

No. 748,038.

PATENTED DEC. 29, 1903.

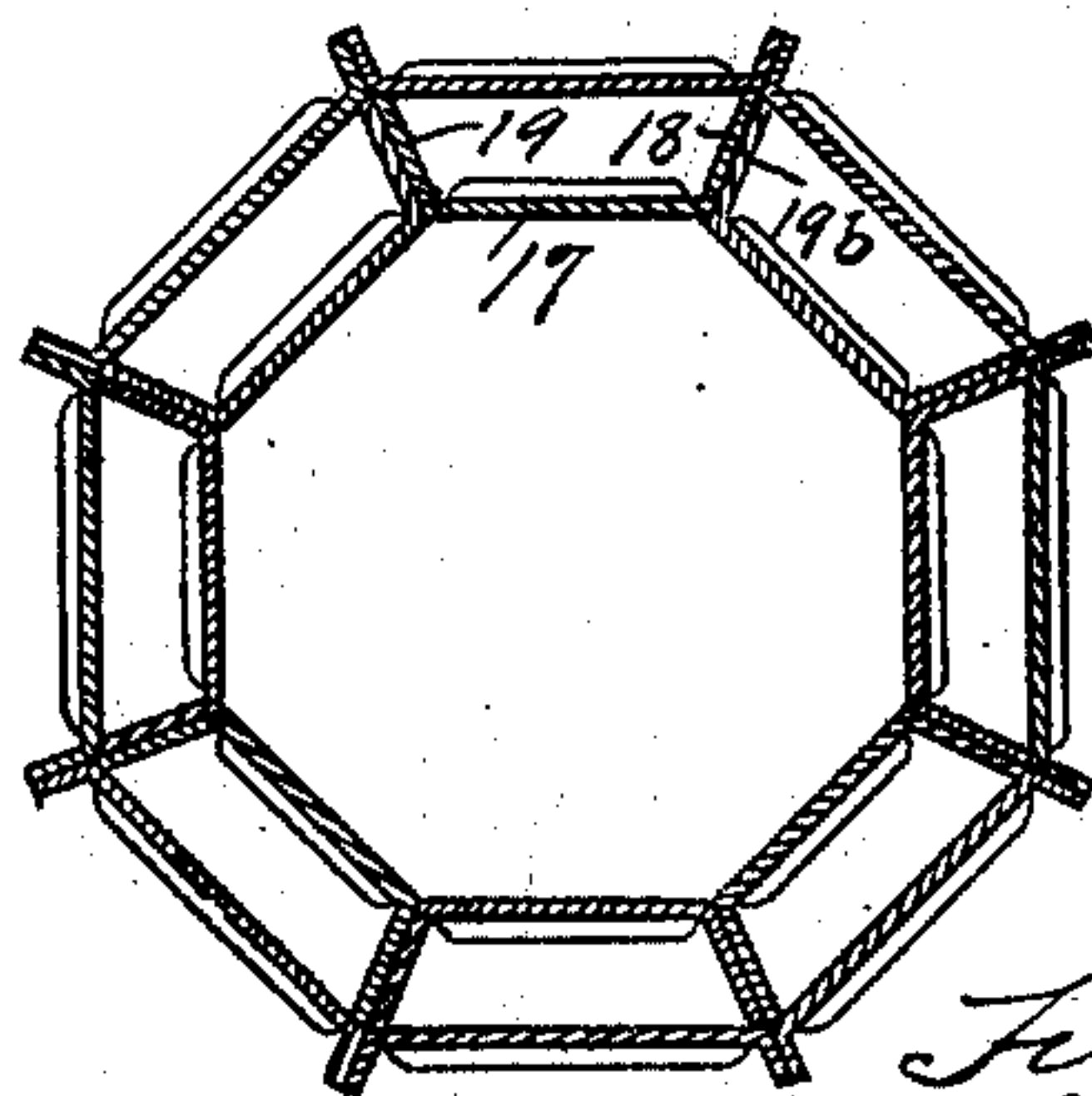
