

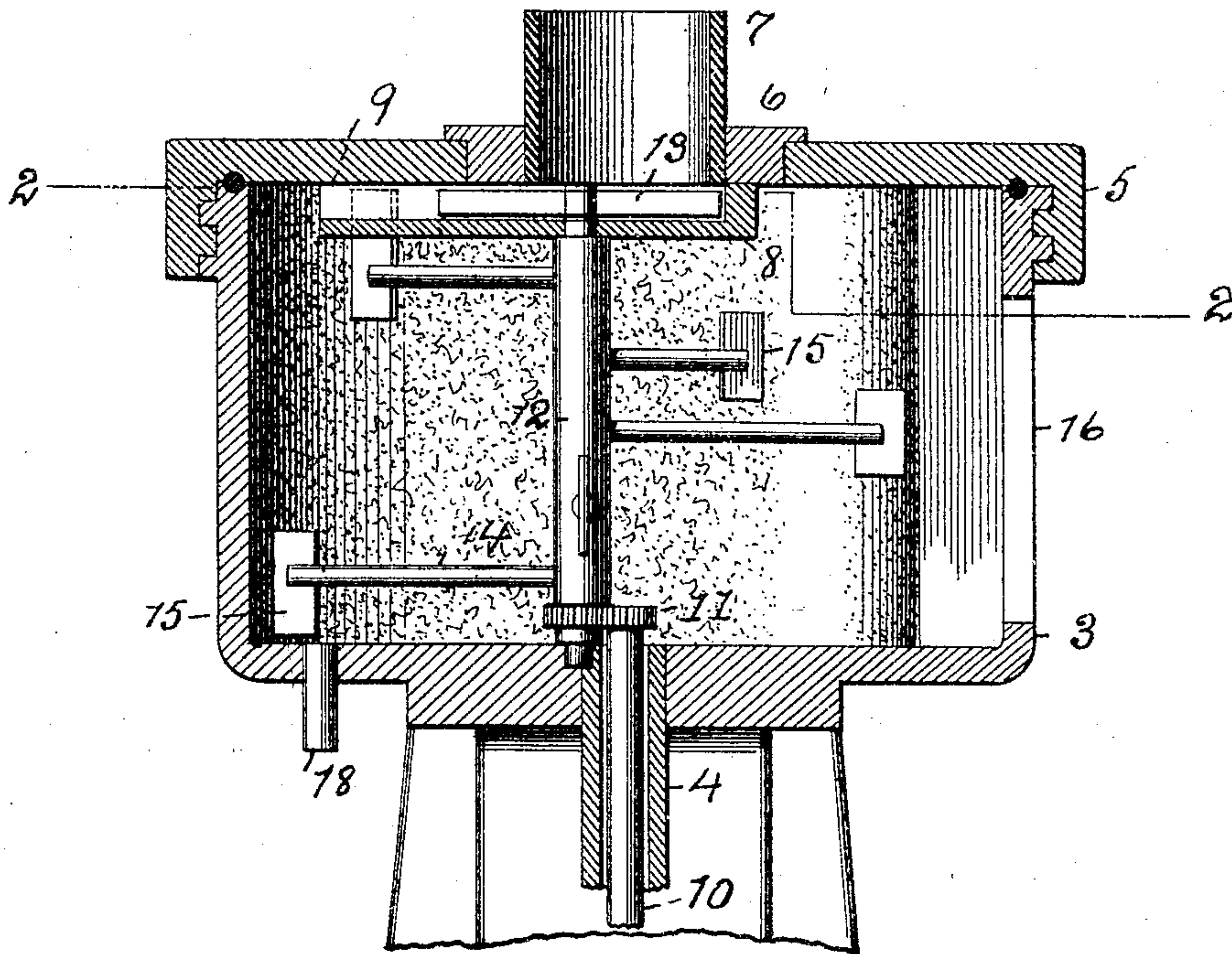
No. 774,821.

PATENTED NOV. 15, 1904.

