

April 14, 1942.

R. W. LIMPP

2,279,473

AMALGAMATOR

Filed Feb. 3, 1941

2 Sheets-Sheet 1

Fig. 1.

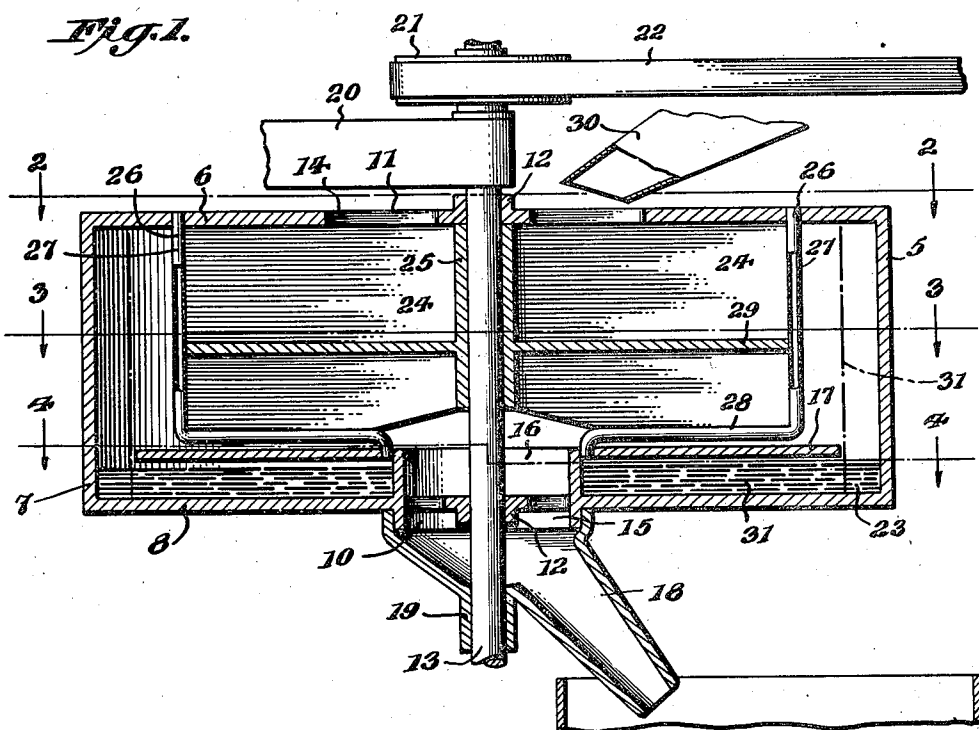
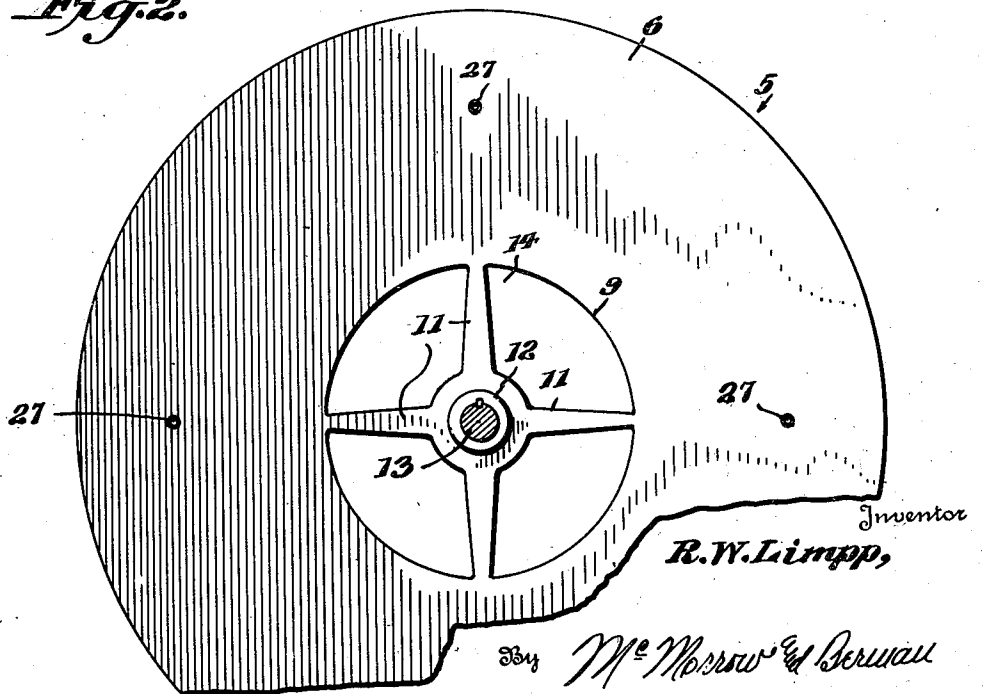


Fig. 2.



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Fig. 3.

