

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured covers/
Couverture de couleur
- Covers damaged/
Couverture endommagée
- Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée
- Cover title missing/
Le titre de couverture manque
- Coloured maps/
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur
- Bound with other material/
Relié avec d'autres documents
- Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- Additional comments:/
Commentaires supplémentaires:

- Coloured pages/
Pages de couleur
- Pages damaged/
Pages endommagées
- Pages restored and/or laminated/
Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées
- Pages detached/
Pages détachées
- Showthrough/
Transparence
- Quality of print varies/
Qualité inégale de l'impression
- Continuous pagination/
Pagination continue
- Includes index(es)/
Comprend un (des) index

Title on header taken from: /
Le titre de l'en-tête provient:

- Title page of issue/
Page de titre de la livraison
- Caption of issue/
Titre de départ de la livraison
- Masthead/
Générique (périodiques) de la livraison

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CANADIAN CONTRACT RECORD

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

EVERY SATURDAY

Vol. 3.

Toronto and Montreal, Canada, November 19, 1892.

No. 41

THE CANADIAN CONTRACT RECORD,
 PUBLISHED EVERY SATURDAY
 As an Intermediate Edition of the "Canadian Architect and Builder."

Subscription price of "Canadian Architect and Builder" (including "Canadian Contract Record"), \$2 per annum, payable in advance.

C. H. MORTIMER, Publisher,
 CONFEDERATION LIFE BUILDING, TORONTO.
 Telephone 2362.

64 Temple Building, Montreal.
 Bell Telephone 2399.

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

ADVERTISING RATES ON APPLICATION.

At its Convention held in Toronto, Nov. 20 and 21, 1889, the Ontario Association of Architects signified its approval of the CANADIAN CONTRACT RECORD, and pledged its members to use this journal as their medium of communication with contractors with respect to advertisements for Tenders.

The following resolution was unanimously adopted at the First Annual Meeting of the Province of Quebec Association of Architects, held in Montreal, Oct. 10th and 11th, 1890: "Moved by St. Perreault, seconded by A. F. Dunlop, that we the Architects of the Province of Quebec now assembled in Convention being satisfied that the CANADIAN CONTRACT RECORD affords us a direct communication with the Contractors, resolved, that we pledge our support to it by using its columns when calling for Tenders."

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



NOTICE TO CONTRACTORS.

TENDERS FOR ANNUAL SUPPLIES.

Tenders will be received by registered post, addressed to the City Engineer, Toronto, up to 11 o'clock a.m. on TUESDAY, NOVEMBER 29TH, 1892, for the following supplies for the year ending December 31st, 1893.

Sewer Pipe, Iron work, Lumber, Crossing Stone, Lako Stone, Horse Feed, etc., Pressed Spikes, Wire Nails, Gravel, Loam, Sand.

Specifications and forms of tender may be obtained on and after November 22, 1892, at the office of the City Engineer.

A deposit in the form of a marked cheque, payable to the order of the City Treasurer, for the sum of 5 per cent. on the value of the work tendered for under \$1,000, and 25 per cent. for the value of the work tendered for over that amount, must accompany each and every tender, otherwise it will not be entertained. All tenders must bear the bona fide signatures of the contractor and his sureties (see specifications), or they will be ruled out as informal.

The Committee do not bind themselves to accept the lowest or any tender.

JOHN SHAW,

Chairman Committee on Works.
 Committee Room, Toronto, Nov. 16, 1892.

TENDERS

Will be received by the undersigned for the several trades for the erection of Three Houses on Church Street for Robert Thompson, Esq. Plans and specifications may be seen at our office or 35 Church Street.

EDWARDS & WEBSTER, Architects,
 18 Victoria Street, Toronto.

EXECUTOR'S SALE.

GOOD business openings in London, Ontario. Executor's Sale of planing mill with all the latest improved machinery, adjoining G. T. R. in London; also coal and wood and lumber business. Bathing planing mill and coal yard are splendidly situated, oil established and successful business. There are excellent opportunities for business men. For particulars apply to E. W. Green, Executor or Gibbons, McNab & Mulken, solicitors—state late Thos. Green, London.

