

# CANADIAN CONTRACT RECORD

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

EVERY WEDNESDAY

*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. 14.

TORONTO AND MONTREAL, JANUARY 27, 1904

No. 50.

## THE CANADIAN CONTRACT RECORD

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## THE G. H. MORTIMER PUBLISHING COMPANY

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## Tenders Wanted

### SPRINGHILL WATER WORKS

Sealed tenders will be received, addressed to the undersigned, up till SATURDAY, THE 20TH DAY OF FEBRUARY next, at 8 p.m., for the supplying and construction complete, upon a foundation already prepared, of a

### Steel Storage Tank,

25 feet diameter and about 50 feet high according to plan and specifications, which may be seen at the office of the Town Clerk, Springhill, N.S.; at the office of Nova Scotia Fire Insurance Co., 164 Hollis Street, Halifax; or at the office of John Galt, Consulting Engineer, care National Trust Building, Toronto.  
Specifications will be mailed on application to any address, by the undersigned.

DANIEL McLEOD,  
Town Clerk.

Springhill, N.S., Jan. 19, 1904.

## CITY OF WINNIPEG

### Tenders for Gondola Hopper Cars

Sealed tenders, addressed to the wharman of the Committee on Works, for the supply of 25 gondola hopper cars, will be received at the office of the undersigned up to 8.30 p.m. on TUESDAY, FEBRUARY 27th, 1904.

#### DESCRIPTION.

Capacity, cubic ft 800, capacity load, lbs. 80,000; size about 8x30 ft. Box arranged so that it can be increased in height to capacity of 1,400 cubic feet. Cars to be strictly self-discharging of broken stone and coal. Separate price for air brake.

Plans and specifications of cars to be submitted with bids. Date of delivery not later than 31st of May next.

Each tender must be accompanied by an accepted cheque or cash deposit for \$1,000, which will be subject to forfeiture in case of failure to enter into a written contract with approved sureties if called upon to do so.

The city reserves the right to reject any or all tenders or to accept any bid which appears advantageous to the City of Winnipeg.

C. J. BROWN,  
City Clerk.  
City Clerk's Office, Winnipeg, Jan. 22, 1904.

## TENDERS FOR

### Stone Paving Blocks

Tenders, sealed and endorsed "Tender," addressed to the undersigned, will be received up to 12 o'clock noon on MONDAY, THE 1ST FEBRUARY, 1904, for

### Stone Paving Blocks

Specifications and blank tenders may be obtained upon application to Mr. John Kennedy, Chief Engineer, at this office.

The Commissioners reserve the right to reject any or all of the tenders received.

DAVID SEATH,  
Secretary-Treasurer.

57 Common Street, Montreal, 30th Dec., 1903.

## Tenders for Debentures

Sealed tenders will be received by the undersigned up to noon on MONDAY, THE 8TH DAY OF FEBRUARY, 1904, for the purchase of the following debentures of the Town of Walkerville, which will be delivered and must be settled for at the Town Treasurer's office.

\$17,121.45 in 4 per cent. local improvement debentures guaranteed by the municipality at large, payable in ten consecutive annual instalments; the first debenture of \$2,123.93 for principal and interest being payable on 13th day of December, 1904.

\$8,852 in 4 per cent. debentures of the said town, payable in twenty equal consecutive annual instalments; the first debenture of \$665.51 for principal and interest being payable on the 15th day of December, 1904.

All of said debentures are payable at the Canadian Bank of Commerce, Walkerville.

Existing debenture debt, \$24,929.43.

Assessment \$2,304,999.00; General rate 9 1/2 mills.

The highest or any tender not necessarily accepted.

No tender will be considered unless accompanied by a marked cheque payable to the town treasurer for 4 per cent. of the amount offered, which will be returned in the event of the tender not being accepted.

For further particulars apply to

CECIL H. ROBINSON,  
Town Clerk,  
Walkerville.

Walkerville, 20th January, 1904.

#### CONTRACTS OPEN.

RED DEER, N.W.T.—A new court house will be erected here in the spring.

SILLSVILLE, ONT.—George Sharp contemplates building a residence next summer.

CLARKSBURG, ONT.—It has been decided to form a company to build a large fruit storage warehouse.

SUSSEX, N. B.—G. W. Heggie, of Fredericton, proposes to establish a canning factory here.

BURNSIDE, MAN.—Steps will be taken at once to build a new school in Fox school district.

ST. GEORGE, ONT.—It is understood that S. C. Wait is preparing to build three tenement houses.

HENSALL, ONT.—Henry Taylor has purchased a lot and intends building a brick dwelling next summer.

WALLACEVILLE, ONT.—The English Methodists are making an effort to build a new church next summer.

LARIVIERE, MAN.—Tenders received by J. H. Fargey up to February 5th for erection of brick school house.

NEW HAMBURG, ONT.—Arrangements are about completed for the erection here of a large brick grist mill.

