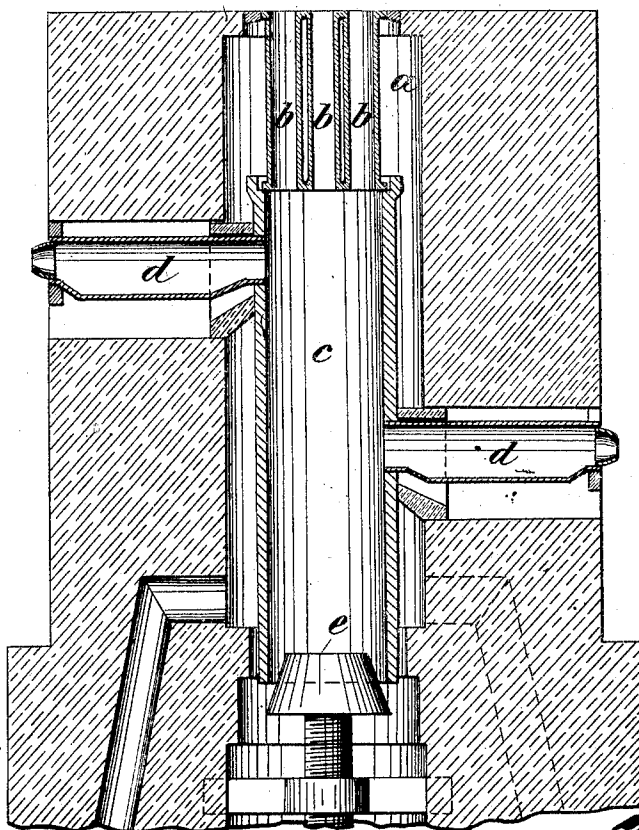
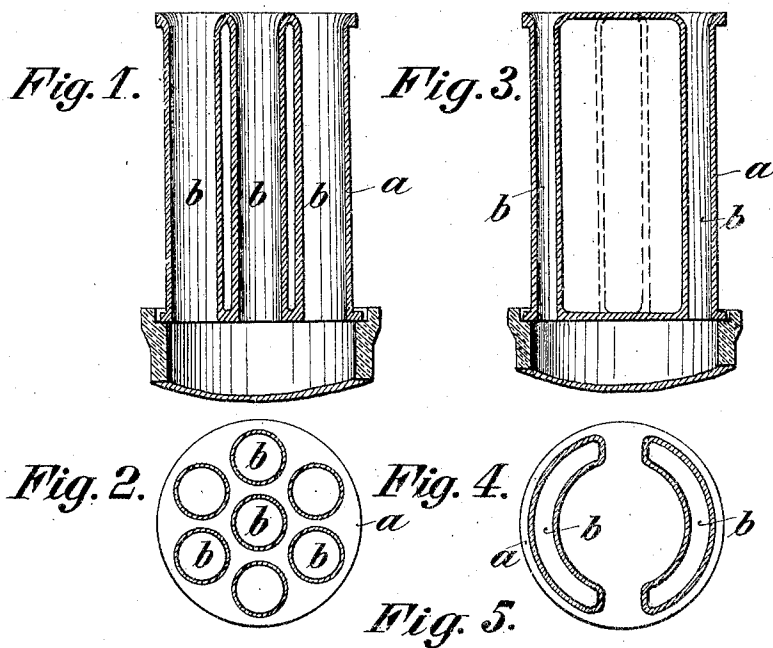


C. ROITZHEIM.
 HEATER FOR ZINC REDUCING FURNACES.
 APPLICATION FILED JAN. 19, 1912.

1,038,205.

Patented Sept. 10, 1912.



Witnesses:
 Georg Otto
 Max Schmidt

Inventor:
 Carl Roitzheim

UNITED STATES PATENT OFFICE.

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HEATER FOR ZINC-REDUCING FURNACES.

1,038,205.

Specification of Letters Patent.

Patented Sept. 10, 1912.

Application filed January 19, 1912. Serial No. 672,224.

To all whom it may concern:

Be it known that I, CARL ROITZHEIM, a subject of the German Emperor, and resident of 23 Am Bayenturm, Cologne-on-the Rhine, Germany, have invented certain new and useful Improvements in Heaters for Zinc-Reducing Furnaces, of which the following is a specification.

The present invention relates to an arrangement for heating the charge to be reduced in muffles or the furnace chamber of a zinc reducing furnace. Arrangements of this kind are already known but they have the disadvantage, that owing to the large sectional area of the heater and the bad heat conducting capacity of the charge, the heating of the latter required a long time. The outermost particles which are directly exposed to the heat very soon assume the temperature of the heater, while the core of the charge remains cold for hours.

It is very desirable in practice to reduce the heating period if the process of reduction is to be a continuous one. If the heating proceeds slowly this will, however, require a large capacity and therefore also a large volume of the heater.

These difficulties are obviated by the present invention, by the charge being conducted through cavities or tubes and thereby quickly and thoroughly heated.

In the accompanying drawings the present invention is exemplified in a constructional form.

Figures 1 and 2 showing the heater in longitudinal and cross section respectively. Figs. 3 and 4 show another constructional form. Fig. 5 is the heater in combination with a vertical muffle.

The heater *a* has cavities or tubes *b* of small sectional areas adapted to receive the charge. In consequence of the large contact surface and the small sectional area of the tubes the charge is quickly and completely heated and the heating gases are

better utilized. From this heater the charge passes into the muffle *c* beneath it. The zinc vapors are condensed in the receiver *d*, while the residues in the muffle are removed continuously or intermittently at *e*. The charge sinks gradually in the muffle and the dimensions must be so chosen, that the ore residues reaching the bottom are practically free of zinc. For insuring the constant sinking of the charge from the heater a corresponding fresh quantity is filled into the same. When the zinc ore is reduced in hearth furnaces the operation is similar to that described.

The furnace *f* incloses the free heating charging device *a*, which is disposed substantially wholly outside the reduction chamber *c*, and thus the charging device *a*, is subjected to the heat of the furnace so that the charge going through the charging passages *b*, will be heated to a high temperature prior to its entrance to the reduction chamber *c*.

I claim:

A metal reduction furnace comprising a furnace chamber and a reduction chamber, a charging device disposed within the furnace chamber and substantially wholly outside the reduction chamber and comprising a plurality of charging passages of relatively reduced cross-section with respect to their length and arranged to deliver to said reduction chamber, said charging device being subjected to the heat of the furnace whereby the charge is heated prior to its entrance into said chamber, substantially as described.

In testimony whereof I have hereunto signed my name this 9th day of January, 1912, in the presence of two subscribing witnesses.

CARL ROITZHEIM.

Witnesses:

JOHANN SCHRÖDER,
HANS KOLDE.