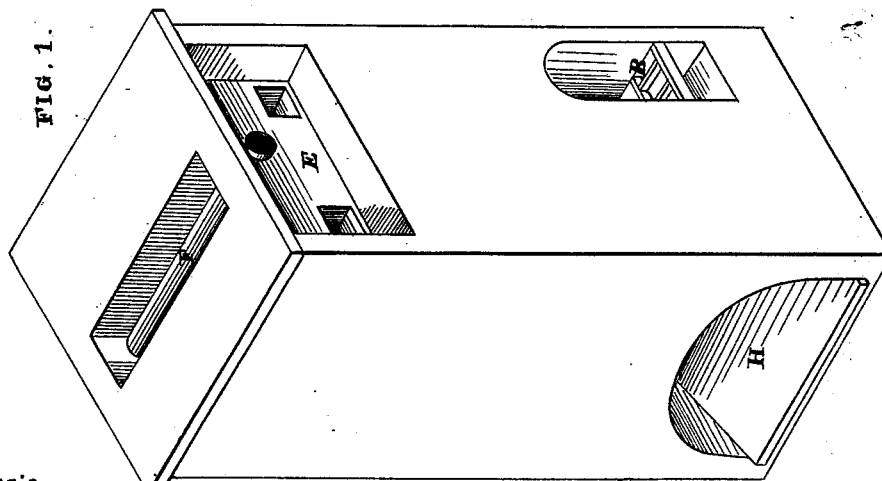
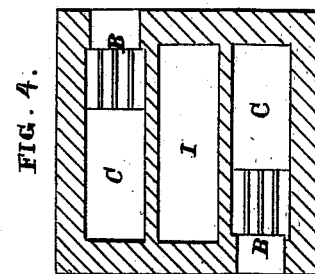
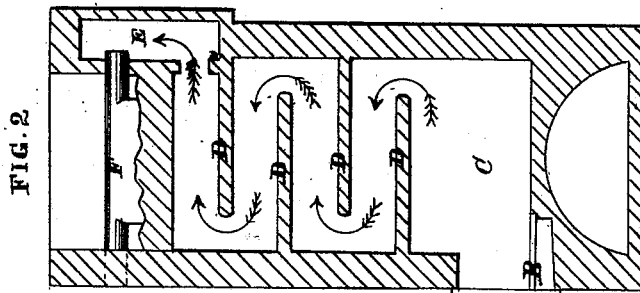
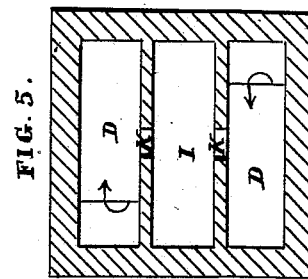
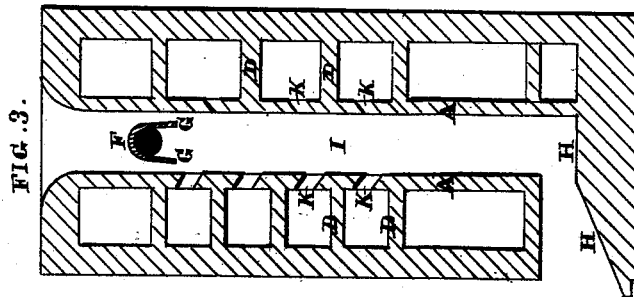


G. W. REAMER & E. ANDERSON.
Ore-Furnace.

No. 219,763.

Patented Sept. 16, 1879.



Witnesses
Geo. H. Strong.
Frank H. Crooks

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UNITED STATES PATENT OFFICE.

GEORGE W. REAMER AND EDWARD ANDERSON, OF FOREST HILL, CAL.

IMPROVEMENT IN ORE-FURNACES.

Specification forming part of Letters Patent No. **219,763**, dated September 16, 1879; application filed May 7, 1879.

To all whom it may concern:

Be it known that we, GEORGE W. REAMER and EDWARD ANDERSON, of Forest Hill, county of Placer, and State of California, have invented an Ore-Furnace; and we hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

Our invention relates to an improved furnace for roasting and desulphurizing ores, and it is more particularly intended for working the ores of mercury, the fumes of which are to be caught and conveyed to condensers. It is specially constructed to roast fine ores, which, in ordinary furnaces, are apt to clog or liable to pack in such a manner that the fire has not free access to all the particles.

It consists in constructing a central chamber between vertical walls, on the outer side of each of which is a fire-place, the drafts from the two fire-places passing in opposite directions and meeting in a common flue, where they join the fumes from the ore and pass to the condensers.

Figure 1 is a perspective view. Fig. 2 and 3 are vertical sections. Figs. 4 and 5 are horizontal sections.

