

(No Model.)

R. C. HANSEN & M. H. BRUNN.

CENTRIFUGAL CREAMER.

No. 356,466.

Patented Jan. 25, 1887.

Fig. 1.

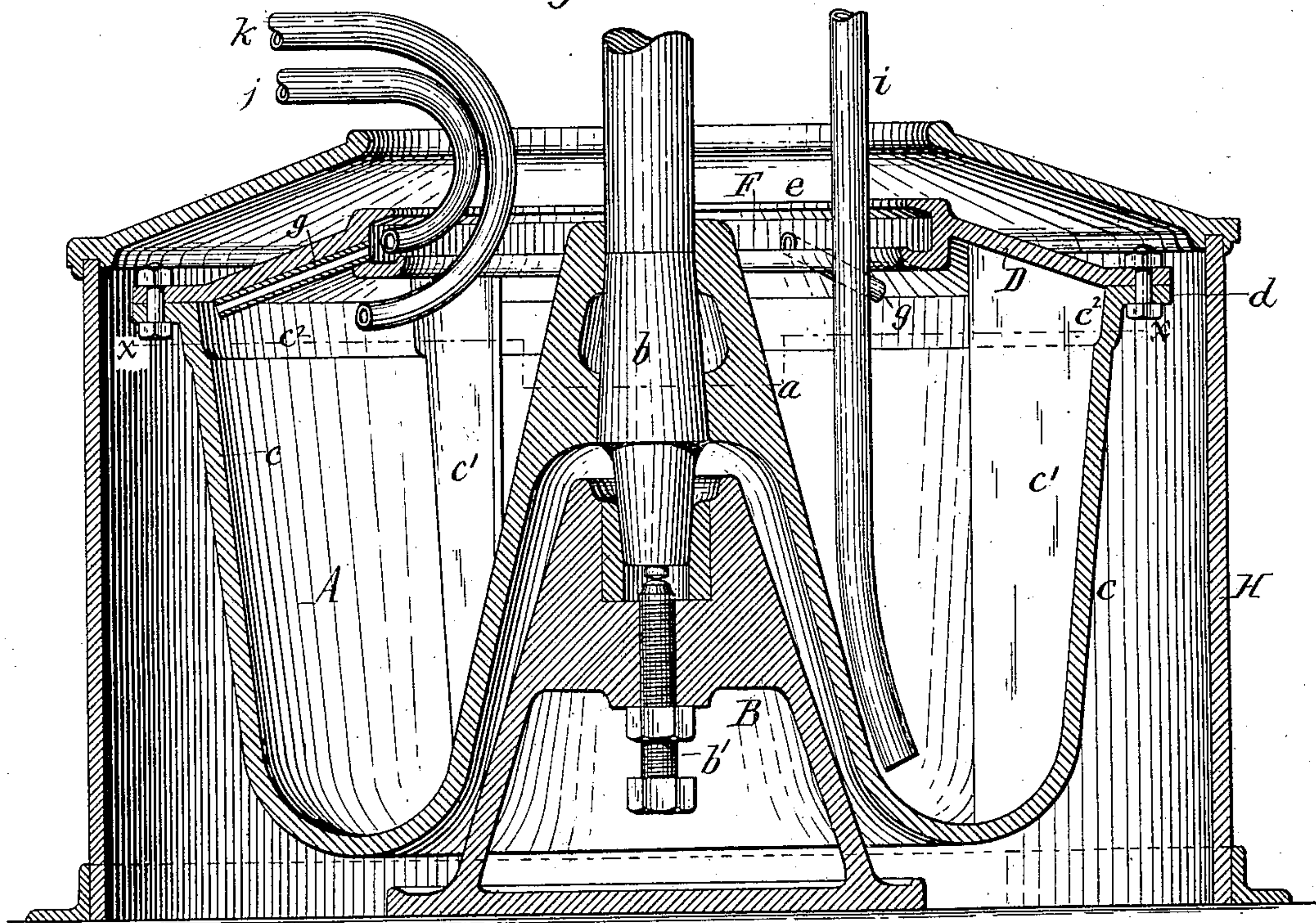
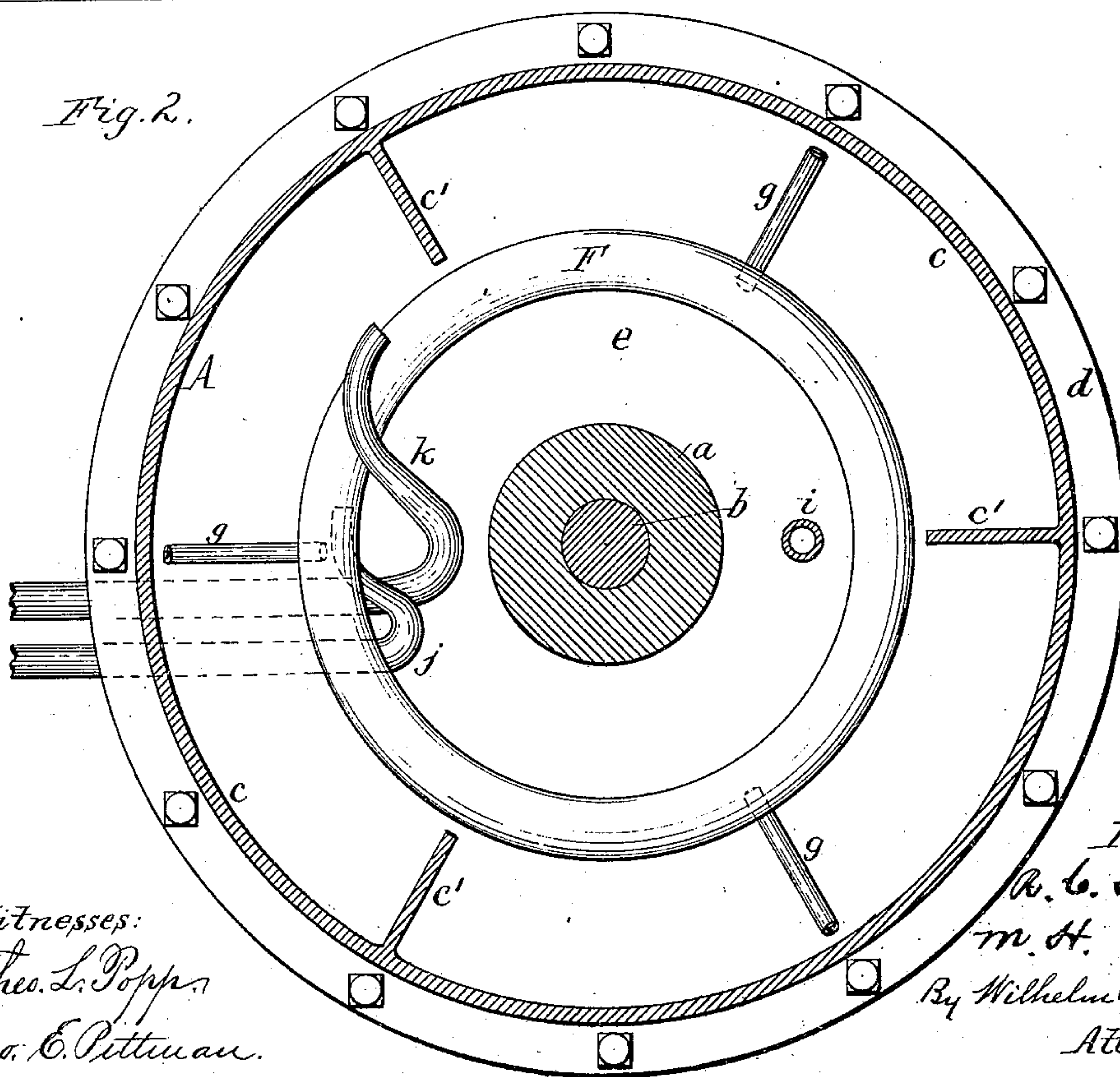


