

CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL OF PUBLIC WORKS AND 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. 12

SEPTEMBER 11, 1901

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THE CANADIAN CONTRACT RECORD,

PUBLISHED EVERY WEDNESDAY

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DRAUGHTSMAN WANTED.

Architectural Draughtsman wanted immediately. BOX 33, CONTRACT RECORD.

TENDERS

FOR

GRANOLITHIC WALKS

A by-law has been passed authorizing the issue of Debentures for \$15,000, for laying of Cement Concrete Sidewalks in Village of Port Colborne. Sealed tenders will be received until

**Monday, September 16,
at 9 P.M.**

addressed to the undersigned, from whom specifications may be had.

DRWITT CARTER,
Recve.

Port Colborne, Ont., Sept. 5th, 1901.

DATE OF PUBLICATION.

Architects, engineers, municipal authorities and others are reminded that the CONTRACT RECORD is printed every Tuesday afternoon, and that advertisements should reach the office of publication not later than 2 o'clock p.m. on that day to ensure insertion in the issue of the current week. Advertisements are frequently received too late for insertion, to avoid which special attention is directed to this announcement.

COUNTY OF LANARK

TENDERS WANTED

Tenders will be received by the undersigned up to 4 p.m. on

Thursday, September 12, 1901,

for the erection and completion of a stone (or brick)

House of Industry

(near Perth) Lanark County, including "Hot Water" system of heating.

Plans and specifications can be seen at the County Clerk's office, Perth, or Mr. W. Pattie's office, Carleton Place, on and after MONDAY, SEPTEMBER 24th, bona-fide security, for the fulfilment of the contract, to be furnished by the contractors.

The lowest or any tender not necessarily accepted.

(Signed) W. PATTIE,
Chairman Building Committee,
Carleton Place.

BRIDGE NOTICE

Sealed Tenders, marked "Tender for Superstructure of Andover Bridge," will be received at the Department of Public Works, Fredericton, until

**Monday 30th day of September,
1901, at noon,**

For building the Steel Superstructure of "Andover Highway Bridge," across the St. John River, connecting the Villages of Andover and Perth Victoria County, N.B., according to Plans and Specifications to be seen at the Public Works Department, Fredericton, N.B. The structure consists of five through pin connected truss spans, each 188 ft. 10 in. in length from centre to centre of end pins. For detail information relating to plans and specifications apply to A. R. Wetmore, provincial engineer, Fredericton, N.B.

Each tender must be accompanied by a certified bank cheque or cash, for an amount equal to five per cent of the tender (which would prefer not receiving P.O. orders), which will be forfeited if the party tendering declines to enter into contract when called upon. Should the tender be not accepted the deposit will be returned. Two good sureties must be named in each tender. Not obliged to accept lowest or any tender.

C. H. LAMBLAIS,
Chief Commissioner.

Department of Public Works,
Fredericton, August 13th, 1901.

A NEW FLOORING.

A German chemist is reported to have found a means of mixing sawdust with certain chemicals, to produce a flooring which is as hard and smooth as marble or concrete, and yet elastic and warm to walk on. It is stated to be fire-proof, impervious and sound-deadening, and although laid down for some years to have in no instance showed signs of bulging or cracking. It is laid down in a moist state without seams, and thereby allows of the corners and sides being rounded off, an important point from a hygienic point of view. It hardens completely in forty-eight hours.

CONTRACTS OPEN.

MAGOG, QUE.—Tenders have been asked for building fire station.

BALSAM, ONT.—J. Jones contemplates building a new residence on his farm.

SEBRINGVILLE, ONT. — R. F. Kastner has purchased property on which to build two dwellings.

ORILLIA, ONT. — Myers & Hammond are about to build an addition to their carriage factory.

BERLIN, ONT.—Charles Jones architect, has just taken tenders for erection of a brick veneered hotel.

LITTLE CURRENT, ONT.—D. McGilvery, village clerk, is prepared to receive offers for purchase of debentures.

RED DEER, N.W.T.—The Commissioner of Public Works is about to build a steel bridge over the Blindman River

SARNIA, ONT. — Robert Fawcett architect, is preparing plans for a two storey brick residence for Francis Blaikie.

MIDDLEVILLE, ONT. — Lanark township council are asking for tenders for placing a fire-proof vault in the town hall.

ENNISKILLEN, ONT.—John Doyle is asking for tenders up to the 14th inst., for construction of part of the McFayden drain.

MOUNT FOREST, ONT.—Tenders are being taken this week for erection of stone and brick building for electric light plant.

WATERLOO, ONT.—A by-law authorising a loan of \$5,000 for extension of waterworks system was carried here last week.

LOUISE BRIDGE, MAN.—G. T. Hayes, secretary treasurer of the municipality, is receiving bids for purchase of debentures.

PORT COLBORNE, ONT.—Tenders are invited for laying granolithic walks. The work will be in charge of George Ross, C.E., of Welland.

REVELSTOKE, B. C.—W. T. Dalton, architect, of Vancouver, has completed plans for proposed Queen Victoria memorial hospital.

FREDERICTON, N. B.—Tenders are being taken by the Provincial Public Works Department up to the 16th inst. for rebuilding several bridges.

