C. O. ANDERSON.

OILING DEVICE FOR VERTICAL SHAFTS.

APPLICATION FILED MAR. 25, 1916.

1,189,898. Patented July 4, 1916.

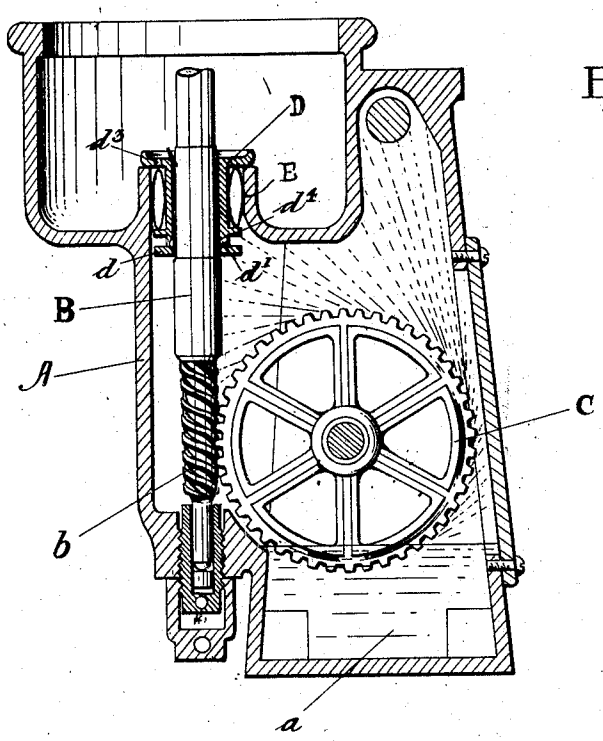


Fig. 1.

Fig. 3.

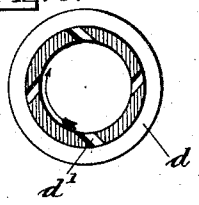
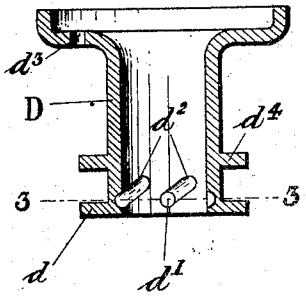


Fig. 2.



Witnesses

Benjamin B. Lowell

A. Pauline Davis

Inventor

Carl Oscar Anderson

By Julian A. Donnell

his Attorney

UNITED STATES PATENT OFFICE.

CARL OSCAR ANDERSON, OF LANCASTER, PENNSYLVANIA, ASSIGNOR TO THE CHAMPION BLOWER & FORGE COMPANY, OF LANCASTER, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

OILING DEVICE FOR VERTICAL SHAFTS.

1,189,898. Specification of Letters Patent. Patented July 4, 1916.

Application filed March 25, 1916. Serial No. 86,573.

To all whom it may concern:

Be it known that I, CARL OSCAR ANDERSON, a citizen of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Oiling Devices for Vertical Shafts; and I do hereby 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.

This invention relates to devices for lubricating shaft bearings, and more particularly to means for oiling the bearings of vertical shafts adapted to rotate at a very high speed, as in the case of a centrifugal cream separator.

The objects of the invention are to provide a simple, efficient and inexpensive device of the character referred to, for automatically oiling the upper bearing of the vertical shaft of a centrifugal cream separator, or other machine, without weakening the shaft by forming grooves or indentations therein as has heretofore been the practice in oiling vertical shafts of machines of the same general character.

The invention will first be hereinafter more particularly described, with reference to the accompanying drawings, which form a part of this specification, and then pointed out in the claims at the end of the description.

Figure 1 of said drawings is a vertical sectional elevation of a machine with a vertical shaft having my improved oiling device thereon; Fig. 2 is a detail vertical sectional view of the upper bearing sleeve detached; and Fig. 3 is a detail transverse section taken on the line 3—3 of Fig. 2.

