

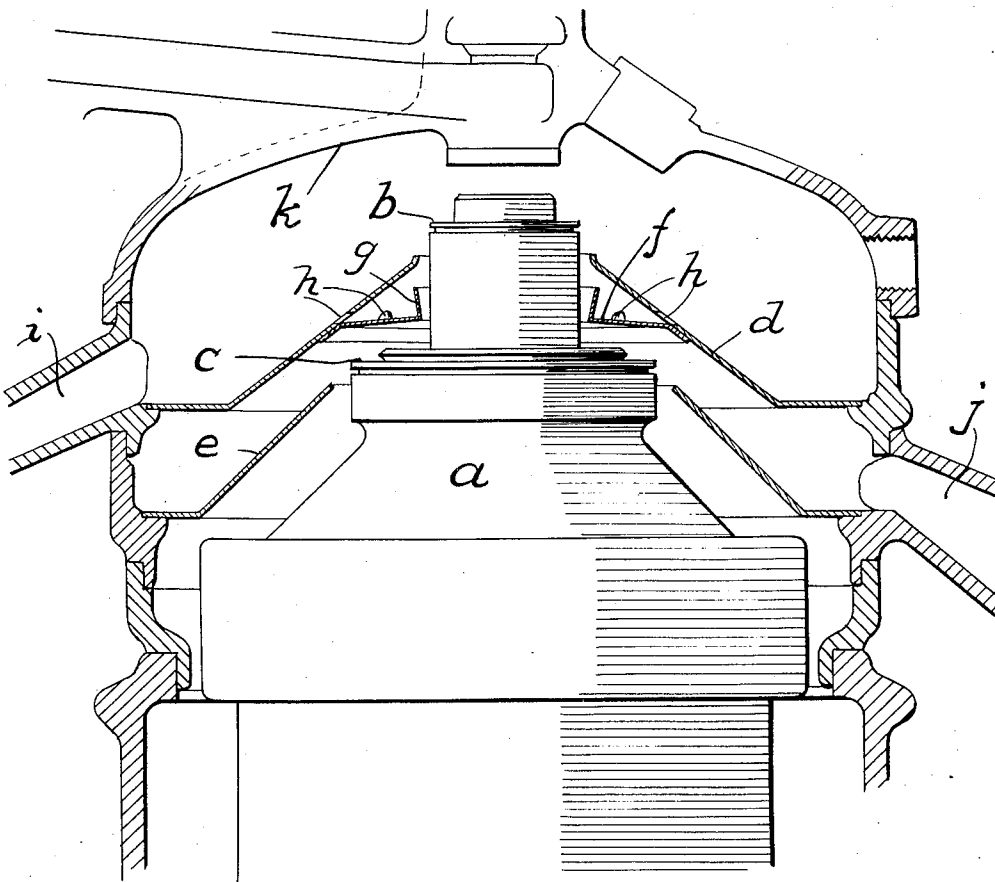
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G. J. STREZYNSKI

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COLLECTING CHAMBER FOR LIQUIDS DISCHARGED FROM CENTRIFUGAL BOWLS

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WITNESS:

Robt. R. Mitchell

INVENTOR

George J. Strezynski

BY

Russell & Harding
ATTORNEY.

UNITED STATES PATENT OFFICE

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COLLECTING CHAMBER FOR LIQUIDS DISCHARGED FROM CENTRIFUGAL BOWLS

George J. Strezynski, Poughkeepsie, N. Y., assignor to The De Laval Separator Company, New York, N. Y., a corporation of New Jersey

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10 Claims. (Cl. 233—46)

My invention is an improvement in collecting chambers, commonly called covers, for the liquid discharged from centrifugal bowls.

The object of my invention is to prevent the escape of lighter liquid from its chamber into the chamber for the heavier liquid. Such escape is sometimes caused by air currents resulting from the rapid rotation of the bowl or from the injector action of the discharged heavy liquid, or ordinary spray from the upper cover.

I have found that by tightly securing, below the main dividing wall, commonly called a hopper, a secondary or supplemental hopper with an upturned flange around the center hole and openings from above its outer edge through the main hopper I can collect and discharge into its main chamber all light liquid that may escape over the inner edge of the main hopper.

The accompanying drawing is a vertical sectional view of the upper part of a centrifugal separator bowl and of the collecting chambers associated therewith and with one preferred embodiment of my invention applied thereto.

The upper part *a* of a centrifugal bowl has a discharge for light liquid at *b* and a discharge for heavy liquid at *c*. *d* is the usual hopper to catch the light liquid and *e* the one for heavy liquid. Below the hopper *d* and tightly secured thereto is a secondary hopper *f* having at its inner edge an upwardly extending ring *g* which may be of a slightly larger diameter at the top than at the bottom. Just above the outer edge of the secondary hopper *f* there is a series of holes *h* through the main hopper that provide communication between the space between the two hoppers and that above the main hopper. *i* is the discharge spout for light liquid and *j* the one for heavy liquid. *k* is the top cover.

When in operation heavy liquid is discharged from the bowl at *c* into the space above the bottom hopper *e* and escapes through the spout *j*. Light liquid is discharged from *b* into the space above the upper hopper *d* and, by striking the under side of the top cover *k*, is partly broken up into a fine mist, some of which occasionally passes downward between the inner edge of the hopper *d* and the bowl neck and mingles with the heavy liquid. This downward passage of mist is due to a downward current of air caused by fan action of the larger diameter bowl parts and by injector action of large quantities of heavy liquid.

