No. 837,197. PATENTED NOV. 27, 1906.

J. M. COUPER.

RIFFLE APPARATUS.

APPLICATION FILED NOV. 13, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

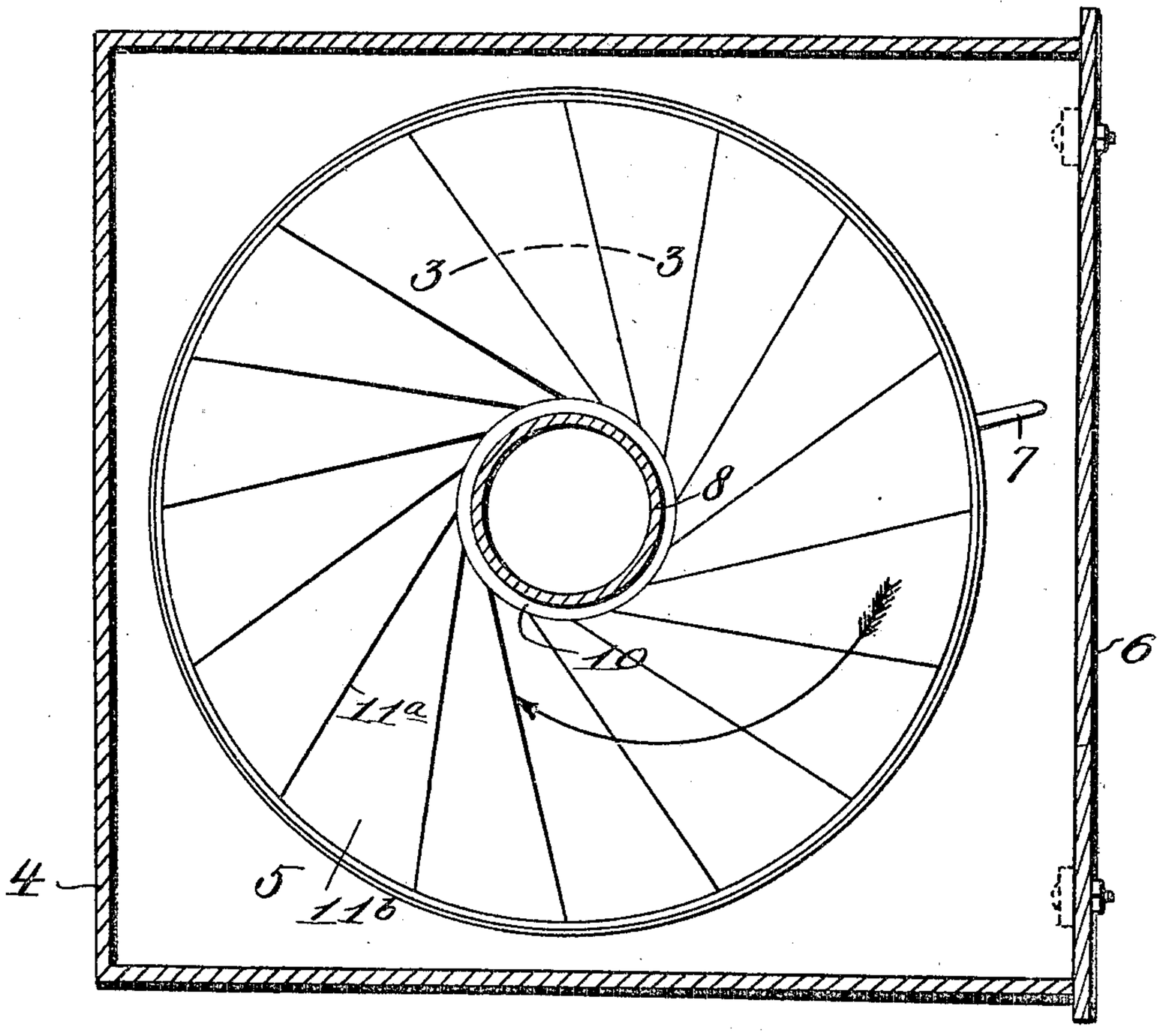


Fig. 2.

