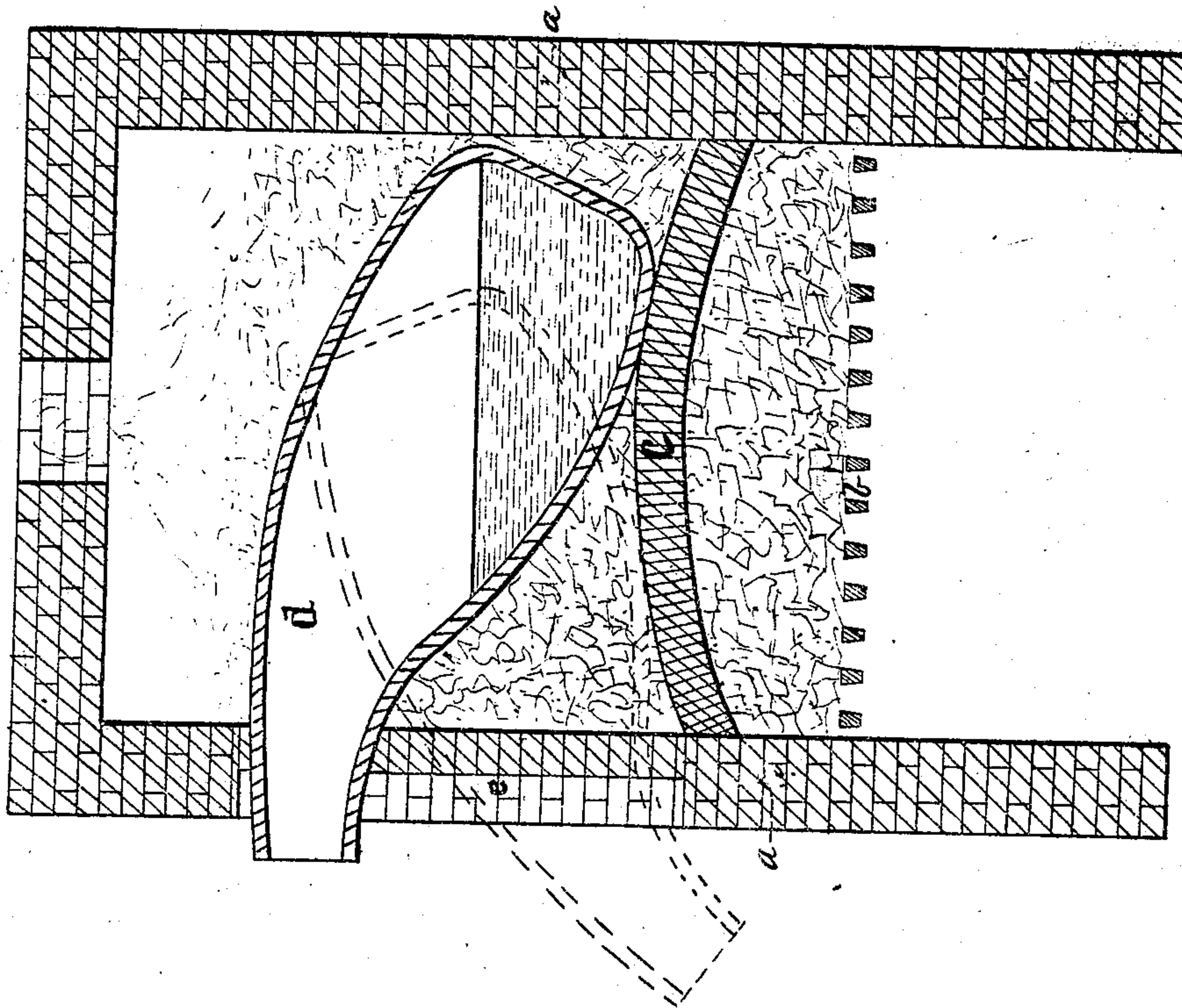


E. Balbach Jr.
Separating Zinc from Gold & Silver
No 64,934. *Patented May 21. 1867.*



Witnesses:
George D. Walker
Chas H Smith

Inventor:
Edward Balbach, Jr.

UNITED STATES PATENT OFFICE.

EDWARD BALBACH, JR., OF NEWARK, NEW JERSEY.

IMPROVEMENT IN SEPARATING ZINC FROM GOLD AND SILVER.

Specification forming part of Letters Patent No. 64,934, dated May 21, 1867.

To all whom it may concern:

Be it known that I, EDWARD BALBACH, Jr., of Newark, in the county of Essex and State of New Jersey, have invented, made, and applied to use a certain new and useful Improvement in Separating Zinc from Gold and Silver Alloys; and I do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawing, making part of this specification, wherein I have represented a vertical section of the apparatus employed to effect such separation.

Gold and silver are often found in galena; and it is common to introduce lead for the separation of gold and silver from pyrites, and afterward to employ zinc for concentrating the lead and precious metals. A process for effecting this is set forth in Letters Patent granted to me July 5, 1864.

In separating the zinc from the gold, silver, and lead alloy, it has been usual to distil the zinc, and condense the same in a receiver; but difficulty has arisen in removing the lead, gold, and silver from the retort for subsequent assay and refining, because such retort was a fixture, and made of clay; and in case of injury from the heat the contents could not be quickly emptied, but run into the fire, often involving considerable loss; hence, such fixed retorts were seldom used a second time after being cooled, because of the risk of breaking.

The nature of my said invention consists in a movable black-lead retort, with a neck, applied in a furnace, in such a manner that it can be turned up for the reception of the alloy of gold, silver, lead, and zinc, while the latter is distilled off by the heat and condensed, and then turned down to empty out the precious metals with the alloy or impurities to be subsequently refined. The retort is then turned up to its place and recharged. This construction greatly facilitates the separation of the zinc, and avoids delays resulting from emptying the retorts heretofore employed, and prevents the risk of loss by breaking, which has heretofore been usual with the fixed clay retorts.

In the drawing, *a a* are the walls of a furnace, of any desired size. *b b* are the grate-bars. *c* is a bridge or bearer, of fire-brick, made narrow so that the coals may be packed to the side of it, and also at the sides of the retort *d*, that is formed with a neck at one end, and rests upon the said bearer *c*. The front of the furnace is provided with an opening, at *e*, through which the neck of the retort *d* projects, and this opening is sufficiently long to allow the retort to be turned down from the position shown in black lines to that shown in red lines; and, when the retort is in use, this opening is to be filled by a block of fire-brick, or by separate fire-bricks introduced beneath the neck of the retort *d*, which also hold the same up during the distillation of the zinc, which is driven off from the mass of metal introduced within the retort.

The zinc is to be received and condensed in any suitable chamber connected to the neck of the retort, and, when the zinc has been distilled off, the space *e* is to be opened, and the retort turned down to pour out the alloy of gold, silver, and lead in the concentrated form in which this process leaves the same.

The fuel is to be supplied through a suitable opening over the retort, and the products of combustion may be taken from the same place to a chimney.

Two of these retorts may be inserted side by side in the same fire, using one condensing-chamber.

What I claim, and desire to secure by Letters Patent, is—

A movable black-lead retort, formed with a neck, and introduced within a furnace, substantially as set forth, for receiving gold, silver, lead, and zinc alloys, and distilling off the zinc, the remaining alloy being poured out by inclining the retort, as set forth.

In witness whereof I have hereunto set my signature this 22d day of March, 1867.

EDWARD BALBACH, JR.

Witnesses:

CHAS. H. SMITH,
GEO. T. PINCKNEY.