Nov. 24, 1936. R. C. PERRY 2,062,103

OIL CHAMBER FOR ELECTRIC CLOCKS

Filed April 12, 1935

Fig. 1.

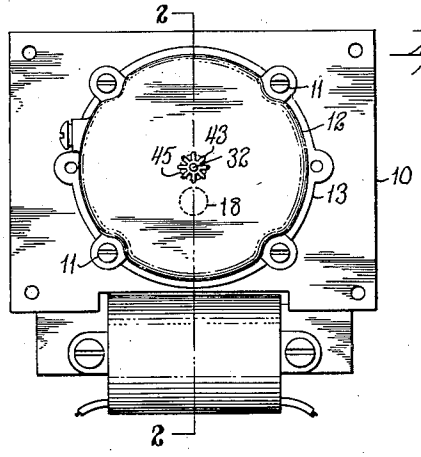


Fig. 3.

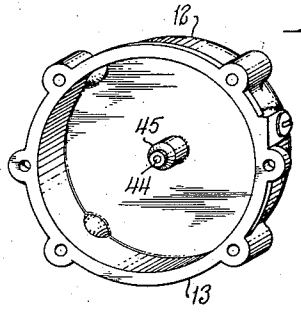


Fig. 2.

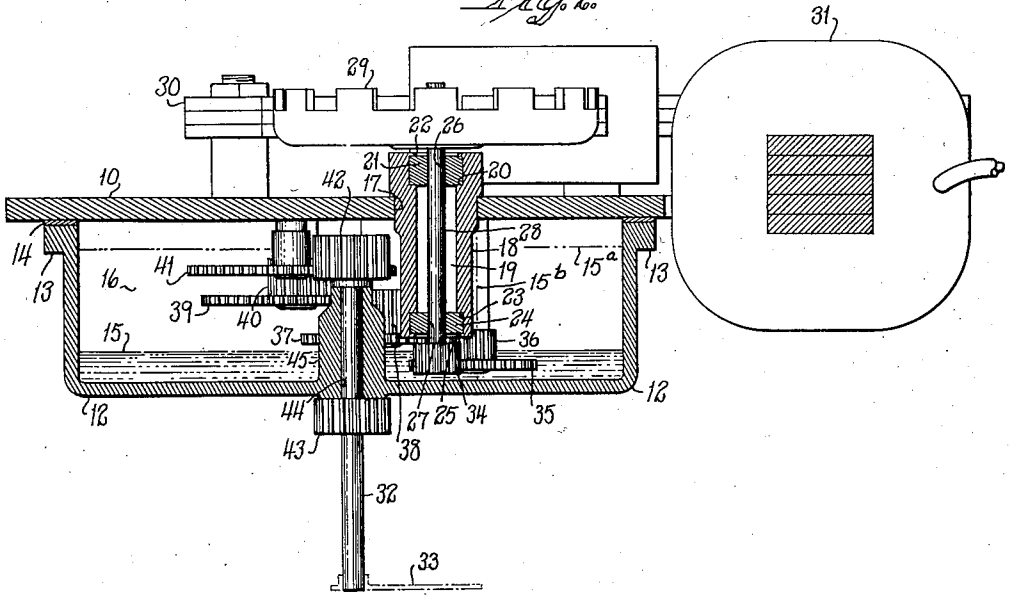
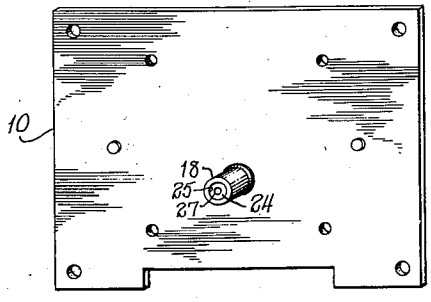


Fig. 4.



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OIL-CHAMBER FOR ELECTRIC CLOCKS

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5 Claims. (Cl. 74—606)

This invention relates to an improvement in oil-chambers, and particularly to oil-chambers for electric clocks and other similar motor-driven devices.

One of the objects of the present invention is to provide a superior oil-chamber construction by means of which an ample supply of oil may be stored therein without endangering appreciable leakage when the structure is placed in positions other than its normal position, as, for instance, in shipping.

A further object is to provide a superior compact oil and gear chamber which will be substantially free of such oil leakage as might be occasioned by tilting.

