

**CONTRACTS OPEN.**

**ADORA, ONT.**—Mr. F. J. Dewis is making preparations to erect a new residence.

**GENCOLE, ONT.**—Messrs. Wm Simpson and W. J. Simpson will each erect new dwellings shortly.

**OTTERVILLE, ONT.**—Mr. Robert Plaxton, banker has purchased a site on which to erect a brick block to cost about \$5,000.

**NEWMARKET, ONT.**—The Reeve has been authorized to order pipe, valves and hydrants at once for water works extension.

**PICTON, ONT.**—Several directors of the C. O. Railway recently surveyed a proposed line of railway from this town to Sandbanks.

**COLLINGWOOD, ONT.**—Tenders for a system of steam heating for the municipal offices of the town will be received up to July 29th. Plans at Town Clerk's office.

**VICTORIA, B. C.**—The Chief Commissioner of Lands and Works invites plans and estimates of cost for the construction of certain Provincial Government buildings.

**KINGSTON, ONT.**—The ratepayers will probably be asked to raise the sum of \$20,000 for grading the streets for the electric railway. Granolithic walks will also be constructed on a number of streets.

**SIMCOE, ONT.**—C. Dickenson, County Clerk, will receive tenders until the 25th day of July for the erection of a Registry office in this town for the County of Norfolk. Plans may be seen at the Court House.

**WINNIPEG, MAN.**—N. Hewitt, Maintou, will receive tenders until the 7th inst., for the erection of the Winram Memorial church, to be constructed of stone. Plans at the office of C. H. Wheeler, architect, this city.

**BROCKVILLE, ONT.**—Mr. W. H. Davis has purchased a site opposite the St. Lawrence Hall on which to erect a residence.—The Ontario Government has selected a site for the new asylum at Picken's Point, at the east end of the town.

**PORT ELIZABETH, ONT.**—B. Cummings, Reeve of Saugeen, will receive tenders until Friday, the 8th inst., for the construction of a steel bridge over Mill Creek in this town; the bridge is to consist of two spans, 150 feet and 40 feet respectively, with concrete piers.

**MONTREAL, QUE.**—The City Clerk will receive tenders until Wednesday, the 6th inst., for paving the following streets with asphalt: Notre Dame street, from McGill street to Inspector street; Chaboulez square throughout; Ontario street, from Papineau avenue to Amherst street.

**HAMILTON, ONT.**—The Council of the Board of Trade has decided to petition the Dominion Government to grant a further sum of \$7,500 for the proper dredging of the harbor.—Ground has been broken for a new church for St. Peter's parish to be erected on the corner of Main and Burlington streets.

**TORONTO JUNCTION, ONT.**—The High School Board have been informed that the establishment of the high school has received the approval of the Government. It has been decided to proceed at once to purchase a site and erect a building, the Council having granted the sum of \$25,000 without submitting the question to the ratepayers.

**OTTAWA, ONT.**—E. F. E. Roy, Secretary Department of Public Works, will receive tenders until Monday, the 4th inst., for the erection of a post office at St. Hyacinthe, Que. The Secretary will also receive tenders until Wednesday, the 27th inst., for the erection of a Land and Registration office at Edmonton, N. W. T.—The following items appear in the supplementary estimates for the year ending June 30th, 1893: Petroleum, public building, to complete, \$7,500; Orillia, public building, \$7,000; Peterboro, Custom House, \$4,000; Trenton, harbor dredging, \$3,000; Belleville, harbor, \$3,000; Toronto, har-

bor, \$75,000; Owen Sound, dredging, \$15,000; Port Arthur, repairs to North pier, \$8,000; Goderich, harbor dredging, \$15,000; Rainy River, improvements, \$2,200; River Beaudet, clearing channel, \$5,000; Port Rowan, wharf, \$6,000; Midland, harbor dredging, \$2,500; Penetang, dredging, \$2,500; Port Arthur, dredging, \$5,000; Trent Valley Canal towards bulging and maintaining a swing bridge at Fenelon Falls, \$10,000; Monument to the late Sir John A. Macdonald, \$10,000.—The Medical Health officer has reported in favor of having plans prepared for the drainage of Stewaton.

