P. S. SWAN.

LUBRICATED BEARING.

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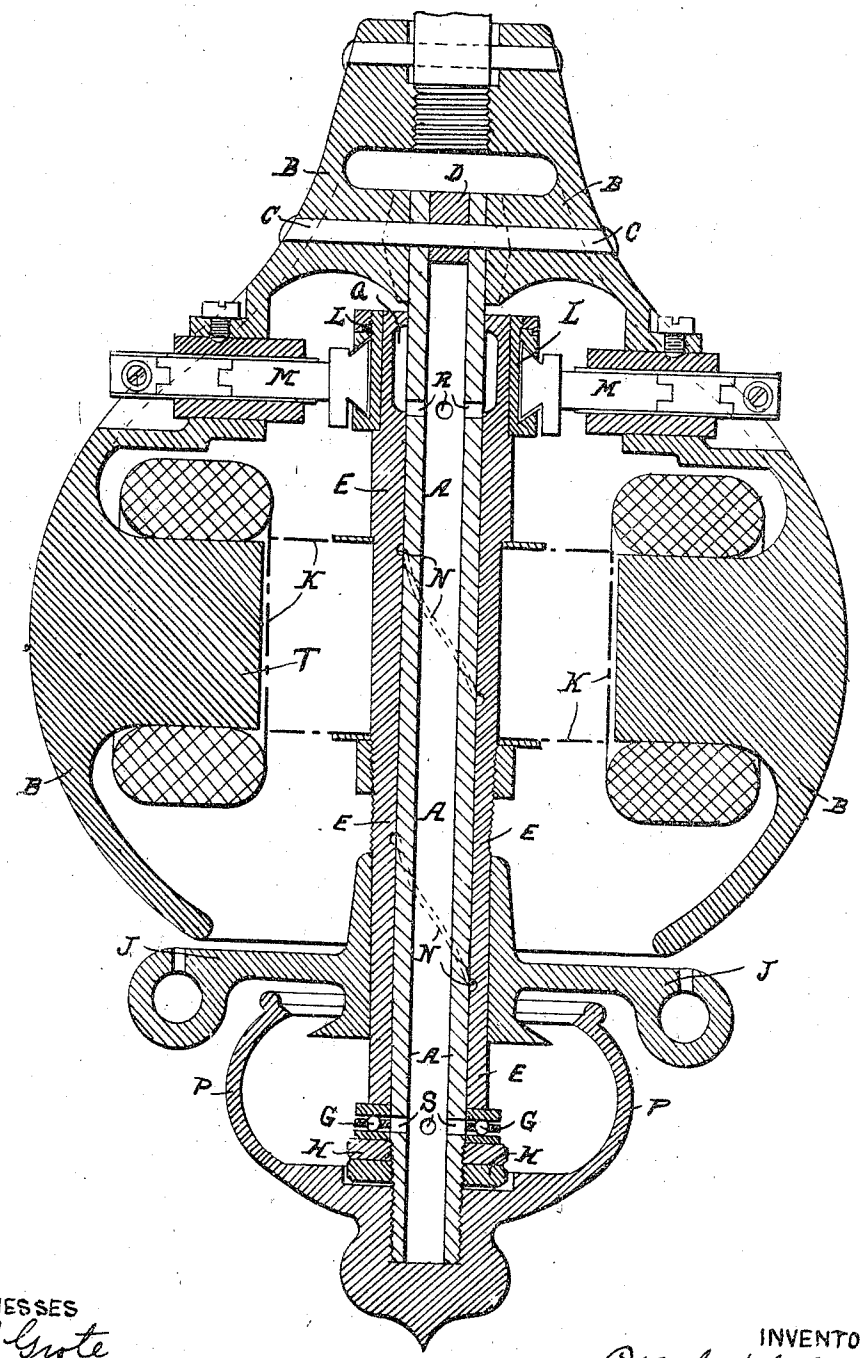
996,536.

Patented June 27, 1911.



WITNESSES

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LUBRICATED BEARING.

996,536. Specification of Letters Patent. Patented June 27, 1911.

Application filed June 14, 1910. Serial No. 566,809.

To all whom it may concern:

Be it known that I, PETER SMITH SWAN, a subject of the King of Great Britain and Ireland, and a resident of Calcutta, India, have invented certain new and useful Improvements in Lubricated Bearings, and of which the following is the specification.

In electric ceiling fans rotating on a vertical axis and where the armature bearings of the motor are above the fan, leakage of lubricant upon the commutator and armature, also upon the fan blades, and its dissemination thereby is objectionable. To overcome this it has been proposed to support fan and armature entirely from below, but with such a device the slightest error in centering between armature and field magnets has resulted in the setting up of severe strains upon the overhung bearing owing to the want of balance in the torque upon the armature.

