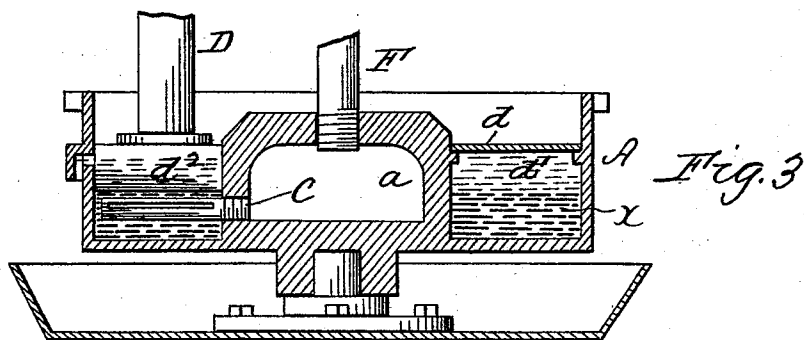
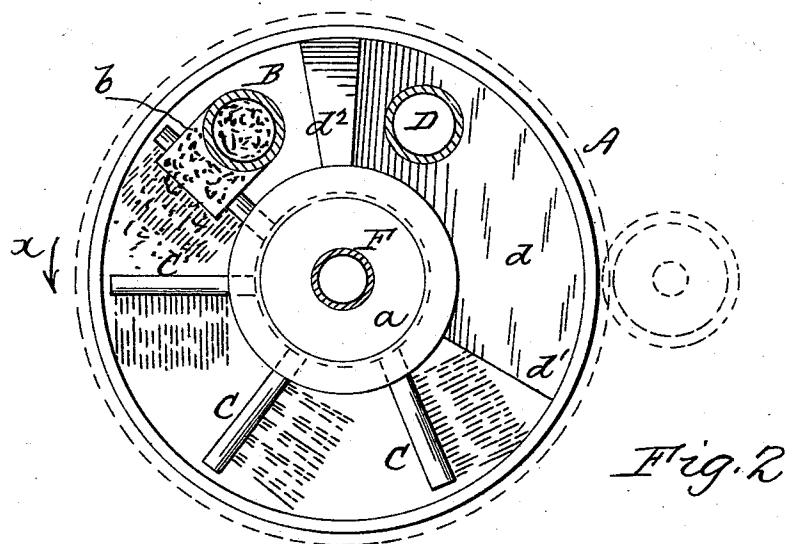
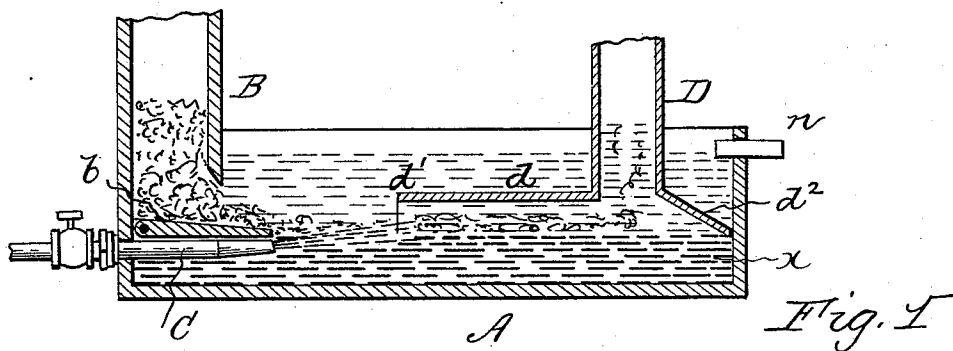


(No Model.)

C. F. PIKE.
ORE WASHER OR CONCENTRATOR.

No. 528,980.

Patented Nov. 13, 1894.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES F. PIKE, OF PHILADELPHIA, PENNSYLVANIA.

ORE WASHER OR CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 528,980, dated November 13, 1894.

Application filed June 10, 1893. Renewed April 17, 1894. Serial No. 507,946. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. PIKE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Ore Washers or Concentrators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has relation to ore-washers, concentrators and amalgamators having a feed, a suction discharge and a body or layer of mercury between such feed and discharge; and it has for its object a more rapid and thorough separation of the metal from the ore or gangue than has heretofore been obtained, and to this end I distantly locate the feed and the suction-discharge and interpose between them suitable forcibly acting means for spreading or dispersing the ore or gangue after it is fed into the washer and for propelling or conveying it or its waste-matter in a dispersed condition across and above the surface of the mercury to the discharge, whereby the metal in the ore or gangue is free to separate from its waste-matters and fall to the mercury for amalgamation therewith while the ore or waste-matters are being propelled or conducted from the feed to the discharge; such conveyance or propulsion being effected without forcing any of the waste matters of the ore into the body or layer of mercury.

My invention accordingly consists of the method of separating or concentrating ore or gangue, and to the combinations, constructions and arrangements of parts as herein-after more fully described in the specification and pointed out in the claims.

Reference is had to the accompanying drawings, wherein—

Figure 1, is a sectional elevation of a form of washer, concentrator and amalgamator embodying one form of my improvements. Fig. 2, is a plan, partly sectional, showing another form of the same, and Fig. 3 is a vertical section, partly in elevation, of the same.

A represents a washer or a receiving vessel of any desired configuration. In Fig. 1 it is indicated as of the form of an oblong open

top box having at one end a feed tube B, the outlet end of which is represented as located adjacent to the surface of a column or layer of mercury x so as to discharge the ore or gangue at or near the surface of the mercury.

