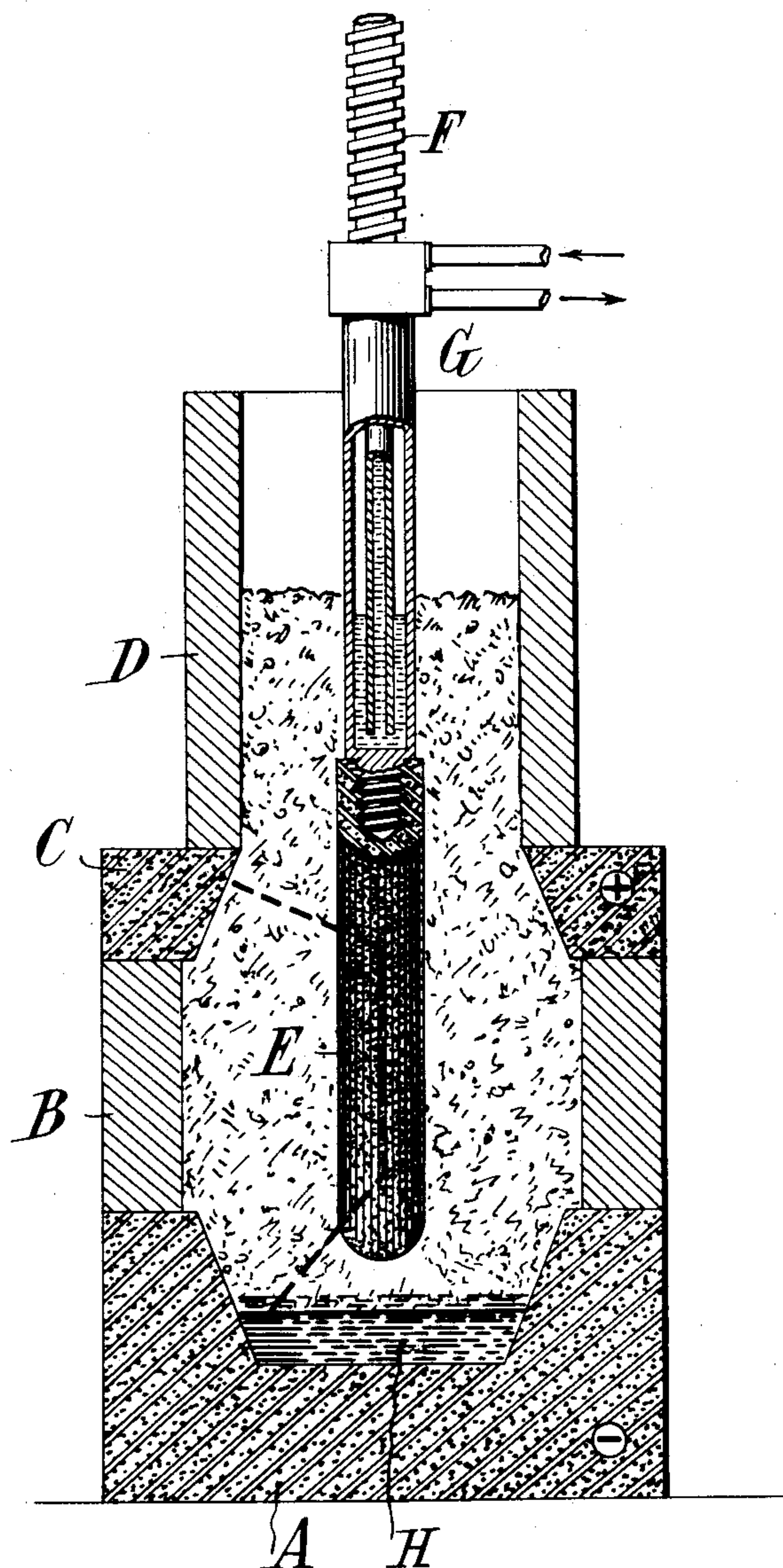


No. 871,273.

PATENTED NOV. 19, 1907.

P. L. T. HÉROULT.
ELECTRIC FURNACE AND METHOD.
APPLICATION FILED MAY 3, 1907.



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PAUL L. T. HÉROULT, OF LA PRAZ, FRANCE, ASSIGNOR TO SOCIÉTÉ ÉLECTRO-MÉTALLURGIQUE FRANÇAISE, OF FROGES, ISÈRE, FRANCE.

