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CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL OF PUBLIC WORKS, TENDERS, ADVANCE INFORMATION AND MUNICIPAL PROGRESS

EVERY THURSDAY

This paper reaches every week the Town and City Clerks, Town and City Engineers, County Clerks and County Engineers, Purchasers of Municipal Debentures and leading Contractors in all lines throughout Canada.

VOL. 8.

APRIL 29, 1897

No. 13.

THE CANADIAN CONTRACT RECORD,

PUBLISHED EVERY THURSDAY

As an Intermediate Edition of the "Canadian Architect and Builder."

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Information solicited from any part of the Dominion regarding contracts open to tender.

Advertising Rates on application.

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TENDERS FOR ELECTRIC LIGHTING.

Sealed tenders endorsed "Tender for Electric Lights," and addressed to the Town Clerk, Owen Sound, will be received up to 12 o'clock, noon, MONDAY, MAY 10, 1897, for lighting the streets of the Town of Owen Sound with arc electric lights for a period optional with the town of five or ten years from September 30, 1897.

Specifications may be seen and forms of tender obtained at the office of the Town Clerk.

An \$500 accepted bank cheque payable to order of the Town Treasurer, Owen Sound, to accompany each tender. Cheque to be returned if tender not accepted. The lowest or any tender not necessarily accepted.

JOHN WELDRICK,

Chairman of Committee on Fire and Light.
Owen Sound, April 21, 1897.

TENDERS FOR STEEL BRIDGE

Tenders will be received by the undersigned till MAY 12th, and opened at 2 o'clock p.m. on May 13th, at the Council Chamber, Chesley, for the erection of a Steel Bridge in the Village of Chesley.

- (1) For 1 span 140 ft., 18 ft. roadway, moving load 120 lbs. per square foot, needle beams to extend on both sides for a 5 ft. sidewalk.
- (2) For 2 spans, each 70 ft.: Same as above, resting on a stone base and steel columns in centre, under or over truss.
- (3) For steel plate cylinders, resting on piles and filled with concrete, about 19 ft. high and 3½ ft. diameter, tender to state cost of each pair. Must be protected with cribwork filled with stone.
- (4) For about 250 cubic yards masonry, quarry stone, rock finish, to be built with cement mortar. State price per cubic yard.
- (5) Tender for sidewalk, 5 ft. wide, on one or both sides of bridge.

The bridge is about ¾ mile from station. A cheque marked good, payable to Treasurer, Co. Bruce, for \$200, to accompany each tender. Tender to state earliest date at which stonework and superstructure will be completed.

The lowest or any tender not necessarily accepted. Further information may be obtained from James Warren, Engineer, Walkerton, or from the undersigned.

JAMES DOUGLAS,
Dobbinton.

Chesley, April 26th, 1897.

Tenders Wanted

Tenders wanted for the Heating of a new Public School in the Town of Arnprior. Size 35x62 feet. Four rooms, to be heated by two coal furnaces. Particulars given by Andrew Bell, Esq., Architect, Almonte, Ont.

Tenders received by the undersigned up to 4TH MAY, 1897.

GEO CRAIG,
Secretary Arnprior Board of Education.



TENDERS FOR HOSE WAGON

Tenders addressed to R. J. Fleming, Mayor, Chairman Board of Control, will be received by registered letter only, up to 12 o'clock noon of TUESDAY, MAY 4TH, 1897, for the furnishing of one two-horse Hose Wagon, for the use of the Fire Department.

Specifications and forms of tender may be obtained at the Fire Department Office, Richmond street, Toronto.

A cash deposit or marked cheque equal to 5 per cent. of the total amount of the contract if under \$1,000, and 2½ per cent. if over amount, must accompany each tender, and the same will be forfeited to the city in the event of the person whose tender is accepted failing to execute the necessary contract or give satisfactory sureties for the due fulfilment of the same.

The deposits of unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

R. J. FLEMING (Mayor),
Chairman Board of Control.

City Hall, Toronto, April 23rd, 1897.



Tenders for Supply of Stone

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to NOON ON WEDNESDAY, MAY 12, 1897, for the supply and delivery at the Frederick Street city yard or dock of from 150 to 200 tons of Stone.

Specifications may be seen and forms of tender obtained at the office of the City Engineer, Toronto, on and after Friday, April 30, 1897.

A deposit in the form of a marked cheque, payable to the order of the City Treasurer, for the sum of 2½ per cent. on the value of the work tendered for, must accompany each and every tender, otherwise they will not be entertained.

Tenders must bear the bona-fide signature of the contractor and his sureties, or they will be ruled out as informal.

Lowest or any tender not necessarily accepted.

R. J. FLEMING (Mayor),
Chairman Board of Control.

City Hall, Toronto, April 27, 1897.

