To all whom it may concern:

Be it known that I, HANS NATHUSIS, residing at Friedenshütte, Kreis Beuthen, Germany, have invented a certain new and useful Electrode for Use in Electric Furnaces and for other Purposes, of which the following is a specification.

This invention relates to electrodes adapted for use in electric furnaces and for other purposes and consisting of a conductor of the second order, and to a process for manufacturing such electrodes. As is known, electrodes are at present made of conductors of the first order, e.g. British anthracite which is compressed in suitable molds after a binder such as tar, pitch, etc., has been added.

It is difficult to obtain suitable anthracite and it is therefore desirable to find a substitute for that material.

I have found that electrodes can be made of conductors of the second order, e.g. dolomite, if a material of this character is mixed with conductors of the first order such as metals. Any suitable binders, such as tar, pitch or the like, and coke or other materials containing carbon, may be added. The mixture is compressed in suitable molds. After molding, it is baked and further treated in the same manner as carbon electrodes or converter linings.

Reference is to be had to the accompanying drawings in which Figure 1 is a longitudinal and Fig. 2 a cross section of an electrode mold with the electrode mass and its insertions in position.

The mass b, composed of dolomite and additions, is forced into the mold by stamping. The conductors of the first order c are so arranged as to make contact with the terminals even if the conductor of the second order is not yet heated and, consequently, has not yet become conductive.

When current flows through the electrode, the metallic substances will melt. They are, so to say, disseminated in the dolomite and are thereby combined with it to such an extent that the electrode remains conductive even if cold.

Preferably, I make the metal substances of sheet metal, as illustrated, in the form of strips, clips, spirals, etc. Their percentage in relation to the conductor of the second order is determined by the required minimum conductivity of the electrode.

Any metal may be used which does not contaminate the charge of the furnace.

It is possible, but not indispensable, that the substances of which the electrode is composed will undergo certain chemical reactions with each other. This, however, has no detrimental effect on the operation of the electrodes.

A particular advantage of the electrodes manufactured by my improved process apart from their cheapness, is that they are extraordinarily strong and dense and have no tendency to break. Even if, in consequence of careless operation, particles of the electrodes should fall into the bath, they have the small percentage of carbon contained in the electrode, they do not increase the carbon content of the bath to any appreciable extent. It follows that soft charges can be obtained which was difficult with the carbon electrodes heretofore in use.

It has been proposed to provide carbon electrodes with insertions, etc., or cores of metal but only with the object of increasing the conductivity of such electrodes which per se consist of a conductor of the first order. The metal insertions in these old electrodes are however not disseminated in the mass of the electrodes.

This has no bearing on my process in which a conductor of the second order forms the skeleton of the electrode. The same process and the same composition of electrode mass may be advantageously applied to the manufacture of substitutes for arc lamp.
Electrodes, contact electrodes etc. in all cases where a solid conductor of not too limited conductivity should be used.

I claim:

1. A process for manufacturing electrodes from conductors of the second order consisting in inserting metal into dolomite, adding suitable binders and substances containing carbon, stamping the mass in molds, baking it and melting the metal insertions by means of electric current.

2. An electrode consisting of a conductor of the second order, comprising dolomite and a binder, and containing metal disseminated within its mass.

In testimony whereof I affix my signature in presence of two witnesses.

HANS NATHUSIUS.

Witnesses:

Henry Haster,
Allen F. Jennings.