No. 612,503. Patented Oct. 18, 1898.

J. J. LINK.

CENTRIFUGAL ORE SEPARATOR.

(Application filed Nov. 11, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

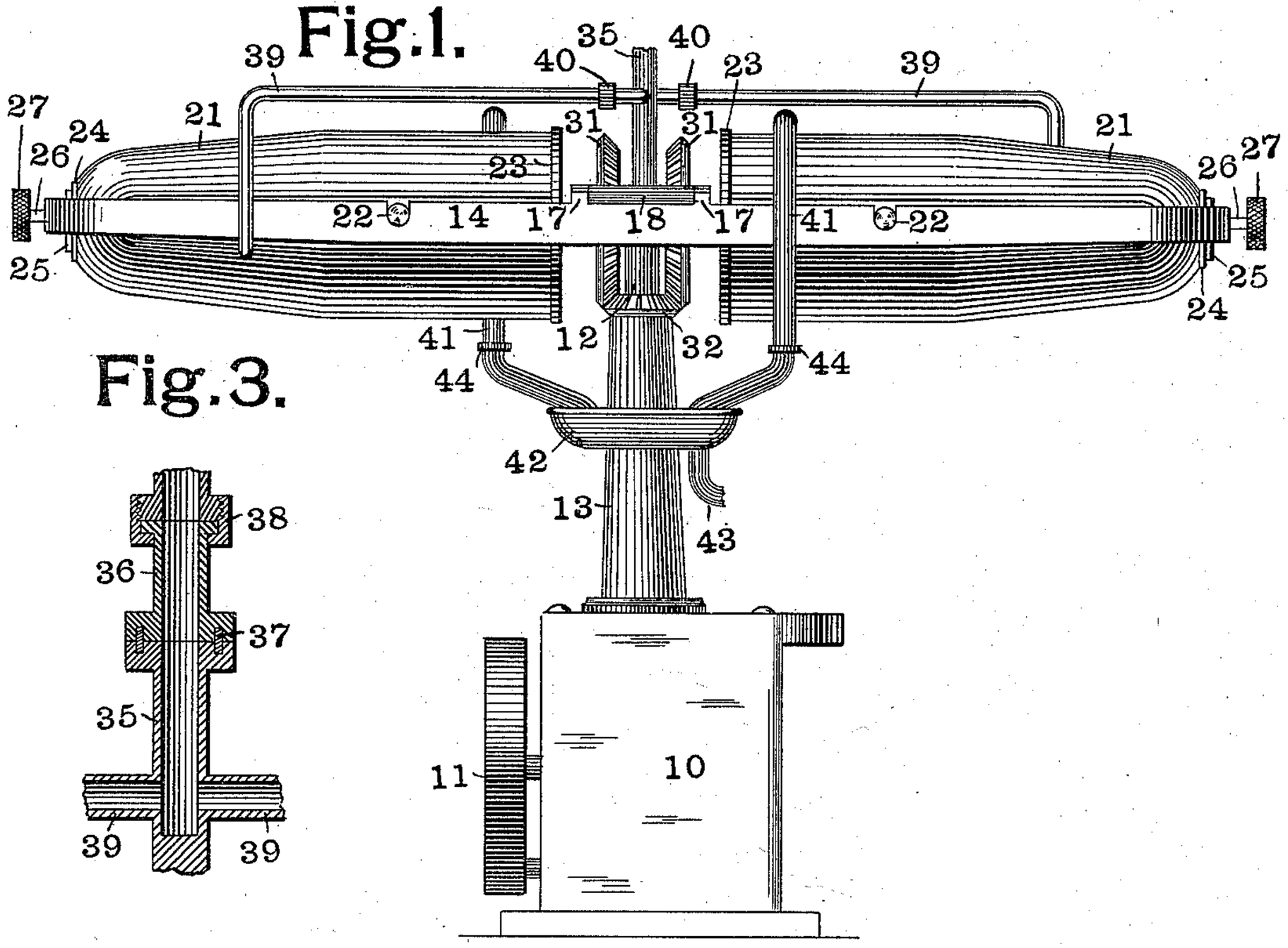

Fig. 3.

Fig. 2.

