

to the boiling point by a hand spirit-lamp, and kept so until the whole of the air has been expelled, which takes from six to eight minutes. In practice the boiling was kept up briskly for ten minutes, and sometimes longer. While the water is still boiling, the india-rubber tube or the exit tube of the receiver is closed with a glass stopper, so tapered that the point slips easily into the tube, and being pressed in closes it tightly. The receiver is now hermetically sealed at the upper contraction, and connection made between the bulb and the flask, by pushing down the tube until the hole *c* is below the cork. A lively disengagement of gas commences, which is kept up by heating the water-bath slowly until the water boils, at which temperature it is kept for some time. When it is judged that the gas has been wholly expelled, the receiver is sealed up at the lower contraction, and the operation is ended.

For chemicals and chemical apparatus supplied to the Expedition, see Appendix C to this chapter.

#### LOWER DECK.

The fittings on the lower deck differed but little from the ordinary fittings of a man-of-war. The wardroom was extended in length to accommodate the additional members of the mess, since—there being no midshipmen or subordinate officers—the sub-lieutenants, as well as the members of the Civilian Staff, messed in the wardroom. The old gunroom was converted into cabins, and the gunroom steward's berth into a chronometer room, and these additional cabins, with those of the gunner, marine officer, and chaplain, were sufficient to provide accommodation for the members of the Civilian Staff.

In the extreme forepart of the lower deck, a small storeroom was built for lobster pots and other basket-work, and two small tiers for spare sounding line.

#### THE HOLD.

The hold of the ship remained unaltered, except in one particular, for the magazines, being no longer required for powder, were converted, the foremost one into a storeroom for spirits of wine, and the after one into a storeroom for dredging rope. The space formerly devoted to shell being amply sufficient, with the reduced number of guns, to provide accommodation both for powder and shell.

The fitting out of the Challenger was commenced in June 1872, and the ship was commissioned at Sheerness on the 15th November of the same year.

When the provisions and most of the stores had been received on board, the ship was carefully swung, to ascertain the errors of the magnetic instruments in use on board, and on the 7th December she sailed for Portsmouth, from which port it had been arranged that