

R. EICKWORTH.
CRUCIBLE FURNACE.
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1,054,286.

Patented Feb. 25, 1913.

Fig. 1

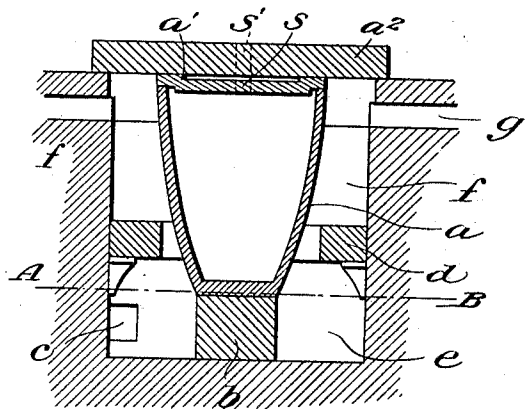
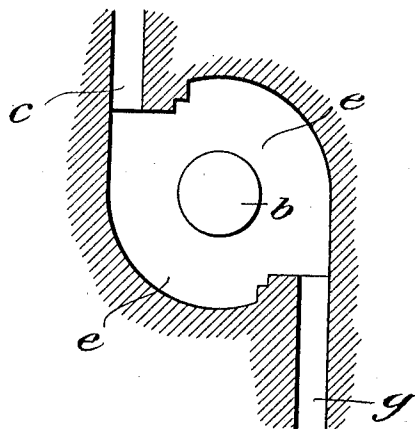


Fig. 2.



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UNITED STATES PATENT OFFICE.

REGNIER EICKWORTH, OF WITTEN, GERMANY.

CRUCIBLE-FURNACE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, REGNIER EICKWORTH, a subject of the German Emperor, and residing at Witten-Ruhr, Germany, have invented certain new and useful Improvements in Crucible-Furnaces, of which the following is a specification.

My invention relates to crucible-furnaces for chemical smelting processes.

It is well-known that when gas-heated crucible-furnaces known heretofore are used for these purposes as for instance, the smelting of barium nitrate the crucibles readily crack. This is due to the smelting process beginning too early in the more elevated parts of the crucible, because the thickness of wall there is less than below, and the temperature in such furnaces is substantially the same at the top and bottom. The gases which are produced subsequently in the bottom part of the crucible and can only escape upward with difficulty, then burst the crucible. In order to avoid these defects it is necessary to heat the crucible so that premature smelting in the upper part of the crucible is avoided. It has been attempted heretofore to remedy the defect of smelting beginning above by employing crucibles of special form and supplying the heating gases horizontally to the crucibles. According to my invention, however, I employ the usual form of crucible, in which the thickness of wall below is very considerably greater than above; accordingly the lower part of the crucible must first be heated very considerably more highly than the upper, and only as the smelting process proceeds upward may the heating increase there also until at last the crucible is uniformly heated.

Now a primary object of my invention is to provide a crucible-furnace which satisfies these conditions and thus remedies the disadvantages which existed heretofore when smelting in the customary crucibles.

According to my invention the entire heating chamber or furnace is divided into two parts, *i. e.* a lower, and an upper, combustion chamber. The two chambers are connected only by way of a relatively narrow, *e. g.* annular chamber around the crucible. When the process begins great heat is produced at first only in the lower combustion chamber, to which the gas is supplied. The heating due to the discharging

products of combustion in the upper part will gradually become greater and only in the course of a certain time, which must be such that it suffices for the completion of the smelting process, will the heating be more or less uniform. Preferably, I make the section of the upper combustion chamber gradually increasing upwardly. The gases generated in the crucible can be drawn off through suitable apertures in the cover.

Some illustrative embodiments of my invention are represented by way of example on the accompanying drawings, wherein:—

Figure 1 is a vertical section through my improved crucible-furnace according to my invention; and Fig. 2 is a horizontal section on the line A—B in Fig. 1.

Like reference characters designate like parts in all views.

Referring to the drawing, Fig. 1 shows a simple form of furnace in which the two superposed heating chambers are separated only by an annular space one from the other. The crucible *a* stands, as usual, on a support *b*. The fuel gas enters through conduit *c* and burns in the chamber *e* bounded by the ring *d* and heats the lower part of the crucible. The ring *d* is spaced from the walls of the crucible and divides the furnace into an upper and a lower chamber. The ring *d* is supported by brackets upon the walls of the furnace. The products of combustion pass away through the upper chamber *f* and the conduits *g*. The crucible is closed by a cover *a*¹ and the furnace by a cover *a*², which are provided with registering openings *s*, *s*¹ respectively for drawing off the gases generated in the crucible.

I claim:—

1. In a crucible-furnace, arranged to support a crucible therein, a refractory ring completely surrounding a portion of the crucible between its top and bottom, and spaced from the walls of such crucible, and means upon the walls of the furnace for supporting said ring, the internal diameter of the ring being substantially less than the internal diameter of the furnace-walls.

2. In a crucible-furnace arranged to support a crucible therein, a refractory ring completely surrounding the crucible between its top and bottom and spaced from the walls of such crucible, two superposed heating-chambers surrounding the crucible

respectively above and below said ring, a
cover for the crucible, a cover for the upper
heating-chamber, both covers having regis-
tering outlet-openings, a gas-supply flue for
5 the lower heating-chamber, and a gas-outlet
flue for the upper enlarged heating-cham-
ber.

In testimony, that I claim the foregoing
as my invention, I have signed my name in
presence of two subscribing witnesses.

REGNIER EICKWORTH. [L. S.]

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