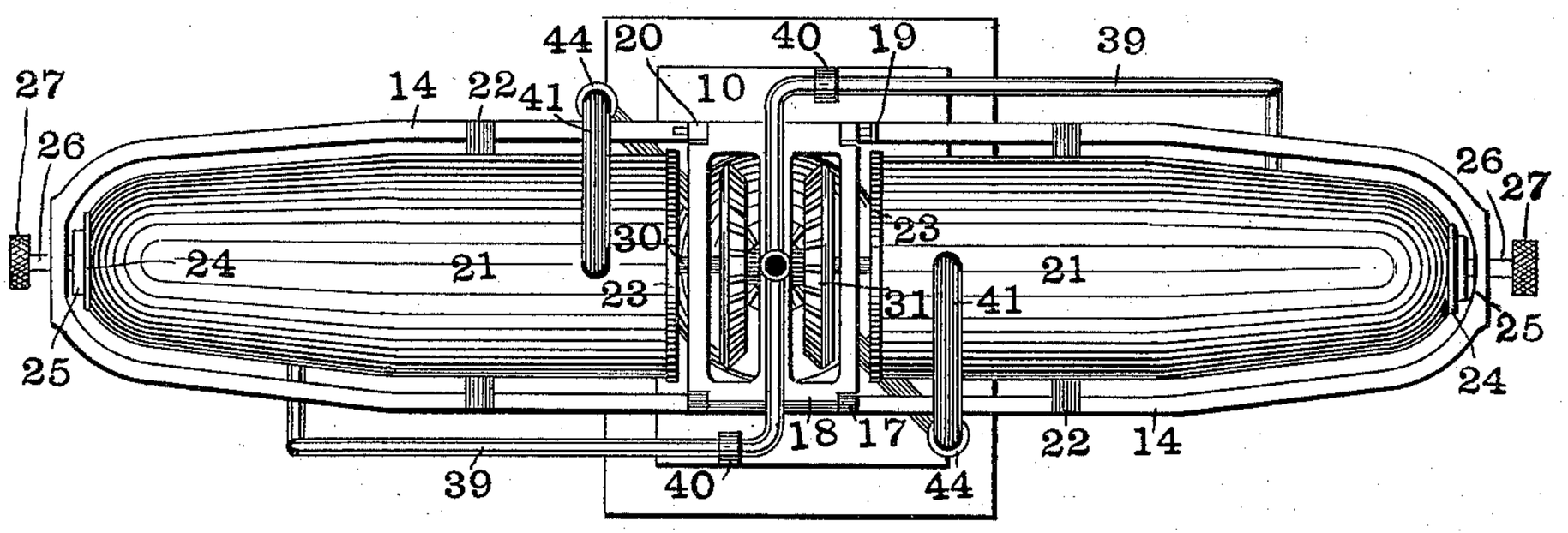

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Fig. 4.