George Wilson, builder and planing mill owner, St. Catharines, Ont., has assigned to W. B. Allen.

CONTRACTS OPEN.

ARNPRIOR, Ont.—A public school building will be erected here, at a cost of \$3,700.

PERTH, ONT.—Thos. McLaren will erect a two-story white brick dwelling this summer.

PILOT MOUND, MAN.—Plans are being prepared by Dow & Currie for a new warehouse, 42 x 40 feet.

ST. CATHARINES, ONT.—It is the intention of C. A. Wilson to erect a block of houses on Ontario street.

PEMBROKE, ONT.—The Canadian Pacific Railway will, it is said, erect new shops here at a cost of about \$30,000.

WOODSTOCK, ONT.—A deputation has applied to the Minister of Public Works for a new public building in this town.

LEAMINGTON, ONT.—Charles Lypps has purchased a site on Marlborough street on which he will erect a dwelling house.

HUNTSVILLE, ONT.—The plans for the new Methodist church have been modified, and new tenders for construction are invited.

BELLEVILLE, ONT.—The City Council has given notice of its intention to construct a sewer on William street, at a cost of \$2,250.

DELHI, ONT.—Tenders for the construction of a wooden bridge over Big Creek at Croton are asked by G. T. Youse until May 3rd.

DARTMOUTH, N. S.—Debentures will be issued as follows: \$30,000 to purchase a steamer, and \$800 for water works and ferry improvements.

SHERBROOKE, QUE.—It is estimated by Mr. Beaudry, C.E., that the cost of improving the waterworks, should the city take control of them, will be \$80,000.

MIDLAND, ONT.—A grant of \$25,000 has been sanctioned by the ratepayers to assist the G.T.R. in building a large elevator here, with a capacity of 1,000,000 bushels.

YORKTON, N. W. T.—The Board of Trade is making an effort to secure the construction of a road from Yorkton to the Dickinson timber limit, a distance of 96 miles.

QUINN, ONT.—Samuel Brown, of this place, will receive tenders until May 15th for the erection of a public school building in school section No. 6, Tilbury East, size 25 x 36 feet.

WINDSOR, ONT.—Surveys are being made for an electric railway from Amherstburg to Windsor, the plans for which have been filed in Toronto by Mr. Auld, of Amherstburg.

QUEBEC, QUE.—David Ouellet is preparing plans for a sacristy to be erected for the parish of Causapsal. Tanguay & Vallee are preparing plans for the interior finishing of the new annex of the convent.

at Sillery. This annex is 55 x 112 feet, four stories.—Archer & Company, St. Andrews street, ask tenders until the 30th inst. for the construction of a wharf.—It is understood to be the intention of the Dominion government to make an appropriation for repairing the fortifications and walls at this port.

MURRAY BAY, QUE.—Recent floods have damaged property to the extent of \$12,000.

ST. STANISLAS DE BATISCAN, QUE.—The bridge across the Batiscan river has been carried away by floods. The loss is about \$3,000.

PARRY SOUND, ONT.—E. S. Pratt is interested in a company which proposes erecting a first-class hotel at this place.—Tenders are being received for a residence for Mrs. Bryson.

TEESWATER, ONT.—J. H. Brick, of this town, is asking for plans for a three-story brick hotel and brick stable.—Andrew Little is getting the material on the ground for a brick dwelling.

COBOURG, ONT.—The old Victoria College buildings have been purchased by the Ontario government, with the intention, it is said, of converting them into a reformatory for girls.

ALMONTE, ONT.—At the last meeting of the town council a resolution was passed to take steps to erect a building for the aged and infirm. Private subscriptions will be solicited.

KEMPTVILLE, ONT.—A. A. Cowen, of Mountain, has made a proposition to the council to erect a roller mill, at a cost of \$25,000, for which purpose a loan of \$5,000 is asked from the town.

INGERSOLL, ONT.—Tenders addressed to W. H. Sutherland, this town, are invited until May 5th for the erection of a Presbyterian church at Thamesford. Plans may be seen at Dr. McWilliam's office at Thamesford.

VANCOUVER, B. C.—W. Blackmore, architect, is calling for tenders for the erection of a building, corner Westminster avenue and Hastings street, for McLeod & Cooté, to be two stories, brick veneered, 132 x 57 feet.

RENFREW, ONT.—Mr. Benj. Dillon is preparing plans for a large brick block for Dr. Murphy, also a hospital building to cost between three and four thousand dollars, and a Methodist church to cost about \$8,000, all in this town.

ST. JOHN, N. B.—The C. P. R. are negotiating for the purchase of property near the bay shore for the purpose of erecting cattle sheds and laying sidings.—It is rumored that the C. P. R. will build another elevator this summer.

