

No. 751,911.

PATENTED FEB. 9, 1904.

R. P. HALL.
AMALGAMATOR.

APPLICATION FILED JULY 18, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

FIG. 1.

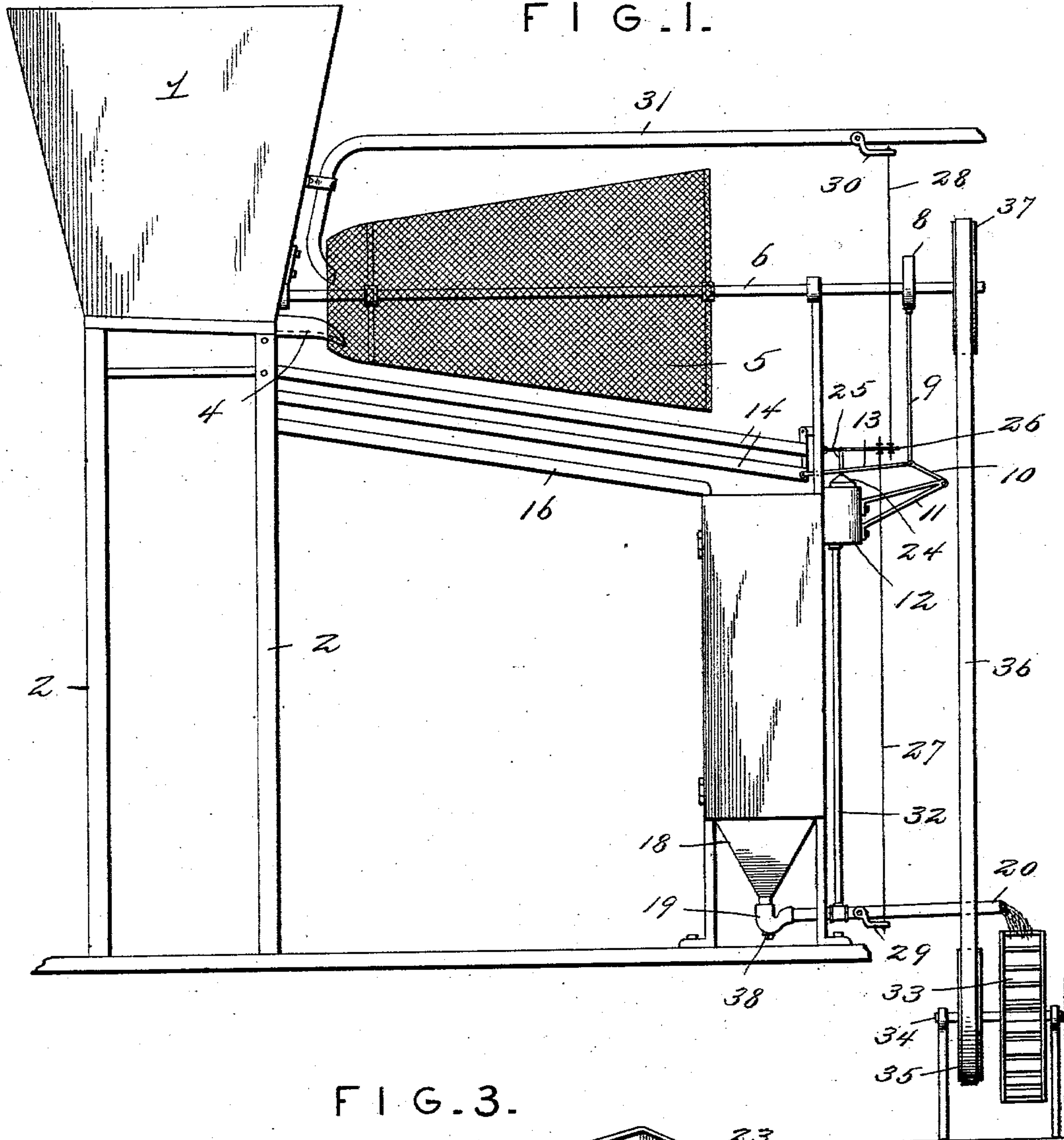
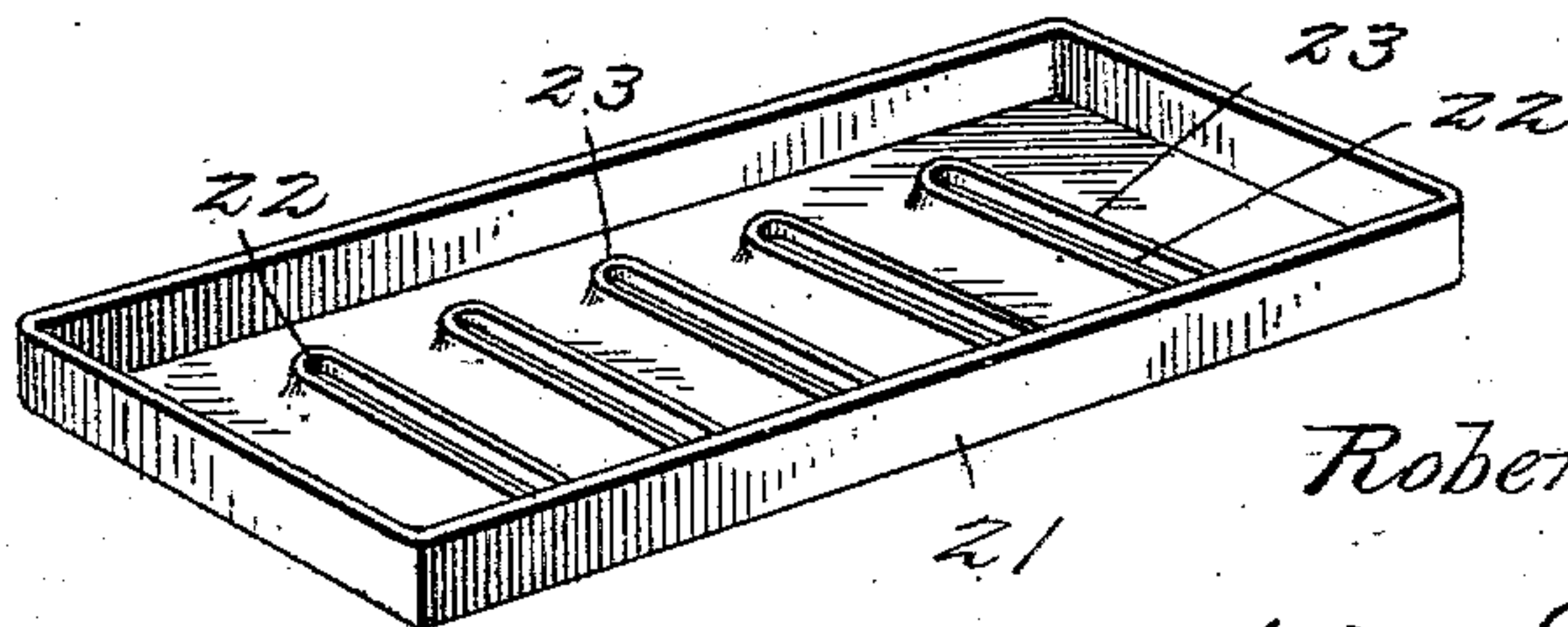


