not, and in order to obtain information on this point some experiments were made by the present writers and the results of these are given in the following communication.

2. *Preliminary Experiments with Mercury.*

In making some preliminary experiments with mercury vapour a Bunsen burner A, fig. 1, was surrounded by a large earth-connected iron cylinder BB

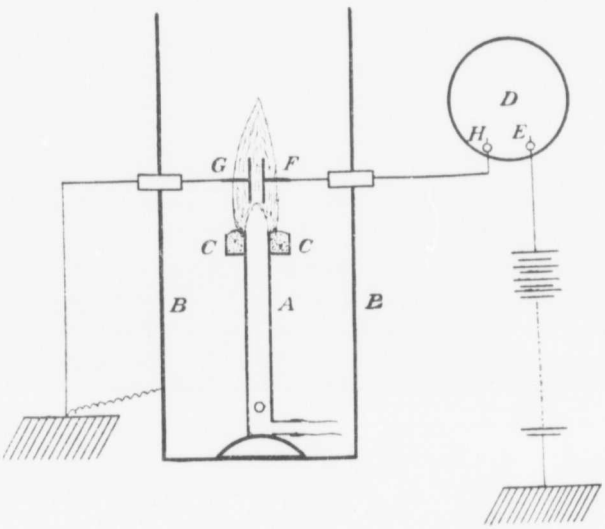

Fig. 1.

for the purpose of screening off air currents from the flame. The burner, which was provided at the top with a close fitting tubular steel cup CC, was also connected to earth. A sensitive D'Arsonval galvanometer, D, was placed upon an insulated stand and one of the terminals, E, was joined to one end of a battery of small storage cells, the other end of which was earthed. Two carefully cleaned platinum discs, F and G, carried by insulating supports were held in position in the flame. One of these, F, was joined to H, the second terminal of the galvanometer, and the other, G, was joined to earth. The discs F and G were each 3 cm. in diameter. With this arrangement it was found that, as soon as the Bunsen burner was lighted with the tubular cup, CC, empty, the galvanometer showed a deflection which indicated that a current was passing through it and that the flame was conducting. When the current was steady and a few drops of mercury were put into the cup, CC, an increase in the galvanometer deflection immediately took place. The heat from the flame warmed the cup and this was sufficient to vaporise the