

## CLAIMS INVENTION OF DIVING BELL

IN a letter addressed to the secretary of the Engineering Institute of Canada, John Taylor, of McAllister & Taylor, engineers and contractors, of Hamilton, Ont., protests against certain statements made by J. J. McDonald in the paper which the latter read at the recent Halifax professional meeting of the Institute. Mr. McDonald's paper described the diving bell used in the harbor work at Halifax, and contained intimations regarding the originality or novelty of the apparatus. Following are extracts from Mr. Taylor's letter to the Institute:—

"Mr. McDonald calls his device a Floating Caisson, or Diving Bell, and lays claim to being the originator of this type of apparatus. It is necessary for me to contradict this statement. I have watched with interest the use of this particular machine, and have awaited the publication of an official detailed description of it, which, I felt, would, sooner or later, be made public. I have also been aware of the claims made in connection with the device, and have had to allow these claims to pass unchallenged for want of official detailed information. It is impossible for an outsider to get such information unless voluntarily given.

"With regard to Mr. McDonald's claim as to the unique and original features of the caisson, namely, the convertible buoyancy and ballast chambers, if you will refer to the "Engineering News" of April 23rd, 1914, you will find a description of a self-contained floating caisson or diving bell, invented and designed in May, 1913, by me, and put in operation by me in August, 1913, on the construction of the underwater sub-structure of the dock walls at Hamilton, Ont. This apparatus worked successfully from the first day of its use, and continued in use, more or less continuously, for three years at the Hamilton harbor until the completion of the work in hand.

"It is possible, but scarcely probable, that Mr. McDonald and those associated with him were unaware of the existence of the machine in Hamilton on account of the publicity given to the device and the number of engineers in the construction departments of the Dominion Government, to whose attention the apparatus was brought.

"The apparatus in Hamilton consisted of a working chamber, with buoyancy chambers convertible into water ballast chambers attached to the sides of the chamber, and with an air lock on top. It also carried additional water ballast tanks on top for use when required for additional submersion. The machine depended partly on its own dead weight and partly on the water ballast contained in the buoyancy or ballast chambers to give the necessary load to resist the upward thrust of the air compressed in the working chamber. The particular device was perfectly stable under all conditions for which it was intended, the metacentre being well below the centre of gravity under all conditions, whether floating light or submerged in operation. The machine in use required very light draft in order to clear the submerged structure, which was built in sections, and this result was obtained by placing the main buoyancy chambers alongside of the working chamber.

"The device was equipped with spuds to serve as anchorages for work near the surface, but were not required to ensure stability. Air was supplied to the working chamber, air tools, etc., from a compressor mounted on a separate scow alongside the outfit. It was not necessary on this work to have a long air shaft from the lock

to the working chamber, but the device in principle only required this change and other structural adaptations for deep-water work.

"The Halifax machine, when in actual operation, does not float, the buoyancy chambers merely serving the purpose of facilitating its transportation from one part of the work to another. The one used at Hamilton actually floated at all times.

"The writer has arranged with Messrs. James Stewart & Co., of New York, for the use of his patent and design on the construction of about four miles of sub-structure of the breakwater wall to be built by the company at Toronto harbor, between the western entrance and the mouth of the Humber. This apparatus, as designed, will weigh about four hundred tons, and have a working chamber 24 feet wide, 100 feet long and 7 feet high.

"The design for this outfit has been completed in all its details, and the construction of it is only held up on account of this work having been closed down by the Dominion Government on account of the war as being not (strictly speaking) essential construction. This arrangement was made two years ago, after considerable investigation by Messrs. Stewart, and the general principle of this device is the same as that used at Halifax, except that the design of the structure has been modified and adapted to shallow water conditions.

"The writer is disposed to be charitable, and assume that Mr. McDonald was unaware that the principle and system had been anticipated, and had been in successful operation for three years before his design for the Halifax machine was prepared. In further proof of this, if that is necessary, the writer may say that he was granted a Canadian patent early in 1914 on the device and a United States patent at a later date. This fact may interest Mr. McDonald and his company in view of possible claims for patent infringement.

"The writer does not wish to unduly criticize, but as the device is hailed as something entirely novel and radical in principle by some of the engineers at the ports of Halifax and St. John, he feels it only just that the facts should be made known to the engineers of Canada as a whole, and fully expects this to be done."

## PAVING NEEDED IN HALIFAX

CITY ENGINEER DOANE, of Halifax, N.S., recently submitted to his Board of Control a report on street paving, from which the following are extracts: For many years there seems to have been a tendency to allow the total cost of any proposed improvements to loom so large that any benefits to be obtained were hidden. In consequence, Halifax has delayed permanent improvements which should have been made years ago.

There are two difficulties which prevent Halifax from overtaking the street repairs in a satisfactory manner with the appropriation provided by the city council this year.

The first is the scarcity of labor, which prompts the competing employers of labor to bid higher than the city can afford to bid. The second is the difficulty in obtaining the broken stone and other material which is necessary for street repairs fast enough to overtake the work within the working season. There are two reasons for this latter difficulty,—first, the trouble which employers have in obtaining labor, and second, transportation problems.