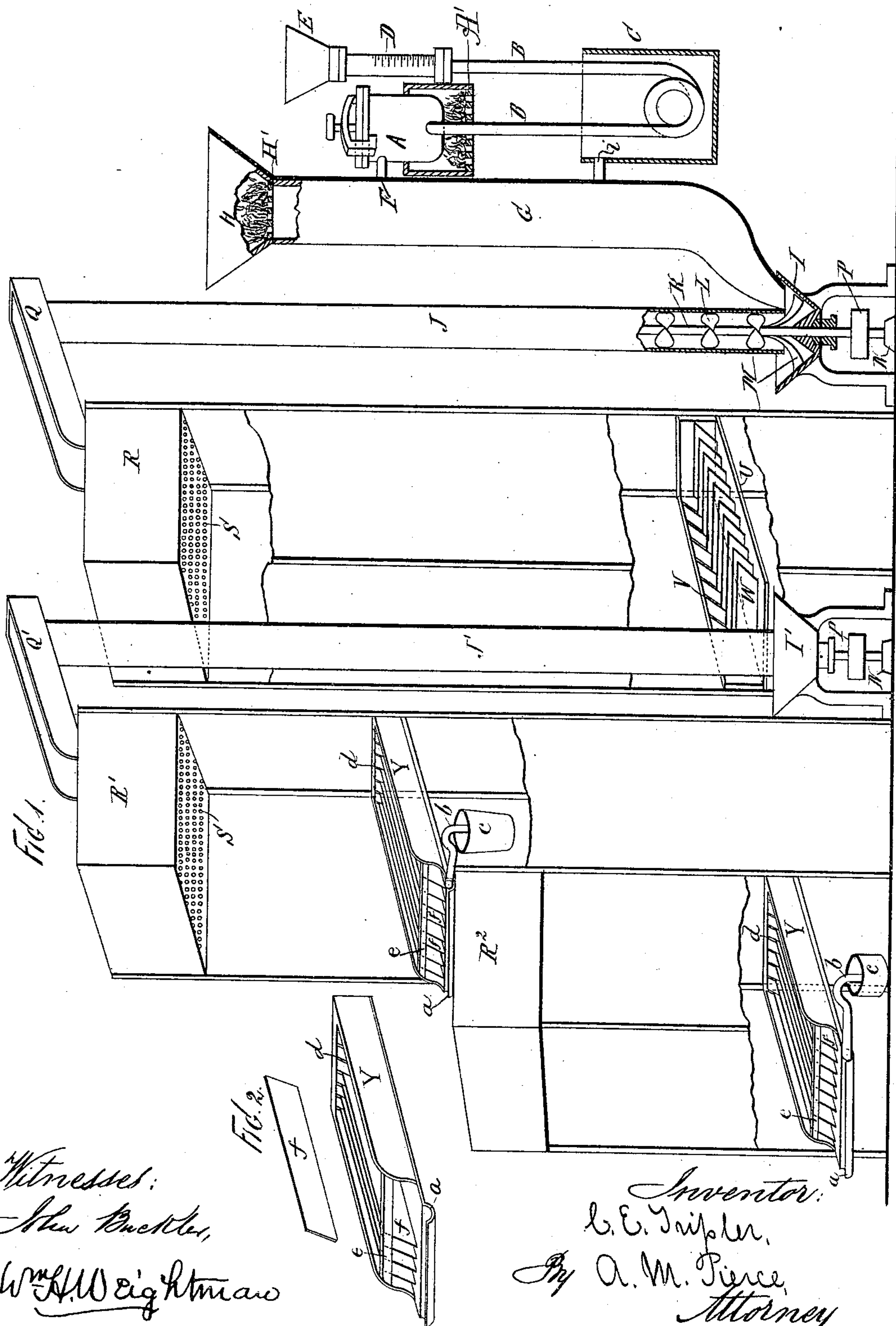


(No Model.)

C. E. TRIPLER.
AMALGAMATOR AND SEPARATOR.

No. 373,542.

Patented Nov. 22, 1887.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES E. TRIPLER, OF NEW YORK, N. Y.

AMALGAMATOR AND SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 373,542, dated November 22, 1887.

Application filed May 11, 1886. Serial No. 201,804. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. TRIPLER, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Amalgamators and Separators, of which the following is a specification.

My invention relates especially to devices employed for amalgamating and gathering precious metals, and has for its object the provision of a simple and effective apparatus whereby substantially all of the metal contained in the ore passing therethrough may be secured without appreciable loss of mercury and by the expenditure of but little power.