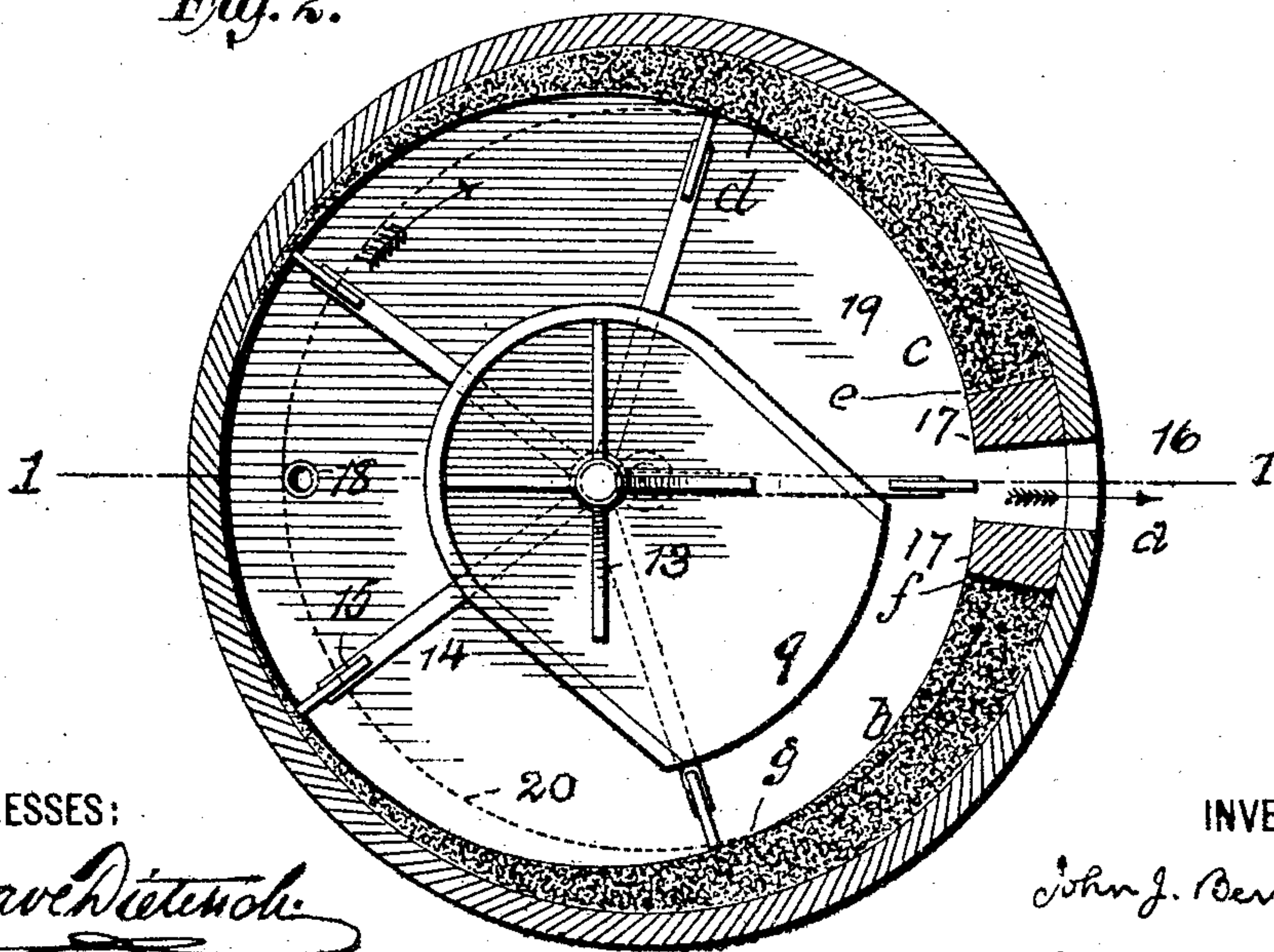
J. J. BERRIGAN.  
CENTRIFUGAL MACHINE.  
APPLICATION FILED FEB. 11, 1904.

NO MODEL.

*Fig. 1.*



*Fig. 2.*



WITNESSES:

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INVENTOR

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# UNITED STATES PATENT OFFICE.

JOHN JOSEPH BERRIGAN, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO  
FRANCIS J. AREND, OF NEW YORK, N. Y., AND JOHN BERNSTROM, OF  
STOCKHOLM, SWEDEN.

## CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 774,821, dated November 15, 1904.

Application filed February 11, 1904. Serial No. 193,148. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN JOSEPH BERRIGAN, of East Orange, Essex county, New Jersey, have invented a new and useful Improvement in Centrifugal Machines, of which the following is a specification.

In United States Letters Patent No. 677,926, dated July 9, 1901, I have set forth a machine for effecting by the action of centrifugal force the separation of solids and liquids, and I have broadly claimed therein a receptacle for the combined constituents to be separated constructed to rotate on an eccentric axis. In my said machine there is also present means for conveying the solid constituent deposited centrifugally on a portion of the interior of said receptacle from its place of deposit to an outlet-opening, whence it is ejected. In the embodiment of my said machine as shown in the aforesaid patent the eccentrically-placed receptacle is arranged in a larger inclosing bowl, partly in which and partly in the receptacle the liquid-ring is formed, so that said bowl rotating about its center of figure serves both as a containing vessel for the eccentric receptacle and, in conjunction with the liquid-ring therein, as a means of balancing the same. I have now discovered that I can do away wholly with the interior eccentric receptacle, and by accumulation of solid material in the bowl I can produce therein an eccentrically-disposed chamber or compartment which will perform the same function as does the actual receptacle which has hitherto been placed in the bowl.

My invention therefore consists in a centrifugal machine for the separation of solids and liquids having a single bowl or drum rotating on a central axis and so constructed as that by the deposition of material therein an eccentric separating-chamber will be formed.

In the accompanying drawings, Figure 1 is a vertical section of my machine on the line 1 1 of Fig. 2, the lower portion of the supporting-standard and driving-gear being omitted. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1.

Similar characters of reference indicate like parts.

