

obtained. When the tube is brought on board, the mud tube is unscrewed, any water that may be on the top of the mud cylinder is poured off, and the mud cylinder itself pushed out by a metal plunger, which just fits the tube. The water is simply poured out of the bottle into any convenient vessel. If the gases dissolved in the water are to be examined, then it must be drawn off by a siphon passed through the upper valve and down to the bottom of the tube.

This sounding tube has been very successfully used on board the ships "Dacia" and "International," belonging to the India-rubber, Gutta-percha, and Telegraph Works Company, while surveying the route for the cable from Cadiz to the Canary Islands. It has the advantage that on board such ships, where rapidity of work is of the greatest importance, good samples of mud and of bottom water are obtained in the course of the ordinary routine work, and without having to use any extra instruments. The weight of the sinkers used was 60 lbs.,<sup>1</sup> but 50 lbs.<sup>2</sup> is quite heavy enough. When the sinker is to be recovered, its weight should not exceed 30 lbs.<sup>3</sup>

In some of the telegraph ships four small tubes were at one time fitted to the lower part of the sounding instrument, and brought up four little rolls of the deposit. Other slight modifications have been introduced in the form and size of the tube and valve for retaining a specimen of the deposit, but these do not differ widely from those which have been noticed above.

A water-bottle, called the *slip water-bottle* (Fig. 11), was almost always attached to the line when sounding on board the Challenger; this bottle closes on striking the bottom, and it frequently happened that it was partly filled with mud or ooze, thus giving, in addition to the sounding tube, indications as to the nature of the deposit.

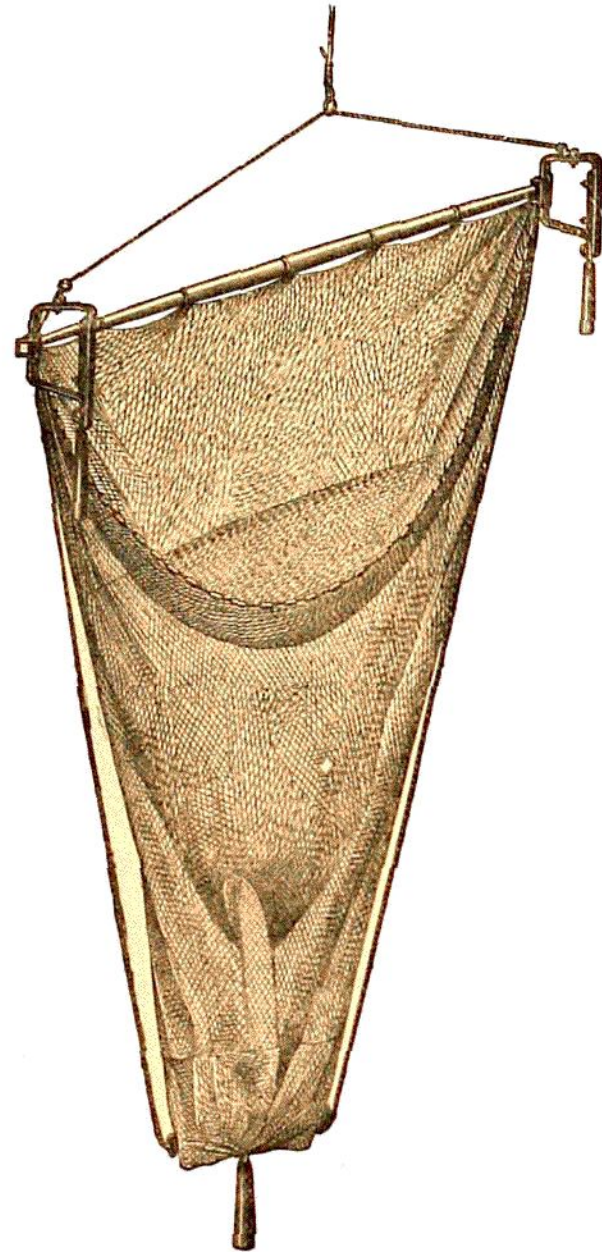


FIG. 13.—The Beam-Trawl used in deep-sea work.

In the *dredges and trawls* (Figs. 12 and 13) used on board the Challenger, a large quantity of deposit was frequently brought up from the greatest depths of the ocean.

<sup>1</sup> 27·2 kilogrammes.

<sup>2</sup> 22·7 kilogrammes.

<sup>3</sup> 13·6 kilogrammes.