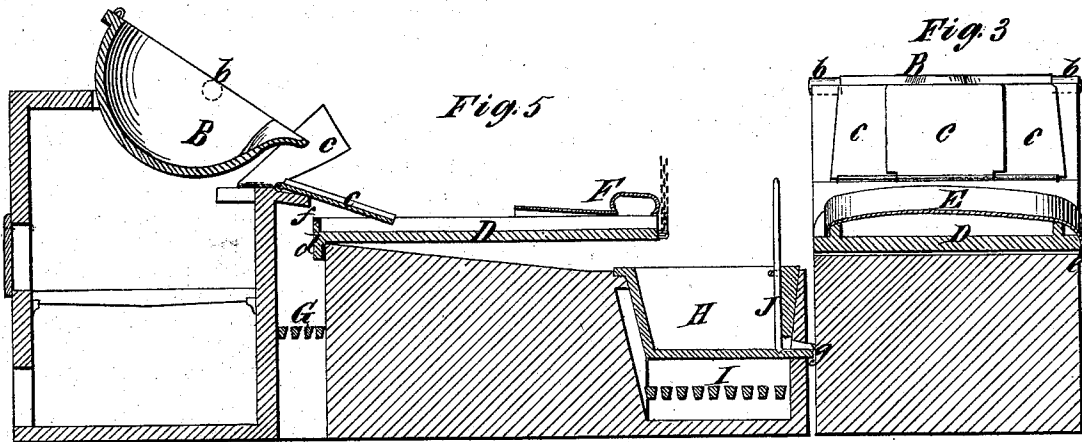
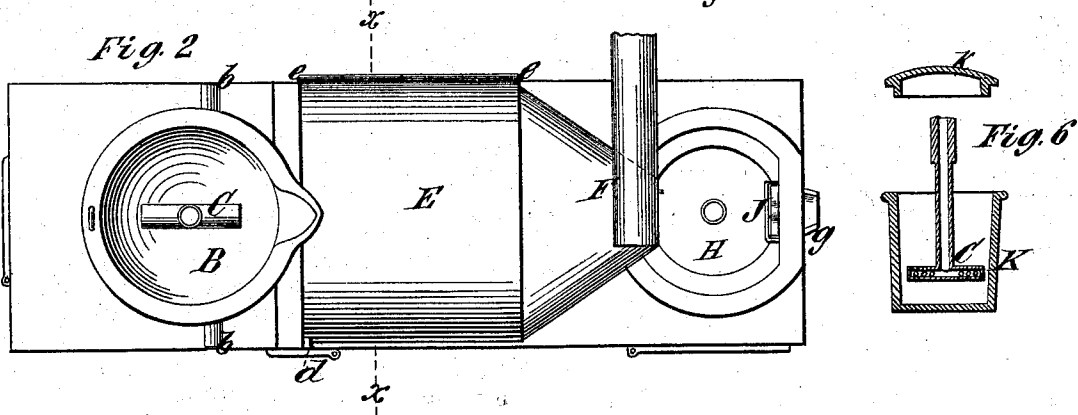
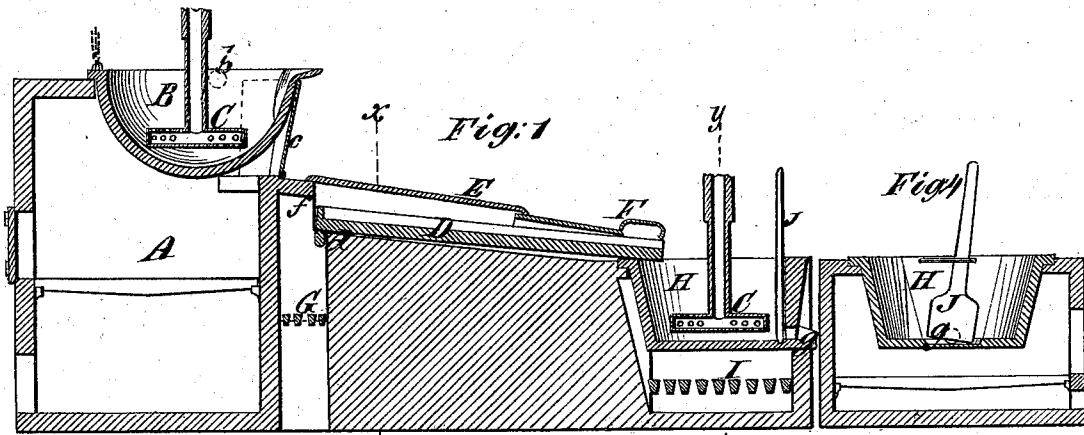


Apparatus for Refining Lead.

Patented May 5, 1874.

No. 150,551.



Witnesses.
Michael Ryan
Fred Haymer

Georg. Faustmann
Physic Attorney
Brown & Klein

UNITED STATES PATENT OFFICE.

GEORG FAUSTMANN, OF NEWARK, NEW JERSEY, ASSIGNOR OF ONE-HALF
HIS RIGHT TO THOMAS J. WILSON, OF SAME PLACE.

IMPROVEMENT IN APPARATUS FOR REFINING LEAD.

Specification forming part of Letters Patent No. **150,551**, dated May 5, 1874; application filed
April 6, 1874.

To all whom it may concern:

Be it known that I, GEORG FAUSTMANN, of Newark, in the county of Essex and State of New Jersey, have invented certain Improvements in Apparatus for Refining Lead, of which the following is a specification:

This invention relates to furnaces and apparatus more particularly designed for refining lead containing both gold and silver, or much of either of the precious metals; and has for its objects the more perfect extraction of said metals and greater economy, both as regards time, labor, and fuel, in accomplishing such work, besides simplifying the apparatus employed and economizing space.

