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CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL OF

PUBLIC • WORKS • • TENDERS • ADVANCE • INFORMATION • AND • MUNICIPAL • PROGRESS

EVERY THURSDAY

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

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TENDERS WANTED

Sealed Tenders, whole or separate, will be received by the undersigned, up to and including

Saturday, February 15th, 1896,

for the various trades (except painting and glazing) required in the erection and completion of a Residence in the Town of Smith's Falls, according to the plans, specifications, contract, etc., of JAMES A. ELLIS, Architect, 4½ Adelaide St. E., Toronto.

Said plans and specifications may be seen at the offices of the Architect and the undersigned.

Satisfactory security will be required. No tender necessarily accepted.

F. T. FROST,
Smith's Falls, Ontario.

According to the Revue Industrielle, M. Blondell has introduced a new method of uniting lead to lead. The two surfaces to be joined are scraped clean and a thin layer of lead amalgam is interposed between them. An ordinary soldering iron is then passed over the line of junction, and the mercury of the thin sheet of lead amalgam being volatilised by the heat, leaves the finely divided lead to fuse and unite the two surfaces.

CONTRACTS OPEN.

SHELBURNE, ONT.—A new rink will be built here.

SINGHAMPTON, ONT.—J. R. Sing will build a brick store.

MONO MILLS, ONT.—A large saw mill is to be erected here.

LANGMAN, ONT.—Jno. Powers will erect a saw mill here.

VAN VLACK, ONT.—Mr. McConnell will build a saw mill here.

SANDON, B. C.—Two Victoria men will build a large hotel here.

CHICOUTIMI, QUE.—Wells Bros. are about to erect a woolen mill.

PERRY'S CORNERS, ONT.—Ezra Geiger will shortly erect a new house.

CAPLETON, N. B.—The sum of $35,000 is to be expended on waterworks.

PORT HOPE, ONT.—Several cottages will be built at the beach next summer.

ARNPRIOR, ONT.—The construction of a system of waterworks is still being agitated.

ROCKLAND, ONT.—The site is being prepared for the erection of the new Baptist church.

BUCKINGHAM, QUE.—The Quebec Legislature has been asked to build a new bridge across the Lievre river.

WALKERVILLE, ONT. Park, Davis & Co. propose building an addition to their laboratory, four story, 60 x 100 feet.

RAT PORTAGE, ONT. The question of erecting a hospital is being urged, and in the spring work may be commenced.

HULL, QUE.—The council cannot establish an electric light plant, as the franchise granted to Thos. Viau covers the privilege.

ANNAPOLIS, N. S.—A movement is on foot to erect a Baptist church in this place. Mr. Billings Schurman has donated the land.

GUYSBORO, N. S.—W. H. Cunningham, treasurer of the municipality, will receive proposals until the 10th of January for a loan of $3,000.

ROSSLAND, B. C.—F. M. McLeod has given notice of application to incorporate a company to operate electric light and waterworks systems.

COBOURG, ONT.—The final contract for the building of the C.N. & H.R. has been signed by Mr. Bowens' representative and by the company.

GUELPH, ONT.—A new wing is to be built to the general hospital. The plans of Messrs. Curry, Baker & Co., architects, Toronto, have been accepted.

RENFREW, ONT. Mr. Alexander Potter, C. E., of New York City, has been retained by the town authorities to design the proposed system of water supply.

NIAGARA FALLS, ONT. The new factory for the Niagara Falls Metal Works Co. will be of brick and stone, cost of building, $20,000, machinery, $25,000. R. C. Eldridge is in charge of the work.

SLATORTH, ONT. The Council will submit a by-law to the ratepayers to raise the sum of $1,500 for an electric fire alarm system a bell and additional hose.

PETERBORO' ONT.—H. Calcutt has decided to build an asphalt bicycle track one-third of a mile in length at Rice Lake. Work will be commenced as soon as spring opens.

SHERBROOKE, QUE. H. B Brown, city attorney, and D. McNanamy were in Quebec last week in connection with the proposed electric railway. The necessary capital, it is hoped, will shortly be subscribed.

ASHCROFT, B. C.—The British Columbia Express Co. are preparing to build a warehouse.—Application will be made at the next session of the legislature by the Ashcroft and Cariboo railway company for a private act to authorize them to build a line of railway from either Ashcroft or Kamloops to Port Simpson via Barkerville.

CHATHAM, ONT.—Thos. W. Horn, barrister, and H. A. Beatty, of Toronto, have had a conference with representative citizens on the question of establishing an electric street railway in this city with radial extensions north and south to the principal towns and villages. The main line contemplated is to Wallaceburg and Lake Erie shore south.

BROCKVILLE, ONT.—The trustees of Wall street Methodist church have appointed a building committee, consisting of W. Brace, Jas. Bissell, C. W. Taylor, Geo. I. Mallory, E. Clint and others, in in connection with the proposed addition. The architects, Messrs. Power & Son, of Kingston, will prepare plans at once, after which tenders will be asked for.

VANCOUVER, B. C.—J. A. Jones has in hand the erection of a dwelling in the west end.—The Board of Works have approved of plans submitted by H. Holden for the new "Province" block to be built on Hastings street. The British Columbia Southern Railway Co. gives notice of intention to apply for an extension of time for the completion of the road.

SANDWICH, ONT. Stratton & Baldwin, architects, of Detroit, have submitted plans to the Board of Trade for the proposed sanitarium to be built here. The plans show the building to be 200 feet long, brick, with 40 baths, accommodation for 60 guests; cost $50,000. As soon as $25,000 stock is subscribed in Windsor the building will be erected and will be finished by June next.

QUEBEC, QUE.—The Harbor Commissioners have decided to offer the Quebec Cold Storage Co. the property between the warehouses at the end of the Commissioners wharf as a site for their proposed warehouse.—G. H. Burroughes invites tenders until next Tuesday, the 7th inst. for the reconstruction of Scott's bridge. Plans at Mr. Burroughes' office.

The Quebec and Montmorency Electric Power Company are considering a pro-

posal to light public buildings in Levis, and to convey the electric current across the St. Lawrence for the purpose by means of a cable laid at the bottom of the river.

