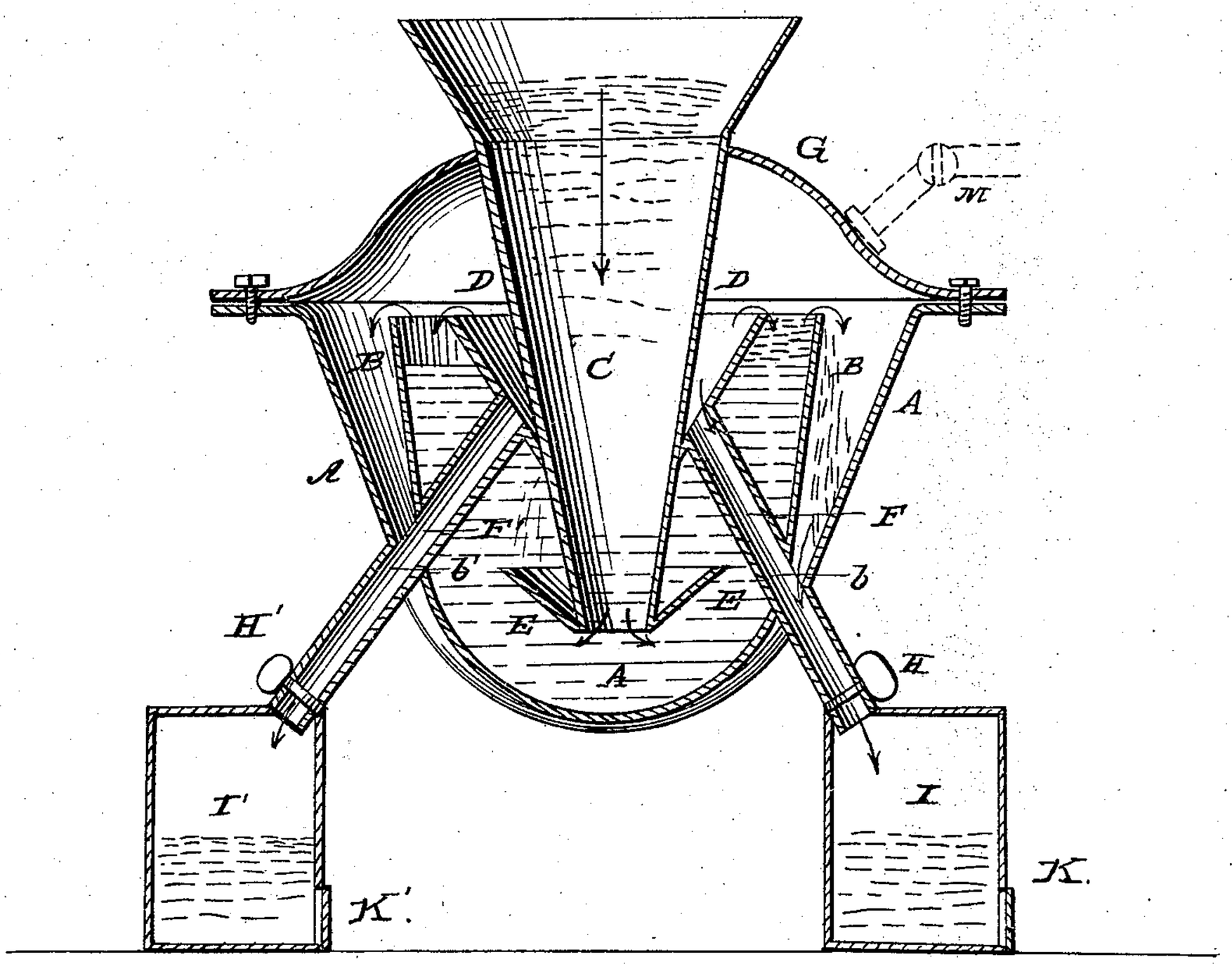
E. HAMILTON.

Amalgamator.

No. 52,846. Patented Feb. 27, 1866.



Witnesses
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UNITED STATES PATENT OFFICE.

EDWARD HAMILTON, OF CHICAGO, ILLINOIS.

IMPROVED AMALGAMATOR.

Specification forming part of Letters Patent No. **52,846**, dated February 27, 1866.

To all whom it may concern:

Be it known that I, EDWARD HAMILTON, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machinery for Extracting Gold and Silver from Quartz; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing.

