3 Sheets—Sheet 1.

J. H. RAE.

Apparatus for Amalgamating Ores.

No. 215,672. Patented May 20, 1879.

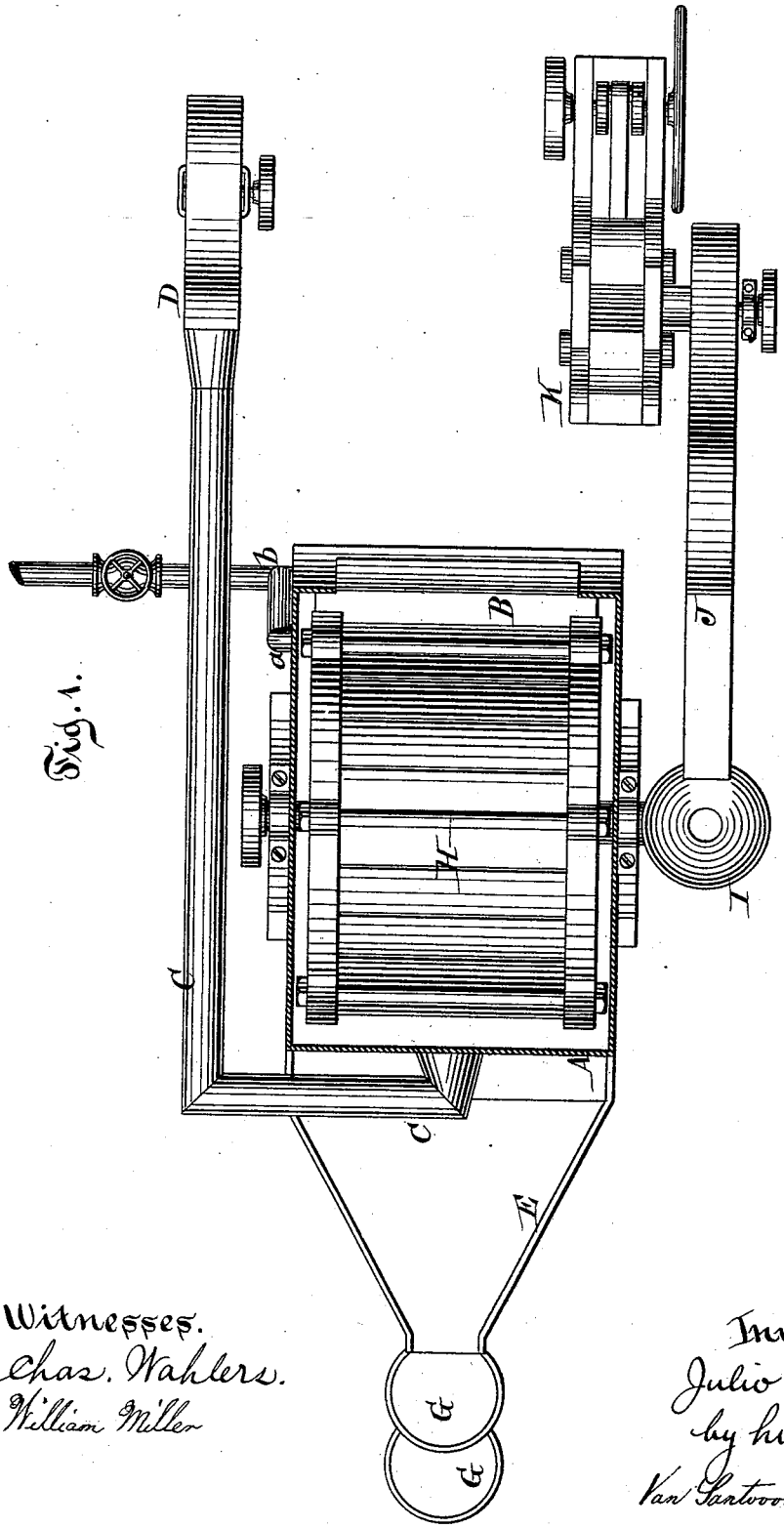

Fig. 1.