HALIFAX, N. S.—A syndicate has been organized to erect a large departmental store in this city. Toronto and English capitalists are the promoters.—The plans of J. C. Dumaresq, architect, of this city, have been accepted for the Lefebvre memorial hall to be erected in connection with St. Joseph's college, Memramcook, N. B. The building will be of freestone, 80×60 ft., ground floor fitted up for museum and laboratories, with opera hall above, having seating capacity for 800, including balcony.

HAMILTON, ONT.—The Markets, Fire and Police Committee have decided to place in the estimates the sum of $4,000 for the establishment of a fire station in the west end.—W. A. Edwards, architect, has taken out a permit for the erection of a dwelling and store at the corner of Locke and Melbourne streets for F. Wright, to cost $1,800.—St. Paul's Presbyterian church trustees have been granted a building permit for a mission building on Mary street, between King and King William streets, to cost $2,000.

TORONTO, ONT.—It is understood to be the intention of the T. Eaton Co. to build a new front to their departmental store on Yonge street. A sub committee of the Property Committee will recommend the erection of new buildings at the Yonge street wharf and the putting down of new planking, at a cost of about $7,000. —The Parks and Gardens Committee have resolved to secure the construction of a system of waterworks for the Island at once, and the Council will be asked to provide $15,000 for the work.

WINNIPEG, MAN.—N. F. Hagel, Q. C., and Col. Scoble have gone to Ottawa to further the interests of the Winnipeg and Hudson Bay canal scheme, which is being promoted by Mr. Archibald Wright, Col. Scoble and others.—Incorporation will be asked for by the Red River Improvement Co., to improve the navigation of the Red River and to build a canal connecting Lake Manitoba with the Assinniboine river.—The project of reconstructing the burned buildings of the Cauchon block into a first-class opera house is being discussed, but no definite action has as yet been taken.

OTTAWA, ONT.—Dr. F. W. Strange, and Messrs. J. C. Stokes, L. E. Hambly and A. B. Armstrong, of Toronto, had an interview last week with the Premier regarding the granting of a charter for the proposed electric or steam railway between Aurora and Schomberg.—Tenders for the erection of immigrant buildings at Halifax, N. S., are invited by E. F. E. Roy, Secretary of the Public Works Department, until Wednesday the 15th inst. Plans may be seen at the above department and at the office of C. E. W. Dodwell resident engineer, Halifax.—F. S. Rathbun, secretary of the Thousand Island Railway Co., has made application to Parliament for an extension of time in which to complete their railway and for power to further extend the line from Gananoque to Rockport.—The Secretary of the Public Works Department invites tenders until Monday, the 27th inst., for the construction of a block at the outer end of the breakwater at Souris, P. E. I. Plans at the Custom House, Souris, and at the above department.—Mr. Rochester, lumber merchant, is promoting a scheme to erect a creamery here.

FIRES.

The store occupied by Mr. Ormsman and owned by H. Casselman, at Wyebridge, Ont., was destroyed by fire last week. Fully insured.—A large church at Harvey Station, N. B., has been burned. —The premises of Houston & Co., at Glencoe, Ont., were entirely destroyed by fire last week. Loss on building, $1,800, covered by insurance.—Holland's mills in the township of Portland west, Ottawa county, were recently destroyed by fire. Loss, $10,000.—S. F. Glass' pottery at Pottersburg, Ont., a frame structure, 54×240 ft., was completely consumed by fire on the 28th December. Total loss, $12,000, loss on building, $4,000.—The residence of Napoleon Gosselin, at St. Sophie de Halifax, Que., has been burned.—The steam saw mill at Andover, N.B. owned by J. E. Porter, was burned on Saturday last. Loss, $5,000. Mr. Porter will rebuild.—Hepworths clothing factory, at Leeds, Ont. has been burned, entailing a loss of $30,000.—Buildings at Orillia, Ont., owned by George Tipping and George Thompson, were destroyed by fire on Monday last. Loss, $3,500 and $5,000 respectively.

CONTRACTS AWARDED.

SOUTH WOODSLEE, ONT.—John Murray & Son have let the contract for a new flour mill.

TORONTO, ONT.—The ceilings of D. S. Perrin & Co.'s extensive offices in London, have just been covered with embossed metallic ceiling supplied by the Metallic Roofing Co., Ltd., of this city.

AMHERST, N. S.—Rhodes, Curry & Co. have been given a contract by the Intercolonial railway management for two large snow plows. They are at present engaged on seven cars and two sweepers for the Halifax Electric Street Railway Company.

OTTAWA, ONT.—Tenders for the supply of syenite for paving purposes were received by the Board of Works as follows: Wm. Kilt, unbroken, $15.95 per toise; C. C. Roger, Canadian Granite Co., unbroken, $10.50, broken, $15 per toise; T. G. Bingham, $17.50 for broken per toise; Peter McVeigh, $15.90 for unbroken and $21.70 for broken per toise; T. J. Nash, $15.70 per toise, broken; C. McDougall, $11.59 for unbroken, and $18.59 for broken per toise. The tender of C. C. Roger has been accepted.

NEW COMPANIES.

SARNIA, ONT.—Hub, Stoke and Bent Goods Mfg. Co., seeking incorporation.

MILLBROOK, ONT.—Millbrook Electric Light Co., incorporated; capital, $6,500; to carry on general lighting business.

FRASERVILLE, QUE.—Fraserville Electric Power Co., applying for incorporation; capital $25,000; to operate telephone lines, electric light plants, etc.

ST. JOHN, N. B.—McDonald Nut Lock Co., applying for incorporation; capital, $60,000; promoters, E. G. Evans, of Hampton, C. N. Skinner, of St. John and others.

GUELPH, ONT.—Raymond Manufacturing Co.; incorporated; capital $130,000; to manufacture sewing machines, and carry on business as iron and brass founders, woodworkers, etc.

VANCOUVER, B. C.—Peters Gold Mining Co., applying for incorporation; capital $25,000. Objects, general mining.—West Coast Packing Co., incorporated; capital $30,000; trustees, Thos. Cooper, of Victoria, R. V. Winch and G. M. Macdonald, of this city. Objects, to deal in lumber, fish, etc.