GALT, ONT.—Bowman & Grey, civil engineers, of Berlin, have been authorized to prepare plans and specifications for proposed sewers in this town.

LEAMINGTON, ONT.—Tenders have been taken for building an Episcopal church.—R. Lloyd, of London, intends building a three storey hotel here.

HEPELER, ONT. — William A. Knibs has purchased three acres of land and will erect a large planing mill and box factory, to cost about \$15,000.

ONONDAGO, ONT.—The people of this vicinity are agitating for the construction of a bridge over the Grand River connecting Onondago with the Indian Reserve.

GUELPH, ONT.—W. F. Colwill, architect, is this week taking tenders for painting and paper hanging, plumbing and hot water heating at St. George's church rectory.

GODERICH, ONT.—It is understood that Mr. Smith, manager of the Menesetung Park, will make a proposition to the town council to build a summer hotel there, to cost \$25,000.

SEAFORTH, ONT.—The council has agreed to grant a franchise to Messrs. McGillicuddy and Goldthorpe, representing a syndicate, to build an electric railway through the municipality.

LISTOWEL, ONT.—The Canadian Bent Chair Company have decided to utilize the building owned by J. C. Hay on Main street east, and to build thereto a three storey addition 60x50 feet.

MEDICINE HAT, N.W.T.—The town will spend about \$22,000 to light the town by natural gas; tenders for drilling gas wells will be received by the town treasurer up to 20th inst.

PRINCE ALBERT, N.W.T.—Tenders for erection of grain elevator with a capacity of 25,000 bushels are asked by R. L. Cook up to 16th inst. Information from Andrew Strang, of Winnipeg.

AYLMER, ONT.—Bids are invited by A. H. Backus, chairman finance committee, up to 20th inst., for purchase of \$20,000 electric light debentures, and \$8,000 local improvement debentures.

STRATFORD, ONT.—A by-law to raise \$20,000 by debentures was carried here last week.—It has been rumored that S. R. Hessian will build a new business block.—It has been decided to make extensive improvements to St. James church.

SYDNEY, N.S.—It is stated that the Nova Scotia Steel & Coal Company will construct a railway to the coal areas in Boularderie, with a bridge across the Bras d'Or Gut.—The Cape Breton Railway Extension Co. has asked for tenders on 100 platform cars.

ST. JOHN, N.B.—The Intercolonial Railway authorities have purchased 38 acres of land as a site for proposed engine house and yard room tracks.—His Lordship Bishop Casey has announced that land has been purchased at the corner of Orange and Carmarthen streets on which to build a school house to replace St. Malach's hall. The plans for the building have been prepared.

HULL, QUE.—The city engineer estimates that the cost of building the main sewer from low water in Ottawa river to the centre of Kent and Division streets will be \$22,980.—Land has been purchased at the corner of Chaudiere and Regent streets as a site for a new Roman Catholic church, to cost \$50,000. It is expected that work will be commenced almost immediately, and that a presbytery adjoining will also be built.

QUEBEC, QUE.—Clark Bros., of New York, who recently purchased a large water power on the St. Marguerite river, near the village of Seven Islands, are now having the necessary surveys made by their engineer, Henry Holgate, of Toronto, and will commence immediately to develop the power and erect a pulp mill. They have agreed to expend half a million dollars within two years, but it is expected that this expenditure will be greatly exceeded. The mill will have a capacity of from 50 to 100 tons of pulp per day, and it is the intention to construct a railway from St. Marguerite to Seven Islands and to provide wharfage accommodation. Thos. Meaney, of Toronto, is also interested in the project.—S. S. Smith, representing the grain

shipping interests headed by Captain Wolvin, of Buffalo, was in the city last week inspecting sites for an elevator and wharves.

COATICOOK, QUE.—Tenders close 19th inst. for erection of town hall in Barford. Particulars from Charles E. Baldwin, this place.

LONDON, ONT.—H. Waddington has taken tenders for alterations and additions to the London Mutual Insurance Company's building.—Herbert Matthews is preparing plans for two new residences on Albert street.—H. C. McBride, architect, is calling for tenders for residence on Dufferin avenue for J. B. Smallman.—The plans of the new addition to the public library have been completed and tenders for the work will be invited immediately.

BRANTFORD, ONT.—Building permits have recently been issued by the city engineer as follows: R. F. Blanchard, brick residence on Northumberland street, cost \$950; Mrs. A. D. Clement, brick residence on Church street, cost \$3,200; Mrs. B. Hope, brick residence on Chatham street, cost \$3,800; John McCutcheon, brick stable on Colborne street, cost \$975; Presbyterian Church of Canada, brick Sunday school, cost \$5,500; F. McCallum, brick residence on Pearl street, cost \$1,000; John Hill, brick residence on William street, cost \$1,000.

VICTORIA, B.C.—The building committee of the Congregational church have decided upon plans for the new church, which will be of stone.—A report states that the Industrial Power Company has secured a water power at the Clowhom River Falls, and will proceed to erect there a large pulp mill.—Engineer Gamble, of the Public Works Department, has selected a site at Chimney Creek for proposed bridge, which will be 300 feet in length and will cost about \$40,000.—W. N. Northcott, purchasing agent for the city, is taking tenders on poles, lamp arms, and wires.—The Provincial Government invites tenders up to the 12th inst. for erection of three-room school at Armstrong.

