & Co., 2-storey brick dwelling, Madison avenue, \$6,000; Davis & Fuller, pair 2-storey semi-detached brick veneered front and rough cast dwellings, Victor avenue, \$2,500; R. A. Graydon, 2 detached 2½-storey brick dwellings, George street, \$8,000; G. Ostrander, 2½-storey brick dwelling, Wright avenue, \$3,000; H. C. Cooper, 2-storey brick veneered front and rough cast dwelling, Muir avenue, \$2,700; Scott & Strickland, pair 2-storey brick veneered front and rough cast dwellings, Lansdowne avenue, \$3,100; L. C. Sheppard, 7 pairs 2-storey semi-detached brick dwellings, MacLinn avenue, \$25,000; L. C. Sheppard, 4 pairs 2½-storey semi-detached brick dwellings, Parr street, \$16,800; M. Davies, addition to dwelling, Markham street, \$2,000; W. O. McTaggard, three 3-storey brick stores and dwellings, College street, \$12,000; Alex. Reid, 2-storey brick dwelling, Dovercourt Park, \$2,300; Pape avenue Presbyterian Congregation, 1-storey brick church, Pape avenue, \$2,000; L. C. Sheppard & Co., 2½-storey brick dwelling, Parr street, \$2,000; L. C. Sheppard & Co., 2½-storey brick dwelling, Parr street, \$2,200; L. C. Sheppard & Co., 2½-storey brick dwelling, Dufferin street, \$2,600; L. C. Sheppard & Co., 2½-storey brick dwelling, Gindstone avenue, \$2,000; A. Elliott, 2 pairs semi-detached and 1 detached 2½ storey brick dwellings, Oakland and Alcorn avenues, \$12,000; Jas. Lancaster, pair 2½-storey semi-detached brick dwellings, Galley avenue, \$5,000; Wm. Rogers, 3 attached 2-storey and attic brick veneered front and rough cast dwellings, Symington avenue, \$4,000; H. J. Squires, 2-storey and attic brick dwelling, Lennox street, \$4,500; P. Rouch, 3 attached 2-storey brick dwellings, Denison avenue, \$10,000; Arthur Bell, 2-storey brick dwelling, Howard Park avenue, \$2,500; Thos. Elsworthy, pair 2-storey semi-detached brick veneered front and rough cast dwellings, Armstrong avenue, \$3,000; Wm. Coon, 2-storey frame store and dwelling, Herbert avenue, \$3,000; Jno. Mugford, 2½-storey brick veneered front and rough cast dwellings, Horne street, \$2,000; Symons & Rae, 2-storey brick biscuit factory, Ontario street, \$10,000; Geo. S. Britnell, addition to factory, Queen street, \$12,000; Canadian Ornamental Iron Co., 1-storey brick factory, River street, \$5,000.—Tenders are invited by H. F. McNaughton, Secretary Public Works up to September 10th for the erection of registry offices at Port Arthur and Sault Ste. Marie. Plans at registry offices in Port Arthur and Sault Ste. Marie and at the Department.—George H. Gooderham has purchased property on Toronto street on which he will erect a five-storey motor garage.

CONTRACTS AWARDED.

BRANDON, MAN.—L. La Chance, of Ottawa, has secured the contract for erecting the new armouries at \$52,700.

PETERBORO, ONT.—The Knox church authorities have given the tender for the new gallery to McIntyre Bros., of this town.

FLORENCEVILLE, N.B.—15 horse power engine for Wheeler's new grist mill: McFarley, Thompson & Anderson, Fredericton.

PETERBORO, ONT.—Brown & Aylmer of this city have secured the contract for building section 5 of the Trent Canal, at \$600,000.

BANK HEAD, ALTA.—The coal company have awarded a contract for the erection of 25 workmen's cottages to W. S. Spofford, of Calgary.

GIBSON, N.B.—The Chief Commissioner of Public Works has awarded the contract for rebuilding the Cole Island bridge to R. A. Logan.

OTTAWA, ONT.—The Collegiate Institute Board have awarded contract for extensions to their building to Taylor, Lackey & Crain. The price is in the neighborhood of \$225,000.

GREENWOOD, B. C.—The B. C. Copper Co. have just purchased a 100 h.p. variable speed Bullock motor, to drive their Mother Lode crusher, from the Allis-Chalmers-Bullock Co.

WAWAESA, MAN.—The Northern Construction Co., of Winnipeg, have secured the contract for the sub-structure to be built over the Souris river at this place, and the Algoma Steel Bridge Co. the contract for the superstructure.

WINNIPEG, MAN.—Extension to Drewry bottling plant: Brick work, Contractor Horner; excavation, Dodson & Jackson.—The City authorities have awarded an important contract to McAvity & Son, of St. John, N.B., for the supply of 2,000 6-inch valves at \$13.50 and 25 8-inch valves at \$20 each.

HALIFAX, N.S.—The following contracts have been awarded: For 2,000 half-inch trident meters, the Neptune Meter Co., of New York, at \$13.26 each; 100 three-quarter-inch trident meters, the same company, at \$19.89 each; and for 900 half-inch Lambert meters, H. B. Clark & Son, this city, at \$11.20 each with connections.

