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CANADIAN CONTRACT RECORD

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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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GOOD TRANSIT, with 5-inch vernier plate and vertical circle. Address, "TRANSIT," CONTRACT RECORD Office.

CHIMNEY VENTILATION.—In many cases the space between the lining and chimney is utilized for ventilating purposes and it gives good results without detracting from the efficiency of the chimney draft a sufficient amount to be noticed or produce inconvenience. Even when the chimney is not in use the draft is strong and sufficient to maintain good ventilation. This system, however, does not compare with the ventilation produced by fans or blowers, in exact results obtained. The cost of adding to the diameter of a chimney when building is but a small portion of the total amount and the ventilation of a building can be obtained, to a great extent, by this method.
—Mas & Steam Fitter.

CONTRACTS OPEN.

GREENBANK, ONT.—M. O'Neil is preparing to build a house.

SAPPERTON, B. C.—N. Nelson is about to erect a new brewery.

SARNIA, ONT.—Beckler & Co. are preparing to build a large saw mill.

RENFREW, ONT.—The Methodists are preparing to build an \$8,000 edifice.

BELLERIVE, QUE.—It is intended to build a church at this place shortly.

FORT WILLIAM, ONT.—The C. P. R. have decided to construct a new freight shed.

NORWICH, ONT.—S. Allen has decided to rebuild his vinegar works recently burned.

SEAFORTH, ONT.—A by-law to raise \$1,500 for an electric fire alarm system has been carried.

MEAFORD, ONT.—A deputation has requested the Dominion Government to improve the harbor here.

PETROLEA, ONT.—A by-law to expend \$172,000 on a system of waterworks was carried on Friday last.

ESSEX, ONT.—Diebel & Bricker propose erecting a grain elevator with a capacity of 50,000 bushels.

MORRISBURG, ONT.—The Village Council is considering the question of putting in an electric light plant.

PORT PERRY, ONT.—The corporation invite tenders for the purchase of \$39,000 of debentures. F. M. Farnold, clerk.

BATTLEFORD, N. W. T.—Tenders for the purchase of \$2,000 of debentures are invited by I. A. Fraser, until the 1st of March.

VICTORIA, B. C.—The plans and profile of the Trial Creek and Columbia River railway have been deposited with the registrar.

QUEBEC, QUE.—D. Ouellet, architect, is preparing plans for a church to be built of wood in the parish of St. Malachie de Dorchester.

RIDGETOWN, ONT.—D. Cochrane, clerk, invites proposals until the 10th of February, for the purchase of \$6,416 of debentures.

NORTH BAY, ONT.—A deputation has requested the Dominion Government to grant an appropriation for the erection of a wharf here.

WILLOWDALE, ONT.—Harold H. Gibson, O. L. S., intends erecting a brick residence in the spring. Plans are now prepared for tenders.

RIDGEWAY, ONT.—The Crystal Beach Improvement Co. propose constructing two miles of electric railway from Crystal Beach to Ridgeway.

ARNPRIOR, ONT.—Mr. Bolfield, of Eganville, is seeking a franchise for electric lighting. The power house will be located on M. Havey's property.

WOODSTOCK, N. B.—A motion has passed in Council to procure legislation

for raising \$10,000 by debentures for further construction of sewerage works.

WOODSTOCK, ONT.—Plans were procured last year for a trunk sewer, and the Council will probably devise means this year to carry out the work.

KESWICK STATION, N. B.—W. H. and H. W. Laurance intend building a large tannery at the mouth of Cardigan stream. Work will be commenced about the 1st of April.

PORT STANLEY, ONT.—Mr. McKay, engineer for the L. E. and D. R. railway, is preparing for the building of the slip dock and the making of other improvements.

ST. LAMBERT, QUE.—The by-law passed by the municipality to contract a loan of \$7,500 for a system of waterworks and drainage has been sanctioned by the Lieutenant-Governor.

VANCOUVER, B. C.—The power house for the Western Light, Heat & Power Co. will probably be built on False Creek.—The School Board will urge the government to establish a normal school in this city.

WINNIPEG, MAN.—Plans are now being prepared for rebuilding the Cauchon block. Tenders for the work will probably be asked on the return of S. J. Colston, agent for the owners, from the east.

LANARK, ONT.—The ratepayers will vote on a by-law granting the sum of \$10,000 for an electric railway from Perth to Lanark. The members of the proposed company are J. B. Reilly, Alex. Wender and others.