HAMILTON, ONT.—It is said that the Canadian Dress Poultry Company will erect an abattoir in this city. C. E. Langely is architect for the company.—Building permits have been granted as follows: Thos. Allen, two brick dwellings, West avenue, between Robert and Barton streets, cost \$2,500; F. J. Lyne, a brick dwelling, Emerald street, between Robert and Barton streets, for Mrs. Quigley, cost \$1,150; Charles Plant, brick dwelling, Smith avenue, for David Coulter, cost \$1,400; Thos. Robson, two brick dwellings, Earl street, between Barton and Princess street, cost \$2,000.

OTTAWA, ONT.—The Department of Public Works invites tenders up to Thursday, 26th inst., for erection of post-office at Granby, Que. Plans at above department and on application to postmaster at Granby.—M. J. Gorman has invited tenders for erection of building on Maria street for the Columbus Club.—Hon. R. R. Dobbell has purchased two lots between Mackenzie avenue and Sus-

sex street, and bounded on the north by St. Patrick street. The property has been mentioned as a site for new government buildings. Building permits have been granted as follows:—Columbus Club, brick and stone building, 63 Maria street, cost \$15,500; George Mitchell, row of brick veneer dwellings, 9 Wellington street, cost \$4,900.—A. A. Hotte, brick veneer dwelling, 15 King street, cost \$1,300; A. E. Shaver, brick dwelling, 8 Patterson avenue, cost \$1,000.

WINNIPEG, MAN.—The construction of the following works has been recommended:—Granolithic walks on north side Rupert street, from Main to Princess, cost \$1,900; macadam pavement on Market street, Louisa to Bertha, cost \$3,740, and on Jarvis Avenue and Halled streets, cost \$5,925; sewers on portions of Flora avenue and King street, cost \$1,855 and \$3,390 respectively.

MONTREAL, QUE.—MacVicar & Heriot, architects, are completing the following works: Addition to Fairmont school, Montreal Annex; alterations to Mussen building for Leeming, Miles & Company; raising of factory for Lyman Sons & Company; addition to residence of R. J. Inglis; cottage at Cacouna for C. J. Cockburn; alterations to house, Tupper street; residence at Westmount for L. Skaitte. Same firm are preparing plans for R. J. Inglis' new premises on St. Catharine street, and for a residence at Westmount.—The Lachine Rapids Hydraulic & Land Company are this week taking tenders for crib work at Lachine Rapids.—Building permits have been granted as follows: Bernier & Frere, two storey house on Moreau street, cost \$1,250; Montreal Gas Company, alterations to one storey house, corner Ann and Ottawa streets, cost \$1,000; Holmes & Harpin, alterations to three storey house, 231 Chatham street, cost \$1,000; P. J. Seybold, seven storey house and factory, 478 St. Paul street, cost \$20,000 (R. Findlay, architect, H. Dufort, contractor); R. Boyer, two storey house, 283 Laurier avenue, cost \$1,000; Mrs. Sarah Genser, three storey house and store, 499 St. Lawrence street, cost \$3,300; Alf. Dumont, two storey house, 534 St. Andre street, cost \$3,000; A. Moneite, two storey house, 375 Chambarand st., cost \$1,200; Chas. Roberge, two three-storey houses, 379 Frontenac street, cost \$1,500; Felix Labelle, three three-storey houses, St. Urbain st., cost \$4,000 (Jos. Sawyer, architect); Sherwin-Williams & Co., one storey house and warehouse, St. Patrick st., cost \$4,000 (MacVicar & Heriot, architects); J. W. Pike, one two storey house and factory, Wellington st., cost \$5,000; Wire & Cable Co., one three storey house and factory, St. James and Lusignan streets cost \$40,000, (W. J. Carmichael, architect, A. Cowan, contractor); G.T.R. system, one storey railway station, subway, near Wellington st., cost \$3,000.

TORONTO, ONT.—A. Frank Wickson, architect, will shortly invite tenders for a residence to be erected on Park Road, Rosedale, for Mr. Reid, manager of the Featherbone Co.—S. N. Davis,

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TORONTO MONTREAL ST. JOHN HALIFAX