HALIFAX, N. S.—Jas. W. Power will receive proposals up to the 30th inst. for the construction of a main exhibition building, annex building, grand stands, etc., for the Provincial Exhibition Association. Plans may be seen at the city engineer's office.

NIAGARA FALLS, ONT.—A new electric railway company has been formed, composed of H. C. Symmes, R. Paine and others. It is proposed to construct a line which will connect with the Niagara Falls Park and River Railway and extend to Lundy's Lane battle ground.

LONDON, ONT.—The London township council is calling for new tenders for the repairing of the Adelaide street bridge.—The City Engineer has recommended that tenders be asked for a steel bridge and sewer viaduct across the river at King st.—Herbert Matthews, architect, invites tenders until Monday, May 3rd, for improvements and alterations to E. J. McRobert's residence on Queen's avenue.

KINGSTON, ONT.—Tenders are asked by W. Newlands, architect, until 6 p.m. to-day (Thursday), for the erection of two

brick dwellings on Alfred street.—A committee appointed to report on the proposal made to the city to erect a grain elevator have recommended that a bonus of \$25,000 and exemption from taxation be granted to Edwin Mooers & Company to build a 500,000 bushel elevator.—The City Council has given notice of its intention to construct a number of sewers, at a total cost of several thousand dollars.

RAT PORTAGE, ONT.—The by-law to raise \$40,000 for improvements has been carried by the ratepayers.—The authorities of the C. P. R. have arranged with the Town Council for the construction of a dock, work on which will be commenced at once. The company will also immediately erect a station at Wabigoon.—Hurd & Peters, architects, will receive tenders until May 5th for the erection of a brick school at Keewatin.

STRATFORD, ONT.—The township of West Zorra has decided to purchase a road grader.—It is reported that property on Ontario street has been purchased with the object of erecting an opera house thereon.—The City Council have under consideration the question of sewage disposal, and a special meeting will shortly be held to discuss the matter. It is estimated that the sum of \$20,000 will be required to construct the necessary plant.

PARRSBORO, N. S.—The town is asking for bids until the 7th day of May, at 6 p.m., for the following: Masonry dam at intake; excavation and back filling of trenches; laying and jointing of about 15,500 feet 6-inch, 13,900 feet 8-inch, 4,500 feet 10-inch, and 1,900 feet 4-inch cast iron pipe; laying hydrants and valves; also for 31,500 lbs. best quality lead, and 500 lbs. Russian hemp, tarred and twisted. W. H. Upham, Town Clerk.

OWEN SOUND, ONT.—The Fire and Light Committee of the town council has engaged Mr. Jas. C. Kennedy, C. E., to prepare a plan and specification for a new contract for street lighting, also to furnish an estimate of the value of the electric light plant of the company now supplying the street arc lights, and also to furnish an estimate of the cost of putting in an entirely new electric light plant by the town. In the meantime tenders are to be invited for lighting the streets by arc lights for a term of 5 or 10 years.

CHARLOTTETOWN, P. E. I.—Plans have been prepared by a Chicago architect for a large pork packing establishment to be erected in this city by Messrs. Rattenburg. The work of construction will be commenced at once.—Tenders for the construction of the proposed Prince of Wales college and Normal school are invited by the Commissioner of Public Works until noon on Tuesday, June 1st, the contract to be completed before the 10th of August, 1898. Plans may be seen at the office of C. R. Chappell, architect, this city.

WINNIPEG, MAN.—A special meeting of the university council was held last week to consider the erection of a university building, at which a committee was appointed to arrange details. The proposed building will cost about \$60,000.—H. Wilson, chairman committee on works, will receive offers until Wednesday, May 5th, for supplying from 500,000 to 1,250,000 feet of pine lumber, also for the construction of macadam pavements on several streets.—Preparations are being made for the erection of the C. P. R. cold storage warehouse.

HAMILTON, ONT.—W. A. Edwards, architect, invites tenders until May 1st for alterations to the residence of Murray Pettit at Winona.—The city clerk will receive tenders until the 21st of May for 1,800 dog tags.—The Cataract Power Company are seeking authority to extend their proposed raceway to a point on the Welland river near Port Robinson.—The

C. P. R. has purchased property on Walnut street on which a freight shed will probably be erected.—Building permits have been granted as follows: F. J. Rastrick, two 2-story brick dwellings on Augusta street, cost \$1,500; E. B. Fatterson, brick addition to Herkimer street Baptist church, cost \$2,000; trustees of Zion Tabernacle, for a new roof, cost \$2,000; Mrs. Ann McMillan, three houses, cost \$2,500.—The Hamilton, Grimsby & Beamsville Electric Railway Company have purchased a lot in Beamsville on which they will erect a station.—Architect Mills has prepared plans for T. H. Pratt to put a new front in the Betram store, lately destroyed by fire. It will have an additional story. The entire front will be built of pressed brick, with stone dressing and plate glass.

