

The sounding machine and disengaging sinkers were only used when there was reason to expect a depth of over 1000 fathoms ; for lesser depths either a valve or cup lead of 56 lbs., 112 lbs., or 168 lbs. was used, and the apparatus was recovered.

*The Cup Lead* (see fig. 17) is an ordinary deep-sea lead A, having at its lower end an iron spike C driven in ; at the bottom of this spike is an inverted hollow iron cone B,

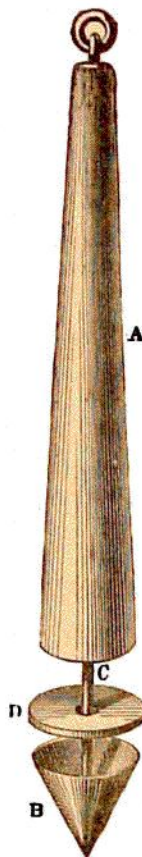


FIG. 17.—The Cup Lead.



FIG. 18.—The Valve Sounding Lead.

and above the cone is a sliding iron disc D movable up and down the spike between the lead and the top of the cone, and just large enough to cover the opening of the cone when resting on it. During the descent of the lead the disc is raised off the cone by the friction of the water, so that when the bottom is reached the cone penetrates and is filled with the mud or other material it encounters, and as the lead is raised to the