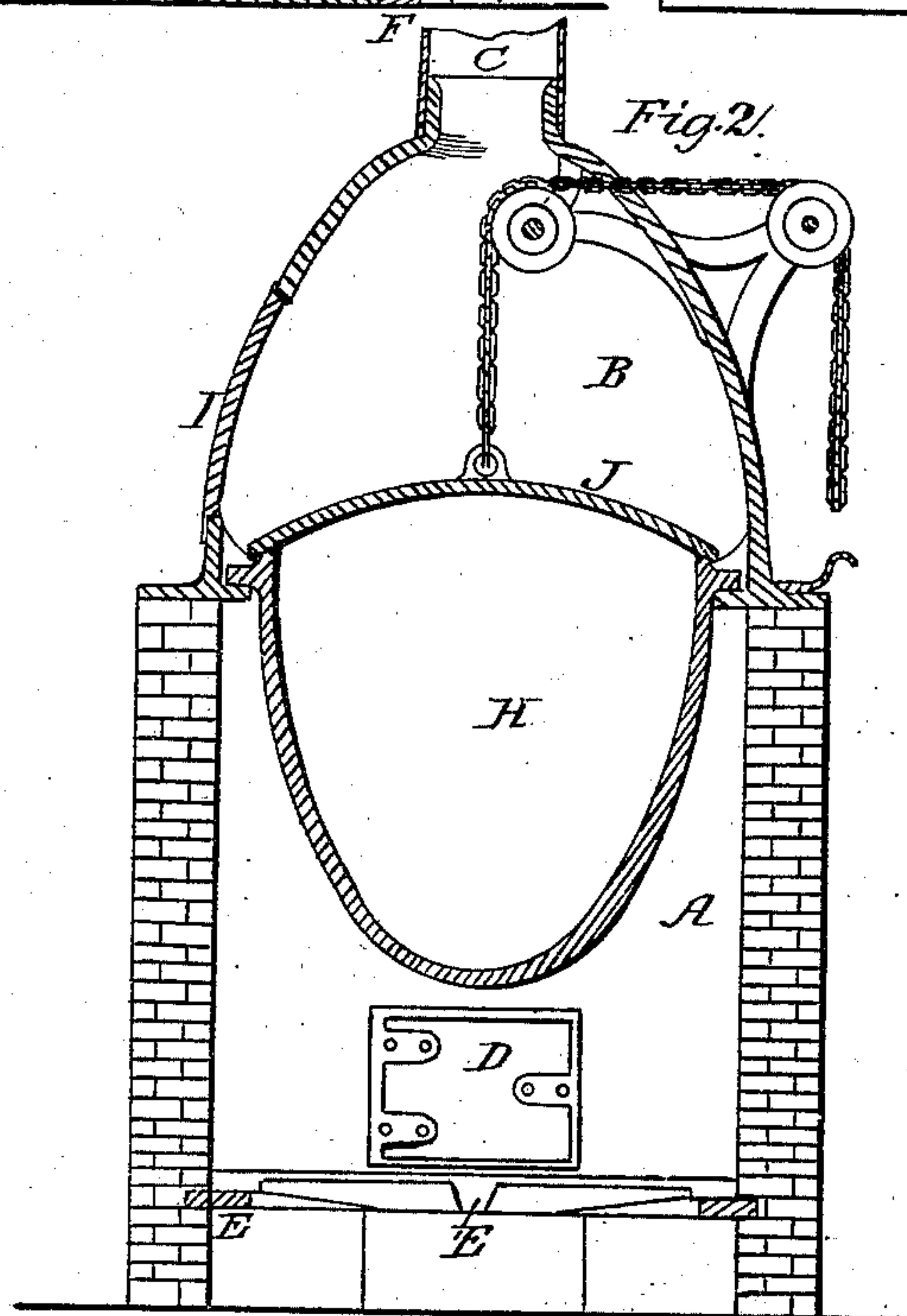