With the above and other objects in view, as will appear to those skilled in the art from the following, considered in conjunction with the accompanying drawing and appended claims, the present invention includes all features disclosed therein which are novel over the prior art.

In the accompanying drawing:

Fig. 1 is a view in front elevation of a synchronous electric clock mechanism illustrating one form which the present invention may assume;

Fig. 2 is a transverse central sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a perspective view of the cup-shaped housing-member looking toward the inner face thereof; and

Fig. 4 is a similar view of the mounting-plate looking toward the forward face thereof.

The particular synchronous electric clock structure herein chosen for the illustration of one form of the present invention includes a rectangular mounting-plate 10 having secured to its forward face, by means of screws 11, a cup-shaped housing-member 12 which may be of any approved form and may, for instance, be produced by die-casting.

Interposed between the rear face of the flange 13 of the housing-member 12 and the forward face of the mounting-plate 10 is a gasket 14 serving to prevent the leakage of a body of oil 15 contained within the closed chamber 16 provided by the coaction of the housing-member 12 and the mounting-plate 10.

Tightly mounted in a passage 17 in the mounting-plate 10 and projecting both forwardly and rearwardly therefrom is a sleeve or bearing-projection 18 having a relatively-long longitudinal passage 19 therein, as particularly well shown in Fig. 2. The rear end of the passage 19 in the sleeve 18 is slightly enlarged to form a shoulder 20 against which is seated a rear bearing-bushing 21 held rigidly in place by burring the metal of the rear sleeve 18 thereover as at 22. The forward end of the sleeve 18 is similarly enlarged to provide an annular shoulder 23 against which a front bearing-bushing 24 is held by means of a swaged-over portion 25 at the forward end of the sleeve 18.

Extending through the passage 19 of the sleeve 18 and turning in the axially-bearing passages 26 and 27 respectively formed in the bushings 21 and 24 is a shaft 28, preferably smaller in diameter than the diameter of the said passage 19 in the sleeve 18. The shaft 28, just referred to, has rigidly secured to its rear end a rotor 29 and may, for convenience of description, be designated as the "power-input shaft", inasmuch as power impressed upon it by the rotor 29 is transmitted to suitable gearing within the chamber 16, as will be more fully hereinafter described. The rotor 29, above referred to, forms a feature of a synchronous electric motor which requires no detailed description further than to say that it includes, in addition to the said rotor, a stator-structure 30 of iron or equivalent magnetic material, and mounts a usual energizing coil or solenoid 31.

In the structure shown in the accompanying drawing, the electric motor, including the parts 29, 30 and 31, is designed to function as a synchronous electric motor to impart accurately-timed rotation to a shaft 32, which latter may be designated, for convenience of description, as the "power-output shaft", inasmuch as it may serve to drive a hand or pointer 33 or other suitable element.

The forward end of the power-input shaft 28, which is located within the chamber 16, rigidly mounts a pinion 34, meshing into and driving a gear-wheel 35, rotating as a unit with a pinion 36. The last-mentioned pinion 36 meshes into and drives a gear-wheel 37 rigidly attached to a pinion 38, which in turn meshes into and drives a gear-wheel 39. The gear-wheel 39, just referred to, like the gear-wheels 35 and 37, is rigidly secured to a complementary pinion such as 40. The pinion 40 meshes into and drives a gear-wheel 41, in turn meshing into and driving a pinion 42, rigidly attached to the rear end of the power-output shaft 32, before referred to.

The hand or pointer 33 at the outer end of the shaft 32 may, for instance, constitute the seconds-pointer of a synchronous electric clock, and for the purpose of taking off power to drive a minute-pointer, the shaft 32 may be provided about midway of its length, adjacent the forward face of the housing 12, with a pinion 43. The pinion 43, just referred to, when suitably staked or otherwise secured to the power-output shaft 32, serves to restrain the inward axial movement of the latter in the bearing-passage 44 extending through the forward wall of the cup-shaped housing-member 12 and through a rearwardly-extending boss or bearing-projection 45 formed integral with the said wall.

From the foregoing, it will be seen that within the closed chamber 16 is provided a supply of lubricant 15 and a suitable gear-train enabling the power-input shaft 28 to effect the accurately-timed rotation of the power-output shaft 32 at a greatly reduced speed. The oil within the closed chamber 16 will be distributed by the various gears and pinions to the bearing-passages 26, 27 and 44, as well as to the bearings of the various gears and pinions of the train itself.