MONTREAL, QUE.—Northern Electric and Manufacturing Co., incorporated; capital stock, $50,000; to manufacture brass, copper, etc.—Dominion Woolen Manufacturing Co., seeking incorporation; capital $30,000; to manufacture textile fabrics, etc. Stockholders, W. C. McIntyre, D. McIntyre, E. A. Small and C. H. Doblin.

TORONTO, ONT.—Pine & Hardwood Co., incorporated; objects, to carry on business as lumber dealers and manufacturers.—John Ritchie Plumbing and Heating Co., incorporated; capital $75,000; to manufacture boilers, furnaces, plumbers' supplies, etc. Among the promoters are John Ritchie, James H. Wilson and A. H. Richardson.

BUSINESS NOTES.

Marson & Robichon, contractors, Montreal, have dissolved.

James Johnston, brick manufacturer, London, Ont., is dead.

Hansen & Tressider, contractors, of Montreal, have dissolved.

F. Lefebvre & Co., decorators, Montreal, have dissolved partnership.

E. A. Spencer, builder, Rossland, B.C., is reported to have left the country, leaving liabilities of about $4,000.

Theobald & Co., painters, Union, B.C., have dissolved, G. H. Scott retiring, and H. J. Theobald continuing.

F. Lefebvre, of Montreal, is doing business alone as painter and decorator under the style of F. Lefebvre & Co.

The firm of Post & Holmes, architects, Toronto, has been dissolved, Mr. Post retiring, and the business will be carried on by Arthur W. Holmes.

Mr. Joseph R. Douglas has retired from the firm of Douglas Bros., roofers, etc., Toronto and Ottawa, and has commenced business on his own account in the latter city.

The Gartshore-Thomson Pipe & Foundry Co., of Hamilton, is seeking incorporation, with a capital stock of $50,000. The promoters are A. Gartshore, James Thomson, J. G. Allan, W. J. Thomson, of Hamilton, and W. M. Gartshore, of London.

The system of heating and ventilating provided for the new Pabst theatre in Milwaukee is elaborate and possesses some unique features, says Heating and Ventilation. All the heat will come in through openings in the proscenium arch which appear to be part of the decorative scheme. Each is oval and is filled with a wrought iron screen. The heating apparatus is in the roof, but there is no fire there, the steam used for heating coming from the Pabst power house, from which place the electricity used for light and power also comes. The air is taken in from above the building and is "washed" by being conducted through a shower of water. After being purified it goes through steam coils which heat it to any degree that may be desired and then two big fans, each thirteen feet in diameter, force it through the openings in the arch and into the auditorium. While the heating is done through the ceiling, so to speak, the ventilating is through the floor. Under each seat, or rather behind each seat, is a ventilating hole, which lets the foul air through into the basement, which is a big ventilating chamber. In one corner are two more big fans of the same size as those in the roof, and they suck out the foul air below as fast as the others force fresh air in. An electric motor of 50 horse power drives the fans, but a very gentle action will accomplish the desired end, and Architect Strack says that he could produce a draft, with the machinery at his command, strong enough to take the ladies hats off their heads.

LAYING HOUSE DRAINS.

Under the cognomen of "An Old Hand" a writer in the Illustrated Carpenter and Builder gives the results of his experience, as follows : -

A drain may be watertight, but if not properly laid, deposits will occur, and, sooner or later, a stoppage will result. The main drain should be straight and laid to a regular gradient. Before breaking ground, it is necessary to strain a line on the surface over the intended site of the drain. By so doing, when the bottom of trench is reached, there will be no need to cut under at different parts of the trench in order that the line may strain clear of the sides. The width of trench should not be less than 2in.

The trench being excavated to its approximate depth, the next thing is to fix an interceptor, for from this we must determine the fall. Before fixing the interceptor, that part of the drain that connects the trap to sewer must be tested for clearness by passing rods through. In fixing the interceptor don't fix it at a dead level, but with a slight fall to sewer; it assists in passing solid matter quicker through the trap.

From the inlet of this trap we now take our fall for the main drain, which should be about 1 in 40, or 1½in. in 5ft. Sometimes, however, there is only just sufficient depth from the trap to the upper end of drain for a slight fall, and this has to be evenly distributed throughout the length of drain. To know how much we have for a fall we must take a level along the surface of ground from the point above the trap to the upper end of drain, measure down from level to bottom of drain at upper end. Deduct the depths of upper end from the depth at lower end, and the remainder will give the amount of available fall. For example suppose the interceptor is 3ft. below surface, and allow 1ft. below surface at upper end, and the length of drain is 100ft., then 3ft. — 1ft. = 2ft., thus we have 2ft. fall. Now, 100ft ÷ 2ft. gives us 1½in. in 6ft. 3in. Now, get a straight edge 6ft. 3in. long, nailing on one end a piece of board 1½in. thick, and place this end level with the lower part of inlet of the trap, and at the other end you drive a peg in the middle of trench so that the straight edge can rest upon it. By noting when level will be the proper height of first peg. Continue throughout the length of drain, the pegs standing 4ft. 6in. above the bottom of trench for concrete. The branch drains need not be of the same gradient as the main drain. They generally come up sharper from the junction to the gully or fixture. The proper way to determine the fall is by fixing the gully temporarily in its proper position, also the junction with its branch inlet well above the bottom of trench. A line or straight edge from inlet of junction to outlet of gully will be the gradient level for concrete.

CONCRETE.

Concrete is next laid in to level of pegs —in fact, ruled off to top of pegs, so that the pipes, when laid, shall be even on the top. When the concrete is set, the next thing is to drive a long chisel by the side of the interceptor and another at the upper end of drain; then strain a line from these two points at the height of centre of sockets. All is now ready for laying the pipes, the most important part of which is making the joints.