Referring to said drawings, in which the same reference letters are used to denote corresponding parts in different views, the letter A may denote a casing or housing for the driving gearing of a cream separator, in which is journaled a vertical shaft B adapted to support the bowl of a cream separator; said shaft having a worm *b* thereon engaging a worm-wheel or gear C for imparting a rapid rotary movement to said shaft. The casing or housing A may be of the forms shown or any suitable construction, having an oil pit or chamber *a*, in the bottom thereof, so located that the rim of the gear-wheel C will dip into or be partly immersed in oil, to adapt said gear-wheel in rapid rotation to splash the oil around the interior of the housing and over the machine parts, bearings, &c., therein, as indicated by the dotted lines in Fig. 1. The lower bearing in which the shaft B is journaled may be of the form shown, which is a well known type, or any desired construction. The upper bearing consists essentially of a sleeve D fitting around the shaft and preferably formed integrally with annular flanges at top and bottom and also with an intermediate flange d^4, though the bottom flange *d* only is essential. Said bottom flange *d* may be either flat or concaved to adapt it to catch any oil that may be splashed thereon by the rotation of the worm-wheel C. Through the body of the sleeve D, adjacent said bottom flange *d*, are formed tangential oil holes d^1, preferably four in number, arranged equidistant around the sleeve and slanting slightly downward and in the direction in which the shaft revolves, to adapt the oil to be drawn or sucked in by the rotation of the shaft, while upwardly inclined grooves d^2 on the inner surface of the bearing sleeve, and which start from the inner ends of the tangential oil holes and extend only a short distance, direct the oil entering through said holes in an upward direction, and by the rotation of the shaft the oil is caused to enter said grooves and is forced or pressed upwardly and out of the grooves upon and around the shaft and the interior of the sleeve, thereby effectually automatically oiling the bearing the full length of the sleeve. The shaft is thus automatically oiled by rotation of the gearing, and the usual oil grooves which have heretofore been made to run the whole length of the bearing are eliminated, thus greatly increasing the durability of the machine. In the form shown, the upper flange on the sleeve D rests upon a tubular projection extending up into the bowl at the upper end of the housing within which the separator bowl rotates, and between the top and intermediate flanges is placed an elliptical spring E, or spring of elliptical form, bearing on the interior wall of said projection and the exterior of said sleeve and serving to center the shaft while

allowing it to yield slightly under the action of centrifugal force.

It will be understood, of course, that the form of the flange on which the oil is splashed may be varied, and although it is preferably integral with the bearing sleeve, it may be formed separately and rigidly secured thereto; and instead of four equidistant tangentially inclined oil holes in the bearing sleeve a greater or less number may be employed, and in some cases the upwardly inclined grooves or ducts leading from the inner ends of the oil holes may be omitted, but they are preferable and desirable for greater efficiency and durability of the bearing with more satisfactory results.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A vertical shaft bearing comprising a sleeve having an exterior annular flange thereon and oil holes therein extending tangentially to and in the direction of rotation of the shaft and terminating in upwardly inclined ducts, whereby oil thrown onto said flange will be drawn into the sleeve and carried upwardly along the shaft.

2. A vertical shaft bearing including a sleeve having an exterior annular flange thereon and oil holes through the body of the sleeve extending in the direction of rotation of the shaft, whereby oil thrown or splashed onto said flange will enter said holes and be drawn into the sleeve and carried along the shaft.

3. In combination, a housing having an oil chamber, a gear-wheel having its periphery partly immersed in oil in said chamber, a vertically disposed shaft having a gear thereon in mesh with said gear-wheel, and a bearing sleeve on said shaft having an annular flange thereon and adjacent tangential oil holes through which the oil thrown or splashed upon said flange by the rotation of the gear-wheel is drawn into the sleeve and forced upwardly along the shaft.

4. In combination, a housing having an oil chamber, a gear-wheel having its periphery partly immersed in oil in said chamber, a vertically disposed shaft having a gear thereon in mesh with said gear-wheel, and a bearing sleeve on said shaft having a circumferential flange and tangential oil holes adjacent said flange and upwardly inclined grooves leading from said holes, whereby oil splashed on said flange is drawn into said sleeve by the rotation of the gear-wheel and carried upwardly along the shaft.

5. In combination, a gear casing having an oil chamber in its bottom, a gear-wheel having its periphery partly immersed in oil in said chamber, a vertical shaft having a gear thereon in mesh with said gear-wheel; said shaft being journaled in upper and lower bearings; said upper bearing comprising a sleeve surrounding the shaft and having an annular flange thereon adapted to catch oil splashed by said gear-wheel, and said sleeve having oil holes therethrough adjacent said flange and grooves on the inner surface thereof slanting upwardly from the inner ends of said oil holes so as to conduct the oil entering said holes upwardly along the shaft.

In testimony whereof I affix my signature in the presence of two witnesses.

CARL OSCAR ANDERSON.

Witnesses:
C. H. DEERY,
MERLE R. BURKHARDT.