

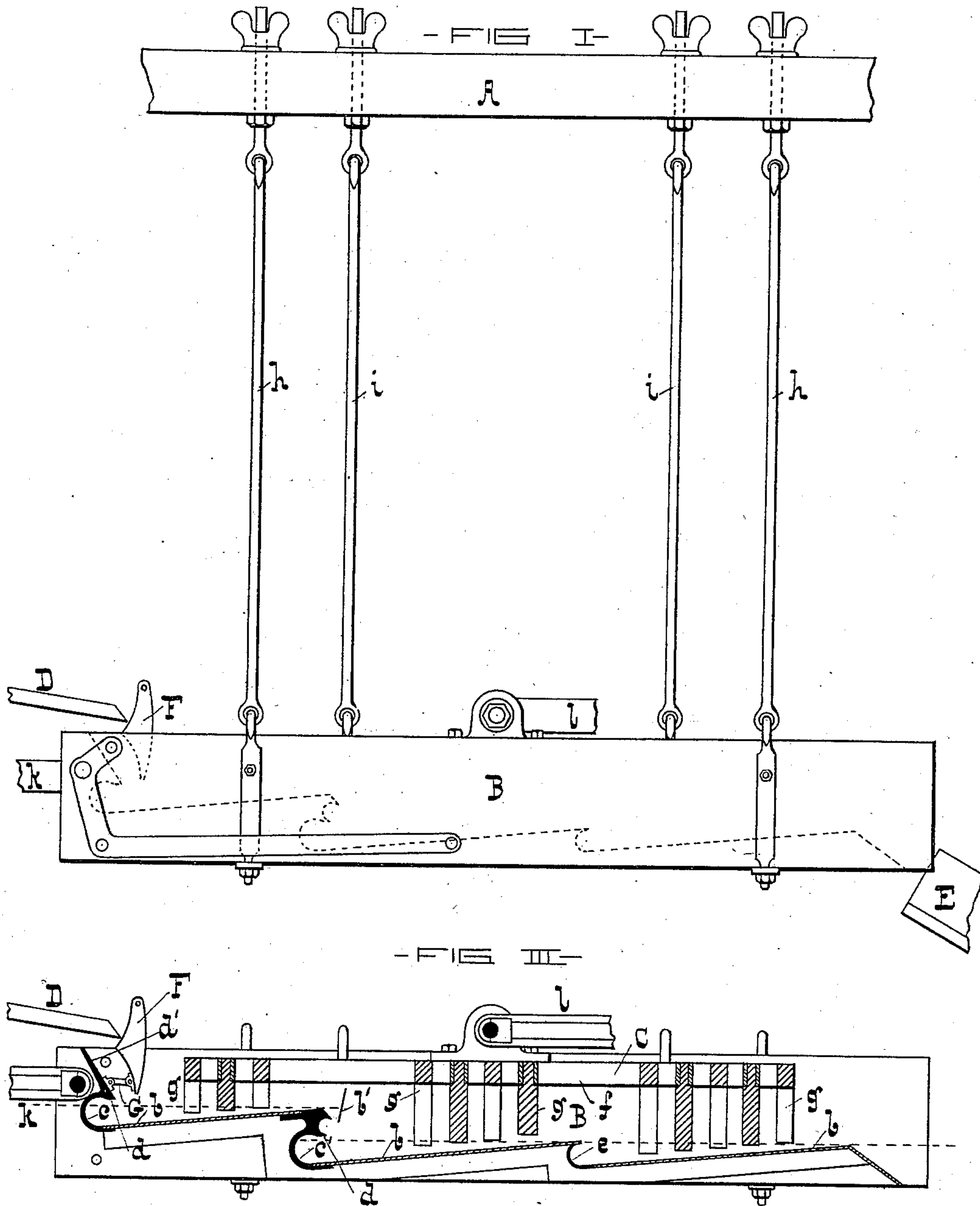
(No Model.)

2 Sheets—Sheet 1.

H. MOON.  
AMALGAMATOR.

No. 300,106.

Patented June 10, 1884.