To attain the desired end my invention consists, essentially, in a conduit for powdered ore or sand, wherewith a mercury-vaporizing retort communicates, said retort being upon the same principle as that illustrated in Letters Patent No. 287,981, granted to me November 6, 1883, for process of and apparatus for amalgamating ores, but being provided with means for supplying mercury to the retort in a cool state, and with a gage for regulating the supply.

From a hopper at the bottom of the above-mentioned conduit the ore, after passing through the vapor of mercury, is elevated through a conduit by means of a revolving-shaft, whereon are located a series of blades which thoroughly stir the mass as it is elevated. At the top of this conduit chute, leading to a tank having a perforated bottom, beneath said tank, is a closed trunk or case, near the bottom whereof is located a receptacle having a slightly-inclined bottom. The walls of this receptacle are not amalgamated, but a series of transverse sloping amalgamated plates fit into slots or grooves in the sides, and are elevated sufficiently above the bottom of the receptacle to permit the ore pulp to pass therebeneath to a hopper, from whence the ore pulp is again elevated, as above described, to a second chute, from whence it flows to a second tank having a perforated bottom, wherefrom it showers upon a pan, the bottom and sides whereof are amalgamated. Within this pan are longitudinal sloping amalgamated plates placed at an angle, the lower extremity of the pan being provided with a trough to re-

ceive the amalgam and carry it to a convenient receptacle. A third tank and second collecting-pan, constructed as above described, are employed to prevent any loss of amalgam or mercury, and from this pan the tailings are allowed to flow away. My invention also involves certain other novel and useful combinations or arrangements of parts and peculiarities of construction and operation, all of which will be hereinafter first fully described, and then pointed out in the claims.

In the drawings, Figure 1 is a perspective view of my amalgamator and separator, some of the parts being shown in section. Fig. 2 is a perspective view of one of the collecting or separating pans.

Like letters of reference, wherever they occur, indicate corresponding parts.

A is the mercury-retort, heated by a furnace, A', wherein it is supported.

B is a pipe passing from said retort to a cold-water tank, C, and from thence to a glass tube, D, said tube being surmounted by a feeding-funnel, E. By this arrangement the mercury may be supplied to the retort, and its height therein be ascertained at a glance; and by passing the supply-pipe through the cold-water tank there will be no danger of overflow or heating of the supply outside of the retort.

F is a pipe leading from retort A to an ore-conduit, G. Powdered ore, either wet or dry, is supplied to conduit G through a funnel, H, and as it falls the vapor of mercury is absorbed, the mass falling into a hopper, I. Water is supplied through a pipe, i, leading from the tank C. Within funnel H, directly over the conduit G, is a perforated bottom, H', through which the ore pulp passes, the pulp resting upon the bottom H', preventing the escape of the mercury vapor.

Extending upward from hopper I is a conduit, J, wherein is a vertical shaft, K, upon which are fixed blades or fans L, having the helicoidal shape of screw-propeller blades, and within hopper I stirring-arms M. Shaft K extends through the bottom of hopper I, rests upon a step, N, and is driven by a band passing around a pulley, P. I have found the blades or fans superior to a screw or other contrivance for elevating the pulp, as in its passage up the conduit it is thrown from one

set of blades to the next and is thoroughly mixed, insuring a proper amalgamation of the metal contained in the pulp.

At the top of conduit J is a chute, Q, leading to a tank, R, made of any approved material, said tank being provided with a perforated bottom, S, wherefrom the pulp escapes in minute streams or drops. Beneath tank R is a trunk, T, and near the bottom thereof is a receptacle or pan, U, made of any approved material, but not amalgamated. The bottom of receptacle U slopes to a second hopper, I', the end next said hopper being open. In the sides of receptacle U are sloping grooves or slots V, extending nearly to the bottom of the receptacle, arranged to receive removable amalgamated plates W. These plates are so arranged that the bottom of the first is overhung by the second plate, and so on through the length of the receptacle. The office of this receptacle is to thoroughly amalgamate the metal before being separated from the pulp, and by the peculiar arrangement of the plates W each stream or drop of pulp escaping from tank R finds a clean amalgamated surface to strike, and must pass over such surface before escaping from the receptacle. Tank R is located at such a height above receptacle U as to give sufficient force to the falling pulp to insure the contact of each particle of mercury and metal with the amalgamated surfaces of plates W, utilizing the force of gravity to thoroughly incorporate the gold contained in the ore with the mercury.

