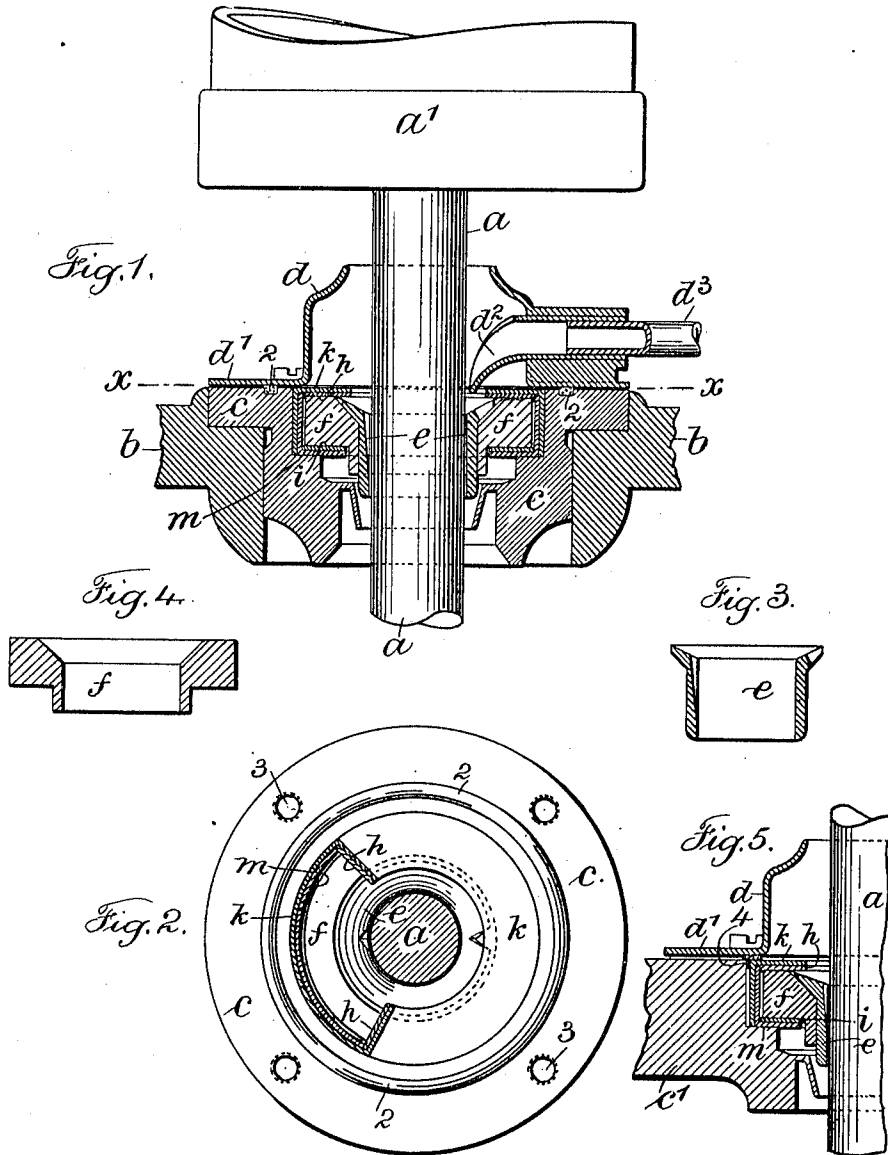


L. H. HARTMANN.
JOURNAL BEARING.
APPLICATION FILED NOV. 29, 1909.

984,369.

Patented Feb. 14, 1911.



Witnesses

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UNITED STATES PATENT OFFICE.

LOUIS HENRY HARTMANN, OF BAINBRIDGE, NEW YORK, ASSIGNOR TO AMERICAN SEPARATOR COMPANY, OF BAINBRIDGE, NEW YORK, A CORPORATION OF NEW YORK.

JOURNAL-BEARING.