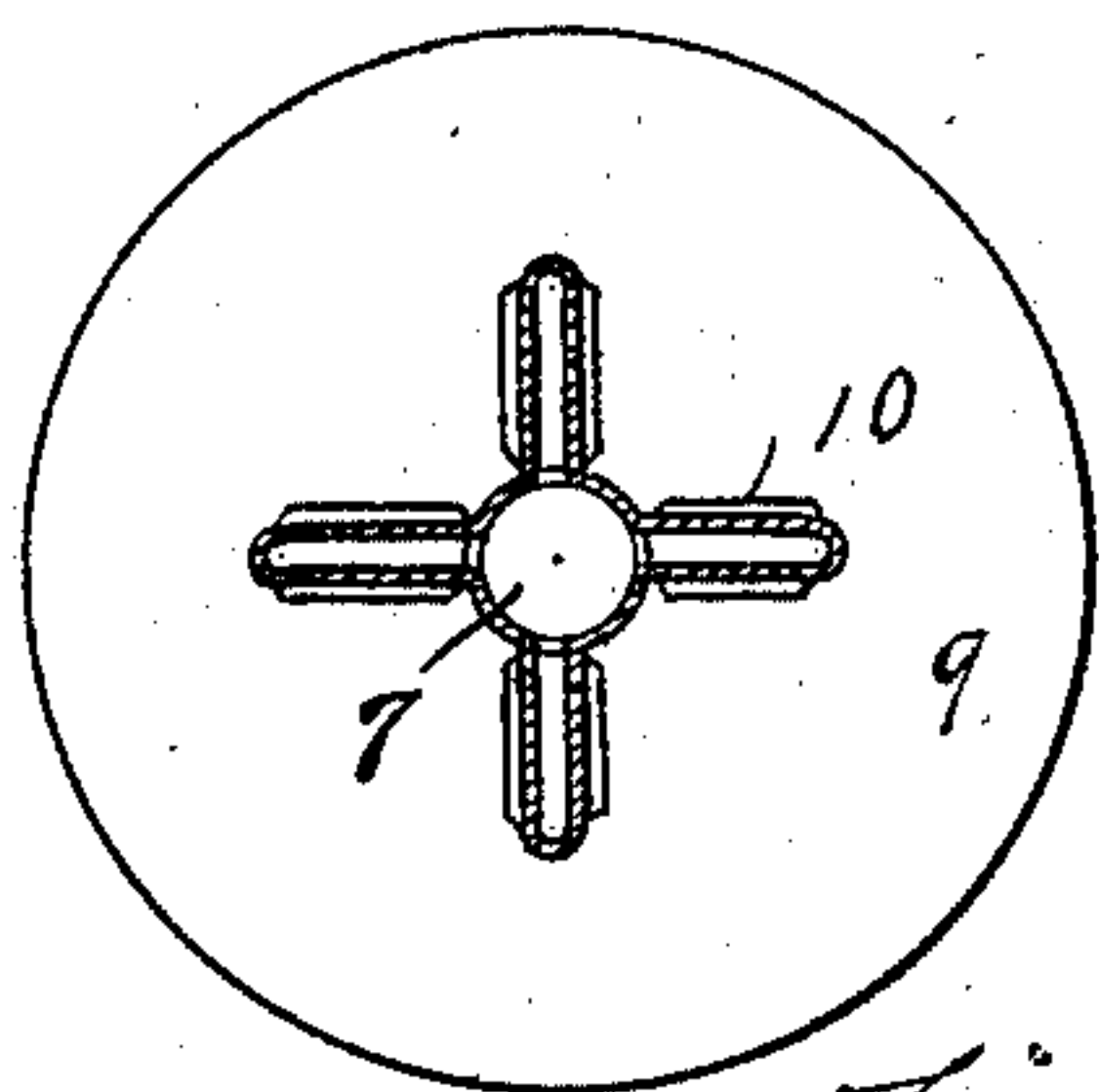