PEMBROKE WATER WORKS.

Notice to Contractors.

Scaled tenders will be received by the Chairman of the Waterworks Committee, Pembroke, until 6 p.m. on FRIDAY, DECEMBER 9TH, 1892, for the construction of a system of Water Works for the Town of Pembroke, as follows:—

- A—Intake pipe and well.
- B—Buildings and Chimney.
- C—Pumping machinery and boilers.
- D—Distribution system.
- E—Water tower.

"Bulk Tenders" will also be considered.

Plans, specifications, contracts, etc., can be seen and forms of tender obtained at the Town Clerk's office, Pembroke, or at the office of the Chief Engineer, on and after 25th instant.

WILLIS CHIPMAN,

Chief Engineer, 103 Bay St., Toronto.

WM. O'MEARA,

Chairman W. W. Committee, Pembroke.

Dated November 18th, 1892.

It very frequently happens that where the specifications do not distinctly state the manner of painting to be employed on the galvanized iron work, that the painter will object to doing any work upon it at all, saying that there would be no use of galvanizing the iron if it was intended to be painted. Of course this argument seems to be sound enough, for the coating of zinc on the surface of the iron will protect it from rust in a reasonable degree, provided this coating is free from flaws or breaks of any kind, which freedom can be obtained only by placing the finished piece of iron work in the zinc bath. Most of the cornice work is made from thin sheet iron, galvanized and bent into shape afterward. During this shaping there is more or less cracking of the coating, especially at the sharp angles of the mouldings and every crack forms a place for the admission of moisture and the commencement of rust. Hence the absolute necessity for painting galvanized iron work, even though it be but a simple conductor spout or ridge roll on a roof.—*Painting and Decoration.*

CONTRACTS OPEN.

KINGSTON, ONT.—Capt. Noonan will build a new steamer this winter, at a cost of \$8,000.

GALT, ONT.—J. G. Dikes, Treasurer, will receive tenders until the 5th of December for the purchase of \$10,000 worth of debentures.

BELLEVILLE, ONT.—Mr. Henry Carre, C. E., has submitted to the Council a report on a system of sewerage for this city.

NORTH TORONTO, ONT.—The Town Clerk will receive tenders until Wednesday 23rd inst. for 1,000 feet of fire hose, also three hand reels.

MAGOG, QUE.—Plans have been submitted to the D. C. M. Co. for a fine row of houses to be erected on the vacant lot opposite the Fairview.

BUCKINGHAM, QUE.—The corporation invites tenders until the 5th of December for the purchase of \$40,000 worth of waterworks debentures.

KINGVILLE, ONT.—Mr. David Coughlin has purchased a site on Main street on which he intends to erect a two storey residence in the spring.

ST. STEPHEN, N. B.—Mr. C. O. Baker will erect next season a brick block on the site of his store on Water street, now occupied by Ganong & Wilson.

MITCHELL, ONT.—The congregation of Knox Church, held a meeting the other day and unanimously decided to proceed at once with the erection of a new church.

WINNIPEG, MAN.—A committee of the Grain Exchange has been appointed to confer with the Board of Trade in regard to securing the erection of grain elevators in this city.

HULL, QUE.—The E. B. Eddy Manufacturing Company are contemplating the erection of a new paper mill on the site of the present sash and door factory, which will be built out to the street line and greatly enlarged.

RAT PORTAGE, MAN.—The Lake of the Woods Milling Company intend during the coming winter to increase their water power at a cost of \$8,000 to \$9,000. A new sixty-six inch turbine wheel will be purchased.

QUÉBEC, QUE.—The sum of \$16,000 has been subscribed towards the proposed Champlain monument.—The members of the Garrison Club have decided to add another storey to the present building to contain a dining room and several bedrooms. Mr. H. Staveley is now preparing the plans.