architect, 61 Victoria street, wants tenders for brick-laying and carpenter work.—Tenders from all trades except carpenter work for pair of brick houses are wanted at 31 Leonard avenue.—At a meeting of the Michipicoton Falls Power Co. held in this city last week it was decided to begin operations at once to develop the power.—A report has been presented to the Property Committee on the proposed additions and alterations to the cattle market. The cost, as estimated by the city commissioner, would be \$25,834, and it has been decided to ask the council for \$10,000 to commence the work at once.—The city engineer has recommended the construction of the following works:—Brick pavements—Pearl street, from York street 633 feet east, cost \$4,630; Waterloo Avenue, Gladstone to Dufferin, cost \$2,685; Carlton street, from Sumach 400 feet easterly, cost \$2,975. Asphalt pavement—Bedford road, Bernard avenue to Davenport road, cost \$2,740. Macadam roadways—Breadalbane street, Yonge street to St. Vincent, cost \$1,800; Lansdowne Avenue, from Bloor to Royce avenue, cost \$20,910; also from Royce avenue to city limits, cost \$1,505; Davenport road, from Hazelton avenue to Avenue road, cost \$2,890; Mutual street, Wilton avenue to Gould street, cost \$2,280. Brick sidewalk—Sherbourne street, from the bridge to Ancroft place, cost \$217. Cedar block pavement—Soho street, Queen to Phoebe, cost \$1,095. Concrete sidewalks—Robert street, east side, Sussex avenue to Bloor street, \$573; Spadina avenue, east side, Clarence square to Front street, \$454; Czar street, north side, Yonge to Balmuto, \$230; Bedford road, east side, Bernard avenue to Davenport road, \$248; Bellevue avenue, east side, from Bellevue place to Oxford street, \$1,446; Gould street, south side, Church to Dalhousie, \$201; King street, south side, Stafford to Strachan avenue, \$230; Tyndall avenue, west side, King to Springhurst avenue, \$1,192; Sword street, east side, Gerrard to Spence, \$507; Wellesley street, north side, Rose avenue to Parliament street, \$150; Dunn avenue, both sides, Queen street to 3,662 feet south, \$4,969 and \$4,937; Soho street, both sides, Queen to Phoebe, \$1,191; Huntley street, east side, Earl to Isabella, \$238; Euclid avenue, west side, Ulster to Bloor, \$1,650; Wilton avenue, north side, Seaton to Ontario, \$219; Davenport road, north side, Hazelton avenue to Avenue road, \$319; King street, south side, Niagara to Walnut, \$214; King street, south side, Dufferin to Dowling, \$2,315.—Building permits have been granted as follows: W. Phillips, two dwellings on Bedford road, cost \$6,000; H. T. Mara, dwelling on Elm avenue, near Glen road cost \$3,000; D. Schwalm, pair two-storey attached brick dwellings, west side Ossington avenue, near College street, cost \$3,200; H. F. Squires, two dwellings, 53 and 55 Howland avenue, cost \$7,000; C. R. S. Dinnick, residences on Huron street, cost \$4,500, and \$4,000 respectively; Thos. McIlwain, two brick dwellings on Spencer

avenue, near Huxley street, cost \$6,000; H. M. Death, two dwellings in Mackenzie crescent, near Dovercourt road, cost \$3,200; Walter Weston, two-storey brick warehouse, 29 Arthur street, cost \$1,200; Harold A. Wilson Company, alterations to stores, 35 and 37 King street west, cost \$3,500.—Tenders will be invited immediately by the city for stands to be built in connection with the reception to the Duke and Duchess of York.—A. R. Denison, architect, has been instructed to prepare plans for new offices and caretakers' houses at the cattle market.

FIRES.

Residence of S. H. Brown at Grand Forks, B. C., loss \$3,000.—Lozier's flour and paper mills near Belleville, Ont., totally destroyed.—Stave and hoop mill of Steinhoff & Gordon at Wallaceburg Ont., loss \$8,000, insurance \$2,000.—Foundry of Copp Bros. at Hamilton, Ont., damaged to extent of \$10,000.—Sash and door factory of J. H. Giguere at Quebec, Que., partially destroyed.

CONTRACTS AWARDED.

RENFREW, ONT.—The Renfrew Power Co. have let the contract for dam and power house to E. A. Cawsey.

WALKERTON, ONT.—The contract for sewer on Victoria street has been let to Guelph Pavement Co., price, \$1,869.

HANOVER, ONT.—H. Prast, of this place, has secured the contract for chair factory at Southampton for S.M. Knechtel.

FREDERICTON, N.B.—Whitman Brewer, of St. Mary's, has secured the contract for building Government bridge at Sackville.

NORTH SYDNEY, N.S.—The tender of J. C. MacIntosh, of Halifax, has been accepted for purchase of \$50,000 debentures.

KINGSTON, ONT.—The carpentry contract for new school of Mines building at Queen's University has been awarded to Wilmott & Davis.

GRIMSBY, ONT.—L. L. Bagar has let the contract for a brick residence to cost \$7,000, the plans for which were prepared by A. W. Peene, architect, Hamilton.

NELSON, B.C.—The Canadian Pacific Railway has given the contract for construction of a new seven-mile cut, off Field, B.C., to W. J. Stewart, of this place. The work will cost about \$100,000 per mile.

SYDNEY MINES, N.S.—The contract for erection of new high school has been let to Michael McMillan, of North Sydney; estimated cost \$12,000. The architect is Mr. Hopson, of Sydney.

ST. JOHN, N.B.—F. N. Brodie, architect, has let the contract for a self-contained residence on Leinster street for H. S. Wright to John Edgett. Sub-contracts have been let as follows: Masonry, Sprull & Burley; galvanized iron work, Freeze Bros.; painting, William Reed.—The contract for building new C. P. R. pier has been given to G. S. Mayes.