Witnesses.
Chas. Wahlers.
William Miller

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by his attys.
Van Santwood & Hauff

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J. H. RAE.

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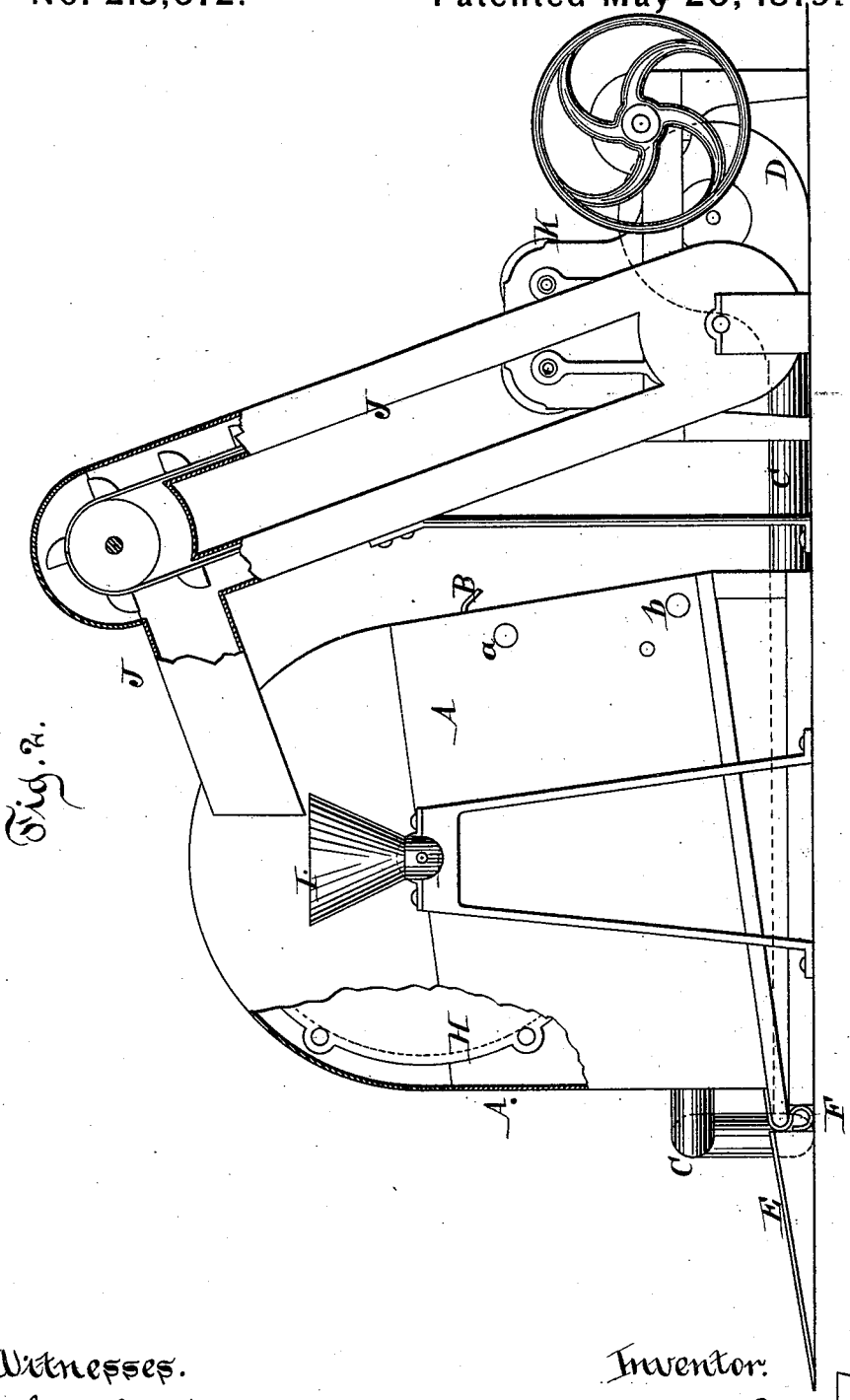

Fig. 2.

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3 Sheets—Sheet 3.