TORONTO JUNCTION, ONT.—Mr. J. A. Ellis, architect is preparing plans for a detached residence to be erected at the corner of Dawson Road and High street Port Arthur, for Mr. J. L. Meikle. It will be built of pressed brick and will cost upwards of \$7,000.—Applications will be received by the Town Council until Friday, 25th inst., for the position of Superintendent of the Toronto Junction Waterworks system. Particulars may be had from the Mayor or Mr. John D. Spears, Chairman of Waterworks Committee.

MONTREAL, QUE.—A meeting of the shareholders of the Montreal and Pacific Junction Railway Company was held last week, at which it was decided to proceed with the construction of the road at an early date. Mr. J. P. Casgrain will be chief engineer. The capital of the com-

pany is placed at \$500,000. A conference was held at the City Hall on Tuesday last to consider the question of a bridge or tunnel at the canal crossing, Point St. Charles. Public opinion seems to be in favor of a tunnel, and a deputation will interview the Minister of Railways and Canals at Ottawa in a few days.

ST. LAMBERT, QUE.—The municipal council on Friday last adopted a by-law for the provision of water and drainage for the village. The by-law will be submitted to a vote of the property-owners on the 6th of December. The sum to be expended under the plans considered will be about \$60,000 or \$70,000.

VICTORIA, B. C.—News has been received from Chicago to the effect that all the stock has been subscribed for the construction of the Canada Western Railway and that the work of construction will be proceeded with at once. Construction will commence from the terminus of the Esquimalt and Nanaimo Railroad, over whose rails the Canada Western rolling stock will be operated to Duluth, a town which the railway is to create on Duncan's Bay. It is there that the terminal buildings will be erected and the ferry landings constructed. The School Board are considering the erection of a new High School building.

LONDON, ONT.—Messrs. Barnes, Brown, Webb and Ginge, representing an English firm of produce merchants, recently waited on the Minister of Agriculture regarding the establishment of a large factory in this city. As a result the company have purchased six acres of land at the junction of the G. I. R. and G. W. R., known as the "V," for the site of the proposed establishment, and work will be proceeded with at once.—Sufficient funds for the establishment of a prison gate home have been subscribed and a strong feeling exists in favor of proceeding with the work this fall.—The City Engineer will receive tenders until the 21st inst. for the construction of a tile drain on Euclid avenue, in London South.

HAMILTON, ONT.—Mr. John C. Woods has purchased two lots on the corner of Bay street and Aberdeen avenue and intends building a fine residence thereon. It is said that the gentlemen who proposed building a new theatre last winter are now contemplating the erection of a spacious concert hall and assembly room, the site chosen being immediately west of the Bank of Montreal on Main street. It is understood that most of the stock has been subscribed.—Building permits have been granted as follows:—John Gompf, addition to ice house on Catharine street, between Burlington and Brock streets, cost \$17,000. Hannaford Bros., two-storey brick dwelling on Hannah street, between Bay and Caroline streets, cost \$1,600. W. J. McDonald, two-storey brick dwelling on Argue street, cost \$1,250.—Charles Mills, architect, has prepared plans for a large concert and assembly hall to be erected here, tenders for which will be asked after the New Year, also plans for a brick residence for a gentleman, to be built in the city of Boston, Mass., and a large bank barn, with all the latest improvements, for the Avondale Stock Farm. William Lawrence, two-storey brick dwelling on Emerald street, between King William and Wil-

son streets, cost \$1,000.—At a recent meeting of the vestry of the Church of Ascension a committee was appointed to take into consideration a project for the enlargement of the schoolroom.—The Council are considering the enlarging of the market.