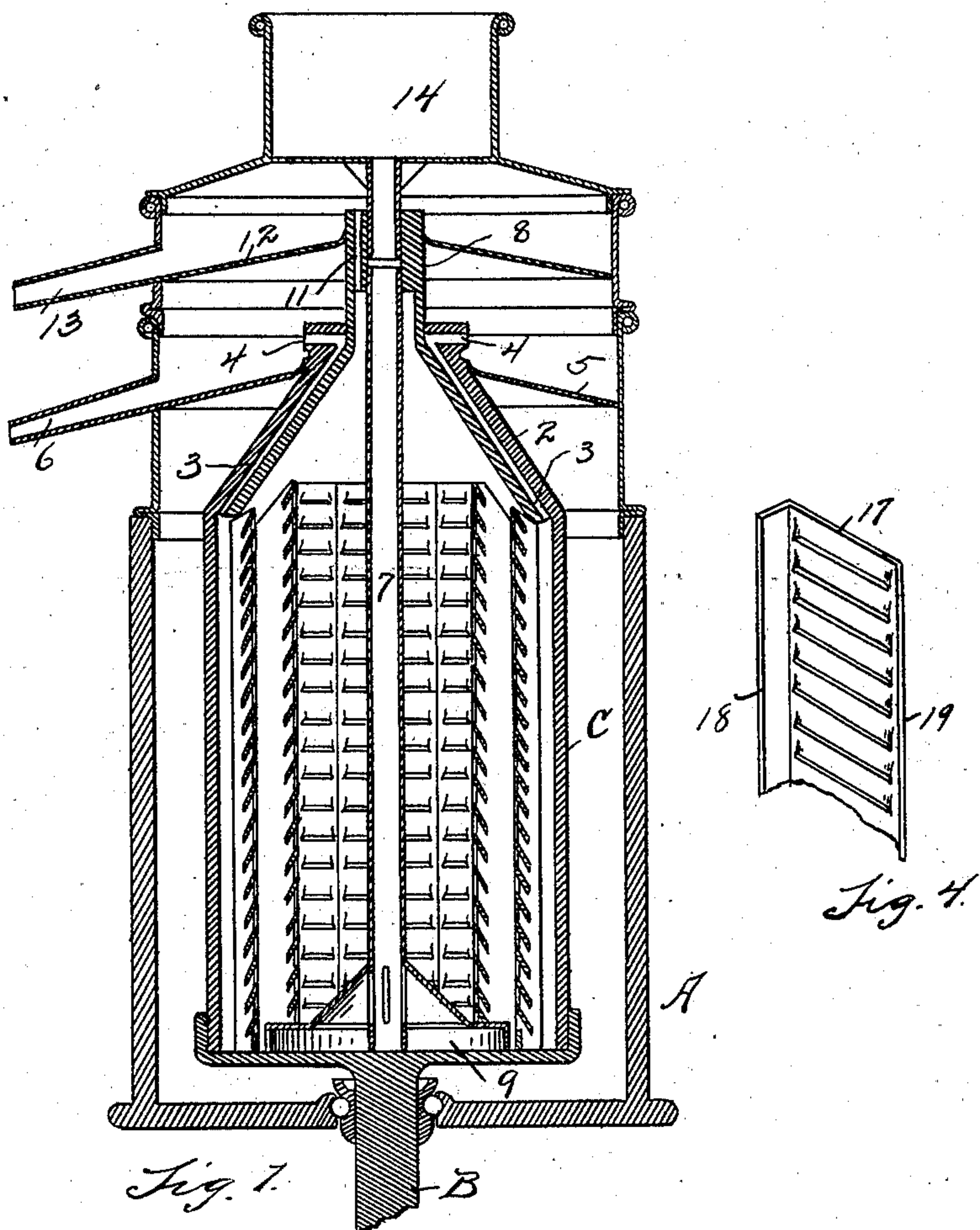
J. H. AYERS, DEC'D.