J. H. RAE.

Apparatus for Amalgamating Ores.

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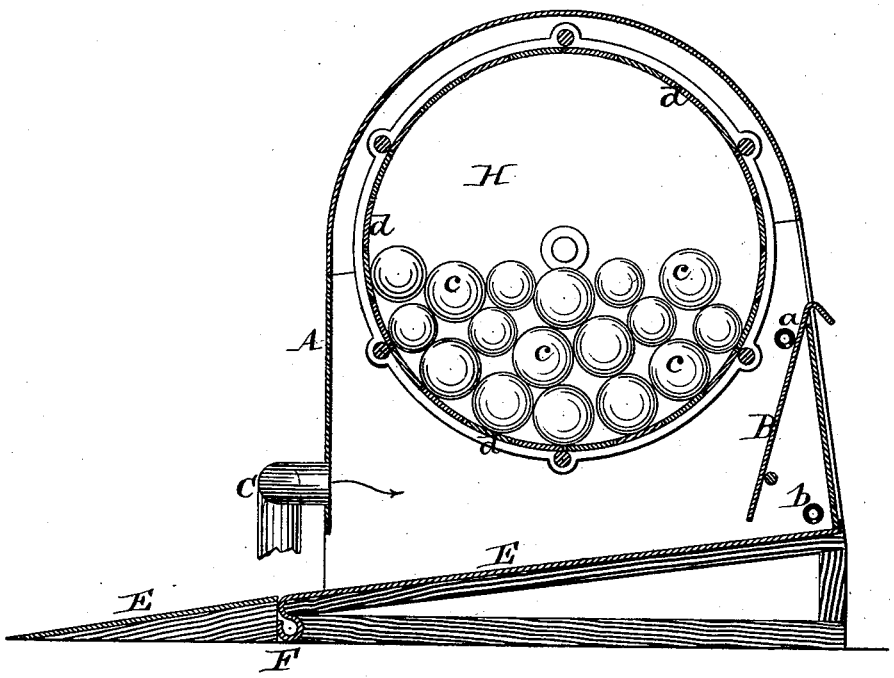
Fig. 3.



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Chas. Wahlers.
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Van Santvoord & Hauff

UNITED STATES PATENT OFFICE.

JULIO H. RAE, OF NEW YORK, N. Y.

IMPROVEMENT IN APPARATUS FOR AMALGAMATING ORES.

Specification forming part of Letters Patent No. **215,672**, dated May 20, 1879; application filed January 22, 1879.

To all whom it may concern:

Be it known that I, JULIO H. RAE, of the city, county, and State of New York, have invented a new and useful Improvement in Apparatus for Amalgamating the Precious Metals, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan view, partly in section, of an apparatus used in carrying out my invention. Fig. 2 is a side elevation thereof, partly in section. Fig. 3 is a longitudinal vertical section of the amalgamating-chamber.

Similar letters indicate corresponding parts.

My invention relates to certain improvements in amalgamating-machines, and is designed to improve upon that class in which the pulverized ore is forced through a pipe against an amalgamating-disk by an air-blast.

The invention consists, in combination with a closed chamber, of a lateral amalgamated plate, means for supplying the lateral plate with water, and in an air-forcing device connected to one side of the chamber opposite to the lateral plate, whereby I obtain an apparatus peculiarly adapted to the carrying out of the process set forth.

With the parts last enumerated are combined an amalgamated base-plate, situated beneath the lateral amalgamated plate, and means for supplying the base-plate with water, so that while the latter is adapted to the amalgamation of the coarse ore not blown against the lateral plate, it receives at the same time the fine ore washed off of the lateral plate, so that this fine ore is subjected to a second amalgamating process. The amalgamated base-plate is divided into two parts or sections, and with the same is combined a trap, which is made in one piece with the first section of the plate, and arranged between the two sections thereof, so that the mercury or amalgam not adhering to the first section of the plate is caught in said trap, and waste is prevented to a great extent, the tailings being, however, permitted to clear said trap, and thence to pass onto and over the second section of the base-plate.