In making and finishing joints I proceed as follows: Tap each pipe for soundness before laying, rake out a little concrete near the joint of pipe so that the hand can be got well under the socket; fill in the socket of pipe with cement all round flush with the bore of the pipe; then insert the spigot end, forcing it well against the shoulder of the socket, causing the cement to fill out the joint in every part. Do not finish the joint at once, but proceed to lay another pipe, taking care that the inside of pipe is cleared after making every joint. By the time the second pipe is in position the first joint will be getting stiff; fall back on this joint, and form a ring of cement well sloped all round it. Lay a third pipe, and then finish off the first joint by "ironing" it well with the trowel, leaving it neat and clean. In fixing a gully or closed trap you cannot clean the inside of joint as in a straight pipe; you must either make the joint from the outside, caulking it first, or a ball made of rag with string attached must first be inserted in the drain before fixing the trap. The joint is then made in the usual manner, taking care that the end of the string is placed in the trap before fixing, so that the rag ball can be pulled through the trap at the completion of joint, clearing away any superfluous cement inside. Sometimes under the floor of house a joint will come just where it is awkward to get at. To get over this, take two pipes, placing one in the other vertically, and make the joint in this upright position. When the joint is hard, the two pipes can be laid as one, only sufficient cement to be gauged for one joint at the time, and it is as well to test the cement in the bag by thrusting your bare arm into it. It should be comfortably warm.

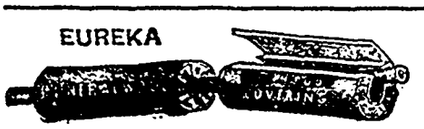
In some cases the joints are first caulked with gasket, and the cement added afterwards, but generally and, I think, preferably, the joints are made with cement alone for this reason. The sockets are about 1¼in. in depth and in inserting the gasket the depths becomes less, with a corresponding reduction in the volume of cement when added, and should there be a long run of 6in. main drain with a good fall, when the water test is applied you have a pressure of a ton or more forcing the joints. Now, by using cement alone, and in the way I have described, a butt joint is formed in the socket of each pipe, so that when the water is applied it does not penetrate the joint beyond the bore of pipe, thus reducing the pressure in each joint considerably.

Manholes and inspection chambers are now generally constructed in a new system of drainage. Should there be a manhole in front, or where the interceptor is fixed, and no inspection chamber at the back of house, it is best to continue the main drain to the surface of ground, with an easy bend for clearing purposes, fixing a stone on the top.

The drain completed, the next thing is to test it by fixing a stopper at the interceptor, or the first pipe if in a manhole, and filling the drain with water. Should the branch inlets be sealed off, a difficulty will arise. You pour in a pail or so of water, and all at once the water rises in the gully to the top, and there remains. This is a good sign, and shows that the drain is air and watertight, and is brought about by the fact that the air that was in the drain previously to changing cannot escape, so the water remains constant in the gully. In order to charge the drain one of the branch inlets must be unsealed, or a piece of compo pipe, bent so as to pass the water seal in the gully, must be inserted. This allows the air to escape. The drain being found correct and the pipes covered with concrete, the next thing is filling in. I never use a rammer; at any rate, not for the first 2ft. or 3ft., for it stands to reason that though the soil may be moderately fine, yet the weight of rammer coming over joints conveys a force on the pipes which, I think, is best avoided. Use water for filling in lower part of trench.

A few words in reference to the iron covers of manholes and inspection chambers may not be out of place. Always treat the cover as a trap for practically that is what it is or should be, in order to prevent the smell of drain escaping, and possibly find its way into the dwelling. The manhole, as a rule, is built outside the house, so that the cover is trapped by rain or other surface water; but when the manhole is inside, the groove or channel in the frame must be filled with soft soap, or oil, or sand, &c., in order to form a permanent seal when the cover is laid on. There must be a fresh air inlet at the lower end of drain and an outlet at upper. Outlet is generally taken off a soil pipe, and continued up the building clear of windows.

TO SILVER GLASS.— Have melted half an ounce of lead and half an ounce of fine tin in an iron ladle; add half an ounce of bismuth whilst in fusion, and before the composition cools add five ounces of quicksilver.



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FLAT SLATE ROOFS.

Builders and roofers generally regard slate as adapted only for roofs having a high degree of pitch, and that sheet metal is the proper material for all classes of roofs of low pitch, or entirely flat. This opinion is based on past experience in roofing, but has no foundation in fact. A flat roof may be constructed of slate, having all the advantages of any other slate roof. The slate, instead of being split into thin slabs and cut in various sizes of ordinary roofing slate, is sawed into large blocks of any convenient size, with square corners and edges, and split into slabs varying in thickness from one-half to 2in., according to the strength of roof required. The edges of these slabs are carefully smoothed and jointed, so as to fit closely, and placed side by side, so as to form a plain, smooth surface, instead of lapping. The joints or edges are laid in a cement which unites the piece and renders them watertight. The slabs are kept in posi- by their own weight, or may be fastened to their supports by galvanzed iron or copper bolts or screws. A roof of this construction requires no painting and very little repairing. It has a decided advantage over sheet metal in that expansion and contraction from heat and cold are inappreciable in slate. By using iron trusses or beams as supports, a perfectly fireproof roof may be constructed in this manner, a want long felt but never fully realized in the erection of fireproof buildings.

USEFUL HINTS.

Mahogany is one of the hardest of woods, is also one of the slowest to season; pine, one of the softest, is among the quickest.

Virginia yellow pine, when freshly cut, weighs 47.8 pounds per cubic foot. After two years' drying this weight is reduced to 34.3 pounds.

Cast iron radiating surface that has been bronzed with radiate heat at the rate of 250 thermal units per square foot of surface per hour when working with steam at 3 to 5 pounds pressure. The same kind of radiators with unpainted surface will radiate under the same conditions, 400 thermal units. Hot water radiators under the same conditions will give about 60 per cent. of the above results.

RULES TO ASCERTAIN THE WEIGHT OF SQUARE, ROUND OR FLAT CAST STEEL BY MEASUREMENT.—Square cast steel, 1 ft. in length: When the dimensions are given in fourths of an inch, square the number of fourths in the size given and divide the product by 4 5. If given in eighths, the divisor is 18, sixteenths, 72; thirty-seconds, 268; sixty-fourths, 1,152. Round cast steel, 1 ft. in length: When the dimensions are given in fourths of an inch, square the number of fourths in the diameter and divide the product by 6. If given in eighths the divisor is 24; sixteenths, 96; thirty-seconds, 384; sixty-fourths, 1,536. Flat cast steel, 1 ft. in length. When the dimensions are given in fourths of an inch, multiply the width by the thickness in fourths, and divide the product by 4 5. If given in eights, the divisor is 18; sixteenths, 72; thirty seconds, 288; sixty-fourths, 1,152.

