

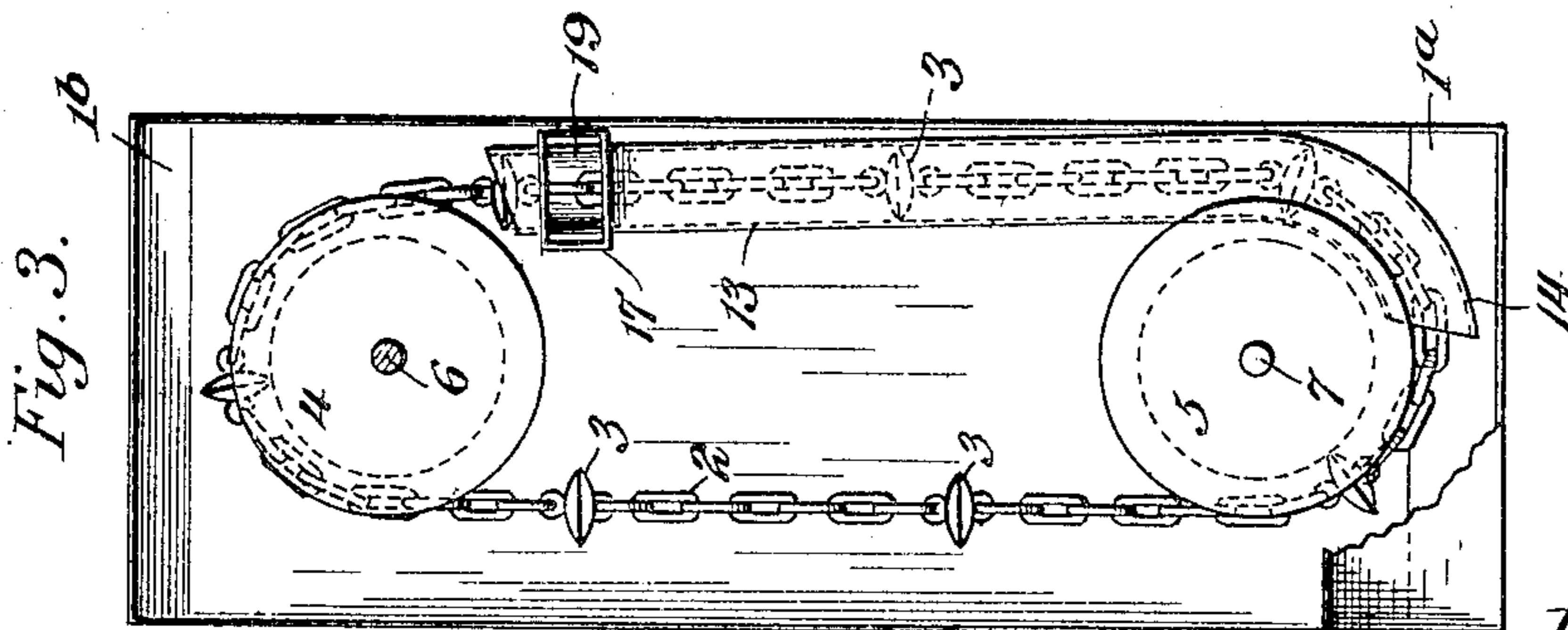