CARBERRY, MAN.—A Board has been formed here to take steps to build a new hospital, at an estimated cost of \$3,000.

TRURO, N. S.—D. Henderson, architect, is preparing plans for remodelling the interior of the First Presbyterian church.

EDMONTON, N. W. T.—The Bank of Montreal will receive tenders up to 30th inst. for erection of a bank building in this town.

KOUCHIBOUGUAC, N. B.—The farmers of St. Louis and Kouchibouguac intend organizing a company to build a grist mill here.

PORT ARTHUR, ONT.—The Gordon, Ironside & Fares Co. have completed arrangements for building a cold storage plant in this town.

WOODFORD, ONT.—Lewis Walters, of this place, desires tenders by February 16th for building a Methodist church, with stone basement.

PERTH, ONT.—Alex. Munsie, Rideau Ferry, wants bids by February 2nd for erection of a cheese factory. Plans at the Courier office in this town.

SUTORVILLE, ONT.—Tenders will be received by Howard Shirley up to February 12th, for erection of a brick schoolhouse for S.S. No. 7, Brooke.

PELEE, ONT.—William Stewart, township clerk of Pelee, will receive bids up to 30th inst. for purchase of \$8,272 Little Marsh relief drain debentures.

OCHRE RIVER, MAN.—H. C. Arnold will receive bids in behalf of the corporation up to February 13th for purchase of \$15,000 twenty year debentures.

WESTBOURNE, MAN.—Rev. M. Scott desires tenders by February 15th for erection of a stone church here, for which stone foundation was built last fall.

BELLEVILLE, ONT.—Harry Corby will make extensive improvements to his residence here in the early spring. F. H. Herbert, architect, of Toronto, will have charge of the work.

REGINA, N. W. T.—Tenders for erection of power house for waterworks and electric light plant will be received by J. A. Cross up to February 1st. Plans by John Galt, C. E., Toronto.

FREDERICTON, N. B.—The Provincial Government is calling for tenders for rebuilding of Larlee Brook bridge, Perth Centre, and Saddler's Mi bridge, parish of Perth.

KINGSVILLE, ONT.—The Brown & Wigle Co. having decided not to accept the loan offered them by the

town, these debentures will not at present be put on the market.

**CREEMORE, ONT.**—John Galt, C. E. & M. E., of Toronto, is engaged to report on a waterworks system for this place.

**REGINA, N.W.T.**—John Galt, C. E., of Toronto, has completed designs for the reservoir dam in connection with waterworks system here and tenders will be invited at an early date.

**ATWOOD, ONT.**—Thomas Fullerton, Clerk of Elma Township, will receive tenders up to February 15th for construction of the Grenalder branch drain, also culverts and bridges.

**PARIS, ONT.**—The Thom Implement Works, of Watford, has been purchased by the Paris Plow Co. of this town, which will necessitate the erection of a new building by the latter company.

**FORT FRANCES, ONT.**—The mill site lease on the Indian Reserve has been granted to H. Williams, who has leased one-half of same to the Preston-Bell Co., who will proceed at once to build a saw mill.

**NEWMARKET, ONT.**—The ratepayers will vote on a by-law on February 8th to grant a bonus to the Davis Tanning Co. to build a tanning factory in this town, the buildings and plant to cost about \$40,000.

**FORT WILLIAM, ONT.**—George Evans and Alonzo McKenzie have each purchased property on which they intend building stores.—Tenders for building of elevator for Oglivie Flour Mill Co. at this place close February 5th.

**COBOURG, ONT.**—The Dominion government is asking for tenders up to Tuesday, February 9th, for erection of an armoury here. Plans at the Department of Public Works, Ottawa, and on application to John Boyd, this town.

**LONDON, ONT.**—The congregation of Chalmers church, of which Rev. Walter Moffat is pastor, have appointed a committee to secure plans for a new edifice to cost about \$10,000.—The Middlesex County Council will issue \$2,000 debentures to redeem old debentures.

**BRANDON, MAN.**—It is reported that the Canadian Bank of Commerce is negotiating for a site in this town on which to build a bank building.—Application for the position of city engineer will be received by the secretary-treasurer of the city up to February 12th; salary \$1,300 per annum.

**ST. MARY'S, ONT.**—L. H. Reesor, superintendent of water and light, has recommended that a pumping well of at least 150,000 gallons capacity be constructed, also that a large single phase generator be added to the electric light plant.

**VICTORIA, B.C.**—Mrs. Hayter Reed, of Quebec, has been commissioned by the Canadian Pacific Railway Co. to select the decorations and furnishings for the interior of the company's palatial hotel now in course of erection in this city.

**HAMILTON, ONT.**—At the annual meeting of Knox church last week, it was decided to proceed at once with improvements to the church, at an estimated cost of \$16,000.—Copley, Noyes & Randall have bought land on Merrick street on which they will build a large warehouse.