Fig. 2.



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UNITED STATES PATENT OFFICE.

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CENTRIFUGAL CREAMER.

SPECIFICATION forming part of Letters Patent No. 356,466, dated January 25, 1887.

Application filed May 14, 1884. Serial No. 131,509. (No model.) Patented in Denmark May 8, 1882, No. 684; in Belgium October 31, 1882, No. 59,253; in France December 14, 1882, No. 151,509, and in Sweden August 16, 1883.

To all whom it may concern:

Be it known that we, RASMUS CLAUSEN HANSEN and MORTEN HANSEN BRUNN, subjects of the King of Denmark, residing, respectively, at Uppersleik and Horsleik, Lolland county, Denmark, have invented a new and useful Improvement in Centrifugal Creamers, (for which we have obtained patents in Denmark, bearing date the 8th day of May, 1882, No. 684; France, December 14, 1882, No. 151,509; Belgium, October 31, 1882, No. 59,253, and in Sweden August 16, 1883,) of which the following is a specification.

This invention relates to an improvement in that class of centrifugal separators in which an imperforate revolving drum or separating-vessel is employed for separating a compound liquid into its constituent liquids of different gravities or densities.

The object of this invention is to simplify the construction of those parts of the separating-drum by which the denser liquid, which is forced by the centrifugal force against the peripheral wall of the drum, is discharged from the latter.

Our invention consists to that end of the improvements which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical section of our improved separator. Fig. 2 is a horizontal section in line $x x$, Fig. 1, looking upward.

Like letters of reference refer to like parts in the several figures.