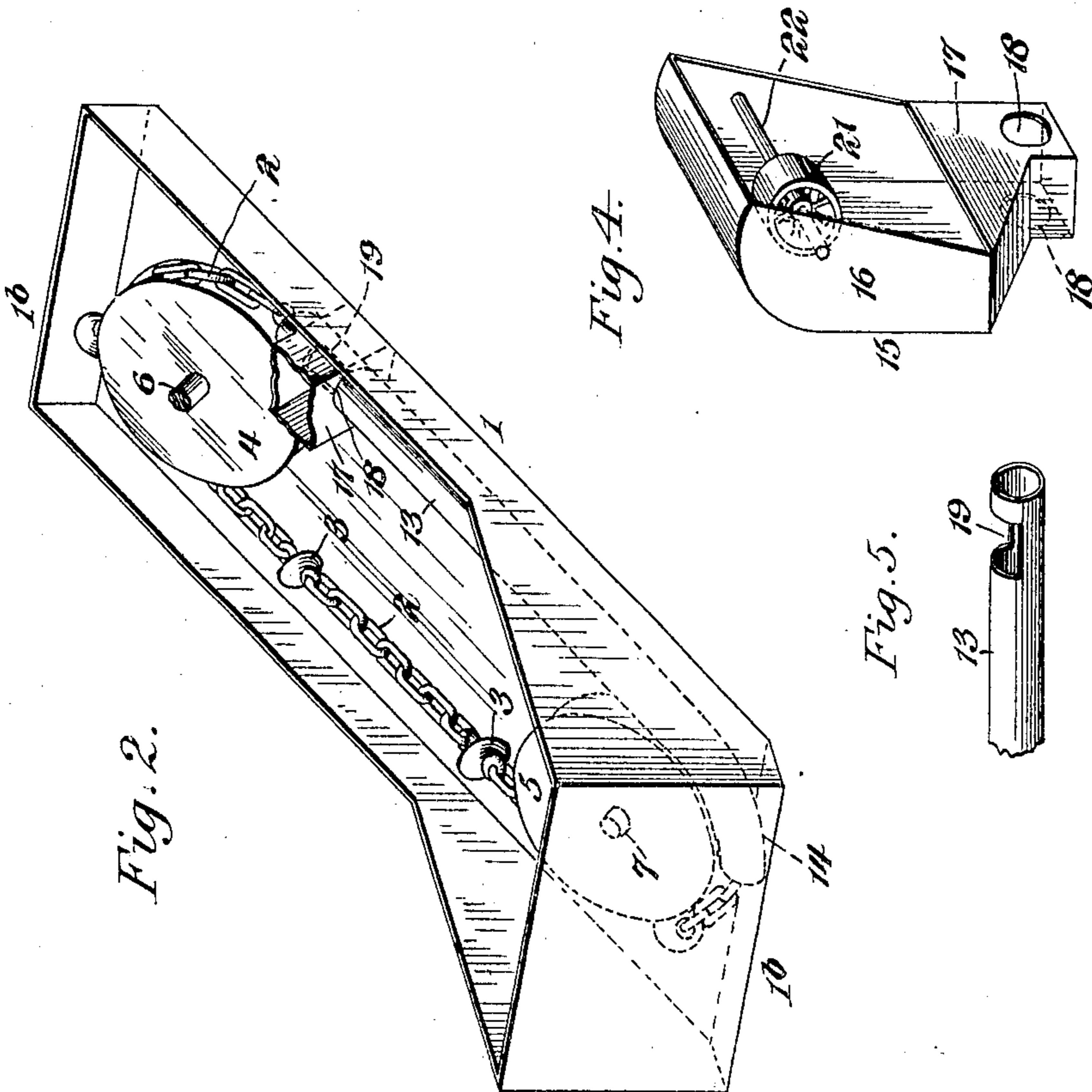
No. 887,319.