984,369.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LOUIS HENRY HARTMANN, a citizen of the United States, residing at Bainbridge, in the county of Chango and State of New York, have invented an Improvement in Journal-Bearings, of which the following is a specification.

My invention relates to an improvement in top journal bearings for machines having high speed vertical shafts, particularly centrifugal machines and centrifugal cream separators, and the same is an improvement upon the devices shown and described in Letters Patent #648,725, granted May 1, 1900, and #907,047, granted December 15, 1908, to the American Separator Company, my assignee in the present invention. In the devices of these patents as well as in other devices in this art it has heretofore been deemed necessary to employ springs of some form in these top bearings for the high-speed vertical shaft employed in these machines. These machines are set up for use on a foundation as nearly level as possible, consequently the high-speed vertical shaft is presumably vertical, but practice has proven that these shafts are not as vertical as set as they become when running at high-speed; therefore the employment of springs (as heretofore used and because of such movement) tends to compel a false position of such shaft, or in other words, tends to press the shaft out of the most accurate vertical position and thereby produce an appreciable friction, calling for the expenditure of more power than necessary, all of which it is the object of my invention to overcome.

In the device of my invention and in combination with a high-speed vertical shaft, a revoluble device supported thereby, a suitable frame member having an annulus supporting portion carried thereby and an apertured cover, I employ a bearing sleeve surrounding the shaft, and a bearing collar, the said collar mounted in a case preferably with friction producing means and in which case the collar has a lateral movement in a horizontal plane, that is, a slight movement at right angles to the vertical position of the shaft. The case is supported by the frame member.

In the drawing, Figure 1 is a vertical section and partial elevation representing the preferred form of my improvement. Fig. 2 is a sectional plan at about the dotted line x, x , of Fig. 1, with the parts broken open for clearness in illustrating the internal construction of the parts. Fig. 3 is a vertical section of the bearing sleeve alone. Fig. 4 is a vertical section of the bearing collar alone, and Fig. 5 is a partial vertical section showing the simple form of my invention.

Similar reference letters are employed upon similar parts.

a represents a vertically disposed high-speed shaft and a^1 a receptacle device supported thereby, such for instance as the vertical shaft and the bowl of a cream separating device.

b represents a suitable frame member rigidly connected to or formed with a suitable standard of the machine, and c is an annulus member received within the frame member b and supported thereby. In the upper surface of this annulus member c is a groove providing for a packing ring 2 and the flange d^1 of an apertured collar d rests upon this packing ring 2 just above the upper surface of the annulus member c ; the said flange d^1 and the member c being provided with holes 3 for suitable screws adapted to hold the cover securely to the annulus member c . This collar d is not only apertured for the vertically disposed shaft a but is provided with an oil supply pipe d^2 and lip and with an oil supply pipe d^3 for conveying the oil from a source of supply to be delivered by the lip to the shaft a and the bearing sleeve e in which the same runs and is loosely mounted. This bearing sleeve e has a flanged upper edge and is received into the bearing collar f which the same fits snugly. The bearing collar f in turn is received into the upper portion of the annulus member c and is supported thereby, and as between the annulus member c which is fixed and the bearing collar f , there is a looseness which provides for a lateral movement of the collar in a horizontal plane, that is to say, a slight movement at right angles to the vertical position of the shafts, and in the device of my invention no springs whatsoever

ever are employed so that there is nothing to prevent the vertically disposed high-speed shaft *a* taking an absolutely vertical position and maintaining it without any devices exerting an influence on the shaft to divert it from its vertical position.

I have shown and prefer to employ a bearing collar *f* in a case in which flat rings *h i* are employed, the one against the upper face of the collar *f* and the other against the under face and said rings are of slightly greater diameter than the collar and the case comprising cap-shaped members *k m* reversed as to one another, and the case *k* made slightly larger than the case *m* so that the latter telescopes with the former and the case *m* agrees in interior diameter with the diameter of the rings *h i*, thus producing between the periphery of the collar *f* and the inner surface of the case member *m* a slight annular opening providing for a slight lateral movement of the collar *f* in a horizontal plane under the friction produced by the rings *h i* against the opposite surfaces of the collar in the case.