TORONTO, ONT.—The following contracts have been awarded by the Board of Control: Asphalt pavements, Godson Contracting Co., Portland street, King to Queen, \$4,389; Gould street, Victoria to Mutual, \$4,879; Halton street, Dundas to Shaw, \$2,738; Delaware avenue, Shanly to Hallam, \$5,388; Admiral road, Bernard to St. George, asphalt, Barber Contracting Co., \$4,834. Brick pavements to City Engineer, Davies avenue, Queen to Matilda, \$3,918; Burnfield avenue, Shaw to Ossington, \$3,068. Bitulithic pavement, Castle Frank avenue and crescent, Warren Paving Co., \$10,017.

FIRES.

Mill and elevator at Russell, Man., loss \$25,000.—Buildings of Ann street school, loss \$10,000.—Buildings of R. C. McFarlane, Niagara Falls, Ont., loss \$5,000.—Buildings of W. H. Charlton, M. T. Cavanaugh, and others, St. John, N. B., loss \$5,000.—Buildings of Norris J. McCaw, E. L. Mattick, C. W. Speers, A. Douglas and others, Griswold, Man., loss \$25,000.—Rotary mill of the Gould Northrup Co., Washerville, N.S., loss \$4,000.—Fennell's store and several other buildings destroyed at Trenton, Ont.

ENGLISH CONTRACTORS COMING.

As a result of an article recently written by City Engineer Rust, of Toronto, for The Surveyor, an English engineering journal, upwards of 100 applications for information about paving contracting have been received from all parts of England. The writer of one letter stated that he had a capital of \$500,000. Mr. Rust has sent the required information with invitations to come and start contracting in Toronto.

TRAMWAY SUPPLIES.

Contractors are requested to note that the date for the reception of tenders for tramway supplies for the City of Winnipeg power plant is Thursday, September 5th instead of October 1st as given in the advertisement last week.

DAWN OF THE AGE OF CEMENT.

While neither iron nor steel is going out of use, yet it is certain that the world is now verging into an age of cement, which is to be the chief constructive material of the future. When a single mammoth skyscraper contains enough concrete work to pave Broadway from curb to curb, a foot deep for a length of over two miles; when the anchorages and approaches of the new Manhattan bridge require 65,000 tons of Portland cement to make the concrete; when one manufacturer of cement advertises an output of 30,000 barrels a day—when such conditions surround us, it is time to pause and consider what there is about cement-made concrete that has brought it into such general demand within a few years.

Because wood, which has been growing scarce, has increased in price, and because the world has learned that concrete made with cement is the best and cheapest building material. Concrete is an artificial stone made of sand and broken rock, bound together with cement. Almost any sort of sand and stone will do, and, when properly mixed with water and about a sixth to an eighth part of cement, the whole hardens into a solid mass of great strength, and this strength actually increases with age and exposure to weather. Instead of deteriorating under water, cement grows harder, and its resistance to fire is superior to any other known cheap material.—Moody's Magazine.

NOTES.

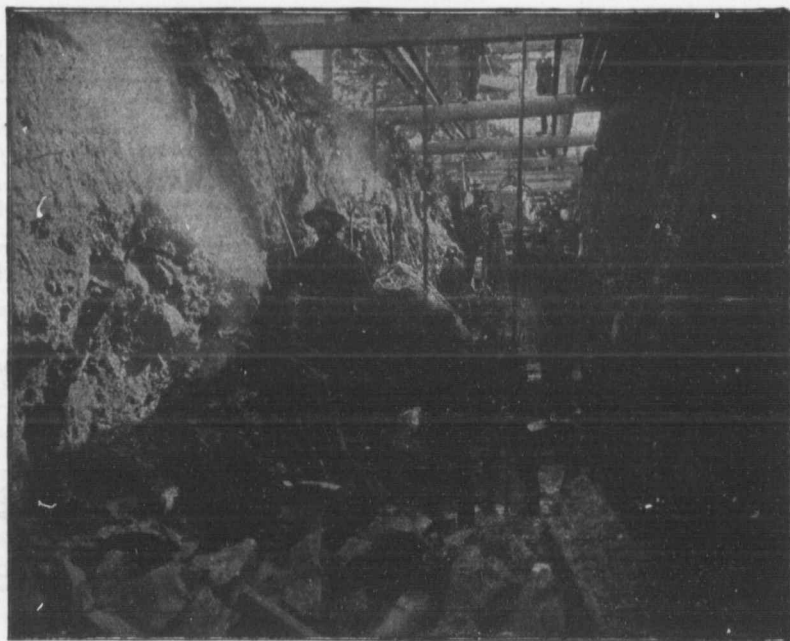
It is reported that a big English crucible company have been investigating the graphite fields in northern Quebec, which cover an immense area.

At the recent congress of the Architects' Association, held in Montreal, it was decided to apply to the Government for an act of incorporation. This would make the architectural profession a closed one, and would render it necessary for everybody to be properly certified before engaging in the profession.

PERSONAL.

Ernest A. Stone, Assistant Structural Engineer for the Canada Foundry Co., has been offered the Chair of Civil Engineers in Dalhousie University, Halifax, N.S.

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Three out of the ten of our "Ingersoll" steam drills used by Messrs. Laurin and Leitch in excavating rock at St. Louis de Mile End, Quebec. These rock drills are fully described in catalogue No. 81.

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NEW YORK BOARD OF UNDER-WRITERS ON CEMENT CONSTRUCTION.