**STRATFORD, ONT.**—Mayor Hepburn, in his inaugural address, recommended that estimates be obtained for a system of storm sewers, also that steps be taken to build a hospital for consumptives.—The erection of a concrete arch bridge at the site of the long bridge will be undertaken this year.

**BURK'S FALLS, ONT.**—The lake has been tested and found satisfactory as

a source of supply for a waterworks system, and John Galt, the engineer, expects to complete surveys at an early date and to call for tenders early in the spring.

**ST. THOMAS, ONT.**—The Hamilton, London & Lake Erie Railway Company has asked for incorporation to build a system of railways from Aylmer to St. Thomas, thence to Port Stanley, London and Glencoe; also eastward from London to Ingersoll, Woodstock, Paris and Hamilton and from Paris to St. George and Harrison to Hamilton.

**CAMPBELLFORD, ONT.**—A. B. Colville, of this place, has applied to the Dominion Government for a charter to construct a railway from a point on the Canadian Pacific line between Blairton and Ivanhoe through the counties of Hastings, Peterboro, Northumberland, Durham, Ontario and York to a point on the C.P.R. line between Locust Hill and Leaside Junction.

**NORTH BAY, ONT.**—The Canadian Pacific Railway contemplate extensive improvements on their Lake Superior division during the coming year, and some 260 estimates have been prepared in the division engineers' office here for various works between Chalk River and Fort William, including new stone stations at Sturgeon Falls and Sudbury.

**CALGARY, N.W.T.**—The Merrick Anderson Co., of Winnipeg, will build a wholesale establishment in this city next spring.—W. M. Dodd, architect, has prepared plans for the new building for the Bank of Nova Scotia and tenders will be called for almost immediately.—Plans have been prepared for a new church for Knox Presbyterian congregation, to accommodate 900 people in the church proper and 600 in the school room. Work will be commenced in the spring.

**ST. JOHN, N. B.**—Lieut. Col. Tucker, M. P., is reported to have induced the Dominion Government to make immediate provision for dredging in the west end of the harbor.—The McLaughlin Carriage Company, of Oshawa, Ont., have purchased the large brick building on Union street occupied by J. B. Hamm, which will be remodelled and fitted up as a carriage repository.—Alterations and improvements are to be made this spring to St. David's church, at a cost of \$10,000.

**MONTREAL, ONT.**—It is understood that the congregation of St. Giles church will shortly build a new edifice. Rev. J. R. Dobson is pastor.—The annual report of the Western General Hospital urges the erection of a new hospital building at an early date.—The inauguration of a Railway Department at McGill University will, it is said, necessitate the erection of a new building. Plans have been prepared for the proposed new Y.M.C.A. building at McGill, for which \$80,000 has already been subscribed. The building will be five-stories and basement.—The Laprairie Brick Co. are said to have decided to increase their plant.

**ST. CATHARINES, ONT.**—A special meeting of the city council was held last week at which the question of building a high level bridge was discussed. A motion was submitted to ask the Ontario Government for power to expend the \$150,000 which the city was empowered to borrow to develop water power at DeCew Falls, for the erection of a high level bridge, construction of a sewerage system and improvement of public roadways.—Gordon & Helliwell, architects, of Toronto, have prepared plans and will shortly invite tenders for a new building for the St. Catharines Y.M.C.A., to cost about \$18,000.

**HALIFAX, N. S.**—As soon as the

new custom house now under way is completed, the renovation of the present customs and post office building will be undertaken. The plans, as already prepared, show that the interior will be entirely remodelled and two elevators put in; estimated cost \$25,000.—The plans for the extension of the Dominion government building at Sydney are on view at the office of C. E. W. Dodwell, this city.—The building of a pier and store on the site of the present Marine and Fishery wharves' site has not yet been definitely announced by the Intercolonial Railway, but work on the pier at Richmond is to be pushed immediately. The government has ordered \$40,000 worth of cross piling for this work.

**VANCOUVER, B. C.**—W. Blackmore, architect, has prepared plans for another store to be added to the Van Horne block on Granville street by the proprietor, John West. Other improvements to the building will also be made, the total expenditure to be about \$30,000.—The by-law providing for sewerage work construction was carried last week by a large majority.—The Canadian Pacific Railway Co. is considering the building of a new steamship for service on Pacific Coast waters.—Recent permits include the following: J. A. Donahoe, frame dwelling, Cordova street, cost \$2,700; W. J. Connors, frame dwelling, Beach avenue, cost \$3,500; W. J. Beam, factory, Gore avenue, cost \$2,000; Crowe & Wilson, frame store, Granville street, cost \$2,000.—R. C. McMorran has sold the Windsor House, corner Westminster avenue and Barnard street, to Seattle parties, who intend making improvements and extensions.

