

the spindle on which the cups turn. Attached to the same spindle is the rope *D*, which ends above in an iron ring. *E* represents a pair of tumbler hooks, fastened likewise to the end of the sounding-line; *C* a heavy leaden or iron weight, with a hole through it wide enough to allow the rope *D* with its loop and ring to pass freely; and *B*, a strong india-rubber band which passes round the handles of the scoops. In the figure the instrument is represented as it is sent down and before it reaches the bottom. The weight *C* and the scoops *A* are now suspended by the rope *D*, whose ring is caught by the tumbler hooks *E*. The elastic ring *B* is in a state of tension, ready to draw together the scoop handles and close the scoops, but it is antagonized by the weight *C*, which, pressing down into a space between the handles, keeps them asunder. The moment the scoops are driven into the ground by the weight, the tension on the rope *D* is relaxed, the tumblers fall and release the ring, and the weight falls and allows the elastic band to close the scoops and to keep them closed upon whatever they may contain; the rope *D* slips through the weight, and the closed scoops are drawn up by the rope *F*. This is a pretty idea, and an ingenious and elegant apparatus, but it is rather complicated. I have never seen it in use, but I should fear that the observer might often be thwarted by the scoops falling in a wrong direction, or by pebbles getting into the hinges and preventing their closing thoroughly. The simpler all these things are the better.

We used in our trip in the 'Lightning' in 1868 an instrument (Fig. 41) which at first sight scarcely looks promising from its apparent want of compact-