

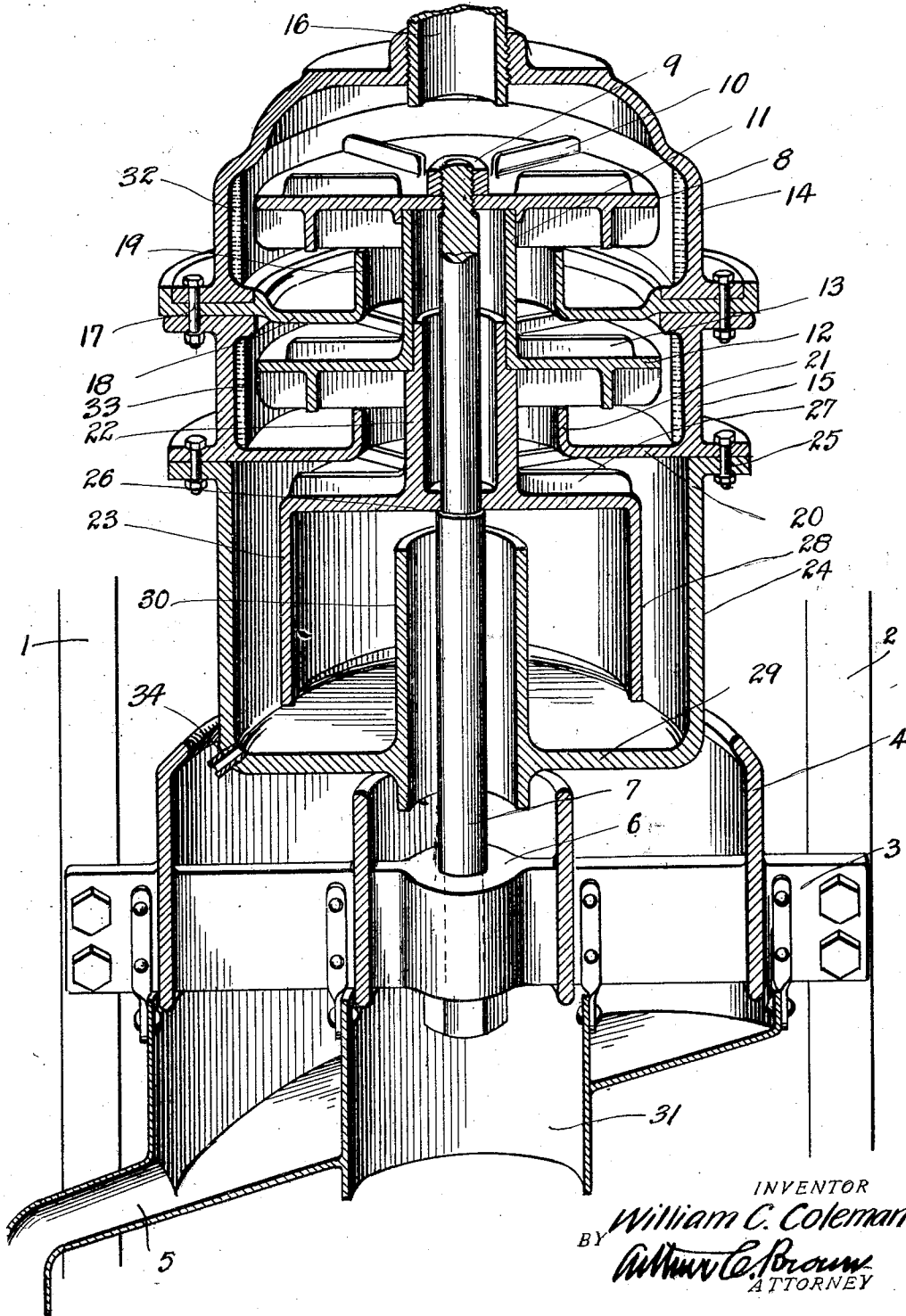
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CENTRIFUGAL SEPARATOR

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# UNITED STATES PATENT OFFICE.

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## CENTRIFUGAL SEPARATOR.

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This invention relates to a centrifugal machine and particularly to an amalgamator and concentrator for removing metal from ore sludge or pulp.

5 The invention contemplates a centrifugal machine so constructed that the ore pulp may pass through a plurality of amalgamator stages if desired and finally be subjected to the action of a concentrator, the prime  
10 object being to remove the metal from the sludge and allow the sludge to pass off as waste.

The novel construction of the invention will be apparent by reference to the following  
15 description in connection with the accompanying drawings, in which—

The figure is a vertical, longitudinal, sectional view through a separator constructed in accordance with my invention.