PATENTED MAY 12, 1908.

F. D. FENN.
AMALGAMATING APPARATUS.

APPLICATION FILED APR. 19, 1906.

3 SHEETS—SHEET 2.



Witnesses
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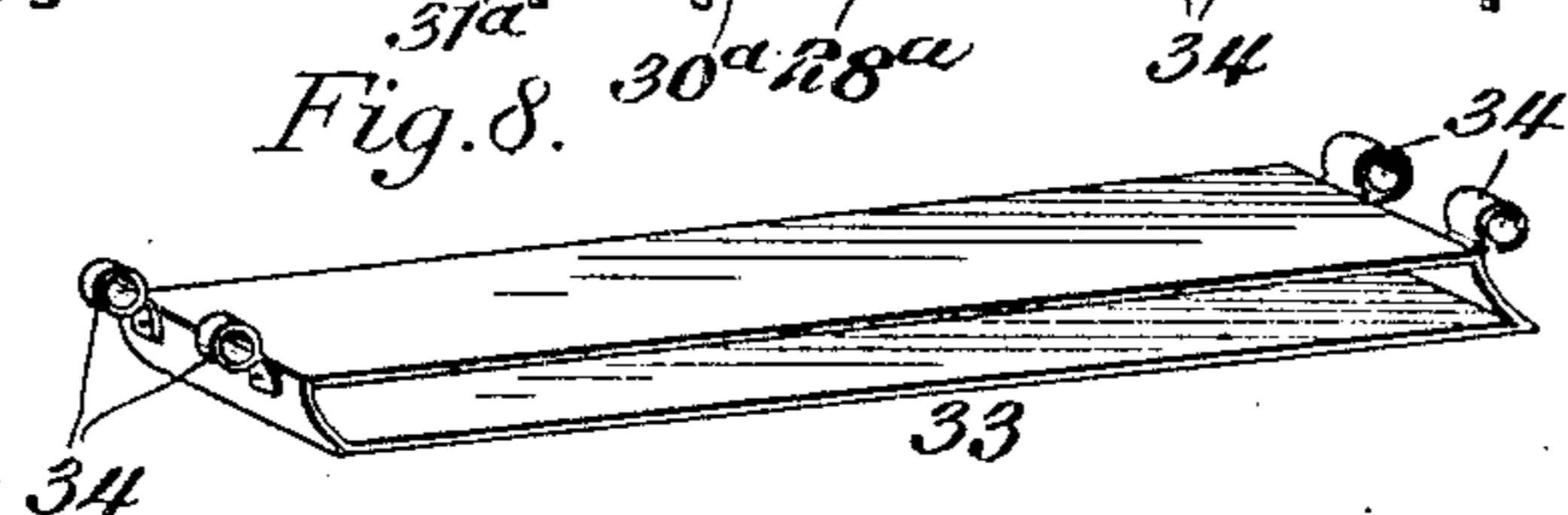