**WINNIPEG, MAN.**—The proposed plans for the new C.P.R. subway will be considered at a council meeting this week.—H. C. Stone, who has recently opened an office in this city, is the architect for the new Free Press building.—The congregation of St. Giles church have decided to take steps to provide increased accommodation.—Rev. Father Magnan states that tenders will be invited shortly by the Government for rebuilding the Industrial School at Qu'Appelle.—A bill has been introduced into the Manitoba Legislature to provide for the erection of judicial buildings for the southern judicial district.—Chief Buchanan, of the Fire Brigade, in his annual report, recommends that larger water mains be constructed and that No. 3 fire station be remodelled.—Up to January 21st of this year permits for buildings to the value of \$32,400 had been issued in this city, as compared with \$15,350 for the month of January last year.—The Sons of England are considering the erection of a new hall.

**OTTAWA, ONT.**—Work on the new French National hall is expected to commence in the spring. The proposed site is at the corner of George and Dalhousie streets.—It is stated that the Metropolitan Power Company have decided to complete their proposed works at Britannia and to that end have appointed John Kennedy, consulting engineer of Montreal, to award contracts for work on the canal and equipment of power house.—The city intends to construct an 18-inch tile pipe sewer on Clarence street, from King to Cumberland, at a cost of \$1,056.—Ald. James Davidson is considering the erection of a high-class theatre on the site of the burned planing mill of Davidson & Thackray on Sparks street, between Bank and Kent street. He is also considering the reconstruction of the Hotel Cecil.—Representations will shortly be made to the Dominion Government asking for the erection of a new customs house in this city.—The Martin Piano Co., of Peterborough, have made a proposition to

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establish a factory in this city.—Tenders are this week being taken by the city clerk for interior fittings required for the Fat Stock Show buildings at Lansdowne Park.—At the annual meeting of the Glebe Presbyterian church, it was decided to take steps immediately to build a new church.—The Ottawa Improvement Commission have had plans prepared for the construction next summer of a driveway from Eigin street to Clewov avenue.

TORONTO, ONT.—Messrs. Staunton, Limited, will build an addition to their factory, plans for which are in preparation by S. H. Townsend, architect.—Chadwick & Beckett, architects, are getting out plans for a modern brick and stone residence for Mrs. V. Chadwick, Poplar Plains road, Toronto, also for a brick residence for T. G. Blackstock, 20 Homewood avenue, Toronto.—The Sand & Dredging Co. have leased a site adjoining the northern elevator, on the water front, for the purpose of erecting a plant for making wall plaster.—The City Engineer is in favor of taking early steps to improve the water supply. He recommends either a tunnel or a cast iron pipe across the bay. The approximate cost of the former would be \$525,000.—J. Francis Brown, architect, is taking tenders on a summer cottage at Scarborough.—A company has been incorporated, to be known as Apartments Limited, and with a capital of \$200,000, the purpose being to build or acquire apartment buildings. The provisional directors are J. S. Lovell, William Bain, and E. W. McNeil.—S. H. Davis, architect, is taking tenders up to 27th inst. for all trades for the erection of six houses.—The question of building a Masonic temple in this city is under consideration. The present lease of the Monsonic quarters in the Temple building expires in four years.—Mr. Ross, Superintendent of City Post Offices, was in Ottawa last week consulting with Chief Architect Ewart in regard to further alterations to the post office in this city with the object of providing additional accommodation.—T. Eaton has donated to the Young Men's Christian Association a strip of property on Yonge street immediately south of their building and extending back about 70 feet, and it is likely that an extension to the present building will be built thereon.—The various Presbyterian churches in this city held their annual business meetings last week. The congregation of Knox church decided to once more petition the Presbytery to obtain its consent to the sale of the building church site, with the object of moving in a more northerly section of the city. St. Paul's church, of

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which Rev. G. R. Fasken is pastor, decided to build a new edifice, and Chalmers congregation resolved to decorate the church and install a new lighting plant, at a cost of \$1,600.—The management of the Bloor street Baptist church have decided to renovate and re-carpet the main body of the church in the near future.—F. H. Herbert, architect, has prepared plans for a large detached residence, to be erected on the south side of Elm avenue, Rosedale, near Sherbourne street, for P. Lendley, tenders for which will be asked shortly.—Frank Hillock, 103 Albert street, wants tenders for erection of a brick house Simpson avenue.—Tenders are wanted at 45 Mutual street on brick and carpenter work.—The Electric Development Co., of which Frederic Nichols is general manager, will shortly call for tenders for water wheels and iron work for their power station at Niagara Falls. The associate company, The Toronto & Niagara Power Co., will soon be ready to invite tenders for construction of pole line.

**CONTRACTS AWARDED.**

**NASSAGAWEYA, ONT.**—Presbyterian manse: Harry McLeod, contractor.

**PEMBROKE, ONT.**—The contract for new dock here has been let to W. J. Poupre, at \$44,000.

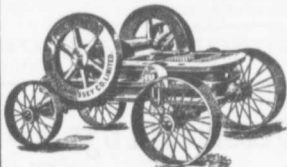
**SYDNEY MINES, N.S.**—The contract for lighting the town has been given to W. A. Mackay, of Sydney.