This invention relates to certain improvements in apparatus for extracting gold and silver from quartz for which Letters Patent were issued to Willard Munroe Fuller on the 2d of January, 1866.

The disadvantage attending the use of the apparatus used by Fuller is that it cannot be worked continuously—that is to say, when it becomes necessary to open the aperture or tube through which the quartz is drawn off the machine must necessarily cease its operation during the time said tube remains open, for the reason that the vessel being no longer air-tight the air-pump cannot form the vacuum in the vessel, on which the working of the apparatus depends.

The object of my invention is to remedy this defect, so as to produce a machine constructed in such manner that the quartz can be drawn off without interfering with the continuous operation of the machine, which I accomplish substantially as follows:

Instead of a discharge-pipe standing from the shell of the amalgamating-vessel there are two or more pipes extending from the interior obliquely downward through the sides of the vessel, and connecting with large receiver-boxes. Each pipe, near the point of junction with its receiver-box, is furnished with a valve, by which the flow of quartz may be intercepted. Each receiver-box is also furnished with a valve or door, through which the quartz is drawn off when required. By means of these valves a flow of quartz can be secured without interfering in the least with the continuous operation of the machine. There are also other improvements in the interior of the vessel for facilitating the flow of the quartz into the pipes, which will be hereinafter described.

To enable others skilled in the art to understand and use my invention, I will now proceed to describe its construction and operation.

In the drawings, A is the amalgamating vessel or kettle, to which the cover G is secured, hermetically sealing it. Through the cover the conical chute or tube C passes, being in the form of an inverted truncated cone, provided at its upper end with a funnel-shaped hopper. Around the bottom of the chute the flange E is placed, which acts as a deflector and prevents the particles of gold and quartz from collecting about the sides of the chute.

D is an annular receiver, its lower end secured to the sides of the chute, its upper end open for the reception of the quartz. F F′ are the discharge or delivery pipes, inserted in the bottom of the receiver D, and extending thence obliquely downward through the sides of the vessel.

B B is the inner wall or shell of the amalgamating-vessel, and the space between the outer shell, A, and the inner wall, B, forms a receiver similar to the receiver D, and connected with the pipes F F′ at *b b′*.

I I′ are the receiver-boxes, furnished with valves or doors K K′. H H′ are valves placed above the points where the pipes connect with the receiver-boxes.

This apparatus is operated as follows: The requisite quantity of mercury or melted lead having first been placed in the vessel, the chute C is filled with the crushed and powdered ore. The air in the vessel is then exhausted by means of an air-pump applied to the pipe M, (indicated in dotted lines.) A vacuum having thus been formed in the vessel, the pressure of the outside atmosphere upon the ore forces it down the chute, where, owing to the convergence of the sides, the ore becomes more and more packed and air-tight as it approaches the delivery end of the chute. When the ore passes through the mercury or lead the gold or silver is separated from the quartz. The former unites with the mercury to form a soft amalgam, which is precipitated to the bottom of the vessel. The latter rises to the surface of the mercury, and as soon as it is collected in sufficient quantity will pour over into the receivers B D, as indicated by the arrows in the drawing. From the receivers the quartz flows into the pipes F F′, and from thence into the receiving-boxes I I′.

The valves on the pipes and receiving-boxes should be so arranged as to permit only one receiver-box to fill at a time. For instance,

suppose the valve H of the pipe F is open; then the valve H′ of the pipe F′ should be closed. As soon as the receiver-box I is filled the valve H is closed, which prevents the further flow of the quartz into the receiving-box, and the valve or door K is then opened, by which the quartz is drawn off and the receiver-box emptied. At the same time the valve H is closed the valve H′ of the pipe F′ should be opened, the valve or door K′ having just been closed, and the flow of quartz is then directed into the pipe F′ and receiver-box I′.

In order to insure that the vessel shall be perfectly air-tight it is only necessary that one valve on each pipe and receiver-box should be closed. If the valve H is open the valve K should be closed, and vice versa, and it is the same with the valves H′ K′.

By this arrangement the continuous working of the machine is secured, while at the same time the quartz can be drawn off without difficulty.

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

In apparatus for extracting gold and silver from auriferous and argentiferous ores, operating substantially as herein described, the arrangement of the annular receivers, discharge-pipes, and receiving-boxes, as and for the purposes herein set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

EDWARD HAMILTON.

Witnesses:

CHARLES T. TAYLOR,

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