ANDOVER, N. B.—The C. P. R. is having a line surveyed from the Grand Falls road, Atwood Junction, to Limestone. C. LeB. Miles, C. E., is the engineer. Construction will likely be commenced in the spring.

HAMILTON, ONT.—The Hospital Committee have decided to put in a new boiler at the City Hospital.—The trustees of St. Patrick's church have resolved to erect a new presbytery on the church property on Main street.

HESPELLER, ONT.—G. St. V. Morgan recently addressed the Township Council on the advisability of forming a company for the manufacture of cement. It is probable that during next summer the company will be formed and suitable buildings erected.

LONDON, ONT.—McBride & Farncombe, architects, are asking for tenders until the 1st of February for the erection of three brick houses.—Andrew Callahan has been granted a permit to erect two two-story brick dwellings on Maitland street, to cost \$3,600.

ST. CATHARINES, ONT.—E. A. C. Pew is promoting the electric railway scheme across the north-western portion of Ontario, from Port Perry to Lake Huron. A charter will be applied for at the present session of Parliament, which when obtained, will be passed over to a New York

company, which proposes to build the road without asking for bonuses or government assistance.

ST. THOMAS, ONT.—The bridge over Kettle creek, for which tenders are now invited, will cost \$1 200. The sub-structure will be of stone or concrete, and the superstructure of steel.—It is reported that the M. C. R. shops here will be enlarged.

LINDSAY, ONT.—At a meeting of the directors of the Lindsay, Haliburton and Mattawa Railway Co., it was decided to arrange with the Boards of Trade of Toronto, Lindsay and Mattawa, to wait upon the Ontario and the Dominion Governments with a view to securing bonuses for the road.

CHATHAM, ONT.—The Water Commissioners are about to enlarge the capacity of the present filter plant, and are considering the Howatson patent polarite system.—The City Council will apply to Parliament to declare MacGregor creek non-navigable and to erect a permanent bridge over it.

FREDERICTON, N. B.—F. P. Killeen, C. E., will apply to the Legislature for authority to incorporate a company to construct a railway from Fredericton to Moncton. The new company will be called the Central New Brunswick Railway Company.—Geo. Dayton, of the public works department, Ottawa, is here taking a survey of the river channel for dredging purposes next summer.

WINDSOR MILLS, QUE.—The works of the Canada Paper Co. are shortly to be operated by electricity. Power from the St. Francis river, one mile distant, will be transmitted to their mills. The factory will also be lighted by electricity and an electric railway will be constructed from the power house to the mills. The total amount of power to be transmitted will be about 1,000 h. p. The work is in the hands of Mr. Geo. White-Fraser, electrical engineer, Toronto.

GUELPH, ONT.—The council have under consideration the construction of a sewerage system. Mr. Staebler, of Berlin, recently addressed the Board of Trade on the question.—The trustees of Chalmer's church have decided to proceed at once with the enlargement of the edifice.—J. A. Trimble has completed plans for an office building to be erected at the corner of Wyndham and Douglas streets. The plan shows a handsome front of 75 feet, two stories in height. The building is to be of pressed brick, is estimated to cost \$8,000, and will be the property of McLean & McLean, barristers.

KINGSTON, ONT.—Arthur Ellis has been appointed architect for the proposed new school building, which is estimated to cost from \$16,000 to \$20,000.—Power & Son, architects, are receiving tenders for the erection of a residence on Johnson street for Wm. Downey.—James Devlin, chief engineer at the Penitentiary, has gone to Ottawa to consult with the authorities regarding plans for the heating, lighting and water appliances for the new Dominion reformatory at Alexandria.—A brisk demand for cheap building lots is reported, and building operations are likely to be active in this city next season.

MONTREAL, QUE.—The Montreal Maternity Hospital authorities are considering the erection of a new building.—A joint stock company is being formed to establish a cafe, at 10 and 12 Victoria street. On the ground floor there will be a cafe, 100 x 20, and also a restaurant of similar dimensions, while on the flat above there will be ten private dining rooms and a large banquet hall.—The private competition for the remodelling and extension of St. Laurent college has been won by H. R. Falbord, architect. The extension will be 157 by 65 feet and four stories high, with a detached museum 40 feet

square and four stories high. The buildings will be made fire-proof, and will cost \$60,000. Work will be commenced in the spring.