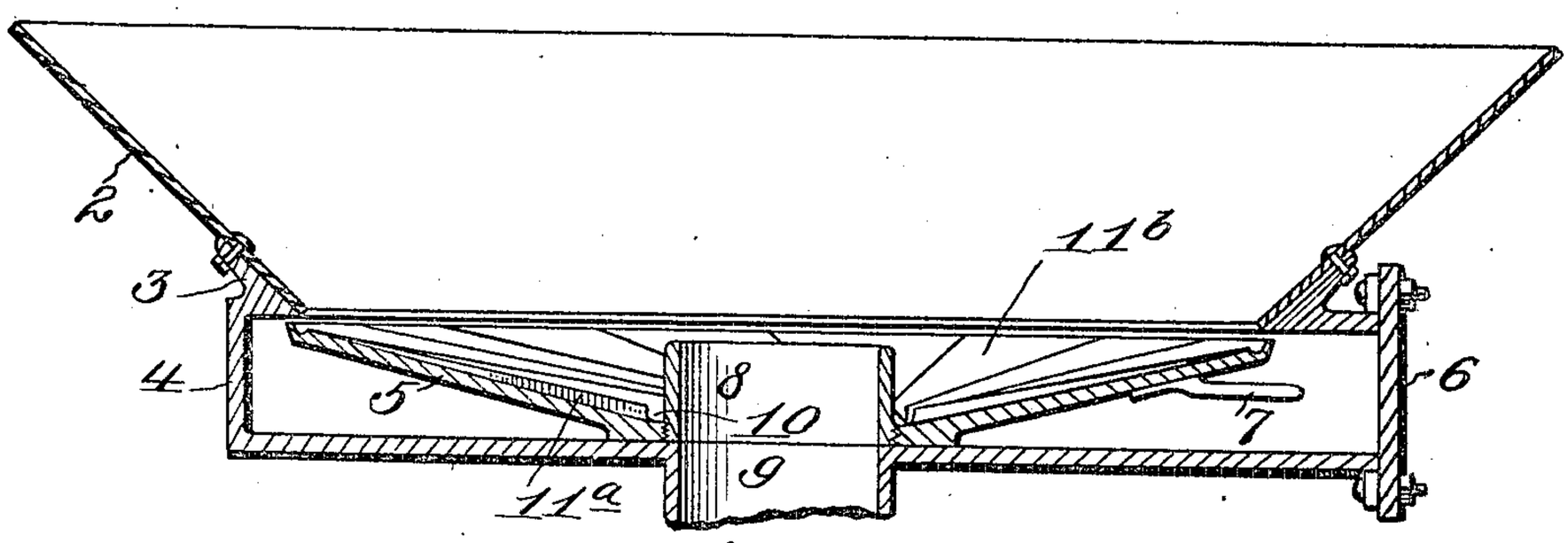
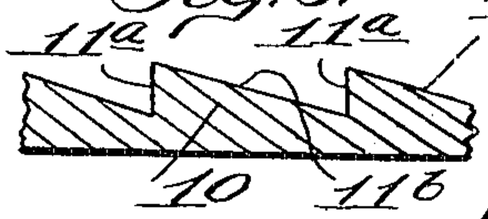


