I. M. PHELPS.

Sublimating-Apparatus.

No. 215,969. Patented May 27, 1879.

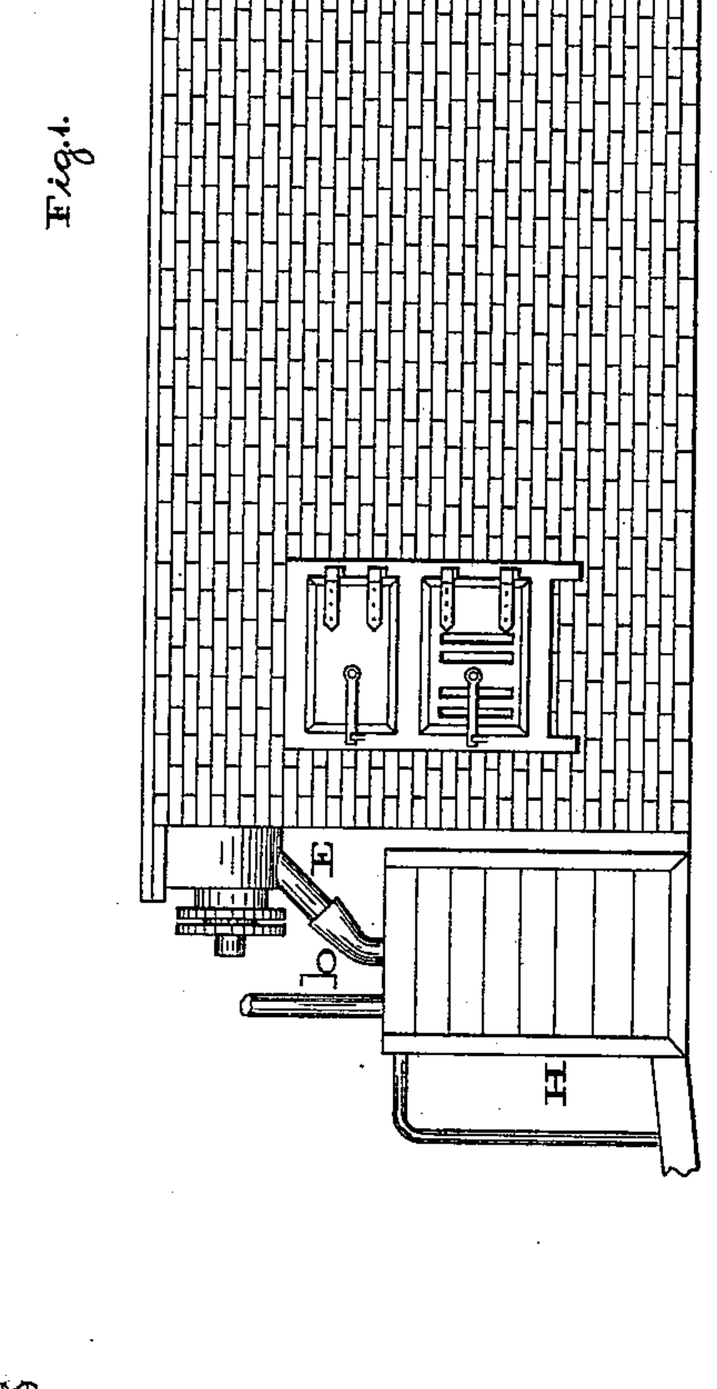

Fig. 1.

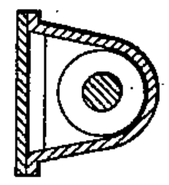

Fig. 3.

