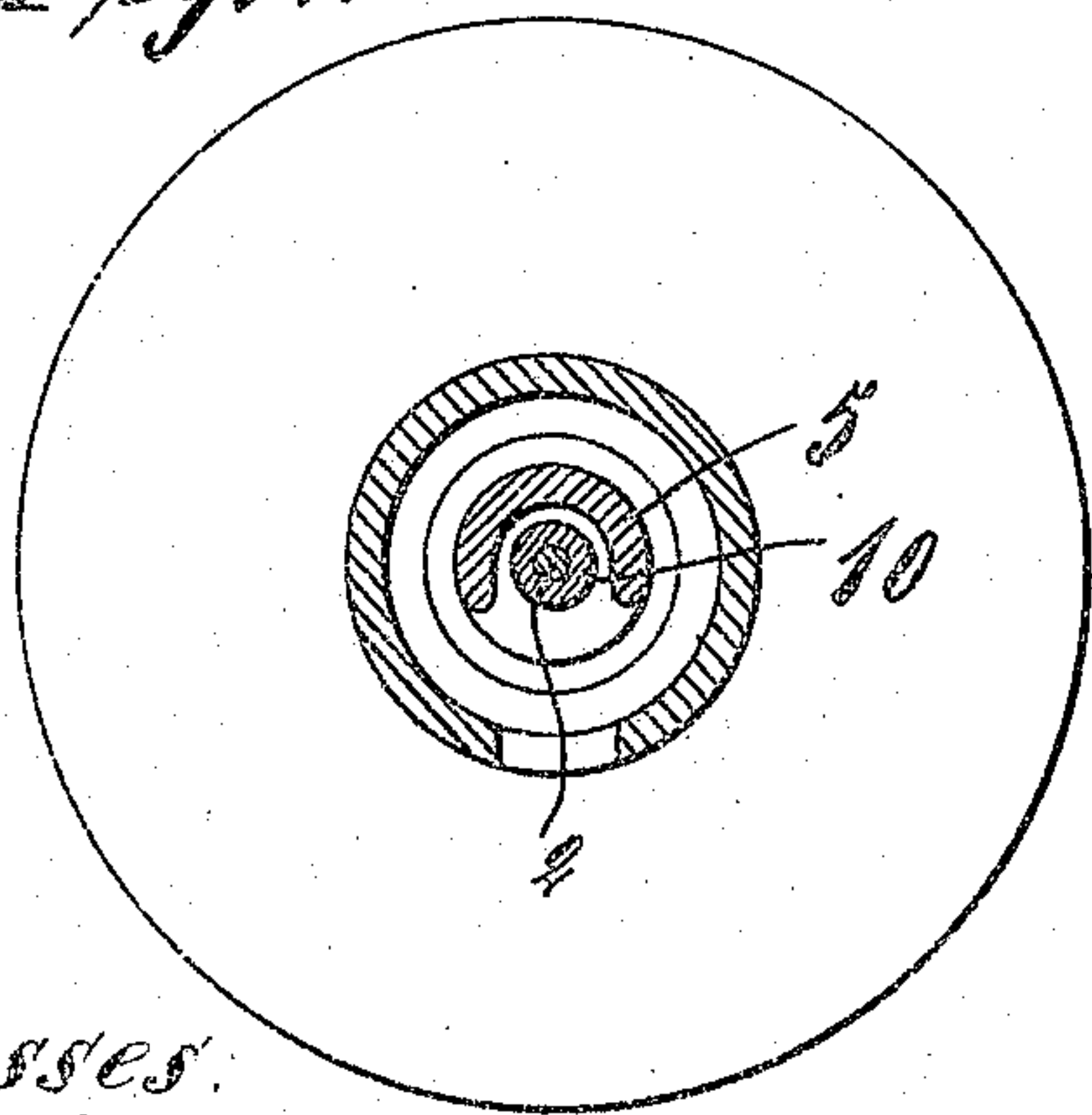
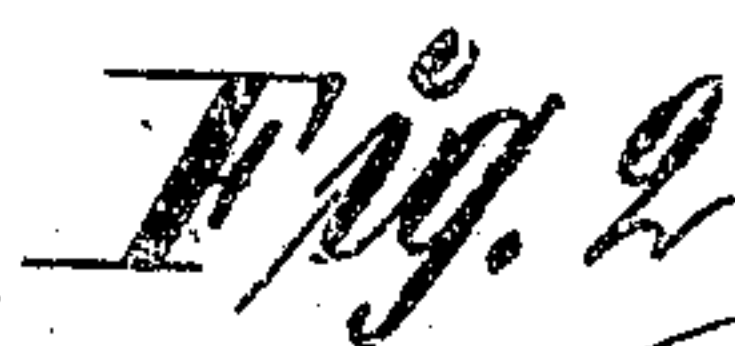