A. B. AYERS, ADMINISTRATOR.

CENTRIFUGAL LIQUID SEPARATOR.

APPLICATION FILED JULY 28, 1902.

NO MODEL.



WITNESSES
Chas E. Wiesner
Roy C. Hinman

By

INVENTOR
John H. Ayers
Parker & Burton
Attorneys.

UNITED STATES PATENT OFFICE.

JOHN H. AYERS, OF LANSING, MICHIGAN; ALMOND B. AYERS ADMINISTRATOR OF SAID JOHN H. AYERS, DECEASED.

CENTRIFUGAL LIQUID-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 748,038, dated December 29, 1903.

Application filed July 28, 1902, Serial No. 117,270. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. AYERS, a citizen of the United States, residing at Lansing, county of Ingham, State of Michigan, have invented a certain new and useful Improvement in Centrifugal Separating - Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to centrifugal separating-machines, and has for its object improvements in that class of separating-machines in which a compound liquid is separated into its constituent liquids of different densities and in which the separated liquids are drawn away into separate or different receptacles.

As is well known, when a compound liquid of which the constituents have different densities is placed in a bowl and the bowl is rapidly rotated, carrying the liquids with it in rapid rotation, the heavier constituent is thrown by the centrifugal action to the outside of the bowl and the lighter constituent is crowded to the more central part of the bowl and the two may be drawn off separately into separate receptacles; but if the bowl be a simple bowl without a partition or diaphragm either the rotation must be kept up for a long period of time or the separation is not completed, and if it be desired to make the operation continuous by feeding into the bowl additional liquids to take the place of the separated constituents drawn off from time to time or continuously drawn off then either the feed and consequent delivery must be slow or some adjuncts must be added to the structure to prevent the heavier part of the subsequently-added material from carrying out and holding out some part of the lighter constituent which is desired to have separated out from the heavier constituent; and it is such an adjunct to aid in the work that forms the object of this invention.

In the drawings, Figure 1 is a vertical section of a complete separating-machine. Fig. 2 is a cross-section of the adjunct plates or baffle-plates. Fig. 3 is a cross-section at the

bottom of the feed-tube by which the compound liquid is fed into the bowl. Fig. 4 is a perspective of a part of one section of the adjunct diaphragm.

A indicates a casing supported from any suitable fixture, and B indicates a rotatable shaft journaled through the casing A and provided with any suitable means for producing rapid rotation thereof. The shaft B is vertical, and on its upper extremity inside the casing A is fixed a bowl or chamber C, preferably nearly cylindrical through the greater part of its height, but closed at its upper end with a conical or contracted covering 2, provided with numerous small passages 3, leading to outlet nozzles or mouths 4.

For structural purposes the cover is usually made in two pieces, one of which is either grooved or ribbed, so that the two pieces when assembled form a cover to the bowl, between the parts of which are the passages that form outlets from the bowl, and the passages lead from near the outer walls upward and toward the center to the discharge-orifices 4.

The bowl and the cover rotate together, and under the discharge-orifices 4 is fitted the floor or bottom part 5 of a chamber, into which liquid passing from the bowl through the passages 3 is caught and from which the liquid is carried through the spout 6 to any suitable receptacle.

Inside the bowl are fitted two sets of baffle-plates, which will be described more at length hereinafter, and inside the baffle-plates concentric with the bowl is a vertical tube 7, open at the top, where it extends into a portion through what may be called the "plug" 8 at the upper end of the cover 2.

The tube 7 revolves with the bowl, and at its bottom end it is provided with openings that lead into the bowl. Preferably there is near its bottom end a chamber 9, the upper or ceiling surface of which is provided with a number of holes 10, through which liquid running down through the pipe 7 into the chamber 9 may escape upward into the interior of the bowl. Inside the cap, which is continued upward somewhat like a bottle-neck underneath the plug 8, is a chamber in which the lighter part of the liquid accu-

mulates when the heavier liquid gathers at the outer zone. There is an opening 11 through the plug, and through this opening the lighter liquid is forced upward and delivered into a chamber having a bottom 12, and from this it is delivered through spout 13 to any suitable receptacle. A funnel 14 rests above the cap, with the spout of the funnel leading into the plug in register with the tube 7. The funnel does not rotate, but is held fixed to the stationary part of the machine, and the stationary parts are all supported on the casing A or on one another above the casing A.

