

(No Model.)

2 Sheets—Sheet 1.

C. F. PIKE.
ORE WASHER OR CONCENTRATOR.

No. 528,982.

Patented Nov. 13, 1894.

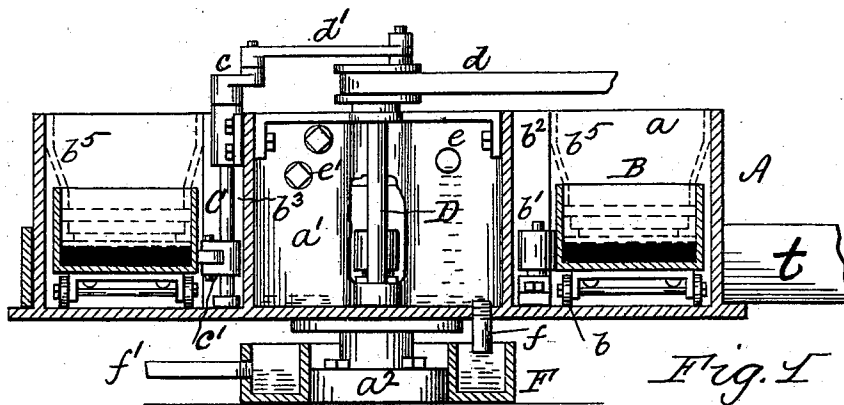


Fig. 1

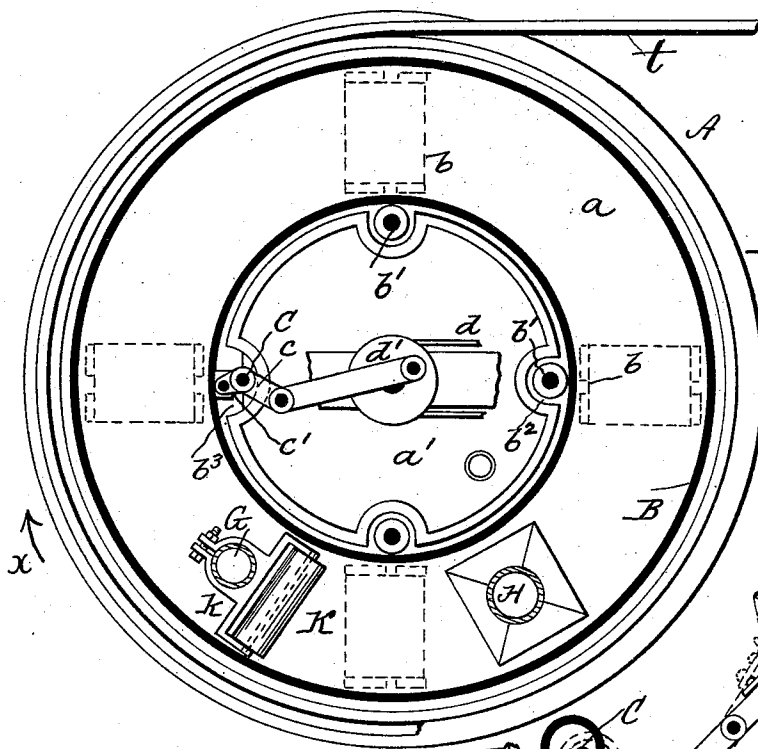


Fig. 2

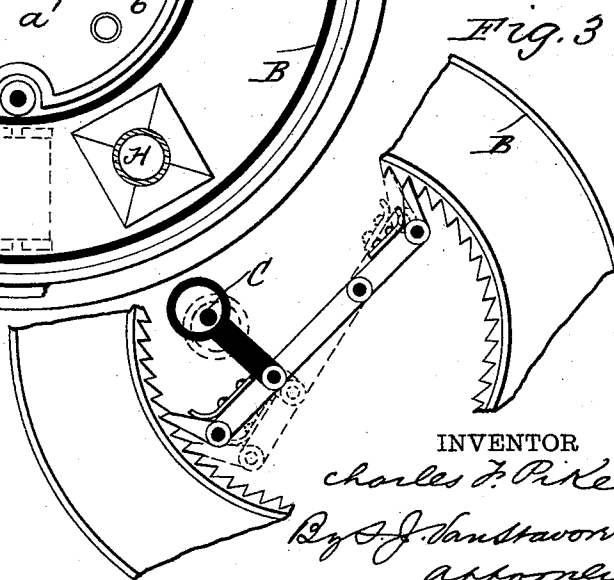


Fig. 3

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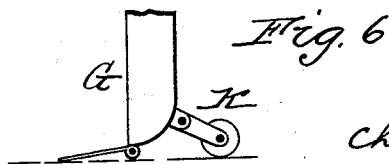
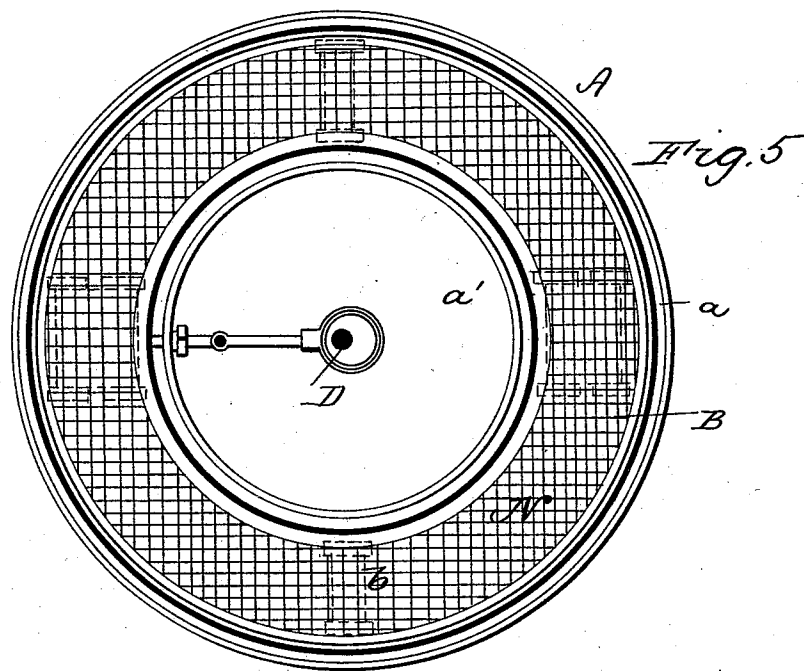
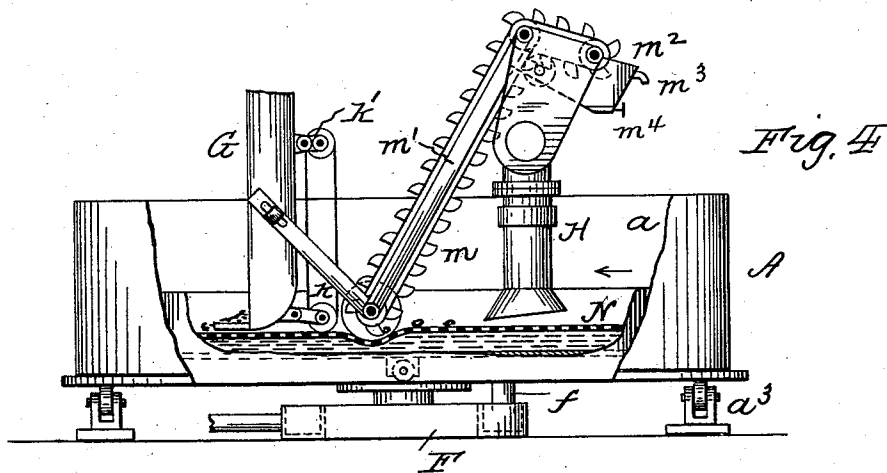
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WITNESSES:
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UNITED STATES PATENT OFFICE.

CHARLES F. PIKE, OF PHILADELPHIA, PENNSYLVANIA.

ORE WASHER OR CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 528,982, dated November 13, 1894.

Application filed June 10, 1893. Renewed April 17, 1894. Serial No. 507,948. (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 and concentrators wherein a body or layer of mercury is contained in a moving vessel which has distantly located feed and discharge appliances for the ore and gangue; and it has for its object simple and effective devices for quickly concentrating the metal from the ore or gangue; to devices for removing the greasy gold remaining in the concentrator after the gangue has been discharged and appliances connected to the feed or supply for keeping or maintaining the surface of the mercury clean and bright for amalgamation purposes.

