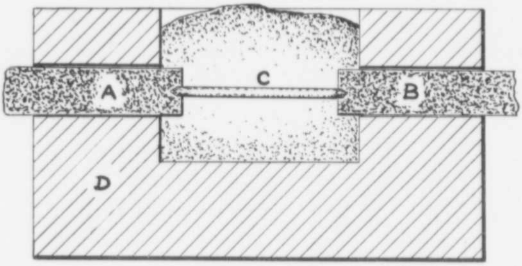

Fig. 14.—Borchers' Resistance Furnace.

The simplest example is Borchers' experimental resistance furnace, Fig. 14,* in which a thin pencil of carbon C is supported between stout carbon rods A and B, and the charge to be heated surrounds C. The current flows between A and B through C, and may raise the latter to a white heat. The charge serves in part as an envelope to retain the heat.

Acheson's carborundum furnace, Fig. 8, is the most important example of this class. In this furnace the conducting core is composed of granular carbon, and is supported and surrounded by the material to be heated. The furnace is efficient, because the heat is developed in the midst of the charge, which serves to retain it. The temperature can also be exactly regulated by varying the current, while by using a number of cores, as in the siloxicon furnace, Fig. 41, page 154, it is possible to obtain a fairly uniform temperature throughout a large portion of the charge. On the other hand, when the furnace is in operation, it is impossible to regulate the resistance of the core,† and since this decreases considerably as the furnace becomes hotter, the current, if supplied at a constant voltage, may increase during the work of the furnace until it becomes too great for the dynamo, or transformer from which it is supplied; thus involving the use of special apparatus for regulating the voltage. As the material to be heated acts as an envelope to retain the heat, and as the charge does not become fused, the outer walls can be of the simplest de-

*Borchers' Electric Smelting and Refining, 1897 Ed., Figs. 54, 55, 172, and Electrochemical Industry, vol. iii., p. 215.

†In small furnaces of this type the resistance of the core can be regulated, within moderate limits, by placing weights on the charge.