

rault & Son, \$2,449; Francois Lemoine and A. H. Chagnon, \$3,900. It is probable that the tender of Dufresne & Co. will be accepted.

**BRANTFORD, ONT.**—The following tenders were received by the City Council for work in connection with the flood prevention scheme: Section "A," stone abutment and concrete pier—Elliott, Workman & Bogue, \$14,491; Elliott & Wingate, \$14,348; W. L. Innes, Peterboro', \$10,000. Section "B," iron span of Lorne bridge—Elliott & Wingate, \$3,184.50; Hamilton Bridge Co., \$2,895; King Bridge Co., Cleveland, \$3,996; Dominion Bridge Co., Montreal, \$2,797. Section "C," excavation at Lorne bridge and rip rap walls—Elliott, Workman & Bogue, \$7,172.90; Elliott & Wingate, \$9,045.85; W. L. Innes, \$7,400; W. E. Phinn, sections "C" and "E," \$8,794. Section "D," dam and sluiceway—Elliott, Workman & Bogue, \$18,746; W. E. Phinn, \$10,958; Elliott & Wingate, \$12,560; W. L. Innes, \$9,675. Section "E," rip rap walls south of dam, east side—Elliott, Workman & Bogue, \$4,807.25; W. E. Phinn, "C" and "E," \$8,794; Elliott & Wingate, \$4,048. Section "F," filling on flats and rip walls against T. H. & B. railway—Elliott & Workman, \$6,884.90; Elliott & Wingate, \$4,600. Section "G," filling and work in Eagle place—Elliott & Workman, \$2,715.20; Elliott & Wingate, \$2,436.80. Section "H," work at Two Fish Islands—Elliott & Workman, \$8,572.06; W. E. Phinn, \$7,234; Elliott & Wingate, \$8,059.40; Schultz Bros., \$7,203. Contracts have been awarded as follows: Section "A," W. L. Innes, Peterboro', \$10,000; section "B," Dominion Bridge Co., \$2,770; section "C," Elliott & Workman, \$7,172; section "D," W. L. Innes, \$9,675; section "H," W. E. Phinn, \$7,234. It was decided that the Board of Works should complete sections "E," "F" and "G."

We regret to learn that Mr. James Hutcheon, city engineer of Guelph, Ont., met with a serious accident recently. He was engaged in superintending the fixing of a block and tackle to take down railroad rails in the old rolling mills, when a board upon which he was standing gave way and he fell some 50 feet to the floor below. Although his injuries are quite serious, it is believed that he will recover.

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### TESTS OF MATERIALS.

The testing of materials is commonly a slow process and one which needs costly machines if the tensile and torsion strains are to be accepted as trustworthy. The loss of time is grievous to Americans who try to do all work in a hurry, and consequently impact tests are coming into favor in the States. At the last meeting of the American Society of Civil Engineers the experience with a newly-invented machine was described. From what was said about experiments by Mr. L. L. Buck, one of the members, it would appear as if wide divergence between results is likely to arise unless a uniform system of testing is adopted. It appears that a No. 7 wire, 100 feet long, with a normal strength of 60,000 pounds per square inch, was suspended from one of the towers of the Brooklyn bridge. It was provided with a large, strong washer at the lower end, supported by a nut screwed on at the extremity. Above the washer was a 50-pound weight with a hole in the centre, through which the wire passed loosely. The weight was first raised 4 feet and dropped on the washer, then raised to 8 feet and dropped, the distance increasing by increments of 4 feet. Considerable extension of the wire was caused, but it was not broken until the weight was dropped 36 feet. Afterward a 1-inch rod, 94 feet long, was suspended from the tower with a wire, nut, washer and weight attached. The wire was cut from the same piece as that previously tested, but was only 6 feet long. The weight was dropped as before, first from a height of 1 foot, the drop increasing by 1 foot at each test. The wire broke with a fall of 6 feet. The subject is worth investigating, for the

laws of impact have been hitherto expounded only in class-rooms.

The dissolution is announced of Baillancourt & Barbeau, painters, Quebec.

Horner Bros., contractors, Kirkfield, Ont., are said to be involved in financial difficulties.

John Butler, brick manufacturer, Waterford, Ont., is reported to have assigned to O. F. Duncombe.

Mr. James Morley Mowat-Biggs, C. E., who was the first engineer of the town of Toronto Junction, died recently, of malaria fever, in Central Africa, where he was sent by the British government on an important mission.

Ice, often the bridge builder's dangerous enemy, may sometimes be made his servant, says The Engineering Record, as is the case in a bridge recently commenced across the Ottawa river at Nepean Point, Canada. Work was being vigorously pushed to secure a bonus, and the solid ice across the river was advantageously utilized as a working platform. From it soundings were made, and on it materials were hauled and stored and men have worked to build the pier cribs. The cribs were sunk through holes cut in the ice and through 30 feet of water to a deposit of sawdust and water-logged timber 15 feet thick. In two cases the cribs have been carried down to solid rock by means of dredging through open wells. Another crib is to be sunk 75 feet deep by the same process, and the fourth pier may have a pneumatic caisson foundation. Permanent concrete filling is chiefly used for ballast and to sink the cribs, and is deposited under water by a special bucket designed by Mr. E. S. Jarrett, M. Am. Soc. C. E., of Sooy Smith & Company, New York city, who are contractors for the substructure.

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