

(No Model.)

R. H. TERHUNE.

SLAG POT.

No. 323,607.

Patented Aug. 4, 1885.

Fig. 1.

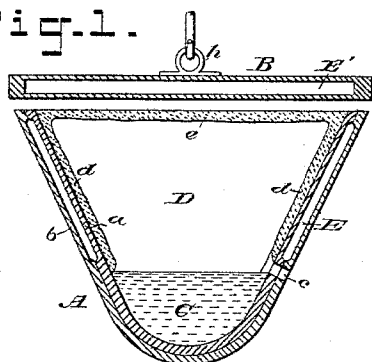


Fig. 2.

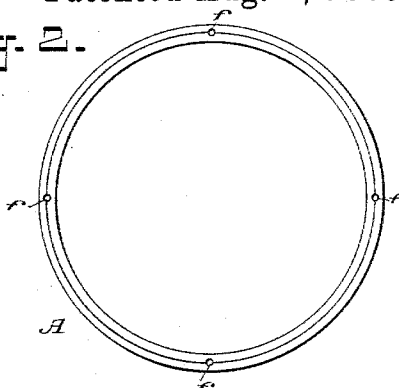


Fig. 3.

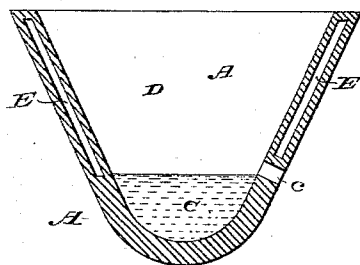


Fig. 4.

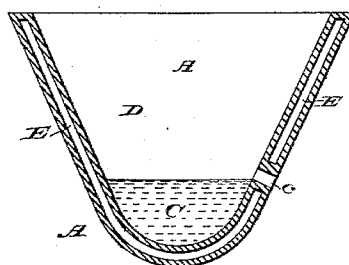


Fig. 5.

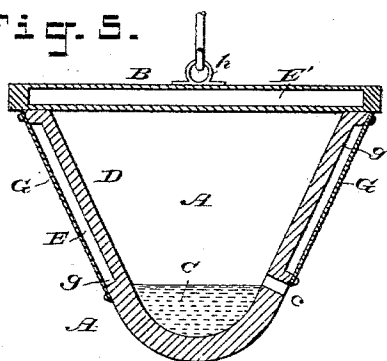


Fig. 6.

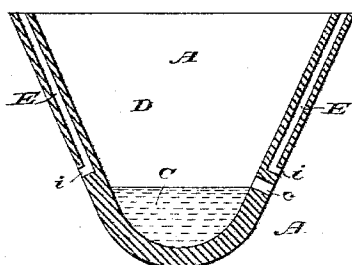
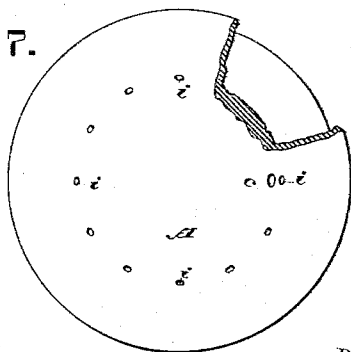


Fig. 7.



WITNESSES:

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SLAG-POT.

SPECIFICATION forming part of Letters Patent No. 323,607, dated August 4, 1885.

Application filed April 30, 1885. (No model.)

To all whom it may concern:

Be it known that I, RICHARD H. TERHUNE, a citizen of the United States, residing at Salt Lake City, in the Territory of Utah, have invented certain new and useful Improvements in Slag-Pots, of which the following is a specification.

In the manufacture of base bullion the slag and matte are tapped from the furnace and discharged into a conical-shaped vessel of cast iron, commonly called a "slag-pot." This pot is then taken from the furnace to some convenient place and allowed to stand until the mass of slag and matte has solidified. When the pot is emptied the solid mass is found to consist of two distinct portions, separable from each other by a perfect line of cleavage. Of these the lower is the matte, a valuable secondary product, which is saved and utilized, and the upper is the waste slag. It is found that when the comparatively hot slag is tapped from a hole in the side of the pot, just above the matte line, (according to a process at present in use,) a chilled wall of slag and matte remains attached to the pot, and also that a similar chilled shell or crust forms at the top of the molten mass. These top and side shells are found to be sufficiently rich in silver and lead to justify subsequent treatment for the extraction of these metals, but the thickness of the shells presents a difficulty which jeopardizes the commercial success of this treatment. It is found that the rich and profitable material is directly in contact with the pot in a thin film, and also in the upper portion of the top shell. On receding from this rich film toward the center of the original mass the slag becomes too poor for economic treatment. It is the purpose of my invention to reduce the thickness of these chilled shells, and to accomplish this result I have invented my improved pot or bowl.