TORONTO, ONT.—At a recent meeting of the Property Committee of the City Council it was decided that the sum of \$1,000 be placed in the estimates of next year to be awarded to the authors of the best architectural plan for enlarging and improving the St. Lawrence Market, by the inclusion of the old City Hall and drill shed. It was also decided to order the preparation of plans for adding an additional storey to the Registry Office.—The question of converting the old Immigration sheds into a public abattoir was also discussed. Commissioner Coatsworth having reported that \$6,500 would put the buildings into the desired shape, the matter was deferred to the next meeting.—A deputation from St. Andrew's Society recently waited upon the Mayor and urged the necessity of having a new hardwood floor laid in the Horticultural Pavilion. It will cost about \$1,000.—New stained glass windows are to be put in the chancel of Christ Church, Deer Park.—Mr. D. B. Dick, architect, has completed the plans for the new building to be erected for the Haven and Prison Gate Mission. The cost of execution will be \$16,000. At a recent meeting of the promoters it was urged that the work be proceeded with at once.—Building permits have been granted as follows: W. F. Mountain, 120 Jameson ave., det. 2 storey and attic, bk. dwelling, 10 Jameson ave., cost \$4,000, Arthur Moore, 627 Jarvis street, large 1 storey r. c. storage warehouse, s. side Shaftesbury avenue, cost \$1,200, George Barrett, Yonge street, det. 2 storey and attic bk. dwellings, 263 McCaul st., cost \$2,800; H. J. Tharll, 57 Dunn ave., pr. s. d. and one det. 2 storey and attic bk. dwellings, s. w. cor. King and Springhurst sts., also one det. same kind, 59 Dunn ave., cost \$15,000; Mrs. A. Belford, Close ave., two det. 2 storey and attic bk. dwellings, 208—10 Cottingham st., cost \$9,000.

FIRES.

The new Comstock block on Court House avenue, Brockville, was damaged by fire last week to the extent of \$4,000.—Mr. Joseph Cooper's planing factory at Bracebridge, Ont., was totally destroyed by fire on Sunday last; loss, \$3,000; no insurance.—The Keelersville cheese factory, near Kingston, Ont., was burned to the ground on Wednesday. The factory was owned by Mr. Rothville, Jones' Falls.—The buildings of J. S. Thorn and the Kelly block, owned by James Kelly, at Sarnia, Ont., were destroyed by fire last week. The total loss is \$2,300, which is partly covered by insurance.—The establishment of M. Gray & Co., dealers in hardware, stoves, etc., Orangeville, Ont., was completely destroyed by fire on Monday last, entailing a loss of \$10,000, which is mostly covered by insurance.—The tug C. G. Munro, owned by Cook & Lindsay, of Port Colborne, Ont., was burned on Wednesday last. The boat was valued at \$5,000, most of which is covered by insurance.—The store and residence of E. B. Nash, Cookstown, Ont., was destroyed by fire recently. The loss is said to be heavy.

CONTRACTS AWARDED.

LONDON, ONT.—The McClary Manufacturing Company have awarded the contract for a \$10,000 addition to their works to Messrs. Tambling & Jones.

WINNIPEG, MAN.—The contract for short pipe sewers on Tenth street south and Dagnair street has been awarded to Messrs. Dobson & Jackson, at the price of \$2,048.

QUEBEC, QUE.—D. Ouellet, architect, has awarded a contract to Mr. Thos. Caron, of the parish of St. Aubert (1stlet), for the inside decoration of the R. C. Church of the said parish, to be in pine wood, with carved ornaments, altars, pulpits, pews, etc., the ceiling to be painted in white with gold ornamentation. Cost, \$6,300.

TORONTO, ONT.—The contract for alterations to No. 1 police station has been awarded to Messrs. Wilson & Hanc, at \$680.—The decoration of the Legislative Chambers in the new Parliament buildings has been awarded to Messrs.

Elliott & Son.—Mr. John Fielding, of Belleville, has been awarded the contract for erecting the bridge over the railway tracks at the western cattle market. The price is \$4,248.

COST OF QUARRYING.

Mr. Roger Rigley recently read a paper before the Western Pennsylvania Mining Institute, upon the "Cost of Excavating and Handling Rock." Among other things, he said:

The average weight of a cubic yard of sandstone, or conglomerate in place, is given as 1.8 tons, and of compact granite, gneiss, limestone, or marble, 2 tons, or an average of 1.9 tons, or 4,256 pounds. A cubic yard, when broken up ready for removal, increases about four-fifths in bulk, and one-fourteenth of a cubic yard, or 177 pounds, in a wheelbarrow load. Experience shows that with wages at \$1 per day of 10 hours, 45 cents per cubic yard is sufficient allowance for loosening hard rock. Soft shales and allied rocks may be loosened by pick and plow at a cost of 20 cents and 30 cents per cubic yard. The quarrying of ordinary hard rock requires from one-fourth pound, to one-third pound, and sometimes one-half pound of powder per cubic yard. Drilling with a churndriller costs from 12 to 18 cents per foot of hole bored. Upon these data Mr. Rigley estimates the total cost per cubic yard of rock in place, for loosening and removing by wheelbarrow (labor assumed \$1 per day of ten hours) as follows: When distance removed is 25 feet, total costs equals \$0.537; when 50 feet, \$1.549; when 100 feet, \$0.573; when 200 feet, \$0.622; when 300 feet, \$0.768; when 1,000 feet, \$1.011, and when 1,800 feet, \$1.401. This is exclusive of contractors' profit.

When labor is \$1.25 per day, add 25 per cent. to the cost price given, when \$1.50 per day, add 50 per cent, and so on. In hauling by cart, the cost of loading, which will be about 8 cents per cubic yard of rock in place, and additional expense of maintaining the road, must be added. Allowing then, 851 pounds as a cart load, the total cost per cubic yard is estimated, when removed 25 feet, at \$0.596; when 50 feet, \$0.599; when 100 feet, \$0.605; when 200 feet, \$0.617; when 300 feet \$0.655; when 1,000 feet, \$0.717, and when 1,800 feet, \$0.940.—Stone.

USEFUL HINTS.

To remove old paint, wet the place with naphtha, repeating as often as is required. As soon as it is softened, rub the surface clean.

The new paving brick factory to be erected in Springfield, Ill., will be located in the western part of the city, and a novel feature in connection with this factory is the proposed shipment of the product to the several railroad stations by the street-car lines. One motor will draw five trucks heavily loaded with brick. The cars run regularly between 6 a.m. and 12 midnight for passenger traffic, and the brick trains will fill in the remaining six hours time.

SIZE FOR WALL PAPER.—When you have a border with loose red lines on the edges which are sure to rub up when wet, just give them a size of water glass on the face a few moments before you paste the border and the paste on the

other side will have no effect upon the color. You can either size the entire border, or pencil down the red or other loose and high colored places. If you are putting up decorations, or putting in small panels of delicate paper, just give the face of the paper a coat of water glass varnish and let it dry before you cut or paste your paper, and you need have no fear of your colors washing up or the paper getting clouded by the use of the brush or roller.

To preserve hempen ropes exposed to a moist atmosphere, it is recommended to impregnate them according to one of the two following receipts, which are quite inexpensive. 1. Dissolve about 4 ounces of soap in 1 quart of water, draw the dry through the solution and dry it. Then give it a thin coat of hot tar and dry it in the air. 2. Dissolve 5½ ozs. of blue vitriol in 1 quart of water and put the dry in the solution, allowing it to remain 4 days. A coating of hot thin tar completes the process, after which the rope is dried in the air. The blue vitriol protects the fibres from the attacks of small animals, as well as from moulding and rotting. The coating of tar fixes the blue vitriol in the fibres.

MUNICIPAL DEPARTMENT.

LEGAL DECISIONS AFFECTING MUNICIPALITIES.

Thomas A. Connell, of Prescott, brought an action against the town claiming \$6,000 damages for injuries received owing to the alleged negligence of the defendants' servants in blasting out a culvert or drain across Wood street in that town. The action was tried at Brockville by Mr. Justice Street and a jury and a verdict given in favor of the plaintiff for \$3,000 and costs. The defendants appealed to the Chancery Divisional Court and the appeal was dismissed. They are now appealing to the Court of Appeal.

York v. Township of Osgoode.—Judgment on motion by the plaintiff to continue an interim injunction granted by the local Judge at Ottawa. The defendants took the objection to the motion that the action did not lie, because the rights of the parties were concluded by the finding of the county judge affirming an award in proceedings under the provisions of R. S. O., ch. 220, the Act respecting ditches and watercourses. The learned chief justice holds that the express words of sec. 11, sub-sec. 4, of this Act show that the appeal to the county judge is final, and that the plaintiff has no remedy by action. Motion refused, with costs to the defendants in any event.