**FREDERICTON, N. B.**—Rebuilding Aboushaon bridge, Parish of Shediac: Whitman Brown, contractor.

**CALGARY, N.W.T.**—Thomas Tompkins, of Brockville, Ont., who has the contract for the C.F.R. shops here, will shortly commence the work.

**LONDON, ONT.**—For rebuilding Vauxhall bridge, Middlesex County Council has accepted the tender of the Hamilton Bridge Co. for superstructure at \$3,111, and that of Crouse & Talbot for concrete work.

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## PROGRESS OF MUNICIPAL ENGINEERING.

By C. H. RUST.

Upon my election as president last year I had the honour to read a short address to the members, wherein I suggested the advisability of adopting the practice of a number of other engineering societies of having the president's address at the close of the year instead of at the commencement, but I had no idea the executive committee in my absence would place my name upon the programme for another address at this meeting, which signals the close of my term of office. Had I been present at the meeting of the executive when this subject was broached I would certainly have objected to inflicting another address upon the members of the Club. This evening I will attempt to give a short review of the progress made in a few branches of municipal engineering during the past decade.

Dealing first with the question of sewage disposal: Ten years ago, if purification of sewage were necessary, the system generally adopted was precipitation by chemical means. The number of chemicals that were used or advocated as precipitation

\* Presidential address before the Engineers' Club of Toronto, Thursday, January 14, 1904.

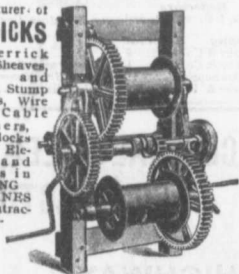
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agents were numerous, many of them on practical tests proving worthless. Others were abandoned on account of the expense, and after a number of experiments it was found that lime and sulphate of alumina were the most reliable and satisfactory. The process of precipitation removes from 50 to 60 per cent. of the organic matter, and while fairly satisfactory is objectionable on account of the large amount of sludge resulting, and the difficulty of disposing of the same. A number of cities at the present time are still using this method of disposal. The system of broad irrigation and intermittent downward filtration are satisfactory, providing a sufficient quantity of land of a suitable soil can be procured at a reasonable cost, and proper supervision is exercised, but in many cases, through carelessness and on account of placing more sewage upon the land than it could possibly dispose of, a nuisance has been created, and other means of treatment had to be adopted.

These methods of treatment have in some instances been superseded by septic tanks and contact beds, which has to some extent remedied the sludge nuisance. It is estimated, I believe, that the sludge produced after septic tank treatment is only one-seventh of that resulting from chemical precipitation. After tank treatment the effluent is passed on to contact beds, composed generally of cinders, although broken stone and gravel have been experimented upon with fairly good results, coke which was generally used having proved unsatisfactory. A number of towns and cities in England have been experimenting with this method of sewage disposal for a number of years and the

results have been, on the whole, satisfactory, so much so that Manchester has adopted this system, and the works are now under construction. The method of disposal in that town up to the present time has been precipitation by chemical means.

Two important points which have not yet been fully decided upon is the life-time of the beds and the annual cost of operation. I, however, think that in this country where suitable land can be obtained at a reasonable cost, septic tank treatment followed by after purification upon land will be found the most satisfactory method of disposal. I do not anticipate any difficulty owing to our severe climate. In England, in some cities, the sewage is placed upon the contact beds by means of a continuous revolving sprinkler, which has been found very satisfactory, but I do not think it would be possible to adopt this system during our winter months.

I need hardly point out to the members of the Club that in the operation of any sewage disposal works it is absolutely necessary, in order to ensure good results, that the works are placed in charge of experienced men, and that a chemist be employed to make frequent analyses of the effluent.

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electric traction, it is only within the past ten or twelve years that the old horse-cars have been substituted by electricity. The system most generally in use is what is known as the overhead trolley, although in large centres of population the underground conduit has been used with satisfactory results. One of the great advantages derived from electric railways is, that cities, towns and villages are brought in close touch with one another. Owing to the economical method of construction and to the fact that the right-of-way in a majority of cases was granted free of cost, the companies have been able to operate the roads at a much lower rate of fare than steam railways, so much so that where the steam railway companies had a very large suburban business they have found it advisable altogether to abandon suburban trains, owing to the impossibility of successfully competing with electric companies. From experience we have been able to gather during the past ten or twelve years it has been advisable to use a much heavier type of rail than was originally contemplated. It has also been ascertained that owing to the heavy electric cars now in use it is advisable to have a continuous rail, which is possible by means of cast-welding. In cities the rails are now laid upon a solid bed of concrete, and steel tie bars used in place of wood. Regarding the type of rail to be used, it is the general opinion among municipal engineers that the grooved girder rail is the only suitable rail to be used in paved streets, but in country roads and where the streets are macadamized, the T rail is admissible and preferable. The railway companies, however, in every instance prefer to use the T rail if possible, but it is found very difficult to maintain a pavement next the rails where this type is adopted.

