

Toronto, 30th July, 1893.

The Chief Engineer,
Public Works Department, Ottawa.

Sir,—I have the honour to present a drawing (lit. 1) and description of a new hydrograph recently devised by me, and acting under your direction set up at the western entrance channel of Toronto harbour.

A is the recording cylinder 2 feet in length by 24 inches in circumference, which by means of the clock *B* completes one revolution every 24 hours; *C* and *C'* are the standards upon which the cylinder revolves. *D* and *D'* not only carry the small pulleys *E* and *E'*, but form the terminals for the horizontal nickel plated guide rod *F* and another similar and parallel rod immediately behind it. These rods form a track for guiding the carriage *G*, on which the self-recording pen *H* is mounted. The penholder is pivoted so that it may be thrown back from the cylinder when changing the recording sheet. The float *I* is placed in a shaft composed of two concentric parts, viz.: an outer square box of 2 inch planking measuring about 12 by 12 inches inside, perforated with a number of anger holes near the bottom which is closed, and an inner cylindrical galvanized iron tube *K*, 10 inches diameter inside, also closed at bottom, which has only a few small holes near its lower extremity.

This composite shaft was sunk by outside the storm signal house where the instrument has been in permits of the inner tube *K* being drawn out and cleaned, should the mares become choked. The lower portion of the outer box is attached a lower timbers of the wharf, as shown at *J*, while the upper portion to prevent any possible future settling of the upper cribwork from dista

The movement of the float is transmitted to the recording sheet in the following manner:—

A cord of fine twisted brass wire passes from float *I* over pulley *L* to and several times around pulley *M*, and is attached to the outer grooved circumference of this pulley. At the smaller grooved circumference of the same pulley is attached a similar flexible metallic cord which passes over pulley *E* through the centre of the carriage *G*, and then over pulley *E'* to the counter weight *N*.

The ratio of the motion of the pen to that of the float is as 1 to 5. The horizontal lines upon the recording sheet represent heights in feet and tenths of a foot, and the heavy, medium and fine vertical lines indicate hours, half-hours and quarter hours respectively. As the circumference of the cylinder measures 24 inches, an inch upon the sheet corresponds to one hour in time. To correctly set the instrument, it is only necessary to move the carriage *G* along the flexible wire, until the recording pen has reached the required number of feet and tenths of a foot above the previously