CD is the comparison coil S, made of the same wire as the resistance coil T, and equal to it in resistance when the temperatures of both are the same. This coil is immersed in a copper vessel with double sides, filled with water, and the temperature of the water is adjusted by adding iced or hot water until the bridge is balanced. The temperature of the water in the vessel is then read by a mercurial thermometer; and this will also be the temperature of the resistance coil T. To avoid the error which would be otherwise introduced by the leads to the resistance coil T, the cable was constructed of a double core of insulated copper wire, protected by twisted galvanised steel wire. One of the copper

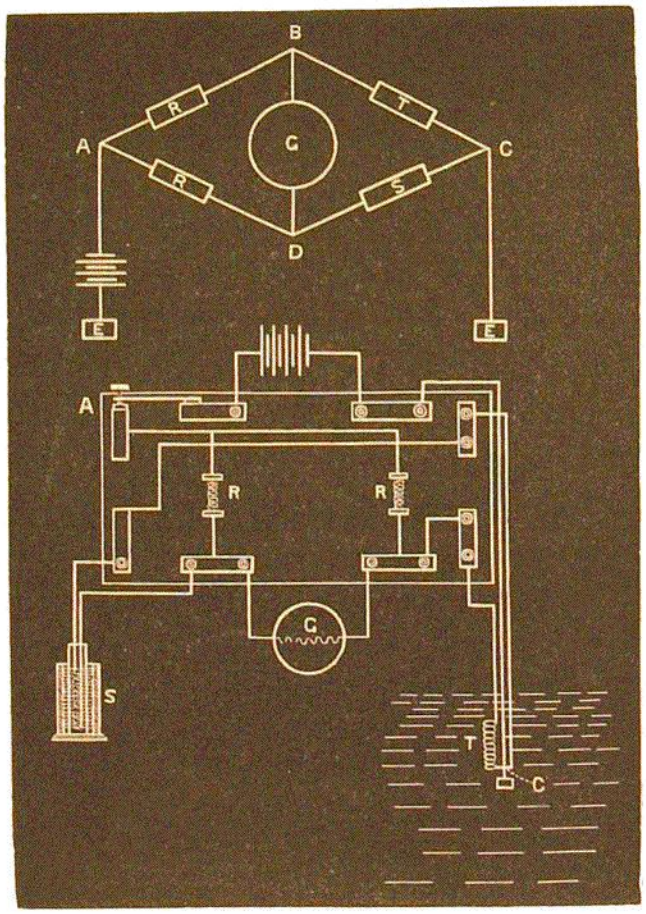

FIG. 32.—Siemens' Electrical Thermometer.

cores was connected to the arm BC of the bridge, and the other to the arm DC, and the steel wire served as the return (earth) connection for both. The resistance coil and comparison coil were made of silk-covered iron wire 0·15 mm. diameter, and each about 432 ohms resistance at a temperature of 66° F. To allow the resistance coil to be readily affected by changes in the temperature of the water, it was coiled on a brass tube with both ends open, allowing a free passage to the water. Sir William Thomson's marine galvanometer, with a mirror and scale, was employed to determine the balance of the bridge.

Several more or less successful observations were made with this instrument during