Shortly after the introduction of electric roads it was discovered that electrolytic action was taking place and that serious damage was resulting to the various underground conduits, such as water and gas pipes and telephone cables, and while this is still the case it has been largely obviated by a better system of bonding the rails.

The introduction of electric traction has to some extent increased the nuisance and danger of overhead wires. The trolley wire is not so objectionable as the large

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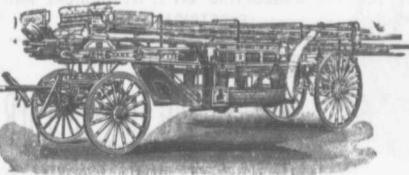
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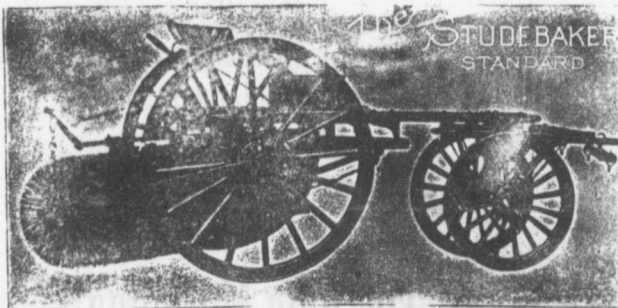
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number of feed wires that are required in cities, and I think that in all large municipalities these feed wires should be placed underground.

Another important matter that municipal engineers have to deal with is the question of garbage disposal. Until recent years the method of disposing of garbage, street sweepings, ashes, etc., was by dumping them in some low unfrequented spot, but

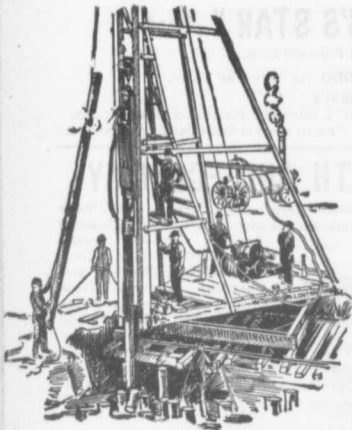
the great growth which has taken place during the past ten years in our large cities has rendered this impossible, and other means of disposal had to be considered. In England and on the Continent every city of importance has one or two garbage destructors in service and this method of disposal has been adopted in a number of American cities. In England these destructors not only satisfactorily dispose of garbage but also generate steam for commercial purposes, such as

electric street lighting, etc. There has recently been introduced in the United States what is known as the Edison system of garbage disposal, whereby the garbage is treated in digesters and the grease and fertilizing material extracted. The patentees of this process anticipate a

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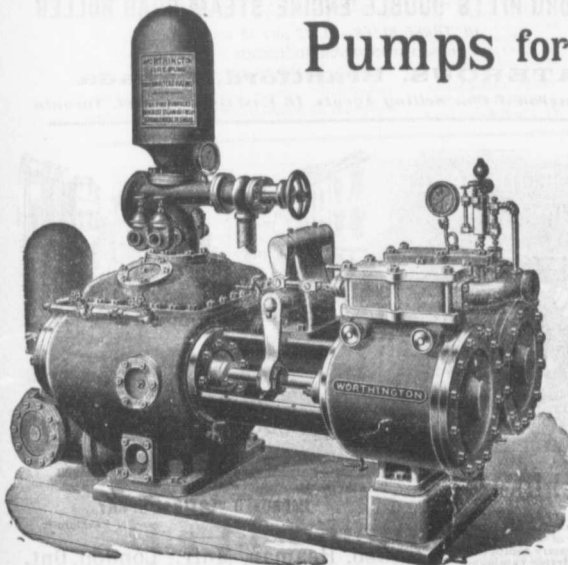
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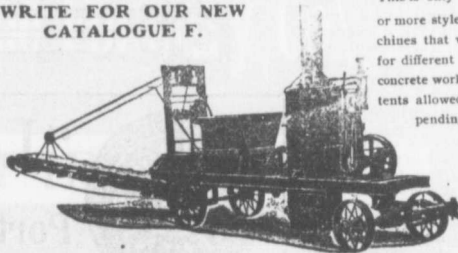
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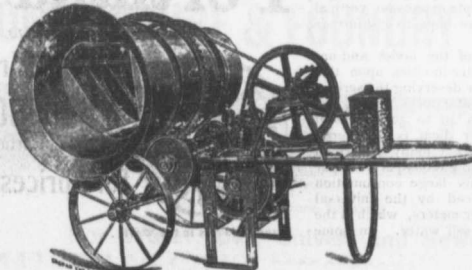
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considerable profit, their estimates running as high as \$4.00 per ton.