FIG. 3.



Witnesses

Harry L. Amer
Herbert D. Lawson

Inventor

Robert P. Hall.

By

Victor J. Evans

Attorney

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2 SHEETS—SHEET 2.

FIG. 2.

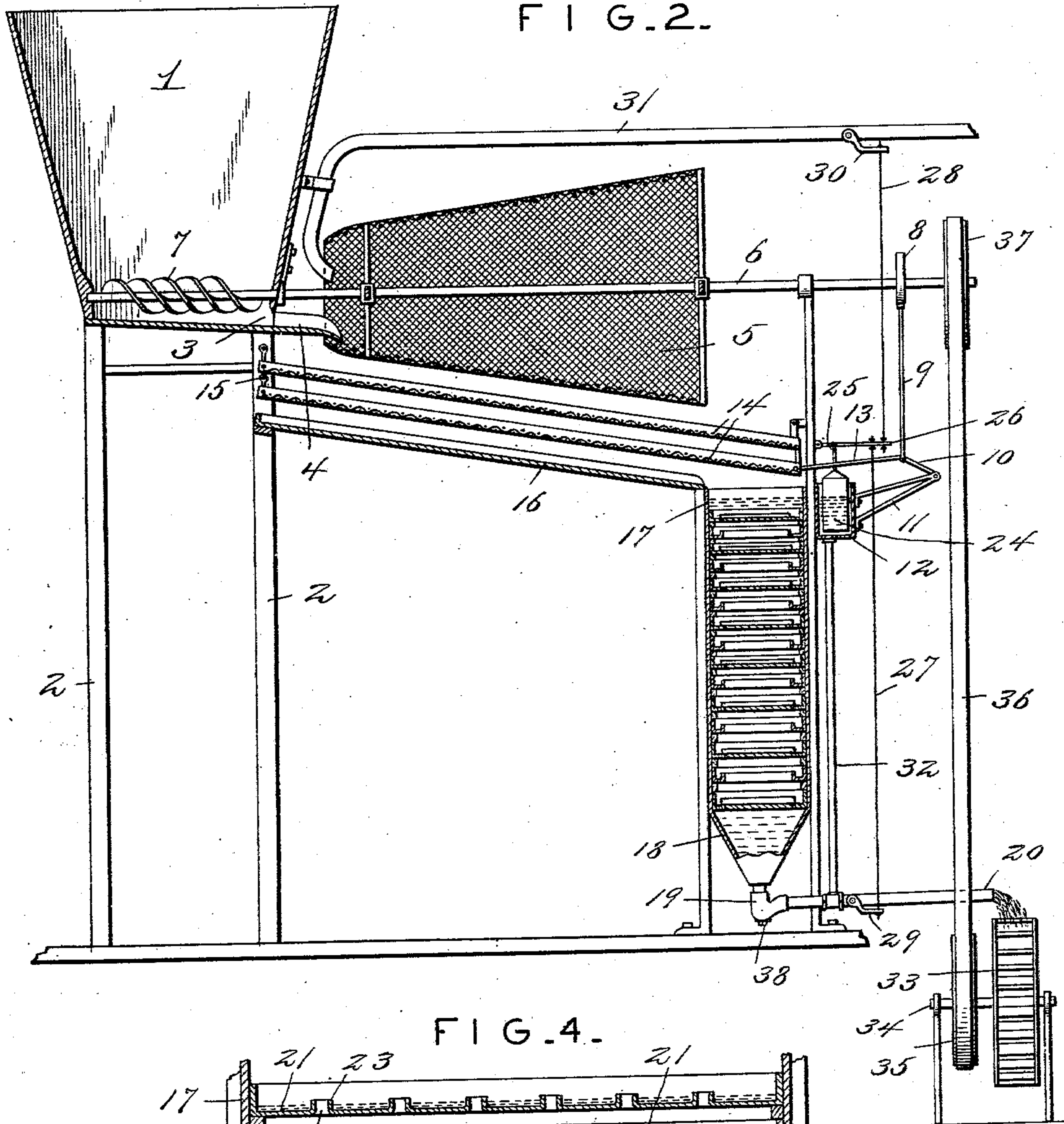
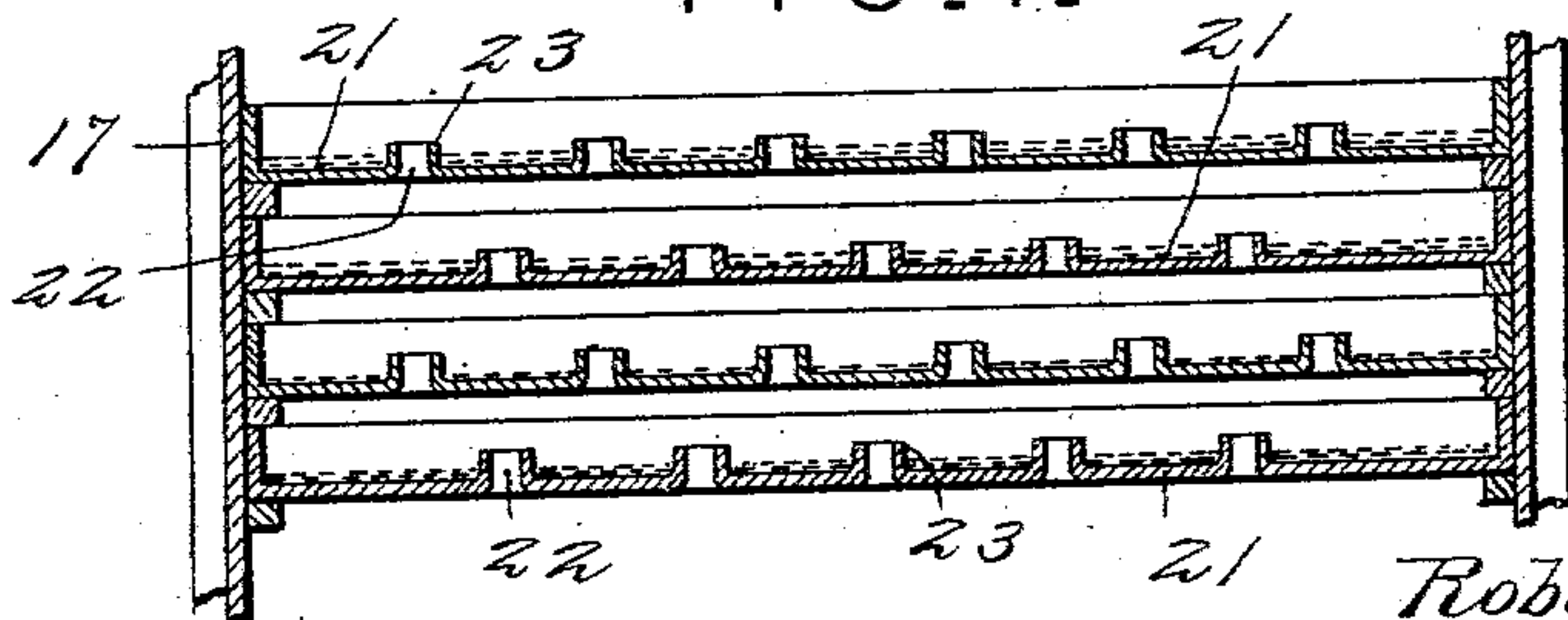


