This application is a continuation of my application Ser. No. 338,212, filed Jan. 16, 1964, now abandoned.

The present invention relates generally to railroad car journal boxes and, more particularly, to an improved journal stop device for limiting transverse movement of the journal relative to the journal box.

In the conventional journal boxes which are used on most railroad cars, it is necessary to provide lubrication for the journals of the car axles. For many years, this lubrication was provided by filling the lower portion of the journal box with a compacted mass of "waste" which was soaked with the desired lubricant. In order to hold the waste in place, inwardly protruding "waste retainer ribs" were provided on the side walls of the journal box to prevent the waste from creeping up along the sides of the journal.

Although the use of waste as a lubricant is extremely economical and convenient, it has a tendency to cause "box boxes" and has never been considered an ideal lubricating device. Thus, in recent years various substitute lubricating devices have been proposed, and a number of such devices are in use today. For example, one such device is described in my United States Patent No. 3,008,780, entitled, "Journal Lubricating Device." Since these substitute lubricators generally require a small pool or reservoir of uncontaminated lubricant in the bottom of the journal box, it has been necessary to provide liquid seals between the journal and the opening in the journal box through which the journal extends in order to prevent leakage of the uncontaminated lubricant therethrough.

In normal operation of railroad cars, the axle journal tends to move horizontally relative to the journal box in a direction transverse to the journal axis. For example, such movement may occur during starting or stopping of the railroad car, during bouncing of the car due to track imperfections, during car "humping," etc. Repeated movement of this type tends to damage and eventually destroy the liquid seal mentioned above. Thus, it has been necessary to provide so-called "journal stops" which limit or restrain transverse movement of the journal, and a number of such devices have already been proposed.

However, with each of the journal stops proposed thus far, certain problems have been encountered which have prevented their widespread adoption. Those stops which require the welding of retainers in the box, or drilling holes in the box sides, have not been received with great favor by the railroads for obvious reasons. Stops which are not rigidly anchored have been extremely difficult to position properly in the journal box or, if positioned properly initially, have tended to work out of position during operation of the railroad car. It has been proposed to attach otherwise freely mounted stops to a wide connecting band which fits against the lower surface of the box, but this prevents the lubricator, which must be placed on top of the connecting band, from reaching the rough inner surface of the journal box. As a result, the upper surface of the connecting band becomes extremely slippery, and it is very easy for the lubricator to be rolled up by the rotating journal so as to become hung up between the journal and the side wall of the journal box.

A further problem is encountered in the many journal boxes still in use which have waste retainer ribs. Since these ribs are usually located adjacent the most desirable area of the journal to be engaged by the stops, it has been virtually impossible to use most of the previously proposed journal stops in boxes both with and without retainer ribs.

It is, therefore, a main object of the present invention to provide an improved journal stop which effectively limits transverse displacement of the journal relative to the journal box and which can be easily positioned properly within the journal box. In this connection, it is an object to provide a journal stop which permits substantial engagement between the journal lubricator and the inner surface of the box so that the lubricator cannot roll up and become hung up between the journal and the side wall of the journal box. Another related object is to provide such a journal stop which remains in its proper position throughout extended periods of hard use.

It is another object of this invention to provide an improved journal stop which has universal application, that is, which can be used interchangeably with either the older type of journal box which has waste retainer ribs, or the more modern journal box which has no such ribs. It is another object to provide such a journal stop which actually utilizes the waste retainer ribs to hold the stop more firmly in place.

A still further object of the invention is to provide an improved journal stop which has improved wear resistance and optimum stiffness characteristics. A related object is to provide such a stop which requires a minimum of material and is extremely economical to manufacture. Still another object is to provide such a journal stop which facilitates installation and removal of both the journal stop and the journal lubricator.

Other objects and advantages of the invention will become apparent upon reading the attached detailed description and upon reference to the drawings, in which:

FIGURE 1 is a sectional end elevation view taken through the middle of the bearing locking ribs of a conventional railroad journal box and showing a journal stop, not in section, which embodies the present invention positioned therein;

FIGURE 2 is a section along line 2—2 in FIG. 1 with the journal shown in full lines;

FIGURE 3 is a plan view of the journal stop of FIG. 1 removed from the journal box;

FIGURE 4 is an end elevation of the journal stop shown in FIG. 3; and

FIGURE 5 is a side elevation of the journal stop shown in FIG. 3.

While the invention will be described in connection with a preferred embodiment, it will be understood that I do not intend to limit the invention to that embodiment. On the contrary, I intend to cover all alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims.

