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METHOD FOR INSTALLING LUBRICATOR DEVICES IN JOURNAL
BOXES OF RAILROAD CARS AND THE LIKE
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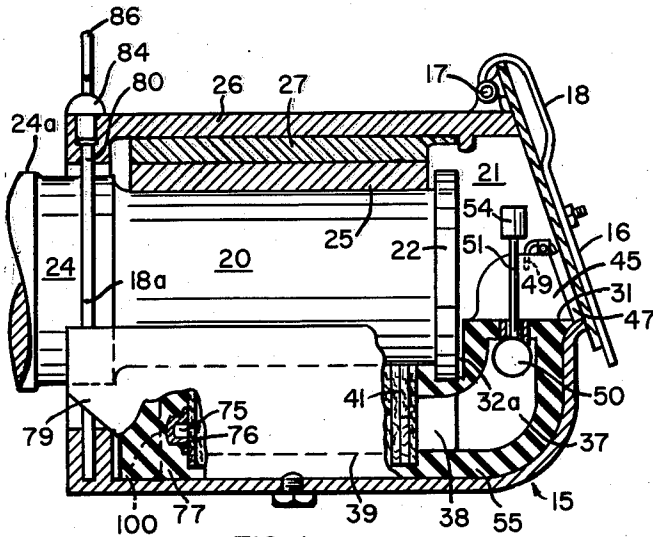


FIG. 1

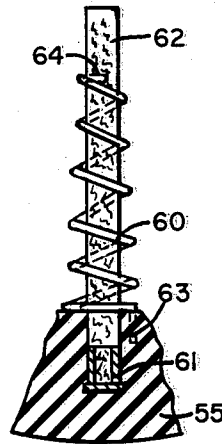


FIG. 7

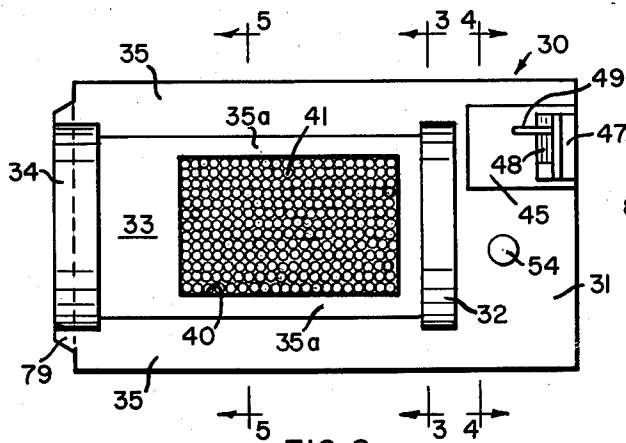


FIG. 2

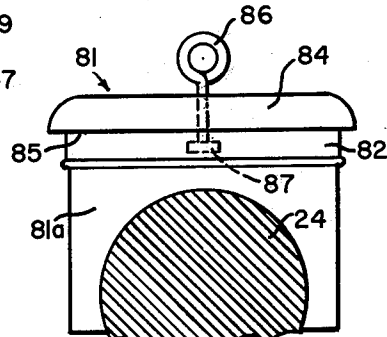


FIG. 6

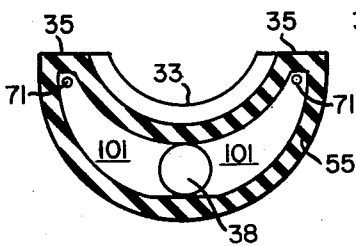


FIG. 3

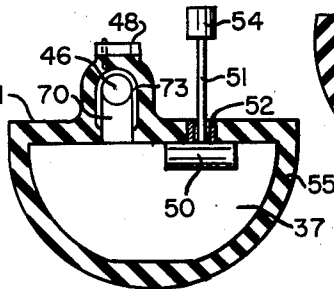


FIG. 4

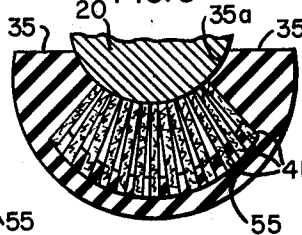


FIG. 5

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METHOD FOR INSTALLING LUBRICATOR DEVICES IN JOURNAL BOXES OF RAILROAD CARS AND THE LIKE

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Original application June 22, 1953, Ser. No. 363,348, now Patent No. 2,846,279, dated Aug. 5, 1958. Divided and this application May 12, 1958, Ser. No. 734,500
14 Claims. (Cl. 29—149.5)

This invention relates generally to lubrication of railroad car journals and relates more particularly to methods for installing lubrication devices in journal boxes of such cars and the like. This is a division of applicants' copending application for Lubricator and Sealing Device, Serial No. 363,348, filed June 22, 1953, now Patent No. 2,846,279, issued August 5, 1958.

