

indicate the nature of the rock or other hard substance upon which the instrument had struck. In sounding in enclosed arms of the sea, such as the lochs of the west of Scotland, where the deposit is a soft mud, although the depths are usually under 100

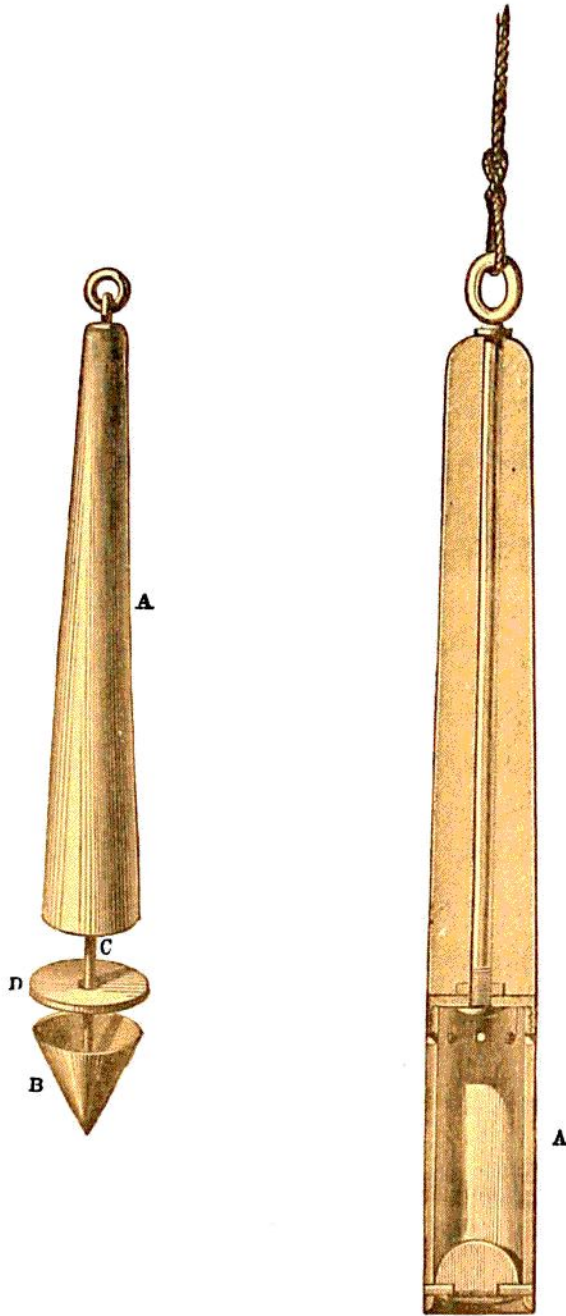
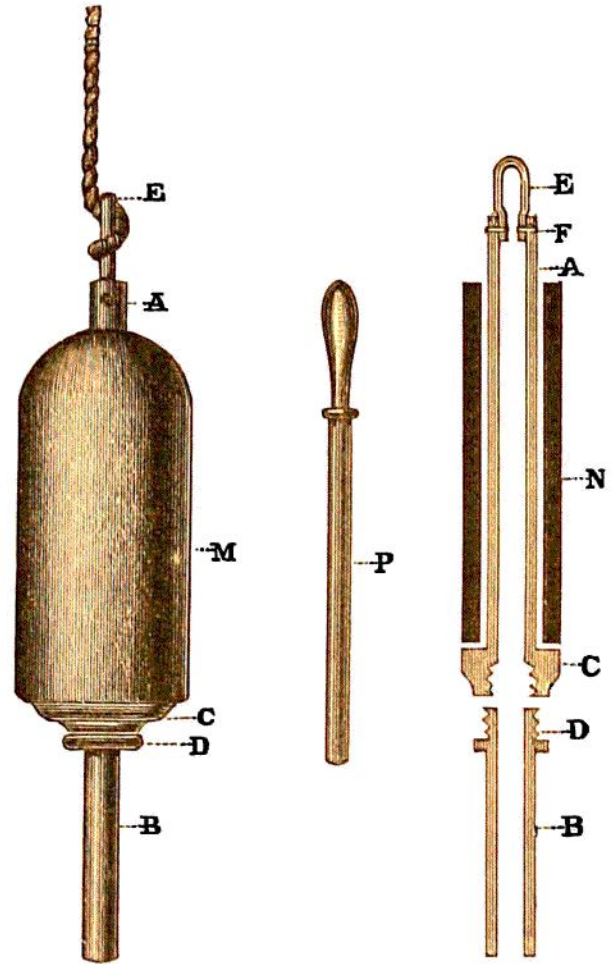


FIG. 1.—The Cup Lead.

A, ordinary deep-sea lead ; B, inverted hollow iron cone ; C, iron spike ; D, sliding iron disc.

FIG. 2.—The Valve Sounding Lead.

A, iron cylinder ; B, butterfly valve.



FIGS. 3, 4.—Buchanan's Improved Sounding Lead.

A and B, brass tube 1 inch (25·4 mm.) in diameter in two pieces, at lower end of the upper piece a shoulder C, with a thread screw, receives the corresponding shoulder D of the lower piece. The leaden weight M or N rests on the shoulder C. When used, tube B is filled with a plug or cylinder of the mud, the upper part containing water. The plunger P is used to push out the plug of mud from B when the latter is unscrewed at D. The weight M is 14 lbs. (6·4 kilogrammes), the weight N, 3 lbs. (1·4 kilogrammes). A comb valve may be fitted at the lower end of the tube if necessary (see L, Fig. 7).

fathoms, a modification of this tube is desirable, so as to procure a section of the mud by plunging the tube deep into the deposit. Such a modification was devised by Mr. Buchanan and is represented in Figs. 3 and 4.

*The Hydra Sounding Machine, or the Baillie Sounding Machine, represented in the*