

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

PUBLIC WORKS • TENDERS • ADVANCE INFORMATION • AND MUNICIPAL PROGRESS

EVERY SATURDAY

Vol. 3. Toronto and Montreal, Canada, July 16, 1892. No. 22

**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,  
14 KING ST. WEST, TORONTO, CANADA.  
Telephone 2362.  
63 Temple Building, Montreal  
Bell Telephone 2260.

## TENDERS WANTED.

Tenders will be received at the office of the undersigned until noon of the 22nd inst. for the works necessary in the erect on and completion of a Stock Barn Drainage. The lowest or any tender will not necessarily be accepted. Plans and specifications may be seen at our offices.  
**POWER & SON, Architects,**  
Kingston, Ont.

## TOWN OF BARRIE.

### Tenders for Steam Heating.

Tenders will be received by the undersigned on and after Tuesday next, the 19th inst. for the Steam Heating and Ventilation of the Court House at Barrie, Ont. Plans and specifications can be seen at the Court House, Barrie, or at the office of W. J. Burroughes, 353 Queen St. West, Toronto.

Tenders to be made out on blank forms provided and must be accompanied by the actual signatures of two responsible parties who are willing to become security for the completion of the contract to the satisfaction of W. J. Burroughes and the County Council of the County of Simcoe.

H. GRAHAM,  
Chairman of Committee,  
Court House, Barrie.



## Notice to Contractors

Tenders will be received by registered post, addressed to the City Engineer, Toronto, up to Eleven o'clock a.m. on **TUESDAY, JULY 26TH, 1892,** for the following work:

### A SEWER

On Roseberry Avenue, from Bathurst Street to 335 feet easterly.

Specifications and forms of tender may be obtained on and after July 19th, 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 Five per cent. on the value of the work tendered for under \$1,000, and 2½ 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 of Committee on Works,  
Committee Room, Toronto, July 15, 1892.

## TENDERS

Wanted for building SEWERS and works connected therewith in Moore Park, Ip. York. Plans, specifications, etc., can be seen and sealed tenders received at the office of the undersigned until

5 o'clock p.m. on Saturday, 30th July, 1892.

The undersigned will be at 7p. rooms, Tremont House, Yonge St., Toronto, from 2 to 5 p.m. on Saturday, 23rd inst., with plans, etc. The lowest or any tender not necessarily accepted.  
**PETER S. GIBSON,**  
Engineer York Ip.

Willowdale, July 13th, 1892.

## NOTICE TO CONTRACTORS.

Tenders will be received by the undersigned till **MONDAY, THE 25TH DAY OF JULY, 1892,** at 6 o'clock p.m., for the following work

For paving with Cedar Blocks, that portion of Petrolia Street commencing at the track of the the Michigan Central Railroad and running west to the west limit of Princess Street.

Plans and specifications can be seen at the Town Clerk's office in Petrolia, or at the office of J. M. Moore, Esq., Civil Engineer, London.

**GEO. S. McPHERSON,**

Town Clerk, Petrolia, Ont.  
Petrolia, July 6th, 1892.

## TORONTO JUNCTION SEWERAGE WORKS

Tenders will be received at the office of the Town Clerk until 6 p.m., July 21st, for the necessary materials for the construction of about

### 15,000 Lineal Feet of Sewers,

9 inch, 12 inch, 15 inch and 18 inches in diameter. Specifications, instructions forms of tender, etc., may be seen at the Sewerage Works Office, Toronto Junction, and at the office of the Chief Engineer, 103 Bay St., Toronto.

(Signed) **WILLIS CHIPMAN,**  
Chief Engineer.

Dated July 15th, 1892.

## ELECTRIC STREET RAILWAY.

### TENDERS WANTED.

Sealed tenders will be received by the undersigned up to July 20th for the construction of an Electric Street Railway in the city of Brantford. The contract to include the removal of present street railway tracks, the laying of new tracks and the erection of poles. Plans and specifications for the work may be seen at the Office of the Edison General Electric Co., 77 Bay St., Toronto, or at the Office of Wm. Kerr, Kerby House, Brantford. The Company reserves the right to reject any or all bids.