LONDON, ONT.—Herbert Matthews, architect, has accepted the following tenders for residence on St. George street fo: Charles Cloerick: Mason work, William Copp; carpenter work, R. Inwood.—T. Irwin has let contracts as follows for residence on King street east: Mason and brick work, Martyn & Hammett; carpenter work, L. H. Martyn; plastering,

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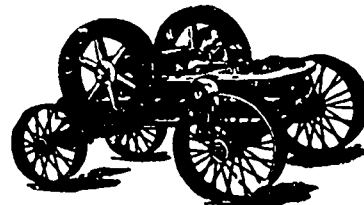
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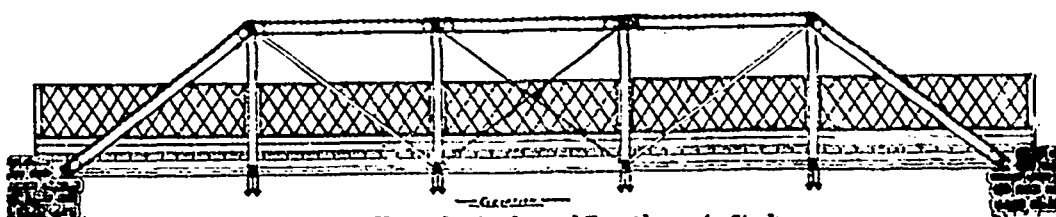


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Gould Bros.; painting and glazing, George Howe; plumbing and gas fitting, W. J. Green; electric wiring, London Electric Co.—M. Allen has accepted the following tenders for residence on Ontario street: Mason and brick work, Hyatt Bros.; carpenter work, L. H. Martyn; plastering, Jacobs & Gower; painting and glazing, Waspe & Pearson; electric wiring Rogers Electric Co.

MONTREAL, QUE.—The contract for a million bushel fire-proof elevator to be built by the Harbor Commissioners has been awarded to J. A. Jamieson, of this city, at the price of \$642,000. The tenders received for the work were as follows: J. A. Jamieson, Montreal, \$642,000; Barnett & Record, Minneapolis, \$820,000; McDonald Engineering Company, Chicago, \$975,000; A. F. Chapman, Buffalo, \$1,000,000.—The contract for Laing Packing & Provision Co.'s buildings have been awarded by W. E. Doran, architect, as follows: Brickwork, Alfred Gauthier; carpentry and woodwork, James Shearer Co.; drainage, Lawrence McDonald; laying water main, Thomas O'Connell.—Contracts for warehouse for Seybold Sons & Co. have been awarded by R. Findlay, architect, as follows: Masonry, H. Dufort; brickwork, U. Paul & Sons.

TORONTO, ONT.—The following contracts for local improvements were awarded yesterday by the Board of Control: Asphalt pavement—James street, Albert to Louisa, Construction and Paving Company, \$2,924; Euclid Avenue, Ulster street to Bloor street, Barber Asphalt Company, \$14,000. Cedar block pavement—Morse street, from Queen to a point 2,103 feet south, Dominion Paving and Construction Company,

\$4,495; Marion street, Fuller street to Sorauren avenue, W. F. Grant & Co., \$857. Macadam roadway—Smith street, Broadview to Logan avenue, Dominion Paving and Construction Company, \$3,699; De Grassi street, Queen to Gerrard, same firm, \$4,624; Powell street, Dale avenue to Maple avenue, City Engineer, \$850. Concrete sidewalks—Wellesley street, south side, Rose avenue to Parliament street, Harvard Paving Company, 45 cents per lineal foot; Grosvenor street, Yonge to S. Vincent, and Wellesley street, north side, Church to Jarvis, same firm, 55 cents. Tile sewer—Edith avenue, Edwin avenue to Franklin avenue, City Engineer, \$479. Brick sidewalk—Cameron street, Queen to Cameron Place, City Engineer, 50 cents per lineal foot.

THE CEMENT MARKET.

The arrivals of cement at Montreal last week were 1,500 barrels Belgian and Ger-

man and 100 English, as against 400 Belgian and German and no English for the previous week, making a total to date of 63,942 Belgian and German and 10,400 English. There has been a decided improvement in the demand for all brands of cement of late, and considerable sales of lots ranging from 100 to 500 barrels have taken place. This, coupled with the decrease in the arrivals of foreign brands, has created a better feeling in the market, and stocks on spot have been reduced to some extent. A feature of the trade has been the cutting in the price of a favorite Belgian brand among importers, but this has had no actual effect upon values for other grades. On the whole a fairly active trade is passing, and with continued fine weather it is likely to continue for some little time, as there is a large amount of outdoor work in progress.

The receipts of firebricks for the past week were 17,140, making a total to date of 1,313,273. A fair trade in this line is reported for the season, and prices show no change.