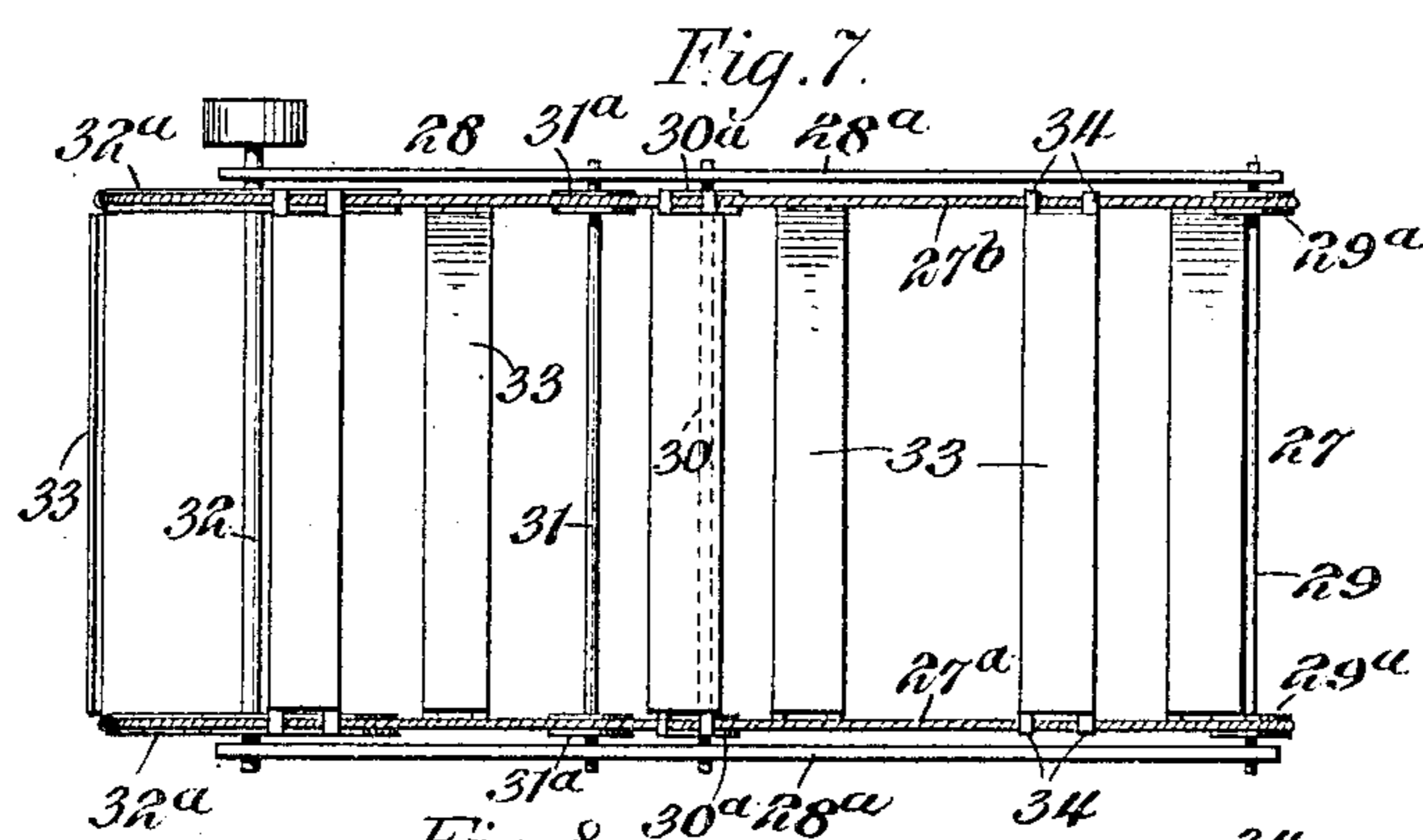
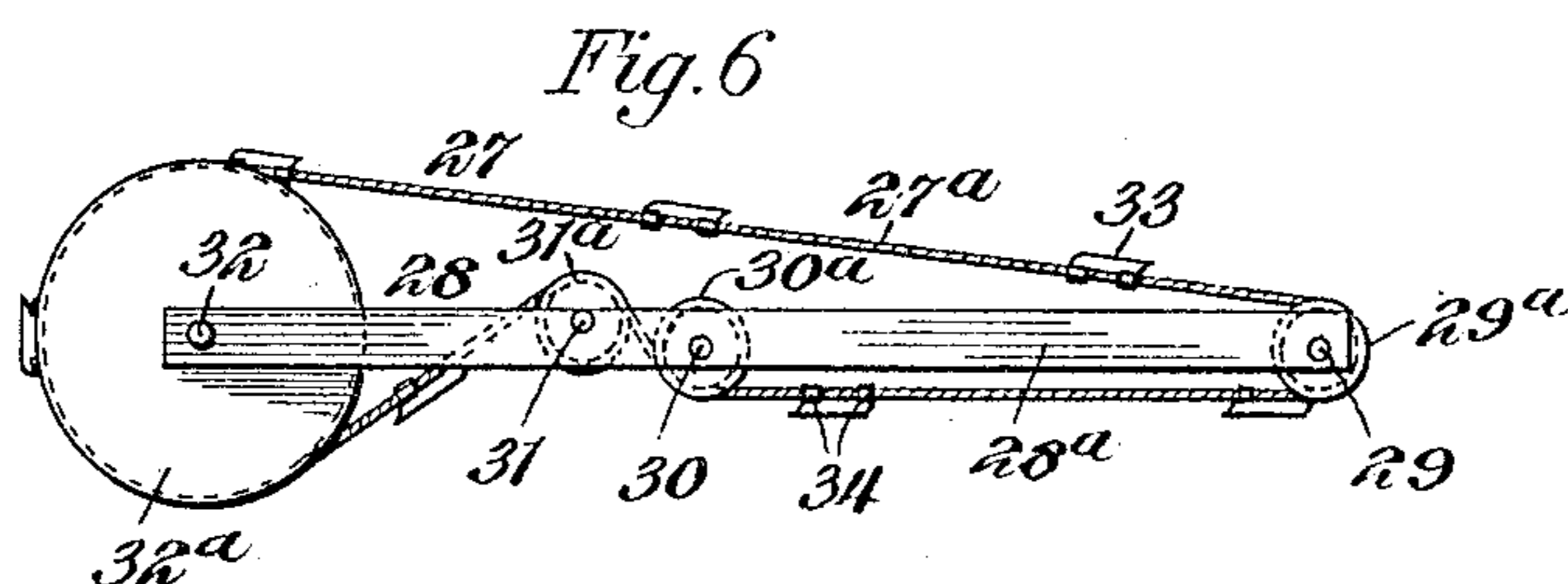
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UNITED STATES PATENT OFFICE.