MONTREAL, QUE.—The Harbor Commissioners will shortly urge the government to proceed with the harbor improvements.—Ald. Stevenson has requested a grant of \$8,000 from the finance committee for the purchase of a steam fire engine. The sum of \$15,000 has also been asked for laying water mains.—A number of contracting engineers are in the city for the purpose of tendering on the widening of Victoria bridge. The plans will be submitted to Mr. Hayes, general manager of the G. T. R., and a decision known within a week. The contract for the masonry is said to have been awarded to William Gibson, M. P., of Beamsville.—Robert Findlay, architect, is calling for tenders for two houses to be erected on Cote St. Antoine road for Mrs. G. Wait; also for a block of flats to be built on Lake street for William Kerr.—Chas. Chausse, architect, is preparing plans for four self-contained residences at Cote St. Antoine, tenders for which will be invited shortly.

OTTAWA, ONT.—It is said that the Pontiac & Pacific Railway Company are having plans prepared for the erection of workshops in Hull, and for the extension of their line from Aylmer.—Thomas Cleary has purchased property at the corner of Bank and Somerset streets and will erect a new structure thereon.—E. L. Horwood, architect, is receiving tenders this week for the removal of the buildings on the south-east corner of Banks and Sparks streets.—The City Council has given notice of its intention to construct a number of artificial stone sidewalks.—Plans for the proposed hospital building have been prepared by E. L. Horwood, architect, and show a four-story building, having sixteen private wards and room for 37 public patients. The cost of the building, which will be erected at the corner of Elgin and Ann streets, will be \$30,000.—Word has been received from Mr. Rudolph Hering, C. E., of New York, that plans for the main drainage scheme will not be completed for several weeks. It is therefore improbable that work will be commenced this summer.

TORONTO, ONT.—Ground has just been broken for new buildings on the north side of Bloor, near Yonge street and on the east side of Jarvis street, above Wellesley street.—Building permits have been granted as follows: J. Stoddart, pair semi-detached two-story and attic brick dwellings, 76-78 Sumach street, cost \$3,500; Dr. W. Britton, two-story and attic addition to dwelling, 17 Isabella street, cost \$1,500; A. Nelson, pair semi-detached two-story and attic dwellings, west side St. George street, near Bernard avenue, cost \$7,500; Mrs. M. A. White, three attached brick houses on King street and brick addition to hotel at north-east corner King street and Strachan avenue, cost \$7,000; E. Phillips, pair detached two-story and attic dwellings, north side Tranby avenue, near Bedford road, cost \$5,000; Thomas Brennand, alterations to 78 and 80 Power street, cost \$500; J. Lowther, 427 Euclid avenue, detached two-story brick dwelling on Howland ave.,

cost \$2,500; G. Weston, 103 Sullivan st., 2 story bk. bakehouse, dwelling and store, n. e. cor. Spno and Phoebe sts., cost \$8,000; Wm. Booth, 115 Bedford rd., det. 2 story and att. bk. dwelling, w. side Bedford rd., near Beruard ave., cost \$3,000; J. W. Magee, 2 story and attic bk. dwelling, e. s. Brunswick ave., nr. Lowther ave., cost \$3,000. Since the first of the present month building permits have been granted reaching in value \$115,000, against \$81,635 for the whole month of April last year.—Property owners on Euclid ave. have petitioned for a cedar block pavement on that street.—Tenders will be invited this week for extending the Fort Rouille and Dominion street sewers and for an 18-inch steel extension from the Dufferin street sewer into deep water.—W. J. Douglas, town clerk of North Toronto, is receiving tenders this week for sinking a circular well at the waterworks 8 feet in diameter and 27 feet deep.—The City Engineer will shortly present a report in reference to the establishing of a civic electric light plant for the new city buildings.—A sub-committee of the property committee have recommended that exemption from taxation be granted to William Harris on his proposed building and plant for the dead meat trade.—The congregation of East Toronto Baptist church have purchased a site at the north-east corner of Gerrard street and Enderby road, on which they will erect a new church.—Plans for enlarging the East Toronto public school will be submitted to the School Board at its next meeting.—Mr. G. A. Stinson desires to secure from the city some property on Dufferin street, south of King, on which a client proposes to erect a wine factory.—The City Engineer has recommended that the asphalt pavements on track allowances on several streets be replaced by brick.—Tenders will be asked early in May for the erection of the new building at the north-west corner of King and Yonge streets, the plans for which are being prepared by Messrs. Darling & Pearson.—Mr. J. F. Brown, architect, is receiving tenders for a brick addition, 75 x 48 feet., to Firstbrook Bros.' factory, King street east.—The contract for the bridge at York Mills, for which tenders were recently asked by the County Engineer, will likely be awarded this week.