My invention accordingly consists of the combinations, constructions and arrangements of parts as hereinafter 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 ore washer and concentrator embodying part of my improvements, the ore supply and discharge appliances not here being shown. Fig. 2 is a plan of same, partly in section showing the feed and discharge appliances. Fig. 3 is a sectional plan showing a modification of mechanism for reciprocating the mercury-containing vessel, such mechanism producing a quicker return than forward reciprocation. Fig. 4 is a sectional elevation similar to Fig. 1, with feed and discharge appliances, elevator devices for removing the greasy gold from the washer or concentrator after the gangue is discharged and appliances for maintaining the surface of the mercury clean or bright. Fig. 5 is a plan of a washer with modified form of shaking appliances for the mercury-containing vessel; and Fig. 6 shows an elevation of the lower end of the

feed tube with modified form of arresting plate for the ore and devices for keeping the mercury surface bright or clean.

A represents any suitable form of washer or concentrator. As shown, it consists of an annular vessel *a* with central chamber *a'*, which vessel is rotated upon its step or bearing *a²* by a belt or other power transmitting mechanism *t*. If desired it may be additionally supported and rotate on roller bearings *a³*. (See Fig. 4.) Within chamber *a* is an annular mercury-containing vessel B mounted upon trucks or wheels *b* and having vertically located pressure or other roller bearings *b'* in pockets *b²* of chamber *a'*. In the latter is suitably supported a shaft D having a driving belt or wheel *d* which has a link connection *d'* with a bell-crank *c* on shaft C suitably mounted or having its bearings in a pocket *b³* in chamber *a'*. The lower end of shaft C has crank-connection *c'* with the vessel B so that when shaft C is actuated the vessel B is reciprocated to and fro in the line of its rotary movement with the washer A.

If desired the sides of the vessel B may have flexible aprons overhanging the same and secured at their upper ends to the walls of the annular chamber *a* as indicated at *b⁵* to prevent the liquid material in vessel B swashing over the edges of the same into chamber *a*. The latter has in the walls of chamber *a'*, a series of overflow openings *e* at different heights with removable plugs *e'* so that any one or more of the same may be opened as desired to regulate the height and the volume of the overflow from chamber *a*. The chamber *a'* has an outlet tube *f* leading to a settling chamber F of an annular form as shown or any other forms of overflow devices for chamber *a* or vessel B may be used. The settling chamber F may have an outlet *f'* leading to any desired point as shown and described in pending application filed by me of an even date herewith, Serial No. 477,162.

G represents the feed pipe and H the suction discharge pipe or other discharging appliance. As the vessel A rotates in the direction of arrow *x*, Fig. 2, the feed pipe is relatively distantly located from the discharge pipe H. Between the feed and discharge pipes G and H is located a roller, apron or other suitable device K for cleaning the surface of

the mercury in advance of receiving thereon the ore fed to it from pipe G. As shown in Fig. 2, the device K is in the form of a roller mounted in a frame *k* supported and adjustable on the feed pipe G as shown. In Fig. 4 said device is in the form of an endless apron mounted on automatically adjusting bearings or frames *k'*.

To the rear of the cleaning device K is any suitable form of elevator *m* the frame *m'* of which is suitably mounted upon or secured to the discharge pipe H or other fixture as desired, and it is provided with a receiving reservoir *m²* provided with overflow *m³* and discharge valved outlet *m⁴*. This elevator *m* is for removing from the surface of the mercury any float greasy gold not passing into or discharged through the pipe H.

If a perforate plate, flexible or rigid, is used at the top of the mercury as shown at N, Fig. 4, it may be made flexible to admit of the buckets on the elevator depressing into said plate to remove any greasy gold or other material not discharged by the suction pipe H.

In Fig. 3 a form of actuating mechanism is shown for the vessel B which has a longer stroke in one direction than the other to give a quick return movement of the vessel B when reciprocated thereby more effectually agitating the ore in its travel from the feed to the discharge pipes and admit of a quicker and more thorough separation of the metal from the ore.

In Fig. 6 the feed pipe G is shown provided with a hinged arresting plate to admit of its conforming to the surface of the mercury.

