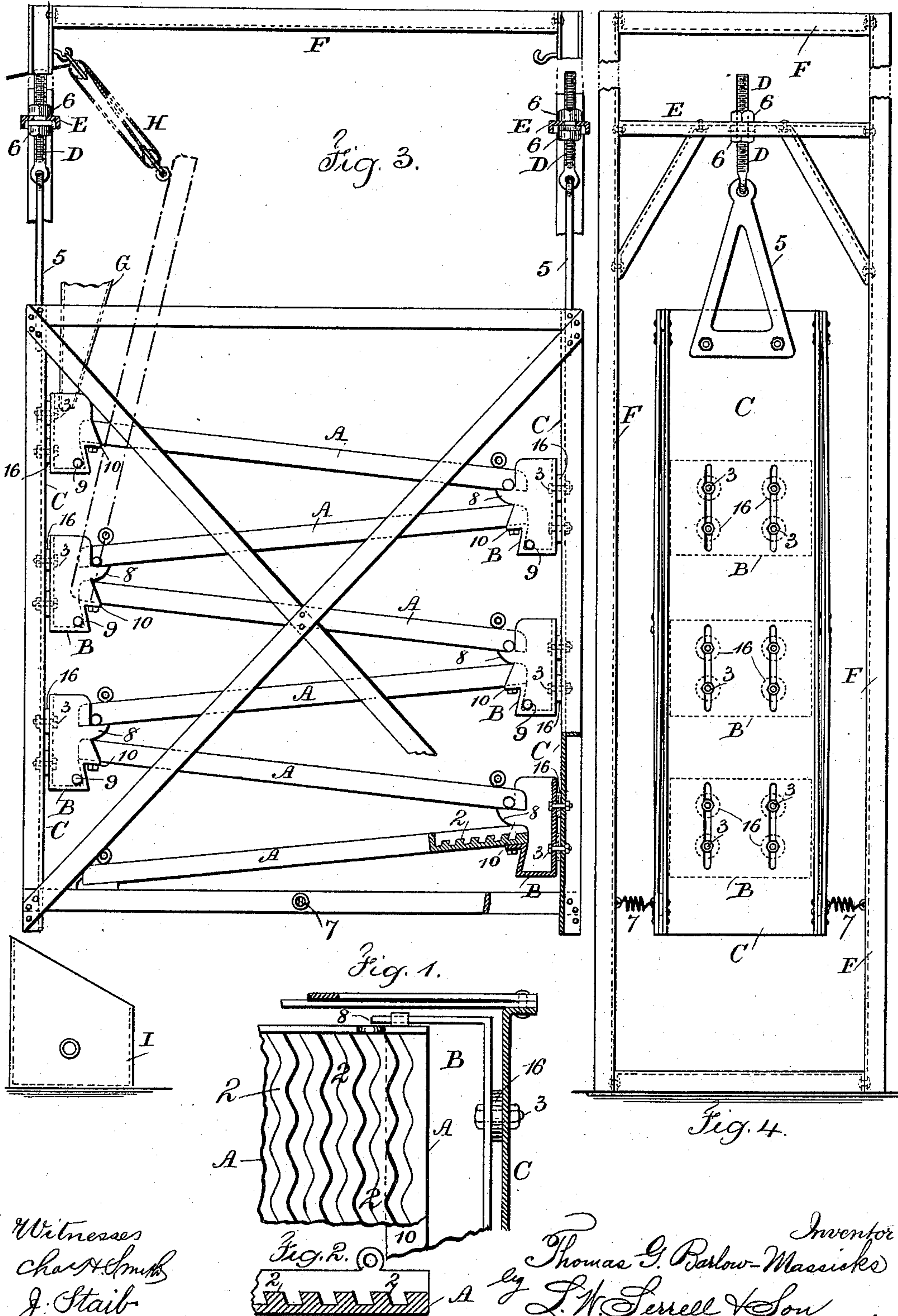


(No Model.)

