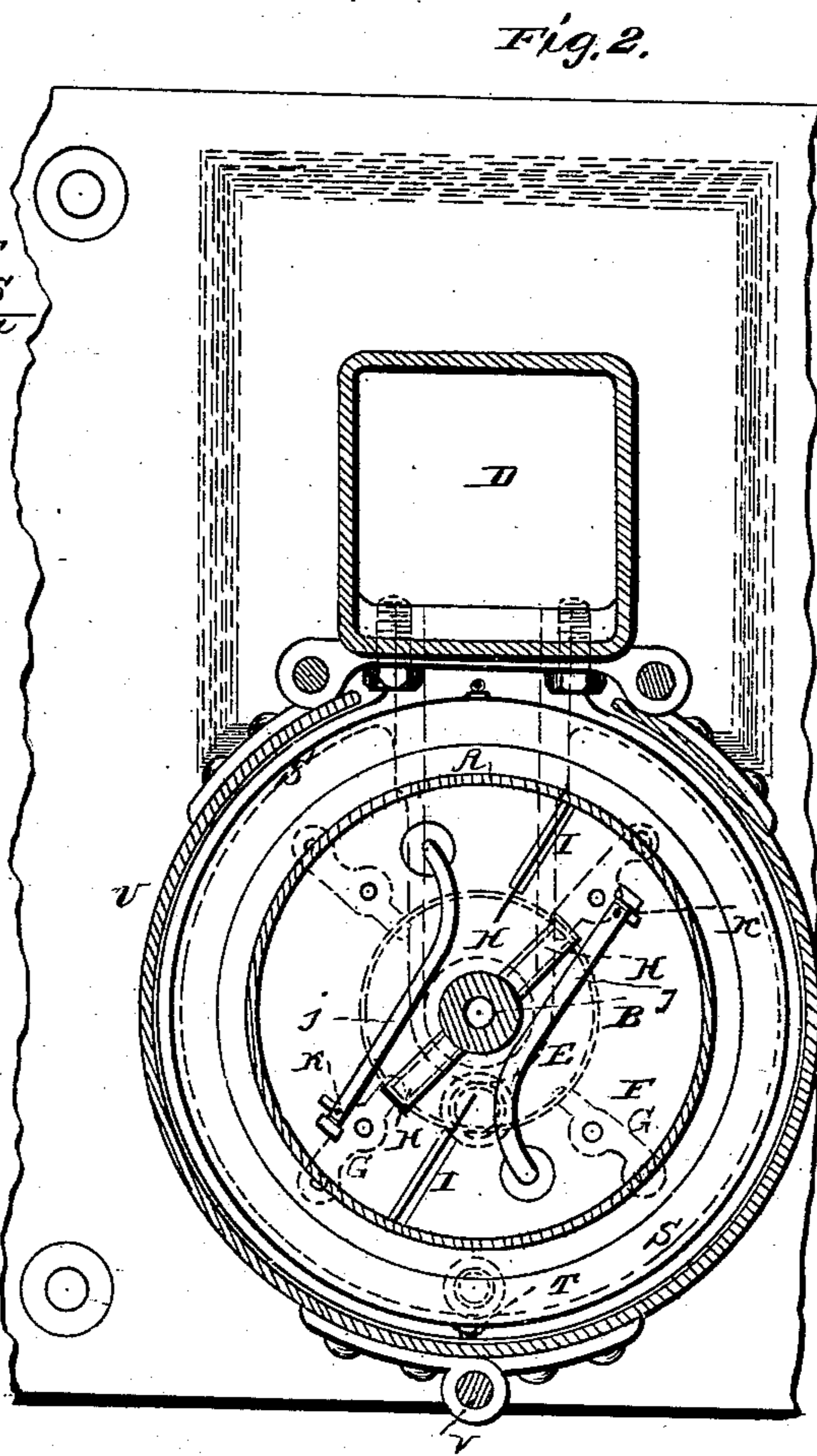
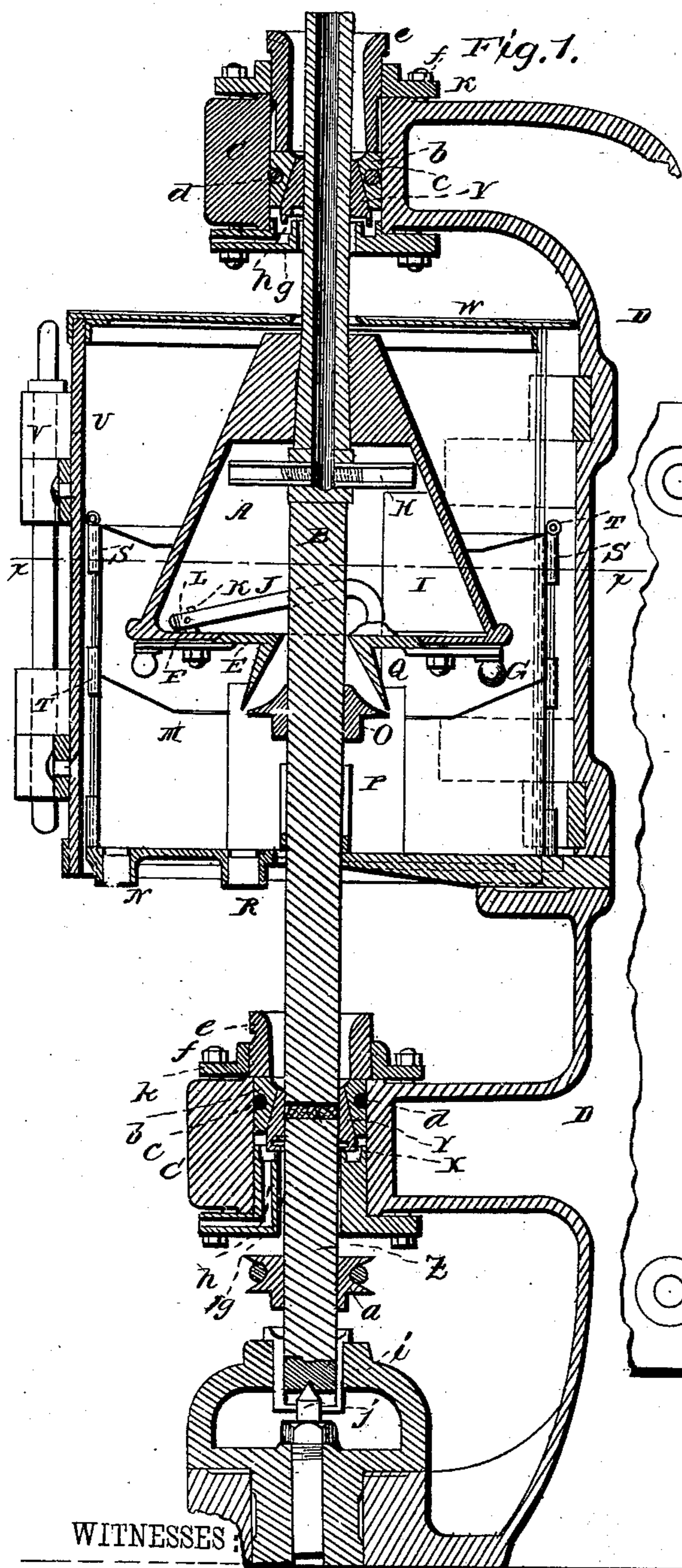


