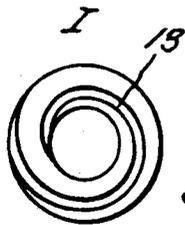
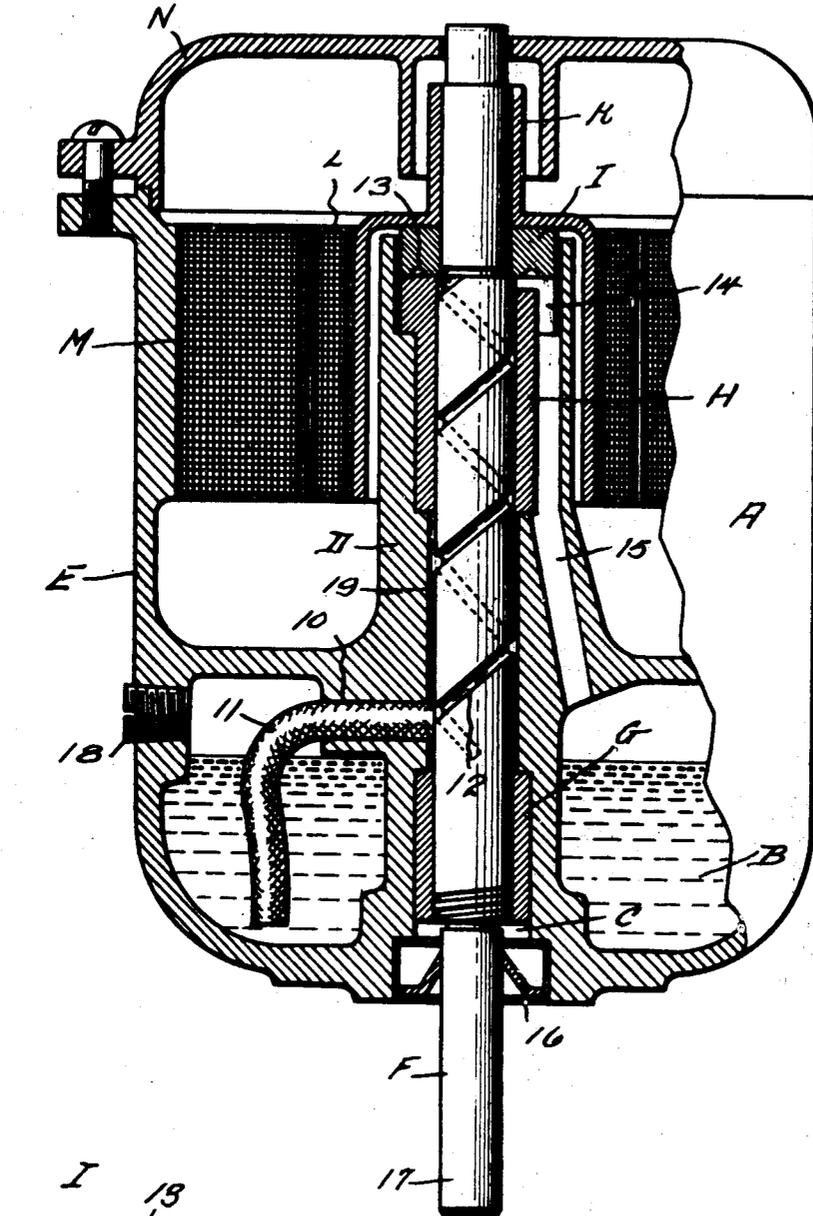


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A. D. WALTER  
BEARING LUBRICATION  
Filed Feb. 5, 1932

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*Fig. 1*



*Fig. 2*

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# UNITED STATES PATENT OFFICE

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## BEARING LUBRICATION

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Application February 5, 1932, Serial No. 591,090

4 Claims. (Cl. 308—168)

This invention relates to an electric motor of the type in which the armature shaft extends vertically. The principal object of the invention is to provide a simple and effective lubrication system for such a motor. A further object is to provide an improved construction of motor casting and armature mounting. A still further object is to provide a vertical-shaft motor which is especially suitable for use in installations in which the upper portion is subjected to comparatively high temperatures.

I attain the foregoing and other and more limited objects in and through the construction hereinafter described and illustrated in the accompanying drawing in which Fig. 1 is a broken-away sectional view of the motor, and Fig. 2 is a detail, bottom plan view of one of the bearing members.