Turning first to FIGS. 1 and 2, there is shown a conventional railroad journal box 10 having a lower oil sump portion 11 and containing bearing structure 12 which rests on the journal 13 of a railroad car axle. The inner surface of the journal box 10 is relatively rough and includes a pair of relatively long waste retainer ribs 14 and 15 extending inwardly from opposed inner side walls of the box adjacent the side surfaces of the journal 13, and a pair of relatively short bearing locking ribs 10a extending inwardly from opposed inner side walls of the box above the ribs 14 and 15. Fitted within the journal box 10 between the bottom portion thereof and the journal 13 is a flexible lubricator 16, such as described in my United States Patent No. 3,008,780, which operates to supply oil to the journal 13. The lubricator 16 comprises two spaced pads 17 and 18 with a supply of liquid lubricant 19 contained in the spaces between the two pads. The two pads 17 and 18 are connected by a member 18a.
In order to restrain the journal 13 against horizontal displacement relative to the box 10 in a direction transverse to the axis of the axle, a journal stop 20 is positioned between the journal 13 and the side walls of the journal box 10. The journal stop 20, which is shown in more detail in FIGS. 3-5, includes a first pair of trapezoidal stop members 21 adapted to engage one side of the journal 13, and a second pair of similar stop members 22 adapted to engage the other side of the journal 13. The relatively thick stop members 21, 22 are connected by a relatively thin flexible supporting and aligning member 23 adapted to fit against the lower portion 11 of the journal box. The stop members are flush with the outer surface of the member 23 and protrude inwardly beyond the inner surface of the member 23 to engage the opposite sides of the journal 13. The stop members 21, 22 in each pair are spaced so as to fit easily on either side of the bearing-locking ribs 16 formed conventionally as parts of the box 10.

The flexible member 23 has opposed inboard and outboard edges 24 and 25, respectively, and a pair of opposed side edges 26 and 27 extending between the inboard and outboard edges. For the purpose of facilitating installation of the journal stop and to insure that it remains firmly in place during operation, the width of the member 23 between the inboard and outboard edges is such that when the member 23 is fitted against the lower portion 11 of the journal box, the inboard and outboard edges of the inboard and outboard ends respectively, of the journal box. The inboard edge 24 is provided with a small flange 28 to enlarge the contact area between the edge 24 and the back end of the box, while the outboard edge 25 is curved to fit neatly within the cupped lower front of the box 10 and to facilitate manipulation of the member 23 during installation and removal.

In accordance with one important aspect of the invention, the journal stop is provided with a relatively large open area to permit the lubricator 16 to contact the rough inner surface of the journal box. Thus, the central portion of the flexible member 23 is provided with a plurality of openings 29 (see FIG. 3) which are sufficiently large to expose a substantial area of the inner surface of the box 11. In general, these openings 29 should represent at least about ten percent, preferably at least twenty percent, of the total area encompassed by the edges of the member 23. In the preferred embodiment illustrated, the openings 29 extend diagonally across the member 23 to form a herringbone pattern of solid strips 30 and a central longitudinal strip 31. This pattern provides optimum stiffness characteristics with a relatively small amount of material, and also reduces the tendency of the journal stop 20 and the lubricator 16 to catch on each other during installation and removal. Of course, the openings 29 also serve to permit the passage of the lubricating oil from the bottom surface of the box 10 up into the lubricator 16.

In accordance with another feature of the invention, the journal stop 20 is of universal application in that it can be used either with a journal box which has waste retainer ribs, such as the ribs 14 and 15 in the box 10, or with a journal box which has no retainer ribs. Thus, the side edges 26 and 27 of the thin supporting member 23 fits between the inboard and outboard edges of the journal box 10. 23 which are adapted to be contiguous and coextensive with the lower surfaces of the ribs 14 and 15. The relatively thick stop members 21 and 22, in turn, are attached to the inner edges of the flanges 31 and 32, respectively, so as to engage the corresponding side surfaces of the journal 13. The stop members include relatively thin portions 21a, 22a which extend upwardly from the flanges 31, 32 past the innermost surfaces of the ribs 14 and 15, and relatively thick portions 21b, 22b which extend outwardly over the upper surfaces of the ribs into engagement with the adjacent side walls of the journal box. Thus, the stop members 21 and 22 and the flanges 31 and 32 define a plurality of recesses or grooves 33 which mate with the ribs 14 and 15 so as to hold the journal stop 20 firmly in place, even during rotation of the journal 13. The flanges 31 and 32 also prevent the lubricator 16 from being rolled up by the rotation of the journal 13 and becoming hung up between the journal and the box side walls.

It will be seen that the journal stop 20 is extremely economical to manufacture. For example, the entire stop device may be conveniently manufactured by a single molding operation to form the journal stop 20 should be sufficiently stiff to urge the stop members 21 and 22 toward the side walls of the box when the journal stop is installed. In other words, the material should be sufficiently stiff to maintain the journal stop out of engagement with the rotating journal 13 in its normal position, with the journal stop serving to engage and arrest the journal 13 only when the latter shifts from its normal or centered position. This is important to prevent the journal stop from wipping of the lubricating oil off the surface of the rotating journal and also avoids unnecessary wear on the journal stop.