(No Model.)

O. S. ANDERSEN & T. T. A. HANSEN.  
CENTRIFUGAL MACHINE.

No. 272,185.

Patented Feb. 13, 1883.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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DENMARK.

## CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 272,185, dated February 13, 1883.

Application filed November 25, 1882. (No model.)

*To all whom it may concern:*

Be it known that we, OLUF SIGURD ANDERSEN and THORVALD TAGE AGATHON HANSEN, subjects of the King of Denmark, residing at Copenhagen, Kingdom of Denmark, have invented certain new and useful Improvements in Centrifugal Machines; and we 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a vertical sectional view of our improved centrifugal machine, and Fig. 2 is a horizontal sectional view of the same on line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts in both the figures.

Our invention has relation to centrifugal machines for separating the heavier and lighter parts of fluids; and it consists in the improved construction, combination, and arrangement of parts of the same, as hereinafter more fully described and claimed.

In the accompanying drawings, the letter A represents a receiver, which may be spherical, conical, or cylindrical, as desired, and is fastened to and revolves with the hollow shaft B, which turns in bearings C in the frame D.

The bottom E of the receiver is removable, and is held in place, its beveled edges bearing against the beveled edges of the bottom flange, F, by the pivoted arms G.

The shaft B, upon which the receiver is fastened, is hollow at its upper part till where it enters the receiver, where it opens out into the same by two or more short tubes, H. The fluid to be treated enters the receiver through this shaft from a suitable receptacle above.

Inside the receiver, and fastened to the sides of the same, are partitions I, corresponding in number to the inlet-tubes, and extending about half-way into the receiver. These partitions serve to force the fluid to rotate with the receiver, so that the heavier and lighter parts may be separated.