My invention consists in providing the pot or bowl with a non-conducting space or portion in its walls surrounding the molten mass, and also in providing it with a cover having a similar non-conducting space.

Figure 1 of the accompanying drawings is a vertical mid-section of a slag-pot and cover constructed according to my invention in its preferred form. Fig. 2 is a plan of the pot.

Figs. 3, 4, 5, and 6 are vertical mid-sections of four different modifications of the pot, and Fig. 7 is an inverted plan of the pot shown in Fig. 6.

Referring to Figs. 1 and 2, let A designate the pot and B the cover. The pot A in this construction is made of two shells, *a* and *b*, the former fitting inside the latter, and a hole, *c*, being formed through both for the discharge of the liquid slag.

C is the mass of matte in the bottom portion of the pot; D, the space above this portion, which is occupied by the slag until the latter is run off through the hole *c*. *d* is the chilled film or shell of matte and slag adhering to the sides of the pot, and *e* is the crust of matte and slag extending over the top.

The two shells or pots *a* and *b* fit close together below the level of the matte C, forming a solid bottom. Above this level the two shells are thinner, their adjacent surfaces being out of contact, and forming between them an air-space, E. This air-space, which extends entirely around the pot, interrupts the metallic conduction of heat and forms a non-conducting jacket, its effect being to retard the cooling of the first thin crust or shell, *d*, of combined slag and matte and prevent the thickening of the same by the chilling of more slag against it. To permit the air in the space E as it is heated and expands to escape, I provide passages *f f*, extending upward from the air-space, as best shown in Fig. 2.

Fig. 3 shows a pot made all of one piece, the air-space E being cored out in the casting of the iron pot. In both Figs. 1 and 3 the bottom of the pot, which receives the mass of matte, is made solid to insure greater strength and durability; but it may in some cases be preferred to make it hollow, thus extending the air-space E beneath the pot as well as around its sides. This construction is shown in Fig. 4, where the pot is shown as made entirely in one piece, the air-space being cored out in casting.

Fig. 5 shows a different way of forming the air-chamber. The pot is cast solid with a recess, *g*, around it on its outside, above the matte level. A sheathing, G, of sheet metal is then placed around the pot, covering the recess, which thus becomes the air-space E,

and this sheathing is fastened to the casting by rivets, screws, bolts, or otherwise.

The cover B (shown in Figs. 1 and 5) consists simply of a flat plate made hollow to form an air-space, E', and adapted to be laid across the top of the pot when the latter has been filled with matte and slag. Its effect is to hold the heat in the molten mass, and prevent the formation of too thick a top crust of matte and slag. It is provided with a handle, *h*, on top by which to lift it. It is shown partly lifted in Fig. 1 and down in place in Fig. 5. It may be hinged to the pot or entirely unattached. I find that these air-spaces E E' exert a marked influence in reducing the thickness of the chilled shells or crusts *d e*, and consequently in the reduction of the proportion of slag contained in them to a given quantity of matte—or, in other words, these adhering shells are less in quantity and richer in quality than those found in the pots prior to my invention. My improved pot has the additional advantage of being more durable than one of solid metal, as the hollow walls prevent any rapid expansion and contraction, and also permit the expansion and contraction to take place with less strain.

It is not essential that the spaces E E' contain air, as they might, instead, contain any other suitable non-conducting or heat-retaining substance—such as charcoal, asbestos, mineral wool, or other material.

Figs. 6 and 7 show a further modified form of pot, wherein the space E is made to act not only to retain the heat in the pot, but also as a source of heat. The air-space extends to the top of the pot and is open, and at its bottom it is provided with a series of holes, *i i*.

(Shown best in Fig. 7.) The fine fuel, now a waste product in smelting-works, is introduced into the annular space at the top, and, being ignited, burns in the space, receiving air through the holes *i i*, and discharging its products of combustion at the top of the space. The ashes that accumulate below are poked out from time to time through the holes *i i*.

I claim as my invention—

1. A slag-pot provided with a non-conducting space or jacket surrounding it, substantially as and for the purposes set forth.

2. A slag-pot constructed with a non-conducting space, E, in its walls, substantially as set forth.

3. A slag-pot consisting of two cast shells, *a* and *b*, constructed to fit one within the other and formed with a hollow space, E, between them, substantially as described.

4. A slag-pot constructed with an air-space, E, in its walls, and with vent-openings *ff*, for the escape of air from said space, substantially as described.

5. A slag-pot consisting of a solid body portion for containing the mass of matte and hollow side walls, as described.

6. The combination, with a slag-pot, of a cover adapted to close over the top thereof and formed with a non-conducting space, E', substantially as and for the purposes set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

RICHARD H. TERHUNE.

Witnesses:

CLARK H. PARSONS,
WILLIAM E. JACOBS.