Leading from hopper I' is an elevating device, J', arranged as described of J, said elevator leading to a chute, Q', communicating with a tank, R, also provided with a perforated bottom, S. Beneath tank R' is located a separating-pan, consisting of an amalgamated body, Y, the bottom sloping slightly and terminating at the lower end in a trough, a, having a conduit, b, leading to a receptacle, c. In the back end of pan Y are formed diagonal slots or grooves d, and at the front end is a cross-bar, e, also provided with diagonal slots d, into which the removable amalgamated plates f fit, said plates touching the bottom of pan Y.

It will be observed that the distance between tank R' and the separating-pan is much less than between tank R and receptacle U, as it is desirable to have the pulp gently showered into the separating-pan, preventing the scattering and floating and consequent loss of amalgam and mercury, as would be the case if the fall were too great.

R² is a tank arranged as before described, and having a gathering-pan, Y, located therebeneath, in all respects like the above described.

The operation of my improved amalgamator and separator is as follows: Powdered ore or sand being supplied to conduit G, is impregnated by the vapor of mercury from retort A, and falling into hopper I is stirred and mixed by the arms therein. The mixing pro-

cess is continued by the elevator carrying the pulp to tank R, and the amalgamation completed by the force of the fall of the pulp from the perforated bottom of said tank onto the inclined plates W in receptacle U. From the arrangement of the said plates a clean amalgamated surface is provided for the reception of each stream or drop of pulp, that falling at the lower end of the receptacle passing over a surface precisely like that at the upper end, which would not be the case if a single amalgamated surface were employed, because the mass of pulp passing over such plate gradually thickens toward the lower end, cutting off the dropping pulp from contact with the amalgamated surface. After leaving hopper I' the ore is thoroughly amalgamated and the amalgam is ready for separation from the pulp. This is accomplished by showering said pulp from tank R' into pan Y. From the peculiar construction of said pan the collecting of the amalgam is quickly and thoroughly accomplished. A clean amalgamated surface is provided throughout the entire area of said pan, and the sloping longitudinal plates being in contact with the bottom thereof, a channel for the amalgam is formed at the junction of the edges of each plate with the pan-bottom in such a manner as to convey the amalgam off in streams corresponding in number to the plates in the pan—a process much more rapid and effectual than if the amalgam were spread over the whole bottom in a thin sheet.

I have found by careful experiment that the first pan Y collects substantially all the amalgam; but in order to guard against possible loss I prefer to add the second pan, as shown. These pans Y are arranged to slide out of the supporting-frame, and when it is desired to scrape the plates a fresh pan may be substituted for the pan removed without loss of time; and as said pans are inclosed there is no danger of the amalgam being abstracted by unauthorized persons.

I am aware of the existence of Patent No. 46,546, issued to A. B. Crosby, February 28, 1865, for an improvement in ore-amalgamators, and to the construction and arrangement shown and described in said Letters Patent I make no claim.

To the construction and arrangement of the frames M M and J J, as located in the device shown and described in said Letters Patent No. 46,546, I make no claim, only so far as a similar construction is employed by me as one step in my process of amalgamating and separating.

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

1. The combination, with the mercury-retort A, of the supply-pipe B, provided with transparent extension D and cold-water tank C, substantially as shown and described.

2. In an amalgamator, a receiving-hopper, I, a perpendicular conduit mounted thereabove, and a shaft within said conduit pro-

vided at intervals with helically - curved blades, and means whereby said shaft may be rotated, the whole combined and arranged substantially as shown and described.

5 3. In an amalgamator, a receiving-hopper, I, a perpendicular conduit mounted there-
above, and a shaft within said conduit pro-
vided at intervals with helically - curved
blades, and with stirring-arms within the re-
ceiving-hopper, means being provided where-
10 by said shaft may be rotated, substantially as
shown and described.

4. The combination, with an elevated tank
having a perforated bottom, of a separating-
15 pan located therebeneath, said pan having a
sloping bottom terminating in a collecting-
trough, amalgamated plates inclined to the
longitudinal vertical plane of the pan being
placed within said pan, substantially as shown
20 and described.

5. The pan Y, open at one end and pro-
vided with an amalgamated bottom sloping
to the open end and terminating at a collect-
ing-trough, the open end having a diagonally-
grooved cross-piece, e, similar grooves being 25
formed in the opposite end of the pan, in
combination with the separate removable in-
clined amalgamated plates f, resting upon the
bottom of the pan, substantially as shown and
described. 30

Signed at New York, in the county of New
York and State of New York, this 10th day
of May, A. D. 1886.

CHARLES E. TRIPLER.

Witnesses:

W. J. MORGAN,
A. M. PIERCE.