In producing a new form of substitute for plaster of paris, ground wood pulp of ordinary grade is used, and beaten in an engine to get an even consistency. At this stage a liquid gesso, composed of whiting previously soaked in water, and mixed with linseed oil and resin, is added. Soft soap and white wax is also dipped in. The pulp is given a beating, then injected into moulds of proper shape for making convenient blocks, pressed, dried by hot evaporation, treated to a bath of warm linseed raw oil and resin at a temperature of about 100 degrees Fahr, baked in an oven at 220 degrees Fahr., then subjected to another bath of the raw linseed oil and resin, followed by another baking, when the block is ready for the final operation previous to carving, which consists in soaking in soft soap forty-eight hours, for the purpose of rendering the fibre soft and pliable to the action of the carving tool.

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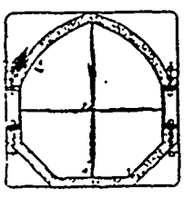

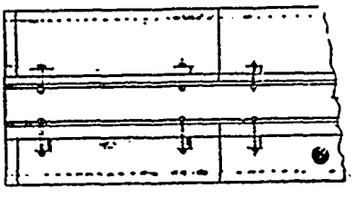

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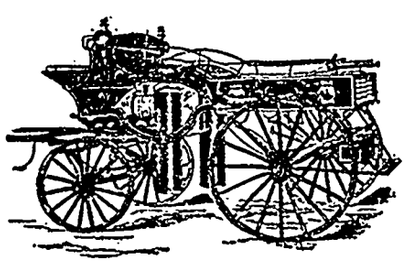

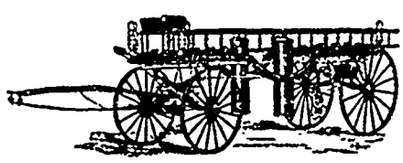

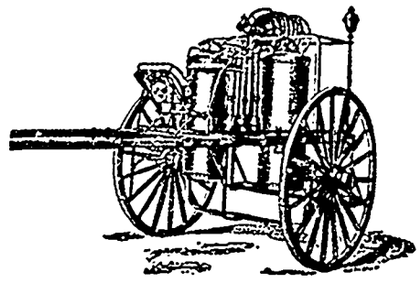

This machine is the most powerful fire fighter. It has two cylinders, 40 gallons capacity each. The combination of chemicals will not freeze, renders material with which it comes in contact non-inflammable, and will not corrode when not in use. For full particulars, write to the Head Office of the Company at Kingston.

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MUNICIPAL DEPARTMENT

THE INVESTIGATION OF PUBLIC WATER SUPPLIES.*

By Floyd Davis.

Whenever I am called upon to investigate the water supply of a city, which may include wells and other sources, I generally classify waters under five divisions, as follows:

1. Excellent waters, or those which are so pure and free from suspended matter that aeration and filtration would scarcely improve them. Aerated distilled water and the water from some springs in granite regions belong to this class, but it is rare that a chemist has to investigate them.

2. Permissible waters, or those which can be used constantly for all domestic purposes, without injurious effects. They are waters which, however, can be improved by better methods of storage, or by a thorough filtration. Nearly all drinking waters belong to this class.

3. Suspicious waters, or those which are liable at any time to produce ill-effects, or to become so polluted by an influx of filth that they may become bad, or even dangerous. I always recommend that suspicious waters be first thoroughly boiled, and then filtered, before being used for drinking.

4. Bad waters, or those which are sufficiently polluted to render them unfit for domestic use. These may not be immediately productive of disease, but I believe that they lower the vitality of the system and render it very susceptible to zymotic infection. On account of the nature of their pollution, common intelligence should prevent us from using them.

5. Very dangerous waters, or those which are polluted by direct communication with cess-pools or privies, and in which the pollution is of so high a degree that they should be immediately condemned. Such waters are often productive of typhoid fever and other filth diseases.

In passing upon the quality of a public water supply it is, therefore, essential that all water flowing into it which is seriously polluted with sewage should be rejected. There are other waters, not thus polluted, that have a disagreeable taste and obor, and are manifestly unfit for drinking; still, they are sometimes used in public supplies, largely from necessity.

Cisterns and common surface wells are too infrequently used for public purposes to be considered here, and there are few or no apologies for such a supply in any wide-awake town, although from a sanitary standpoint they deserve our most careful consideration. Springs are used as a source of public water supply in many mountainous regions where the topographical conditions are favorable for their utilization, but in other localities ground waters, stored surface waters, rivers, and lakes are generally used. In many parts of Europe several of these waters are introduced into one city, sometimes at great expense. In this country the usual source is the one that is most convenient to adopt, which is somewhat determined by the topographical conditions of the locality. Thus Denver has a delightful water supply furnished by mountain springs and melting snow, supplemented by hundreds of artesian wells; some cities, like Columbus and Des Moines, located near never-failing streams, utilize the ground waters in the adjacent gravel beds; Boston and New York, having no adequate supply of fresh water near by, store in artificial lakes or reservoirs the rainfall on the nearest elevated water shed; some cities, like Cincinnati, St. Louis, and Omaha, situated on rivers, secure their water supply from these natural channels; while other cities, like Cleveland and Chicago, having great lakes at their doors, reach out into these for their waters.

Spring water which flows from subterranean sources is generally pure and wholesome, because from necessity it is free from organic contamination, and, when the springs are remote from the agencies of pollution, their water is certainly our most healthful beverage. It is so much superior to surface water for domestic use that some cities have incurred great expense to introduce it for public supply, and in some instances have thus freed themselves of much sickness and a high rate of mortality.