Normally considered, the collar *f* with its bearing sleeve *e* provide for a substantially accurate vertical position of the high-speed shaft *a* and for a margin of nominal movement under a high-speed, permitting the shaft to assume an absolutely vertical position without the effect thereon of spring members or outside influences; the collar *f* being adapted to shift slightly between the flat rings *h i* and the case members to accommodate any slight movement and difference in position that the shaft may assume. While it is a fact that this difference is slight, it is necessary, however, to provide for a movement of the bearing collar *f* with its sleeve *e* of several hundredths of an inch more or less.

In the simpler form of my invention shown in Fig. 5, I have illustrated that the frame member *b* and the annulus member *c* received therein according to Fig. 1, may be made as one, that is, as a frame member *c'* having an annulus supporting recess for receiving the reversed cap shaped members *k m* carrying the rings *h i*, and bearing collar *f*. In this form of my invention I have shown the annulus supporting recess as of slightly greater diameter than that of the cap shaped member *k*, and a washer or packing ring 4 coming at this part above the upper face of the member *k* and surface of the frame member and below the flange *d'*, a packing ring 4, not only closes the joint keeping out any fluid but partially enters the space preventing movement of the member *k* and parts connected therewith. It is also obvious that it would not be a departure from my invention to make the sleeve *e* and collar *f* in one piece instead of the two

parts shown nor would the function performed by said parts be changed thereby.

The journal bearing of my invention while particularly adapted for centrifugal cream separators, is also adapted with equal facility for vertically disposed high-speed shafts in other machines in which the shaft is permitted because of its high speed to assume its own absolutely vertical position.

I claim as my invention:

1. In a journal bearing, the combination with a shaft, a fixed support and an annulus member carried thereby, of a bearing collar carried by said annulus member, a bearing sleeve freely surrounding the shaft, snugly fitting the bearing collar, supported thereby and movable therewith, a casing surrounding said collar and fitting said annulus member so as to provide a lateral movement for the collar, devices bearing against the upper and lower surfaces of the bearing collar for producing a friction upon the surface of said collar and which devices are contained within the casing for the bearing collar, and a cover apertured for said shaft and connected with the said annulus member and means extending through the cover for supplying oil for lubricating the said shaft, bearing sleeve and adjacent parts.

2. In a journal bearing, the combination with a shaft, a fixed support and an annulus member carried thereby, of a bearing collar carried by said annulus member, a bearing sleeve freely surrounding the shaft, snugly fitting the bearing collar, supported thereby and movable therewith, a casing surrounding said collar and fitting said annulus member so as to provide a lateral movement for the collar, devices parallel with the collar and bearing against opposite faces thereof for producing a friction upon the surfaces of said collar and which devices are contained within the casing for the bearing collar, and a cover apertured for said shaft and connected to the said annulus member.

3. In a journal bearing the combination with a shaft and a suitable frame member or fixed support having an annulus supporting portion or recess, of a sleeve and a bearing collar receiving the same and both received in said recess and supported by said fixed support and movable in said recess to accommodate the vertical position of the shaft under rotation, cap-shaped members reversed and the one fitting the other and peripherally surrounding the bearing collar and slightly larger than said collar to provide a movement for the collar therein.

4. In a journal bearing the combination with a shaft, of a revoluble bearing sleeve freely surrounding the shaft, a bearing collar surrounding the sleeve and carrying the same, a casing comprising two reversely positioned cap-shaped members telescoping the

one within the other and receiving the said bearing collar, and rings agreeing in internal diameter with the smaller of said cap-shaped members and coming against opposite faces of the said bearing collar and of slightly greater diameter than the bearing collar, whereby a slight annular space is provided for the movement of said collar, and a fixed support receiving said case members and bearing sleeve. 10

Signed by me this 23rd day of November 1909.

LOUIS HENRY HARTMANN.

Witnesses:

STANLEY BEAGLE,
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