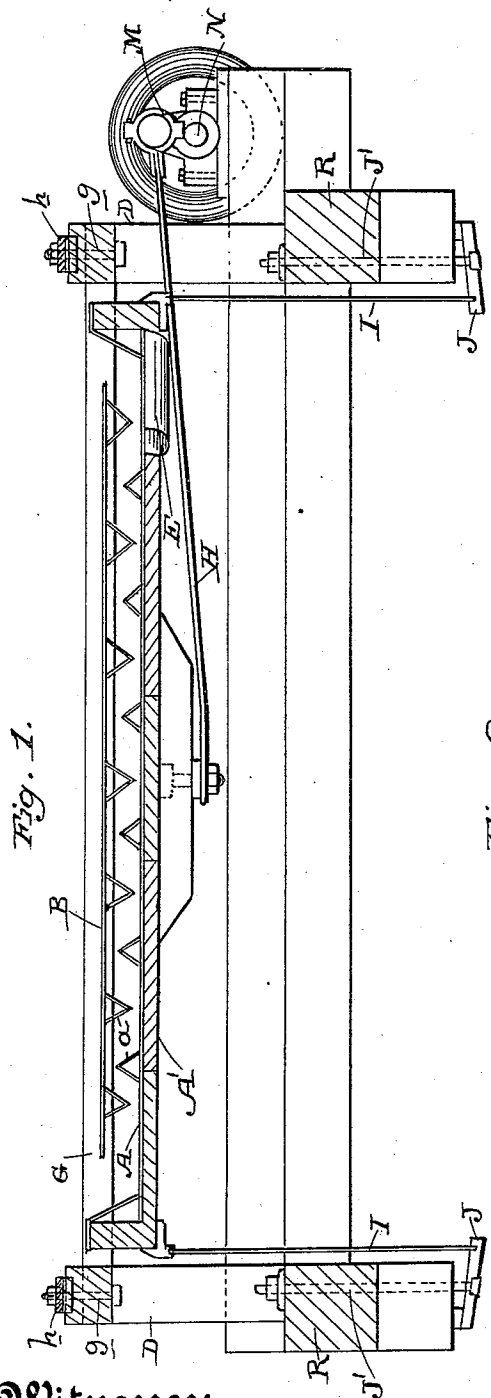


(No Model.)

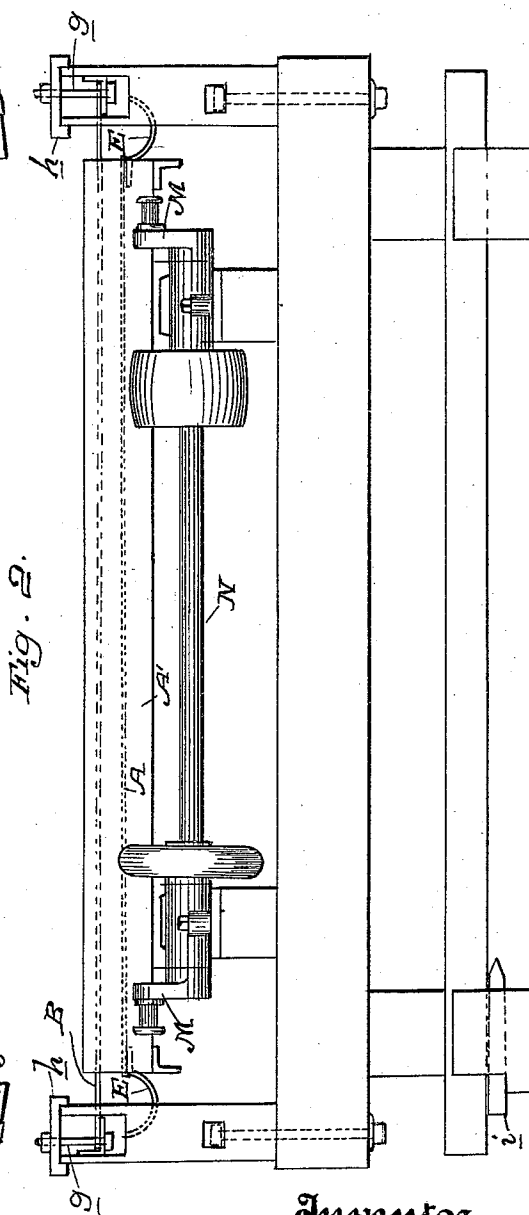
W. E. DARROW.  
AMALGAMATOR.