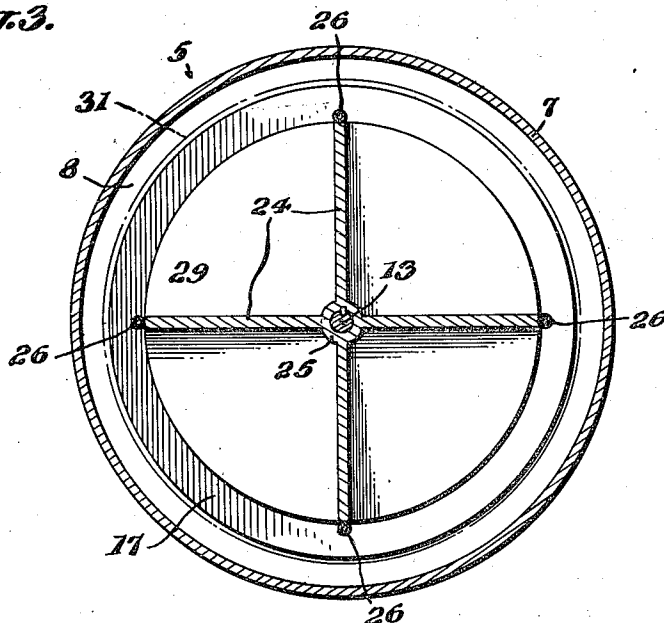
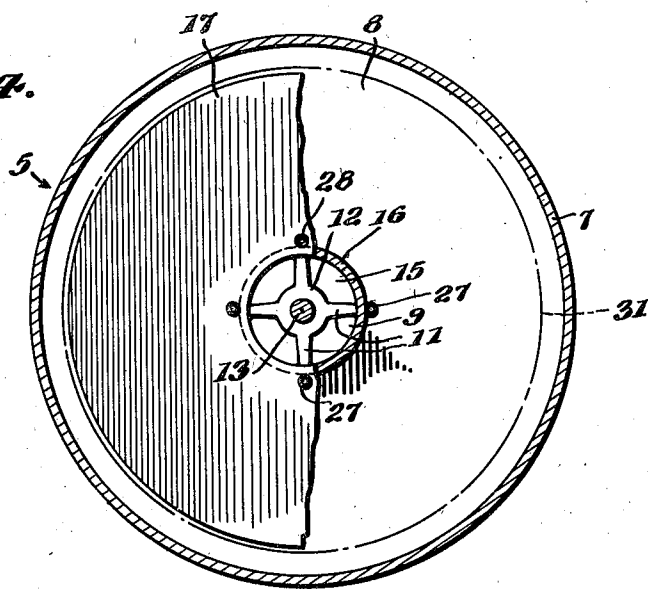


Fig. 4.



Inventor
R. W. Limpp,

By *McMorrow & Benham*
Attorneys

UNITED STATES PATENT OFFICE

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AMALGAMATOR

Richard W. Limpp, King City, Mo.

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4 Claims. (Cl. 209—199)

My invention relates to amalgamators, concentrators and separators of a type wherein pulverized ore or the like containing precious metals is brought into contact with mercury.

One of the principal objects of my invention is to provide an amalgamator so constructed and arranged whereby material under treatment is brought into intimate contact with a mercurial body for effecting exhaustive extraction of the precious metals from the material.

Another object of my invention is to provide an amalgamator or device of the above described character so constructed and arranged as to facilitate the ready separation of the metals from adhering gangue and to provide for a thorough distribution of water throughout the mass of ore being treated.

A further object of my invention is to provide a device of the above described character which functions to automatically concentrate the precious metals and to discharge the gangue and water from the device.

An important object of my invention is to provide a device of the character described which is simple in construction, durable in use, efficient in operation and economical in manufacture.

Other objects and advantages will be apparent from the following description, appended claims and annexed drawings.

Referring to the drawings wherein like reference characters designate like parts throughout the several views:

Figure 1 is a vertical sectional view of my invention.

Figure 2 is a horizontal sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a cross sectional view taken on the line 3—3 of Figure 1 and on a reduced scale.

Figure 4 is a transverse sectional view taken on the line 4—4 of Figure 1 and on a reduced scale.

In practising my invention, as illustrated in the drawings, I provide a cylindrical hollow body 5 formed with top, side and bottom walls 6, 7 and 8 respectively. The top and bottom walls are fashioned with centrally disposed spidered sections 9 and 10 respectively and with said sections having radially extending spokes 11 connected at their inner ends to hubs 12 fixed to a drive shaft 13 extending through the body. The openings defined by the spokes of the sections 9 and 10 constitute inlet and outlet means 14 and 15 respectively. The outlet means 15 is peripherally defined by a collar 16 having its upper end terminating an appreciable distance above the bottom wall 8 and fashioned with a

circumferentially and horizontally disposed trap wall 17. The lower end of the collar 16 extends subjacent the bottom wall 8 and is rotatably mounted within the upper end of an inclined discharge spout 18, the latter being formed on one side with a bearing 19 in which the lower section of the shaft 13 is rotatably mounted. The upper end section of the shaft 12 is rotatably mounted in a bearing 20 and has fixed thereto a pulley 21 for rotating said shaft through the medium of a drive belt 22 trained about said pulley.

