

covering, G, was arranged to reduce as far as possible the radiation of heat from the crucible.

In this furnace he was not only able to melt several pounds of steel and platinum, but even to vaporize copper which had been packed with carbon in the crucible.*

Siemens also invented a furnace having horizontal electrodes, as shown in Fig 3.† In this furnace the arc passes between the two electrodes B and C, and heats, by radiation, the material contained in the crucible. In both furnaces he provided water-cooled copper electrodes for the negative pole of the arc, to avoid the wasting that takes place when carbon electrodes are used. In Fig. 3, the negative electrode, C, consists of a copper tube, closed at one end, and cooled by water, which is introduced by a smaller

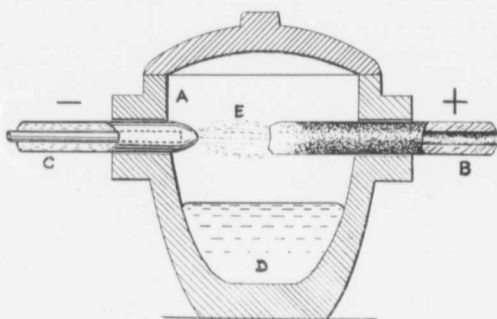


Fig. 3.—Siemens' Horizontal Arc Furnace.

pipe inside it. The positive electrode, B, is a hollow carbon rod, and through it a neutral or reducing gas, can be introduced into the furnace.

In 1883, Faure patented an electric furnace of the resistance type, the heat being generated by the passage of the current through solid conducting rods imbedded in the hearth of the furnace, on the same principle as the electric cooking stove.

The resistance type of electric furnace was made a commercial success by the brothers, E. H. and A. H. Cowles, whose

*Siemens and Huntingdon, *British Assoc. for the Adv. of Science*, 1882, pp. 496-8.

†W. Siemens' English patent, 4,208, 1878, see Borchers' *Electric Smelting*.