WEBSTER v. CITY OF TORONTO.—Judgment on motion by the plaintiff to commit Robert Gray for refusing to be sworn on an appointment for his examination as an officer of the corporation of the city of Toronto, for discovery. Action for damages arising out of a sidewalk accident. The defendants' street commissioner had already been examined, and stated that he himself had general supervision of the road and sidewalks, and that Gray was the foreman under him. The learned Chief Justice holds that the case, is concluded by the judgment of Rose, J., in Thomas v. G. T. R. Co., 12 C. L. T. Occ. N. 42. Motion dismissed with costs to the defendants in any event.

THE COLLECTION OF WATER SUPPLIES.

(Continued from last week)

When the watershed of the stream lends itself to the construction of a reservoir by building a dam across the stream the quantity of water available would be greater than the previous average discharge at that point, according to Mr. Brightmore, because the average distance the rain has to travel before reaching the mass of water is less than before, and a portion of the rainfall which previously fell on the ground now falls directly into the reservoir, resulting in a reduced evaporation and absorption by vegetation. For the same reason the discharge of a catchment basin depends on the distance of its part from the point of discharge. A valley of a stream is suitable for a reservoir if it narrows at a point so as to give the desired volume of storage, and if at the point of contraction there is an impervious stratum at no great depth beneath the bottom and sides. If the rock is near the surface and a hard quality, and stone is plentiful, it would generally be more satisfactory to have a masonry dam. If the gorge is narrow and the rock rises on each side the dam would probably be much cheapened by arching it in plan, in which case its sectional area would be much reduced. If, however, the impervious stratum is at a considerable depth, or is of a soft nature requiring the pressure to be well distributed, an earthen dam would be most suitable, and a puddle trench would, in this case be carried down to the impervious strata. It is, above all things, necessary in such a reservoir to have a good storm overflow big enough to amply provide for the greatest hourly rainfall that could occur. most failures to dams having been due to insufficient overflows.

The water obtained from catchment areas being taken nearer to its source is less likely to be polluted by organic matter than water pumped from a river, although if the water by percolation has taken up iron or lime carbonates, or contains dissolved hydrogen sulphide, the flow along an open channel facilitates the deposit of the former and the escape of the latter.

When the conditions are such that the water table nearly coincides with the surface of the ground, but where there is no natural depression to collect the water in a lake or stream, then the supply may be obtained either from springs or from shallow wells by pumping, or intercepting tunnels or drains. In districts sparsely populated, if springs exist or wells be sunk, they may prove valuable sources of supply. Most towns or cities at one period of their history have been supplied from shallow wells which have been abandoned as they became polluted. In California, for instance, there are a number of shallow artesian wells from 100 to 250 feet deep, much used for domestic supply and irrigation. As such a district becomes more closely populated such wells, unless there is a layer of impervious material above the water-bearing strata, are very liable to contamination. Springs however if removed from the source of contamination, are valuable sources of supply.

The domestic supply of Paris, France is from the spring waters of the Vanne and Dhuis and from artesian wells at Grenells and St. Dennis. Rome is to a large extent supplied by the Acqua Marcia, which derives its supply from the seven Siren springs. Vienna is also supplied from springs, and part of London by the New River, from the springs at Chadwell and Amwell. In some instances, as at Frankfurt-on-the-Main, the springs are in the spring-time supplemented by pumping from deep wells. Spring water is generally free from organic matter, but often contains mineral matter in solution, generally ferro-carbonate and calcium carbonate, both of which are partly deposited by exposure to the air, which also permits the escape of any dissolved hydrogen sulphide. Iron may be removed from solution in water by causing the water to fall in fine streams for about 7 feet, and then passing it through filters,

MUNICIPAL ENGINEERS, CONTRACTORS, AND MATERIALS.

which may be done at a greater rate than in ordinary filtration.