Referring now to the accompanying drawing, the character A indicates generally the main casting which comprises a bottom portion defining an oil reservoir B and provided with a central opening C. Extending upwardly from the bottom portion of the casting are substantially concentric, generally cylindrical portions D and E. A shaft F extends through the opening C and is journaled therein in bearings G and H. The shaft F has fixed thereto near the upper end a bearing member I above which is secured an armature carrying member K. Mounted on the member K, substantially entirely below the top of the projection D, is an armature L. Carried by the outer cylindrical portion E is a field M. A cover N is secured to the upper portion of the main casting A and is spaced a considerable distance above the armature and field and uppermost bearings. The upper end of the shaft F may be modified in any desirable manner for cooperation with mechanism to be driven.

Extending from the oil reservoir B through an opening 10 in the casting A is a wick 11 which terminates adjacent the shaft F. Extending upwardly from the wick 11 is a helical groove 12 formed in and extending around the shaft F and adapted to feed oil delivered from the wick upwardly to the upper bearing members H and I. Inasmuch as the groove 12 merely delivers oil at the intersection of the shaft with the plane of contact of the members H and I, I have found it desirable to provide in the bottom face of the member I a spiral groove 13 for feeding oil outwardly whereby to lubricate the entire contacting area of the members H and I. Communicating with the contact area of the members H and I is an oil return opening consisting of a part 14

formed in the member H and a part 15 formed in the portion D and communicating with the oil reservoir B. The shaft F may be shortened and the lower end of the opening C entirely closed, or an oil tight packing 16 may be provided to surround a shaft extension 17 projecting below the bottom of the casting A. A filling plug 18 is provided adjacent the top of the oil reservoir. A drain plug (not shown) may be provided in the bottom thereof, if desired.

In operation, oil is fed through the wick 11 against the shaft F by capillary attraction. This will fill the small space 19 between the shaft and the portion D. The helical groove 12 will feed oil upwardly to the upper bearing H, I, while oil will flow by gravity to the lower bearing means G. I have found that the very short distance from the oil level to the point at which the wick discharges results in a sure and ample supply of clean oil being delivered to the shaft. The helical groove is then relied upon to elevate oil to the upper bearing means. By employing the combination of the "short lift" wick with the helical groove I am able to provide a satisfactory supply of oil to the upper bearings when the motor is running, while allowing nearly all of it to drain down into the oil reservoir when the motor is stopped. In cases where the upper portion of the motor is subjected to rather high temperatures there is often a tendency to burning or deterioration of the oil in that portion. By the use of the "short lift" wick, which supplies more oil than would a wick extending all the way from the oil reservoir to the upper bearing, coupled with the groove 12 and the return 15, I am able to provide a sufficiently large flow of oil, prevent the same oil from remaining too long at the relatively hot upper portion of the motor, and avoid deterioration of oil in the wick. For the same reason I place the oil reservoir at the bottom of the motor which is most distant from the heated upper portion. The cover end, spaced from the upper portion of the casting A, affords some protection from the high temperatures. By connecting the armature with the shaft at a point above the upper bearings, I also secure the advantage of being able to position the bearings more favorably than I could do otherwise. In some cases I prefer to provide a plurality of wicks instead of one as shown.

While I have shown and described an illustrative embodiment of my invention, I wish it understood that changes can be made without departing from the spirit of my invention, and that I am limited only in accordance with the scope of the appended claims and the prior art.

Having thus described my invention, what I claim is:

1. A body having an opening therethrough provided with bearing means, a shaft journaled in said bearing means, an oil reservoir associated with said body, a wick extending from said oil reservoir to a point adjacent said shaft, said shaft being provided with a helical groove extending upwardly from said wick for carrying oil, delivered by said wick, upwardly to said bearing means.

2. A body having an opening therethrough provided with bearing means, a shaft rotatable in said bearing means, an oil reservoir formed in said body, a wick extending from said oil reservoir to a point adjacent said shaft and slightly above the oil level in said reservoir, said shaft being provided with a helical groove extending upwardly from said wick to a bearing whereby to lubricate the latter.

3. In a device of the class described, a body provided with an opening and spaced bearing means positioned one above the other, a shaft journaled in said bearing means in said opening, an oil reservoir, wick means extending from said reser-

voir to a point adjacent said shaft and slightly above the oil level in said reservoir, said shaft having a helical groove extending from said wick to the uppermost of said bearings, and means for draining surplus oil from said bearing means to said reservoir.

4. In a device of the class described, a casting, an oil reservoir formed in said casting, said casting having a pair of substantially concentric, generally cylindrical, upwardly extending projections, a lower bearing formed in said casting, an upper bearing having radial and thrust portions carried by the inner of said projections, a shaft journaled in said bearings, and a wick extending from said oil reservoir through a portion of said casting to a point adjacent said shaft and a short distance above said reservoir, said shaft being provided with a helical groove extending from said wick to the top of said upper bearing whereby oil delivered through said wick will be carried upwardly to said upper bearing, and means comprising a spiral groove formed in a thrust face of said upper bearing for draining surplus oil therefrom to said reservoir.

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