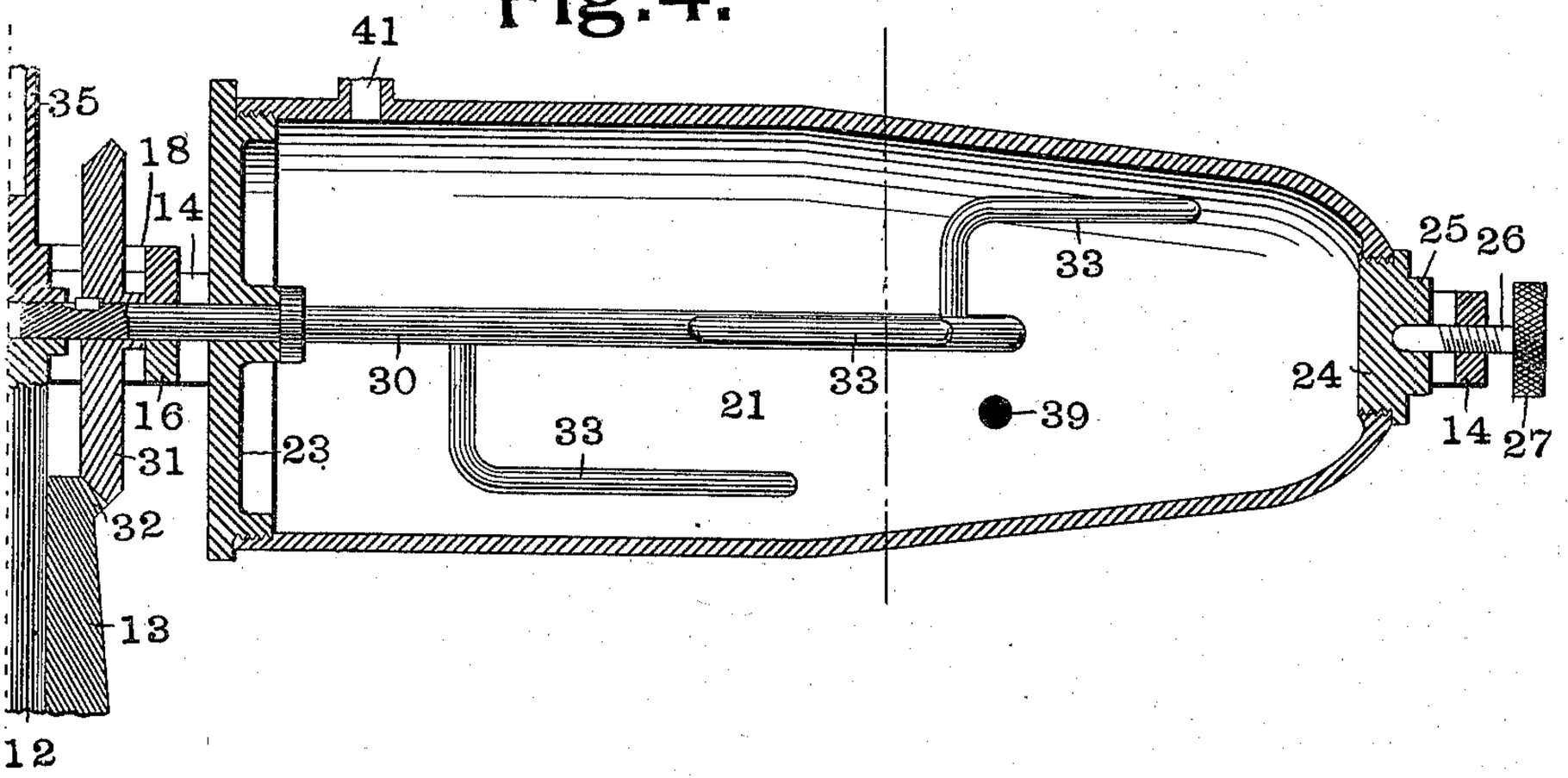
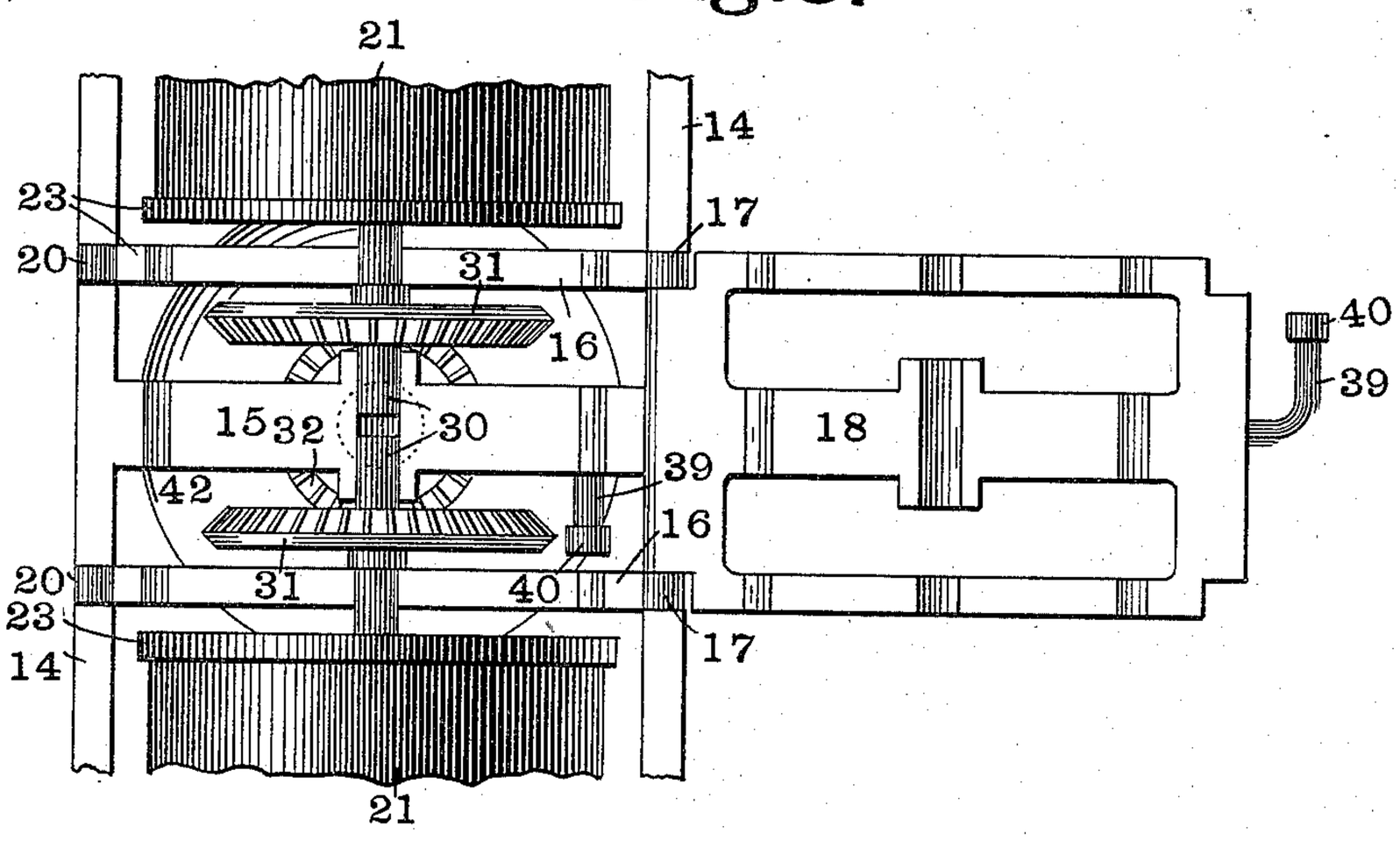