FIRES.

The carpet factory of G. A. Burrows at Guelph, Ont., was gutted by fire on the 22nd inst.: loss \$4,500, insurance \$2,000.—C. Norsworth & Company's foundry and machine shop at St. Thomas, Ont., was damaged by fire recently to the extent of several thousand dollars, fully covered by insurance.—R. Ripley's saw mill, situated on the Short Line Railway near St. Stephen, N. B., was burned on April 16th; loss \$5,000, insurance \$4,000.—The T. H. & B. railway station at Smithville, Ont., has been burned.—At Appleton, Ont., on the 22nd inst., the residence of A. W. Cram was destroyed by fire; insurance \$5,200.—Arthur Harvey's residence at Sawyerville, Que., was burned to the ground on Saturday last.—The match factory at Drumbo, Ont., has been partially destroyed by fire.—The Queen's hotel at Haliburton, Ont., owned by D. Kelleit, was burned on Sunday last; insured.

CONTRACTS AWARDED.

HALIBURTON, ONT.—The contract has been let for the erection of a new town hall, to cost \$2,500.
RICHMOND HILL, ONT.—Innis & Son have secured the contract to erect a dwelling near Aurora for J. Hutchinson.
LEAMINGTON, ONT.—John Elhott, principal of the high school, has given a contract for erecting a large residence on Marlborough street.
DELORAIN, MAN.—The contract for

the new Methodist church has been let to Laird & Flynn, at the price of \$6,525, exclusive of heating and seats.

PETERBORO, ONT.—James Bogue, of this town, has been awarded the contract for the pivot pier and abutments of the railway bridge over the Trent Valley canal, near Little Lake.

OTTAWA, ONT.—The contract for the addition to the Water street hospital has been awarded to J. Fauteux, exclusive of plumbing, heating and elevator. The following were the tenders received: Poulin & Fitzpatrick, \$28,450; John O'Connor, \$27,100; J. Lyons, \$25,890; Charlebois, \$25,050; J. Bourque, \$22,825; J. Fauteux, \$22,665.

MONTREAL, QUE.—J. B. Resther & Son have awarded contracts as follows for reparations and modifications of a house on Sherbrooke street for the Estate Victor Beaudry: Masonry, Boucher & Huberdeau; brick, Jos. Beland; carpenter and joiner's work, Chapleau & Leboeuf; roofing, heating and plumbing, Jacotel & Bros.; plastering, J. Lefebvre; painting and glazing, O. M. Lavoil.

QUEBEC, QUE.—Building permits have been granted as follows: One house on Parent avenue for J. E. Trépanier, contractor, P. Belanger, cost \$4,500; one building on Palace street, four stories, 135 x 60 feet, contractors, F. Parent, J. H. Gignac and Vandry & Matte, estimated cost \$11,000.—The tender of George Fortin has been accepted for the wooden pontoon; price \$8,960.

LONDON, ONT.—Tenders for supplies have been accepted as below: Sidewalks, Wm. Howie, jr.; Credit Valley stone, C. Beckett; St. Mary's stone, P. Mulhall; stone curbing, S. H. Craig; gravel, C. Beckett, W. Donahue, M. Baldwin & Son, T. B. Fox and Oliver Jarvis; lumber, Mickle, Dymont & Son; iron castings, London Foundry Co.; paving crossings and gutters, M. Baldwin; laying cedar

block crossings, M. Baldwin; concrete pipe, E. North and W. Anthistle.

HULL, QUE.—The School Board have let the contract for heating the new school to McKinley & Northwood. The tenders were as follows: McKinley & Northwood, \$1,081; G. J. Julien, \$1,149; Butterworth & Co., \$1,298; F. A. Cote & Co., \$1,475; E. J. Laverdure & Co., \$1,300; Wilson & Couturier, \$1,800; St. Jacques & Normand, \$1,199.20 and \$1,280.55.

TORONTO, ONT.—J. Francis Brown, architect, has let contracts as below for a pair of houses on Sumach street: Brickwork, Wickett Bros.; carpentry, Wm. Williamson; painting and glazing, Egles & Lington; plastering, Hannah & Nelson; furnace, Wheeler & Bain. Same architect has accepted tenders for alterations to Dr. Britton's house on Isabella street as follows: Masonry, Elgie & Co.; carpentry, Francis Bice; plastering, J. C. Jorden.—Tenders have been accepted by F. H. Herbert, architect, for a new hotel, corner King street and Strachan ave. The successful contractors are: Masonry, Henry Lucas; carpentry, Hutchins & Burns; plastering, Geo. Rudlen; painting, H. W. Johnston; roofing, R. Rennie & Son; galvanized iron, A. B. Ormsby & Co.; plumbing and heating, W. J. Maguire & Co.