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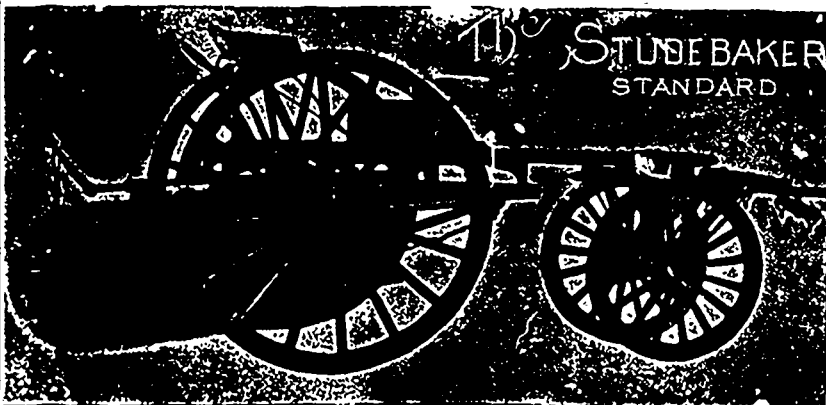
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bottom and 20 inches at the top, we have an average thickness of 23 inches, or nearly 2 feet. Now measure the outline of the building, which we will call 182 feet. There is 5½ feet of stone work below grade and 2½ feet above, making a total of 8 feet, which multiplied by 182 equals 1,456 square feet, which we will call 15 squares, allowing the slight gain here and on the average thickness of wall to make up for extra width of footings, pier, chimney and step foundations, &c. Now if the wall were 1 foot thick there would be practically 4 perches in a square, but in this case double that for a 2-foot wall, making 8 perches. Now, knowing the cost per perch, we can readily get the cost of a square and multiply by the whole number of squares, and thus find cost of total stone work. Next consider the concrete. Take the area of the cellar, inside of walls, and having found the number of squares multiply by the cost per square, which will be from \$4.50 to \$5, according to quality and thickness. Now look back to the first floor area—184 squares. Say the joists are 2x12 inches and placed 16 inches on centers. Now, if they were 1x24 inches and we were to lay them flat, each joist would lap over onto the next space 8 inches, or half the space. Thus you will readily see that the board measure of the floor joists is equal to the area plus half the area. Then for a square of floor we get 150 feet of frame, 100 feet of boards for under floor, or 250 feet in all, plus one-fifth for waste, making 300 feet, at 3 cents per foot in place, which equals \$9. If the ceiling is plastered add 2 cents per foot for it, or \$2. Then add, say, 8 cents per foot, or \$8, for top floor and the paper under it, making a total of

\$19 as the cost of a square of floor complete. Now multiply by the 18 squares and the result is the cost of the entire first floor.

In the same manner get the number of squares of walls, roofs, partitions, hogg ceilings, etc., and carry out costs as above. This still leaves doors, windows, stairs, sundry inside finish, and such items as plumbing, painting, brick work, gas pipe, electric work, heating, etc. The doors and windows we can count and by a little figuring find the cost complete of one average door and one average window, including labor, finish, hardware, etc., then multiply by the whole number of each and thus dispose of these items. What other inside finish there is, such as base and molding, sheathing, panel work, balustrades, closets and so on, can be gotten at separately and added in. Then it will be possible to figure the other items mentioned or judge the cost very closely by drawing comparisons with like work in similar buildings you may have erected or had brought to your notice and of which you know the cost. In many cases most of these items would have been figured by the sub-contractors doing those particular lines of work and then a definite figure could be obtained.

Assuming now that you have carried out these various totals, you have simply to add the column to find the total net cost, to which you can put for profit any per cent. you see fit. After two or three buildings have been figured in this way you will have the cost per square for all sorts of surfaces in your head and will not have to stop to figure it up as I have done above in order to make things plain. As one who makes a living by estimating for a general contractor all kinds of brick, stone and wood structures, I would not recommend figuring this way if you have the time to go more into detail. However, I frequently figure this way, when pushed for time, especially certain classes

of houses, factories and stables, but measurements must be taken reasonably accurate and care must be used to get in all such items as are not taken by the "square."

BLASTING A ROCK.

The blasting of a very large rock on a steep slope just above the tracks of the railroad from Brantome to Champagne, France, is described in the "Genie Civil." The rock was about 56 feet high, 53 feet long and 20 feet wide, and projected from the face of a cliff, the upper part of which was about 150 feet from the track and about the same distance above it. It was seated on the narrow neck of a base about 10 feet high and was separated from the main cliff by a vertical fissure about 16 inches wide, in which it was thought possible that ice might form and overturn the rock so as to roll it down to the track below. Seventy 2½-inch holes were drilled to a depth of from 1½ to 23 feet, in three rows in the side of the rock and one row in the top, and half a dozen were drilled obliquely in the base. Three-storey scaffolds were erected on 10-foot poles and the holes were drilled obliquely from them in vertical planes parallel to the face of the rock. They were charged with 533 pounds of dynamite in ½-pound cartridges, which were loaded in strings, gently rammed with wooden bars, and finally tamped with copper bars. While the holes were being drilled, the slope between the rock and the track was cut in four terraces, concave toward the rock, so as to arrest any fragments rolling toward the track. The charges of dynamite were simultaneously exploded by electricity and shattered the whole mass, of an estimated volume of 1,962 cubic yards, two-thirds of which was retained on the first terrace, and one-quarter on the second terrace. The track was only slightly obstructed, and only four rails were bent.

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METHOD OF FELLING BRICK.