TORONTO, ONT.—Mr. Rust, acting City Engineer, in his report presented to the Board of Works on Monday last, recommends the following: The purchase of a sand-pump, to cost \$18,000, and of a portable stone crusher, to cost \$400; the construction of a sewer on Manchester ave., to cost \$712; that the City Treasurer provide \$45,000, being the city's share of the cost of the York street bridge, so that the work can be commenced.—The City Council has decided to petition the Dominion Government to urge the necessity of proceeding at once with the construction of the Nipissing and James Bay railway.—The island waterworks will be commenced in a short time. The intention of the department is to lay pipes by day labor, and call for tenders for the pumps when required. The St. Lawrence Foundry are the contractors for the water pipe.—The acting City Engineer has decided that out of the 180 streets reported on, 53 are in a condition which renders them dangerous for traffic.

OTTAWA, ONT.—Arnoldi & Ewart, architects, have completed plans for buildings to be erected by Mr. Orme and Mr. Stevens on Sparks street. They will be built of pressed brick, with colored brick and sandstone trimmings, one four storeys high and the other three storeys. Tenders will probably be invited this week.—E. F. E. Roy, secretary Department of Public Works, invites tenders until the 14th of February, for the construction of a wharf at Seaside, Inverness County, N. S. Plans may be seen at the post-office, Port Hood, and at the above department. Mr. Roy also invites tenders until the 27th inst. for the construction of a block for the breakwater at Souris, P. E. I., plans for which may be seen at the custom house in that town.—The Protestant Hospital Building Committee have accepted the plans of Arnoldi & Ewart, for the proposed wing.—In the Senate recently Mr. Perley enquired if the government intended making any provision to procure a water supply in the Northwest Territories for farm purposes. He thought \$20,000 would be sufficient to conduct scientific experiments. The matter will be taken into consideration.—Mr. Surtees, City Engineer, in his annual report presented last week, states that he is willing that an experienced civil engineer should be engaged to report on a suitable system of sewerage. Regarding the question of pavements, the engineer advises that should the legislature refuse to grant the privilege of having streets paved upon the same principal as Sparks, Banks, Rideau and Sussex, the rate-payers be requested to vote on a by-law to provide the sum of \$100,000 to carry out the work.—A movement has been commenced to secure the erection of a new building for the home for friendless women. Estimated cost, \$20,000.—A petition is being circulated opposing the granting, by the Dominion Government, of an extension of time to the Pontiac and Pacific Junction Railway Company for the completion of their line to Pembroke.—The Dominion estimates, which have just been presented, contain the following appropriations for Ontario public works. River Kaministiquia, \$10,000; Dominion reformatory, \$30,000; Dominion public buildings—renewals, improvements, repairs, etc., \$15,000; Picton post-office, custom house, etc., \$13,000; Collingwood, repairs to breakwater, \$2,850; general repairs and improvements to harbor, river and bridge works, \$10,000; Kingston harbor, Lake Ontario, \$5,000; Lake Simcoe and Couchiching, regulation of waters, \$5,500; Owen Sound harbor, dredging, etc., \$20,000; Toronto harbor, works at eastern entrance, etc., \$50,000.

Twenty thousand dollars is to be spent in construction of lighthouses.

FIRES.

Chase & Co.'s large warehouse at Port Williams, N. S., was completely destroyed by fire on the 26th inst. Loss \$5,000.—James Smith & Sons' saw mills at Stanley, N. B., have been burned. No insurance. They will probably rebuild.—The Alexandria Furniture Co.'s works at Alexandria, Ont., have been burned. Loss, \$20,000.—The grain warehouse of P. McIntosh & Sons, 109 Front st. e., Toronto, was damaged by fire recently to the extent of \$40,000. The building was damaged to the extent of \$8,000.—Campbell's mill above Hartland, N. B., has been totally consumed by fire. Loss, \$6,000; insurance, \$3,000.—The residence of S. Cline, of Belmont, Ont., has been burned.

CONTRACTS AWARDED.

BLYTH, ONT.—The contract for the new public school has been let. The cost will be about \$5,000.

HALIFAX, N. S.—The contract for erecting the new immigration sheds has been awarded to Rhodes, Curry & Co., Amherst.

PENETANGUISHENE, ONT.—P. Payette & Co. have completed the hot water heating for the Northern hotel and plumbing work for the Bay View House at Penetang.