CORROSION OF IRON IN STONE WORK.

The corrosion which takes place on the bottom of iron railings set in stonework with melted lead is, according to Professor J. M. Thomson, of England, largely due to galvanic action, and the same action will exercise its influence in all cases where two different metals come in contact, unless that contact be as perfect as possible. But the action of acid vapors which are in the atmosphere of some towns on iron and zinc is considerable, especially when

THE Authorities at Ottawa have been investigating the merits of the new Wall Plaster, known as

“ASBESTIC”

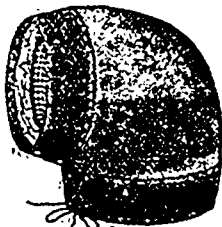
which is nearly the pure product of Asbestos, and possesses all the remarkable qualities of that mineral, being Absolutely Fire-Proof, and as a Plaster, Cohesive and Elastic, besides allowing a Perfect Surface Finish. The result of such examination and investigation, from actual work done in Ottawa, and the opinions of eminent Architects, is to prove that it is all that it is claimed to be. A large order has been given for this material, which is to be used in the reconstruction of the Parliament Buildings, lately destroyed by fire.

The Authorities have shown great wisdom in their choice, as the cost over ordinary plaster is very trifling, and the advantages so manifest to every Architect who has given this remarkable production careful attention, that it cannot fail to commend itself as a positive assurance of safety against fire risk, entailing the minimum of cost for such an object.

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the metals are in the form of thin or perforated sheets and gauze. Professor Thompson observed the action of the air of Glasgow on a window-blind of fine iron wire-gauze during a period of about seven years. Although originally protected with lacquer, the lower portion of the blind in position opposite to where the window had been daily raised from its sash had been gradually eaten away. There is no doubt that such corrosive actions are assisted by the simultaneous process of oxidation, but there is, at the same time, evidence of the direct action of the acid vapors. The principal conditions under which lead fails are when it comes in contact with air, moisture and carbonic acid, more especially if organic acids derived from the soil or other sources are also present. In this case rapid corrosion may be expected, the action being similar to that already mentioned in the formation of the basic carbonate or white lead. This action being continuous in the presence of the chemical substances mentioned, the lead becomes finally entirely converted. The rusting of grey cast iron is apparently slower than that of wrought iron, the different varieties corroding more quickly as the amount of carbon increases in the iron. A cement known under the name of "rust-joined cement" is employed in the junction of iron pipes. It is composed of eighty parts fine iron filings, one part of ammonium chloride, and two parts of sulphur made into a paste with water. When this is packed into a joint it sets into a hard cement, apparently produced by the formation of mixed oxide and sulphide of iron.

QUEBEC LAND SURVEYORS

The Corporation of Quebec Provincial Land Surveyors held their annual meeting in Quebec for the election of directors for the next three ensuing years, on Wednesday, the 7th April. The following members were elected:—H. B. Tourigny, C. E. Gauvin, Arthur Smith, W. McLea Walbank, Ant. Painchaud, Thomas Breen, N. J. Gastonguay, John Sullivan, George Roy, J. E. Malhiot, J. E. Sirois, H. S. Harwood, I. P. B. Casgrain, D. C. Morency, P. C. Talbot. At a meeting of the

Board of Directors, held on the 8th inst., Messrs. W. McLea Walbank, of Montreal, was elected President; D. C. Morency and George Roy, Vice-Presidents; C. E. Gauvin, Secretary; I. P. B. Casgrain, Syndic. There are four candidates up for final and one for preliminary examinations.

PREVENT LEAKS IN SLATE ROOFING.

The worst leaks in slate roof come from improper position of the gutters, by which wet snow sliding from the roof is caught and held back. It soon freezes to the roof along the lower edge, the upper portion remaining free, and the water subsequently running down the slope, is caught in a long, deep pocket, in which it rises rapidly until its level reaches that of the upper edge of a course of slates or shingles, over which it pours in a sheet to find its

way into the rooms below. Next to this defect insufficient flashing in valleys is perhaps the worst, says T. M. Clark in "Building Superintendence." As metal is expensive, the roofer's interest is to save as much of it as possible, and the superintendent must consider the circumstances of pitch and extent of roof surface draining into the valley. In certain cases, where the roofs are large, this may be 18 inches or more in summer showers, and the only security is to make the valley flashings of corresponding size.

In estimating for slate work much depends on the quality of the slate and on the manner in which they are laid or "hung." The manner may be in the weathering and the lap, or in the finishing of the "tails" of the slates, as like shingles, they may be wrought with a circular, a pointed or an elliptical end, to which the cost will be very much increased.