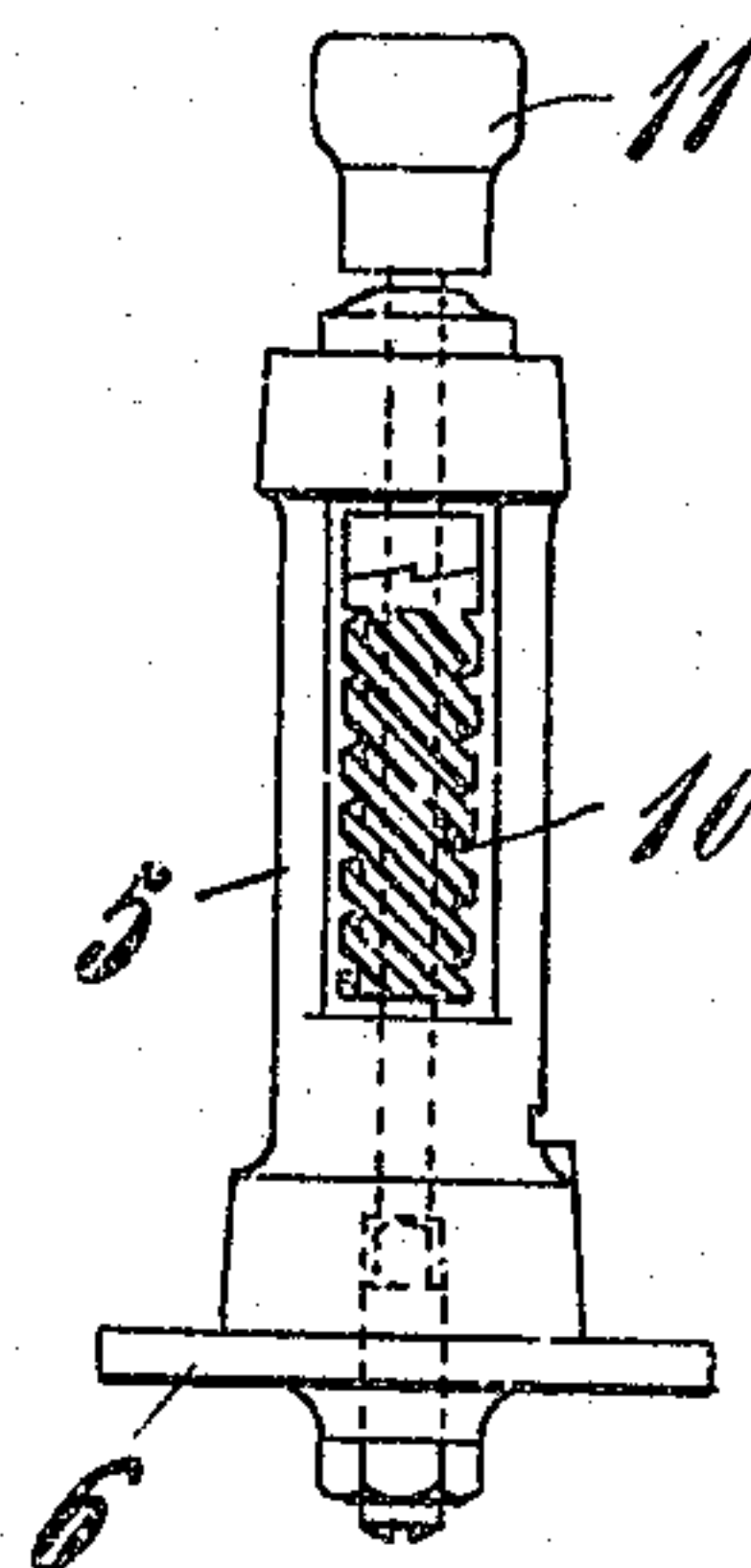


