

rangement and dimensions of the parts are sufficiently apparent from the plate to make further description unnecessary. The slipping arrangement is in principle the same as that used on Brooke's sounding-rod.

In order to adapt this water-bottle to collecting water at intermediate depths, it is fitted with a slipping plate, F, Fig. 11, furnished with a metal flap, Q, which depresses it when the motion of the instrument is reversed. It is inserted into a slot, S, immediately below the usual slipping plate to which the sounding-line is attached, and differs from the latter in having a deeper notch, R, and having a slot instead of a hole for the reception of the pin T, round which it turns. The object of this slot is, that after the string has been cast free, the flap may fall down close along-side the rod, and afford as little resistance as possible in pulling up. In using the instrument, it must be let go before the flap enters the water, and not checked until the depth desired has been reached. For collecting water at any given depth below the surface, and retaining the gases dissolved in it, Mr. Buchanan has devised the very ingenious instrument (Fig. 12), which, in careful hands, gives satisfactory results. It consists of a brass tube, A, two inches and a half in diameter, and of a length suitable to the capacity desired, closed at both ends by stop-cocks, B, B, with $\frac{3}{4}$ -inch clear passage, attached by flanges, screwed down upon washers. The stop-cocks are connected by a straight brass beam, C, and, when fully open, the levers D, D, which work them, stand up at an angle of 45° to the axis of the instrument, and when fully

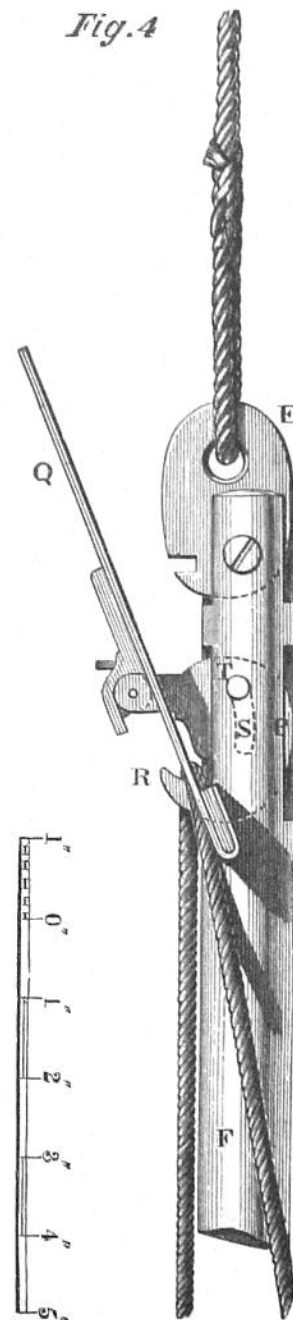


FIG. 11.—Instrument for slipping the cylinder at intermediate depths.