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

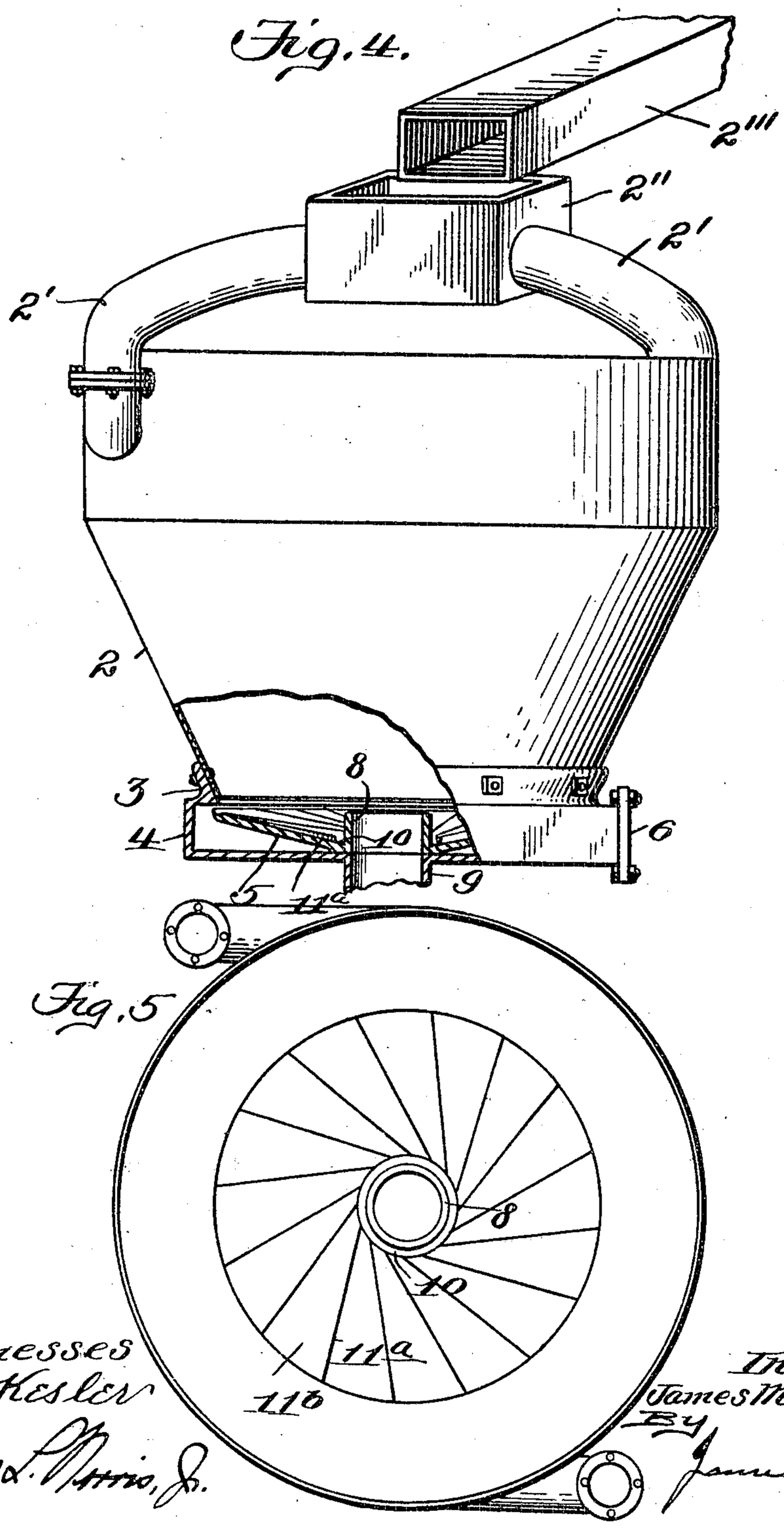

Fig. 5

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RIFFLE APPARATUS.

No. 837,197. Specification of Letters Patent. Patented Nov. 27, 1906.

Application filed November 13, 1905. Serial No. 287,100.

To all whom it may concern:

Be it known that I, JAMES M. COUPER, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented new and useful Improvements in Riffle Apparatus, of which the following is a specification.

This invention relates to riffle apparatus, the object being to provide a simple and effective article of this character which is positive in operation and by which large quantities of mineral values which ordinarily go to waste can be saved.

The improved device can be used in several connections, it being particularly advantageous when employed in conjunction with an ore-separator of the character disclosed in Letters Patent No. 783,931, granted to me February 28, 1905, to which reference may be had.

In the drawings accompanying and forming a part of this specification I illustrate a simple form of embodiment of the invention, which to enable those skilled in the art to practice said invention I will set forth in detail in the following description, while the novelty of the invention will be included in the claims succeeding said description.

In the drawings, Figure 1 is a horizontal sectional view of a riffle apparatus involving my invention. Fig. 2 is a vertical sectional elevation of the same. Fig. 3 is a sectional detail on the line 3 3, Fig. 1. Fig. 4 is an elevation of an apparatus involving my invention, a portion of the lower part thereof being broken away; and Fig. 5 is a top plan view of the same.

Like characters refer to like parts throughout the views.

I have shown my invention as combined with an ore-separator of the same general type as that disclosed in the Letters Patent hereinbefore referred to. I use the expression "same general type" for the reason that the separator shown in part in the drawings is not exactly like that shown in the patent.

In the accompanying drawings there is only one conical vessel, the same being denoted by 2. Into this vessel at diametrically opposite sides wash-water and pulp can be introduced, as by the pipes 2′, the wash-water and pulp entering the conical vessel 2 tangentially thereof, so that as it travels downward it will follow spiral paths and cause the mass containing mineral values to pursue a similar path contiguous to the inner surface of the conical vessel 2. The said inner surface is amalgamated, for which purpose it may be equipped with amalgam-plates attached thereto in any desirable way.

The pipes 2′ lead oppositely from the box 2″, into which the pulp and wash-water are delivered by the spout or conduit 2‴.