930,760.

Patented Aug. 10, 1909.



F. H. Kline

*[Handwritten signature]*

Carl Alrik Hult  
Oscar Walfred Hult

by Henry Connors  
Attorney



# UNITED STATES PATENT OFFICE.

CARL ALRIK HULT AND OSCAR WALFRID HULT, OF STOCKHOLM, SWEDEN.

## BEARING FOR SHAFTS ROTATING WITH GREAT SPEED.

No. 930,760.

Specification of Letters Patent.

Patented Aug. 10, 1909.

Application filed January 10, 1907. Serial No. 351,674.

*To all whom it may concern:*

Be it known that we, CARL ALRIK HULT and OSCAR WALFRID HULT, subjects of the King of Sweden, and residents of Stockholm, in the Kingdom of Sweden, have invented certain new and useful Improvements in Bearings for Shafts Rotating with Great Speed, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to bearings for shafts rotating with great speed especially the shafts of centrifugal liquid separators.

In order that it may be possible to impart to the drum or bowl of centrifugal liquid separators a great rotary velocity, the said drum, usually, is journaled in the frame in such manner, that it hangs freely in the same or is supported by a vertical shaft. In the case last mentioned the shaft or spindle is usually divided transversely into two parts, the lower one journaled in the frame in a stationary manner, the worm-wheel, pinion, etc. of the motion transmitting device always engaging the said shaft part, while the top shaft part, connected with the drum or bowl, loosely rests on the bottom part but engages the same in such manner that it is compelled to partake in the rotation of the bottom part.

According to this invention the bottom shaft part is journaled in such manner that it can easily be detached, which is necessary, for the reason that the bottom shaft part or spindle part, which, at the same time as it has a great rotary velocity, is subjected to a lateral pressure from the driving mechanism, engaging the same, and causes a great wear and tear of the journal boxes, so that the latter will very soon get an oval form inside. For that reason it has been necessary to make the said boxes exchangeable, generally in the shape of conic bushes, which fit in correspondingly shaped bores in the frame. The changing of the bushes is, however, not easily effected, because it is firmly forced into the frame and in course of time sticks still faster. For that reason the said changing, which generally must be effected by persons who are not familiar with such kind of work, can easily involve such damage, that the whole apparatus gets out of order.

The object of our invention is to remove the said disadvantage.

Our invention makes possible an easy re-

moval of a main part of the apparatus, when it is necessary to remove dirt, thickened oil and the like from the same; and that those parts of the apparatus, which are worn most rapidly, as the bottom and center bearings, the bottom shaft part with the worm wheel or pinion, the socket, coupling the top shaft part to the bottom shaft part, and the pivot, may be kept as a whole in reserve and easily be mounted in the apparatus in a few minutes by a non-professional man, so that the centrifugal operation need not be interrupted for a long period of time.

In the accompanying drawing Figure 1 is a vertical section of a centrifugal liquid separator arranged in accordance with this invention, the centrifugal drum being shown in a side view. Fig. 2 is a horizontal section on the line A—B of Fig. 1. Fig. 3 is a side view of the said removable portion, shown by itself.

1 is the top shaft part and 2 the bottom shaft part. The latter is supported by the pivot 3 and is journaled at its top end in a bearing 4. The said pivot, which may be of any suitable construction, and the center bearing 4 are mounted in each end of a common, socket shaped piece 5, which fits snugly at its top and bottom ends in holes provided in the frame and is fixed by means of screws 6\*, threaded from below through holes provided in a bottom flange 6, bearing against the frame. The bush 4 is mounted in a bore 7 in the piece 5. For facilitating the fitting of the said piece in the frame it is provided with conical collars or flange shaped portions 8 and 9 at its top and bottom ends, tapered upward, so that the piece 5, when inserted in correspondingly shaped, conical bores provided in flanges or projections 8\* and 9\* on the inner side of the frame will have a firm, centralized position in the frame. The worm-sleeve 10 is mounted on the shaft part 2 and is engaged by the worm-wheel or toothed wheel not shown in the drawing of the driving mechanism, a slot being provided in the wall of the piece 5 for the said wheel. On the top end of the said shaft-part 2 the coupling box 11 is provided, inclosing the lower end of the top shaft part. For the said worm-sleeve 10 may be substituted a pulley or the like fixed to the shaft. After the screws 6\* have been loosened, the piece 5 can easily be withdrawn from the frame, the inner parts of the piece being



then accessible in an easy manner. The screws 6\* may be inserted laterally or in any other suitable manner. The piece 5 may, evidently, have another shape than that shown in the drawing, the main point being that the center bearing and the pivot are mounted in one and the same piece or body, provided with coaxial openings for the said bearings, and that the said piece in its turn at its top end as well as at its bottom end has preferably conical surfaces 8, 9 on the outside, concentric with the axis of the shaft, said surfaces fitting exactly in corresponding bores in the frame and said piece being fixed by means of screws or in any other suitable manner so that it can easily be withdrawn.

As stated above, the described arrangement may be used in other types of centrifugal apparatus, *i. e.* in apparatus having their shafts constructed in another manner as for instance made in one piece, so that the bottom part 2 forms the whole shaft and

the drum is loosely engaged on the top end of the shaft.

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Having now described our invention, what we claim as new and desire to secure by Letters Patent is:

The combination of a driving shaft formed in detachably connected sections, a socket piece in which the lower shaft section is journaled, a frame, said socket piece having conical end portions and adapted to be fitted detachably in openings in the frame, whereby the said socket piece and the shaft section journaled therein are adapted for detachable connection with said frame.

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In witness whereof, we have hereunto signed our names in the presence of two subscribing witnesses.

CARL ALRIK HULT.

OSCAR WALFRID HULT.

Witnesses:

CARL FRIBERG,  
AXEL EHRNEY.