20 Referring now to the drawings by numerals of reference:

1 and 2 designate two supports which carry a cross bar 3. The cross bar supports a discharge hopper 4 having a flow-off pipe  
25 5. The cross bar 3 is provided with a central or hub portion 6, in which is rigidly fastened an upstanding rod 7 carrying at its upper end a plurality of distributors. The distributor 8 comprises a disk made  
30 fast to the rod 7 by the nut 9. The disk has a plurality of radial fins 10 and it is secured to the upstanding tubular portion 11 of a similar disk or distributor 12 also provided with radial fins designated 13.  
35 The disk 8 is in the first stage 14 of the separator and the disk 12 is in the second stage 15 of the separator.

The first stage of the separator comprises an inverted, cup-shaped member having an  
40 inlet through a tubular shaft 16 and it is fastened to the second stage by fastening devices 17. Between the first and second stage casings 14 and 15 is a wall or baffle 18, having an upstanding tubular portion 19  
45 of less diameter than the disk 8 and beneath it. The tubular portion surrounds the tubular portion 11 and it constitutes an exit from the first stage into the second stage so that material from the first stage will  
50 drop onto the distributor disk 12.

The bottom 20 of the second stage is provided with an upstanding tubular portion 21 of greater diameter than the tubular

member 22 of the concentrator distributor 23 so that the material may pass from the  
55 second stage into the concentrator casing 24 to which the second stage is fastened by fastening devices 25. The distributor for the second stage rests upon a shoulder 26  
60 on the rod 7 so it will be seen that the distributors for the first and second stages of the amalgamator and the distributor for the concentrator are all rigidly supported on the rod 7.

The distributor 23 for the concentrator  
65 is provided with radial fins 27 and the distributor has a depending flange 28 spaced from the wall of the concentrator 24. The bottom 29 of the concentrator has an up-  
70 standing tubular portion 30 of greater diameter than the rod 7 so that material may pass from it into the waste pipe 31 carried by the bottom of the hopper 4.

The first and second stages of the amalgamator carry annular mercury columns 32  
75 and 33. Therefore, as material enters the first stage through the hollow shaft 16, it will flow over the edge of the disk 8 and since the outer casings of the three stages rotate in unison (since they are fastened  
80 together), the material will come into contact with the mercury in the first stage so that the mercury can take up some of the metal. The material will then pass into  
85 the second stage where any metal which has not been taken out by the first stage will be acted on, and finally, the material will pass into the concentrator where the material will be subjected to a concentrating  
90 action in the usual manner. The concentrates can flow out through the outlet port 34 in the bottom of the concentrator, into the hopper, and then out through the pipe 5.

It will be apparent that the ore sludge will be subjected to a tortuous path through  
95 the machine so that there will be ample time for it to be acted upon by the mercury columns and by the concentrator so that practically all of the metal will be taken out.

The hollow shaft 16 may be the drive shaft  
100 and it can be driven by any appropriate means, the distributors in the present machine being stationary so all the rotary motion will be provided by the casing.

The device can be readily assembled when  
105 taken apart for inspection or repairs and it

will provide an efficient means for recovering fine metal from ore sludge or pulp. After the machine has been in use, the mercury can be taken out and subjected to the usual process to recover the metal.

What I claim and desire to secure by Letters-Patent is:—

1. In a machine of the class described, an amalgamator casing having a vertical axis, a concentrator casing having a vertical axis communicating with the amalgamator casing, the amalgamator casing having an inlet and the concentrator casing having an outlet and a flat disk distributor in the respective casings having upstanding radial wings.

2. In a machine of the class described, an amalgamator casing having an inlet, a concentrator casing communicating with the amalgamator casing and having an outlet, and rigid distributors in the respective casings.

3. An amalgamator and concentrator comprising a multi-stage amalgamator having a vertical axis, a concentrator having a vertical axis, the stages of the amalgamator communicating one with the other and the lowermost amalgamator stage communicating with the concentrator and distributors in the respective stages of the amalgamator and concentrator, said distributors comprising

horizontal, rotatable disks having upstanding radial vanes.

4. In a device of the class described, a plurality of superposed casings, the lower one of which is a concentrator and the upper ones of which are amalgamator casings, annular mercury columns in the amalgamator casings, a rigid rod extending concentrically through the respective casings, and distributors rigidly secured to the rod.

5. In a device of the class described, a plurality of superposed casings, the lower one of which is a concentrator and the upper ones of which are amalgamator casings, annular mercury columns in the amalgamator casings, a rigid rod extending concentrically through the respective casings, and distributors rigidly secured to the rod, the distributor in the amalgamator casing having a depending flange spaced from the wall of the concentrator.

6. A device of the class described comprising a multi-stage machine having a casing, means for rotating the casing of the machine, and distributors in the respective stages comprising disks having radial vanes, the respective stages having bottom members with upstanding tubular outlets.

In testimony whereof I affix my signature.  
WILLIAM C. COLEMAN.