

No. 818,070.

PATENTED APR. 17, 1906.

R. ZIESING.
RETORT.

APPLICATION FILED DEC. 29, 1903.

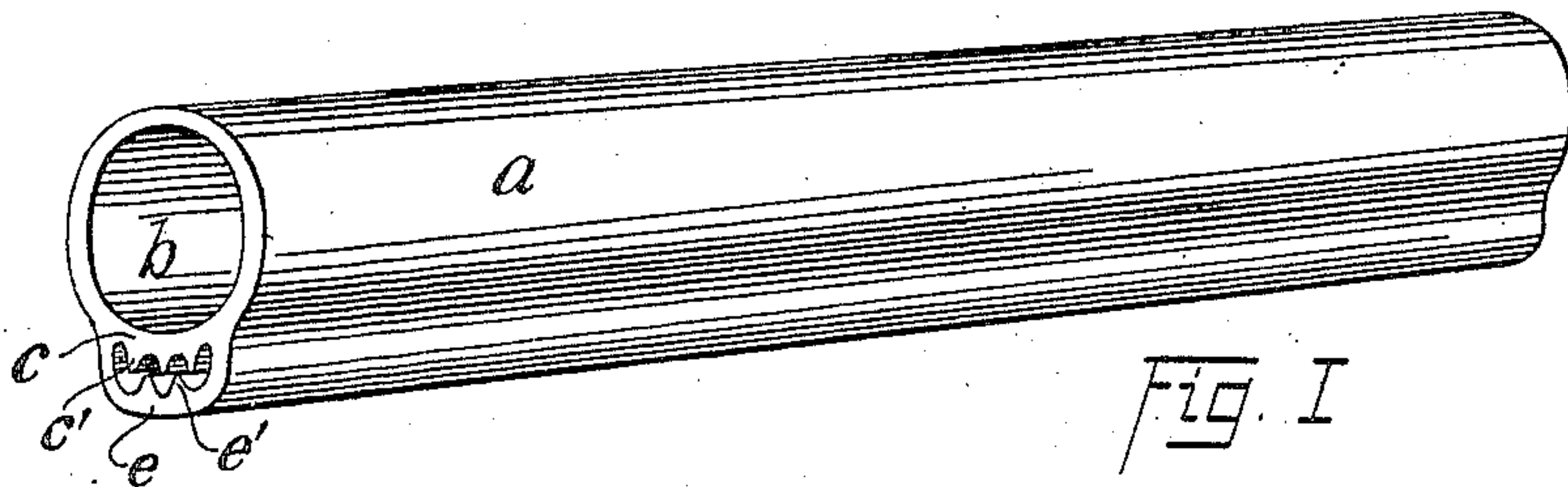


Fig. I

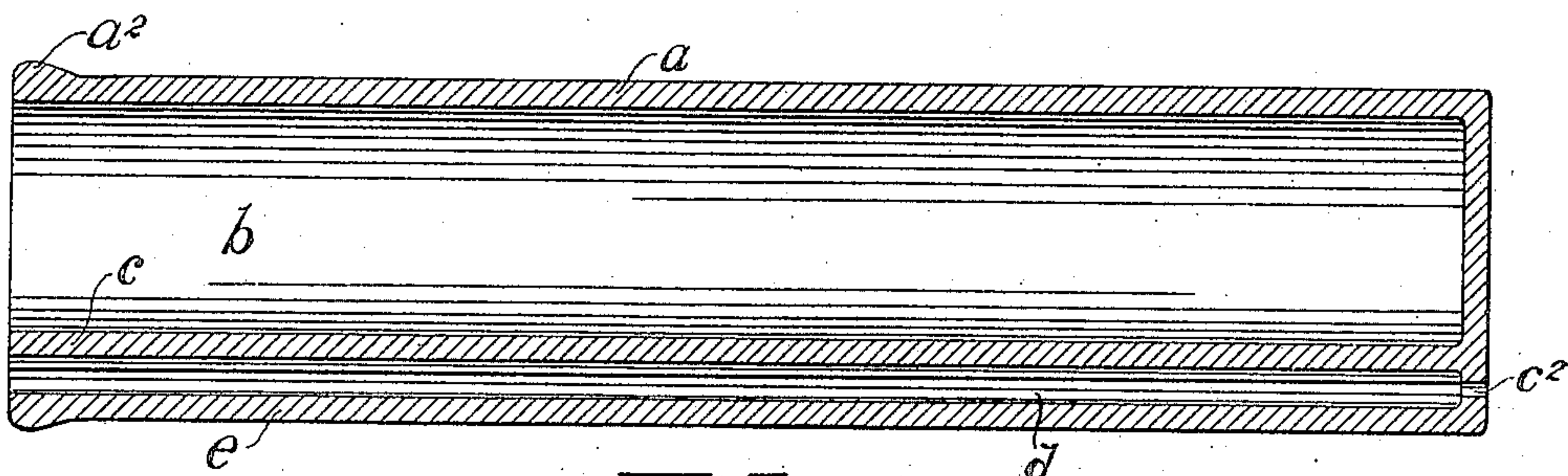


Fig. II

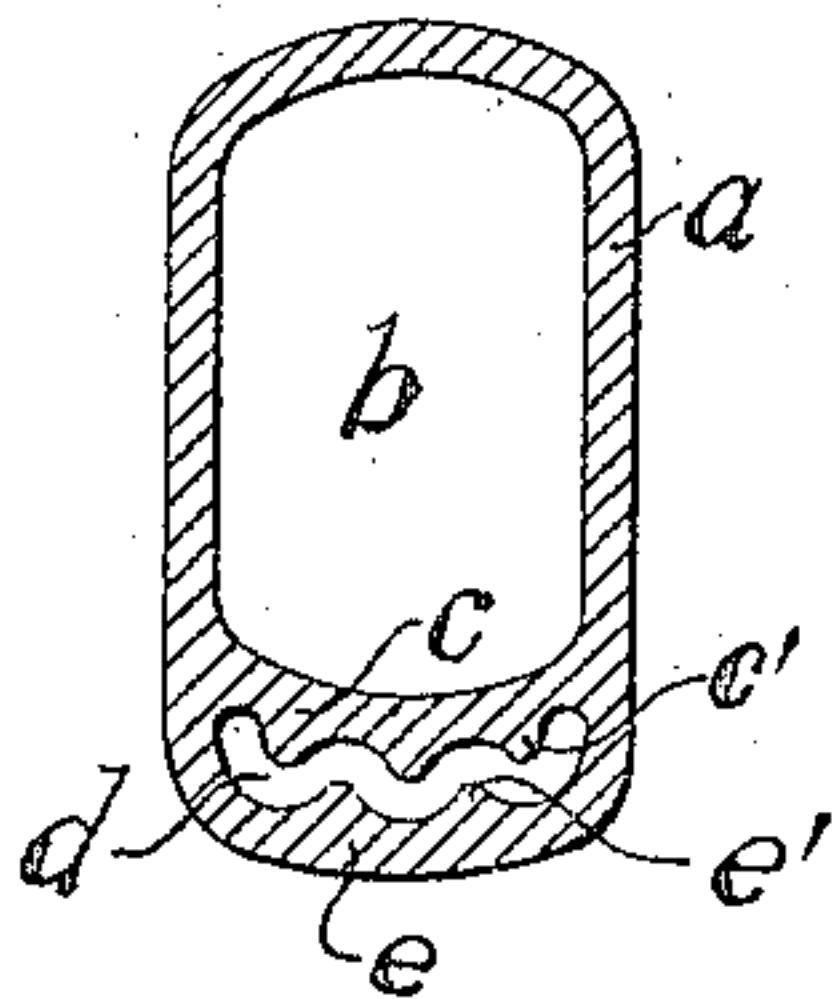


Fig. III

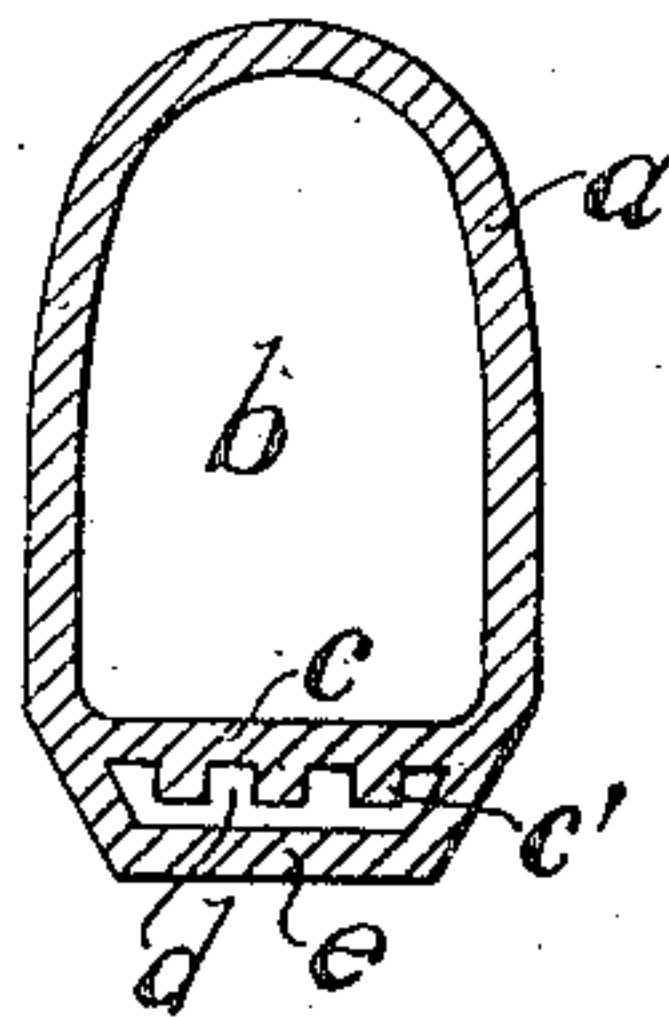


Fig. IV

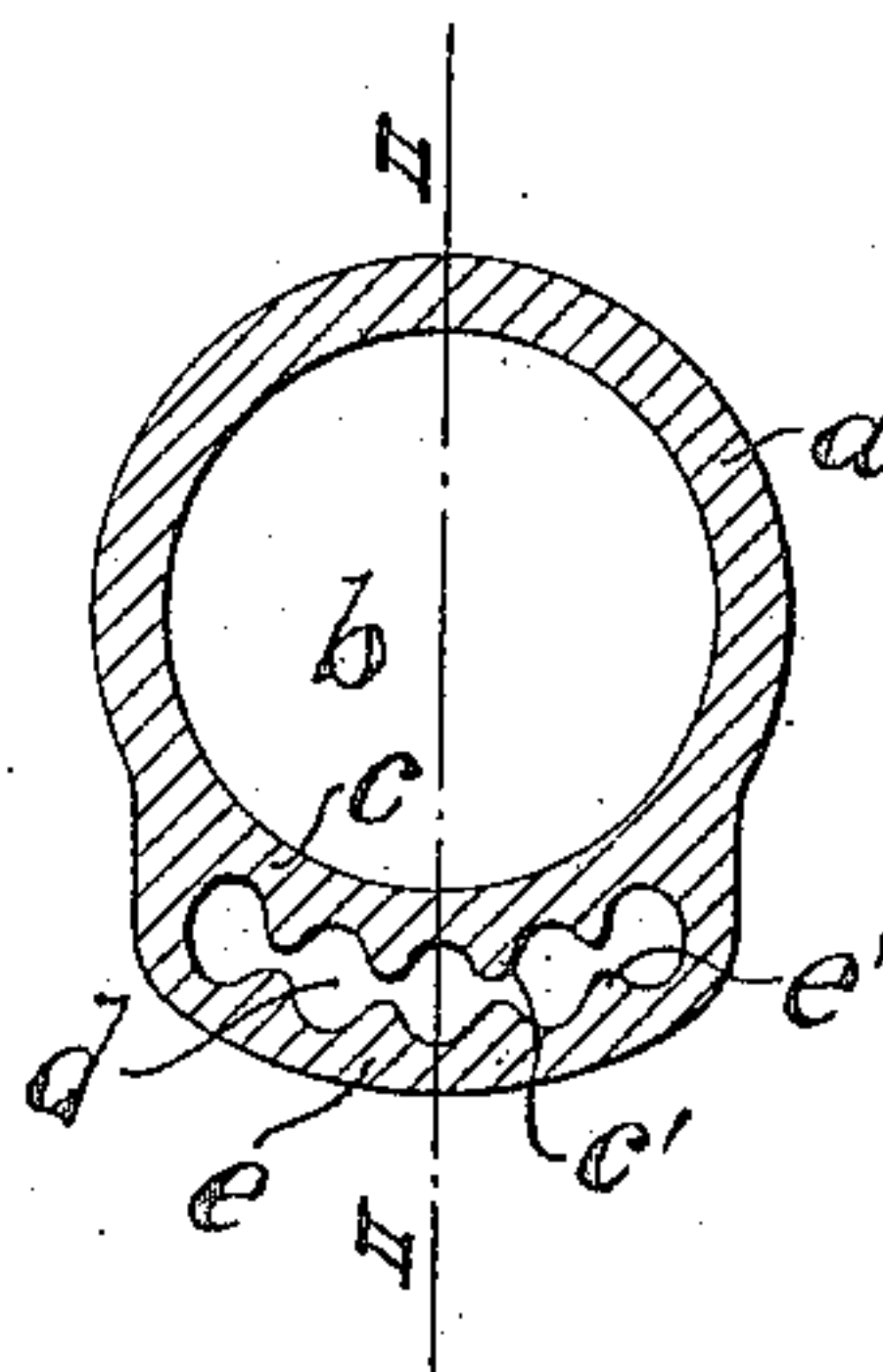


Fig. V

Witnesses:

J. C. Valentine
N. M. Chandler

Inventor.
Richard Ziesing

By Albert E. Lawrence,
his attorney.

UNITED STATES PATENT OFFICE.

RICHARD ZIESING, OF CLEVELAND, OHIO.

RETORT.

No. 818,070.

Specification of Letters Patent.

Patented April 17, 1906.

Application filed December 29, 1903. Serial No. 186,990.

To all whom it may concern:

Be it known that I, RICHARD ZIESING, a citizen of the United States of America, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Retorts, of which the following is a specification.