CORNWALL, ONT.—The contract for the construction of the electric railway has been signed by Messrs. Hooper & Starr, of Montreal. The franchise was held by W. R. Hitchcock.

SARNIA, ONT.—The tender of the Confederation Life Association for the purchase of \$16,000 of 20 year debentures, has been accepted by the County Council. The price realized was about \$16,300.

OTTAWA, ONT.—E. Farquhar has sublet to Poulin & Fitzpatrick, twenty miles of the Ottawa and Parry Sound railway. This contract is estimated at \$200,000. Other sub-contracts for the remaining 27 miles are expected to be given out this week.

MONTREAL, QUE.—Edward Maxwell, architect, has awarded contracts for the erection of a residence at Westmount for Dr. J. M. Elder as follows: masonry, Hughes & Brisson; brickwork, M. De-guise; carpenter and joiner's work, Jos. Shearer; roofing, Montreal Roofing Co.; plumbing and heating, E. C. Mount & Co.; plastering, John Morrison & Son; painting, W. P. Scott; electric wiring, Montreal Electric Co.

HAMILTON, ONT.—Tenders for supplies for the Board of Works were received as follows: 5 inch wire nails, Carpenter & Ramsay, \$2.89; Peter Bertram, \$2.91, (accepted); Hamilton Hardware Co., \$2.91; Ferres Hardware Co., \$2.89. Lumber and cedar posts, Laking, Thompson & Patterson, lumber, \$13.85, cedar posts, 7½ cents; Robert Thomson & Co., lumber \$13.50, cedar posts, 7 cents; Reid Co., Toronto, lumber, \$12.97, cedar posts, 10 cents, (accepted); M. Brennan & Sons Co., lumber, \$13.70, cedar posts, 9 cents.

BUSINESS NOTES.

The B. C. Construction Company is being organized at Victoria to carry on a general contracting and building business.

J. H. M. Bernier, plumber, St. Hyacinthe, Que., is offering to compromise at 35 cents on the dollar. His liabilities are about \$13,000.

Electric heat has been applied with success to the thawing out of frozen water pipes in England. A wire is run into the pipe until it meets the obstruction and then the current is turned on.

CANADIAN SOCIETY CIVIL ENGINEERS.

The 10th annual meeting of the above association was held in the rooms of the Society, 112 Mansfield street, Montreal, on the 14th and 15th of January, Mr. Thos. Monro, president, in the chair. There was a good attendance of members, the representation from Ontario being the largest ever present at an annual meeting.

The report of the Council showed a satisfactory balance sheet, and states that the annual subscriptions have been well paid up.

The report of committee on "Close Corporation" was presented by Mr. Alan Macdougall, chairman of committee, and adopted. Steps are to be taken to carry out the recommendations made on the report. The original committee in "Close Corporation" was dissolved, and a larger committee with representatives in each province and a central committee formed to carry on the work, who are to report to Council before the fall.

After routine business had been disposed of, the retiring president, Mr. Thos. Monro, of Coteau Landing, delivered a very able address on the St. Lawrence, as the great water route of our country.

The Gzowski medal was awarded to Prof. Bovey for his paper on "Tests of the Strength of Douglas Fir."

The annual dinner held at the Queen's Hotel on Tuesday evening was one of the largest ever given by the Society, and was thoroughly enjoyed by all present.

On Wednesday evening, Prof. C. A. Carus-Wilson delivered a lecture before the society, on "Electric Power Waves," in the Physics building of McGill University.

The balloting for the election of officers resulted as follows:

President, Herbert Wallis, Montreal.

Vice-presidents, Henry T. Bovey, Montreal, Chas. Macdonald, New York, and W. G. Thompson, St. Catharines.

Treasurer, K. W. Blackwell, Montreal.

Secretary, Professor C. H. McLeod, Montreal.

Librarian, W. McNab, Montreal.

Members of Council, W. D. Barclay, Lethbridge, Man; J. D. Barnett, Stratford; St. Geo. Roswell, Quebec; M. J. Butler, Napanee; W. R. Butler, Windsor, N. S.; R. J. Cambie, Vancouver, B. C.; G. C. Cunningham, Montreal; W. B. Dawson, Ottawa; G. H. Duggan, Montreal; H. Irwin, Montreal; E. H. Keating, Toronto; Alan Macdougall, Toronto; W. G. Mathewson, New Glasgow, N. S.; D. A. Stewart, Winnipeg, Man.; W. J. Sproules, Montreal.