**TORONTO, ONT.**—At a recent meeting of the Central Presbyterian church on Bloor street, it was decided to make extensive improvements to the interior of the building, at a probable cost of \$6,000. A new heating apparatus will be among the improvements.—Mr. Hamilton, Superintendent of Waterworks, has recommended the laying of companion twelve inch water mains on King street, south side, between Shearbourne and Simcoe, and on Yonge street, east side, between Queen and Bloor streets, at a cost of \$11,943 and \$18,968, respectively.—The City Engineer has recommended the construction of the following works: Cedar block pavements on Bloor street from Dufferin to Dundas street, cost \$35,730; on Ottawa avenue from the end of the present pavement to the railway tracks, cost \$700; on Delaware avenue, from College to Bloor street, cost \$14,420; a macadam roadway on Centre road, Crescent road and a portion of South Drive, Rosedale, cost \$10,234; a cobble stone pavement on lane on south side of Queen street, between Tecumseth and Niagara, cost \$1,924; on lane in rear of John street, cost \$480; on Edmund street, from C. P. R. tracks to Royce avenue, cost \$2,500; a cement concrete sidewalk on Dundas street, from 67 feet north of Humbert street to Argyle street, cost \$892; a 15 inch tile sewer on Barton avenue, from Manning avenue to Christie street, cost \$1,112.—Three new houses are to be erected on the Bedford Park estate, Yonge street.—The congregation of St. Andrews church, at a meeting held on Wednesday last, decided to proceed with the removal of the building, providing the finances would permit.

**FIRES.**

The Grand Trunk station and freight shed at Craigville, Ont., were burned on the 25th ult., loss \$6,000. The kiln house of the Hamilton and Toronto Sewer Pipe Company, at Hamilton, Ont., was destroyed by fire on Saturday last.—A dwelling house on Head street, Chatham, owned by Mrs. E. E. Spashett, was destroyed by fire on the 26th inst. On the 28th inst., Messrs. Hay Bros. flour mill at Lastowel, Ont., was completely destroyed by fire. The estimated loss on the mill and machinery is \$20,000, insurance \$12,000.—The residence of Mr. E. E. Mann, of the *Jewelers' Guide*, Montreal, was destroyed by fire on Tuesday last.

**CONTRACTS AWARDED.**

**WINDSOR, ONT.**—Messrs. Curry & Robinet, of this place, have been awarded the contract for supplying the brick for the Port Arthur post office.

**WALKERVILLE, ONT.**—The contract for the new Methodist church has been awarded to Mr. E. C. T. Doole, of Toronto. The contract price is \$7,000.

**PORTSMOUTH, ONT.**—Michael Sullivan, of Kingston, has secured the contract for the erection of the new Catholic church at this place. The estimated cost is \$12,000.

**STRATFORD, ONT.**—The contracts for additions to Romeo Ward separate school have been awarded as follows: carpenter work and painting, Wm Dayly, \$1,935; masonry and plastering, E. Jacobs, \$1,475; ironwork, Jeffrey Bros., \$118.

**WINNIPEG, MAN.**—Messrs. McBain & McBain have been awarded the contract for the erection of the new Baptist church,

the price being in the neighborhood of \$30,000.—Messrs. Gray Bros. have received the contract for the erection of Mr. Fould's new store on Main street, at the price of \$5,200.

**OTTAWA, ONT.**—At a joint meeting of the City Board of Works and the County Roads and Bridges Committee, held last week, it was decided to award the tender for the ironwork in the construction of the new bridge across the Ottawa river to the Central Bridge Company, of Peterboro. This company agrees to supply a bridge weighing 198,000 pounds, for \$9,122.

**MUNICIPAL DEPARTMENT.****PROTECTION OF EXPOSED WATER MAINS CROSSING BRIDGES.\***

These two facts struck me very forcibly as to possibility of combining both, with a view of protecting water pipes from loss due to radiations of heat and oxidation, or rust. I at once conceived the idea that it was practical to whitewash over with Portland cement a water main laid in a trench, then cover it with 3 to 4 ins. of plaster of paris and sawdust, apply an outside thin coating of cement mortar, producing a covering when dry that would be a preservative to the iron, a good non-conductor of heat, and, what is very desirable, at a reasonable cost. This scheme did not strike me very favorably in cases where the pipe is entirely exposed, a bridge crossing for instance.