Instead of sinking shallow wells, intercepting tunnels may be driven into the water-bearing strata, as is done in California in the boulder and sand formation. In Naples the town supply is collected from springs by galleries 50 feet below the surface, and at Constantinople the supply is increased by leaving the joints of a tunnel open to allow the percolation of water. The yield of springs may sometimes be increased by making a puddle trench so as to prevent the flow of water past the spring. Another method of intercepting water, much practiced in Holland, for collecting water for domestic supply from the sand dunes which lie near the coast, is to intersect the dunes with one or more canals, into which the water from the sand drains. The fine sand of which the dunes are composed is very retentive and consequently forms a reservoir for the rain water. Even after a long drought the amount of water stored continues to drain into the canals, and the supply is consequently equalized.

In the discussion on this paper, Mr. J. H. T. Turner stated that syphons are frequently used to collect water from the wells in the low plains of Flanders into a central pumping well. In order to intercept a large quantity of the subterranean flow that is slowly passing beneath their feet they sink a number of shallow wells. The water table is very near the surface there, and they sink these wells in each district, then a central well, and then syphon from the various collecting wells into the central well, using an ejector to exhaust the air out of the syphon, so that they have a half-dozen natural pumps going at once.—*Engineering Record.*

Canada Pipe Foundry,

HAMILTON, ONTARIO.

ALEX. GARTSHORR, Proprietor.

Manufacturer of

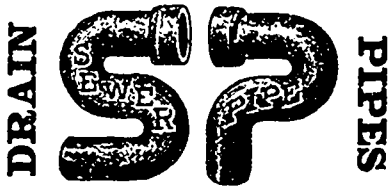
CAST IRON WATER, GAS AND SEWER PIPES.

— ALSO —

Special Castings of every description.

CAPACITY: 50 TONS PER DAY.

In use from Vancouver to Sydney, Cape Breton. Correspondence solicited.



For SEWERS, CULVERTS; also WATER PIPES, INVERTS, VENTS, &C. Goods shipped by water or rail to all points.

The Thos. Nightingale Pressed Brick Co.

67 Adelaide St. East, Toronto. Telephone 449. Works at Port Credit.

MUNICIPAL OFFICIALS

should see to it that in the erection of town and city PUBLIC BUILDINGS, the installation of water works plant, etc., the advantages of



are made use of for deadening sound in floors and partitions, insulation of heat and cold, fireproofing, etc., also SECTIONAL MINERAL WOOL COVERING for steam pipes, boilers, exposed water pipes, etc.

Montreal Agent. GBO. A. GOWAN, Room 23, 204 James Street.

Canadian Mineral Wool Co., Limited, 122 Bay Street, TORONTO.

THOROLD CEMENT

WELLAND CANAL ENLARGEMENT. RESIDENT ENGINEER'S OFFICE, WELLAND, April 17th, 1884.

JOHN BATTLE, Esq., Thorold

Dear Sir,—Yours of yesterday, relative to Thorold Hydraulic Cement, is received. In reply, I beg to say that my tests of the Thorold Hydraulic Cement have extended over a period of twenty-eight years, and have been on a large scale, as exemplified in the locks, bridges, culverts and other masonry on the Welland Canal and Welland Railway, and that the record, which has been invariably satisfactory, is to be found in examination of the structures. The necessary tearing down of masonry and concrete, during the Welland Canal Enlargement, has afforded abundant evidence of the reliability of the Thorold Hydraulic Cement, both in masonry and concrete, and above and under water. I desire no better cement for the class of work referred to.

I am, dear sir, yours truly,

W. G. THOMPSON, Resident Engineer.

ISAAC USHER & SON, THOROLD, ONT.

Manufacturers of

QUEENSTON CEMENT

Proved by Government tests to be the best Canadian natural cement. Write for prices, &c

DEBENTURES WANTED.

Municipalities issuing debentures, no matter for what purpose, will find a ready purchaser by applying to G. A. STIMSON, 9 Toronto Street, Toronto. N.B.—Money to loan at lowest rates on first mortgage

R. E. H. BUGNER,

39 Adelaide St. East, - TORONTO.

PATENT CAST IRON GULLIES,

Vitrified Clay Sewers - Dust Bins - Sewer Pipe Cements - Steam Road Rollers - Stone Breakers - Street Scrapers - Horse Brushes, etc.

