

Dec. 13, 1938.

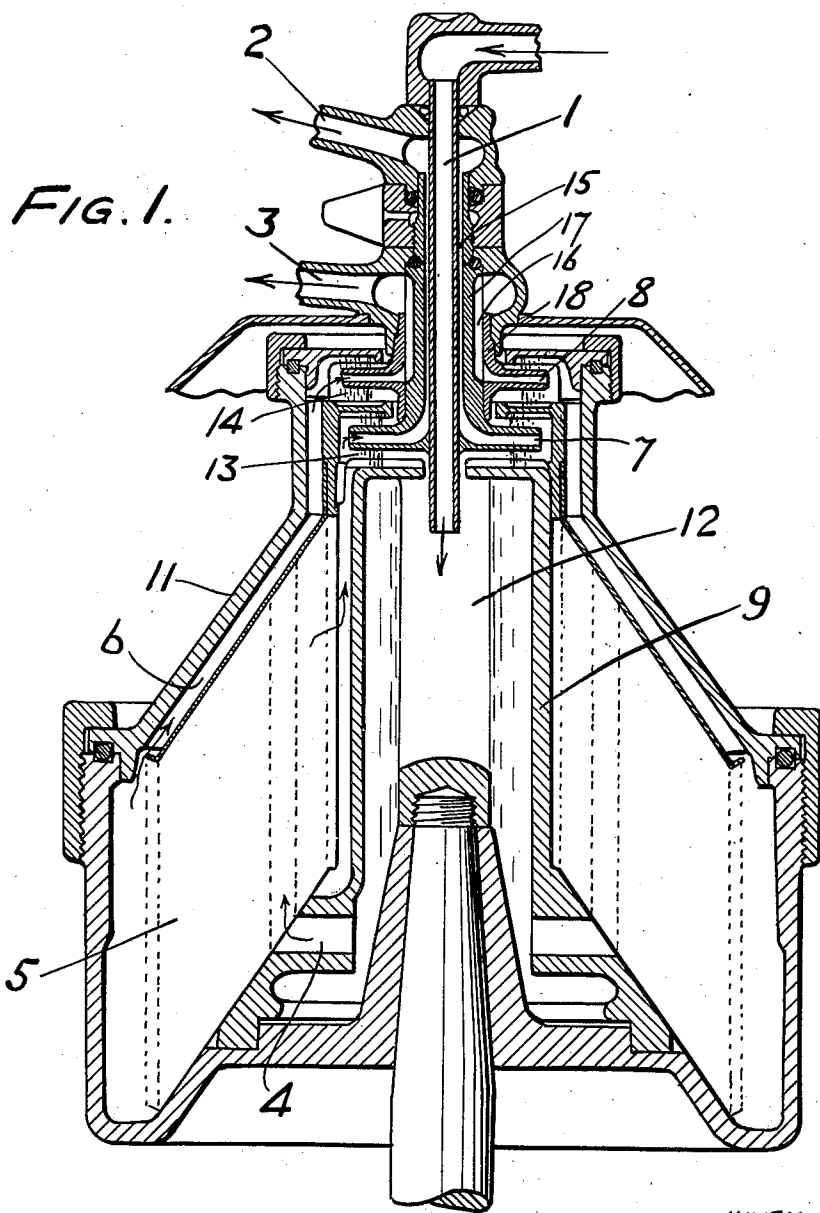
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CENTRIFUGAL SEPARATOR FOR THE SEPARATION OF LIQUIDS TENDING TO FORM FROTH

Filed Jan. 9, 1935

2 Sheets-Sheet 1



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WITNESS:

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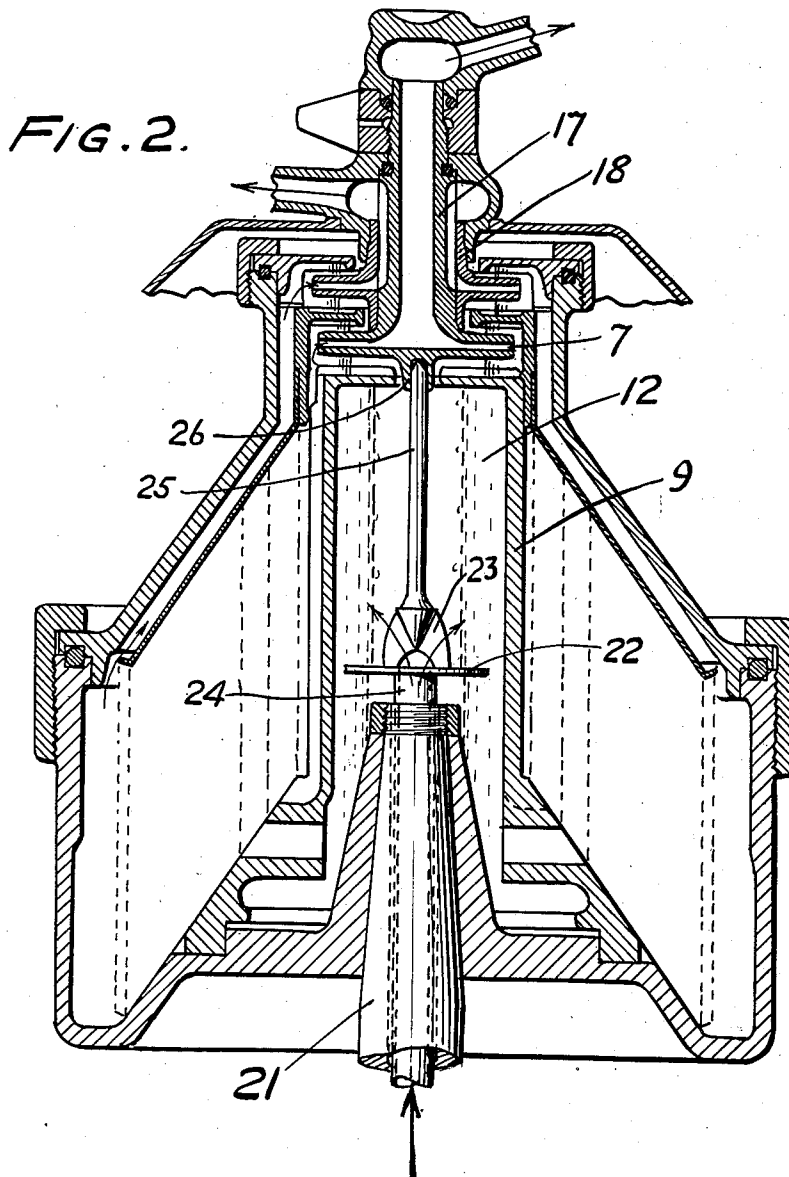
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UNITED STATES PATENT OFFICE

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CENTRIFUGAL SEPARATOR FOR THE SEPARATION OF LIQUIDS TENDING TO FORM FROTH

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Application January 9, 1935, Serial No. 976
In Sweden April 21, 1934

2 Claims. (Cl. 233—22)

The object of my invention is to provide a centrifugal separator especially designed for the separation of liquids which tend to produce froth.

According to the invention the supply of liquid to the bowl is so arranged that the liquid to be separated cannot absorb more than the limited quantity of air which is contained in the inlet chamber of the bowl for the liquid at the start of the separation. An essential feature of the invention is that the paring device and discharge chamber for the heavier separated liquid shall have a greater outward extension from the axis of the bowl than the paring device and discharge chamber for the lighter separated liquid, thereby effecting a generation of pressure in the paring device for the heavier separated liquid higher than that generated for the paring device of the lighter separated liquid. Two embodiments of the invention are disclosed in the accompanying drawings, in which—

Fig. 1 is a vertical sectional view of a centrifugal separator comprising one embodiment of the invention.

Fig. 2 is a similar view of a modification.