The best non-conductors make a loss in any event, some more and some less. Prof. Ordway's tests show that cotton and wool wadding make the least loss, while an air space pure and simple, or asbestos, rank very low, not much better than sand. Asbestos is a mineral fibrous substance which when separated bears a close resemblance to cotton, or perhaps more nearly to silk fibre. Trace it back and we find it is simply aluminum or clay, but in a different form, and while possessing the property of being non-combustible, probably owes all its non-conducting properties to the confined air held between the fibres. The province of asbestos is simply to protect the more combustible materials, which are the real non-conductors, from being charred or destroyed. Prof. Ordway, in his paper, remarks in regard to asbestos:

"Asbestos is commonly supposed to have wonderful virtue in resisting heat, but there is really no magic power in the mineral fibre. It is a non-conductor only when it is in a light, downy condition and full of air. It was observed that in those cases in which asbestos paper is put between the pipe and hair felt, the asbestos fails to prevent the scorching of the hair. Incombustibility should not be confounded with non-conducting power. And then again, experiments Nos. 47 and 50 show that a wrapping of asbestos paper does not insulate so well as the same thickness of mere air. The popular confidence in asbestos partakes of the character of a superstition."

An airspace pure and simple ranks low, due to mobility. Prof. Ordway says:

"Air alone, as is shown by experiment No. 50 in the tables, transfers much heat when it can move about in a closed space. The usefulness of mere air spaces has been much overestimated, for they can rarely be placed so as to render much service. The air no doubt slides much more freely over smooth particles. It is

not unlikely that the great difference between wool and asbestos is largely due to the smoothness of the soapy mineral fiber asbestos. It is hard to conceive of anything better fitted to counteract the mobility of air than the irregular twists of flattened cotton fiber, the crinkles and scaliness of wool, the fringed edges of down filaments, or the feathered angles of snow-like crystals. When more and more organic fiber is crowded into a given space, the thickness of the stratum remaining the same, the transmissive power appears to be diminished till a certain limit is reached beyond which there comes an increase. Probably, then the mobility of the air has been brought to a minimum and the proper conducting power of the fiber begins to act more decidedly."

The Prof. Ordway experiments show that we must look in the direction of cotton and wool fiber for the best non-conductors, but with water pipes it has seemed to me that we must go a step further. We must find some substance or substances in combination that will supply back again the increment of heat test. With steam, the boiler supplies this. A water main is constantly losing some heat from the water with the very best non-conductor pure and simple, and the only ordinary remedy is a more free circulation to bring new particles of the water into the exposed pipe to be acted upon. Where the circulation is rapid and constant through the whole 24 hours, this plan, in connection with a good non-conductor, fills the bill.

Unfortunately, however, during the hours of the night there is usually very little legitimate consumption, and resort must be had to waste pipes to maintain rapid circulation during the night hours. This means a loss of water, and as it cost money to produce the water in the mains, it is also a financial loss.

The question of spontaneous combustion then suggests itself. Water pipes in winter, or even at any time, are always at a low temperature, with a certain amount of moisture or sweat on the outside. Spontaneous combustion under these conditions will hardly, if ever, take place, in fact, it may be assumed never. Again, all chemical changes, even decay, which is a chemical change, produce heat, and I turned my enquiries in that direction. I found that at all the knitting mills there is a waste product called wool waste, being composed partly of wool and cotton fiber; that this waste, due to the progress of manufacture is partly saturated with oils, and when placed in a pile slowly generates heat and finally decays. The best grades are sold to the paper makers, and lowest grades thrown away. The best grades vary in price from 1 to 2 cts. per pound. This material, then, just fills the required conditions of being, first, the best class of non-conductor of itself, and also having in combination a partial saturation of oil, which promotes decay, hence heat. I determined to use this material as a filling around the water pipes crossing the bridges and as wool laid with the fibers parallel, and in no case with the ends of the wool at an angle with the pipe to prevent the mobility of air through the cells of the wool, is a very good non-conductor as well as a cheap outside covering. I determined to make a box