

good quality steel from scrap steel, pig iron, etc.; and good crucible and special alloy steels have for some years been produced commercially in the electric furnace. The original patents of these pioneers of electric steel-making were taken out about the year 1900,* just one hundred years after the discovery of the voltaic battery.

The origin of the electric smelting of iron ores was, however, somewhat earlier than this. In the year 1898 Captain Stassano,[†] in Italy, patented his electrical furnace for smelting iron ores, and in the following year demonstrated the working of his process. Quite a sensation was produced by his experiments, as although it was not surprising to learn that iron ores could be smelted by electricity, the ordinary price of electric power was so high that it appeared preposterous to attempt to use it in competition with coke in the blast furnace.

It is a matter of general knowledge that the retail price of any commodity is higher, and sometimes even several times as high as the wholesale price, or the cost of production; but it was probably not generally realized until quite recently that the small consumer of electric light pays about one hundred times as much for electricity as the actual cost of producing it from a good water-power. This enormous difference had given an exaggerated idea of the costliness of electrical power, and was, no doubt, largely responsible for the skepticism with which Stassano's early experiments were received. These experiments of Stassano, although not as yet commercially successful, have, no doubt, impressed on many minds the financial possibility of electric smelting in general, and a large crop of such processes has followed.

Some other furnaces suitable for smelting iron ores are those of Keller, Heroult and Harmet, which are described and illustrated in Chapter v.

In view of the great importance to Canada of developing the electric smelting of iron ores, the Canadian Government appointed in 1903 a Commission under Dr. Haanel to report on the electro-thermic processes for the smelting of iron ores and the making of steel in operation in Europe. The Commission visited Europe in 1904 and saw the Heroult, Keller and Kjellin furnaces in commercial operation making steel and ferro alloys. At Dr. Haanel's

*The Colby induction steel furnace was patented in 1890. See *Electrochemical Industry*, vol. iii. (1905), p. 299, and vol. v. (1907), p. 232.

[†]Stassano Steel Furnace. *Electrochemist and Metallurgist*, vol. i. (1901), p. 230; *Electrochemical Industry*, vol. i (1902-3), pp. 247, 363.