**T. S. RUSSELL,**  
Engineer Brantford Street Railway.

## CONTRACTS OPEN.

**PERTH, ONT.**—The ratepayers are agitating for a system of waterworks.

**MAISONVILLE, QUE.**—The Baptist congregation are erecting a new church.

**GLASGOW, N. S.** The sum of \$25,000 has been voted for school building

**CHALK RIVER, ONT.**—An English church is to be erected in this place.

**GRAFTON, ONT.**—The congregation of St. George's church will erect a new rectory.

**PORTAGE LA PRAIRIE, MAN.** The Roman Catholics are calling for tenders for the erection of a church and school room.

**KNOWLTON, QUE.**—The Village Council has decided to negotiate a loan of \$5,000 for the purpose of building three iron bridges.

**EMIRO, ONT.**—Mr F. Cody Clerk will receive tenders until the 26th inst. for the erection of a Town Hall in this village. Plans at Clerk's office.

**SARNIA, ONT.**—The capital stock of the Sarnia Curling and Skating Rink Club has been increased to \$25,000, the intention being to erect a commodious rink.

**HALIFAX, N. S.**—At the last meeting of the City Council it was decided to proceed with the construction of the new pipe line, the estimated cost of which is \$157,000.

**TORONTO JUNCTION, ONT.**—The Sewerage Engineer has been instructed to advertise for materials for section B, of the sewerage works, tenders to be in by July 21st.

**LANARK, ONT.**—The ratepayers have carried a by-law granting the sum of \$4,000 for the purpose of leasing the water power and assisting in the erection of a roller grist mill.

**BRANTFORD, ONT.**—Mr. Wm. Paterson, M. P., has received definite assurances that the Government will grant the sum of \$10,000 towards the erection of a new drill shed.

**CHATHAM, ONT.**—The Town Council has decided to readvertise for tenders for lighting the streets by electricity, the Reliance Electric Light Company having failed to sign the contract.

**NAPANEE, ONT.**—John Lowry, Chairman of Street Committee, will receive tenders until the 17th inst., for the construction of a sewer on East street, from Graham street to Napanee river.

**ALLISTON, ONT.**—Mr. Jos. W. Renny, architect, of Collingwood, has been instructed to prepare plans for a new opera house and town hall, the building to be 80x42 ft., and three stories high.

**GUELPH, ONT.** Mr. S. J. Taylor, Chairman Market Committee, will receive tenders until the 21st inst. for two new furnaces for heating the City Hall, having a capacity each of 65,000 cubic feet.

**STELLARTON, N. S.**—Tenders are being asked by the Town Clerk for the excavation and pipe laying for a system of waterworks, also for the supply of water pipes, plant and machinery required in the construction.

**BROCKVILLE, ONT.**—Mr. Kives Tully, architect, of the Department of Public Works, Ottawa, is at present engaged in laying out the grounds for the new asylum. It is expected that tenders will be called for at an early date.

**CARLETON, N. B.**—Plans are now being prepared for the construction of sewers on Winslow street, Guilford street and Market Place, and a large terra cotta sewer on Adelaide Road extending along Metcalf and Victoria streets.

**St. CATHARINES, ONT.**—Capt Harvey Neel on, of this city, has completed arrangements for the organizing of a joint stock company, with a capital of \$75,000, to erect a magnificent summer hotel and resort at Port Dalhousie.

**PETERBORO, ONT.** At a meeting of the Board of Health held last week a resolution was adopted urging the Council to submit a by-law for the construction of a main outfall sewer, and also that the work be proceeded with at once.

**KINCARDINE, ONT.** A by-law will be submitted to the ratepayers to raise the sum of \$2,000 to be expended as follows: \$1,350 for erecting an iron bridge on iron pile piers crossing the river Penetanguishene, and \$650 for repaving the town hall.

