No. 647,614. Patented Apr. 17, 1900.

M. RUTHENBURG.

ELECTRIC FURNACE.

(Application filed Nov. 22, 1899.)

(No Model.)

FIG. 1.

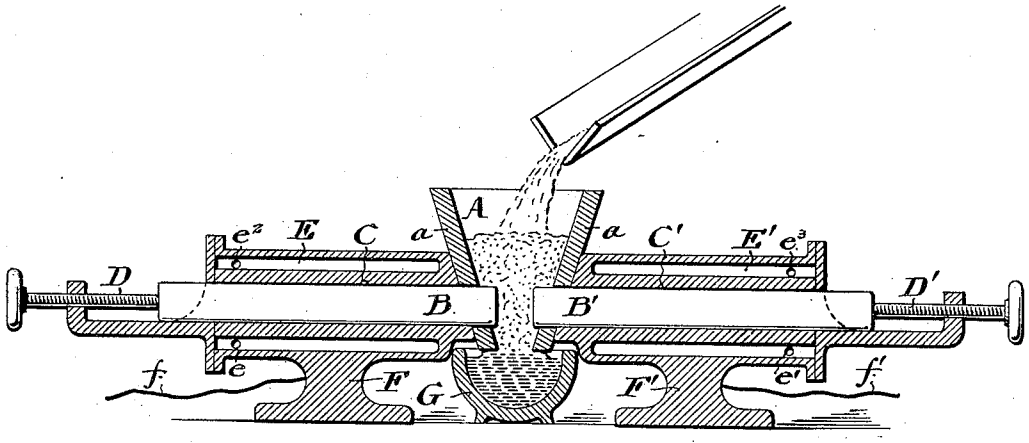


FIG. 2.

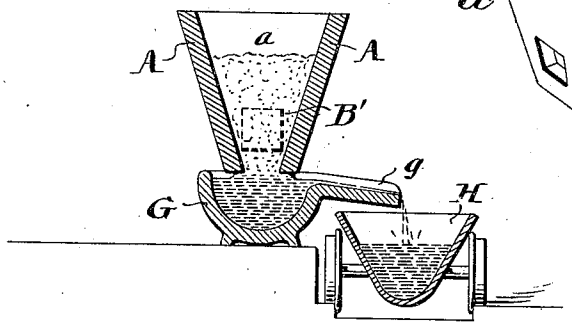
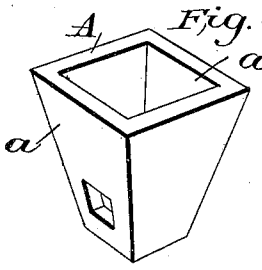


Fig. 3.



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UNITED STATES PATENT OFFICE.

MARCUS RUTHENBURG, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRIC FURNACE.

SPECIFICATION forming part of Letters Patent No. 647,614, dated April 17, 1900.

Application filed November 22, 1899. Serial No. 737,853. (No model.)

To all whom it may concern:

Be it known that I, MARCUS RUTHENBURG, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Electric Furnaces, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to an electric furnace peculiarly adapted to be used in smelting and refining ores. As ordinarily constructed such furnaces are arranged to be operated intermittently, the material to be treated being alternately charged and discharged with respect to a hearth.

It is the object of my invention to provide a furnace of such construction and arrangement as to permit of the continuous operation thereof, and thus increase the output by avoiding the delays incident to the operation of charging and discharging aforesaid.

My invention consists in a furnace comprising terminals of an electric circuit opposed within a casing or bosh which is open at both top and bottom and through which the material to be treated may be continuously fed, said furnace being provided beneath said bosh with a crucible to receive the smelted material, said crucible comprising an outlet from which the smelted material may be continuously overflowed and discharged.

My invention also comprehends certain details of construction hereinafter more definitely specified and claimed.

In the accompanying drawings, wherein I have shown a convenient embodiment of my invention, Figure 1 is a central longitudinal sectional view, and Fig. 2 is a transverse sectional view. Fig. 3 is a perspective view of the bosh.

In said figures, A is the casing or bosh, which is open at both top and bottom, as shown, and is preferably in the form of an inverted quadrilateral pyramid conveniently formed of slabs of refractory material. Said bosh is formed of the peculiar shape indicated in order that the material may be retarded in passing therethrough and in a measure supported by the inclined side walls thereof until liquefied. The opposed walls *a a* of said bosh are perforated to receive the proximal ends of the electrodes B B′, which are mounted to slide within tubular bearings C C′, provided with means, such as the screws D D′, to facilitate their longitudinal adjustment. Said bearings C C′ are surrounded by jackets E E′ in such relation therewith as to permit the flow of water or any other convenient cooling medium therebetween, the circulation of said cooling medium being conveniently effected by means of inlets *e e′* and outlets e^2 e^3. Said bearings and the jackets surrounding them are respectively insulated and mounted upon standards F F′ in rigid relation in connection with the current-conductors *f f′*. Beneath said bosh A is a crucible G, preferably of hemispherical form, as shown. Said crucible is provided with an outlet *g* at its top, beneath said bosh, arranged to overhang the wheeled receptacle or carrier H, so that the material overflowed through said discharge-outlet is deposited within said receptacle and may be conveniently removed.

The operation of the device is as follows: The material to be treated is continuously fed within the bosh A by any convenient means, and said material lodges within said bosh, upon the inclined sides thereof, until liquefied by the current passing between the electrodes B B′. The liquefied material gravitates into the crucible G and rising therein to the level of the outlet *g* is discharged through the latter. The molten liquid within said crucible G forms an additional check to the passage of the unsmelted material through said bosh, and the furnace is to a certain extent self-regulated, in that the material is retained within the bosh until smelted and is discharged therefrom as rapidly as it is liquefied, the rate of flow being of course determined by the nature of the material and the proportions of the current employed. When the terminals B B′ are composed of carbon, I find that advantageous results are secured when the current passing therethrough equals one thousand amperes per square inch of the cross-section thereof.

In view of the state of the art it is to be understood that I do not desire to broadly claim an electric furnace having opposed electrodes and means for adjusting the same. However, I believe it to be new to combine in an electric furnace the elements hereinbefore de-

scribed, and therefore do not desire to limit myself to the precise arrangement and construction which I have shown.

I claim—

1. In an electric furnace, the combination with opposed terminals of an electric circuit, of a bosh laterally inclosing said terminals, and open at the top and bottom thereof, a crucible directly beneath said bosh in relatively-movable relation therewith, and an overflow-outlet at the top of said crucible, substantially as set forth.

2. In an electric furnace, the combination with opposed terminals of an electric circuit, of a bosh of quadrilateral form, laterally inclosing said terminals and open at the top and bottom thereof, a crucible directly beneath said bosh, and an overflow-outlet at the top of said crucible, substantially as set forth.

MARCUS RUTHENBURG.

Witnesses:
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