As will be noted from the drawing, the bearing-projection or boss 45 of the housing-member 12 is eccentrically positioned with respect to the bearing-projection or sleeve 18. It will further be noted that the rear end of the boss 45 of the housing 12 is located well rearwardly of the forward end of the sleeve 18, which latter, as before noted, may properly be considered a bearing-boss complementing the bearing-boss 45, already referred to.

Viewed in another manner, the forward end of the bearing-projection 18 may be said to extend well forwardly of the rear end of the bearing-projection 45. Thus, when the device is positioned as shown in Fig. 2, the rear end of the bearing-projection 45 will project well above the level of the body of oil 15 therein, which will thus be prevented from forcing its way by gravity outwardly through the bearing-passage 44. If the device should be reversed in position 180° from the position in which it is shown in Fig. 2, the oil level would come to about the position indicated by the broken line 15^a in Fig. 2, and thus be well below the forward end of the bearing-projection or sleeve 18. Thus, under the latter circumstances, the oil would be unable to force its way outwardly by gravity through the bearing-passages 27 and 26. If positioned upright, as would be normal with a clock structure, the oil level would substantially coincide with the dotted line 15^b in Fig. 2.

By providing an oil-chamber construction in which the bearing-projection of one shaft projects inwardly beyond the inner end of a complementary bearing-projection, the oil-chamber may be filled with a supply of oil adequate for a long period of use without, however, endangering the gravitational leakage of the same outwardly through the bearing-passages when the device is turned in various positions, as would occur repeatedly in shipping.

The invention may be carried out in other specific ways than that herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiment is therefore to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. An oil-chamber construction designed and adapted to store a relatively-large amount of lubricant in its interior, including: a housing providing an oil-chamber therein; and two complementary bearing-projections eccentrically positioned with respect to each other and extending inwardly into the oil-chamber in the interior of the said housing from opposite sides thereof and each provided with a bearing-passage extending therethrough in substantial parallelism, the respective inner ends of each of the said bearing-projections extending past the inner end of the other thereof.

2. An oil-chamber construction designed and adapted to store a relatively-large amount of lubricant in its interior, including: a housing providing a substantially-cylindrical oil-chamber therein; two complementary bearing-projections eccentrically positioned with respect to each other and respectively extending inwardly into the oil-chamber from the opposite end-walls thereof and each having a bearing-passage extending therethrough in substantial parallelism, the respective inner ends of each of the bearing-projections extending past the inner end of the other thereof.

3. An oil-chamber construction designed and adapted to store a relatively-large amount of lubricant in its interior, including: a housing providing an oil-chamber therein; and two complementary bearing-projections eccentrically positioned with respect to each other and extending inwardly into the oil-chamber in the interior of the said housing from opposite sides thereof, each of the said bearing-projections being provided with a bearing-passage extending therethrough from the interior to the exterior of the said oil-chamber, the respective inner ends of each of the said bearing-projections extending past the inner end of the other thereof; two shafts respectively installed in the bearing-passages of the said bearing-projections; and gearing located within the said oil-chamber and operatively interconnecting the respective inner ends of the two said shafts.

4. An oil-chamber construction designed and adapted to store a relatively-large amount of lubricant in its interior, including: a housing providing a substantially-cylindrical oil-chamber therein; two complementary bearing-projections eccentrically positioned with respect to each other and extending inwardly into the oil-chamber in the interior of the said housing from the respective opposite end-walls thereof and each provided with a bearing-passage extending from the interior to the exterior of the said oil-chamber; two shafts respectively mounted in the bearing-passages of the said bearing-projections; and gearing located within the said oil-chamber and operatively interconnecting the inner ends of the two said shafts; the respective inner ends of each of said bearing-projections extending past the inner end of the other thereof.

5. An oil-chamber construction designed and adapted to store a relatively-large amount of lubricant in its interior, including: a housing providing a substantially-cylindrical oil-chamber therein; two complementary bearing-projections eccentrically positioned with respect to each other and extending inwardly into the oil-chamber in the interior of the said housing from the respective opposite end-walls thereof adjacent the axial center of the cylindrical oil-chamber, and each provided with a bearing-passage extending from the interior to the exterior of the said oil-chamber; two shafts respectively mounted in the bearing-passages of the said bearing-projections; and gearing located within the said oil-chamber and operatively interconnecting the inner ends of the two said shafts; the respective inner ends of each of the said bearing-projections extending past the inner end of the other thereof.

RUPERT C. PERRY.