The baffle-plates placed in the bowl and substantially concentric are preferably made in two or more series and are preferably made from sheet metal or thin metal, each segment being made of a body part 17 and two wing parts 18 and 19, bent at angles such that the wing parts of two adjacent sections shall engage closely together, and a number of the sections properly engaged together will form a regular polygon.

That part which forms the side of the polygon (the part indicated at 17 in Fig. 2) is cut in slits that run across the face of a section, and at the cut the material on one side of the cut is bent and forced outward, giving to each part of the section which lies between two adjacent cuts a direction which is oblique to the original or general course of the surface of the section.

When the segments of one set of baffle-plates are assembled and the wing-pieces 18 and 19 fastened together, so that the wing-piece 18 of one engages the wing-piece 19^b of an adjacent section, the chamber produced is polygonal, with wings projecting radially.

A second set of baffle-plates, similarly made and of sufficient size to engage over the first, but otherwise similar in all respects, is placed outside the first polygonal structure, and the two sets of baffle-plates are inserted in the bowl and the wings of the outer polygonal structure engage closely against the sides of the bowl, and there are now formed in the bowl a number of chambers of substantially trapezoidal horizontal cross-sections, and there is communication through the wall from the center outward through the holes or slits that were cut in the sections, but which are each guarded by the obliquely-arranged portions of the metal, that has been forced outward in the way described. This causes the liquid in its travel outward under centrifugal force to travel downward in order to pass the obstruction, and the lighter material is caught or retained, while the heavier material, owing to its tendency to travel faster, passes outward and the separation is more complete than it would otherwise be. The heavier of the two liquids gathers in the outer series of chambers, and as it accumulates it passes out through the opening 3, through the opening

4, and through the spout 6. The lighter material rises and passes through the passage 11 into the receptacle having the bottom 12 and through the spout 13.

What I claim is—

1. In a centrifugal separating-machine, a baffle-plate composed of sheet metal provided with horizontal slits and with the metal between each pair of slits bent at an angle to the plane of the plate, substantially as described.

2. In a centrifugal separating-machine, a plurality of baffle-plates provided with wings bent to enable the baffle-plates to assemble in a regular polygonal form, and having each plate provided with horizontal slits and with the metal between each pair of slits bent at an angle to the plane of the plate, substantially as described.

3. In a centrifugal separating-machine, a plurality of baffle-plates arranged concentric and provided with passage-ways leading diagonally from above downward and from inside each plate through the plate to the outside thereof, substantially as described.

4. In a centrifugal separating-machine, the combination of a bowl, and means for feeding liquid therein, a set of baffle-plates arranged in polygonal form provided with wings and with horizontal slits between the wings and with the metal between the slits bent at an angle to the plane of the plate and with its lower edge projecting beyond the upper edge to produce a downward movement of the liquid passing therethrough, substantially as described.

5. In a centrifugal separating-machine, in combination with a bowl, a plurality of baffle-plates arranged in concentric order with chambers between said plates and with openings through the walls of said chambers, the metal between the openings being bent at an angle to the plane of the plate and having its lower edge extending radially outward farther than its upper edge, whereby it causes a downward flow of liquid passing through said openings, substantially as described.

6. In a centrifugal separating-machine, in combination with a bowl, a set of baffle-plates spaced from the outer wall by ribs running from the baffle-plates to the wall, and with openings through the baffle-plates, the metal between the openings being bent at an angle to the frame of the plate and having its lower edge extending outward farther than its upper edge, whereby it causes a downward flow of fluid passing through said openings, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

JOHN H. AYERS.

Witnesses:

F. B. HOLDER,
M. L. PAINE.