of hammered iron four feet high and four feet across (Fig. 89), supporting four vertical fans of canvas. The iron cross-pieces are fastened by a bolt in the centre so that they can be folded away when not in use; and they are kept at right angles by a lanyard attached to their ends. To the bottom of the frame a half-cwt. lead is slung to sink it rapidly in the water, and the current-line—a sufficient length of ordinary service "cod-line" —is fastened to the top. When the drag has been let down to the desired depth, the line is attached on the surface to the watch-buoy, a spindle-shaped iron buoy five feet long by one wide in the centre, so fashioned as to expose as little surface as possible to the drift or the wind, while it has sufficient buoyancy to sustain a weight of seventy pounds in the water.

In using this instrument, the direction and force of the surface-current are first ascertained in the manner already described, and the boat then frees itself by letting go the dredge-rope, which is hauled in by the ship. The current-drag is lowered to say 50 fathoms from the boat, and the watch-buoy attached. The boat with the observer then follows the watch-buoy closely, without interfering with its movements; and the surface-log is again dropped from the boat, allowed to run for a given fraction of an hour and checked, when its bearing and the length of line run out give the direction and rate of the surface-current from the boat. But the boat is no longer a fixed point —it is keeping with the watch-buoy; that is to say, it is moving in the direction and with the rate of a current at a depth of 50 fathoms. As the log-ship is free to move with the surface-current, all divergence, whether in rate or direction, between it and the watch-buoy must be due to influences acting upon the latter, for they would otherwise be drifted along together; and the rate and direction of the surface-current being already known, the deep-water movement can be readily calculated from the relative positions of the watch-buoy and the log-ship; the actual movement of the watch-buoy with reference to a fixed point