**SANDWICH, ONT.** Mr. John Mullen of Amherstburg, representing a Cleveland syndicate, has purchased 600 feet of water front in this town for the erection of a coal dock across the river. The plans are for dock and sluices to cost not less than \$30,000.

**VANCOUVER, B. C.** The City Engineer wants tenders until the 25th inst. for the laying of a number of bituminous rock asphalt pavements. It is proposed to construct a canal connecting Okanagan and Dog Lakes, the C. P. R. having expressed themselves as favorable to the scheme.

**HAMILTON, ONT.** Building permits have been granted as follows: Wm. Magill, three two story brick dwellings on Aikman avenue, between Wentworth street and Myrtle avenue, cost \$14,700; Rev. Thomas Geoghegan, church at the corner of Burlington and Main streets, cost \$5,000. Tenders are wanted by the City Clerk for constructing a pipe sewer on Margaret street, between Main street and King street.

**LONDON, ONT.**—The City Council has given notice of its intention to construct tile drains on P'ecadilly street and Wellington streets. At a meeting of No. 2 Committee of the Public Schools Board held on Thursday last, a resolution was adopted recommending the erection of a new school on Colborne street, at a cost of \$16,000, an addition to the Collegiate Institute, cost \$20,000, and three smaller primary schools, cost \$5,000.

**OWEN SOUND, ONT.**—The Town Engineer is engaged in taking levels for the proposed Bay street and county buildings sewer. The work required on this sewer will probably be the most extensive of any pipe sewer in town, owing to the great length necessary to secure an outlet. It will commence at Russell and extend along as far as Connell street, a distance of 3000 feet, and then turning down the last named street under the C. P. R. tracks and out into deep water.

**OTTAWA, ONT.** A deputation from the County and City Councils recently waited on Hon. Mr. Taggart, urging the construction of two new bridges, one across the breakwater at Hogs Back, and the other across the canal at the south of Concession street. The estimated cost of both bridges is \$3,000. It is stated that the Ottawa and Parry Sound railway intends to construct an electric railway to Hintonburg and seven miles

out into the country, providing the Ottawa electric railway is not extended to that point.

WINNIPEG, MAN.—G. H. West, chairman of Water and Light Committee, will receive tenders until the 19th inst. for the construction of a one-horse hose wagon.—The ratepayers of the municipality of Woodlands will vote on a by-law to raise the sum of \$15,000 for a system of drainage, also \$4,000 for the erection of a roller grist mill.—Nearly \$10,000 is to be expended on improvements to the Leland House.

PENBROKE, ONT.—Mr. Alexander Millar will receive tenders until Monday, the 25th inst., for the erection of a Presbyterian manse on the Calvin church grounds.—Mr. W. B. McAllister, proprietor of the Pembroke flouring mills and Pak-eham mills, intends building a grain elevator with a capacity of two hundred thousand bushels. Work will be started when the contemplated changes in the C.P.R. have been fully determined upon.

KINGSTON, ONT.—A deputation recently visited Sharpton for the purpose of locating a bridge across the Mud Lake to Florida. A civil engineer will be engaged to decide where the bridge will be built and the estimated cost.—The Street Committee have decided to report to Council in favor of the trolley system of electric railway, and that negotiations be entered into at once with Mr. Folger respecting the construction of the road.—A committee has been appointed by the Roman Catholic's to select a site among the Thousand Islands for the erection of a Catholic school.