T. G. BARLOW-MASSICKS.  
AMALGAMATOR AND CONCENTRATOR.

No. 585,812.

Patented July 6, 1897.



Witnesses  
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# UNITED STATES PATENT OFFICE.

THOMAS G. BARLOW-MASSICKS, OF MASSICKS, ARIZONA TERRITORY.

## AMALGAMATOR AND CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 585,812, dated July 6, 1897.

Application filed May 7, 1896. Serial No. 590,530. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS G. BARLOW-MASSICKS, a subject of the Queen of Great Britain, residing at Massicks, in the county of Yavapai and Territory of Arizona, have invented an Improvement in Amalgamators and Concentrators, of which the following is a specification.

Ore-washers have heretofore been made with tables or plates having transverse grooves that are undercut or at an inclination to form acute-angular edges over which the material flows as it leaves the groove in the plate, and in other instances ribs or riffles have been provided upon the surface of the inclined plate, and such ribs or riffles have been in some instances zigzag in form, the external angles of the riffles or ribs coming opposite to each other or in reverse; but in ore washers or amalgamators of this character there is considerable lost space, and in ore washers or amalgamators, especially those that are portable, it is of great importance to obtain the proper action in as small compass as possible, and with amalgamators in which the riffles are straight the mercury held by the riffle forms a comparatively thin line in the angle between the surface of the plate and the upper edge of the riffle, and where amalgamators are movable, especially those that are upon cars, the riffle-plates may not be level and the mercury runs toward the lower ends of the riffles, leaving the upper portions of such riffles uncharged and inoperative. This difficulty is entirely avoided by my invention.

My present improvement is the result of extensive practical experimenting, and I preferably employ riffle-plates having parallel undulating riffles closely adjacent to each other, so as to leave undulating grooves between the riffles of the proper width for the separating action to take place as the auriferous material in a finely-pulverulent condition passes across such riffles by the action of a current of water. I suspend the amalgamator or concentrator in a frame, so that it will hang and easily maintain the troughs in a level position, and to insure a uniform grade or inclination to the riffle-plates the supports for the troughs are adjustable in the suspending devices, and in addition to this I provide

for removing the amalgam and washing off the apparatus with rapidity by raising the plates in succession to discharge the mercury or amalgam into the troughs and draw off the same through openings with removable plugs at the ends of the troughs.

In the drawings, Figure 1 is a plan view showing a portion of a riffle-plate and trough. Fig. 2 is a vertical section of part of the plate. Fig. 3 is a side view of the apparatus, partially in section; and Fig. 4 is an end view of the apparatus.

The plate A is to be of any desired size, according to the character of the ore washing or amalgamating apparatus, and the riffles 2 are of the desired size sectionally, and they are preferably trapezoidal, so that the upper side of each riffle is at an acute angle to the surface of the plate, and the grooves between these riffles are as wide, or approximately so, as the riffles themselves, and longitudinally the riffles are undulating and the surfaces are parallel, or nearly so, in order that the riffles may be the same thickness throughout, and the spaces between the riffles are of uniform section and shape, or nearly so. It will be apparent that by this construction a large number of riffles can be obtained in a comparatively small space, and that the riffle-plates can be easily cast and will be comparatively light, and when used in amalgamators the mercury in the grooves will accumulate at intervals in the curved receptacles formed by the undulations of the riffles, and as the water with the finely-pulverized auriferous material flows over the surface of the plates the heavier materials will be deflected into the bottoms of the respective undulations and against the mercury, so that the gold will be taken up, and the mercury will in all instances be kept together in a condition to prevent the flow of the water washing the same over the riffles, and such mercury can be easily removed by raising the plate up endwise, and the fresh mercury can be applied after the plates have been restored to their normal positions.