FRED D. FENN, OF BOISE, IDAHO.

AMALGAMATING APPARATUS.

No. 887,319.

Specification of Letters Patent.

Patented May 12, 1908.

Application filed April 19, 1906. Serial No. 312,644.

To all whom it may concern:

Be it known that I, FRED D. FENN, a citizen of the United States, residing at Boise, in the county of Ada and State of Idaho, have invented a new and useful Amalgamating Apparatus, of which the following is a specification.

This invention relates to a novel amalgamating apparatus, designed more particularly for the separation of placer values from sand or other gangue.

The object of the invention is to produce a simple and efficient apparatus for conveying gold laden sand or pay dirt to the amalgamating tank and for removing the gangue from said tank.

To the accomplishment of the objects stated, the preferred embodiment of the invention resides in that construction and arrangement of parts to be hereinafter described, illustrated in the accompanying drawings, and succinctly defined in the appended claims.

In the accompanying drawings—Figure 1 is a general view of the complete apparatus. Fig. 2 is a detail perspective view of the amalgamating tank and interior parts. Fig. 3 is a plan view of the same subject-matter. Fig. 4 is a detail perspective view of the sand chute. Fig. 5 is a detail view of the upper end of feed spout or pipe. Fig. 6 is an elevation of the gangue conveyer or draper belt. Fig. 7 is a top plan view of the same. Fig. 8 is a detail perspective view of one of the buckets or scoops of the draper.

Each part is indicated by the same reference character throughout the views.

The primary element of the apparatus is a mercury tank 1 disposed at an inclination and having a deep lower end 1^a and a shallow upper end 1^b which extends a considerable distance above the level of the mercury *a* with which the lower end of the tank is filled. Disposed adjacent to the inclined bottom 1^c of the tank 1 is an endless conveyer 2 in the form of a chain provided at intervals with carriers 3 and passed around peripherally grooved pulleys 4 and 5 located at opposite ends of the tank. These pulleys are mounted on shafts 6 and 7 retained in parallel relation by a bar 8. The shaft 6 is extended somewhat above the tank and is driven from a driving shaft 9 through the medium of beveled gears 10 and 11. The shaft 9 is equipped with a belt pulley 12 to

facilitate the belting thereof to a suitable source of power and is designed to drive the feed conveyer 2, as well as other conveyers to be described.

The downwardly moving side or run of the feed conveyer 2 is inclosed for the major portion of its length by a tubular feed spout or pipe 13, the lower end of which is curved concentric with the pulley 5 and extends within the peripheral groove thereof, as shown in Fig. 3. The lower extremity 14 of the spout being located at the bottom of the tank and adjacent to the front wall thereof for the purpose of discharging the pay dirt or gold bearing sand at the bottom of that portion of the tank where the greatest depth of mercury occurs. The gold bearing sand is delivered to the feed spout 13 from a sand chute 15 inclined in the opposite direction from the tank and having its lower end arranged within the same and comprising a hood 16 and a hopper 17, the front and back walls of the latter being provided with apertures 18 through which the upper end of the feed spout 13 is extended, see Figs. 1 and 2.

The upper side of that portion of the feed spout 13 which is located within the hopper 17 is cut away to form an enlarged opening 19 through which the sand descends from the hopper 17 to the interior of the spout, through which it is conveyed to the mercury bath by the conveyer 2.