No. 473,385.

Patented Apr. 19, 1892.



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# UNITED STATES PATENT OFFICE.

WILTON ELMORE DARROW, OF AMADOR, CALIFORNIA.

## AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 473,385, dated April 19, 1892.

Application filed October 19, 1891. Serial No. 409,190. (No model.)

### *To all whom it may concern:*

Be it known that I, WILTON ELMORE DARROW, a citizen of the United States, residing at Amador, Amador county, State of California, have invented an Improvement in Amalgamators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus which is especially adapted for the saving of fine particles of gold, silver, or amalgam from the slimes which are produced in connection with crushing or grinding mills.

It consists of corrugated amalgamated plates situated one above the other, with the corrugations extending longitudinally and the corrugations of one projecting into the spaces of the other. One of said plates is stationary and the other has a shaking movement.

It also consists in certain details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a transverse section of my apparatus. Fig. 2 is a side elevation.

In the recovery of valuable precious metals from their ores it is well known that the crushing and grinding process to which the ore is subjected produces a fine impalpable slime, which carries a great deal of fine gold and mercury, which have been triturated by the preceding operations to such an extent that they will float upon the surface of the water and are very difficult to bring into contact with any amalgamated plates or surfaces over which the material passes.

My invention is designed to bring these slimes into intimate and forcible contact with amalgamated surfaces without subjecting them to the cutting action of the coarser sands which are carried along with them.

A is the lower corrugated plate, which is made of silver-plated copper or other material, and it is supported in a sluice or frame-work A' of suitable rigidity for the purpose.

a are ridges or corrugations which are made longitudinally from one end to the other of the plate, and the sides are upturned sufficiently higher than the ridges to prevent the material from splashing over the sides of the sluice. This sluice is supported upon elastic arms or springs I, the upper ends of which are

suitably attached to the sides of the sluice and the lower ends are supported upon plates J. These plates are suspended by rods J', passing through the timbers R of the frame, having screw-threads upon their upper ends and nuts turning upon these threads, by which the rods may be lengthened or shortened, and by this or other equivalent means the springs at either end of the sluice may be raised or lowered, so as to keep the sluice level transversely and adjust it to correct any warping which may take place.

At the upper end and the lower end, respectively, of the sluice are fixed the traps E, which consist of semi-cylindrical troughs fixed to the ends of the sluice. These troughs are copper or copper-lined, and they serve to collect and save any small particles of amalgam or precious metals which are heavy enough to drop into them. This table A is given a side shaking motion by means of cranks M, mounted upon a crank-shaft N, suitably journaled at the side of the machine. These cranks are connected with the table by elastic pitmen or connecting-rods H, so that when the shaft is rotated the table will be shaken from side to side.

B is a second amalgamated or silvered plate, which is supported above the plate A by angle-irons G, which are fixed to the supports D of the main frame-work. This upper plate has corrugations similar to those in the lower plate and projecting downwardly between those of the lower plate, and it is supported and adjusted as follows: The angle-iron plates G extend across the frame and are suspended by screw-bolts g, the upper ends of which pass through the cap-pieces h. By means of nuts upon the upper ends of the bolts g the stationary plate B is adjusted with relation to the shaking table, so as to maintain a proper distance to allow the coarse material to flow freely and at the same time produce the desired action upon the slimes. Slits are cut in the angle-plates to admit the downwardly-projecting angles of the plate B, and these prevent side motion or displacement. The discharge end of the shaking table is raised or depressed by means of wedges i, which are placed between the sills of the frame A' and the main supporting-posts upon which the structure rests. The two plates are near