FIG. 4.



Witnesses

Harry L. Ames.
Herbert D. Lawson.

Inventor

Robert P. Hall.

By

Victor J. Evans
Attorney

UNITED STATES PATENT OFFICE.

ROBERT P. HALL, OF GEM, IDAHO.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 751,911, dated February 9, 1904.

Application filed July 18, 1903. Serial No. 166,124. (No model.)

To all whom it may concern:

Be it known that I, ROBERT P. HALL, a citizen of the United States, residing at Gem, in the county of Shoshone and State of Idaho, have invented new and useful Improvements in Amalgamators, of which the following is a specification.

My invention relates to new and useful improvements in gold separators and amalgamators; and its object is to provide mechanism of simple construction for separating gold into different grades and washing the flour-gold through a series of trays containing mercury.

A further object is to utilize the water employed for washing purposes for driving the screens utilized for separating purposes.

With the above and other objects in view the invention consists in providing a hopper having a feed therein, which is mounted on a shaft to which is secured a rotary cylindrical screen. The material within the hopper is adapted to be fed to the rotary screen, and shaking screens are suspended below this rotary screen for the reception of the material discharged through the mesh of the cylindrical screen. A receptacle is so arranged as to receive the flour-gold separated by the screen above referred to, and within this receptacle are arranged trays, which are located one above the other and provided with apertures for causing the gold to move in an irregular course in its downward passage through the receptacle. These trays are provided with mercury for the purpose of separating the flour-gold from any particles which may be washed with it into the receptacle. An outlet is provided at the bottom of the receptacle, and this serves to direct water supplied by an inlet-pipe outward upon a water-wheel, which is connected by a belt or other suitable device to the shaft of the rotary screen and to mechanism employed for shaking the lower screens of the mechanism.

The invention also consists in the further novel construction and combination of parts hereinafter more fully described and claimed, and illustrated in the accompanying draw-

ings, showing the preferred form of my invention, and in which—

Figure 1 is a side elevation of my improved gold-separator. Fig. 2 is a vertical longitudinal section therethrough. Fig. 3 is a detail view of one of the amalgamating-trays, and Fig. 4 is a longitudinal section through a series of trays.

Referring to the figures by numerals of reference, 1 is a hopper mounted upon suitable standards 2 and having an outlet 3 at the bottom, which serves to direct the contents of the hopper upon a spout 4. This spout projects into the inner end of a rotary screen 5, which is mounted on a shaft 6. The shaft projects into the bottom of the hopper 1 and is provided with a worm 7, which serves to force the contents of the hopper toward the opening 3. An eccentric 8 is arranged on shaft 6 and serves to impart a reciprocating motion to a rod 9, which is connected by means of a link 10 to a bracket 11, secured to a receptacle 12, supported in any suitable manner upon the framework of the machine. A rod 13 is connected to the joint between rod 9 and link 10 and is also connected to one end of a screen 14, which is suspended by means of pivoted hangers 15, mounted within the frame. Two of these screens are provided, one above the other, and it is obvious that when the reciprocating motion is imparted to rod 9 rod 13 will be drawn longitudinally, and thereby cause the rapid oscillation or jumping of the screens.

An inclined board 16 is arranged under the screen 14, and its lower end opens into the top of a receptacle 17, which extends downward to a point adjacent the bottom of the plane of the machine, the bottom thereof being preferably conical, as shown at 18, and opening into a trap 19, from which extends an outlet-pipe 20. Arranged within the receptacle 17 is a series of trays 21, each tray having transversely-extending apertures 22 in the bottom thereof, which are inclosed by upwardly-extending flanges 23. These flanges are not as high as the sides of the tray, but

are of sufficient size to retain a desired quantity of mercury upon the bottom of the tray. As hereinbefore stated, the trays are arranged one above the other; but the slots 22 are not in vertical alinement, but are preferably in the positions illustrated in Fig. 4. A float 24 is arranged within receptacle 12 and is connected by means of a link 25 with a lever 26, which is pivoted to the frame of the machine and is connected by means of rods 27 and 28 to valves 29 and 30, respectively. The valve 29 is arranged in the outlet-pipe 20, while valve 30 is arranged in a supply-pipe 31, which opens into the inlet end of the rotary screen 5. A pipe 32 extends from the outlet-pipe 20 at a point near the trap 19 to the bottom of receptacle 12.