TORONTO, ONT.—The York County Council has decided to widen Davenport road to 66 feet.—At the next meeting of the Board of Health Dr. Allen will recommend the construction of a crematory for the west end.—Workmen are now employed in preparing the ground for the new gymnasium of the University of Toronto. The building will be situated north of University College, near Hoskin avenue. The plans for the new building for a chemical laboratory are not yet complete.—Mr. A. J. Robinson, of Main st., East Toronto, is about to erect two houses—Mr. H. Smith is asking for tenders for the erection of three residences. Particulars may be had at W. Parsons, 4 Adelaide street East.—The Board of Works will meet on Monday next to award contracts for asphaltting King and Yonge streets—Building permits have been granted as follows: H. M. Stevenson, brick front and mansard roof addition in rear of 641 Ontario street, cost \$2,000; S. G. T. McAllister, six attached 3 storey bk. stores and dwellings, n.e. corner College and Givens st., cost \$24,000; J. W. Butchart, 8 attached 2 storey bk. dwellings, e. side Lansdowne ave., south of Bloor st., J. A. Ellis, Architect, Toronto Junction, cost \$12,000; John Holmes, det. 2 st. and attic bk. dwelling, Crescent road, opposite Hill st., cost \$3,000; Wm. Belshaw, ten 2 storey bk. fronted dwellings on new street running south from Wilton ave., between Sackville and Blair ave., cost \$20,000; E. Sexton, seven att. 2 storey and attic bk. dwellings, e. s. Shaw st. north of College, cost \$27,000.

MONTREAL, QUE.—L. J. Sargeant, General Manager Grand Trunk Railway, will receive tenders until to-day (Saturday), for the superstructure of various iron bridges required on the Great Western division. Plans may be seen at the office of the Chief Engineer of the Company at Hamilton, Ont.—The Secretary-Treasurer of the village of St. Lewis du Mile End will receive tenders until to-day (Saturday) for the construction of a sewer on Mount Royal avenue.—The congregation of Westminster Presbyterian church intends building a new church near the corner of Atwater avenue and St. Antoine street. Plans are now in course of preparation, and it is expected that part of the edifice will be completed this fall.—The Town Council of St. Cuneogonde, at a meeting held on Wednesday last, decided to proceed with the erection of a new Town Hall, at a cost not to exceed \$60,000.—Building permits have been granted as follows: R. Penker, 2-story brick store and dwelling on Rushbrooke st., cost \$3,500; W. A. Rineand, 2-story brick store and dwelling on Charlevoix st., cost \$3,800; W. Se-combe 2-story stone & brick dwelling on Congregation st., cost \$2,200; B. O. R. Simard, two 3-story stone & brick dwellings on Maisonneuve st., H. R. Fallbord, architect, cost \$3,600; J. L.

Beaudry, three 3-story stone & brick dwellings, cor. Notre Dame and Amherst sts., G. Simard, architect, cost \$18,000.—Chris. Clift, architect, is preparing plans for a Presbyterian church at Montreal Junction.—E. St. John, architect, is preparing plans for a residence for Mr. Caron, at Long Point.—W. Lavernore, architect, is preparing plans for a building on Craig st. for J. S. Thompson & Co.—A. Floekton, architect, is calling for tenders for the erection of a brick residence on Dorchester st., Cote St. Antoine, for Mr. W. Knox, also for 2 dwelling houses on Park avenue, with cut stone fronts, for Mr. J. S. Dixon.—Theo. Daoust, architect, is preparing plans for twenty-five stores and dwellings and a large theatre on St. Lawrence st., also for six houses on Sherbrooke st. and six cottages at Pt. Claire. Tenders will be asked for shortly.—Wm. H. Hodson, architect, is preparing plans for one store and dwelling, and two dwellings on Dorchester st. Tenders will be called for next week.

**CONTRACTS AWARDED.**

CHATHAM, ONT.—Mr. John Darling has been awarded the contract for the erection of an addition to Queen street school at the price of \$1,349.

OTTAWA, ONT.—Messrs. Faquhar Bros., of Toronto, have the contract for building the Amprior section of the Ottawa and Parry Sound railway.

KINGSTON, ONT.—Mr. G. Wilson has secured the contract to erect a two story double brick house on the corner of Alfred and Johnston streets, for \$2,500.

TORONTO JUNCTION, ONT.—Messrs. F. Hyde & Co., Montreal, have secured the contract for supplying the 15 in. and 18 in. Scotch fire clay pipes for the sewerage works.