The next subject I wish to speak upon is the paving of our streets and sidewalks. In 1887 the first asphalt pavement was laid in Toronto and there are now about 46½ miles of this class of pavement. At that time the only paving material used was cedar block and macadam. In 1892 the mileage of cedar block had reached 177 and it is now reduced to 45. This class of pavement has never been a favorite, largely owing to the fact that the first pavements laid were allowed to become worn-out and dangerous, as no repairs were attempted nor was any repaving done. Cedar block makes a very good pavement for five or six years; it is cheap, noiseless and easily repaired, whereas macadam is very dirty in wet weather and very dusty in dry weather, and a very expensive pavement to maintain. I think the ideal pavements for city streets are wooden blocks, treated with a preservative and laid on concrete; asphalt and brick, although the latter is objected to on account of the noise. One of the most important questions to be considered in the construction of pavements, especially in large centres of population, is freedom from noise. This matter has not received the attention that it should, especially in American cities, but in London it was an important factor in deciding upon the use of the wooden block pavement.

There are about 12 miles of brick pavement in this city, and so far they have given good satisfaction, with the exception of the noise. Very few repairs are required, whereas during the past year we spent about \$18,000 upon asphalt repairs, exclusive of repairs carried out by various contractors under their guarantees.

In this connection there is another matter that has been very much discussed and upon which engineers hold diverse opinions, viz., the question of the guarantee. In Toronto for some years past we have called upon the contractor to guarantee all asphalt pavements for a term of ten years, which I think is the most satisfactory method. In one or two of the large American cities they are now, I understand, only calling for a short term guarantee. This entails an outlay for a very extensive system of tests, and even with exhaustive laboratory tests I do not think it is as satisfactory as a long-term guarantee. I think it is a question whether we are justified in throwing upon the property owners the extra expense involved owing to the contractor being called upon to keep the pavement in repair for ten years.

Within the past few years concrete has been substituted for plank in the construction of sidewalks, and up to the present time there are about 35 miles of concrete sidewalks. In 1890 there was only about 1½ miles of this class of walk. It is very satisfactory except during extremely cold weather, when it becomes slippery, and we are now considering the question of having the surface coat roughened to obviate this difficulty.

Regarding waterworks matters, during the past ten years, owing to the improvements made in pumping engines, the cost of pumping water has been very much reduced. For instance, in 1890 the cost of pumping water in this city, including coal, wages, maintenance, interest and sinking fund, was 7.52 cents per 1000 gallons. In 1900 this was reduced to 4.86 cents, and we are now installing a 15-million gallon triple-expansion vertical engine by which we hope to still further reduce this cost.

The prevention of the lavish and unnecessary use of water in cities upon this continent is a matter deserving the serious consideration of waterworks managers. In European cities 40 to 50 gallons of water per head per diem is considered ample and in a great many American cities from 100 to 200 gallons per head per diem is used. This large consumption can only be reduced by the universal introduction of water meters, which is the only proper way to sell water. In some

American cities where this practice is in force the consumption has been reduced as low as 60 gallons per head per day.

I would also refer to the nuisance caused by the almost universal use of soft coal in factories. The City Council have passed a by-law compelling all users of soft coal to take some means of preventing the smoke nuisance.

In concluding this short, and, I am afraid, rather incomplete address, I wish to congratulate the members of the Club upon the increased membership and the interest that nearly all the members now take in Club matters. I also wish to

thank the secretary and other officers for their cordial support and co-operation during my term of office. Our secretary has been indefatigable in his efforts to make the Club a success, and I am sure we owe Mr. Chipman a very hearty vote of thanks.

**JOHN GALT, C.E. & M.E.**  
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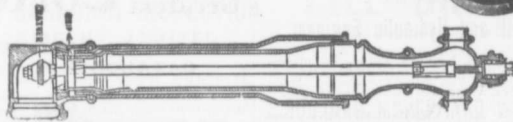
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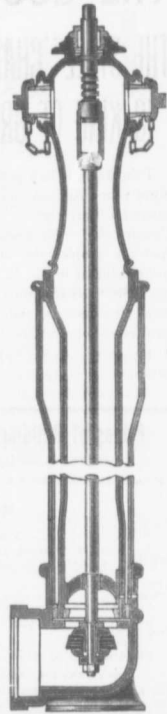
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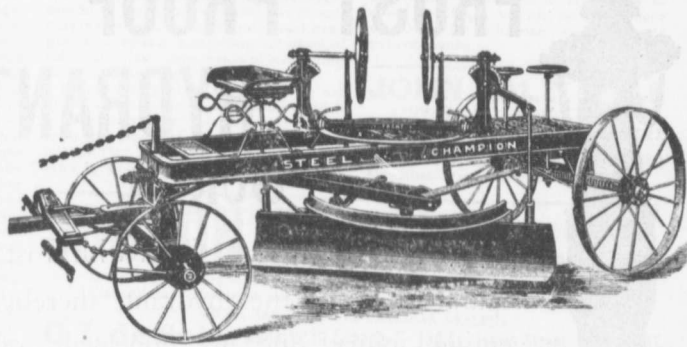
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Brown	25 50	26 50
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Buff	33 50	34 50
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" 2	10 50	11 50
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" 2	13 00	14 00
Brown	20 00	21 00
Roman Red	30 00	31 00
Buff	33 00	34 00
Brown	35 00	36 00
Hard Building	6 50	7 50
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Moulded and Ornamental from \$2.00 to \$5.00 per 100.		
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Red Peerless Facing	\$15.00	\$20.50
" No. 1	13.00	18.50
" No. 2	11.00	16.50
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Brown Peerless Facing	20.00	25.50
" No. 1	18.00	23.50
Buff Peerless	20.00	25.50
" No. 1	18.00	23.50
" No. 2	15.00	20.50
Moulded and Ornamental Bricks from \$3 to \$10 per C.		
Roman Red (Size 2 1/4 x 1 1/4 in.)	28.10	33.50
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Brown	34.00	39.50
Vitrified Pavina Brick No. 1	18.00	23.50
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	Car Lots	Less
Boyd	21 00 M.	26 00 M.
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Common Rubble, per tonne, delivered at building.	13 50	11 00
Large flat Rubble, per tonne, delivered.	14 00	18 00
Foundation Blocks, per C. ft.	4 1	5 00
Granite (Statensad) Ashlar, 2 in. to 12 in., rise 9 in., per ft.		2