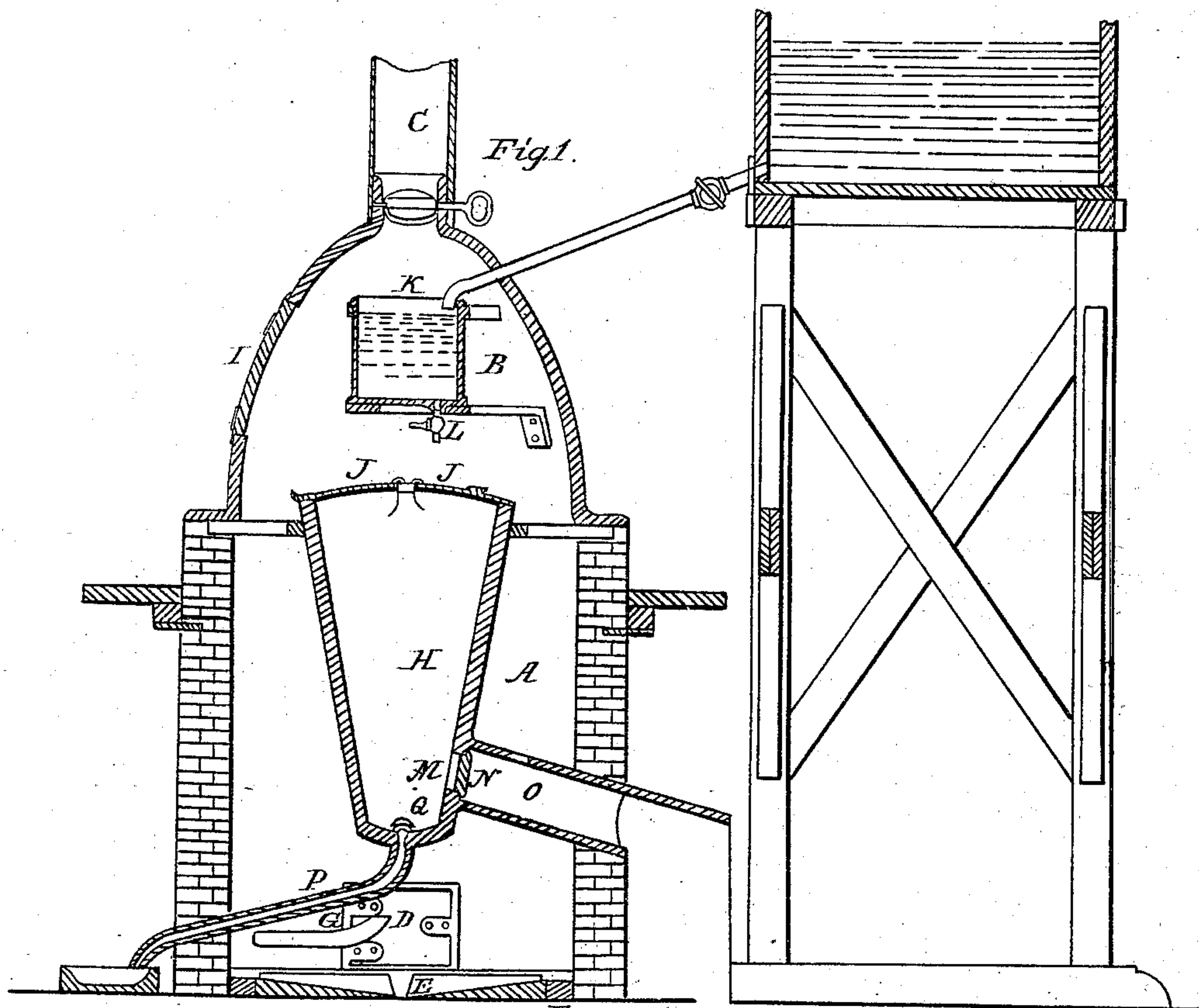