To these ends the invention includes a primary kettle, hung upon trunnions, to facilitate pouring, and arranged over a furnace, which is one of a series in the same structure, the lead either being run into said kettle direct from the blast-furnace, or it may be put therein as pig and melted, and the antimony and copper extracted from the lead by skimming off the same as they are brought to the surface by a perforated steam agitator and distributor. The upper front portion of this furnace is of a hinged sectional construction to provide for the tilting of the primary kettle, and to form a runner for the lead as it is poured therefrom onto the sweating plate or table, where it is cooled by artificial means or otherwise, and which plate is hinged in the rear, and first raised to keep said plate at a level while the cooling is being effected, and, after the precious metals have been brushed off or collected, is lowered to run off the lead or residue as melted by a furnace under the sweating-plate, and which acts in a reverberatory manner by the passage of its flame over the spread lead. To attain this result there is used a hinged metallic plate capable of being thrown back when the lead is being cooled, but of being closed to form a flue when it is necessary to run off the lead from the sweating-plate into a finishing-kettle, in which is a perforated steam distributor and agitator to provide for the extraction of the zinc and other extraneous metals, and which is provided with a gate to run off the refined lead into molds, said finishing-kettle being

heated by a third or separate furnace in the same general structure. The gold and silver, together with any zinc or lead, as taken from the sweating-plate, is placed in a black-lead crucible, which is put into a coke fire, and the contents brought into a metallic fluid state, the crucible being closed to prevent oxidation of the zinc, and a perforated steam distributor and agitator being used, if desired, to complete the separation of the metals.

In the accompanying drawing, Figure 1 is a longitudinal sectional elevation of an apparatus constructed in accordance with my invention prior to or at the commencement of the operation; Fig. 2, a plan of the same; Fig. 3, a transverse vertical section on the line *xx*; Fig. 4, a transverse vertical section on the line *yy*; and Fig. 5, a longitudinal vertical section, showing the tilting of the primary kettle and elevation of the sweating-plate during the process or operation. Fig. 6 is a sectional elevation of the crucible, with accompanying parts used in the course of the operation.

A is the primary furnace, and B the primary kettle, into which latter the lead is run from the blast-furnace, or in which it is placed as pig and melted. In this kettle is arranged a perforated arm steam distributor and agitator, C, made to revolve by any suitable means, for the purpose of bringing the antimony and copper to the surface, and which is afterward skimmed off. After the lead has been duly melted or retained in its fluid state in the primary kettle B, the same is poured onto what is known in the art as a sweating plate or table, D. To facilitate this the primary kettle B is hung upon trunnions *b b*, and the same tilted, as represented in Fig. 5. To provide for this, the upper front portion of the furnace A is made up of hinged sectional plates *c*, hinged below the center, one of which forms a runner for the molten lead as it is being poured from the kettle B onto the sweating-plate. The sweating-plate D is hinged in its rear end, as at *d*, under the mouth of the primary kettle, and, in its normal condition, occupies a downwardly-inclined position from the primary kettle, as represented in Fig. 1, but which is raised at its forward end to place it on a level or in

a horizontal position when running the lead from the primary kettle, as represented in Fig. 5. E is a metallic lid or cover hinged at *e*, on the one side of the plate D, and which is thrown up or back when running the lead from the primary kettle onto the sweating-plate. After the lead has been run onto the sweating table or plate, it is cooled by a blower or otherwise, and the gold and silver, as far as practicable, collected from the broken or powder-like mass. The lid E is then let down or closed to form a flue in connection with the branch F, whereby draft for the flame from an independent furnace, G, through an aperture, *f*, is established over the remaining lead and residue on the surface of the sweating-plate. The metal thus run off from the sweating-plate is emptied, on lowering the forward end of said plate, into a second or finishing kettle, H, arranged over an independent furnace, I, and which kettle is provided with a lever-gate, J, to regulate the gradual discharge of the lead from said kettle, through an aperture, *g*, into molds, the pipe or a similar perforated steam distributor and agitator C, as used in the kettle B, being used to separate the zinc and other impurities. The gold and silver, with any remaining zinc or lead taken from the sweating-plate D, are run into a black-lead crucible, K, which is put into a coke fire, and, after its metallic contents are brought into a fluid state the crucible is closed by a lid, *k*, to prevent oxidation of the zinc. The metal in said crucible may also be subjected to the action of the perforated steam distributor and agitator C, to effect the extraction of any remaining baser metals.

This invention essentially differs from the process heretofore practiced, or means employed, in several important respects. Thus, the lead, as heretofore, is not run from the primary kettle into molds, and the pigs afterward placed on the sweating-table, subject to flame, which heats the gold and silver away. My invention obviates this waste—does away with a separate furnace for cleaning before introducing into the first kettle, the steam distributor and agitator C in said kettle effecting the desired result, and its re-use in the second kettle completing the cleaning process, and hand labor generally; besides, first cost and other outlays are economized.

The tilting action of the sweating-plate D, which keeps the metal back till it is required to run it or the residue off, and the lid or cover E, constitute important elements in the apparatus, and, by my invention, not only are more gold and silver extracted, but the lead residue is purer or better refined.

I claim—

1. The primary kettle B, hung on trunnions *b*, in combination with the furnace A and sectional hinged or movable upper front plate *c*, substantially as specified.

2. The inclined sweating plate or table D, hinged in the rear or at its upper end, in combination with the furnace G, the lid or cover E, draft-outlet F, substantially as specified.

GEORG FAUSTMANN.

Witnesses:

VERNON H. HARRIS,
MICHAEL RYAN.