The sand may be delivered to the sand chute in any suitable manner, but I prefer to employ an endless sand conveyer 20 extended upwardly from a suitable source of supply and passed around a pulley 21 mounted, within a hood 16, on a shaft 22. The shaft 22 is extended beyond one side of the hood and is geared as by a belt 23 to a countershaft 24 driven from the shaft 9 through the medium of beveled gears 25 and 26, Fig. 1. As the gold bearing sand is delivered continuously to the tank 1, the ascending run of the feed conveyer 2 serves constantly to agitate the mercury. The gold will amalgamate with the mercury in a manner well understood in the art, and the sand being lighter than the mercury, will rise to the surface of the latter.

As the sand or other gangue accumulates at the surface of the mercury *a*, it is removed by an endless conveyer or draper 27 mounted in what may be termed a draper frame 28

the side bars 28^a of which are connected by shafts 29, 30, 31 and 32. The draper 27 includes two endless cables 27^a and 27^b carrying and connected by buckets or scoops 33 provided at their opposite ends with eyelets 34 through which the cables are passed, see Figs. 6, 7 and 8. The buckets or scoops, which skim the gangue in a horizontal position, are shallow, flat and oblong and are open only at the front. When the buckets or scoops are in a horizontal position for skimming the gangue from the surface of the mercury, the bottom wall is extended in advance of the top wall to provide a projecting lip, which facilitates the skimming operation. Each of the cables 27^a and 27^b is led over a set of pulleys 29^a, 30^a, 31^a and 32^a mounted respectively on the shafts 29, 30, 31 and 32. The pulleys 32^a are comparatively large, while the remaining pulleys are quite small, the pulleys 29^a and 30^a being located in the same horizontal plane, but the pulleys 31^a being slightly elevated relative to the adjacent pulleys 30^a. The draper 27 is led from the upper side of the pulleys 32^a over and around the pulleys 29^a, thence to the under side of the pulleys 30^a, and thence over the pulleys 31^a to the under side of the pulleys 32^a. By this arrangement that portion or run of the draper extending between the pulleys 29^a and 30^a is disposed at the surface of the mercury, and the scoops are therefore enabled to remove the sand as they travel rearwardly. As the filled scoops pass from the pulleys 30^a to the pulleys 31^a, they are turned to an upright position, but are inverted as they pass down from the pulleys 31^a to the under side of the pulleys 32^a. Therefore, it will be noted that as the scoops pass over the mercury tank, they gather up the sand accumulated upon the surface of the mercury, and having moved back beyond the tank, they are inverted to dump the material so gathered. The draper 27 may be operated in any suitable manner, but is preferably driven from the shaft 9 for which purpose the countershaft 24, geared as stated, to the driving shaft, is belted to the shaft 32 through the medium of a belt 35 and suitable pulleys.

To recapitulate briefly, the gold laden sand or pay dirt is carried from a suitable source of supply by the endless conveyer 20 and is dumped into the sand chute 15, from whence it flows into the feed spout or pipe 13 and is conveyed thence by the feed conveyer 2 to the bottom of the mercury tank 1. The feed conveyer 2 serves the double function of conveying the sand to the tank and of agitating the mercury. The gold amalgamates with the mercury in the tank *a*, and the sand, rising to the surface of the mercury, is carried off by the draper 27 and dumped.

What I claim is:—

1. An amalgamating apparatus including a mercury tank, a chute having its lower end located therein, an endless conveyer located wholly within the tank and passed through the lower end of the chute, and a feed spout passed transversely through the chute and inclosing one run only of the conveyer, said spout opening into the chute and being extended to the bottom of the body of mercury contained in the tank.

2. An amalgamating apparatus including a mercury tank having an inclined bottom wall, upper and lower pulleys mounted on said wall, a chute extended into the tank adjacent to the upper pulley, an endless conveyer passed around the pulleys and through the lower end of the chute, and a feed spout extending along the inclined bottom wall of the tank from the chute to a point below the lower pulley and opening in said chute.