If desired, the discharge end of pipe B may be provided with a hinged or other suitably mounted arresting plate b to conform to and float on the surface of the mercury to bring the gangue or ore to a comparative or actual state of rest before being discharged or passed into the washer.

D represents the suction discharge pipe, the inlet end of which may be of any suitable construction, and it is located at a distance from the feed tube B, as desired, or the requirements of service demand. In Fig. 1 such discharge end pipe D is shown provided with a rearwardly extending inverted or open bottom chute or conduit d with rear open end d' and a closed front end d^2 , which chute is employed for a purpose hereinafter to be described.

CC represent jet-tubes of which there may be as many as desired, located below and adjacent to the outlet end of the feed tube B. When the arrester plate b is used, the tubes C will be located below the same, as indicated in Fig. 1. The head or force of the jets from tubes C impinging upon the feed from pipe B scatter or disperse such feed above the surface of the mercury to comminute and freely distribute it in the washer and also propel it above the surface of the mercury toward the discharge tube D. There is, therefore, no forcing of the ore or its waste or commingling of such ore and mercury. The light or waste particles of the ore are propelled to a greater distance than the heavier metal particles. The latter are thus separated from the former and when free to do so, fall or sink into the mercury below for amalgamation therewith. The force of the jets may be such that they will propel the lighter or the waste particles to within the direct influence of the suction-discharge, in which case, the hood or chute d on pipe B need not then be used. If the contrary is the case, the chute d is employed for utilizing the suction force in pipe B for propelling or conveying such light waste matter through the washer for the length or such

chute after they have passed out of the influence of the propelling or conveying force of jets C. So too, if the jets C C are dispensed with, the ore will be conveyed from the feed either by the rotation of the washer or by the chute *d* if sufficiently extended.

In Fig. 2, the vessel A is shown of an annular form, the discharge-tube chute *d* being of segmental configuration to conform to the annular chamber A, and the jet tubes C being radially arranged from the central hub *a* of vessel A into which leads a common supply F for said jet tubes as more plainly shown in Fig. 3. If desired the vessel A may be revolved as indicated by arrow *x* in Fig. 2 in which case the jet tubes may revolve with the vessel A and when it is rotated such movement is also a factor for propelling the ore or gangue in addition to the jets and suction pipe. The latter is provided with a suitable over-flow *n* as desired.

I do not claim the hinged arrester-plate *b* at the end of a feed tube in an ore washer having a suction discharge, as it forms the subject matter of another concurrent pending application, Serial No. 477,173.

In this application I claim broadly, in an ore washer, concentrator and amalgamator, a vessel containing a layer or body of mercury; a feed-device for discharging the ore or gangue adjacent to the surface of the mercury without causing such ore or gangue to forcibly penetrate into the mercury, a suction discharge located at a distance from the feed and conveyor or propelling media for carrying the ore or gangue from the feed device to the suction discharge across and above the body or layer of mercury whereby the metal particles in the ore or gangue are placed in a condition for free separation from the waste matters of the ore or gangue for descent to the mercury while such waste matters are removed from the washer without being commingled with said mercury.

Again in this application I also claim the use of the jet tube C in the combination with the chute on the suction pipe extending toward the feed-tube for conveying the ore from the feed to the discharge. This construction differs from that shown in another concurrent pending application, Serial No. 477,173, which embodies only the specific construction of a series of jet-tubes above the mercury one after the other for either assisting in said conveyance of the ore or for wholly performing such function.

As it is evident that the novel features of my improvements may be varied without departing from the spirit of my invention I do not limit myself to the same as shown and described.

What I claim is—

1. The method of separating metals from

ore or gangue which consists in placing a layer or body of mercury in a vessel, depositing the ore adjacent to the surface of the mercury, causing said ore to be scattered or dispersed above the surface of the mercury and correspondingly propelled or conveyed from its place of supply to a place of discharge distant from the former for effecting a separation of the metal from the ore without commingling the latter with the mercury and then discharging the gangue from said vessel, substantially as set forth.

2. In an ore washer or concentrator, the combination of a vessel containing a layer or body of mercury a feed-device for said vessel having its outlet-end above the surface of said mercury for discharging the feed into said vessel in a scattered or dispersed condition above the surface of said mercury and a suction discharge device located at a distance from said feed device for conveying the waste matters of the ore from the feed across and above the surface of the mercury and for discharging the same from said vessel, substantially as set forth.

3. In an ore washer or concentrator, the combination of a mercury containing vessel, a feed-device and a suction discharge device located at a distance apart, jet-tubes for propelling the ore across and adjacent to the surface of the mercury from the feed to the discharge, substantially as set forth.

4. In an ore washer or concentrator, the combination of a mercury containing vessel, a feed-device and a suction discharge device located at a distance apart, jet-tubes for propelling the ore part way across and adjacent to the surface of the mercury, and means attached to the suction-pipe for utilizing the suction in said pipe for continuing the travel of the ore across the surface of the mercury to the discharge-pipe, substantially as set forth.

5. In an ore washer or concentrator, the combination of a mercury containing vessel, a feed-tube and a suction discharge-device located at a distance apart, a jet tube or tubes at the feed end of the vessel, and a chute attached to the discharge device leading in the direction of the feed, substantially as set forth.

6. The combination of a rotating vessel A, a feed B, a discharge suction-pipe D located at a distance from the feed relative to the direction of rotation of the vessel A, and jet tube C between said feed and discharge, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES F. PIKE.

Witnesses:

THOS. S. RODGERS,
JAMES T. DAILY.