With a view to determining the fire-resisting qualities of cement and concrete, and formulating a standard specification for their use, a special committee of the Board of Underwriters of New York has been engaged in an exhaustive study of the subject. One difficulty of the investigation arose from the fact that the action of concrete, when combined with reinforcing materials, has been hitherto only partly understood, and experimental data on the subject is, even at this day, comparatively scarce. The board, however, has issued a revised edition of a model building code, which it is urging the municipalities throughout the United States to adopt. The committee strongly urges that the design of concrete buildings should be undertaken only by engineers of special training and experience in this line of work. The report says that the experiences of the last year have given additional proof of the gross carelessness and incompetence which have prevailed in many important works. There have been several instances of the collapse, during construction, of large and expensive buildings, which have been traced in every case to the neglect of well-known rules of safety. In one case, where there was lack of intelligent superintendence, the cheap labor did not appreciate the need for careful workmanship, and the result was the use of too little cement, or too little water, or improper mixing, followed by the collapse of the wall before it had reached half its full height. In several cases the concrete, while under construction, was allowed to freeze, and as soon as the forms were removed its inevitable collapse followed. In other cases the wooden moulds or forms had not been properly cleaned out, and shavings, blocks of wood and other refuse had been so imbedded in the concrete as to introduce a fatal weakness at important points in the building. In another case reinforcing rods were put in the wrong place, or omitted altogether, and these faults, coupled with unsafe design, caused one of the most serious of the recorded wrecks of concrete buildings.

The report specifies six conditions which, if followed, will give the highest fire-resistance qualities in a hollow-concrete block building. First, the thicker the shell of the block the better the resistance; secondly, the block should consist of a brand of Portland cement that conforms to the standards of the American Society of Civil Engineers or some similar specification of high authority; thirdly, the block should contain not more than four parts of sand or other material to every one part of cement; fourthly, the best

block is that which is made with the wettest mixture practicable; fifthly, the block should be carefully cured for not less than thirty days before it is used, and during this time it should be frequently moistened by water, spray or steam; lastly, in hollow-block buildings care should be taken to use solid blocks for the course on which joists or girders rest; that is to say, the concentrated load of such members should never be allowed to rest upon or depend from the inner side of a hollow shell since this may very readily break off.

QUEBEC BRIDGE DISASTER.

An appalling catastrophe, involving the loss of 100 lives and an approaching monetary loss of nearly \$1,500,000, recently occurred at Quebec, in the collapse of an arm of the enormous cantilever bridge, now under construction. The structure, which will cost something like \$7,000,000 and which will be the largest bridge of its kind in the world, was to have been finished in a couple of years, but this terrible mishap must result in considerable delay. It has been suggested that the accident was due to the overcrowding of the structure, while some attribute it to an engineering mis-calculation, and others to defective material, but all is at present more or less a matter of conjecture, and we can only hope that, for the benefit of future enterprises and in the interests of the trade, the court of enquiry will have complete success in their efforts to determine the cause of this lamentable disaster.

LEADING FIRMS AMALGAMATE

It is rumored that the Allis-Chalmers-Bullock company and the John McDougall Caledonia Iron Works company of Montreal are amalgamating. We understand that the joint concern will manufacture an additional line of cement machinery, including a complete line necessary to equip modern cement plants, also tube mills and grinders, besides continuing the output of their former respective standard lines of machinery. J. S. Irwin, general manager of the International Portland Cement company, is a prospective director, and will take an active part in the merging of these interests, the amalgamation of which will be productive of probably the strongest machinery concern in the Dominion.

James & Otterbine, lumber dealers, of Didsbury, Alta., have assigned.

According to J. W. Frank, of Nebraska, an expert of considerable reputation, who recently returned from Fort McKay, on the Athabasca river, there is enough asphaltum on the Athabasca to

pave all the streets of all the cities in the world, and it can be manufactured at small cost.

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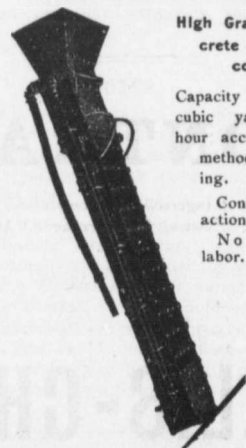
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WATERPROOFING CONCRETE.

In an article read before the Detroit Engineering Society by Clarence M. Barber, C. E., the problem of waterproofing concrete was discussed in detail, from which the following has been condensed:

Concrete can be made practically waterproof by making the aggregate as dense as practicable and using about one-half as much cement as sand. It is also claimed that a little thoroughly hydrated lime is an advantage. In the case of blocks, however, the quantity of cement required for a 2 to 1 mixture in the body of the block is generally prohibitive on account of its cost.

The most recent and, we believe, the best, method is to make the body of the block of a good strong concrete with properly graduated sizes of pebbles or broken stone and sand, together with cement enough to make a thoroughly strong concrete and then face the block with a thoroughly dense and waterproof mixture by using 1 to 2 cement and sand and 1 per cent of a good waterproof compound. This protects not only the inside face but the entire block and practically no moisture is absorbed even by the outer face.

A glass of water inverted on the face of such a block will hold the water for weeks with practically no absorption by the block. The writer has a glass of water inverted on a piece of a block that has been standing four weeks. About one-third of the water has escaped in that time. On an ordinary clay

brick the water passed wholly out of the glass in an hour.