ASPHALT PAVING

We are prepared to do first-class work on WALKS, FLOORS, CELLAR BOTTOMS, &c., with ROCK ASPHALT, which is conceded to be the best for this class of work.

H. WILLIAMS & CO.,

Roofers and Paviers,

4 Adelaide Street East, - TORONTO.



DRAIN AND WATER PIPES,

Double Strength for railway culverts, etc. Saver Bottoms or Invert Blocks, Cement. Note.—Only pure SCOTCH unglazed Fire Clay Linings will be kept in stock; any other quality is worthless for rearing heat. Correspondence invited. Quotations promptly furnished. Office: 31 Wellington St., Montreal.

EUREKA CONCRETE SIDEWALKS

FOR CCELLARS, FLOORS, STABLES, ETC.

A. GARDNER & CO., - ROOM 17, YONGE STREET ARCADE, TORONTO. TELEPHONE 2147.

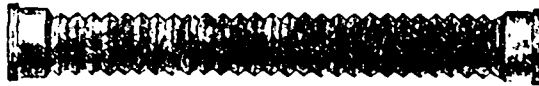
A. & E. LOIGNON,

CIVIL ENGINEERS.

Bridge and Structural Iron Work. Steel Beams kept in stock. Plans, Estimates and Specifications.

WORKS: ST. COLUMBAN ST. AND CANAL SIDE, MONTREAL. OFFICE: 2 PLACE D'ARMES. Telephone 9177

CORRUGATED SOIL PIPE AND FITTINGS (PATENTED).



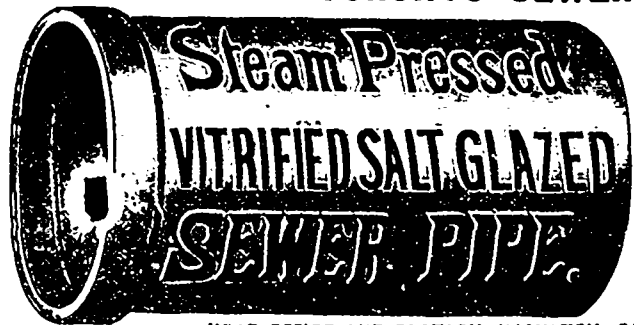
This improvement marks an era in sanitary reform. Universal certification in its favor from Architects, plumbing inspectors, master plumbers' associations, and others. Costs no more; more economical to use.

H. R. Ives & Co., - Montreal.

HAMILTON AND TORONTO SEWER PIPE CO.

- FOR -

SEWERS, CULVERTS, AND WATER PIPES. INVERTS Fire Brick Sewers



Write for Discounts.

HEAD OFFICE AND FACTORY, HAMILTON, CANADA.

Drummond McCall Pipe Foundry Company,

MONTREAL MANUFACTURERS OF

CAST IRON WATER AND GAS PIPES

WORKS: LACHINE, QUE.

PRICES ON APPLICATION.

THE STANDARD DRAIN PIPE CO.

OF ST. JOHNS, P. Q., (LIM.)



Manufacturers of Salt-Glazed, Vitrified SEWER PIPES

Double Strength Railway Culvert Pipes, Inverts, Vents,

AND ALL KINDS OF FIRE CLAY GOODS.

Canadian Bridge & Iron Co.

MONTREAL.

Architectural Ironwork a Specialty. Pleased to furnish estimates.

THE J. C. EDWARDS

Vitrified Terra Metallic Paving Brick

— FOR —

STABLE, COACH HOUSE, BOILER HOUSE, BREWERY FLOORS AND YARDS, Also all places of heavy and light traffic.

The only Genuine Vitrified Brick. The best in the Sidewalks & Street Crossings FRONT-PROOF, WATER-PROOF, TIME-PROOF

JOHN S. CUTHBERTSON, AGENT FOR CANADA, Room 64, Temple Building, Montreal. PRICES ON APPLICATION.

