

boat, manned by six men and a captain, and will probably be stationed at Miller Bay. Two horses and a heavy wagon will also be provided by the Government. The lifeboat placed at Long Point, Lake Erie, two years ago, was left to be manned and cared for by volunteers, and was soon allowed to go adrift.—*Marine Record*.

WATER WORKS NOTES.

London, Ont.—The new pumping machinery at Springbank has during the past few weeks been thoroughly tested, and the examination by Mr. Geo. C. Robb has proved that the Water Commissioners, Messrs. A. B. Powell (Chairman), Jas. Muirhead and Mayor Meredith, under whose direction, together with Mr. T. H. Tracy, City Engineer, the work was begun, should receive the greatest credit for their energy and untiring exertions in securing for London the "best pumping machinery in Canada." The Commissioners would have been satisfied if a duty of 50,000,000 foot pounds could have been secured for each 100 pounds of coal consumed, but the manufacturers said, "No, we will give you at least 60,000,000." It will be seen that this has been far surpassed, and that the Inspector's report shews 81,192,159, surpassing the most sanguine expectations. The Commissioners are now at liberty to relieve the contractors from further responsibility, and will at the earliest possible moment take the machinery off their hands. The following is the Inspector's report in full:—

"London, November 3, 1882.

"A. B. Powell, Esq., Chairman of Board of Water Commissioners, London.

"Sir,—In accordance with your instructions I made examinations and tests of the steam pumping apparatus supplied by Messrs. Stevens, Turner & Burns and Messrs. J. H. Killey & Co., Hamilton, and erected at the Springbank pumping house.

"The apparatus consists of a pair of horizontal compound rotating steam engines coupled to some crank shaft.

"The steam cylinders are 15 inches and 30 inches in diameter and 30 inch stroke, and both are steam jacketed. The cranks being at right angles, there is a steam receiver between the cylinders. Both cylinders are fitted with slide valves and cut off valves. The cut off on the high pressure cylinder is automatic, being regulated by a Porter governor.

"The pumps are placed one behind each steam cylinder, and are connected by rods directly to the steam pistons.

"The plungers are 9½ inches in diameter, and have a stroke of 30 inches and are double acting.

"The pump valves are made of phosphor bronze, and are small annular discs, and close upon phosphor bronze seats.

"Each pump has 216 of these valves, there being 54 suction and 54 discharge valves in each end. The area for the passage of the water through the valves is largely in excess of the area of the plunger, and the advantages resulting from this arrangement are greater efficiency of the pumps, quieter working and greater durability.

"Steam is supplied by two boilers of the horizontal tubular type, and are 54 inches in diameter and 12 feet long, with 64 tubes, 3 inches diameter, in each.

"On the 19th and 20th October, with your City Engineer, Mr. Thomas H. Tracy, I conducted a full test, with the following results: The pumps were run continuously for 12 hours and 13 minutes, making in that time, as registered by an automatic counter, 36,110 double strokes.

"The quantity of coal consumed while pumping was going on was 3,598 pounds.

"The quantity of water pumped was at the rate of 2,120,922 Imperial gallons in twenty-four hours, and the duty per 100 pounds of coal consumed while pumping was 73,533,262 foot pounds, no allowance being made for cinders or clinkers or for steam used for any other purpose.

"At the conclusion of this test I suggested that certain changes and alterations should be made with a view of increasing the general efficiency of the apparatus, and at the same time make it more convenient for the men employed to work it.

"These changes were made, and on the 1st and 2nd of November, with Mr. Tracy, I again conducted a full test with the following result:—The machinery was run continuously for 12 hours and 20 minutes: the number of double strokes of the pumps was 36,720, and the coal consumed while pumping was 3,326 pounds.

"The quantity of water pumped during twelve hours was 1,069,523 Imperial gallons.

"The duty per 100 pounds of coal consumed while pumping, no allowance being made for clinkers, or ashes, or steam used for any other purpose, was 81,192,159 foot pounds. The fuel used on both occasions was anthracite coal, of the size known as egg coal, and was of good quality, the quantity of ashes and clinkers being about 12 per cent.

"After the conclusion of this latter (fuel test) steam was blown off one boiler and the flues cleaned out. Steam was then raised in one boiler only, and it was found that by firing with a mixture of anthracite and bituminous coals steam could be supplied by one boiler sufficient to run the engines and pumps at the rate of 45 revolutions per minute, equivalent to pumping at the rate of 1,937,500 Imperial gallons in 24 hours.

"The firing on both occasions was done by one of the employees at the pump-house, and was very carefully and well done (although he had no experience), and I have no doubt the regular daily working will give as good results as were obtained at the test.

"Indicator diagrams were taken from the engines, and also from the pumps, and having thus made careful tests of the working of this machinery, and having frequently examined it while in course of construction, I am in a position to express an opinion of its merits.

"I congratulate you, sir, and your fellow-commissioners in having obtained for your city such complete, efficient and durable pumping apparatus.

"I consider it superior to any in use in any city in Canada in the points of efficiency, economy and durability.

"The buildings containing the machinery are neat and suitable for the purpose, and, while there is no spare room, there is ample for regular working.

"The engine and pump foundations seem sound and solid, showing not the least sign of any defect while the machinery was running at its highest speed and heaviest load.

"I am, sir, your obedient servant,

"GEO. C. ROBB.

"Chief Engineer of the Boiler Inspection and Insurance Company of Canada."

Toronto.—At the Water Works Committee meeting on 8th inst. it was resolved that the following water mains be laid with a view to increase the water supply for fire protection:—Twelve inch mains on King street, from Simcoe to Sherbourne, \$10,500; Front from Simcoe to Church, \$7,000; College avenue and Carlton street, \$8,000; Bloor street from Bathurst to city limits west, \$14,850; College street and part of Dufferin street, \$14,500. Six inch mains on Hope street, \$3,200; Clinton, \$1,900; Crawford, \$5,800; Cecil, \$200; Beaconsfield avenue, \$2,100; Lisgar street, \$950; Argyll street, \$250. East of Don, \$3,500. Contingent, \$10,000. Total, \$82,750.

A proposal of Mr. Killey, of Hamilton, to put in two new engines to afford additional pumping capacity, was referred to the Engineer and Manager.

Kingston.—A survey is being made of the city preliminary to the construction of new Water Works. The purpose is to lay new pipes capable of supplying the needs of a population of 25,000, the growth of the city is being anticipated.

Correspondence is to be opened by the Council with Messrs. Berger & Beique, of Montreal, in regard to the establishment of a system of Water Works similar to that to be erected at Brockville, the cost not exceeding \$50 per hydrant.

The Corporation ask for tenders with complete plan and specification for a complete system of Water Works, and offer to pay \$100 for the most serviceable and economical plan with specification, for this purpose, approved of by the Council.