fitted two studs, and on its lower were two holes, so that when one sinker was placed upon another the studs on the upper surface of the one fitted into the holes on the under surface of the other, and the holes through their centres, as well as the grooves at their sides, coincided. (See Baillie sounding machine, fig. 14 B.)

Sounding Machines.—Two kinds of apparatus for detaching the sinkers were supplied; one the Hydra rod, before leaving England, and the other, the Baillie rod, at the Cape Verde Islands.

The Hydra rod (so called from its having been made by the blacksmith of H.M.S. "Hydra," as an improvement on Brooke's rod, the American invention) is a cylinder of brass tubing $1\frac{1}{3}$ inches in diameter and $3\frac{1}{2}$ feet in length (see fig. 13), having at its bottom B a butterfly valve, and at its top a sliding iron rod C $2\frac{1}{2}$ feet in length. On the upper part of this iron rod is a small stud D, with a spring that reaches out to the head of the stud when there is no pressure on it. The sinkers were attached to the rod, and on reaching the bottom they were disengaged. To attach the sinkers, an iron disc or washer E with a hole through it (of a slightly larger diameter than the cylinder of the sounding-rod) was placed over one of the holes in a grating; a piece of wire (No. 9 gauge), two fathoms in length, was fastened at each end to this disc, and the bight of the wire was left standing up; on the top of the iron disc a sinker was placed so that the hole through its centre corresponded precisely with that in the disc and grating; other sinkers F were now added until the weight was sufficient for the supposed depth of water, two sinkers, or 1 cwt., being generally allowed for each thousand fathoms. When the requisite number had been placed in position, one on another, the rod was passed through the hole in their centres, and through the iron disc at the bottom, and the bight of the wire attached to the disc was placed over the stud D on the upper part of the rod (the spring being fastened back with a piece of twine to facilitate this operation), and the rod A on being lifted raised with it, by means of the wire on the stud, the sinkers which were kept in their places by the rod passing through their centres, and by the wire fitting into the grooves at their sides. When the full weight of the sinkers was on the stud, the twine which confined the spring was cut so that it was then only kept back by the weight of the sinkers on the wire. On reaching the bottom the weight of the sinkers no longer rested on the wire, so that the spring pushed it off the stud, and the sounding rod was thus relieved from the weights; the disc, wire, and sinkers being left at the bottom.

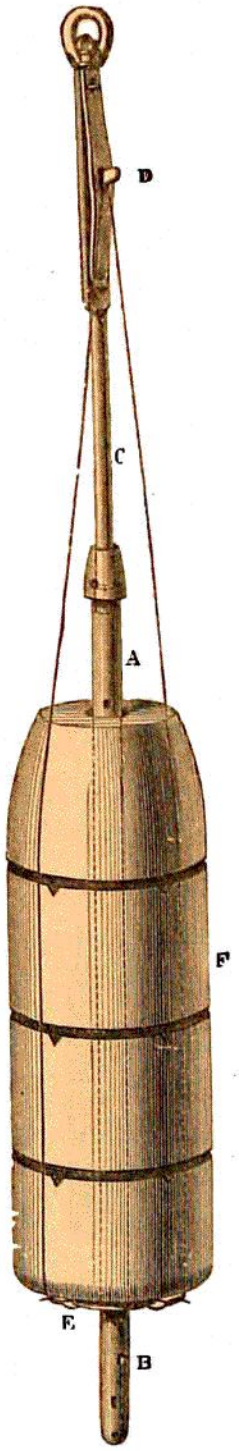

FIG. 13.—Hydra Sounding Machine.