In the drawings, the letter A designates a closed chamber, in which is arranged a lateral plate, B, this plate being, preferably, inclined toward the interior of the chamber, and the inner or upper surface thereof being amalgamated with mercury. Adjacent to the lateral plate B, and near its upper end, is arranged a pipe, *a*, which is perforated throughout its entire length, and connected to a water-supply source. To that side of the chamber B opposite the lateral plate B is connected one end of a pipe, C, the other end of which is connected to a fan-blower, D, or other air-forcing apparatus.

The letter E designates a base-plate, which is arranged beneath the lateral plate B, and is inclined in a like direction to the latter, but to a less degree. Near the upper end of this base-plate is located a pipe, *b*, which, like the pipe *a*, is perforated, and connected to a water-supply source. I make the base-plate E in two sections, and between the two sections thereof I arrange a trap, F. This trap consists of a scroll, made by bending the outer end of the first or upper section of the base-plate E, this scroll being, moreover, bent back of the junction-line between the two sections, and the latter being brought close together, as shown, so that the space between the sections is sufficient to allow the mercury or amalgam to find its way into the trap F, but not to permit the tailings to enter the same.

If a current of air is forced into the chamber A through the pipe C, and auriferous or argentiferous ore in a pulverized state is brought into this air-current in any manner, the very fine or very light particles of ore usually washed away are caught up thereby and forced against the lateral plate B, where they are momentarily held—that is to say, a sufficient length of time to allow amalgamation to take place—the tailings being washed off and onto the base-plate E, where they become mixed with the coarse or heavy particles of ore that pass unaffected through the air-current and fall on the base-plate. Any mercury or amalgam flowing down on the first section of the base-plate E to the division-line between the two sections thereof follows the surface of said first section, and is caught in the trap F, while the tailings pass over said division-line and onto the second section, from which they may be conducted or deposited in washers G, as represented in Figs. 1 and 2, these washers being, preferably, constructed

in accordance with Letters Patent of the United States granted to me on the 26th day of January, 1869, No. 86,249.

The trap F forms an efficient means for saving the mercury not incorporated, or but slightly incorporated, with the precious metal in the ore, and which usually is lost.

By my process of treating the light particles or dust of pulverized ore—namely, by the air-blast and lateral amalgamated plate B—a great amount of precious metal usually wasted is saved; and in the example shown I have represented the best means which I have hitherto devised for carrying out this part of my invention.

The ore to be amalgamated is brought to the required state in a suitable pulverizer, which I have represented as being situated in the upper part of the chamber A, and as consisting of a cylinder, H, which contains balls or weights *c*, and is composed of a series of staves, *d*, between which spaces are left for the escape of the ore as it becomes pulverized. The ore is fed to the cylinder H through a hopper, I, (see Figs. 1 and 2,) to which it is carried by an elevator, J, taking the ore from a crusher, K. This crusher K can, however, be arranged to empty directly into the hopper I, in which case the elevator is dispensed with.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in an apparatus for amalgamating auriferous or argentiferous ore, of a closed chamber, a fixed inclined and lateral amalgamated plate situated in said chamber, a perforated pipe extending along the face of said plate for supplying the same with water, and an air-forcing device connected to one side of the chamber opposite to the said fixed inclined and lateral plate, all constructed substantially as described.

2. The combination, in an apparatus for amalgamating auriferous or argentiferous ore, of an amalgated base-plate, a closed chamber arranged directly above said plate, a lateral amalgamated plate situated in said chamber to operate in conjunction with the base-plate, pipes for independently supplying both of said plates with water, and an air-forcing device connected to one side of the chamber opposite to the lateral plate, all constructed and adapted to operate substantially as described.

3. The combination, in an apparatus for amalgamating auriferous and argentiferous ore, of an amalgamated base-plate divided into two sections, a trap interposed between said sections, a lateral amalgamated plate, pipes for supplying both of said plates with water, and an air-forcing device for projecting the pulverized ore against the amalgamated plate, substantially in the manner and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 8th day of January, 1879.

JULIO H. RAE. [L. S.]

Witnesses:
W. HAUFF,
CHAS. WAHLERS.