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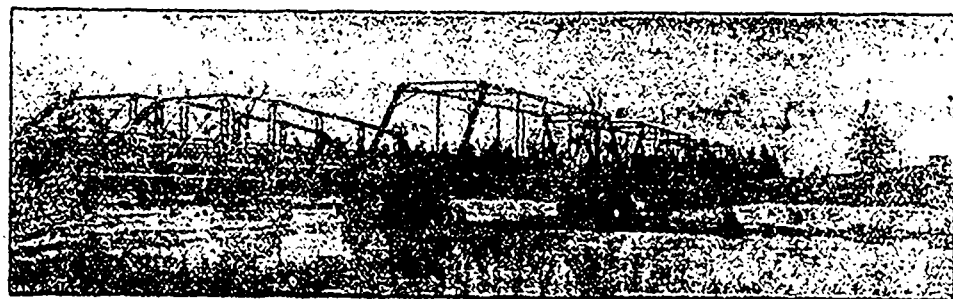
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THE WATER SUPPLY OF MANCHESTER.

The distance to which Manchester, England, has gone for its water supply, as a new source, is about 100 miles, to the well known Lake Thirlmere. The rainfall of this region is said to be about 180 inches annually, and the lake has been raised by a dam so as to have an area of some 800 acres, the dam being at one end, near the intake, while the aqueduct starts near the other. The dam is a massive concrete structure rising about sixty feet above the bottom of the lake, and in some places extending nearly as deep in the rock bottom, so as to prevent the passage of any water below it through fissures; on the upstream side the dam has an inclination of $1\frac{1}{2}$ inches in every foot of vertical height, and the downstream face is curved to a radius of 100 feet. The water for the city is taken from the lake through a tunnel in the rock, and the flow is controlled by elaborate apparatus. The aqueduct leading from the reservoir is nearly ninety-six miles long, fourteen miles of this being in tunnel, thirty-seven miles masonry work built in trenches, and forty-five miles cast iron pipes. The tunnel and masonry portions have capacity of 60,000,000 gallons daily, and the pipe line, which can be readily duplicated, a present capacity of 12,000,000 gallons. The 48-inch pipes are nine feet and the 40-inch pipes twelve feet long and vary from 1 to $1\frac{3}{4}$ inches in thickness.

BOSTON'S NEW WATER SUPPLY.

The Metropolitan water commission is about to build the largest storage reservoir in the world, its capacity being no less than 65,000,000,000 gallons, or, according to Fire and Water, "enough to supply the city of Boston for $3\frac{1}{2}$ years and four times as much as the capacity of all the existing waterworks reservoirs of that city. Its capacity is twice as much as that of the new Croton reservoir of New York, thrice that of the six reservoirs of Birmingham, England, 30 times that of the Cochituate and 25 times that of Hobbs brook of the Cambridge system. It will hold more water than the inner harbor of Boston."

This dam is to be built at Clinton, Mass., and the vast volume of water covering over 4,000 acres, will be entrapped and retained by a dam 1,250 feet long (or 20 feet shorter than the Croton dam), 127 feet high above the ground and 158 feet high above its rock foundation. This dam is, however, not as high as a number of others which retain much less water. The Croton dam has a height of 157 feet above ground and 245 above rock. To guard against the pressure of the millions of tons of water that will be exerted on the dam, the en-

gineers have made their plans with the greatest care, drawing upon every attainable source of information. The dam will cross a narrow gorge about three-fifths of a mile above the Lancaster mills, at which point a solid rock support for every part of the dam exists. It will be built wholly of masonry, having the same form of cross section as that of the new Croton dam. Engineering News.

SELF-PROPELLING FIRE ENGINES.

Steam fire engines are usually drawn to the scene of their usefulness by horses driven at a gallop, but there is no reason why they should not propel themselves, now that the restriction on auto-motors are removed. This becomes the more necessary as engines increase in size and power. It is true that the time occupied in dragging the engine to its work by horses has hitherto been utilized in getting up steam, but with the rapid steam boilers now available, this time on the way is not necessary. Owing to the great height of buildings in Boston, U. S., engines of extra power are required to throw sufficient water high enough. These usually weigh about $4\frac{1}{2}$ tons, and require at least three powerful horses to draw them. It is now found that engines of greater power are desirable, but these would be almost unmanageable if horses were used in narrow and busy thoroughfares. It has now been decided by the Boston Fire Department to have a large self-propelling fire engine, which will throw some 1,850 gallons of water per minute to a height of 350 feet, with a $1\frac{1}{2}$ inch nozzle. Very little machinery in addition to the ordinary mechanism of a fire engine is required to operate the self-propelling gear, and this is so arranged that it can be easily disconnected. An extra water tank is carried at the rear of these engines until connection can be made with a hydrant. These engines can travel on a level road at the rate of twelve miles an hour, buildings are not raised to such a height in England as in America, and for that reason less ponderous fire engines are serviceable, but we should all be glad to be rid of the noisy panic which is caused by the rapidly driven horses through our streets. All new fire engines ordered for use in large towns ought to be self-propellers.

