work, and generally known as the Miller-Casella thermometer. It is represented in fig. 27, and the copper case in which it is enclosed when sent down is shown, on a smaller scale, in fig. 28. The instrument is of small size (9 inches in length), to reduce, as far as possible, the friction in passing through the water. The tube is mounted in ebonite, and the scale (Fahrenheit's) is engraved on slips of glass which are fixed to the ebonite alongside the capillary tube of the instrument. The primary bulb of the thermometer is enclosed in a secondary one, and the space between them partially filled with spirit. The thermometer is filled with a solution of creosote in spirit. The capillary portion is bent in the form of a U, and the bend is filled with mercury; the limb furthest from the bulb ends in a cylindrical reservoir, partially filled with the thermometric liquid, but with a large space empty, or rather containing the vapour of the liquid and slightly compressed air. A small piece of steel wire enclosed in a very thin glass tube forms the index; it retains its place in any part of the tube by the spring of a hair tied on one end of it. Each limb carries an index of this kind. When the thermometer is to be used, the indices are drawn down in each limb of the tube by a strong magnet till they rest on the surface of the mercury on each side. When the thermometer is brought up, the height at which the lower end of the index stands in each tube indicates the limit to which the index has been driven by the mercury, the extreme of heat or cold to which the instrument has been exposed.

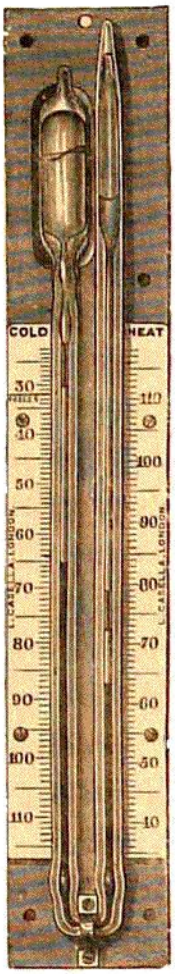

FIG. 27.—Six's Deep-Sea Thermometer.

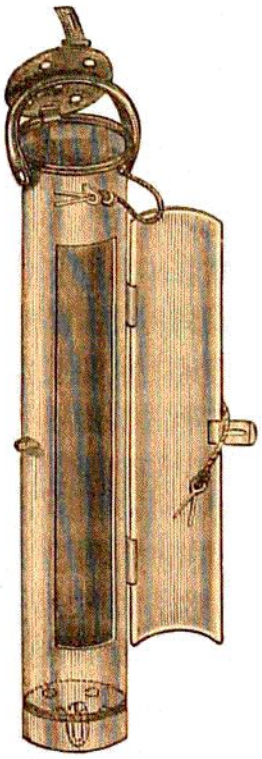

FIG. 28.—Case for enclosing Six's (Miller-Casella) Thermometer.

During the course of the voyage, it became evident that the thermometers as supplied were wanting both in delicacy and in accuracy. It is true that the great source of error had been removed by the application of the secondary bulb, so that the indications were practically unaffected by pressure, but when it had been found that the great bulk of the ocean water is at a low and nearly uniform temperature at great depths, it became of importance to be able to distinguish accurately fractions of a degree. With the thermometers supplied this was impossible, because they were so short for the range of temperature they had to show, that the length occupied by one degree could not easily have been subdivided beyond a quarter, even if the scale had been engraved on the stem, and it was impossible to attain even that degree of accuracy with certainty when the scale was on a slip of glass at the side of the stem, and