Ground water in regions remote from habitations is generally very pure, and, although it may be, and often is, derived from polluted rivers, yet, owing to its thorough natural filtration, it cannot often be considered unwholesome. Indeed, with the exception of springs and some mountain streams, I consider ground water by far the best general supply for a city, and in the Mississippi valley this can generally be easily obtained. When such water is secured from wells and filtering galleries in beds of gravel above a city, or along a river course some distance from its channel, it is generally clear, sparkling, and nearly free from organic matter. This is especially true when the gravel beds are separated from the surface by an impervious stratum of clay, and the supply of water comes for long distances by filtration from rivers or other inexhaustible sources. Such water owes its purity to sedimentation and thorough filtration, combined with oxidation; for, during the passage of the water from its source to the well or gallery, the suspended decaying organic matter and the bacteria are retained in the soil, while the soluble organic substances are oxidized into harmless inorganic compounds. It is generally superior to artificially purified water, inasmuch as it is rendered pure long before being utilized, while surface water is purified as used.

Stored surface waters, rivers, and lakes may be very similar in their impurities. The former, when gathered on uninhabited water sheds will contain little else that is harmful than decaying vegetable matter. But rivers are the receptacles of the waste products of the inhabitants of the districts through which they flow, and are sometimes very dangerous to use. When it becomes known that a surface water is in any considerable degree contaminated with the wastings of feed-lots and slaughter-houses, the refuse of manufactories, dead and decaying animals, and the drainage filth of many thousand square miles, it should be avoided; and, when it is further contaminated with sewage, or privy and cesspool drainage, or in any way mixed with the waste products of the human body, its use for drinking and cooking should be prohibited, for some of our most dreaded diseases are now traced to such water supplies.

My reason for rejecting all such water as unfit for human use depends also upon other principles well-established in all civilized communities. The first is that common decency causes every intelligent person to rebel against the use of sewage-polluted water, for no one but a savage, or a lowly-organized scavenger, will wilfully devour the urine, excrement, washings, and filth of man and beast. That such filth is actually finding its way into many rivers is beyond dispute, for the many thousand head of cattle and hogs now kept along our western rivers during the feeding season contribute annually an immense amount of filth to these waters. Trampling the clay soil soon renders it impervious to the rains, and consequently nearly all the filth finds its way in rainy seasons through the small streams into these rivers. In time of high water, there is only little sedimentation of these impuritias, and they are carried in suspension and solntion down to and past the intake of water works of cities and towns located below. In time of low water much of the heavier suspended matter settles to the bottom of these rivers, there to decay and pollute the water, or to be washed down the stream at the next fall of rain.

The second principle is that, when a water has once become infected with disease germs, it can never be entirely purified, except by distillation or sanitary filtration. Such germs are liable to be contributed to these rivers at any time, should a sporadic case or an epidemic of typhoid fever occur in the drainage area above and the dejections of the patients go into the river. The impurities in these river waters are such as will favor the multiplication and development of germ life, and the living organisms, instead of disappearing, sometimes become more numerous as the rivers are descended. During high water, when there can be no permanent sedimentation, these waters become constantly more impure in their flow down the river; so, in using them as a source of supply, we must expect to be confronted with all the evil effects that can arise from the sewage and filth that go into them.

(To be Continued.)

Mr. A. M. Brown, who held the position of city clerk of Winnipeg, Man., from 1874 until 1882, and father of the present city clerk, is dead, at the age of 75 years. He at one time was a resident of Kingston.

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WALTER MILLS, General Manager

Prices of Building Materials.

CONDITION OF THE MARKET.

TORONTO: The market generally is in an unsettled condition, and quotations fluctuated slightly during the past week. Building paper is likely to advance. The trade for this season is reported in cement, iron pipe and Canada plates. Glass, paints and oils are quiet, with no change in prices.

MONTREAL: No activity can be reported in the demand for builders' supplies, and until the new year has well set in the market is likely to remain quiet. Quotations in glass have advanced a trifle, and some call is reported.

LUMBER.

CAR OR CARGO LOTS.

	Toronto. $	Montreal $	Toronto. $	Montreal $
1¼ to 2 clear picks. Am ins	33 00@36 00		40 00@45 00	
1¼ to 2 three uppers, Am ins.		37 00		40 00 45 00
1¼ to 2, pickings, Am ins.		26 00		27 00 30 00
1 inch clear				40 00 45 00
1 x 10 and 12 dressing and better	20 00	22 00	18 00	20
1 x 10 and 12 mill run	16 00	17 00		19 00
1 x 10 and 12 dressing	20 00	22 00		18 00
1 x 10 and 12 common	13 00	14 00	8 00	10 00
Spruce culls	10 00	11 00	8 00	10 00
1 x 10 and 12 culls	9 00	10 00		9 00
1 inch clear and picks	28 00	3200	35 00	40 00
1 inch dressing and better	20 00	22 00	18 00	20 00
1 inch siding, mill run	14 00	15 00	12 00	16 00
1 inch siding, common	12 00	13 00	10 00	13 00
1 inch siding, ship culls	11 00	12 00	10 00	11 00
1 inch siding, mill culls	9 00	10 00	8 00	9 00
Cull scantling	8 00	9 00	8 00	9 00
1¼ and thicker cutting up plank	24 00	26 00	22 00	25 00
1 inch strips, 4 in to 6 in. mill run	14 00	15 00	14 00	15 00
inch strips, commor	11 00	12 00	10 00	12 00
1¼ inch flooring	16 00	17 00	12 00	15 00
1½ inch flooring	16 00	17 00	12 00	15 00
XXX shingles, sawn, per M 16 in.	2 40	2 50	2 60	2 60
XX shingles, sawn	1 40	1 50	1 60	1 70
Lath	2 00			1 50

VALUED QUOTATIONS.