The reduced lower end of the inverted conical vessel or receptacle 2 is fastened to the inner side in some suitable water-tight manner of an annular outwardly-inclined flange 3 upon the upper side of the box 4, which box contains centrally the riffle 5. One side of the box 4 has an opening adapted to be closed by a door, as 6, by opening which the riffle 5 can be removed to take out mineral values therefrom, after which it can be reintroduced into place through the openings and the door fastened in any desirable way. To facilitate handling of the riffle 5, it may be equipped with a handle, as 7. The riffle 5 is shown as consisting of a dished disk, it having a central opening into which is removably fitted, as by means of a screw-threaded joint, the ring or sleeve 8, the upper edge of which is in approximately the same plane as that of the riffle or disk 5. The diameter of the disk 5 is a little greater than the least diameter of the conical vessel 2. The said disk rests on the bottom of the box 4 under or below the conical vessel 2, so that the mass of material traversing the said vessel can pass from the latter onto the marginal portion of the upper side of the riffle or disk 5. It will be obvious that the periphery of the disk 5 is under the lower edge of the conical vessel 2. Leading from the bottom of the box 4 is a discharge-pipe, as 9, for the waste material and wash-water, the opening of the pipe being in register with the opening through the ring or band 8.

As understood, the disk 5 inclines upward and outward from its central opening. The upper surface of the disk is shown as corrugated substantially tangentially to said central opening. The inner ends of the corrugations extend short of this central opening, so as to produce an annular trough 10, into which the channels of the corrugations lead. The pecious particles in a mass of ma-

terial on the upper inclined surface of said disk can therefore roll down such surface and into quicksilver placed in the trough 10. Each projecting portion 11 of the corrugated surface presents a vertical face 11^a and a laterally-inclined face 11^b, which slopes downward from the apex or top of said face 11^a to and merges into the base of the vertical face of the projecting portion next in advance thereof. The projecting portions 11 are of progressively-decreasing height from their lower to their upper ends, the latter merging practically into the upper surface of the disk near the periphery thereof.

As the water containing the material to be separated travels spirally down the inside of the conical vessel 2 it follows that it pursues a similar path while on the riffle or disk 5. As the material traverses spirally the upper corrugated surface of the disk the faces 11^a, acting as abrupt shoulders, arrest the motion of the precious particles and cause them to enter the channels of said corrugated portion and to roll downward in said channels into the trough 10. The sand and refuse matter in the mass are washed over the upper edge of the ring 8 by the force of the water and enter the discharge-pipe 9.

To obtain the gold or other mineral values from the riffle, the latter will be bodily removed from the box 4 by opening the door 6, and access may be readily had to the quicksilver containing the mineral values by taking off the ring 8. Fresh quicksilver can be introduced into the trough 11, after which the riffle will be put back into place in the box and the door 6 closed.

The dished disk or riffle 5 is in the present case stationary. From this I do not mean that it cannot be moved, for from what has been hereinbefore stated it will be apparent that such is not the case, for the disk or riffle can be taken from its place in the box 6. The disk, however, is stationary in the sense that it has no movement during the amalgamating operation.

What I claim is—

1. The combination of a separating vessel, and a disk below the vessel having a corrugated surface to receive material from said vessel, the corrugated surface being inclined from the outer toward the inner part of the disk and the latter having an annular trough into which the channels of the corrugated portion lead.

2. The combination of a separating vessel, and a disk below the vessel having a corrugated surface to receive material from said vessel, the corrugated surface being inclined from the outer toward the inner part of the disk and the latter having an annular trough into which the channels of the corrugated portion lead, and a ring fitted into the disk centrally thereof.

3. The combination of a substantially conical separating vessel, and a stationary disk below the vessel having a corrugated surface inclined from the outer toward the inner part of the disk, to receive material from the vessel, said disk being stationary and being provided with an annular trough into which the inner ends of the channels of said corrugated portion lead.

4. The combination of a separating vessel, a box for supporting the same, and a disk removably mounted in the box below the vessel, said disk having an inclined corrugated surface to receive material from the vessel, provided with an annular trough into which the inner ends of the channels of the corrugated portion lead.

5. The combination of a separating vessel, a disk below the vessel having an inclined surface to receive material from the vessel and a central opening, said disk being corrugated on its upper side the corrugations being approximately tangential to the opening, and a trough into which the channels of the corrugated portion lead, and a ring fitted into said central opening.

6. A riffle consisting of a disk having a central opening and provided with a corrugated surface, the corrugations being substantially tangential to said opening, and each projecting portion of the corrugation having a vertical face and an inclined face extending laterally from said vertical face and merging into the vertical face of the next adjacent projecting portion.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES M. COUPER.

Witnesses:
E. H. STEVENS,
I. L. HOLBROOK.