It was decided to hold a summer convention in Toronto during the month of June next.

NOTES ON THE PROPERTIES OF MORTAR.

The durability of brick walls is very much affected by the character of the mortar used in laying the brick, and in the condition of the brick when laid. Clean, sharp and rather coarse sand should be used for mortar, and the lime should be water: slaked and fresh.

Hollow brick, it is said, are coming into more general use in eastern cities, and quite a number of large buildings have been built with them. They crush at 30,000 lbs., or about the pressure which the best solid brick will stand. They are made 8 x 8 x 12, with walls one inch thick. It is claimed that they cost one third less than the regular form, making walls proof against fire, moisture and frost, being warm in winter and cool in summer. They require a peculiar clay in their manufacture, one that will not shrink when dried or burned. The brick are set on end, thus making a wall hollow from top to bottom.

It is reported that the German government testing laboratory for building materials has reported favorably on a new paving block called iron brick. This brick is made by mixing equal parts of finely ground red argillaceous slate and finely ground clay and adding 5 per cent of iron ore. This mixture is moistened with a solution of 25 per cent sulphate of iron, to which fine iron ore is added until it shows a consistency of 38 degrees Baumé. It is then formed in a press, dried, dipped once more in a nearly concentrated solution of sulphate of iron and finely ground iron ore, and is baked in an oven for 48 hours in an oxidizing flame and 24 hours in a reducing flame.

The fact that mortar of old chimneys suffers greatly from the corrosive effect of the creosote of wood soot, says an exchange, was pointed out years ago. The creosote formed from the slow combustion of wood contains a large proportion of pyroligneous vinegar or crude acetic acid. This acid is formed in large quantities when the combustion of wood is slow, and many quarts will be condensed in cold weather, where a large wood fire is very much checked. The time required for such a condensation is but a few hours. The acid dissolves lime readily, carrying it away in solution. In this way the mortar is frequently entirely removed from the tops of old chimneys in the country. New chimneys suffer in the same way. Cases might be instanced where the top courses of bricks in chimneys but two years old are entirely without support other than that afforded by the sand with which the lime was mixed. Usually bricks can be lifted from the top courses of chimneys with the fingers, if the chimney is more than eighteen months old.

USEFUL HINTS.

Five courses of brick will lay one foot in height on a chimney; six bricks in a course will make a fine flue 4 inches wide and twelve inches long; eight bricks in a course will make a flue eight inches wide and sixteen inches long.

A simple way of removing rust from finely polished steel without injury to the surface consists in cleaning the article with a mixture of ten parts of tin putty, eight of prepared buck's horn and twenty-five of alcohol, and then rubbing with soft blotting paper.

To stain bricks red, melt one ounce of glue in a gallon of water; then add a piece of alum as large as an egg, one-half pound of Venetian red and one pound of Spanish brown; redness or darkness is increased by using more red or brown. For coloring black, heat the bricks and dip in fluid asphaltum or in hot linseed oil and asphalt.

The following will soften old paint, when it can be easily scraped off: Two pounds of sal soda, quarter-pound quicklime and one gallon warm water. Stir well and apply hot or cold, and allow it to remain fifteen or twenty minutes. Then scrape the paint off and wash thoroughly with acidulated water (vinegar and water), which is for the purpose of neutralizing the alkali and to stop its action upon the wood, and more still upon the repainting.

Cracks in floors, around the skirting or other parts of a room, may be neatly and permanently filled by thoroughly soaking newspapers in paste made of one pound of flour, three quarts of water and a tablespoonful of alum, thoroughly boiled and mixed. The mixture will be about as thick as putty, and should be forced into the cracks with a bent knife or other handy tool. When dry, it will be harder than the boards.

The following receipt for the cementing of wood and glass is said to have the advantage over many others in that it does not injure the most brightly polished hardwoods: Mix together some finely pulverized, well dried zinc-white with clear copal varnish in such quantities as to produce a half liquid preparation; spread this over the parts to be cemented, and it will be found that they will be joined firmly together.

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DEFECTS IN VARNISHES AND THEIR REMEDIES.

In applying oil varnishes to different objects various defects often make their appearance; these are, in many cases, very obscure in their origin, although painfully obvious in their effects. The defects may arise through faults in making the varnishes, through defects in the surfaces of the objects which have been varnished, through faulty methods of application, or through climatic changes. Seeing, therefore, that there are so many factors which produce defects in varnished surfaces, it is no wonder that the causes of such defects are obscure, especially as the varnisher may be of an unobservant character and fail to notice faults at the time the varnish is being applied.

