J. R. ABBE.

Amalgamator.

No. 211,365. Patented Jan. 14, 1879.

Fig. 1.

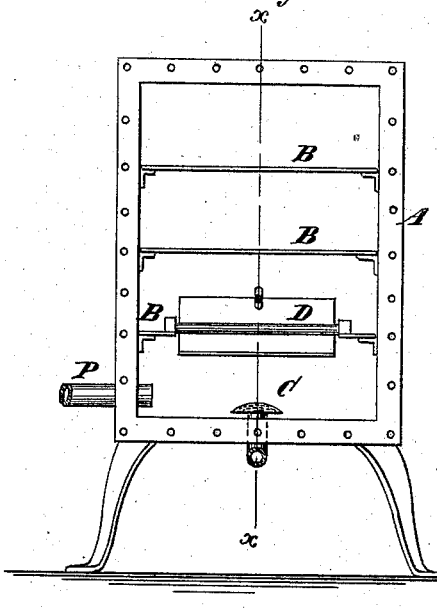


Fig. 2.

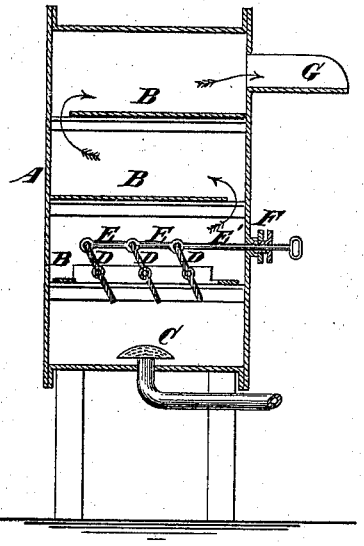
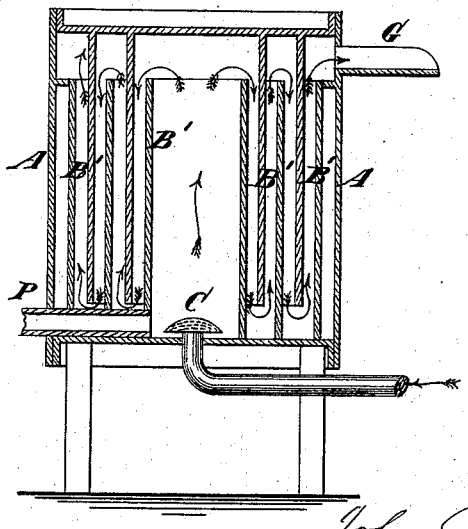


Fig. 3.



Witnesses

John Becker

Fred. Haynes

Inventor

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UNITED STATES PATENT OFFICE.

JOHN R. ABBE, OF SOUTH WINDHAM, CONNECTICUT, ASSIGNOR OF ONE-HALF HIS RIGHT TO CHARLES SMITH, OF SAME PLACE.

IMPROVEMENT IN AMALGAMATORS.

Specification forming part of Letters Patent No. **211,365**, dated January 14, 1879; application filed October 26, 1878.

To all whom it may concern:

Be it known that I, JOHN R. ABBE, of South Windham, in the county of Windham and State of Connecticut, have invented an Improvement in Amalgamating Separators for Separating Metals from Ores; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

My invention has for its object the more complete separation of metals from ores than has hitherto been attained, by a more complete amalgamation of the same.

The invention consists in the novel construction of an amalgamating-separator, hereinafter described.

Figure 1 in the drawing is a side view of an amalgamating-separator constructed in accordance with my invention, but having one of its sides removed to show the interior parts. Fig. 2 is a section on the line *x x* in Fig. 1. Fig. 3 is a modification of the invention, showing how the invention may be carried out in a slightly different manner without departing from the spirit or principle of the invention as illustrated in Figs. 1 and 2.

The separator is composed of a copper case, A, amalgamated on the inner side, or it may be made of other material lined on the inside with amalgamated copper plates detachable from the exterior case. In the interior of the case A are amalgamated copper plates B, which in the method of carrying out the invention illustrated in Figs. 1 and 2 are detachable or removable shelves, which may be taken out for the purpose of removing the gold or silver amalgam when the said plates have become charged with such amalgam. The said case is provided with an inlet, P, for the introduction of comminuted ore mixed with and suspended by water, and an outlet, G, for the egress of the same after treatment in the separator. Said shelves are arranged on suitable supports in relation with said inlet and outlet, and in such manner that a current passing upward through the separator will be directed first along over one side of each plate, and then along over the other side of the same, as indicated by the arrows, in order that both sides of the said plates may be utilized to the utmost as amalgamating-surfaces.

Water is introduced into the separator through a rose, C, or other device for finely dividing the current and distributing said water to all parts of the separator. In the lower shelf (in this method of carrying out the invention) is an opening in which is arranged an agitator for causing a very minute and thorough intermingling of the water and stone pulp, and for causing every particle of the comminuted metal-bearing ore to come in contact with some part of the amalgamated surfaces. Said agitator may consist of pivoted plates D, connected by a rod or rods, E, and also having connected therewith an extension, E′, of the said rod, or a separate rod passing out of the side of the case A through a stuffing-box or gland, F; but I do not confine myself to the precise form of agitator described, as probably other constructions may answer the same or nearly as good a purpose when used with the separator constructed as described; neither do I confine myself to the precise construction and arrangement of the amalgamated plates as shown in Figs. 1 and 2 of the drawings, reserving to myself the right to arrange the same in any manner that will permit the passage of the current through the separator first along over one side of each plate and then along over the other side, in order that both sides may be amalgamated and utilized as amalgamating-surfaces for the retention of the metallic particles.

One modification of the invention (shown in Fig. 3) is very effective. It consists of concentric annular amalgamated plates B′, so placed with relation to the inlet-pipe P and outlet G that the current is obliged to flow first over one side and then over the other side of each of said plates, as indicated by the arrows. The said figure shows the current as first entering the central part of the separator; but it will be evident that the apparatus could be so constructed that the direction of the current might be reversed and insure precisely the same utilization of both sides of the plates as amalgamating-surfaces. In this modifica-

tion agitators may be placed between the amalgamating-plates to cause a more thorough circulation of the water and comminuted ore. Said agitators may be pivoted plates arranged vertically between the plates, and having their shafts or pivots passing out through the upper part of the separator, and connected in such manner as to be moved all together or independently, if desired.

The action of the separator is as follows: Water bearing the comminuted ore or stone pulp flowing from a grinding-mill is caused to flow into the separator through the pipe P. It then passes first along one side of each plate, and then along over the other side until all the plates are passed, and finally issues from the chute at the top of the case A. The water and comminuted ore, after passing out of said chute, may be caused to flow upon blankets or riffling-tables, if desired, for the collection of the last remnants of the precious metals contained in said ore.

I claim—

1. The combination, in an amalgamating apparatus, of the closed vessel A, the series of amalgamated plates, the inlet-pipe P at the lower end of the vessel, the outlet G at the top thereof, and a rose, C, at the bottom of the vessel, for introducing sprays of water, substantially as and for the purpose set forth.

2. In an amalgamating apparatus, the combination, with the vessel A, having inlet and outlet P G, and the series of amalgamated plates B, of the rose C, for introducing water, and the agitator D, arranged within the vessel, for commingling the water and comminuted ore thoroughly together prior to its passage over the amalgamated plates, substantially as described.

JOHN R. ABBE.

Witnesses:
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