enough together to allow the coarse sands to  
 flow along the bottom of the shaking table  
 without being interrupted by the corruga-  
 tions or projections of the upper one; but they  
 5 overlap each other sufficiently so that all the  
 slimes and lighter material which passes down  
 the sluice will be violently forced against  
 these corrugations as the table moves from  
 side to side. The operation will then be as  
 10 follows: The amalgamator is placed in front  
 of a battery or other apparatus from which  
 the pulp is being discharged. The pulp is al-  
 lowed to first flow over an ordinary plain  
 amalgamating-plate, which will serve as a  
 15 test-plate to amalgamate by. The pulp then  
 flows over the amalgam-trap E at the upper  
 end of the apparatus, and thence upon the  
 table A. The shaking motion which is given  
 20 to the table causes the pulp to be splashed  
 against the amalgamated corrugations of both  
 upper and lower plate, so that any fine valu-  
 able material carried in the slime will be  
 brought into forcible contact with these amal-  
 25 gamated surfaces. The angle of these corru-  
 gations is such that the material will be caused  
 to slide or glance up the sides of the corruga-  
 tions, passing over the corrugations of the  
 lower plate into the next depression, where  
 30 they will be met by the return movement of  
 the plate and its corrugations, and thus forced  
 back into the corrugations from which they  
 were just expelled. These slimes will thus be  
 35 subjected to a violent motion, which will re-  
 peatedly and constantly throw them into in-  
 timate contact with the amalgamated sur-  
 faces, so that the valuable precious metals  
 will be retained thereon, while the heavier ma-  
 40 terial will flow along in the depressions be-  
 tween the upwardly-projecting ridges of the  
 corrugations. When the material leaves the  
 amalgamator, it flows through the trap E at  
 the lower end, which serves to catch any  
 45 small particles of amalgam or other valuable  
 material which may be detached from the  
 plates of the amalgamator.

It will be manifest that either the upper or  
 the lower plates, or both, may be subjected to  
 the vibrating motion; but I have found the  
 50 construction here shown to be very satis-  
 factory.

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

1. In an amalgamator, a sluice having amal- 55  
 gamating-plates with longitudinal projections  
 extending parallel with the flow of the mate-  
 rial and with the projections of one plate en-  
 tering the spaces between the projections of  
 the other and means whereby one or both 60  
 plates are given a lateral shaking motion,  
 substantially as herein described.

2. In an amalgamator, a sluice consisting  
 of amalgamated plates having longitudinal  
 ridges extending parallel with the flow of 65  
 material, arms by which said sluice is sup-  
 ported so as to be movable from side to side,  
 a crank-shaft and cranks connected with the  
 sluice, whereby a side vibrating motion is com-  
 municated to it, a stationary amalgamated 70  
 plate having ridges projecting downwardly,  
 said plate being supported above the vibrat-  
 ing one, so that its ridges project downwardly  
 between those of the vibrating table, substan-  
 tially as herein described. 75

3. In an amalgamator, a sluice consisting  
 of an amalgamated trough having upwardly-  
 projecting ridges extending longitudinally  
 and parallel with the line of flow of the pulp,  
 arms by which said sluice is supported, and 80  
 adjusting mechanism whereby the grade of  
 the sluice is regulated, a crank-shaft and  
 cranks connected with the sluice, whereby a  
 side oscillating motion is imparted thereto, a  
 second amalgamated plate having downward- 85  
 ly-projecting ridges, means whereby said plate  
 is supported in a fixed position above the vi-  
 brating one, with its ridges projecting down-  
 wardly between those of the lower table, sub-  
 stantially as herein described. 90

4. In an amalgamator, a sluice consisting  
 of an amalgamated trough with upwardly-  
 projecting ridges extending parallel with the  
 line of flow of the pulp, arms by which said  
 sluice is supported and adjusted, and a mech- 95  
 anism for imparting a side oscillating motion  
 to the sluice, a second amalgamated plate  
 with ridges projecting downwardly from it  
 between the ridges of the lower plate, sup-  
 ports for said upper plate, and mechanism 100  
 by which it is adjusted with relation to the  
 lower plate, substantially as herein described.

In witness whereof I have hereunto set my  
 hand.

WILTON ELMORE DARROW.

Witnesses

E. T. HALE,

W. F. KEENEY.