ing of iron ores, happened at that time to be on a visit in Ottawa. He signified his consent, if the appropriation were made, to undertake the designing of a furnace of about 250 horse-power capacity, and the investigation of the factors entering into the economic production of pig-iron from Canadian iron ores by the electro-thermic process.

"The Lake Superior Power Company, of Sault Ste. Marie offered a building in which to erect the plant, and the use of one of their alternators of 300 electric horse-power capacity, free of expense for four months. It was decided to accept this offer, and the plant was ordered to be erected in the building provided for this purpose.

"The necessary transformer to transform the current down from 2,200 volts, to about 400, such as was required for our experiments, and the necessary measuring instruments to determine the power consumed were ordered from the

experiments different classes of Canadian magnetite from the different sources of supply, all of high sulphur content, with the exception of the Wilbur magnetite, which was low in sulphur, were employed.

"From theoretical grounds, much difficulty was expected to be encountered in the smelting of magnetite. This can be best understood by describing to you the construction of the furnace which, you will perceive, is exceedingly simple."

## The Furnace Described.

Dr. Haanel used a glass to describe the furnace, explaining that the walls are lined with fire brick; the bottom with carbon; and that just above this carbon lining is the tapping hole, whilst higher up is another hole for floating off the slag. In this crucible the ore is placed, and a sus-



Electric Furnace, showing Method of Regulating Electrode and Measuring Instruments in Place.

Westinghouse Company, and electrodes six feet long and sixteen inches square section were ordered from Sweden. The construction of bins, overhead work of the furnace, construction and erection of furnace and experimentation to adjust the capacity of the crucible of the furnace to the power available consumed the greater part of the fall and winter.

## Tried at the Soo.

The experimentation on Canadian ores began in earnest the middle of February, the furnace being in operation night and day, with some intermissions, until March 5th. During that time about 150 casts were made, yielding about 55 tons of pig iron. For the first experiments the ores employed were hæmatite, such as used by the Algoma Steel Company in their blast furnaces; for the remainder of the

pended carbon electrode 6 ft. long x 16 in. square, (imported from Sweden), is inserted therein. An electric current is passed through the electrode into the ore. Now, whenever the electric current meets with resistance, it is changed into heat. In this case the electric current sent through the electrode is stopped by the ore in the crucible, and the heat generated from this resistance reduces the ore from a mineral condition into a metallic state. Charcoal is the reducing material, and the iron is melted to the bottom of the crucible, when it is tapped out and run into pig-iron moulds, as in blast furnace practice.

"The regulation temperature is maintained by a man who looks after the instrument and moves the electrode, but this is only in the experimental stage. When it is put to commercial utility this regulation will be automatic."