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factory the freshly made blocks are kept for a time in rooms where the atmosphere is saturated with moisture and generally a sufficient quantity of steam is admitted to hold the moisture above the dew point. This treatment gives sharp, hard corners and edges to the blocks, and together with a little heat, it hastens the setting.

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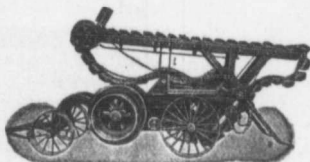
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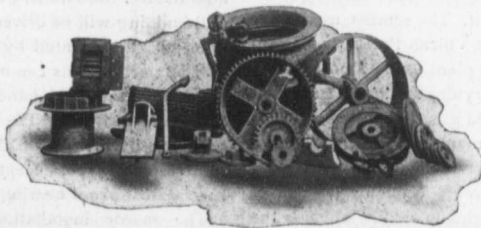
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MONTREAL

New Cement Plant

One of the largest cement manufacturing plants in Canada will be that of the Vulcan Portland Cement Company now being erected at Longue Pointe, Island of Montreal, by W. S. Barstow & Company, Engineers, of New York.

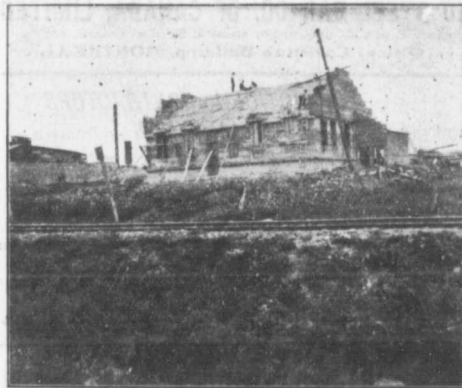
This plant, now nearing completion, is located on the old Morgan farm at Longue Pointe, a property having a frontage of 1200 feet on the St. Lawrence river and extending inland two miles. The quarries, conveniently located near the centre of the property, are considered to be inexhaustible and produce an argillaceous limestone of an almost naturally mixed Portland cement character, while the top soil is a very desirable form of clay. The buildings, nine in number, consisting of stone house, mill building, kiln building, clinker storage, coalmill, stock house, machine shop, office building and transformer station, are constructed with concrete foundations, steel frames, trusses and columns, and corrugated iron siding and roofs, except

Since it is generally conceded that cement machinery is subject to much greater strains and rougher treatment than that of other industries, it can readily be seen what careful attention must be given, and accurate determinations made, from an engineering point of view, to insure successful operations under such severe conditions.

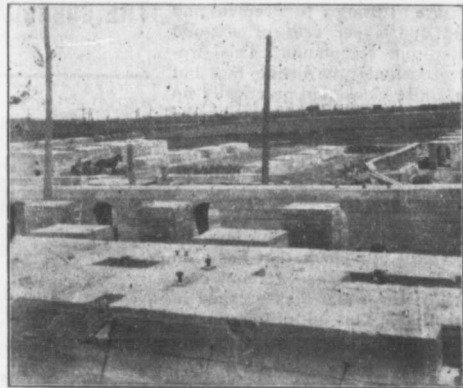
Three phase alternating current, is taken from the transmission lines of the Shawinigan Water & Power Company which cross the Company's property, transmitted at a pressure of 44,000 volts to a substation located at the plant, and stepped down through oil filled, water cooled transformers to 440 volts, at which pressure the motors will be operated.

The Power Company maintain two separate and distinct high voltage transmission lines, which fact eliminates, on the part of the Cement Company the necessity of providing break down apparatus.

All crushers and dryers in the stone house as well as



VIEW SHOWING REINFORCED CONCRETE OFFICE BUILDING FOR VULCAN PORTLAND CEMENT COMPANY, MONTREAL. (W. S. BARSTOW & CO., ENGINEERS).



VIEW SHOWING KILN FOUNDATIONS AND MILL BUILDING FOUNDATIONS, VULCAN PORTLAND CEMENT COMPANY, MONTREAL. (W. S. BARSTOW & CO., ENGINEERS).

the stock-house and office, which will be of reinforced concrete construction throughout. The cement used in the foundations was made by the Vulcan Portland Cement Company in the old Morgan plant on their property.

The usual American rotary dry method of manufacturing cement with pulverized gas coal will be the process adopted, except that many improvements have been inaugurated and departures made from standard practices, effecting considerable economy in cost of manufacture and labor, principally among which is the arrangement of the apparatus in the stone house, and the method of handling and crushing the ore. Belt conveyors, minimizing manual labor to the highest degree are used extensively and in a unique manner, connecting the several buildings in such a way that the various stages of production constitute a continuous process from the quarrying of the limestone to the bagging of the finished product in the stock house.

The entire plant is to be electrically operated throughout. Individual motor drive is used wherever feasible and elsewhere the machinery is so grouped that friction and other losses are reduced to the lowest minimum consistent with conservative investment, at the same time increasing the general operating economies.

kominuters, tube mills, grinders and pulverizers in the mill building will be driven by individual motor. The kilns will be operated by a single motor so arranged, that any or all kilns can be driven therefrom. All belt conveying and coal handling apparatus will also be electrically driven. The motors, ranging in size from 5 to 150 H.P., are of the well known slow speed squirrel cage type, except that they are equipped with special dust proof bearings.

The motor installation will aggregate a total of 3000 H.P.