It is an object of the invention to provide a simple and effective method for installing lubricating devices in railway car journal boxes.

Another object of the invention is to provide a method of this character wherein the lubricator device may be inserted into the journal box and thereafter compressed against the journal surface.

Still another object of the invention is to provide a method of this character whereby the lubricator device is inserted into the journal box and thereafter caused to sealingly engage the portion of the journal to be lubricated.

A further object of the invention is to provide a method of this character whereby the lubricator may be installed in present car journal boxes as well as those of new train trucks.

The characteristics and advantages of the invention are further elaborated on in the following detailed description of the accompanying drawings. After considering the method herein described, skilled persons will understand that many variations may be made without departing from the principles disclosed and properly within the scope of the appended claims.

Referring to the drawings, which are for illustrative purposes only:

FIG. 1 is a vertical longitudinal section of a journal box showing a journal therein and a lubricating device operably positioned in said box, portions of the device being broken away;

FIG. 2 is a plan view of said lubricating device;

FIG. 3 is a section taken on line 3—3 of FIG. 2;

FIG. 4 is a section taken on line 4—4 of FIG. 2;

FIG. 5 is a section taken on line 5—5 of FIG. 2;

FIG. 6 is an end view of the top dust seal; and

FIG. 7 is an enlarged view of one type of wick for the device.

Referring now to FIG. 1, the journal box is indicated generally at 15 and is provided with a lid or cover 16 hinged at 17 and having a spring 18 urging same in the closing direction. A journal 20 is operably disposed in the chamber 21 defined by the box 15 and said journal has a collar 22 adjacent the free end thereof, there also being an inner journal collar 24 and hub 24a. The usual bearing or brass 25 is provided at the top side of the journal and between said bearing 25 and the top wall 26 of the journal box 15 is the usual wedge or key 27.

Occupying the lower portion of the chamber 21 is a lubricator device, indicated generally at 30, which comprises a body generally semicircular in cross section. The rounded part of the body is at the bottom and rests on and is supported by the bottom wall of the journal box 15. The upper side of the device includes a top wall, part of which is generally horizontal and disposed at what will be termed the outer end for the purpose of

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clear terminology. There is a depressed portion of said top wall which extends inwardly from the part 31 and along the longitudinal center of the body. This depressed portion is generally arcuate in cross section and includes a groove 32 in which the collar 22 of the journal shaft is operably disposed, said groove 32 being at the inner end of the wall part 31. The outer face of the collar 22 is spaced at 32a from the adjacent end of the groove 32. From the groove 32 a concave recess or journal receiving portion 33 extends toward the inner end of the body and the journal 20 is operably disposed in said portion 33. At the inner end of the body there is a groove 34 in which the inner collar portion 24 is operably received. At each side of the top of the body the upper wall extends inwardly from the part 31 in substantially the same plane, as indicated at 35, portions 35 being disposed at opposite sides of the groove 32, portion 33 and groove 34.

The body 30 has a hollow interior which includes a chamber 37 at the outer end and a passage 38 which connects the chamber 37 through wall 101 (FIGS. 1 and 3) with a wick chamber or portion 39 located intermediate the ends of the body. Chamber 39 is open at the top as indicated at 40 and the upper ends of wicks 41 extend into said opening 40.

The outer end is provided with a filling spout 45 which extends upwardly above the upper surface of the wall part 31 and turns toward the outer end of the body, terminating at an angle corresponding to the angle of the cover 16. There is a filling opening 46 closed by a cover 47 hinged at its upper end to the spout by a hinge 48 and urged closed by a spring 49. When the device is in position in the journal box the cover 47 lies closely adjoining the inner surface of the cover 16, and is further secured and held in place by lid 16.

The chamber 37 constitutes a relatively large reservoir and an oil level indicator is provided comprising a cylindrical float 50 from which a flexible shaft or rod 51 extends upwardly through an opening provided in the well part 31. A metal sleeve or bearing 52 is provided for the flexible rod or shaft 51 and receives said rod loosely enough to provide an air vent to the reservoir. At the upper end of the rod 51 is an indicator 54 which may be of white painted cork or any other suitable material.