The inside diameter of the side wall 7 is appreciably greater than the diameter of the wall 15 17 to define therebetween a circumferential flow passage for mercury as hereinafter more fully described. The bottom wall 8 coacts with the collar 16, wall 17 and side wall 7 to define a mercury trap 23 surrounding the collar 16.

Disposed within the body 5 is a plurality of spaced and radially extending vertically disposed agitating elements or paddles 24, the latter having their inner ends fixed to a hub 25 mounted on the shaft 13 and rotatable with said shaft. The outer ends of the paddles terminate an appreciable distance inwardly with respect to the periphery of the wall 17 and have fixed thereto vertically extending runs 26 of air or vent tubes 27, the upper ends of the latter extending through and fixed to the top wall 6. The lower faces of the paddles are disposed in spatiality with respect to the upper face of the wall 17 and have fixed thereto horizontal runs 28 of the tubes, the inner ends of said horizontal runs 28 being arcuate and terminating within the trap in flushed relation with the lower face of the wall 17 and adjacent the collar 16 as clearly illustrated in Figure 1.

The paddles are formed between their upper and lower ends with horizontally disposed baffle means 29 for receiving thereon material, for instance, ore mixed with water, and which material is discharged between the upper ends of the paddles and through the means 9 from a discharge conduit 30 mounted above the top wall 6.

In operation, it being understood that a body of mercury 31 is disposed within the trap 23 as illustrated in Figure 1, the body 5, including the paddles, is rotated at relatively high speed and which causes the mercury to be disposed out of the trap and against the side wall 7 through the medium of centrifugal force. When the body is thus rotated, pulverized ore and water is discharged into the body from the conduit and through the openings 9. The water and cen-

trifugal force urge the ore into intimate contact with the mercury 31 to effect the amalgamation as the ore gravitates below the baffle means with the result that the gangue is floated towards the discharge openings 10 and through the latter into the spout 16. Upon deceleration of the body, the mercury returns to the trap, the tubes serving to vent the trap to permit free movement of the mercury thereinto. When sufficient amalgamation is obtained, the mercury is removed from the trap and the precious metal removed therefrom in a desired manner. It will be understood that any gangue accumulating within the trap is removed therefrom during cleansing of the trap after removal of the mercury.

Without further elaboration the foregoing will so fully explain the invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service. Moreover, it is not indispensable that all the features of the invention be used conjointly since they may be employed advantageously in various combinations and sub-combinations.

It is obvious that the invention is not confined to the herein described use therefor as it may be utilized for any purpose to which it is adaptable. It is therefore to be understood that the invention is not limited to the specific construction as illustrated and described as the same is only illustrative of the principles of operation, which are capable of extended application in various forms, and that the invention comprehends all construction within the scope of the appended claims.

What I claim is:

1. In an amalgamator, a rotatable hollow cylindrical body having top, bottom and side walls and with said top and bottom walls provided with inlet and discharge means respectively, said bottom wall provided with a trap surrounding said discharge means and adapted to contain mercury for disposal about said side wall upon rotation of said body, a plurality of radially extending paddles fixed within said body and spaced from said trap and said side wall respectively, baffle means located between upper and lower edges of the paddles and formed on said paddles, vent tubes carried by said paddles and having upper ends terminating through said

top wall and lower ends terminating within said trap adjacent said discharge means whereby to vent said trap to permit free return of mercury therein from said side wall.

2. In an amalgamator, a cylindrical body, inlet and outlet means for said body and arranged axially thereof and in superimposed relation to each other, a vertical drive shaft secured to said means, means rotatably supporting said drive shaft and thereby rotatably supporting said body, said outlet means including a collar extending inwardly and outwardly of said body and a flange integral with the collar within the body and spaced therefrom to provide a mercury pit, a baffle means in the body between said inlet and outlet means and spaced from the body and the flange and secured to the shaft, and vent means mounted on the body and connecting with the mercury pit.

3. In an amalgamator, a cylindrical body including upper and lower walls, spider constructions formed in the upper and lower walls providing an inlet in the upper wall and an outlet in the lower wall, a rotatably supported drive shaft secured to the spider constructions and extending axially through the body, a collar forming a part of the spider construction of the lower wall, a flange formed on said collar within the body and spaced from the walls thereof to provide a mercury pit, a baffle means secured to the shaft and spaced from walls of the body and said flange, and vent means connecting with the mercury pit.

4. In an amalgamator, a cylindrical body including upper and lower walls, spider constructions formed in the upper and lower walls providing an inlet in the upper wall and an outlet in the lower wall, a rotatably supported drive shaft secured to the spider constructions and extending axially through the body, a collar forming a part of the spider construction of the lower wall, a flange formed on said collar within the body and spaced from the walls thereof to provide a mercury pit, a baffle means secured to the shaft and spaced from walls of the body and said flange, and vent tubes extending through the upper wall and the flange and secured to the baffle means.

RICHARD W. LIMPP.