A water-wheel 33 is mounted upon a shaft 34 at a point directly under the outlet end of pipe 20, and upon the shaft of this wheel is a pulley 35, upon which is mounted a belt 36, which extends over a pulley 37, secured to shaft 6. It will thus be seen that when the water-wheel 33 is rotated shaft 6 is also revolved, thereby causing the worm 7 to force the material within the hopper outward through the opening 3 on to spout 4 and into rotary screen 5. The water discharged into this screen from pipe 31 will wash the material through the mesh of the screen and on to and through screens 14 to the inclined board 16. The tailings from the screens may be conveyed from the machine by means of suitable troughs provided therefor, but not shown in the accompanying drawings. The material after being discharged upon the inclined board 16 flows downward into receptacle 17 and is washed through the alternately-arranged slots 22 to the bottom of said receptacle. During this irregular passage through the receptacle the flour-gold is brought into contact with the mercury upon one or more of the trays and is thus separated from other substances which may be washed into the receptacle by the water. The water will flow outward through the trap 19 and pipe 20 upon the wheel 33 and will rotate this wheel, and thereby cause the shaft 6 to revolve. Should any mercury be washed out of the trays 21, it will settle within the trap 19, from which it can be readily removed by detaching the cap 38, which is detachably fastened to the bottom thereof. The float 24 is arranged in horizontal alinement with the upper portion of the receptacle 17. Therefore should the water within said receptacle rise above the top thereof the float will be carried upward therewith in view of the fact that its receptacle 12 is connected by means of pipe 32 to the receptacle 17. This upward movement of the float will partly or entirely close the valve 30 and will throw the valve 29 wide open. As the water

returns to its normal position the pipe 31 will be gradually opened and pipe 20 partly closed by the return movement of the float 24. It will therefore be understood that this float maintains the water at the same level at all times. The device is extremely simple and compact in construction, and by providing the arrangement of trays herein shown and described all flour-gold fed to the apparatus will be quickly separated from foreign substances with which it is commingled.

In the foregoing description I have shown the preferred form of my invention; but I do not limit myself thereto, as I am aware that modifications may be made therein without departing from the spirit or sacrificing any of the advantages thereof, and I therefore reserve the right to make such changes as fairly fall within the scope of my invention.

Having thus described the invention, what is claimed as new is—

1. In mechanism of the character described, the combination with separating-screens; of a receptacle thereunder, a series of amalgamating-trays within the receptacle and arranged one above the other, said trays having alternately-arranged outlets in the bottoms thereof, an outlet-pipe extending from the bottom of the receptacle, a water-inlet to the screens, valves within the inlet and outlet, a float for operating the valves, and mechanism for rotating the shaft.

2. In an apparatus of the character described, the combination with a hopper having a shaft journaled therein and extending therefrom; of feed mechanism within the hopper and upon the shaft, a revoluble screen upon the shaft and adapted to receive material from the hopper, reciprocating screens thereunder, an inclined board below the screens, a receptacle adapted to receive material from the board, a series of trays within the receptacle and arranged one above the other, said trays having apertures in the bottoms thereof arranged out of alinement, a trap communicating with the bottom of the receptacle, an outlet-pipe extending from the trap, a float, a valve within the outlet-pipe, a pipe for supplying water to the screens and receptacle, a valve therein, mechanism connecting the valves and float, and means for rotating the shaft.

3. In an apparatus of the character described, the combination with a hopper having an outlet, a shaft journaled within the hopper and extending therefrom, and a feed-worm upon the shaft and within the hopper; of a revoluble screen upon the shaft and adjacent the outlet, an inclined board, oscillating screens suspended between the board and reciprocating screen, an eccentric upon the shaft, a bracket, a rod extending from the eccentric,

a link connecting the rod and bracket, a rigid connection between the oscillating screen and the link, and means for rotating the shaft.

4. In an apparatus of the character described, the combination with a hopper; of a
5 revoluble screen adapted to receive material from the hopper, screens below said revoluble screen, an inclined board below the screens, a receptacle adapted to receive material there-
10 from, trays within the receptacle and arranged one above the other, an outlet-pipe extending

from the receptacle, a pipe for supplying water to the screens and receptacle, a valve therein, and means for automatically operating the valve to prevent overflowing of the
15 receptacle.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT P. HALL.

Witnesses:

DAVID B. HALL,
MIKE GLAWS.