From the foregoing it will be noted that the ore or gangue is fed onto a continuously moving clean or bright surface of mercury, which is devoid of any greasy gold or other floating material as it approaches the feeding appliances; that such mercury is shaken or agitated in different directions to correspondingly agitate the ore or gangue to effect the separation of the metal from the ore.

As the construction and arrangement of the novel features of my invention may be greatly changed without departing from the spirit of the same I do not confine myself to those shown and described.

It will be observed that in this case it is the mercury containing or the ore-receiving vessel which travels or rotates and is reciprocated while moving in the line of its travel; the perforated screen N merely resting upon the surface of the mercury in said vessel and having no movement independent of the same. In this respect such screen differs essentially from that shown in companion application of even date herewith, Serial No. 477,175, for in it the screen is alone reciprocated in the line of its traveling movement and the receiving vessel is not subject to such reciprocating movement.

What I claim is—

1. In an ore washer and concentrator, the combination of a freely supported ore or

gangue receiving vessel, actuating devices for rotating said vessel, actuating devices for reciprocating said rotating vessel in the line of its rotation, and a feed and a discharge device for said vessel, substantially as set forth.

2. In an ore washer and concentrator the combination of a freely supported traveling receiving vessel, actuating mechanism for imparting to said vessel its traveling movement, actuating devices for reciprocating said traveling vessel in the line of its travel and a feed device and a suction discharge device, for said vessel, substantially as set forth.

3. In an ore washer and concentrator, the combination of a freely supported traveling receiving vessel, a perforated screen supported within said vessel, actuating mechanism for reciprocating said traveling vessel in the line of its travel, and a feed device and a suction discharge device located on said vessel above said screen, substantially as set forth.

4. In an ore washer, a vessel adapted to contain and actuate a continuously moving body of mercury, a feed appliance, a discharge appliance, and means located between the feed and discharge appliances for cleaning the surface of the mercury, substantially as set forth.

5. In an ore washer or concentrator, the combination of a receiving vessel containing a continuous body of traveling or moving mercury, a feed device, a suction discharge device, and an appliance between the feed and the discharge for cleaning the surface of the moving mercury after passing the discharge and in advance of the feed, substantially as set forth.

6. In an ore washer or concentrator, the combination of a traveling vessel containing mercury, a feed device, a suction discharge device, and an appliance between the feed and discharge for cleaning the surface of the mercury, substantially as set forth.

7. In an ore washer or concentrator, the combination of an outer vessel, an inner freely supported traveling receiving vessel, flexible aprons secured to said outer vessel and overhanging the upper edges of the inner vessel, and means for reciprocating said inner vessel in the line of movement of its travel, substantially as set forth.

8. In an ore washer and concentrator having a feed and a discharge appliance, a mercury-surface-rubbing endless belt between said feed and discharge substantially as set forth.

9. In an ore washer and concentrator having a feed and a discharge appliance, a mercury surface rubbing device between said feed and discharge and separate discharge or extractor appliance for greasy or impure metal located between said rubbing device and said ore or gangue discharge, substantially as set forth.

10. In an ore washer and concentrator, the combination of a vessel containing mercury,

a feed device, a discharge device for the waste-matters of the ore or gangue, and a separate discharge or extractor appliance for greasy or impure metal, substantially as set forth.

11. In an ore washer or concentrator, the combination of a receiving vessel, actuating mechanism for moving said vessel continuously in one direction and simultaneously imparting to it a reciprocating motion in the line of its travel, a feed and a discharge device for said vessel, substantially as set forth.

12. In an ore washer or concentrator, the combination of a traveling vessel, a feed and a discharge device for said vessel and actuating devices which impart a simultaneously traveling movement and a reciprocating motion to said vessel, substantially as set forth.

13. The combination with a freely supported device B, a pivoted oscillating lever with arms of different lengths, actuating devices for said lever, and devices at the free

ends of the arms of said levers for alternately engaging with mechanism on the device B for imparting to the latter a reciprocating motion having a quicker return than forward motion, which quicker return imparts to said device B a continuous intermittent travel in the line of its quick return movement, substantially as set forth.

14. In an ore washer and concentrator a rotating receiving vessel having an inner central tubular hub with overflow openings in the wall of said hub at different heights, removable plugs for said openings, an exit opening at the bottom of said hub, and a feed and a suction discharge device for said receiving vessel, 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.