My invention relates to improvements in retorts especially adapted for the distillation of zinc from its ore or oxid, particularly as employed in the so-called "Belgian" process, my object being the construction of a type of retort avoiding numerous disadvantages of those of the prior art, such as the unnecessary loss of metal during the process of distillation, and increasing the life or period of use of the retorts.

In the Belgian furnace, since the retorts are supported only at their ends, thus affording ready access of the flame and heated gases to the bottoms and sides thereof, the dimensions of said retorts are within certain limits necessarily fixed by reason of the character of the materials of which they are constructed and the high degree of heat requisite in the process. The length must be such that the retort and contained ore charge will be amply supported from the ends during the long-continued heating, while the walls should be only of sufficient thickness to secure the necessary durability and insure the maximum effect of the heat upon the contents of said retort. The walls, moreover, must be so proportioned that they will dry evenly and without cracking in the process of completing the retort. In practice, however, it is found that while the top and sides of a retort of the usual type are not seriously affected by repeated distillations the bottom is commonly attacked and perforated, particularly when impure ores are treated containing lead, iron, or lime. This not only occasions large losses of zinc, but renders necessary the frequent replacement of the retorts. Accordingly I have sought to provide a retort in which these defects are remedied by embodying improvements which I shall below describe in some detail, in connection with the accompanying drawings, wherein—

Figure I is a perspective view of a type of retort constructed in accordance with my invention. Fig. II is a longitudinal sectional view on line II II, Fig. V; and Figs. III, IV, and V are cross-sectional views of retorts of

somewhat varying proportions embodying my invention.

The same character of reference has been employed in connection with each of these figures to designate similar parts.

While the general conformation of the retort does not intimately concern my improvements, I have chosen to illustrate a few characteristic types to which they may be applied. These, it will be observed, have the common feature of a false bottom, affording a protective shield and a ventilating-passage beneath the floor proper of the retort, which floor is further provided with longitudinal ribs or ridges interiorly of the ventilating-passage designed to stiffen or strengthen the structure and also increase the radiating-surface for cooling the floor of the retort to avoid its deterioration or injury. Moreover, in the types of Figs. I and III especially, these ribs or ridges are supplemented by others borne by the false bottom or floor of the ventilating-passage as well and serve the purpose of causing a perforation once formed in the floor of the retort to become in a larger measure self-sealing through the particular disposition of these ribs or ridges, and thus avoiding needless waste of the treated material.