WINNIPEG, MAN.—Messrs. Gray Bros. have been awarded the contract for the erection of Mr. Geo. Fould's new building on Main street. The building will be solid brick with stone foundation.

LONDON, ONT.—Messrs. Tambling & Jones have been awarded the contract for the rebuilding of St. Paul's Cathedral. The price is said to be in the neighborhood of \$40,000.—Mr. J. D. Elshon has received the contract for erecting a cottage on New Orchard Beach, Port Stanley, for the Young Women's Christian Association of London.

TORONTO, ONT.—The Dominion Wire Manufacturing Co., of Montreal, has been awarded the contract for the supply of twenty-seven miles of pure copper trolley wire for the Toronto Street railway. The copper is made in mile lengths.—Messrs. McGuire & Bird, of this city, have received the contract for the heating apparatus for the public building at Peterboro'.

VANCOUVER, B. C.—The Board of Works, have received the following tenders: Seventh avenue grading—Geo. Ronasefell, \$7,304; lump sum, and for the bridge \$17 per 1,000 feet b. m. and log culverts, \$16; Whitehead & Campbell, \$7,400, and \$16 per 1,000 feet for bridges, Hobson Bros., \$6,250, and bridges \$15 per 1,000 feet. T. M. Thomas, \$7,595, and bridges, \$22.75 per 1,000 feet; Cook & McDonald, \$7,194. The tender of Hobson Bros. was accepted. Barely street, sidewalk—E. C. Britton, 21 cents; A. D. McDonald, 21 cents; W. Jones, 22 cents. Mr. Britton's tender was accepted. Grading Barnaby street from Nicola to the foreshore—J. Gibbons, \$1,174; F. M. Thomas, \$1,149; George F. Rounssefell, \$780; Hobson Bros., \$775.50. The latter bid was accepted.

**HOUSE COLORING.**

A very common error, selecting the colors for a house, is to choose a shade for the gables which is darker in effect than the general body color, reds being frequently taken for the gable. This nearly always gives a top heavy appearance, which would be entirely avoided were a color of lighter tone chosen. The proper method to pursue in adopting a color scheme for any building, is to use darker and richer tones at the base, and as we go upward to gradually lighten the

effect, until the highest and most delicate shades are reached in the gables. The roof may properly be considered as a thing by itself; as it is not in the same vertical plane with the side walls the light will be reflected from it in a different manner, and hence the tone will be greatly modified from that of the actual color employed, being generally lighter in effect. Even taking this into consideration, it is not well to choose too dark colors for the roof, or it will appear to crush the house. Of course, the a chitectural effect must be considered, as it sometimes happens that the roof should appear low, in order to reduce the apparent height of the building. In this case the roof may properly be dark, though on the side wall no architectural necessity can ever arise which will require dark colors to be placed above lighter ones.

Another thing well to remember is that the under side of overhanging eaves or the flat under side, or planeeer, of a boxed cornice, should properly be painted in a lighter color than the barge boards or face mouldings. Otherwise, as the under side of the cornice is in shade it will be lost, and will not be readily distinguished in bright sunlight, from the cast shadow on the side walls, hence the effect of projection will be lost and the value of the cornice will be destroyed. On the other hand, the light under side will throw out the cornice, and will increase its architectural value by giving it greater apparent projection.—*Painting and Decorating.*

**ELECTRICAL STONE CARVING DEVICE.**

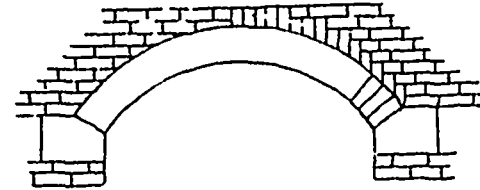
Electricity has now been put to many uses, the very latest being the working of a machine which it is said will revolutionize the art of stone carving. The inventor is a Colorado man, W. P. Carstarphen, and the inventor, we learn from the Denver Sun, is known as the "electrical reciprocating" tool. This tool is provided with a reciprocating plunger, located and moving within the tubular spools of two coils of insulated copper wire through which a direct current of electricity is alternately passed. The current for operating the tool can be supplied from any suitable electrical source, such as an ordinary galvanic battery or a dynamo electric current, which is simultaneously switched from one coil or set of coils to the other by the use of a suitable mechanism located between the two coils, and controlled by the reciprocation of the plunger. The electrical current enters one end of the tool through a revolving swivel, and the rapidity of the strokes made by the plunger is regulated by a button on the side of the tool. In the model, which is a three-pound tool, the stroke can be made to vary from one-eighth of an inch to one inch with a motion varying from 50 to 300 strokes per minute.