3. An amalgamating apparatus including an inclined mercury tank, an endless conveyer located wholly therein and extended above and below the level of the mercury, a chute comprising a hopper extended into the tank and a superposed hood, a feed spout disposed substantially at right angles to the chute and having its upper end passed transversely through the hopper end of said chute, said spout inclosing one run only of the endless conveyer within the tank and being extended to the bottom of the body of mercury, and an elevator supported at its upper end within the hood and arranged to deposit the value bearing sand in the hopper thereof.

4. An amalgamating apparatus including a mercury tank, means for feeding the value bearing material thereto, an endless draper provided with scoops, and means for guiding the draper to produce a horizontal run located within and below the upper edge of the tank to permit the scooping of the gangue from the surface of the mercury, an ascending run rising over the edge of the tank from the horizontal run, and a descending run extending downwardly outside of the tank from the rising run of the draper to cause the dumping of the draper scoops after the latter have cleared the edge of the tank.

5. An amalgamating apparatus including a mercury tank, a horizontal draper frame located over and extended beyond the tank, an endless draper mounted on the draper frame and including endless carriers and transverse buckets or scoops, a comparatively small pulley around which the draper is led at the inner end of the frame, a comparatively large pulley around which the draper is led at the outer end of the frame, a small guide pulley for the lower run of the draper, said pulley being located over the mercury tank and having its axis located in the horizontal plane in which the axis of the two first named pulleys are located, and a

second guide pulley located over the edge of the tank and under the lower run of the draper, said last named pulley having its axis located in a higher plane than the plane in which the axis of the several other pulleys is located.

6. In an apparatus of the character described, the combination with a tank, of an endless conveyer disposed thereover and including buckets or scoops open only at the front and arranged for skimming the gangue from the top of the tank, and means for causing the dumping of said buckets or scoops when the latter have moved beyond the tank.

7. In an apparatus of the character described, the combination with a tank, of an endless conveyer including buckets open only at the front, and pulleys guiding said conveyer to produce a horizontal run disposed at the top of the tank and an inclined run located beyond the tank, whereby the buckets or scoops of the conveyer will skim the gangue from the top of the tank and will dump their contents when traversing the inclined run of the conveyer.

8. An amalgamating apparatus, including an inclined mercury tank having a deep lower end and a comparatively shallow upper end extended above the level of the mercury, an endless conveyer within the tank and extended along the bottom wall thereof both above and below the mercury level, a feed spout inclosing one run only of the conveyer and also extended above and below the mercury level, and a chute connected to the upper end of the spout.

9. An amalgamating apparatus, including a mercury tank, a chute extended into the tank at a point above the mercury level, an endless conveyer passed through the lower end of the chute, and a feed spout inclosing one run only of the conveyer and extended into the body of mercury from the chute.

10. An amalgamating apparatus, including an inclined mercury tank, an endless conveyer located wholly therein and extended

above and below the level of the mercury, a chute comprising a hopper extended into the tank, a feed spout having its upper end in communication with the hopper end of said chute, said spout inclosing one run only of the endless conveyer within the tank and being extended into the body of mercury, and an elevator arranged to deposit the value-bearing sand in the hopper.

11. An amalgamating apparatus including an inclined mercury tank having a deep lower end and a comparatively shallow upper portion extended above the level of the mercury, and an endless conveyer having a horizontal portion extending over the lower end of the mercury tank and having scoops or buckets arranged to skim the gangue from the surface of the mercury.

12. The combination with a mercury tank, of an endless conveyer disposed to travel over the surface of the liquid in said tank and including buckets open only at the front and held in position for skimming the gangue from said liquid.

13. An amalgamating apparatus including an inclined mercury tank, an oppositely inclined chute having its lower end located within the tank, and an endless conveyer operating within the tank and passed through the lower end of the chute.

14. The combination of a mercury tank having an inclined bottom extending at one end above the mercury level and presenting at the other end a deep portion for holding the mercury, and an endless conveyer provided with shallow scoops open only at the front and arranged to travel horizontally over the mercury to skim off the gangue.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FRED D. FENN.

Witnesses:

CHAS. S. KINGSLEY,
MARGARET RYAN