J. A. HITCHINGS.

Desulphurizing Ore.

No. 58,100.

Patented Sept. 18, 1866.



Witnesses:  
John A. Wiedersheim  
W. F. Hall.

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Attys.



# UNITED STATES PATENT OFFICE.

JOHN A. HITCHINGS, OF DENVER CITY, COLORADO.

## IMPROVEMENT IN DESULPHURIZING ORES.

Specification forming part of Letters Patent No. 58,100, dated September 18, 1865.

*To all whom it may concern:*

Be it known that I, JOHN A. HITCHINGS, of Denver City, in the county of Arapahoe and Territory of Colorado, have made new and useful Improvements in Smelting Furnaces and Crucibles; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, sufficient to enable one skilled in the art to which it appertains to construct and use the same, reference being had to the accompanying drawings, which are made part of this specification, and in which—

Figure 1 is a central vertical section through the smelting-furnace, and Fig. 2 is a central vertical section through the crucible and furnace.

The invention consists in the arrangement of the smelting-furnace, which consists of a suspended vessel provided with a discharge-pipe for the molten metal and a channel for the removal of the slag; second, in the crucible for roasting the tailings with quicksilver, the lid being suspended by a chain from a pulley, to admit of changing and withdrawal of the charge.

In Fig. 1 the smelting-furnace designed for the fluxing process is a circular stone structure, A A, lined with fire-proof brick or gneiss, and with a dome-top, B, and valve-chimney C. It has a door, D, near the bottom for fuel, E being the grate-bars, which rest upon a circular rim, F.

G is a blast-pipe, and H the crucible, which is charged from a door, I, in the dome-covering B.

The crucible may be made of boiler-iron and be of a conical shape, and, if of large size, is to be provided with one or two flues throughout its length. It is to be placed vertically in the center of the furnace, with but a few inches of space around its rim or larger part. Its top has half-section iron covers J J hinged to the rim.

A vessel, K, to contain hot water, is placed above the crucible, with a faucet, L, by which water is drawn into the crucible to detach slug from its sides, as occasion may require.

The crucible has an opening, M, on one side near its bottom, with curved doors N to fit, opening outwardly into the truck or passage O, which, passing through the furnace-

walls, affords the means for discharge of the refuse of the charges introduced into the crucible.

A curved iron pipe, P, of an inch or two in diameter, screwed into or riveted to the bottom of the crucible, passes out through the furnace-walls, and serves to draw off the melted ores when sufficiently refined, to be thrown into cold water or cast in molds. The inner opening of the pipe is protected from stoppage by a curved iron plate, Q, scalloped round the edge covering the opening in the roller of the crucible and supported by proper bearings. The pipe P is to be closed by a clay plug externally.

The object of the improvement is the treatment of auriferous and argentiferous ores, which contain sulphurets, &c., for the purpose of removing the sulphur, arsenic, and mineral oils contained therein, after which they may be permeated by the vapor of quicksilver appropriately introduced. The addition of bicarbonate of soda to the extent of one-twentieth of the weight of the material hastens and perfects the process.

The result is treated in an arrastra, and the amalgam retorted, except the button of metal from the crucible, which is broken up and smelted.

The tight chimney and dome carry off the poisonous gases, and the covers of the crucible should fit closely, but not tightly. They may be weighted, but not attached.

The crucible may be arranged, as in Fig. 2, with a lid suspended by a chain and tackle for convenience of manipulation.

Having described my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The arrangement of the crucible, with its dome-covering, sectional lid, and discharge-openings M P, substantially as and for the purpose described.

2. The combination, with the crucible, of the water-supply tank K, as and for the purpose described.

The above specification of my invention signed by me this 1st day of May, A. D. 1865.

JOHN A. HITCHINGS.

Witnesses:

B. HOBBS.

J. M. GALLEMORE.