Not the least interesting feature of the plant is the method employed for the handling, storing and reclaiming of the large quantity of coal used for kiln and power purposes. Requiring a coal low in sulphur and low in ash, Pennsylvania slack will be used exclusively, shipped in barges. This necessitates a permanent dock, which dock carries a mast and gaff outfit with an unloading capacity of 75 tons per hour, elevating and dumping the coal into a hopper, which in turn feeds a car of an automatic make running on a trestle across the storage area and dumping automatically. The coal is then spread by means of a cableway of 800 foot span, consisting of two movable 70 foot towers,

capable of assuming any point between dock and a point 400 feet distant, giving a storage area of approximately 700 by 400 feet. A clam shell bucket of $1\frac{1}{2}$ cubic yards capacity spreads the coal over the storage area to a depth of 10 feet. This same cableway is used for reclamation purposes when desired, the coal being carried by car to the coal mill three-quarters of a mile away, where it is in turn passed through the crushers, dryers and ball mills, thence conveyed to the kilns.

Fifty thousand tons of coal per year will be consumed, while 40,000 tons will also be kept in storage.

The best of transportation facilities both by water and rail are afforded by the St. Lawrence river, the Canadian Pacific, Canadian Northern and Grand Trunk railroads.

W. S. Barstow & Company, Inc., of New York, Montreal, and Portland, Ore., are the engineers for the Vulcan Portland Cement Company, and have designed the entire plant. A large part of the construction work is also being done by this same company.

Mr. S. R. Preston, who designed and built the first rotary kiln plant in Canada at Marlbank, is the general manager of the Vulcan Portland Cement Company, in charge of the operation of the plant. The William G. Hartranft Cement Company will be the general sales agents for the Vulcan Company, and have just opened offices in the Bank of Ottawa Building, Montreal. They are also the general sales agents for the Virginia Portland Cement Company, with works at Fordwick, Va., both works being owned by the same parties.

CONCRETE FOR FOUNDATIONS OF BUILDINGS AND MACHINERY.

The title of this paper indicates the two principle uses of concrete in mass, the object in view being different in each case. Although concrete is now commonly used in the foundations of all buildings, it is by no means always necessary; it is only upon soils deficient in supporting power that it is really required, the desideratum being to spread the base of the walls so as to reduce the intensity of the pressure upon the soil below by a cheaper expedient than extending the footings of the brickwork.

It is generally considered that for heavy walls and foundation work the cement should be heavy and slow setting; but for floors it should be rather lighter and quicker setting.

Thin slabs of concrete, such as are used in fireproof floors, require to be of a strong composition, say, 1:2:4.

For foundation work the concrete may be mixed in the proportion of 1:3:6, and there is a wider range of choice with regard to the aggregate.

In foundations, whether of buildings or machinery, the concrete is seldom more than 3 ft. or 4 ft. thick, and is generally placed in a trench, which at that shallow depth does not require timbering to support the earth at the sides; the concrete consequently fills in solidly to the irregular faces of the earth and makes a sound job.

When a considerable superficial area of concrete is to be laid, it is desirable to have expansion joints. Upon thin surfaces, such as a seaside promenade, 12 ft. square is a suitable limit for each monolithic

portion; in concrete and steel joist fireproof floors every 10 ft. in the long bays is an average distance for expansion joints; and in massive retaining walls about 45 ft. is considered to be the best distance apart. In the former cases a sheet of iron $\frac{3}{8}$ in. thick, smeared with soft soap, makes a good expansion board that is easily lifted out when the concrete has begun to set. In the latter cases there is usually a joint formed between the successive portions like a large masonry joggle. The expansion joint permits of the concrete expanding or contracting during the final setting and localizes any tendency to fracture; the joint may afterwards be grouted up solid.

When the supporting power of the soil is insufficient to support the load with concrete only, piles may be driven in the bed of the excavation before the concreting is commenced. Formerly these piles were of fir (plain or creosoted), elm or oak; but at the present time they are usually of concrete, plain or reinforced. In certain soils plain concrete piles may be made by driving a wooden pile, withdrawing it, and then filling the hole with concrete; but where the ground tends to cave in, or close up, or difficulty would be experienced in drawing the wooden pile, another plan may be adopted. A steel tube with a temporary point is driven to the required depth and then drawn up about a foot, leaving the point at the bottom. Enough concrete to fill this first foot is then put in, and the tube drawn another foot for another lot of concrete to be put in, so that by the time the tube is withdrawn altogether, the hole is filled with concrete and the steel tube ready to be used for the next pile. A slight modification is made by the "Simplex" pile, which is a tube with a crocodile-mouth point that opens as the tube is drawn up. This arrangement provides a point for driving and does not necessitate a spare point for each pile. Reinforced concrete piles are made by inserting steel rods in a vertical wooden case of which the front can be closed in stages of, say, 2 ft., as the concrete is filled in and rammed. There are generally four rods, from $\frac{3}{4}$ in. to 1 in. in diameter, with $\frac{1}{4}$ in. wire connecting them at intervals of 8 ins. to 12 ins. to keep them from spreading. The point may be formed of sheet iron, into which the concrete is filled at the start, or it may be of simple concrete with rods bent inwards. These piles are driven by a pile driver, the same as ordinary timber piles, but the head is protected by a steel helmet filled with sand or sawdust, or by interposing a dolly of hardwood, hooped with iron at the ends to prevent splitting. A good deal of the energy is absorbed by the intervention of these appliances, but this is of little consequence compared with the advantage of being able to have a pile that will not decay. Usually the reinforced concrete piles are not driven down flush, but left standing up about a foot. The concrete is then knocked away so that the upper ends of the rods may be imbedded in the concrete of the foundation. Plain concrete piles are usually sufficient when the concrete of the foundation is not itself reinforced, but a considerable saving may often be made in the depth of the foundation by a suitable addition of reinforcing bars to the concrete.