ELECTRIC FURNACE AND METHOD.

No. 871,273.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed May 3, 1907. Serial No. 371,692.

To all whom it may concern:

Be it known that I, PAUL LOUIS TOUS-SAINT HÉROULT, a citizen of the Republic of France, residing at La Praz, Savoie, France, have invented certain new and useful Improvements in Electric Furnaces and Methods, of which the following is a specification.

This invention aims to provide certain improvements whereby the operation of electric furnaces may be simplified, and whereby especially the difficulties previously incident to movable electrodes are eliminated. For this purpose I prefer to introduce into the charge at a point between two fixed electrodes a device adapted to form part of the path of the current through the charge, and which I call a "false" or "dummy" electrode. By varying the position of this false electrode, which is of conducting material or at least of greater conductivity than the material of the charge, I vary the total resistance to the passage of the current between the two electrodes, and so regulate the furnace. This false electrode may be more easily shifted than the true electrodes, since it does not require any electrical connections or sliding stuffing-boxes or other objectionable details. It may, for example, pass through the center of a ring-shaped electrode arranged a suitable distance above the base of the furnace, which base may be the other electrode. By lifting or lowering the false electrode the distance from the upper fixed electrode is not varied, but that from the lower electrode or from the molten portion of the charge is varied to produce the desired variations in resistance.

The accompanying drawings illustrate in vertical section an embodiment of the invention.

Referring to the embodiment illustrated, the base or hearth A of the furnace forms one electrode, and is made of carbon or other electric conducting material. The side walls B of the furnace are of clay or other nonconducting material. A ring C of carbon may constitute the opposite electrode, and above this may be arranged the shaft D through which the charge is fed, say iron ore and coke in the case of an iron smelting furnace.

Instead of the ring C various other types of electrodes fixed at least during the opera-

tion of the furnace, may be utilized, such, for example, as those described in my application for patent, Serial No. 371,691, filed May 3, 1907, pending concurrently herewith.

The false electrode E may be a stick of carbon which is passed down through the center of the charge and is adjustable as by means of a screw F. It may be supported by a metallic rod G which is made hollow in the manner shown for cooling by means of water or other fluid. For starting the furnace the false electrode E may be extended down to the hearth, or a packing of carbon may be interposed between the hearth and the lower end of the false electrode, and a similar packing of carbon may be introduced between the upper electrode C and the false electrode. After the furnace is set in operation the current passes approximately by way of the dotted path shown. The electrode C may be undercut, and so arranged that the angle of the face of the charge immediately adjacent leaves a short gap, causing an arc to spring from the electrode to the charge.

The top of the furnace may be left open as shown, and the regulation may be effected with the greatest ease by raising or lowering the false electrode E so as to increase or diminish the gap and consequently the resistance between its lower end and the mass of molten material H in the bottom of the furnace.

The false or dummy electrode itself constitutes an invention which may be utilized with various types of furnaces other than that shown, such, for example, as multiphase furnaces.

Though I have described with great particularity certain embodiments of my invention, yet it is not to be understood therefrom that the invention is restricted to the specific embodiments described. Various modifications thereof may be made by those skilled in the art without departure from the invention.

What I claim is:—

1. An electric furnace having a pair of electrodes, a conductor adapted to form part of the path of the current between said electrodes, and means for shifting said conductor to vary the length of the part of the path formed thereby.

2. An electric furnace having a pair of fixed electrodes, and a false electrode adapt-

ed to form part of the path of the current through the charge, and adjustable to vary the length of such part.

3. An electric furnace having a base of
5 conducting material, a feeding shaft, a ring
electrode at the base of said shaft, and a false
electrode passing through said shaft and the
charge to form part of the path of the current
from the ring electrode to the base, and ad-
10 justable to vary the length of said part.

4. Means for regulating the operation of an
electric furnace consisting of a false or dummy

electrode without electrical connections
adapted to form part of the path of the cur-
rent between the electrodes of the furnace, 15
and to be shifted so as to vary the length of
such part.

In witness whereof, I have hereunto
signed my name in the presence of two sub-
scribing witnesses.

PAUL L. T. HÉROULT.

Witnesses:

DOMINGO A. USINA,
THEODORE T. SNELI.