The invention has for its object to provide a simple form of bearing obviating the disadvantages and possessing the advantages of both the systems just referred to.

In an electric ceiling fan made according to the invention, there is provided a stationary (preferably hollow) central spindle secured to the motor casing and serving as a bearing for a rotatory sleeve mounted upon it and carrying the motor armature, the commutator, and the fan spider. Lubricant flows upward between spindle and sleeve to a receptacle at the top of the sleeve from which when the spindle is hollow it finds its way through apertures in the spindle to the interior thereof, and on reaching the lower end of the spindle it passes back again through conveniently placed apertures to the lower lubricant receptacle. Or, where the spindle is solid, the upper receptacle may be commensurate in size with the lower receptacle so as to retain all the lubricant pumped up during the running of the motor, the lubricant finding its way back between the spindle and sleeve to the lower receptacle when the motor is stopped.

On the accompanying sheet of explanatory drawings there is shown in vertical section an electric ceiling fan provided with an example of the improved bearing.

As shown in the drawing there is provided a stationary hollow central spindle A secured to the motor casing B at its upper end by a pin C passed through apertures in the casing and also in the spindle, and a plug D closing the upper end of the spindle. The spindle A serves as a bearing for a rotatory sleeve E mounted upon it, end-thrust ball bearings G being interposed between the lower end of sleeve and lock nuts H on the spindle by means of which nuts the sleeve is adjustable endwise on the spindle. The sleeve E carries a fan spider J also the motor armature K (indicated by dotted lines) and commutator L contacting with the usual brushes M carried in the motor casing B, with which the poles T are integral, an aperture at the lower end of the casing thus formed in one piece permitting of the sleeve E with the armature K on it being passed up on to the spindle A.

Helical grooves N are cut in the interior of the sleeve E, or it may be on the exterior of the stationary spindle A, so that lubricant flows from a receptacle P beneath upward between spindle and sleeve when the motor is running. When the lubricant reaches the top of the sleeve E it passes into an annular chamber Q formed in the interior of the sleeve from which chamber it is delivered through apertures R in the spindle A to the interior thereof, from whence it finds its way back again through apertures S to the lower lubricant receptacle P. The lubricant receptacle P is of cup-form having an inturned lip. It is screwed on to the lower end of the stationary spindle A.

What I claim is:—

1. A stationary vertical spindle suspended at its upper end, a rotor supported by and having said spindle as its axis, a closed oil chamber surrounding the upper portion of said spindle and a stationary oil chamber mounted on said spindle and surrounding the lower end of the rotor bearing on said spindle, a spiral passage between the rotor and said spindle connecting the said oil chambers and arranged to feed said upper chamber from the lower chamber during the actuation of said rotor together with means for returning the oil from the upper to the lower chamber by gravity while the rotor is in motion.

2. A stationary hollow vertical spindle suspended at its upper end, a rotor suspended by and having said spindle as its axis, a closed oil chamber surrounding the upper portion of said spindle and a stationary oil chamber mounted on said spindle and surrounding the lower end of the rotor bearing on said spindle, a spiral passage be-

tween the rotor and said spindle connecting said oil chambers and arranged to feed the upper from the lower chamber during the actuation of said rotor, the wall of said spindle being perforated to form oil passages connecting said upper and lower chambers with the hollow interior of said spindle whereby a passage from the upper to the lower chamber is afforded through which the oil may return to the lower chamber by gravity while the rotor is in motion.

3. A stationary vertical hollow spindle, a rotor supported thereby and having the same as its axis, upper and lower oil chambers surrounding said spindle and communicating with each other by gravity through said hollow spindle while the rotor is in motion, in combination with a spiral passage between said rotor and spindle arranged to feed the oil to the upper from the lower chamber when the rotor is in motion, said lower oil chamber being stationary during the actuation of the rotor.

4. A vertical spindle, a sleeve thereon, said spindle and sleeve being rotatable with relation to each other, a closed oil chamber surrounding the upper end of the bearing between said sleeve and spindle, an oil chamber carried by said spindle and surrounding the lower end of said bearing, a spiral passage between said sleeve and spindle arranged to feed the oil to the upper from the lower chamber during the rotation of said sleeve and spindle with relation to each other, together with a return passage through said spindle affording communication by gravity from the upper to the lower oil chamber during said rotation, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

PETER SMITH SWAN.

Witnesses:

JOHN B. CLARK,

ROBT. B. SALL.