Referring first to Fig. 1: The liquid mixture to be separated is fed through a feed tube 1 into a central chamber 12 within the distributor 9, whence the liquid flows, through inlet holes 4, into the separating chamber 5 of the bowl. The heavier separated liquid flows out, through the channels 6 between the bowl hood 11 and the top disc, into a chamber 14 that rotates with the bowl. The lighter separated liquid flows toward the center of the separating chamber of the bowl and thence into a chamber 13 that rotates with the bowl. Stationary skimming devices 7 and 8 (preferably constructed similarly to turbine wheels and presenting, except for the inlet ends of the channels receiving the separated liquid, a continuous periphery) extend into the chambers 13 and 14 respectively. The liquid receiving channels in these skimming devices communicate with channels 15 and 16 formed respectively between the feed tube 1 and a stationary tubular element 17 and between stationary tubular elements 17 and 18. Channels 15 and 16 communicate respectively with outlet pipes 2 and 3.

The skimming wheels 7 and 8 extend radially beyond the free level of liquid in the chambers and act as liquid seals. The levels of the liquid in chambers 13 and 14 are determined by the counterpressures in the outlets 2 and 3. It is necessary to keep the cylindric liquid levels in chambers 13 and 14 at a safe distance from the inlets of the skimming wheels in order to avoid supply

of air to and formation of froth in the skimming wheels.

In Fig. 2 the construction is the same as in Fig. 1 except that no feed tube extends through the tubular element 17. Instead, the liquid to be separated is fed to the separating chamber of the bowl through a stationary tube 24 extending through a hollow spindle 21. At the upper end of the tube 24 and integral therewith is an annular sealing plate 22 having attached to its upper side two or more wings 23 that join with a stem 25 which, by entering a socket 26 in the under side of the skimmer 7, centralizes and guides the upper end of the tube. The plate 22 is of sufficient size to penetrate the zone of liquid and prevent air from the space between the tube and the spindle entering the space, above the plate, where the entering liquid is so agitated that it would take up much air. In the space below the plate the liquid is rotating so smoothly that it has no tendency to take in air.

In both Figs. 1 and 2 the upper paring device and discharge chamber for the heavier separated liquid have a greater outward extension than the lower paring device and discharge chamber for the lighter separated liquid, thereby effecting a generation of pressure for the heavier separated liquid higher than that generated in the paring device for the lighter separated liquid.

What I claim and desire to protect by Letters Patent is:

1. A high speed centrifugal separator for the separation of a mixture of liquids of different specific gravities, which comprises a rotary bowl having an upstanding neck and a top disc in the bowl having an upstanding neck spaced from the bowl neck and providing between them a passage communicating with the peripheral zone of the bowl, upper and lower rotary discharge chambers and stationary disc-like paring devices, one in each discharge chamber, the lower discharge chamber communicating with the space in the bowl at the inner side of the top disc, the neck of the top disc forming the outer wall of the lower discharge chamber, the upper discharge chamber extending outward beyond the lower discharge chamber and beyond the top of the neck on the top disc and communicating with said passage and the upper paring device extending outward beyond the lower one, said greater outward extension of the upper discharge chamber and paring device effecting a generation of pressure in the paring device for the heavier separated liquid higher than that generated in the paring device for the lighter separated liquid.

2. A high speed centrifugal separator for the separation of a mixture of liquids of different specific gravities, which comprises a rotary bowl providing a separating chamber, two discharge
5 chambers arranged one above the other and rotating with the bowl and communicating respectively with the peripheral and inner portions of the separating chamber of the bowl and adapted to receive respectively heavier and lighter
10 separated liquids, two stationary paring devices projecting into the respective discharge chambers, two stationary discharge channels communi-

cating respectively with the two paring devices, the paring device and the discharge chamber for the heavier separated liquid having a substantially greater diametrical extension beyond the bowl
5 axis than the paring device and discharge chamber for the lighter separated liquid so that the pressure generated in the paring device for the lighter separated liquid is lower than that generated in the paring device for the heavier separated liquid.

NORE EINAR BERGNER.