With my improved covers the holes *h* supply, to the space between the ordinary hopper *d* and the secondary hopper *f*, air to feed a downward

current between the inner edge of *f* and the bowl neck and a slight upward current induced between the inner edge of *d* and the bowl neck by the injector action of the discharging light liquid. They also permit the escape of any liquid that may be caught above the secondary hopper to the space above the upper hopper, while the upturned ring *g* prevents the escape of such liquid to the lower chamber.

Where the word "air" is used in the claims, it is intended to include not only air but any other gas that it may be desirable to substitute for air.

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

1. In a centrifugal machine, the combination with a centrifugal bowl having outlets for light and heavy liquids respectively, an upper hopper providing above it a chamber to catch light liquid and a lower hopper providing above it a chamber to catch heavy liquid, both of said hoppers having clearance from the bowl neck, of a supplemental hopper at the under side of the upper hopper and forming a chamber intermediate between the light liquid and heavy liquid chambers, and having its lowermost portion at a higher level than that of the lowermost portion of the upper chamber, and a passage adapted to drain all liquid from the intermediate chamber into the upper chamber and to permit flow of air in the reverse direction at a point other than the aforementioned clearance.

2. In a centrifugal machine, the combination with a bowl having outlets for light and heavy liquids respectively, and hoppers forming an upper receiving chamber for light liquid and a lower receiving chamber for heavy liquid, there being clearance between the inner edges of said hoppers and the bowl, of an intermediate chamber having its lowermost portion at a higher level than that of the lowermost portion of the upper chamber, and a passage, other than at the aforesaid clearances, for flow of air from said light liquid receiving chamber to said intermediate chamber and flow of liquid in the reverse direction.

3. In a centrifugal machine, the combination with a bowl having an upper outlet for light liquid and a lower outlet for heavier liquid, and a primary hopper, with clearance from the bowl neck, forming the lower side of a receiving chamber for light liquid, of a secondary hopper, fluid-tightly secured to the under side of said primary hopper and provided with an upturned ring at its inner edge and forming a secondary chamber having its lowermost portion at a higher level

- than that of the lowermost portion of the primary hopper, there being openings for interchange of fluids between said two aforementioned chambers other than through the aforementioned clearance.
4. In a centrifugal machine, the combination with a bowl having outlets for light liquid and heavy liquid respectively, an upper receiving chamber for light liquid and a lower receiving chamber for heavy liquid, of an intermediate chamber having its lowermost portion at a higher level than that of the lowermost portion of the upper chamber and an opening between the upper and intermediate chambers other than that between the inner edges of the chamber dividing walls and the bowl, said opening allowing flow of air from the upper chamber to the intermediate chamber and flow of liquid from the lowermost portion of the intermediate chamber to the upper chamber.
5. In a centrifugal machine, the combination with a centrifugal bowl and a primary hopper having clearance from the bowl neck, of a secondary hopper secured to the under side of the primary hopper along a circle intermediate between the inner and outer edges thereof and also having clearance from the bowl neck and provided with an upturned ring above its inner edge, a passage adapted to permit flow of liquid downward from the secondary hopper into the primary hopper and flow of air in the opposite direction.
6. The combination with a centrifugal bowl and a primary hopper having clearance from the bowl neck, of a secondary hopper secured to the under side of the primary hopper and means, above the normal level of liquid in the primary hopper, to drain liquid thereto from the secondary hopper.
7. The combination with a centrifugal bowl and a primary frusto-conical hopper having clearance between its inner edge and the bowl neck, of a secondary hopper secured to the underside of the primary hopper along a circle between the inner and outer edges thereof and extending therefrom inward toward and spaced from the bowl neck, the primary hopper having orifices located above and adjacent to the outer secured edge of the secondary hopper.
8. In a centrifugal machine, the combination with a revoluble bowl having light liquid and heavy liquid discharge outlets and stationary liquid receiving chambers surrounding the respective outlets, and a third chamber between the first mentioned chambers having its lowermost portion at a higher level than that of the lowermost portion of the light liquid receiving chamber and communicating, at both its inner and outer ends, with the light liquid discharge chamber.
9. The combination with a centrifugal bowl having discharge outlets for light separated liquid and heavy separated liquids respectively, of three surrounding stationary hoppers, the inner edges of the upper two of which are positioned between said discharge outlets, the inner edge of the other and lowest of which is positioned below said heavy liquid discharge outlet, all three hoppers having at their inner edges clearances from the bowl neck, the intermediate hopper being otherwise closed from communication with the lowest hopper but having passages communicating with the upper hopper at a substantial distance outwardly from the clearance between the upper hopper and the bowl neck and adapted to drain liquid from the intermediate hopper into the upper hopper.
10. In a centrifugal machine, the combination with a centrifugal bowl having outlets for light and heavy liquids respectively, a light liquid discharge contrivance comprising an upper hopper providing above it a chamber to catch light liquid and a heavy liquid discharge contrivance comprising a lower hopper providing above it a chamber to catch heavy liquid, both of said hoppers having clearance with respect to the outer wall of the bowl, of a supplemental hopper at the under side of the upper hopper and forming a chamber intermediate between the light liquid and heavy liquid chambers, and a passage, independent of the clearance between the upper hopper and the bowl wall, leading from the intermediate chamber, at a level substantially below the level of the inner edge of the supplemental hopper, to the light liquid discharge contrivance and adapted to drain liquid from the intermediate chamber to the light liquid discharge contrivance.

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