Cracks and pinholes: These are often due to climatic changes, especially liable to occur in winter time, when a cold day will follow a hot or warm one. Keeping the object in a warm place for some time will tend to cure this fault, and take care that the varnish cannot get chilled while drying.

Peeling, blistering, spots and crawlings are defects which may be traced to a greasy nature of the surface on which the varnish is applied. This may be due to the use of bad priming paint, or rubbing the work down with oily rags, or to drops of oil on the surface and not properly removed in the preparing operations. The remedy consists in preventing the application of oily matters to the surface, and to see that they are thoroughly removed.

Sagging: This defect arises from two causes, a very greasy nature of the surface or from applying the varnish too quickly. The varnisher is tempted to take up too much on his brush, and unless he takes care to spread this well he will leave it too thick, and then sagging or running down may occur. If in the preparatory processes too thick a coat of paint is put on, the varnish may tend to soften this, and then this defect is liable to occur.

Sweating and blooming may be due to defects in the manufacture of varnish; the gums used have not been properly melted, and too much of their volatile constituents left in, or the varnish may have been sent out before it is properly material. Varnishing on a damp surface will also develop these defects.

Deadening may be due to faulty preparation of the varnish, but more often it is due to climatic conditions—varnishing in too damp an atmosphere, damp surfaces, on the presence of deleterious gases and vapours, too porous a subject, too large a proportion of driers used in making it, all of which tend to cause loss of lustre in a varnish, either immediate or after a time. It is difficult, under these circumstances, to point out a remedy, for one will scarcely know the exact cause in any particular case, and, of course, it is

obvious that the remedy will vary with the cause, and what will suit one case won't do for another.

The varnisher should, if he wants to produce a good job, take every precaution to prevent defects arising—for, in this case, an ounce of prevention is worth a ton of cure. He should see that his varnish is of good quality, that his cans and brushes are in good condition and clean, that the surface he has to varnish is in proper condition, free from grease, dry, and has a smooth surface. He should never attempt a job in wet or damp weather, and he should take care that, after varnishing, his work is not exposed to any bad influences which will retard the drying and hardening of the varnish.
—Oil and Colourman's Journal.

HOW TO SEASON TIMBER.

How to season timber so as to prevent the ravages of dry rot is something in which builders generally are interested. According to R. F. Francius to preserve oak timber from dry rot it should be laid in large piles in salt water for a whole year, and so as to be completely covered with the water. By this means the salt penetrates the wood and the consequence is that it remains always free from dry rot and lasts twice as long as it would do without this preparation. If the wood

DEBENTURES PURCHASED

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can be put into sea water perfectly pure and free from all earthly deposits it is so much better, and on the coast it may be best kept in basins dug for the purpose. Care must be taken to lay it so that it cannot drift away. Where salt is very abundant, wood may be seasoned by covering it with a thick layer of that material, when the air is damp and foggy, without heavy rain.

USEFUL HINTS.

Always strip off solid beams where they are to be plastered; the lath may then be put on so that the mortar may have a clinch and cracks are avoided.

A good mixture for coating roofs may be made as follows. Thirty-five parts clay slate, thirty parts mica slate and about thirty-five parts resin, all finely powdered and heated with fifty parts of tar.

When a ceiling is simply tinted, the tint should be one that softens into the wall or paper color, not one that contrasts. Thus if the tone of the room is that of a soft gray blue, the ceiling should be of a clear fresh pink; or should a gray-green be picked out with black, a lemon color will be appropriate for the ceiling.

ESTIMATING FOR SHINGLES.—If you wish to make an off-hand estimate of the number of shingles required for a roof at one-quarter pitch, multiply the ground surface of the house in square feet by 10. Example: A house 20 x 20 on the ground has 400 square feet; multiplied by 10, gives 4,000 shingles.