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN J. LINK, OF ST. LOUIS, MISSOURI.

CENTRIFUGAL ORE-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 612,503, dated October 18, 1898.

Application filed November 11, 1897. Serial No. 658,185. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. LINK, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Centrifugal Ore-Separator, of which the following is such a clear, full, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a centrifugal ore-separator, and more particularly to that class of separators in which mercury is used to form an amalgam with the material to be separated.

The object of my invention is to provide a separator of the class named in which the material to be operated on will be thoroughly mixed with the mercury on entering the machine, and in which the centrifugal force will be large in proportion to the speed of the machine, and also to so construct the machine that it can be continuously operated until the mercury is sufficiently charged with the metal and at the same time provide for the ready removal of the amalgam.

My invention consists in various novel fea-features and details of construction, all of which are described in the following specification and pointed out in the claims affixed hereto.

In the accompanying drawings, which illustrate a machine embodying my invention, Figure 1 is a side elevation. Fig. 2 is a top plan view. Fig. 3 is an enlarged section showing a detail of construction. Fig. 4 is a vertical section, on an enlarged scale, showing one-half of the main portion of the machine; and Fig. 5 is a top plan view, also on an enlarged scale, of the central portion of the machine.

Like marks of reference refer to similar parts in the several views of the drawings.

10 is the base, which contains multiplying-gearing, which is not shown, as it may be of any of the well-known forms. Power is applied to the gearing in the base 10 by a belt-pulley 11 or other suitable means, and the said gearing drives a spindle 12, which passes upward through a sleeve 13.

Secured to the spindle 12 is a frame 14. Connecting the two sides of the frame 14 is a central bar 15, to which the said spindle 12 is secured, and two side bars 16. Pivoted to the frame 14 at 17 is a small frame 18, which is held in position by a pin 19, Fig. 2, which passes through one end of the said frame 18 and two lugs 20 of the frame 14. Held in the frame 14 are two substantially cylindrical vessels 21, provided with trunnions 22, which rest in suitable depressions in the frame 14. Each of the vessels 21 is provided at its inner end with a screw-cap 23 and at its outer end with a screw-plug 24. Each of the lugs 24 is provided with a square projection 25 for engagement with a wrench and has formed in the end a depression for the reception of a threaded rod or bolt 26, which passes through the end of the frame 14 and is provided with a milled head 27.

Passing through the cap of each of the vessels 21 is a shaft 30, which is journaled between the bars 15 and 16 of the frame 14 and the similar bars of the frame 18. Secured to each of the shafts 30 is a bevel gear-wheel 31, which meshes with a stationary bevel gear-wheel 32 on the sleeve 13. On the portion of the shafts 30 within the vessels 21 are a number of L-shaped arms 33, which serve as stirrers for the contents of the vessel.