A brick chimney, 160 ft. high and 8½ ft. square at the base, and 4½ ft. diameter at the top, has been overthrown in St. Louis by the use of hydraulic jacks. The chimney was first undermined on one side, and three 10 ton hydraulic jacks were placed in position under the side. A hawser was then fastened about the chimney, 60 ft. from the ground, and ropes led from this hawser to crabs placed at a distance of about 100 ft. With eight men at each crab and men at the hydraulic jacks the chimney was slightly lifted and pulled at the same time; the men at the jacks left their posts at the first warning crack, but those at the crabs continued their work until the chimney fell.

SUBMARINE TRAMWAY TUNNELS.

A submarine tramway tunnel is being made under the Boston harbour. The length under the harbour is about 3,000 feet, and the tunnel will be an arched structure of concrete 23 feet 4 inches wide and 20 feet 6 inches high, with concrete walls 2 feet thick in the invert and 2 feet 9 inches thick in the sides and roof. Transverse tie-rods may be put in across the invert, and the section is to be strengthened where found necessary by steel ribs and other forms embedded in the concrete. Where the tunnel passes through sand and gravel bearing much water there will be an outside lining of cast iron segments, with steel segmental ribs embedded in the concrete at intervals of about 2 feet 6 inches. These ribs are plate girders, with the outer edge of the web-plate fluted between the circumferen-

tial flanges of the cast iron lining, and the inner edge has a pair of flange angles riveted on. The work will be carried on by the aid of shields driven forward by hydraulic jacks which abut against cast iron reaction bars embedded in the concrete. The concrete is composed of portland cement, clean sharp and coarse sand, and clean screened gravel in the proportions of 123 lbs. cement to 2½ cubic feet of sand and 4 cubic feet of gravel. The thickness of earth over the tunnel roof will be 16 feet to 18 feet, above which, in the deepest part of the harbour, will be about 35 feet of water.

SHORT METHOD OF ESTIMATING BUILDINGS.

A. W. Joslin, of Roxbury, Mass., writes in Carpentry and Building, on the above subject, as follows: I want to suggest a method of estimating which is comparatively short and accurate enough on which to make a bid if measurements are

carefully made. I will begin by assuming that the subject in hand is a frame church on a stone foundation, with a cellar under the whole area. Of course the dimensions are merely assumed and the prices are based on such work in the writer's vicinity. As far as practicable we will use a "square" (100 square feet) as the unit of measure. First find the area of the first floor, which, for example, we will say is 1850 square feet, or 18½ squares. Now we have got to excavate 18½ squares to a depth, say, of 5 feet. A little mental calculation would be about as follows: 100 square feet, or one square, 1 foot deep, is almost 4 cubic yards; 5 feet deep will be 20 cubic yards, and, at the rate of 30 cents per cubic yard, would be \$6—the cost of excavating an area of one square to a depth of 5 feet—which multiplied by 18½ squares equals \$111, or total cost of excavation.

Now for the stone work. Assuming that the wall is 26 inches wide at the



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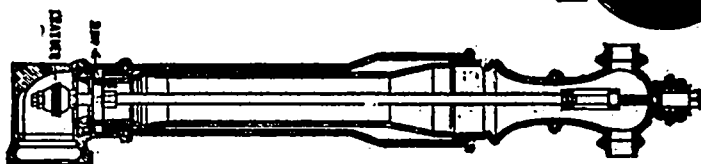
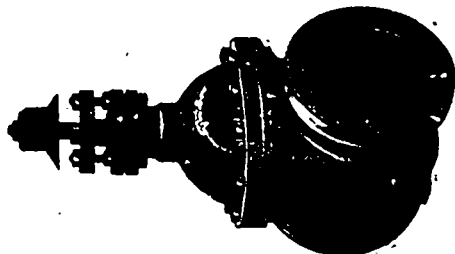
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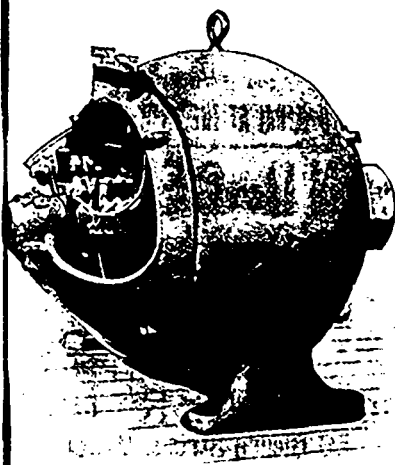
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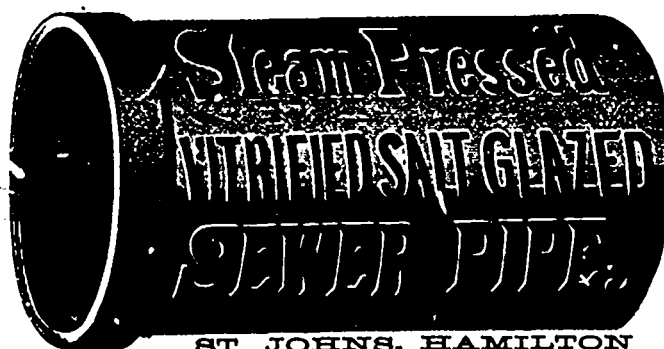
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MUNICIPAL DEPARTMENT

A NEW WATER TOWER.