To operate a tool of this size but from four to six volts current are required. Portable storage batteries twelve inches by six inches by six inches have been made, which are incased in a neat box and intended for operating the tool on scaffolds and elsewhere away from the shop. These have operating force sufficient for a day's work, and can be so charged over night at an expense not to exceed one shilling.

With this tool the carver or sculptor, instead of dividing a portion of his attention to striking his chisel, can devote his entire attention to the lines which he is following, thus producing more accurate and rapid work. It is estimated that the machine will produce work in one-fourth the time of hand work, and therefore a material reduction in the cost will be secured.

**CUTTING BRICKS FOR ARCHES.**

A correspondent of the *Contract Journal* writes as follows: I beg to forward the enclosed drawing of arch (if you deem it worthy of publication), showing the old method of cutting the bricks to the curvature of the arch on the left-hand side, and the new method on the right-hand side.



Your readers will perceive the difficulty a bricksetter has in cutting his bricks to a feather edge, as shown on the left hand side, but on the other you have a good joint all round, with every little difficulty in cutting. I think the new method overcomes the difficulty, looks much better, and is certainly stronger. I have not seen the bricks cut as suggested on any building in my travels, but having shown it to Mr. Brown, the borough engineer of St. Helens, he at once adopted it on the new intercepting sewer, which he has recently constructed in that town, with good effect.

**MUNICIPAL DEPARTMENT.**

**STONE PAVING.**

The following observations are from a paper recently read by R. H. Dorman, County Surveyor, Armagh, at a meeting of the Association of Municipal and County Engineers held in Dublin.

Stone pavements consist of squared setts laid on a suitable foundation. The foundation usually consists of gravel, broken stone, or concrete of varying thickness; this latter is the only reliable material—it should never be less than six inches thick, while nine inches will carry the heaviest traffic. Portland cement and Thames ballast in the proportion of one to seven make excellent concrete. As the concrete is laid in the trench, the top surface should be brought to the proper scamber with the shovel. In Dublin, I recently noticed the concrete was lightly rammed, while in India I was taught to have concrete thoroughly rammed until the lime or cement creamed to the surface, but this appears to be unnecessary and even injurious proceeding, particularly when a good cement is used.

Setts.—Granites of various qualities, whinstone, and occasionally sand stone, are employed. For ordinary traffic Aberdeen or Newry granites are largely used. For very heavy traffic it is advisable to use greenstone or a hard granite; owing to the extreme hardness of greenstone it is very difficult to dress, and, in consequence, the neatest looking pavements can be made with granite setts. Asphalt, an asphaltic mixture, and wood have been suggested as materials for parking, but they are seldom used, owing to the expense; sand and gravel are commonly used. When the foundation consists of broken stone or similar material, gravel is probably the best packing material, but it is not suitable for use on a concrete foundation; it is far easier to bed a stone on sand packing than on gravel, and when well rammed it will take an even bearing, but a stone laid on gravel is liable to rock and work loose. Formerly, it was usual to bed each stone in lime or mortar—no doubt a good method, but expensive.

Grouting.—In the North of England, Dublin, and other places and joints are

MUNICIPAL ENGINEERS, CONTRACTORS, AND MATERIALS.

filled with clean pebbles and then run with an asphaltic mixture, after which the surface is well rammed and covered with a layer of fine gravel. In the South of England the grouting usually consists of sand and lias lime or Portland cement. As regards the comparative advantages of lias and Portland cement as a grouting I look on lias as the best substance to use when there is a probability of the pavement having to be disturbed from time to time to relay pipes, etc. Lias should also be used when the setts are of a slippery nature; one advantage of lias grouting is that it always appears to have some setting properties.