In the apparatus any desired number of riffle-plates may be employed. I have represented six of such riffle-plates and a corresponding number of troughs B, and these troughs are to be substantially similar to those



represented in my application, Serial No. 577,652, filed February 1, 1896. I, however, provide such troughs with screw bolts or studs 3, passing through vertical slots in the end plates C, and there are nuts upon these screw-studs, so that the troughs can be raised or lowered and clamped by the nuts firmly to the end plates, and these end plates are provided with suspending-rods 5, with central eyes connected to the adjusting-screws D, which pass through cross-bars E upon the frames F, and there are nuts 6 upon the screws D, so that the amalgamator or concentrator can be adjusted by raising or lowering either end plate or frame C, so that the grade or inclination of the riffle-plate will be uniform throughout the apparatus to insure an equal speed of travel of the water and earthy materials supplied through the hopper G at the upper end of the top riffle-plate.

It will be apparent that the frame F can be of any desired shape, and it should be properly braced and secured, and it may rest upon a foundation or other support, and the apparatus as a whole will hang vertical from the adjusting-screws D, whether the frame F is vertical or not; and I find it advantageous to apply springs 7, or similar steadying devices which may be adjustable, to prevent the amalgamator swinging as a whole while it is in use. Only a portion of this frame F is shown in Fig. 3.

Each amalgamator-plate is supported at its lower end by projections 8 on the ends of the troughs, and each plate can be raised up by connecting a tackle or fall H to the lower end, the upper end of such riffle-plate resting upon the flange or support 10 at the side of the trough. Hence by unbolting or disconnecting the upper end of the riffle-plate from its trough the riffle-plate may be swung up into the position indicated by dotted lines in Fig. 4 and the mercury or amalgam will be discharged or washed out from the lower portions of the undulations in the riffles and will flow down into the trough, and this operation can be performed on the riffle-plate successively and with rapidity. The riffle-plates can be held up by hooks or other steadying devices.

Each trough B is provided with a discharge-opening at the end, with a movable plug 9, so that by withdrawing this plug the quicksilver can be discharged, and this operation can be facilitated by swinging the apparatus upon the adjusting-screws, so as to bring the discharge-opening at the lower end of each trough.

It is advantageous to place washers 16, of

rubber or other yielding material, between the troughs and the end plates, so as to lessen the risk of the parts becoming misplaced by the nuts not being set up firmly.

The water and earthy materials discharged at the lower end of the bottom riffle-plate may be received into any suitable receptacle, such as a trough I, and from there be permitted to run away.

I claim as my invention—

1. The combination in a concentrating or amalgamating apparatus, of riffle-plates at opposite inclinations, troughs at the ends of the riffle-plates, end plates to which the troughs are connected and a frame and suspending devices by which the apparatus is hung from the upper ends of the end plates for maintaining the troughs in a level position, substantially as set forth.

2. The combination in a concentrating or amalgamating apparatus, of riffle-plates at opposite inclinations, troughs at the ends of the riffle-plates, end plates to which the troughs are connected and a frame and suspending devices by which the apparatus is hung from the upper ends of the end plates or frame for maintaining the troughs in a level position, and adjusting-screws between the upper ends of the end plates and the supporting-frames for adjusting the apparatus and obtaining uniformity in the inclinations of the riffle-plates, substantially as set forth.

3. In an amalgamator or separator, a series of inclined riffle-plates over which the water and auriferous materials pass, in combination with means for connecting the plates permanently in their proper relative position, and means for suspending the entire amalgamator or separator so that it will assume its proper position by gravity after being moved from one place to another, substantially as set forth.

4. The combination with the riffle-plates in an amalgamating apparatus, of troughs with end plates receiving the ends of the riffle-plates between the ends of the troughs, there being flanges or supports for the lower ends of the upper riffle-plates, the upper ends of the lower riffle-plates resting upon the edges of the troughs, and a tackle or fall for raising the upper ends of the riffle-plates successively and discharging the mercury from the riffles into the troughs, substantially as set forth.

Signed by me this 18th day of April, 1896.

THOMAS G. BARLOW-MASSICKS.

Witnesses:

A. B. STETSON,

J. R. SWIGART.