In the concrete foundations of machinery subject to vibration, such as, more particularly, steam hammers, large gas engines, turbines, dynamos and quick revo-

lution engines, it is necessary to provide a large mass in order to absorb the vibrations. When a gun is fired the kick of the gun represents an equal amount of energy to that contained in the flying bullet, only the greater mass absorbs the energy with less movement. The old scientific riddle, "Why does a dog wag its tail? Because the dog is heavier than the tail," is a case in point, the dog itself wags in inverse proportion to its weight compared with the tail. But it is not always sufficient to provide mass alone. Where there is any grinding effect accompanying the revolutions of the machine, as, for example, in the case of emery grinders, the vibration is conveyed in a very unpleasant form to long distances. The amplitude of the vibration is small, but the effect is often distressing. In such cases the foundation requires to be divided into two parts—the lower or true foundation will be an ordinary bed of concrete; then a layer of cork, india-rubber, or felt, may be interposed to deaden the transmission of sound, and upon that the mass of concrete is placed that may be necessary to absorb the vibrations and give stability to the machine. In large foundations for heavy engines it is sometimes necessary to confine the soil by sheet piling round the site, to prevent the soil from being squeezed out.

The piles may be of stout planks, or half balks of timber, or the more recently introduced interlocking steel sheet piling of various patterns. The holding down bolts may be in top mass only if a curb is placed round it to prevent it from shifting horizontally, or they may pass through the sound-proof material to the lower mass. In the latter case they would transmit some of the vibration but only to a small extent, and the difficulty of retaining the machine in position does not then arise. The position of the bolts is generally fixed by holes in a wooden template; the lower end is built in, then a hollow wooden tube 3 ins. square is placed over them to give a clearance for adjustment, the holes being grouted up after the bed-plate is in position. After the concrete has set it should be well wetted and rendered with neat cement, or one cement to one sand, floated over to a true surface; it then looks better and is much more lasting, as it does not tend to disintegrate so readily. It is generally supposed that if oil is allowed to run over the concrete it will render it friable, but the author has not found any trouble arising in this respect.—Henry Adams, M. Inst., C.E., in paper recently read before the Association of Engineers-in-Charge, London.

PROTECT PIPES FROM FREEZING.

The means generally employed to protect pipes from freezing consist in the use of coatings which protect against cold and non-conductors of heat, such as straw, cork and oakum. There are more effective agents, however, practicable for use in thawing out frozen pipes. The pipes are first covered with a thin layer of straw, sawdust or tanbark. Pieces of unslacked lime as large as the fist are then packed around and enveloped in another layer of non-conducting material,—straw, oakum or cork—and the whole is held firmly together by means of a wrapping of coarse linen.

The first layer is for the purpose of protecting the pipe from the action of the fresh lime which would cause the metal to rust. The lime draws moisture from the air and the materials surrounding it and is made

warm by means of the chemical reaction. The outer covering allows only a small amount of atmospheric air to pass through, so that the lime remains unslacked to keep up the temperature during an entire winter.

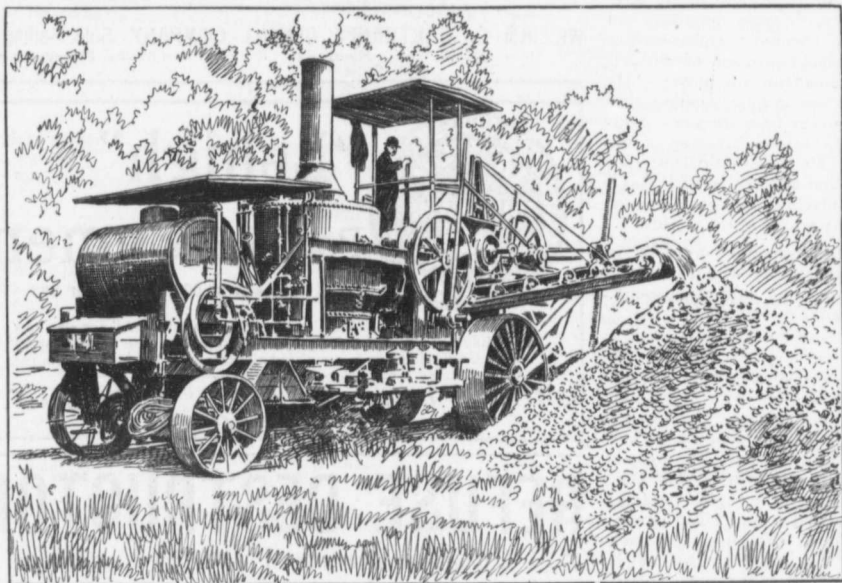
This method, with slight variations, can be applied to the thawing out of frozen pipes. For this purpose somewhat more lime has to be packed around the pipes and water poured over it. The heat generated will melt the ice in the pipe. The ground in winter can also be thawed out in this way when it is desired to lift paving stones without breaking.