3 is the rotary bowl, which is supported on the hollow shaft 4, which shaft is rotated by any suitable means. The outer edge of the bowl 3 is threaded to receive the flanged cover 5. Centrally disposed in said cover is a plug 6, which receives the feed-pipe 7. Secured to the under side of the cover is a box 8, one side of which, 9, is open.

Extending through the hollow shaft 4 is a shaft 10, also rotated by any suitable means, which by means of the gearing 11 rotates the eccentrically-disposed shaft 12. One end of said shaft is stepped in the bottom of the bowl 3. The other end, reduced in diameter, passes through an opening in the bottom of the box 8 and within said box carries radially-disposed arms 13.

The shaft 12 has extending from it a number of arms 14 of equal length, each one of which at its extremity carries a scraping-blade 15. The distance of the outer edge of each scraping-blade from the axis of the shaft 12 is such that the scraping-blades 15 will closely approximate that portion of the inner periphery of the bowl 3 which is least eccentric with reference to the axis of the shaft 12. Directly opposite this least-eccentric portion and formed in the wall of the bowl 3 is an outlet-opening 16, and within the bowl on each side of this outlet-opening are vertical bars 17, which extend from the bottom of the bowl to the cover. The width of these bars 17 measured radially is such that the scraper-blades 15 during their rotation will move in proximity to the inner faces of said bars.

In the bottom of the bowl 3 and near the wall thereof is a pipe 18 for the escape of liquid.

The operation of the device is as follows: The combined materials to be separated entering at pipe 7 pass into the box 8 and by the action of centrifugal force of rotation and of the arms 13 are projected outwardly through the open end 9 of the box and against the inner wall of the bowl 3, over a section thereof adjacent to one of the bars 17. The solid ma-



terial deposits on the wall until it attains a thickness which brings it within the circular sweep of the revolving scrapers 15. These then mold the inner surface of the deposited mass *b* and at the same time carry the new material around the bowl to meet the opposite bar 17, beside which it forms another deposit, *c*, similar to *b*. By reason of these deposits *b c* there is formed an inner cylindrical chamber 19, concentric with the shaft 12, but eccentric to the axis of rotation of the bowl 3. The material entering after the chamber is formed is separated as follows: A liquid-ring is produced the inner boundary of which (indicated by the circle 20) extends to the liquid-outlet 18 and also in part lies between the inner surface of the accumulated deposits *b c* and the inner periphery of bowl 3. The uncovered surfaces *d e* and *f g* of the deposits *b c* will then be substantially dry, so that as the scrapers 15 engage the solid ingredient and transport it around the bowl they will also carry it over a dry space, as *d e*, before bringing it to the outlet 16, from which it is ejected by centrifugal force, as indicated by the arrow *a*. The deposits *b c* remain in place and form substantially a part of the machine as long as desired. Of course if for any reason they are removed they are re-formed in the manner described before the separating action of the machine is resumed. The operation of the apparatus is continuous as long as material is supplied, the separated liquid ingredient escaping at 18 and the solid ingredient at 16 in the manner described.

I claim—

1. In a centrifugal machine for the separation of solids and liquids, a rotary vessel and means for producing upon the inner surface thereof and from the solid material a separating-chamber for the combined materials subsequently introduced therein.

2. In a centrifugal machine for the separation of solids and liquids, a rotary vessel and means for centrifugally producing upon the inner surface thereof and from the solid material a separating-chamber for the combined materials subsequently introduced therein.

3. In a centrifugal machine for the separation of solids and liquids, a rotary vessel having a non-foraminous circumferential wall and means for producing upon the inner sur-

face thereof and from the solid material a separating-chamber for the combined materials subsequently introduced therein. 55

4. In a centrifugal machine for the separation of solids and liquids, a rotary vessel and means for producing upon the inner surface thereof and from the solid material a separating-chamber for the combined materials subsequently introduced therein eccentric to the axis of rotation of said vessel. 60

5. In a centrifugal machine for the separation of solids and liquids, a rotary vessel having an escape-outlet for liquid and an escape-outlet for solids, the last-named outlet being in the circumferential wall of said vessel, inwardly-projecting bars on each side of said solid-escape outlet, and a conveying device rotary on an axis eccentric to the rotation of said vessel and within said vessel and constructed to engage solid material centrifugally deposited in said vessel; and convey the same toward said escape-outlet. 70

6. In a centrifugal machine for the separation of solids and liquids, a rotary vessel having an escape-outlet for liquid and an escape-outlet for solids, the last-named outlet being in the circumferential wall of said vessel, inwardly-projecting bars on each side of said solid-escape outlet, a rotary shaft eccentrically disposed in said vessel, arms on said shaft and scrapers carried by said arms and constructed to engage material centrifugally deposited in said vessel. 85

7. In a centrifugal machine for the separation of solids and liquids, a rotary vessel having an outlet for liquid and an outlet for solids, the last-named outlet being in the circumferential wall of said vessel, inwardly-projecting bars on each side of said solid-escape outlet, means for delivering incoming material against the inner periphery of said vessel adjacent to one of said bars, and means for conveying deposited material around the inner periphery of said vessel. 90

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN JOSEPH BERRIGAN.

Witnesses:

WM. H. SIEGMAN,  
I. A. VAN WART.