May 28, 1929. J. G. AYERS 1,715,267

JOURNAL BOX

Filed Aug. 21, 1925

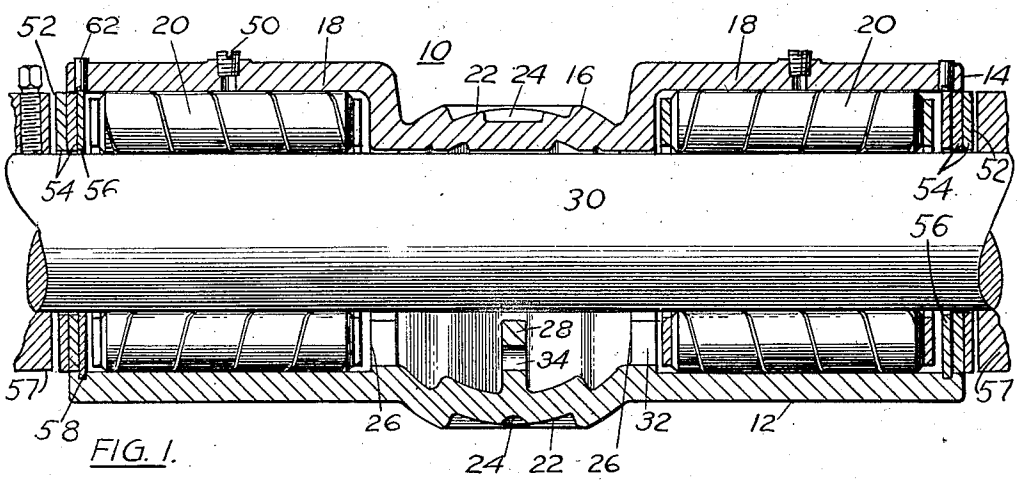


FIG. 1.

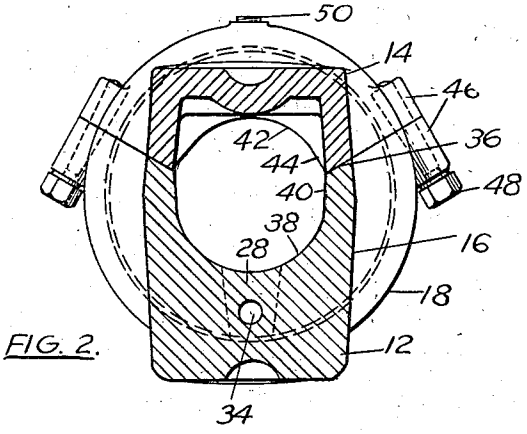


FIG. 2.

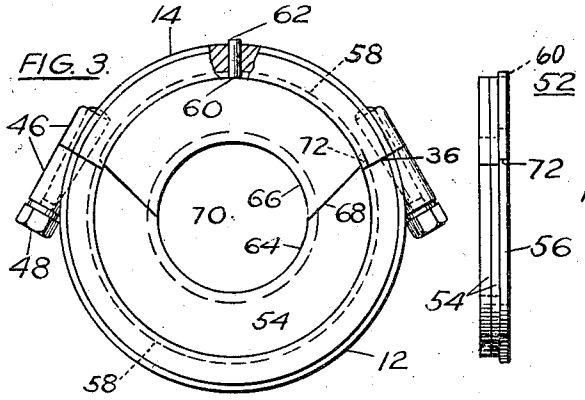


FIG. 3.

FIG. 4.

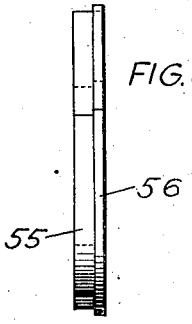


FIG. 5.

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UNITED STATES PATENT OFFICE.

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JOURNAL BOX.

Application filed August 21, 1925. Serial No. 51,537.

This invention relates to journal boxes and comprises all of the features of novelty herein disclosed, by way of example, as embodied in a split, line shaft box.

An object of the invention is to provide a split journal box which will retain lubricant and support antifriction bearings more effectively than prior devices. Another object is to provide an inexpensive journal box of this character which is light and strong and easily assembled with a shaft and hanger.

To these ends and also to improve generally upon devices of the character indicated my invention consists in the various matters hereinafter described and claimed.

In the drawings, Figure 1 is a longitudinal vertical section, Figure 2 a transverse central section, Figure 3 an end view partly in section, Figure 4 an edge view of an end cap and Figure 5 is a similar view of another form of end cap.

The numeral 10 indicates generally the journal box comprising a lower section 12 and an upper section 14, each section having a restricted and flattened central portion 16 and enlarged end portions 18 to receive antifriction bearings, herein shown as split roller bearings 20. The restricted central portion has upper and lower spherical seats 22 and elliptical recesses 24 therein for cooperation with the usual hanger (not shown). Extending inwardly from the restricted portion of the lower section 12 are reinforcing ribs 26 and 28 which are semicylindrical to conform to but clear the shaft 30. Between the ribs 26, depressions formed opposite to the spherical seat 22 act as a sump for lubricant. The ribs 26 also serve as abutments for the end rings of the roller bearings and are slotted as at 32 for the passage of lubricant. The rib 28 also has an oil opening 34.