-WITNESSES-

*Paul Fisher*  
*Chas B Cassady*

-INVENTOR-

*Henry Moon,*  
*by G. H. Howard*  
*attys-*

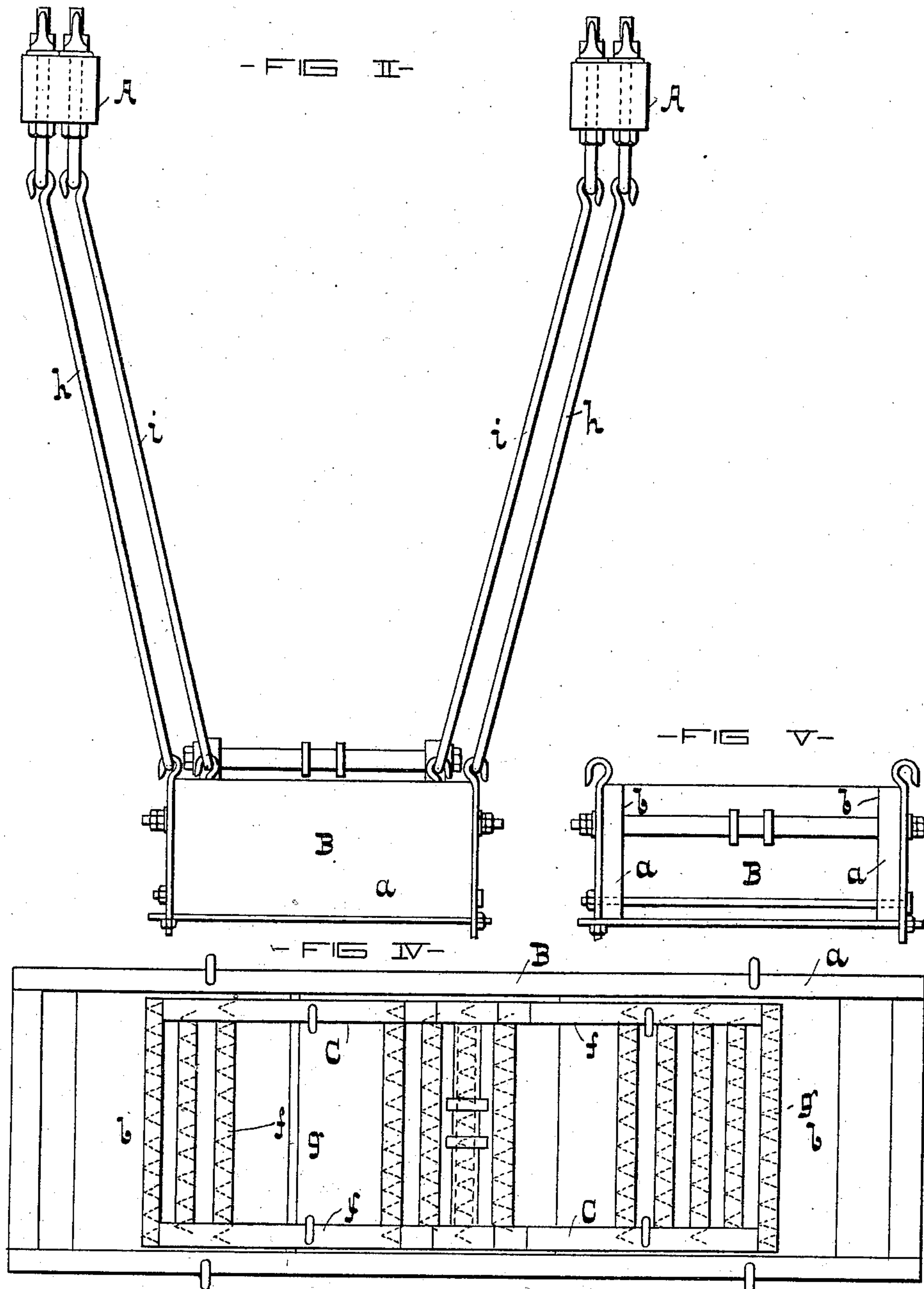
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# UNITED STATES PATENT OFFICE.

HENRY MOON, OF THOMASVILLE, NORTH CAROLINA.

## AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 300,106, dated June 10, 1884.

Application filed February 9, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY MOON, of Thomasville, in the county of Davidson and State of North Carolina, have invented certain new and useful Improvements in Amalgamators, of which the following is a specification.

This invention relates to certain improvements in Letters Patent No. 282,352, granted to me on the 31st day July, 1883, for an improved amalgamator; and they consist in certain details of construction of the apparatus, as will hereinafter fully appear.

In the accompanying drawings, forming a part hereof, Figure I is an exterior side view of my improved amalgamator, and Fig. II an end view of the same. Figs. III, IV, and V are respectively a longitudinal section, a plan view, and a transverse section of the amalgamating pan and mixer, the whole being represented on an enlarged scale.

Similar letters of reference indicate similar parts in all the views.

A represents a portion of the frame, from which the amalgamating-pan B and mixer C depend. The amalgamating-pan is here shown as consisting of a wooden trough, *a*, with its bottom and sides covered with iron plates *b*, and one end provided with the wave-plate *c*.

By reference to Fig. III of the drawings, it will be seen that the upper edge of the wave-plate *c* extends beyond a central vertical line, and approaches the surface of the mercury or amalgam. Consequently, in a rapid longitudinal reciprocating movement of the pan the mercury or amalgam is not only carried up the hollow surface of the wave-plate, but introverted and brought back in a solid sheet, which envelops the float gold on the surface of the water or in the water near to it.