Secured to the center of the frame 18 is a pipe 35, which rotates with the said frame 18. The pipe 35 is arranged end to end with a stationary pipe 36, Fig. 3, and is provided at the joint with a packing-ring 37. In the pipe 36 is a separable joint 38. Extending from the pipe 35 are two supply-pipes 39, which open into the vessels 21 near the outer ends. In the supply-pipes 39 are separable joints 40, like the joint 38 in the pipe 36. Communicating with the vessels 21, near their inner ends, are two discharge-pipes 41, whose ends project into an annular trough 42, carried by the sleeve 13. The trough 42 is provided with a waste-pipe 43. The lower portion of the pipes 41 is made rotatable at 44.

The operation of my device is as follows: The vessels 21 being first charged with the proper amount of mercury, preferably enough to fill the vessels to about the point indicated by the dotted line in Fig. 4, when it is held in the outer ends of the vessel by centrifugal force, power is applied to the pulley

11, which, through the multiplying-gearing, rotates the spindle 12, carrying the frame 14. The material to be treated, mixed with water, is forced down through the stationary pipe 36 into the pipe 35 and thence through the pipes 39 into the vessels 21. The material may be forced into the vessels either by making the pipe 36 of sufficient height so that the weight of the column of material will be sufficient or by using a pump or similar device. As the frame 14 rotates, the gear-wheels 31 are rotated by contact with the stationary gear-wheel 32. The gear-wheels 31, being secured to the shafts 30, rotate the same, causing the arms 33 to thoroughly stir the contents of the vessels 21. The waste material passes out through the discharge-pipes 41 and is discharged into the trough 42, from which it passes through the waste-pipe 43 to the desired place. As soon as sufficient material has passed through the machine to deposit enough metal in the mercury to form the proper amalgam the rotation of the machine and the supply of material are discontinued. The pipe 36 is now disconnected at the joint 38 and the pipes 39 at the joints 40. The pin 19 can now be withdrawn and the small frame 18 thrown back in the position shown in Fig. 5. The bolts 26 are now disengaged from the plugs 24 by rotating the milled heads 27. The vessels 21 are now allowed to swing on the trunnions 22 until the ends of the pipes 41 are clear of the trough 42, when the lower ends of the said pipes are rotated, so as not to come in contact with the frame 14, and the vessels 21 allowed to swing into a vertical position. The plugs 24 can now be removed and the amalgam allowed to run out. To introduce a new charge of mercury or to give access to the interior of the vessels 21 for any purpose, the caps 23 can be removed, carrying with them the shafts 30 and wheels 31.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a centrifugal ore-separator, a suitable revolving frame, means for revolving said frame, vessels transversely pivoted in said frame, and means for preventing said vessels from swinging on their pivots.

2. In a centrifugal ore-separator, a suitable revolving frame, means for revolving said frame, vessels transversely pivoted in said frame, means for preventing said vessels from swinging on their pivots, stirrers in said vessels, and means for actuating said stirrers.

3. In a centrifugal ore-separator, a suitable revolving frame, means for revolving said frame, vessels transversely pivoted in said frame, stirrers in said vessels, gearing for actuating said stirrers, said gearing being brought into operative position when said vessels are swung in a longitudinal position in said frames, and means for securing said vessels in said longitudinal position in said frames.

4. In a centrifugal ore-separator, a suitable revolving frame, vessels transversely pivoted in said frame, means for preventing said vessels from swinging on their pivots, and supply and discharge passages for said vessels.

5. In a centrifugal ore-separator, a suitable revolving frame, means for revolving said frame, vessels carried by said frame, supply-passages opening into said vessels, and discharge-passages communicating with said vessels between said supply-passages and the axis of rotation of said frame.

6. In a centrifugal ore-separator, a suitable revolving frame, means for revolving said frame, vessels transversely pivoted in said frame, means for preventing said vessels from swinging on their pivots, stirrers in said vessels, means for actuating said stirrers, and supply and discharge passages for said vessels.

7. In a centrifugal ore-separator, a suitable revolving frame, means for revolving said frame, vessels transversely pivoted in said frame, means for preventing said vessels from swinging on their pivots, stirrers in said vessels, means for actuating said stirrers, supply-passages opening into said vessels, and discharge-passages communicating with said vessels between said supply-passages and the axis of rotation of said frame.

In testimony whereof I have hereunto set my hand and affixed my seal.

J. J. LINK. [L. S.]

In presence of—

W. A. ALEXANDER,
MAYME SKINNER.