even the diamond itself, and were the origin of the important carborundum industry.

Carborundum is made by placing a mixture of sand and coke with smaller amounts of sawdust and salt in a firebrick chamber, and passing an electric current through a core of carbon placed in the middle of the charge. The sand, in the charge, becomes reduced to silicon, and combines with carbon to form carborundum, which, at the high temperature (over 2,000°C.) of the furnace, assumes a beautiful, iridescent, crystalline form, and is of such extreme hardness that it has proved to be a very valuable abrasive. It is now widely used as a grinding agent in the metal trades and other industries, and it is also useful as a refractory lining for electric and other furnaces, and as a deoxidizing addition in the manufacture of steel.

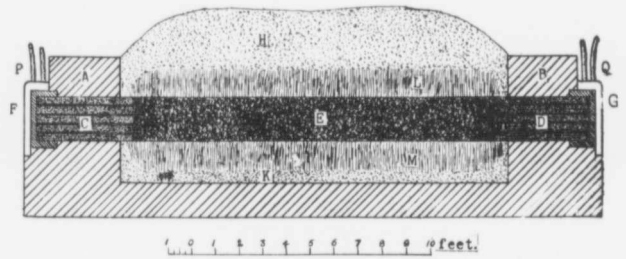


Fig. 8.—Acheson's Carborundum Furnace.

The furnace employed* is shown in Fig. 8, and consists of two permanent end walls, A and B, which support large bundles of carbon rods, C and D, in heavy bronze holders. The current is carried between C and D by a core of broken carbon, E, and as the charge does not fuse, this core remains in position until the end of the operation. A layer of brilliant graphite was usually found between the core and the crystalline carborundum. This graphite resulted from the decomposition of the carbide in the hottest part of the furnace. From this observation Acheson evolved the artificial production of graphite, which he patented in 1896.† It consists in heating coke, anthracite or other form of carbon containing a small amount of iron oxide or certain other substances.

*The Carborundum Furnace, F. A. J. FitzGerald. Electrochemical Industry, vol. iv., p. 53, 1906.

†The Conversation of Amorphous Carbon to Graphite, F. A. J. FitzGerald, Journal of the Franklin Institute, Nov., 1902.