

was at the time doing duty in the Observatory, proposed to Captain Maury a contrivance by which the shot might be detached as soon as it reached the bottom, and specimens brought up in its stead. The result of this suggestion was Brooke's deep-sea sounding apparatus (Figs. 38 and 39), of which all the more recent contrivances have been to a great extent modifications and improvements, retaining its fundamental principle, the detaching of the weight. The instrument as devised by Mr. Brooke is very simple. A 64 lb. shot *E* is cast with a hole through it. An iron rod *A* has a chamber *B* at the lower end, and two moveable arms hinged to the upper end with eyes to fasten two cords by which the rod is suspended; so that when the instrument is hanging free the arms are nearly vertical (Fig. 38). Each arm bears a projecting notched tooth, and before sounding the shot is suspended, with the rod passing through it, in a canvas or leather sling *C* attached by cords whose loops pass over the teeth. The cup at the lower end of the rod is filled with tallow 'arming,' in which a chamber has been made by pushing in a wooden plug. When the instrument strikes, the end of the rod is driven into the material of the bottom, which fills the chamber in the arming, the two jointed arms fall down, the loops of the sling are relieved from the teeth, and the rod slips through the hole in the shot and comes up alone with its enclosed sample of sediment.

In this simplest and earliest form Brooke's sounding apparatus had some of the defects of the cup-lead. The sample of the bottom was too small, and ran a risk of being washed out in hauling up. Modifica-