A represents the revolving separating-drum or vessel, provided with a hub, a , by which it is secured to the vertical spindle b . The latter is supported in a step-bearing, B, provided with an adjustable screw-step, b' , upon which the lower end of the spindle rests.

c represents the outer imperforate wall of the drum A, provided on its inner side with upright blades or wings c' , by which the liquid contained in the drum is compelled to revolve with the same.

D represents the annular cover or top flange, secured to the upper end of the drum A by

means of bolts or screws passing through the cover D and a flange, d , formed on the upper end of the drum. The cover D extends from the outer wall of the drum toward the axis thereof, and is provided with a central opening or eye, e , which surrounds the spindle.

F represents an annular chamber or trough formed at the inner edge of the cover D, around the eye e thereof. The chamber F is made U-shaped in cross-section, and is turned with its open side toward the axis of rotation, while its upper, outer, and lower sides are closed.

g represents a number of pipes, which are inserted in openings formed in the outer wall of the chamber F, and which extend toward and terminate near the outer wall of the drum A, so as to receive at their outer ends the liquid, which is driven by the centrifugal force upwardly along the outer wall of the drum A toward the cover D. This liquid is conducted by the pipes g into the annular chamber F.

The outer wall, c , of the drum A is made slightly flaring upwardly to increase the tendency of the liquid to flow upwardly toward the cover D. The outer wall, c , is provided, underneath the cover D, with an annular depression or groove, c'' , in which the solid impurities collect, and which permits the outer ends of the pipes g to be placed in line with the inner surface of the outer wall of the drum, thereby enabling these pipes to intercept the outermost layer of the densest liquid.

H represents a stationary casing or curb which incloses the drum A.

i represents the pipe through which the full milk or other liquid to be separated is fed into the drum A.

j represents a stationary discharge-pipe having its mouth arranged in the annular chamber F in such manner that the liquid contained in said chamber is driven by the rotation of the drum into the mouth of the pipe j .

K represents a stationary discharge-pipe having its inner end or mouth arranged in the drum below the annular chamber F, in such a position that the layer of light liquid which accumulates nearer the axis of rotation upon

the outer layer of dense liquid is driven into the mouth of the pipe *k* by the rotation of the drum.

If the machine is employed for creaming milk, the full milk enters the drum through the pipe *i* and the cream is separated from the skim-milk by the centrifugal force, the skim-milk being driven upwardly along the outer wall, *c*, of the drum, while the cream collects on the inner side of the annular layer of skim-milk near the axis of the drum. The skim-milk enters the pipes *g*, by which it is conducted to the annular trough *F*, from which the skim-milk is removed by the pipe *j*. The cream enters the pipe *k*, whereby it is removed from the drum.

The annular trough *F* can be cast on the cover *D*, and the pipes *g* can be secured in place by brazing or screw-threads, thereby simplifying the discharge apparatus materially and reducing the cost of the machine. Upon removing the cover *D* the interior of the drum *A* and the under side of the cover *D* can be easily and thoroughly cleaned.

We are aware that an annular trough in the eye of the separating-drum and a discharge-pipe opening into this annular trough for the removal of the liquid therefrom are not new, and that a pipe extending from an annular chamber toward the periphery of the separating-drum for the discharge of the heavy liquid is also old, and we do not claim either of these constructions, separately or broadly.

We claim as our invention—

1. In a centrifugal separator, the combination, with the rotating vessel *A*, made open at the top, of a cover, *D*, secured to the open top

of the vessel *A*, and provided at its eye with the annular chamber *F*, trough-shaped in cross-section and arranged with its open side toward the axis of rotation, and a pipe, *g*, extending from the outer wall of the chamber *F* along the under side of the cover *D*, and terminating near the outer wall of the vessel *A*, whereby the heavy liquid is conducted from the periphery of the vessel *A* into the chamber *F*, substantially as set forth.

2. In a centrifugal separator, the combination, with the rotating vessel *A*, of a cover, *D*, provided at its eye with the annular chamber *F*, trough-shaped in cross-section and arranged with its open side toward the axis of rotation, a pipe, *g*, extending from the outer wall of the chamber *F* along the under side of the cover *D*, and terminating near the outer wall of the vessel *A*, whereby the heavy liquid is conducted from the periphery of the rotating vessel into the chamber *F*, and a stationary discharge pipe or conduit, *j*, projecting into the chamber *F*, whereby the liquid is removed from said chamber, substantially as set forth.

3. The combination, with the drum *A*, having an internal annular depression, *c*², of a cover, *D*, provided with an annular chamber, *F*, and a pipe, *g*, extending from the chamber *F* toward the depression *c*², substantially as set forth.

Witness our hands this 7th day of April, 1884.

RASMUS CLAUSEN HANSEN.
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Witnesses:

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