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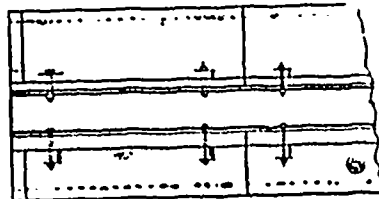
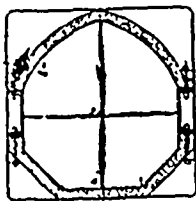
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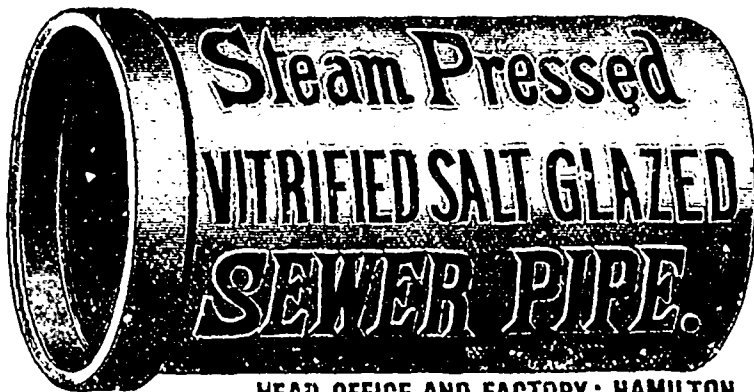


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CONCRETE SIDEWALKS.

Although more or less has been said on this subject in previous numbers, it may not do any harm to reiterate some of the points which are of importance in this class of concrete work, and also, perhaps, to add a little new material to the subject.

The point is naturally raised by people in general as to the wear of concrete walks, and the question is often asked, "Why do these walks crack?" "Why do they go to pieces?" The answer is simple. Because the price for having them put down properly is not paid, or, if what is reasonable for a first-class pavement is paid, because the man who does the work is negligent, or ignorant, or does not furnish proper materials. Given the proper materials, it is an easy matter to construct a concrete walk, within reasonable cost, which will outwear any known paving material.

In New York there are a great number of very poor pavements. The competition is sharp, prices are low, and the work must be done within the contract price. People pay large sums for their walks, but they often get the work done by the general contractors or second parties who have their commissions to make, with the result that the work is carried out by the lowest bidder, and the consequences are discouraging.

Again, the fault lies with the architect, or the engineer, or the landscape gardener, who is ignorant of a proper specification for such walks, does not know that one grade of cement is better than another for color and strength, does not insist on proper drainage and foundation, and is ignorant of the use of dryers and other means taken to avoid labor and lessen the expense. There are many people who are ready to pay even more than the ordinary rates, if they could be assured of getting the value of their money, but, unfortunately, they are not assured, under ordinary circumstances.

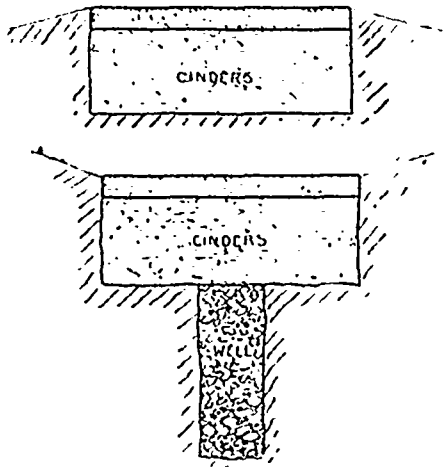
In all ordinary work, on the ground, the following is good practise and will insure success:—

1. Do not lay walks on newly made ground. Allow a year at least for settlement.
2. Excavate 18 to 20 ins. and fill the trench or excavation with (1) clean locomotive or mill cinders; (2) broken brick, pottery, and other porous material; (3) broken stone or gravel. In making the excavation, provide all the means possible for preventing water accumulating in the trench, for it will freeze and heave the walk, to a certainty.

The figures given below show the method of draining which is most satisfactory. Where the slope of the land is such that the water does not naturally flow away from the walk, wells should be

dug at intervals of perhaps 20 ft., and filled with broken stone or porous material of any kind, these wells being 3 to 4 ft. deep, sufficient to go beneath the frozen surface, and permit water to drain away into the earth.

A few bars of three-sixteenths in. square twisted iron or steel rods (Ransome), imbedded about 12 ins. apart, as near the



surface of the walk as possible, will be found to furnish additional security from cracking by frost or settlement.

3. Mix the coarse concrete in the proportion of one part cement to four or five parts of coarse sand or fine gravel and four or five parts of clean 2 in. stone or screened gravel. Mix thoroughly and use a first-class cement of imported or American Portland. Wet to the consistency of a stiff dough. Put this concrete in place and tamp down thoroughly to a uniform thickness of $3\frac{1}{4}$ ins. While this is being done have the top concrete mixed, using the same cement as in the bottom. To cheapen work it is the practise to use one cement for the bottom and another for the top, but this can seldom be done successfully on account of the difference of time in the setting of the two brands.