These retorts may be molded by hand or machine after the usual manner from suitable material, St. Louis fire-clay mixed with burnt clay or chamotte having been found exceedingly well adapted for the purpose. Care must be taken in proportioning the parts in order to prevent breakage or cracking of the retort during the process of drying. The top and side walls *a* are made of substantially uniform thickness to inclose the retort-chamber *b*; but the floor *c* is longitudinally ribbed, as at *c'*, interiorly of the ventilating-passage *d*, formed by the adjacent false bottom or fire-shield *e*, spaced at a short distance therefrom, but preferably integral therewith. At the rear of this passage one or more vents *c*² may be provided, while the forward opening or mouth of said ventilating-passage, which in the furnace will be considerably lower than the vent, is open to induce the circulation of air through the passage and about the depending ribs, thus serving to cool the floor *c*, which, moreover, is shielded from the direct action of the furnace by the false bottom *e*.

In some types of furnace the vent or vents

may advantageously be omitted or closed during heating, the cooling action being secured by the air blanket or cushion afforded by the space or opening *d*, constituting an
5 air-chamber.

Under the high degree of heat to which the retorts are subjected for considerable periods and maintained for the distillation of the contained charge of zinc ore or oxid any tendency of the retort to sag or break is overcome by the sustaining longitudinal ribs or ridges, which are not only of greater thickness than the walls, but remain the coolest portions of the structure, being exposed on
10 three sides to the induced air-currents. These parts are so disposed, however, that they do not interfere with the ordinary mode of charging and operating the retorts.

Since the ends of the retort alone are utilized for supporting it in the furnace, the mouth may be strengthened in some cases with advantage by a thickened portion or external lip, as at *a*², the rear end wall furnishing the additional strength at this point.

Of course in older retorts perforations may occur before said retorts may profitably be withdrawn from service, and accordingly the ventilating-passage preferably is somewhat constricted to cause the retort to be largely
30 self-sealing or, if desired, the ribs *e'*, provided in some types on the upper face of the false bottom, may alternate in position with the ribs *c'* further to restrict the passage at the most likely points of breakage or perforation in the floor of the retort, whereby the contained material or charge of semimolten or highly-heated ore and coal will quickly clog or close an opening or break, thus preventing any considerable escape and loss of
40 zinc. Often such breaks may be repaired when the refuse is removed from the retort, since instead of being hidden and often remaining undiscovered for some time while discharging into the chimney-stack, as with the ordinary type of retort, the perforations are bound to occur where their presence is promptly indicated or detected and may be efficiently closed before serious damage is done to the retort.

50 As before indicated, my invention is not concerned with the general contour of the re-

tort nor with the precise shape or details of construction of the ventilating-passage or air-chamber and fire-shield, and accordingly I claim, and desire to secure by Letters Patent, the following:

1. In a structure of the class described, the combination with the retort-chamber for receiving the charge, of a false bottom affording a ventilating-passage beneath the floor of
60 the said chamber, and means therein comprising a corrugated or ribbed under face for increasing the radiating-surface of the floor of said retort-chamber, substantially as set forth.

2. In a structure of the class described, the combination with the retort-chamber formed of fire-clay walls of substantially uniform thickness, of a series of strengthening ridges or ribs molded integrally along its bottom
70 surface, and adapted to stay the structure for support from its ends, and a false bottom, inclosing the strengthening-ridges, thereby forming an air-passage forwardly open and rearwardly provided with a vent, substantially as set forth.

3. In a structure of the class described, the combination with a retort-chamber for receiving the charge, of a false bottom affording a ventilating-passage beneath the floor
80 thereof, and a series of longitudinal ribs or ridges integral with the floor for increasing its radiating-surface, the said ribs being positioned within the ventilating-passage, substantially as set forth.

4. In a structure of the class described, the combination with the retort-chamber, of a false bottom or shield affording a ventilating-passage of restricted size beneath the same, and a series of alternating ribs or ridges on
90 the top and bottom surfaces of the ventilating-passage for making the structure self-sealing in case of breakage or perforation of the floor, substantially as set forth.

Signed at Cleveland, this 28th day of December, 1903, in the presence of two subscribing witnesses.

RICHARD ZIESING.

Witnesses:

EDWARD W. FURST,
ALBERT LYNN LAWRENCE.