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Amherst Red Sandstone	85	70
Amherst, N.S., per cub. ft.		
Sackville, N.B. by sea or red sto e f. o. b. Quarries	45	45
Maillon	30 00	
Statensad granite paving blocks, 18 in. to 12 in. x 4 in. x 1 1/4 in. per M.	50 00	
Granite curbing stone, 6x 12 in. per lineal foot		
Buctouche Olive Freestone	85	65
Olive Sandstone (Indian-town, N. B.)	80	70
Brown Sandstone (Sackville, N. B.)	80	70
Most red sandstone, per cu. ft.	60	
Black Pasture buff stone	50	
per cu. ft.		
Nova Scotia blue grey, per cu. ft.	65	
Coursera, 6 to 8 in. bed, f. o. b. St. Mary's, per cord	7 00	
Feosting, 6 to 10 in. wide, per cubic foot	15	
Dimension Stone, f. o. b. St. Mary's, per cubic foot	35	
Granite (Laurentian Pink) Ashlar, 6 to 2 in. rise 9 in., per c. ft.	25	
Dimension stock Granite, (Laurentian Pink) for building purposes, up to 2 tons weight, per cubic foot	40	
Do., for polishing purposes, up to 2 tons weight, per cubic foot	70	
Paving sets, per thousand block	60 00	

**CREDIT VALLEY STONE.**  
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Rubble, per ton	60
Brown Coursing, up to 10 per sup. yard	1 85
Brown dimension, per cub.	1 20
Grey cours g. per sup. yard	1 80
Grey dimension, per cub. ft.	50

**ROMAN STONE. F. O. B. Factory.**

Sills per lineal foot	40
Hollow Block, 12-inch wall, per superficial foot	40
Window Heads and Ashlar, per superficial foot, 4-inch bed	40
String Courses, Moulded and Ornamental, per lineal foot	2 00
50c. to 1.00	5 00
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red	30 00	30 00
purple	9 0	10 00
unfading green	10 0	11 00
olive	9 0	9 0
Ornamental Black Slate Roofing		77 50

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Br ok's Shoobridge Anchor	2 35	2 40
Excelsior Brand	2 00	2 10
Belgian—		
"Castle" Brand	2 10	2 15
"Lion" Brand	2 50	2 50
"M. M.'s" Condor	2 40	2 10
Cathedral	2 35	2 50
"White Cross"	2 15	2 20
Atlas	2 25	2 35
Hammer	1 80	1 90
Red Cross Brand	2 20	2 20
Waterloo	2 55	2 50
Raevel's 395 lb. bbl.	2 30	2 30
White Star	2 35	2 55

**Canadian—**

Rathbun's Star	1 90	2 10	2 40	2 50
Ensign	1 70	1 90	2 00	2 00
Trowel	2 00	1 75	1 80	
Samson Brand	2 00	2 05		
Magnet	1 75	1 80		
Hercules	2 00		2 20	
Lion Brand	1 75			
Imperial	1 80			
Crescent 375 lb. gross	2 30	2 40	1 95	2 05
Diamond 350 "	2 20	2 30	1 85	1 95

**American—**

Alpha Brand	1 80	1 90	2 20	2 50
Alsen's	2 40	2 00	2 25	2 35
Lehigh, in bbls., 375 lb.			2 50	2 50
" cotton sacks, 450 net			2 30	2 50
" open bags			2 10	2 35
Keene's "superfine" Whites	10 00	12 00	9 00	10 00
Keene's "Course" Whites	6 50	7 00	5 50	6 00
Five Bricks, Newcastle, per M	27 00	22 00	15 00	21 00
" Scotch	28 00	33 00	19 00	23 00
Plaster, Calcined, N. B.			2 00	2 00
" " N. S.			2 00	1 85