Thus most of the cheaper cements are quick setting and the dearer ones are slow setting—in fact, this is the rough index to the grade of a cement. If a quick-setting cement is used for the coarse stuff of the bottom and a slow-setting cement is used for the fine material of the top, the result is that the bottom concrete is hard before the top sets at all, and this prevents a strong adhesion of this top layer to the bottom. Again, if the same grade of cement is used throughout, it is very important that the coarse concrete is not allowed to set before the top is put on; otherwise there is failure in the adhesion of the two layers. Presently the walk sounds "hollow" as one walks over it, and after a time the top layer begins to crack and break up. It is almost invariably the case whenever the coarse material is allowed to set before the top is put on, and great care should be taken to prevent workmen from putting in more coarse concrete than can be readily finished in a day's work. In straight-away work a first-class finisher and helper with five men ought to finish up 500 sq. ft. a day.

In the mixture for the top use one part cement to two parts of coarse sand or "wheat" stone, the latter preferred. Beach sand of coarse variety, if free from

salt, makes good topping, and good clean pit sand, free from loam or dirt, will be satisfactory, but best of all is "wheat" stone of granite or other hard stone.

In the Western States granite "wheat" is almost universally used in the pavement work, and the words "granolithic" and "granitoid" are names adopted to denote this class of work, although at present "granolithic" denotes the concrete pavement, without reference to the materials of which it is made. Mr. P. M. Bruner was one of the first, if not the first, to use the names "granolithic" and "granitoid," and if all who have adopted these names would also adopt his method and materials we should not hear so much about poor concrete paving.

The topping should not be mixed with too much water. It is the tendency among workmen to use an excess of water, as it saves labor. The practise is to spread the soft material and allow the water to rise to the top, and then use dry cement and sand to absorb the excess of water. The custom is a bad one, for too much water drowns and injures the cement. The "dryer" is sifted on and is then trowelled into the soft material below. The surface thus made is not a hard one and wears away easily. This practise is common in "rolled" work, and the softness of the surface is seen in the rapidity with which the roller marking wears away. The best surface is made by mixing the concrete to a stiff dough and trowelling it on in two or more layers. This will insure a very hard surface, upon which a roller will make little impression, and years of travel will show little wear.

On the matter of coloring there is little to be said. A good quality of lampblack gives the best results in blues and slates. Reds and yellows are not wholly satisfactory, as they do not hold their brilliancy for any length of time. They are suitable, however, for some classes of work where vividness of color is not essential. In using lampblack a good deal depends on the sand, as some kinds take much more than others to get the same depth of color. Sea sand takes as much again as pit sand, for instance, varying for a moderate blue from 1 lb. to 3 lbs. of lampblack per barrel of cement.

Do not attempt to lay concrete pavements in frosty weather out of doors, for the best of care will barely protect them. There is not much danger of injuring the concrete itself, but a thin film of cement and water may freeze on the surface, and eventually this will peel off and ruin the appearance of the walk. Concrete should be thoroughly dried out before being exposed to severe cold; but, again, the injury will depend largely on the quality of cement used.

As far as the writer's experience goes, the best cement for paving is the "Germania" brand, for it makes a very white surface, very uniform and fine in appearance. It is one of the strongest and most reliable of the German cements, and is particularly adapted to pavement work. Dyckerhoff, Alsens, Star Stettin, Hilton, Brooks, Shroobridge, White Bros., and other brands of German and English Portlands have been largely used, and some American brands are finding a market among the paving men.

When a concrete walk is properly and conscientiously constructed there is no better paving material known. It is unfortunate that competition has driven a lot of inferior work into the market, for it is these poor walks that give a hurtful name to concrete in general, but as the material becomes better understood and its use becomes more extended perhaps the requirements for better work will be insisted on, and then we may look for better results.—Ross F. Tucker, in The Brickbuilder.

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MONTREAL: Trade is steady, with little change to note in prices. Plate glass is in a satisfactory condition, and prices have advanced 5 per cent. Cement is dull, but English advices state that prices are higher. Fire-bricks are selling at \$16 to \$22 per thousand. Paints and oils are firm, and a fair demand is reported.

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