Let A represent the two central walls, between which the ore is roasted. On one side of each wall is arranged a fire-place, which heats the ore in the space between the walls. The two fire-places are placed in opposite sides of the furnace; but the products of combustion finally enter a common chamber or flue, as hereinafter described. The fire-place B has the usual doors and grate-bars, and the heat, flame, and products of combustion are carried through the flue C to the side opposite the grate, and then rise to another flue, leading them back again toward and over the grate. A series of alternated diaphragms, D, are arranged one above another, so as to form a continuous flue, the openings in the diaphragms being at alternate ends. In this way the heat and flame are carried to the top, being in contact with the walls A during their passage, so as to thoroughly heat said walls and the ore between them. The same arrangement of flues is made for each fire-place, the only difference being that one has one more diaphragm than the other, so that the heat is finally discharged from both into one chamber, E, on one side of the furnace.

Leading from the chamber E and passing across the space I between the walls A is a pipe, F, made in a peculiar form. This pipe F is open on its under side, where it crosses the furnace, and two flanges, G, project downward from it on each side, so as to throw the rising fumes into said pipe and deflect the ore poured in to the sides of the walls.

At the bottom of the furnace, on front side, is the sloping floor H, through which the ore is discharged, the passage over this floor connecting with the furnace-chamber I, in which the ore is roasted. A series of openings, K, are formed in the walls A, connecting with each flue, for the purpose hereinafter described.

The operation of our furnace is as follows: The ore is poured into the chamber I through the opening in the top until said chamber is filled to the top and across the pipe F. The ore then rests on the floor H, but does not descend until moved with a rake underneath.

When the fires are started up the heat, flame, and products of combustion pass to and fro in the flues outside the walls A. A certain amount of heat is also communicated to the ore through the openings K in said walls. These openings are made inclined downward from the flues to the chamber I, so that no ore will enter the flues from the chamber.

As the ore gradually becomes heated and the mercury is volatilized the fumes rise through the ore and are caught in the pipe at the top of the chamber. The openings K, however, also furnish passages through which the fumes may rise from the ore into the flues, and thence be directed into the chamber, where the flues terminate, and thence into the pipe which leads them to the condenser.

From the construction described it will be seen that all the heat, flame, smoke, and volatile products are carried to the condenser-pipe whether they rise through the ore or enter the flues through the openings.

The ore is fed in and withdrawn continuously. As the ore is discharged at the bottom, the openings for the discharge-flow are made of just the size of a car, and when the door is opened the ore may be withdrawn into the car and carried away.

This really forms a double reverberatory furnace. By having the fires on opposite sides the heat is distributed evenly, and the cham-

ber I perfectly heated. The ore is gradually heated from top to bottom, the more volatile products being first freed, and the ore left in proper condition for thorough roasting. As it is heated gradually on its downward passage to the points of greatest heat, the operation of roasting is thoroughly performed.

Any desired amount of time may be given to the roasting, according to the class of ore, this being determined by the rapidity of removal of the ore from below. No scrapers or stirrers are needed, the vertical stratum of ore being operated on being so thin and small as to insure thorough roasting, and there being no projections or places on the walls A on which the ore may lodge.

If desired, the draft may be shut off on one side, and the fumes drawn off through the openings K from one side only. It is preferred, however, to draw the fumes from both sides of the body of the ore as soon as they are produced, and this we accomplish by means of the openings herein described. A current can be created in either direction desired by regulating the draft.

It will be seen that all the heat is utilized on the ore in the central chamber. There are no downward currents for the draft, as it passes alternately back and forth from one side of the furnace to the other beside the walls A. In this way fine ore, such as all quicksilver-mines produce, is easily worked.

It is customary to make "tierras" or bricks of this class of ore, in order to reduce it properly; but we obviate the necessity of this by our improved construction. The ore is, at all points of its downward passage, in contact with the heated walls, and there are numerous openings through which the fumes may escape to the condensers. At the outer end of the pipe F is an ordinary suction-blower, which draws off the fumes to the condenser.

This furnace is cheaply constructed and operated, and may be easily examined, if necessary, at any time. There are no iron parts in the structure, except the condensing-pipe F, which is easily replaced when worn out. This can, however, if desired, be made of cement or clay, and be suitably supported in position without danger of breakage. This furnace will also be useful for roasting sulphurets, which, after being concentrated, are difficult to work in ordinary furnaces, since they easily clog or pack, and are free from lumps, packing so closely as not to be easily handled or roasted.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an ore-roasting furnace, a central roasting-chamber, I, in combination with two fire-places, B B, located in diagonal corners of the base and communicating with two sets of flues, arranged on opposite sides of the roasting-chamber, so that the drafts from the fire-places rise in oppositely-moving currents along the sides of said chamber I, substantially as set forth.

2. The ore-chamber I, between the walls A, and having the pipe F, with its downward-projecting flanges G, in combination with the fire-place B, flues C, with their perforations K, and common chamber E, whereby the heat, flame, products of combustion, and volatile products of the ore may be caught by the same pipe and led to the condenser, substantially as herein described.

In witness whereof we have hereunto set our hands.

GEO. W. REAMER.
E. ANDERSON.

Witnesses:

CHAS. G. YALE,
FRANK A. BROOKS.