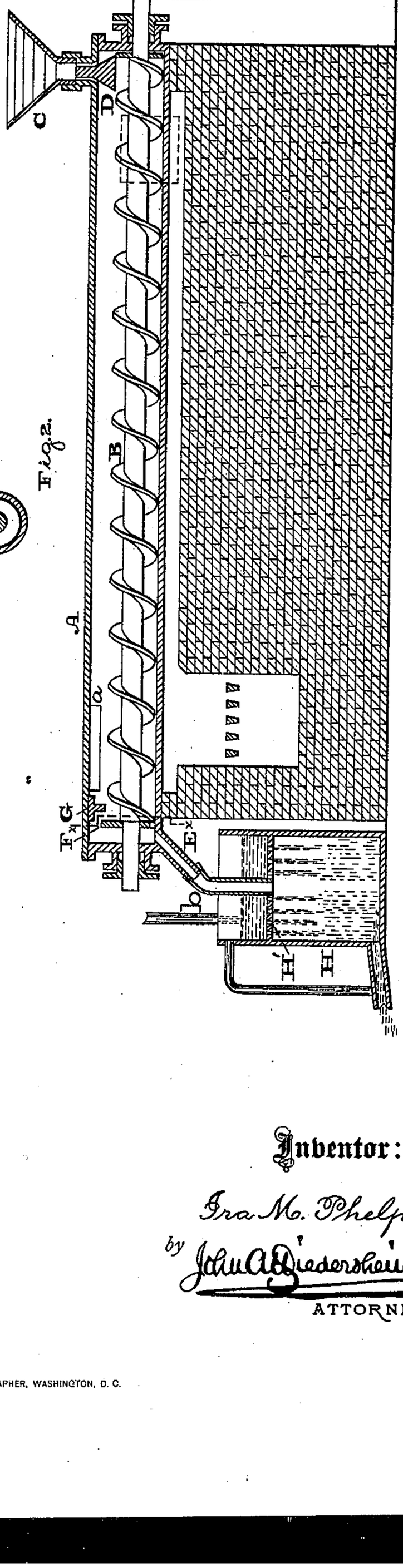

Fig. 2.

Witnesses:

A. P. Grant,

W. F. Kircher

Inventor:

Ira M. Phelps

by John A. Wiedersheim

ATTORNEY.

UNITED STATES PATENT OFFICE.

IRA M. PHELPS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN SHILLITO, JR., OF CINCINNATI, OHIO.

IMPROVEMENT IN SUBLIMATING APPARATUS.

Specification forming part of Letters Patent No. **215,969**, dated May 27, 1879; application filed March 17, 1879.

To all whom it may concern:

Be it known that I, IRA M. PHELPS, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Sublimating Apparatus, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a side elevation of the sublimating apparatus embodying my invention. Fig. 2 is a longitudinal vertical section thereof. Fig. 3 is a vertical section of a detached portion in line *x x*, Fig. 2.

Similar letters of reference indicate corresponding parts in the several figures.

The principal object of my invention is the sublimation of the sulphur contained in sulphuret ores, so as to secure as a by-product a portion of said sulphur.

A second object or purpose is the heating of the ore, and plunging it, while hot, into cold water preparatory to amalgamation.

The invention consists, first, of a retort provided with a conveyer, and having an automatic feeding-valve.

It also consists of a cut-off for preventing the escape of sulphur vapor with the outgoing ore through the ore-discharge.

Referring to the drawings, A represents a retort, which is properly supported on brickwork or masonry; and B represents a screw-conveyer, which extends horizontally and longitudinally within the retort, and is properly mounted on the ends thereof.

At one end of the retort, and communicating therewith, is a hopper, C, having at its base or neck a valve, D, which projects into the retort A, and is adapted to close by upward movement.

To the retort A, at the end opposite to the valve D, is connected a discharge-spout, E, and within the retort there rises a partition, F, through which the shaft of the spiral conveyer freely passes. Depending from the inner face of the retort A, adjacent to the disk F, is a bridge, G, which dips into the retort at least to the height of the diameter or height of the disk F; and adjacent to said bridge is an opening or openings, *a*, constituting the outlet of the retort A.

Beneath the retort A is a fire-box and hot-air space, for purposes of heating said retort and contents thereof.

H represents a water-box, within which is fitted a diaphragm, H′, to which is secured a pipe, *b*, communicating with the spout E, and opening into the box on the under side of or below the diaphragm H′.

The water-box H is provided with a supply-pipe, overflow-pipe, and eduction-pipe, as more readily seen in Fig. 2.

The operation is as follows: The ore is introduced into the retort through the hopper C. The spiral conveyer is properly rotated, whereby the ore, subjected to heat, is carried toward the discharge end of the retort.

Owing to the partition F, the ore is caused to rise and overflow at the top of the partition F, thus enveloping the lower edge of the bridge G, and forming a seal or cut-off at the discharge end of the retort, whereby the sulphur vapor in the retort is prevented passing out with the ore, but is caused to seek an outlet through the opening *a*.

The ore, in a hot state, is directed by the spout E and pipe *b* into the box H below the diaphragm H′, through the perforations of which cool or cold water is passed, thus subjecting the hot ore to the action of the water as a step preparatory to amalgamation, and at the same time preventing the steam that is created from rising and depositing the fine particles of ore in the form of mud in the discharge-spout, and clogging the same, and on the sides of the water-box.

The ore as treated passes out through the eduction-pipe of the water-box.

During the passage of the ore from the receiving to the delivery end of the retort, the supply may be greater than the discharge. In this case the ore collects in the retort and rises at the feed end thereof, and thereby lifts and closes the valve D, thus automatically shutting off the feed. As soon as the supply

has sufficiently decreased, or is at the proper level, the valve drops and thereby opens, thus again admitting ore.

For purposes of cleansing, and in some cases of discharging, the retort, a small opening may be left or formed at the bottom of the partition F, as shown in Fig. 2.

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

1. The retort, in combination with a hopper and an automatic rising and falling valve, substantially as and for the purpose set forth.

2. The retort having a vapor-outlet, *a*, and provided at its discharge end with a vapor cut-off, consisting of the partition F and bridge G, substantially as described.

IRA M. PHELPS.

Witnesses:
JOHN A. WIEDERSHEIM,
SAML. M. GRICE.