SANDSTONE THE POOREST BUILDING MATERIAL AVAILABLE.

Our attention was called a short time since to the remains of what had once been a house dating from the Colonial period. The chimneys had been built supposedly of very excellent brick, and their remains had been lying exposed to the weather throughout the whole winter and were now in such condition that hardly a single piece of burnt clay was intact. The query was raised, why brick should disintegrate, and that brought out the very commonly heard statement that our questioner assumed all bricks were alike and that almost any brick is fit to use in a building if laid up properly. It is never safe to assume that brick is enduring and suitable for building operations unless we know its composition. The most potent factor which must be guarded against is the presence of salts of magnesia. It is only a question of time when brick in which these salts are present in any appreciable quantity will be badly influenced by the weather, and we have seen brick which, when fresh from the kiln, gave every mechanical evidence of being of best quality, so shattered and disintegrated by the combined effect of moisture, frost and the chemical action of the magnesia that a knife could be thrust straight into the heart of the brick with very little effort. Fortunately, there is so much good clay in this country and so many thoroughly reliable brick manufacturers that there is really no excuse for bad brick ever being used; but any brick is not necessarily, therefore, good brick, and care and intelligent discretion must be used in the employment of this material as it should be used in connection with any building medium.

There is a common conception that granite is one of the most enduring stones, but it certainly is not so in our climate, and as a matter of fact most granites would be outlived by thoroughly first quality hard burned brick. A pure syenite, free from iron or mica, constitutes the most enduring of the granites. A granite quarry may have good stone in some portions of the deposit and be utterly worthless in others, and as a general rule it is not safe to use a granite unless the architect knows absolutely its composition and the part of the quarry from which it is taken.

Sandstones, which were formerly so much used in the East, are really the poorest building material in the market. The cementing material in sandstone has a very slight value, and it is probably the poorest material extensively used, as far as resisting the action of frost is concerned, while the presence of iron constitutes an almost fatal defect. It may be said also that very little sandstone is free from iron.—The Brickbuilder.



OUR
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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.

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SOLAR POWER.

By using the principle of the common hot-bed, by which farmers grow fresh vegetables in the dead of winter, Frank Shuman, an American chemist, thinks he has solved the old problem of converting the sun's heat into power. He now has an engine running that gets its power from the sun. Shuman, who is the inventor of the concrete file used in skyscraper construction and of the wire glass, says his machine will revolutionize the motive power of the world.

On the Shuman property in Tacony there is a wooden box 60 by 80 feet sunk into the ground. It is covered with a double top of ordinary hot-house glass with a one-inch air space between the layers. Instead of being filled with greens it is filled with coiled iron pipes painted black. These pipes, filled with ether, connect with a small upright engine. The ether is converted to vapor in the big box, passes through the engine, developing three and a half horse power, thence into a condenser and back again to the hot-box. No fuel is used; the heat of the sun converts the liquid into vapor.

The light rays of the sun in this latitude, Shuman says, can yield a temperature of about 350 or 400 degrees.

The rays penetrate the double glass cover and are absorbed and converted into heat rays by the dark metallic surfaces of the pipes. The air space prevents the heat from escaping, and whatever is in the pipes will boil. If there is water in the pipes it will be turned into steam, and that steam can be used to run an engine, which is just what is being done here.