Mill cull boards and scantling		10 00	10 00	12 00
Shipping cull boards, promiscuous widths		13 00		13 00
Shipping cull boards, stocks		16 00		16 00
Hemlock scantling and joist up to 16 ft	11 00	12 00		10 00
Hemlock scantling and joist up to 18 ft	12 00	3 00	12 00	13 00
Hemlock scantling and joist up to 20 ft	13 00	14 00	13 00	14 00
Cedar for block paving, per cord		5 00		5 00
Cedar for kerbing, 4 x 14, per M		14 00		14 00
Scantling and joist, up to 16 ft		14 00		14 00
" " 18 ft		15 00		16 0
" " 20 ft		16 00		16 00
Scantling and joist, up to 22 ft		17 00		17 00
" " 24 ft		19 00		19 0
" " 26 ft		21 00		21 00
" " 28 ft		22 00		23 00
" " 30 ft		24 00		25 00
" " 32 ft		27 00		27 00
" " 34		29 50		29 50
" " 36 t		31 00		31 00
" " 38 ft		33 00		33 00
" " 44 ft		34 00		36 00
Cutting up planks, 1¼ and thicker, dry	25 00	28 00	25 00	30 00
B. M.				
1¼ in. flooring, dressed, F M.	26 00	30 00	28 00	31 00
1¼ inch flooring, rough, B M.	18 00	22 00	18 00	22 00
1¼ " dressed, F M.	25 00	28 00	27 00	30 00
1¼ " undressed, B M.	18 00	19 00	18 00	19 00
1¼ " dressed	18 00	20 00	18 00	22 00
1¼ " undressed	12 00	15 00	12 00	15 00
Beaded sheeting, dressed	20 00	35 00	22 00	35 00
Clapboarding, dressed		12 00	8 00	12 00
XXX sawn shingles, per M 18 in	2 60	2 70		3 00
Sawn lath	2 50	2 60	2 50	2 60
Cedar		2 90		2 90
Red oak	30 00	40 00	30 00	40 00
White	37 00	45 00	35 00	55 00
Basswood, No. 1 and 2	25 00	30 00	18 00	20 00
Cherry, No. 1 and 2	70 00	90 00	70 00	80 00
White ash, No. 1 and 2	24 00	35 00	30 00	35 00
Black Ash, No. 1 and 2	20 00	30 00	18 00	30 00
Dressing stocks	16 00	22 00	16 00	22 00
Picks, American inspection		30 00		40 00
Three uppers, Am. inspection		50 00		50 00

BRICK—⅌ M

Common Walling		6 50		6 00
Good Facing		8 00		8 50
Sewer	8 50	8 00	8 50	9 00
Pressed Brick, Per M:				
Red, No. 1, f.o.b. Beamsville		16 00		
" " 2		14 00		
" " 3		9 00		
Buff		21 00		
Brown		24 00		
Roman Red		30 00		
" Buff		35 00		
" Brown		40 00		
Sewer		7 50		
Hard Building		6 0		
Roof Tiles		22 00		
Hip Tile (each)		20		
Ridge Tile "		60		
1st quality, f.o.b. at Port Credit		14 00		18 00
2nd " " " "		12 00		15 00
3rd " " " "		8 00		12 00
Hard building brick		6 50		
Ornamental, per 100	7 00	10 00		
F. O. B. DON VALLEY.				
Red A		18 00		24 00
Red B		16 00		20 00
Red C		13 00		17 00
Trojan and Corinthian		21 00		28 00
Portlian		22 00		29 00
Attalian and Egyptian		25 0		31 00
Tyrian		35 00		41 00
Sicilian		40 00		45 00
Roman		35 00		40 00
Carthaginian		40 00		45 00
Ornamental	30 00	100 00	30 00	100 00
Common insides		6 00		
Hard sewers		7 50		
Vitrified pavers		16 00		22 00

SAND.

Per Load of 1½ Cubic Yards		1 25		1 25

STONE.

Common Rubble, per toise, delivered		14 00		14 00
Large flat Rubble, per toise, delivered		18 00		18 00
Foundation Blocks, per c. ft.		50		50
Kent Freestone Quarries Moncton, N. B., per cu ft., f.o.b.		1 00		
River John, N. S., brown Freestone, per cu. ft., f.o.b.		95		
Ballochmyle	80	90	65	75
New York Blue Stone				1 05
Granite (Stanstead) Ashlar, 6 in. to 12 in., rise 9 in., per ft.				25
Moat Freestone			70	80
Thomson's Gatelawbridge, cu. ft.			75	80
Credit Valley Rubble, per car of 15 tons, at quarry		8 00		
Credit Valley Brown Coursing, up to 10 inch, per sup. yard, at quarry		1 75		3 25
Credit Valley Brown Dimension, per cu. ft. at quarry		60		75
Credit Valley Grey Coursing, per superficial yard	1 50	2 00		2 15
Credit Valley Grey Dimension, per cubic foot		60		75
Clark's N. B. Brown Stone, per cubic foot, f.o.b.		1 15		1 00
Brown Free Stone, Woodpoint, Sackville, N.B., per cub. ft.		1 15		1 00
MadocRubble, delivered, per toise	14 00	14 50	14 00	14 50
Madoc dimension floating, f. o. b. Toronto, per cubic ft.	30	32		

OHIO FREESTONE, FROM THE GRAFTON STONE CO.'S QUARRIES.

No. 1 Buff Promiscuous		70		85
No. 1 Buff Dimension		75		90
No. 1 Blue Promiscuous		55		70
No. 1 Blue Dimension		60		75
Sawed Ashlar, No. 1 Buff, any thickness, per cub. ft.		90		1 05
Sawed Ashlar, No. 1 Blue, any thickness, per cub. ft.		75		90
Sawed Flagging, per sq. ft., for each inch in thickness		06½		07½

Above prices cover cost freight and duty paid. For small lots add 5 to 10 cents per cubic foot.

Quebec and Vermont rough granite for building purposes, per c.ft. f.o.b. quarry	33	1 50		
For ornamental work, cu. ft.	35	2 0		
Granite paving blocks, 8 in. to 12 in. x 6 in. x 4½ in., per M		50 00		
Granite curbing stone, 6 in. x 20 in., per lineal foot		70		

SLATE.