When the paving is not liable to be disturbed, I look on Portland cement as the best grouting for Newry Aberdeen, and similar setts; the grouting and the setts wear pretty uniformly, and the stones do not work so round on the top as when a soft grout is used. When a cement grout is used the traffic should not be allowed over the surface for three or four days after the work is completed, as if the traffic is allowed soon, many of the stones will work loose, and will of course remain so unless fresh grouting be run in. Once, however, a pavement grouted with cement becomes thoroughly set, the heaviest traffic will not disturb the stones. Finally, while admitting the superiority of the "Manchester" grout with hard setts, I have a strong predilection for cement grout for the less durable setts when laid on level ground.

*Laying the Pavement.*—The setts should be laid touching one another. Each stone should be so firmly bedded on the packing that it has not to rely on its neighbor for support. The packing should average one inch in thickness, and there should be no pebbles in it, because if a pebble gets between the concrete and a sett it cannot be rammed, and will always rock. The rammer-men require careful supervision. To avoid the trouble of lifting badly-laid setts they often try to get an even surface by ramming the high stones extra hard, and omitting to ram the low-lying stone or stones inclined to give too much. Care should be taken when laying the pavement to see that the setts break joint. The rounding of the setts on the top is usually ascribed to the action of the wheels, but I believe it is rather due to the cogs on the horses' shoes.

In conclusion, I have to express surprise that so few experiments are being made at the present day for the purpose of ascertaining the draught over different surfaces, the comparative merits of roads formed of different materials, how surfaces are affected by velocity of motion, and kindred matters; and that so little has been attempted to ascertain mathematically the resistance to rolling over different surfaces and with different velocities, the most economical means of doing work with animal power, the effects of inclinations, the development of grades, etc.

ISAAC USHER & SON,  
THOROLD, ONT.

Manufacturers of

QUEENSTON CEMENT

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

Established 1841.

THOROLD CEMENT

MANUFACTURED BY

ESTATE OF JOHN BATTLE,  
Thorold, Ontario.

THOROLD, 25th March, 1879.

JOHN BATTLE, Esq. Thorold:

Sir:—I beg to state that during the past four years about one million bushels of Thorold Hydraulic Cement have been used in the construction of the Canal Works in my charge. This experience enables me to testify to the excellence of the article, especially when carefully burnt and thoroughly ground in the manner now carried out at your mills.

I am, sir, your obedient servant,  
THOMAS MONRO,  
Engineer in charge of Welland Canal Enlargement.

GOWER & CO.

204 St. James St., MONTREAL.



Riveted Girders,

Iron and Steel Rolled Beams,

Columns and Stanchions,

Roofs and Trusses.

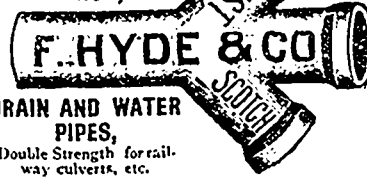
HYATT'S FILTERS,

CROWN, EMPIRE and Nash WATER METERS

Cast Iron Pipes and Specials,

VALVES, HYDRANTS, SEWER PIPES, ETC.

DIRECT IMPORTERS AND DEALERS IN SCOTCH FIRE CLAY-BRICK,



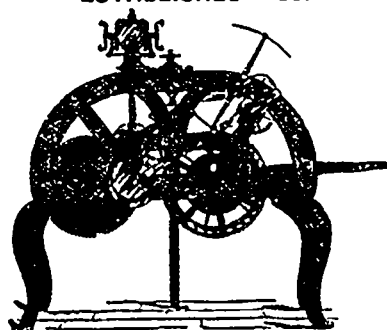
DRAIN AND WATER PIPES,

Double Strength for railway culverts, etc.