The amalgamating-pan may be made entirely of iron, or of wood lined with iron, as may be desired. As the wave-plate *c* does not necessarily extend to the upper edge of the pan B, I provide it with a horizontal extension, *d*, not exceeding one-fourth of the diameter of the circle of the wave-plate, from the edge of which extends another, *d'*, which may be either inclined, as shown in the drawings, or vertical. The inner curved surface of the wave-plate *c* is accurately bored or faced, and its lower edge rabbeted, in order that a tight joint may be formed with the bottom

plate, *b*. The bottom *b* is in three parts or sections, and has at the junction of the first two sections a second wave-plate, *c'*, as shown. This second wave-plate causes the water and crushed ore to pass a second time through a wave of mercury, and any gold which may have escaped the first wave is amalgamated and retained.

I use in connection with the second wave-plate *c'* a plate, *b'*, fixed to the pan B, to guide the ore and water which overflow from the first section of the bottom *b* into the second wave of mercury. The offset *e*, between the second and third sections of the bottom *b*, is curved in a manner similar to the wave-plates; but it is not necessary to the proper operation of the invention that this offset should occur, or that it should be curved, as shown.

C is the mixer, consisting of a frame, *f*, preferably of wood, having projections *g* on its under side. These projections have a V cross-section, and they are arranged so that one transverse row is opposite the spaces in the row immediately behind it. By this means, in the reciprocal movement of the mixer, the portion of the contents of the pan upon which it acts is driven in small streams through the apertures between the projections *g* toward the open end of the pan, from which it escapes by the force of gravity.

The pan B is suspended by means of rods *h* from the frame A, and it will be seen that these rods, which are spread at their upper end to give rigidity to the apparatus and maintain a parallel motion of the pan, are adjustable in length for obvious purposes. The mixer is also suspended from the frame A by means of rods *i*, corresponding practically with the ones *h*.

By reference to the drawings it will be seen that when the pan B is at rest its contents (amalgam, mercury, ore, and water) will occupy the space below the dotted line *y y*, and that the projections *g* of the mixer extend below the surface of the contents of the pan, but do not touch the plates *b*. The pan and mixer receive their reciprocating movements from eccentrics, cranks, or other similar devices, which are connected to them by means of the rods *k* and *l*. It is designed to give the amalgamating-pan about seventy-five double strokes per minute and the mixer about twice



that number; but the speed of either device may be increased or diminished, as desired. The pulverized ore from the stamps or other crushing or grinding apparatus, and water are introduced to the pan B through the trough or chute D, and the overflow from the pan is through a similar chute, E.

F is a box or funnel, with a wide open top, into which the ore and water fall from the chute D, and a narrow opening at the bottom for the escape of the materials. This box or funnel is slightly less in width than the pan B, and is suspended from any suitable support, so as to hang within the pan with its open bottom a little above the introverted edge of the wave-plate. The funnel F is connected to the extension  $d'$  of the wave-plate by means of a link, G, in order that the distance between the wave-plate and the discharge end of the funnel is the same at all parts of the stroke of the pan. By means of this vibratory funnel the ore and water are invariably introduced into the wave of mercury.

In the operation of the invention, the mercury or amalgam at each stroke of the pan impinges against the wave-plates  $c$  and  $c'$ , and, following their curved surfaces, is introverted in the form of waves, as hereinbefore described, and in this movement incloses a portion of the ore and water, which, to escape from their inclosure, have to pass through a body of mercury, and the free gold therein is thus amalgamated. In the continued operation of the apparatus, which includes the mixer, the whole of the ore and water is thus made to pass through a solid body of mercury, as described. The value of this wave action of the mercury will be apparent when it is understood that in all ground ore a large proportion of the gold contained therein is in such a minute state of comminution that it will float on the

surface of water, and this extreme levity of the particles of gold renders the ordinary amalgamating process exceedingly wasteful. In my amalgamator the floating gold is forced within an inclosure of mercury, and cannot escape therefrom without amalgamation, and all gold that may be covered with sulphur or any other substance that prevents its amalgamation with mercury is, by the action of the apparatus, brightened, roughened, and made capable of amalgamation.

I am aware that amalgamating-pans have been made with a curved inwardly-projecting end, but in all such pans the curved surface has either been less than a semicircle, or, if projecting beyond a vertical line extending through the center from the curve, as described, has had an ascending inclination. In both these constructions there is nothing to guide the mercury in a curved wave toward the surface of the water and amalgam, and the mercury consequently falls in separated particles, which cannot be considered as an imperforate envelope as is found when my construction is employed.

I claim as my invention—

1. In a longitudinally-reciprocating amalgamating-pan, the bottom thereof provided with two wave-plates,  $c$   $c'$ , having the horizontal extensions  $d$ , and located at different heights within the pan, substantially as specified.

2. In combination with the longitudinally-reciprocating amalgamating-pan B, and the chute D, the vibratory funnel F, and the link G, which connects it to the said pan, substantially as and for the purpose specified.

HENRY MOON.

Witnesses:

B. MAILLEFERT,  
E. W. CATES.