The material used to form the journal stop should also be resistant to the particular oil or other lubricant used in the journal box and should have good wear resistance. In the practice of this invention, the material should generally be between about 55 Shore "A" durometer and about 80 Shore "D" durometer, and an especially desirable material is urethane rubber having a 90/95 Shore "A" durometer.

While one specific form of the invention has been illustrated and described herein in some detail, it will be apparent that the same is susceptible of numerous modifications. For example, although the journal stop has been described with particular reference to a pair of stop members on each side of the journal, it may be designed with only one stop member on each side. Conversely, it is also possible to have more than two stop members on each side. Moreover, the size and shape of the openings 29 may be varied as long as there is sufficient open area to permit substantial engagement between the lubricator and the inner surface of the box.

I claim as my invention:

1. For use with a journal box having a pair of waste retainer ribs extending inwardly from opposed inner side walls and a journal rotatably mounted within said box between said ribs, a journal stop device comprising a single integral unit forming a relatively thin flexible supporting member adapted to fit against the lower portion of the inside surface of said box with the side edges of said supporting member terminating in inwardly extending flanges adapted to be contiguous with the lower surfaces of said retainer ribs, and at least one relatively thick stop member integral with the inner edge of each flange so as to face the adjacent side surface of said journal, said stop members including relatively thin portions extending outwardly past the inner surfaces of said ribs and relatively thick portions extending outwardly over the upper surfaces of said ribs into engagement with the side walls of said box whereby said journal stop device, when in place, is prevented from being rolled up by the rotation of the journal and becoming hung up between the journal and the box side walls.

2. The combination of a journal box having an inboard end and an outboard end and a rough inside surface, a journal rotatably mounted within said journal box, a flexible lubricator positioned between the lower surface of said journal and the bottom of the journal box, and a journal stop device comprising a relatively thin flexible supporting member having opposed inboard and outboard edges and a pair of opposed side edges extending...
between said inboard and outboard edges, said supporting member being adapted to fit against the lower portion of the inside surface of said box with said inboard edge abutting the inboard end of the journal box, with the outboard edge abutting the outboard end of the journal box, and with the side edges adjacent the opposite side walls of the journal, a pair of relatively thick stop members integral with each side edge of said supporting member, said stop members protruding beyond the inner surface of said supporting member toward the side surfaces of said journal, the central portion of said supporting member having a plurality of diagonally extending openings therein so as to form a herringbone pattern of solid strips, said openings being sufficiently large to permit substantial frictional engagement between said flexible lubricator and the rough inside surface of said journal box beneath said supporting member.

3. A journal stop for limiting horizontal displacement of a journal in a journal box in a direction transverse to the axis of the journal, said journal stop comprising a relatively thin flexible supporting member having opposed inboard and outboard edges and a pair of opposed side edges extending between said inboard and outboard edges, said supporting member being adapted to fit against the lower portion of the inside surface of said journal box with said inboard edge abutting the inboard end of the journal box and said outboard edge abutting the outboard end of said journal box, said supporting member having a plurality of relatively large diagonally extending openings therein so as to form a herringbone pattern of solid strips, and a pair of relatively thick spaced stop members integral with each of said side edges, said stop members being flush with the outer surface of said supporting member and protruding beyond the inner surface of said supporting member, the lower surface of each stop member having a recess in the outer surface of the lower portion thereof.

4. For use with a journal box having a pair of relatively long waste retainer ribs extending inwardly from opposed inner side walls of the box, a pair of relatively short bearing locking ribs extending inwardly from the opposed inner side walls of the box above the waste retainer ribs, and a journal rotatably mounted within said box between said ribs, a journal stop device comprising a single integral unit forming a relatively thin flexible supporting member adapted to fit against the inside surface of said box, the side edges of said supporting member terminating in inwardly extending flanges adapted to be contiguous and coextensive with the lower surfaces of said waste retainer ribs, and a pair of stop members integral with the inner edge of each flange so as to face the adjacent side surface of said journal, said stop members including relatively thin portions extending upwardly past the inner surfaces of said waste retainer ribs and relatively thick portions extending outwardly over the upper surfaces of said ribs into engagement with the side walls of said box whereby said journal stop is held firmly in place, each pair of said stop members being spaced apart sufficiently to fit against opposite ends of the adjacent bearing locking rib, said supporting member being sufficiently stiff to press said supporting members firmly against the box side walls, said flanges being substantially thicker than said supporting member so that flexure between the supporting member and the stop members occurs where the flanges join the supporting member.

No references cited.

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