To the bottom flange are fastened two or more bent tubes, J, which pass through it,

while their inner ends are fastened to the bolt on flange near the sides by means of clamps K. The ends of these tubes are closed; but near the ends, in the sides of the tubes, are small apertures L, which admit the heavier parts of the fluid, which are forced out toward the sides, to flow out through the tubes and into an annular vessel, M, from which it is discharged through an opening, N.

The bottom E has a downward-projecting funnel-shaped flange, Q, which, with a flaring collar, O, fastened to the shaft, forms an annular nozzle, through which the lighter parts of the fluid, which collect near the center, flow out into an annular vessel, P, which stands immediately around the shaft, and has an opening, R, at its bottom, through which the contents may be removed.

It is preferable to divide the vessels M and P diametrically, so that the two halves may be removed, while the corresponding halves of vessels M and P may be made in one only, separated by a cylindrical partition. The two halves of the vessels are held together by hoops S, having pintle-hinges T, by which they may be opened and closed.

To prevent any accident or interference while the machine is in motion, the receiver and the vessels M and P are surrounded by a drum, U, of heavy sheet metal, hinged to the frame D and closed in front by eyes and pintles V, while the top is covered with a head, W.

The lower part of the shaft B rests upon a friction-disk, X, of wood or other suitable material, which is fastened in a conical collar, Y, fastened upon the lower shaft, Z. By this friction-disk the motion from the lower shaft, Z, which is rotated by the drive-pulley *a*, is communicated to the upper shaft, B, and the shaft and receiver are started gradually, and will stop gradually, although the lower shaft may be started or stopped suddenly.

The conical collar Y turns in an inverted conical box, *b*, the outside of which is recessed at *c* for the reception of a rubber packing-ring, *d*, which ring allows the shaft and box sufficient play. The upper end of the box *b* is held in place by a ring, *e*, the outside of which is screw-threaded, and fits in a screw-threaded flange, *k*, which is fastened to the bearing C by means of screw-bolts *f*. The inside of the

ring *e* forms a cup for the application of lubricating material, which is caught up by an annular recess in a lower flanged sleeve, *g*, which is bolted to bearing *C*, and supports the lower part of the conical collar *Y*, and is carried out through a duct, *h*. The upper bearing is of the same construction as the lower, and the lower shaft, *Z*, is turning in a lower bearing, *i*, having an adjustable steel point, *j*, upon which turns the steeled end of the shaft.

Having thus described our invention, we claim and desire to secure by Letters Patent of the United States—

1. In a centrifugal machine for separating liquids, the receiver *A*, mounted upon shaft *B*, and having beveled bottom flange, *F*, and removable bottom *E*, having beveled edge and discharge-nozzle *Q*, and held in place by pivoted arms *G*, substantially as shown and set forth.

2. In a centrifugal machine for separating liquids, the receiver *A*, having bottom flange, *F*, removable bottom *E*, having flange *Q*, inlet-tubes *H*, partitions *I*, outlet-tubes *J*, closed at their ends, and having side apertures, *L*, and pivoted arms *G*, substantially as shown and set forth.

3. In a centrifugal machine for separating liquids, the combination of the receiver *A*, having removable bottom *E*, having funnel-shaped flange *Q*, partitions *I*, and tubes *J*, with the shaft *B*, hollow at its upper part, and having tubes *H* and flaring collar *O*, substantially as shown and set forth.

4. In a centrifugal machine for separating fluids, the combination of the receiver *A*, having curved outlet-tubes *J* and flaring nozzle *Q*, and the shaft *B*, having flaring collar *O*, with the annular vessels *M* and *P*, having outlets *N* and *R*, substantially as shown and set forth.

5. The combination of the shaft *B*, having conical collar *Y*, with the bearing, consisting of ring *b*, having recess *c*, provided with rubber packing-ring *d*, screw-threaded ring *e*, forming a lubricator-cup, flange *K*, fastened by screw-bolts *f*, and flanged sleeve *g*, forming an annular recess, which has outlet-duct *h*, substantially as shown and set forth.

6. The centrifugal machine for separating fluids, consisting of the receiver *A*, shaft *B*, turning in bearings *C* in the frame *D*, annular vessels *M* and *P*, having hoops *S* and pintle-hinges *T*, and drum *U*, having head *W*, and eyes and bolts *V*, all constructed and combined to operate substantially as and for the purpose shown and set forth.

In testimony whereof, and that we claim the foregoing as our own invention, we have hereto affixed our signatures in presence of two witnesses.

OLUF SIGURD ANDERSEN.  
THORVALD TAGE AGATHON HANSEN.

Witnesses:

M. OTTERSTROM,  
VIGGO C. EBERTH.