Roofing (⅌ *square*).				
" red		10 00		20 00
" purple		100		10 00
" unfading green		9 00		6 00
" black		8 00		5 50
Terra Cotta Tile, per sq.		25 00		
Ornamental Black Slate Roofing		8 50		

PAINTS. (*In oil, ⅌ lb.*

White lead, Can., per 100 lbs.	6 25	5 50	5 50	6 00
" zinc, Can., " "	6 50	7 50	6 50	7 50
Red lead, Eng	4 00	5 00	4 50	5 00
" venetian, per 100 lbs	1 60	1 75	1 00	1 75
" vermillion	90	1 00	90	1 00
" Indian, Eng	10	12	10	12
Yellow ochre	5	10	3	5
Yellow chrome	15	20	15	20
Green, chrome	7	12	7	12
" Paris	20	25	14	20
Black lamp	15	25	12	25
Blue, ultramarine	15	20	12	18
Oil, linseed, raw, ⅌ *Imp. gal.*	54	59	58	59
" " boiled	57	63	62	63
" " refined, "	78	85	75	75
Putty	2¾	2½	2¾	2½
Whiting, dry, per 100 lbs	75	1 00	60	75
Paris white, Eng., dry	90	1 25	90	1 00
Litharge, Eng	4	5	4 50	5 00
Sienna, burnt	10	15	12	15
Umber, "	8½	12	12	15

CEMENT, LIME, etc.

Portland Cements.—				
German, per bbl		3 25	2 55	2 65
London "	2 50	2 75	1 92	2 05
Newcastle "		2 50	1 85	1 95
Belgian, Josson, artificial	2 65	2 95	2 25	2 30
English, artifical, per bbl	2 60	2 90	2 55	2 65
Portland Cements.—				
Belgian, natural, per bbl	2 30	2 40	1 70	1 85
Canadian "	2 50	2 50	1 80	1 85
Roman "			2 00	2 25
Parian "	4 50	4 75	5 50	5 75
Superfine "	6 50	7 00	8 00	9 00
Hydraulic Cements.—				
Thorold, per bbl		1 50	1 25	1 50
Queenston, "		1 50	1 50	1 60
Napanee, "		1 50		1 50
Hull, "		1 50		1 50
Ontario, "		1 25		
Keene's Coarse "Whites"	4 50	4 75	4 50	4 75
Fire Bricks, Newcastle, per M	17 00	35 00	15 00	21 00
" Scotch "	17 00	35 00	19 00	21 00
Lime, Per Barrel, Grey		40		
" " White		50		
Plaster, Calcined, N. B.		2 00		
" " N. S.		2 00	2 50	
Hair, Plasterers', per bag	80	1 00		

HARDWARE.

Cut nails, 5cd & 6cd, per keg		2 50		2 10
Steel " " " "		2 60		2 35

CUT NAILS, FENCE AND CUT SPIKES.

40d, hot cut, per 100 lbs		2 55		2 15
30d, " " "		2 60		2 20
20d, 16d and 12d, hot cut, per 100 lbs		2 65		2 25
10d, hot cut, per 100 lbs		2 70		2 30
8d, 9d, " " "		2 75		2 35
6d, 7d, " " "		2 90		2 50
4d to 5d, " " "		3 10		2 70
3d, " " "		3 30		3 10
2d, " " "		4 00		3 60
4d to 5d cold cut, not polished or blued, per 100 lbs		3 00		2 60
3d to 5d cold cut, not polished or blued, per 100 lbs		3 40		3 00

FINE BLUED NAILS.

3d, per 100 lbs		4 00		3 60
2d, " "		4 50		4 10

CASING AND BOX, FLOORING, SHOOK AND TOBACCO BOX NAILS.

12d to 30d, per 100 lbs		2 50		2 60
10d, " "		2 80		2 70
8d and 9d, " "		2 95		2 80
6d and 7d, " "		3 10		3 05
4d to 5d, " "		3 30		3 20
3d, " "		3 70		3 60

FINISHING NAILS.

3 inch, per 100 lbs		3 10		2 95
2½ to 2¾ " " "		3 25		3 10
2 to 2¼ " " "		3 40		3 25
1½ to 1¾ " " "		3 60		3 45
1¼ " " "		4 00		3 85
1 " " "		4 50		4 35

SLATING NAILS.

5d, per 100 lbs		3 35		2 95
4d, " "		3 35		2 95
3d, " "		3 75		3 35
2d, " "		4 25		3 85

COMMON BARREL NAILS.

1 inch, per 100 lbs		3 75		3 35
⅞ " " "		4 25		3 60
¾ " " "		4 75		4 35

CLINCH NAILS.

3 inch, per 100 lbs.		3 35		2 95
2½ and 2¾ " " "		3 50		3 10
2 and 2¼ " " "		3 65		3 25
1½ and 1¾ " "		3 85		3 45
1¼ " "		4 50		4 10
1 " "		5 00		4 60

SHARP AND FLAT PRESSED NAILS.

3 inch, per 100 lbs.		3 75		3 45
2½ and 2¾ " " "		4 00		3 60
2 and 2¼ " " "		4 20		3 75
1½ and 1¾ " " "		4 40		3 95
1¼ " " "		5 00		4 60
1 " " "		5 50		5 10

STEEL WIRE NAILS.

Steel Wire Nails, 75 % discount from printed list

Iron Pipe:

Iron pipe, ¼ inch, per foot		6c.	6c.
" " ⅜ " "		7	7
" " ½ " "		8½	8½
" " ¾ " "		12	12
" " 1 " "		17	17
" " 1¼ " "		24	24
" " 1½ " "		30	30
" " 2 " "		43	43

Toronto, 65 per cent. discount.
Montreal, 60 to 65 per cent. discount.

Lead Pipe:

Lead pipe, per lb	7c.
Waste pipe, per lb	7½

Discount, 30 % off in small lots; 30 and 10 % off in ton lots.

Galvanized Iron:

Adam's—Mar's Best and Queen's Head:		
16 to 24 guage, per lb	4½c.	4¾c.
26 guage, "	4¾	5
28 " "	5	5¼
Gordon Crown—		
16 to 24 guage, per lb	4½	4½
26 guage, "	4½	4¾
28 " "	4¾	5

Note.—Cheaper grades about ¼c. per lb. less.

Structural Iron:

Steel Beams, per 100 lbs	2 75	2 50
" channels, "	2 85	2 60
" angles, "	2 50	2 30
" tees, "	2 80	2 65
" plates, "	2 55	2 35
Sheared steel bridge plate		2 35

(Corrected up to Dec. 31st)