Mr. James Beattie has been appointed clerk of the county of Wellington.

EXPANSION OF BRICK PAVEMENTS.

The hot weather of last summer has shown that the expansion of brick pavement must be taken into account. At Terre Haute, Ind., on South Sixth Street, the bricks expanded until a point was reached that something had to yield, and on a heavy omnibus rattling down the street, the paving pulled free from the foundation and rose up behind the wheels to a considerable height, presenting an extraordinary appearance.

Mr. Geo. H. Simpson, C. E., the city engineer, in reply to our enquiry, says that "to this might be added that two places about three-quarters of a mile south of Walnut on Sixth have humped themselves opposite private returns across the sidewalks, the gutter being raised about eight inches, or two inches higher than the curbs, and at one place the brick of the street at the gutter has slipped by the brick in the return (which laid at right angles to those in the street) an inch and a quarter, the return having raised less to that extent. It is not true, as reported, that a course of brick was taken out and filled with tar, but I think that if brick is to be laid in cold weather, or there is any doubt of the foundation settling away from the pavement by the vibration of the travel on the surface, or from other causes, a filler should be used that would permit the pavement to close the joints in hot weather, or follow the foundation when it settles."

At Roseville, Newark, a similar experience was had. This pavement was laid in 1895, on concrete with the joints of the brick filled with cement grout. The pavement, when finished, was in a contracted condition and so remained until the spring, when unusually warm weather steadily expanded the bricks. The expansion crosswise the street was resisted by the curbstones and their concrete setting, with no perceptible disadvantage to the pavement. But the expansion lengthwise the street forced the brick down a slight grade for a long distance, to a point where the pavement for a short distance was level. The brick pavement was there forced upward in the form of an arch, with a hollow under it, extending with a few breaks across the street. The ridge or crown of the arch was at right angles to the direction of the street. The brick at a few points gave way. We learn through the city engineer that the expansion of the bricks could be traced by the break along the curbs for a distance of a little more than 330 feet.—Brick.

The death occurred at Simcoe, Ont., on the 26th inst., of Mr. N. C. Ford, town clerk, at the age of 86 years. He was one of the oldest residents of the town, having lived there 53 years.

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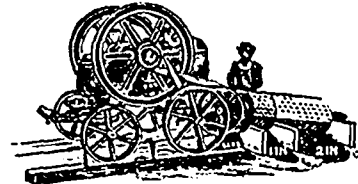
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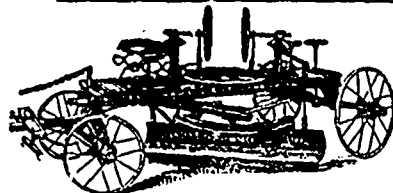
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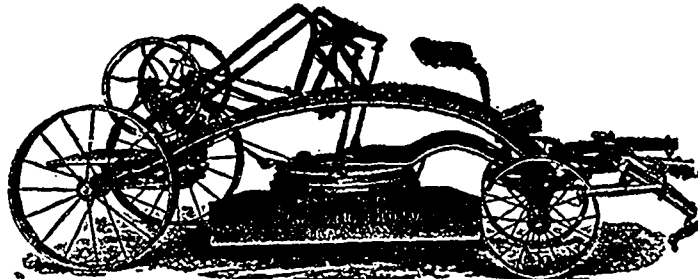
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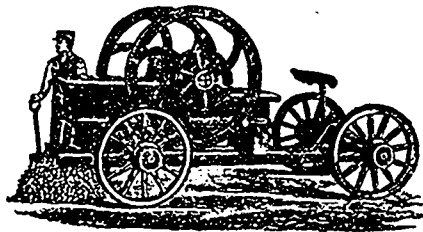
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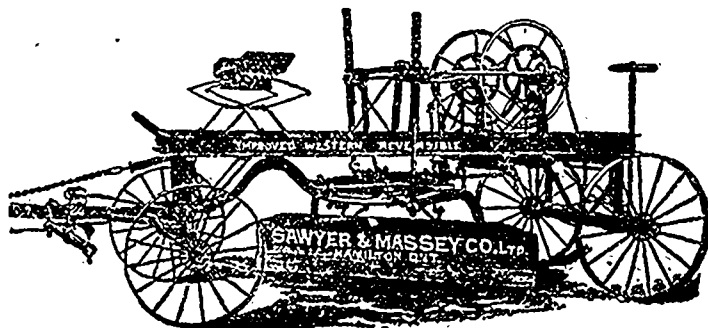
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