Chief Benoit, of the Montreal Fire Department, returned last month from a trip to Holyoke, Mass., where he examined a new water tower ladder, which has been found to be very efficacious in the fighting of fires. The ladder is an ordinary extension fire ladder, but fitted up with a tower hose, which does the work of an ordinary water tower. The arrangement on the ladder is such that after it is raised a tower hose, worked from the ground, can pour water upon a blaze at the height of fifty feet. The tower hose in no way interferes with the working of the ladder, which can be used apart from it. The authorities took these tower ladders to the canal, where a practical test was given. It was demonstrated that almost as soon as the ladders were raised from the truck, the hose tower was ready for operation. In this connection it showed its superiority over the ordinary water tower, which is so very cumbersome, and which takes so much time to erect and get into active service. The price of a regular water tower is about seven thousand dollars; while one of these new tower ladders do not cost over six or seven hundred dollars. It is the intention of Chief Benoit to report to the Fire Committee of the Montreal council in favor of the purchase of some of these new tower ladders.

ASPHALTS.

About 1840 the city of Paris and some other large towns in France made a trial of melted asphalt-rock from French mines of Seyssel as a material for covering street pavements. The experiment attracted attention, and very soon afterwards the officers of the municipality of Hanover gave directions to the professors of the city technical school to examine the material from the mines of Limmer, which had been abandoned and almost forgotten, to see whether it could be used for street pavements in the manner in which the Seyssel asphalt had been tried in Paris. This leisurely investigation was interrupted by the political tumults of 1848, in which barricades of paving stones were used as fortifications by the discontented mob of nearly all the large cities of the Continent. Napoleon III., a practical man, like his uncle, bethought himself that if the streets of Paris were paved with asphalt in the manner which had

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just been tried on a small scale there would be no paving-stones to make barricades of, and by his influence, although not with that avowed object, many miles of asphalt-paving were laid throughout Paris. London, Berlin, Marseilles, and other cities followed the example of Paris, and a great demand sprang up for asphalt-rock. Although London and Paris have now substituted wood-blocks for asphalt in the roadways of their principal streets, the demand for the material continues unabated and fresh deposits are eagerly sought for. At present although the Limmer-Vorwohle mines are extensively worked, those of Pyrimont, Seyssel, on the banks of the Rhone, in the French Department of the Ain, hold the first place in regard to the quality of their product. The rock is a carbonate of lime containing from 6 to 8 per cent. of bitumen so intimately combined that it cannot be removed even by long heating. The stone is very uniform, and has a certain toughness which peculiarly adapts it for pavements. The Val de Travers, a few miles distant from Neuchatel, in Switzerland, furnishes a very similar material. Every architect knows the octagonal and circular blocks in which the Seyssel and Val de Travers asphalts are sent all over the world. For some purposes both these asphalts are mixed with mineral pitch from a mine near Ragusa, in Sicily, owned by the same company as the Pyrimont-Seyssel mines. Lately other asphalt mines have been opened in Southern France—at Marvejols, near Grenoble; at Lovagny, and at Mons, in the department of the Gard.

SMALL SEWAGE DISPOSAL PLANT.

A small sewage disposal plant of considerable interest is described in a recent issue of Indian Engineering. It was designed by Mr. C. C. James for a leper asylum with 400 inmates near Bombay, where the sewage originally drained into two large cesspools. These became a nuisance, so a disposal farm was laid out with settling tanks for liming the raw sewage, but the lime injured some of the crops, and it had to be abandoned. Finally the land became "sick," and the septic system was introduced preliminary to the land treatment. This has been successful and the sale of the farm crops yielded last year a profit of 21 per cent. above working expenses. The septic tanks have a capacity of about 19,000 imperial gallons, and the sewage passes through them at the rate of about 20 feet an hour. The leathery scum on the surface is 1 to 3 inches thick and there is some sludge on the bottom. The septic effluent has been used in experiments with a number of filters. One which gave a good result was made with pieces of coal. Another filter which received raw sewage was made with pieces of brick with pipes to distribute air through it in accordance with the principles advocated by Colonel Ducat. The sewage was 45 minutes in passing this filter and was well purified by the process.

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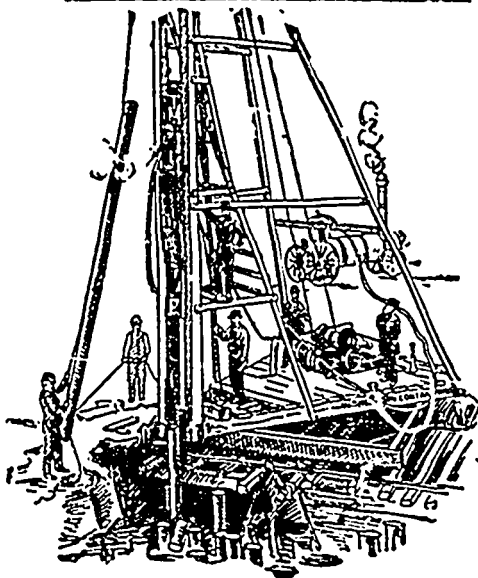
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