For retaining lubricant more effectively the joints 36 between the sections are arranged above the axis of the shaft and inclined. To extend the lower section circumferentially through more than a semicircle would prevent the admission of the shaft into the recess 38 of the restricted central portion although the ends of the box being larger can be and are so extended. The sides of the central recess 38 are accordingly extended upwardly tangentially as at 40 and terminate on a slant as indicated at 36. The top section, at its middle, has semi-cylindrical ribs on the interior as indicated at 42 and tangential side extensions 44 which also terminate on a slant at the joints 36. The inclined joints not only serve to guide and center the top section onto the lower section without requiring dowels but also tend to drain oil down into the box. The joints are also raised above the oil level so that oil is less likely to reach them. The joints are continuous from end to end of the box and although the ends of the lower box sections enclose more than a semicircle, nevertheless the bearings, being split, can be inserted from above by partially rotating the two halves thereof as they are inserted one after the other. This structure is stronger and holds the bearings better inasmuch as the lower section encloses more than half of them and the joints of the box do not coincide with the joints of the split bearings. Pairs of mating lugs 46 on the box sections are bored at right angles to the slanting joints 36 to receive taper pins or bolts 48 for clamping the sections of the box together, the taper of the pins aiding in properly registering them.

Oil is admitted to the box through openings 50 and retained by end caps 52. Each cap is shown in the form of a ring and is made from a pair of outer layers or sections 54 and an inner layer or section 56, all welded together, the outermost section being of comparatively hard metal to form a projecting abutment for a collar 57 on the shaft and the inner section being of softer material. The outer sections 54 may be formed as one thick layer if desired as shown at 55 in Figure 5. The inner section is also of greater diameter than the outer sections to engage aligned grooves 58 in the inner surfaces of the two box sections while the outer cap sections fit the finished interior surface of the box and make a close joint with the shaft. To hold the cap against turning, it has a notch 60 engaged by a pin 62 driven through an opening in the top box section. Inasmuch as the end portions of the lower box section enclose more than a half cylinder, each cap is also split into lower and upper sections 64 and 66, respectively, to allow assembly. The cap is split along the lines 68 which slant upwardly and outwardly from diametrically opposite sides of the shaft opening 70 to points 72 which are higher at the outer periphery. Thus the lower cap section 64 has its shaft opening semicircular to admit the shaft but its outer edge encloses more than a semicircle

and oil which tends to be thrown outwardly is retained more effectively. The lower cap section is inserted in the lower box section (which encloses more than a semicircle) by a rotary movement. The lower cap section extends above the longitudinal joints 36 between the box sections so that it prevents relative longitudinal movement of the two box sections.

Although the invention has been described by reference to a certain specific construction, it should be understood that, in its broader aspects, it is not necessarily limited to the form selected for mere illustrative purposes.

I claim:

1. In a split journal box, a lower box section and an upper box section having longitudinal joints at the sides, said sections having aligned grooves in their inner surfaces, and a split end cap held by said grooves and comprising a lower section extending above the joints between the box sections, and a complemental upper section; substantially as described.

2. In a split journal box, a lower box section and an upper box section having longitudinal joints at the sides, said sections having aligning grooves in their inner surfaces, and an end cap held by said grooves and comprising upper and lower sections meeting on inclines which slant upwardly and outwardly and extend above the joints between the upper and lower box sections; substantially as described.

3. In a split journal box for a shaft, a lower box section and an upper box section having longitudinal joints at the sides, and a split end ring to retain lubricant in the box and comprising a lower section having a semicircular shaft recess to fit the lower half of a shaft with side portions extending upwardly above the axis of the box, and a complemental upper section having a semicircular shaft recess to fit the upper half of the shaft, the two sections of the end ring completely closing the end of the box outside the shaft; substantially as described.

4. A journal box having its inner surface provided with a groove, an abutment plate comprising an outer section of hard metal fitting the interior surface of the box and an inner section of softer metal engaging said groove; substantially as described.

5. In a split journal box, a lower section and an upper section having aligned grooves in their inner surfaces, a cap comprising a section having its periphery of a size to fit said groove and a second section of smaller size fastened to the first section and fitting the inner surface of the box; substantially as described.

6. In a split journal box, a lower section and an upper section having aligned grooves in their inner surfaces, a cap comprising a section having its periphery of a size to fit said groove and a second section of smaller size, said section of smaller size having a notch, and a pin extending through the upper box section and entering said notch; substantially as described.

7. A split line shaft box having a restricted and flattened central portion and cylindrical end portions of larger size, the central portion having its top and bottom faces formed with spherical seats, the interior surface opposite the lower spherical seat having a depression to form a sump for lubricant, antifriction bearings received in the enlarged cylindrical end portions of the box for supporting a shaft, and end caps closing the ends of the box and having detachable connection with the latter; substantially as described.

In testimony whereof I hereunto affix my signature.

JOSEPH G. AYERS.