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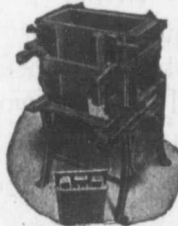
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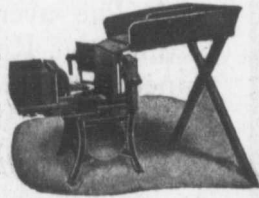
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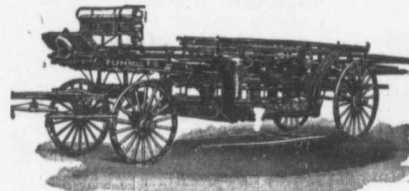
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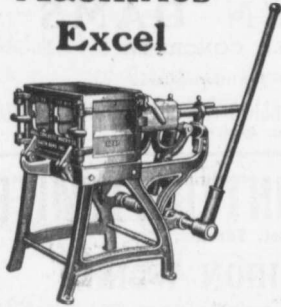
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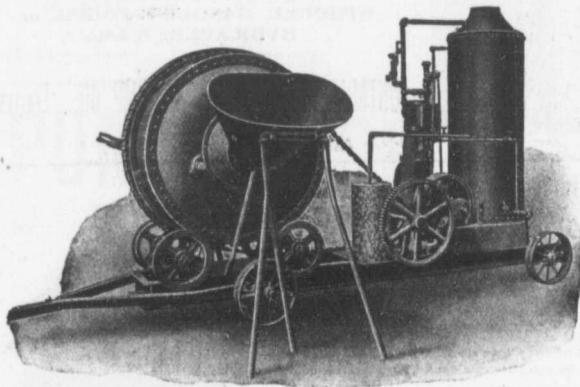
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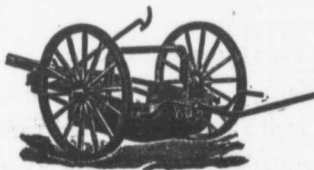
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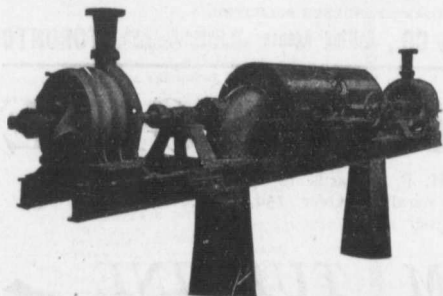
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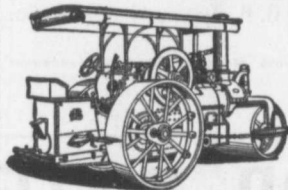
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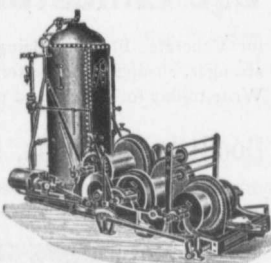
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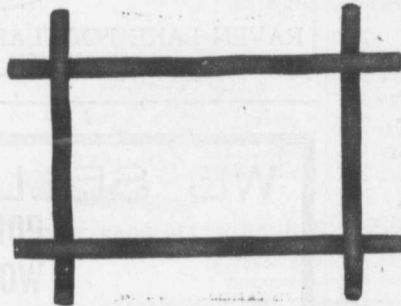
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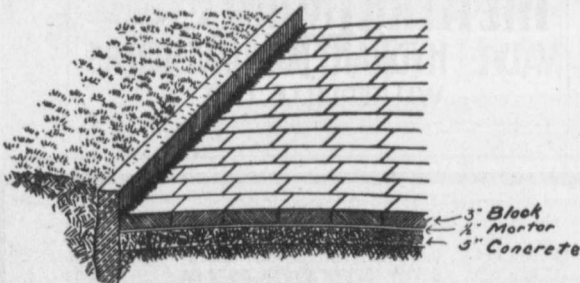
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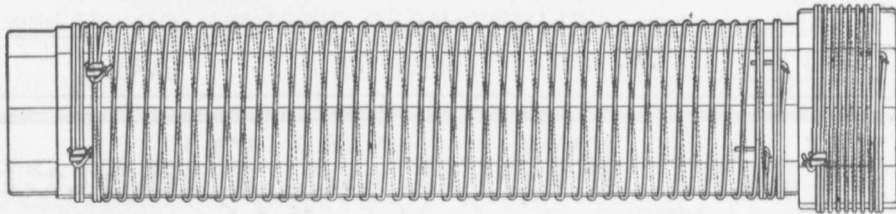
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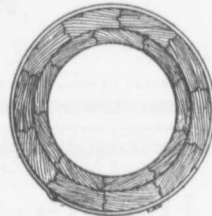
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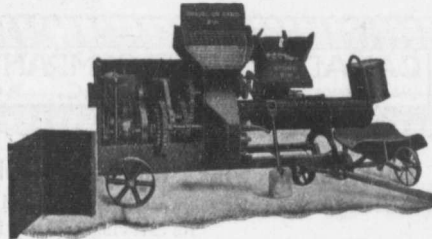
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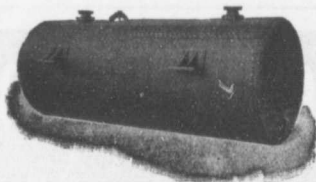
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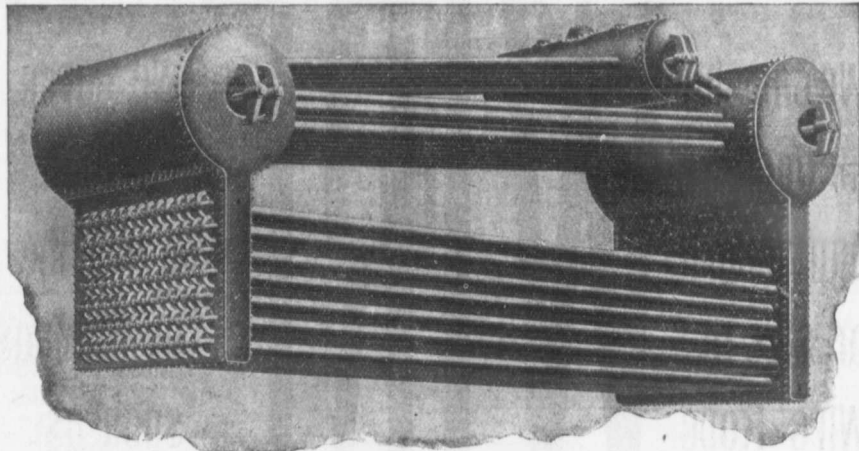
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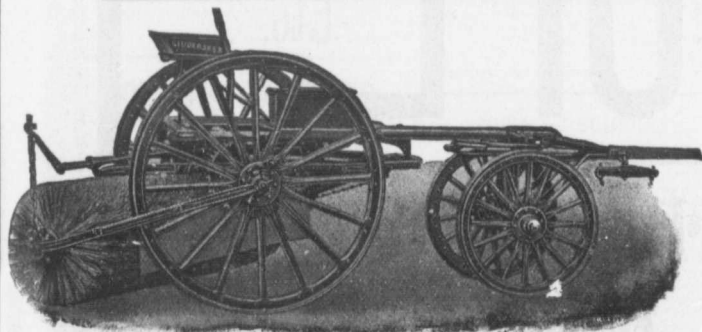
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