Sewer Bottoms or Invert Blocks, Cement. Note.—Only pure SCOTCH unglazed Fire Clay Limes will be kept in stock; any other quality is worthless for resisting heat. Correspondence invited. Quotations promptly furnished. Office: 31 Wellington St., Montreal.

Municipal officers, contractors and others are requested to mention the CONTRACT RECORD in correspondence with advertisers.

ESTABLISHED 1830.



Manufacturers of Tower and Church Clocks, Illuminating Dials, Electric Clocks. Estimates furnished on application to

JAMES E. ELLIS & CO.  
3 King Street East, Toronto

DEBENTURES WANTED.

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

R. E. H. BUCKNER,

37 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 Pavementers,

4 Adelaide Street East, - TORONTO.

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.

EUREKA CONCRETE SIDEWALKS

FOR CELLARS, FLOORS, STABLES, ETC.

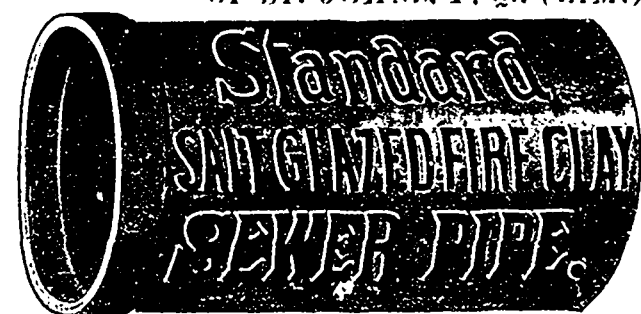
A. GARDNER & CO., - Room D, YONGE STREET WALK, TORONTO.  
TELEPHONE 2147.

THE STANDARD DRAIN PIPE CO.

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

Manufacturers of  
Salt-Glazed,  
Vitrified

SEWER  
PIPES



Double Strength  
Railway Cul-  
vert 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. G. 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 world for Sidewalks & Street Crossings  
FRONT-PROOF, WATER-PROOF, TIME-PROOF

JOHN S. GUTHBERTSON,

AGENT FOR CANADA.

Room 64, Temple Building, Montreal.

PRICES ON APPLICATION.

THE CENTRAL BRIDGE WORKS

Peterborough, Ont.

WM. H. LAW, Proprietor and Engineer.

MANUFACTURERS OF

RAILWAY AND HIGHWAY BRIDGES

Viaducts, Piers, Roofs, Turntables and Girders in Steel and Iron.

Tension members forged without welds. Riveting done by hydraulic or compressed air machinery.

CAPACITY: 2,000 TONS PER ANNUM.

Municipal officers, contractors and others are requested to mention the CONTRACT RECORD in correspondence with advertisers.

St. George's Patent Sectional VITRIFIED GLAY SEWER

CAST IRON STREET GULLEY.

Over 5000 Gulleys are now in use in the following towns: Montreal, Toronto, Ottawa, Quebec, St. Cune-gonde, St. Henri, Peterboro, Owen Sound, Samia, Cote St. Antoine. A saving of \$20 on each gulley over the brick gulleys.



LEWIS SKAIFE, Engineer and Contractor, New York Life Building, - MONTREAL. AGENT.

Prices of Building Materials.

Table listing prices for lumber, mill cull boards, and yard quotations. Columns include item description and prices for Toronto and Montreal.

Toronto. Montreal.

Table listing various building materials and their prices for Toronto and Montreal. Items include flooring, planks, brick, stone, and paint.

Toronto. Montreal.

Table listing various building materials and their prices for Toronto and Montreal. Items include cement, plaster, hardware, and iron.

Toronto. Montreal.

Table listing various building materials and their prices for Toronto and Montreal. Items include nails, iron, and structural steel.

INDEX TO ADVERTISEMENTS In the "Canadian Architect and Builder."

Index listing various advertisements and their locations in the publication. Categories include Architects, Cement, Galvanized Iron, Plastering Fibre, etc.