The body of the lubricator is of resilient material and neoprene has been found to be particularly good for the purpose. The oil wicks are also of any suitable material and may be pleated or braided cotton cord, wool or plastic for example. The wicks are positioned in the oil chamber or reservoir 39 and may have their lower ends moulded into the bottom of the lower wall 55. The upper ends of the wicks extend through the opening 40 and into a position whereat they rest against the lower portion of the journal 20 when the lubricator device is installed in the journal box or housing underneath said journal.

The device is placed in position in the journal box when the wedge and brass are not in place and the journal is at its highest possible position inside the box or housing. When the device has been properly placed underneath the journal the latter is lowered with relation to the box and the brass and wedge installed in position in the well known manner. As the device rests on the bottom wall of the journal box, as best shown in FIG. 1, relative lowering of the journal in the box causes enough compression of portions of the body by the journal in such manner that the sides 35 and 35a and end walls 77 and 101 of the device will form an oil-tight contact or seal with the abutting faces of the journal for the full perimeter of the wick reservoir, extending from a point adjacent the outer end collar to a point adjacent the

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inner collar 24. The resiliency of the device will compensate for the movements of the journal in relation to the housing thereof when the car is in traffic and prevent the seal between the parts from being broken in use.

When the lubricating device, journal, brass and wedge are assembled in their operative positions the upper ends of the wicks will be in contact with the lower outside portion of the journal inside the sealed wick reservoir 39 created inside the body of the device and around the wicks. The swell of the neoprene body, due to contact with and absorption of oil compensates for wear on the body and wicks.

The wicks may be of the self supporting type to keep them erect in their position against the journal or they may be held upright by a spring 60 or the like as shown in FIG. 7. The wick arrangement shown in FIG. 7 includes a metal band or clamp 61 in which the lower ends of the respective wicks 62 are received and said lower ends and bands are moulded into the neoprene of the bottom 55. The spring 60 tapers inwardly from the bottom to the top. This gives a relatively large base for the spring which prevents the displacement of the wick from the upright position with reference to the bottom of the reservoir 39. The respective ends 63 and 64 of the spring are embedded in the bottom wall 55 and the wick 62. The end portion 63 prevents displacement of the lower end of the spring and the end 64 engages the wick. It is to be noted that the spring is under compression when thus installed so that said spring maintains the wick in contact with the bearing face of the journal.

An alternative wick may be formed of neoprene in tubular shape. It has been found that neoprene and some types of plastics are quite efficient. In such construction the passages in the tubes are of capillary size and the tubes are provided with holes at or near the bottom of the reservoir in order to permit the oil to enter the tube, whereupon capillary action raises the oil to the journal face. Capillary tubing when used in place of the other types of wicks is also moulded into the bottom of the reservoir 39 in any suitable manner. The longitudinal passages in the capillary tubing may be tapered with the opening at the top of smaller diameter than at the bottom and the outside diameter of the tubing may also be smaller at the top than at the bottom to better accommodate to the shape of the reservoir 39.

Oil, of any suitable characteristics, with or without additives such as graphite for improving lubrication, is poured into the device through the filling opening 46 and flows through the passage 70 into the reservoir 37. The cap 47 must, of course, first be raised. The oil from reservoir 37 enters the wick holding reservoir 39 through the passage 38 and will fill said reservoir 39. Air from the reservoir 39 escapes therefrom through vents 71 as the oil level rises in said reservoir 39. The vents 71 lead to the reservoir 37 which is vented to outside atmosphere by way of the bearing 52. When the wick reservoir 39 and extra oil space or reservoir 37 are filled, the cap 47 is lowered into place and is doubly secured by lid of journal box being shut.

The oil level is, of course, indicated by the indicator device 54. The device is arranged so that when it indicates a low level the reservoirs are not completely empty but has a considerable reserve as a safety factor and the low oil will be raised to the journal bearing face by the capillary action of the wicks.

When the oil is at the high level the lower portion of the journal bearing face will be immersed therein so that the journal picks up oil directly from the reservoir as said journal rotates. The curved portions of sides 35a of the body act as wipers to remove surplus oil from said journal face, leaving the required oil film only.

While the oil level may be quickly checked by raising the lid 16 of the journal box and noting the position of float top 54, it is to be noted that a double check may be

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had by raising the cover 47 of the lubricator and when the oil level is high the oil may be seen in the reservoir 37 through the passage 70. It is also to be noted that a drip 73 is provided in passage 70 to prevent splashed oil from leaking out the filling opening 46.

It has been found that the neoprene body, due to its elastic nature, makes possible the use of grease instead of oil as a lubricant for lubricating the journal 20 and its associated bearing 25. This is accomplished by eliminating the bearing 52, and the filling spout assembly with its opening to outside atmosphere, the reservoirs 37 and 39 being completely sealed against outside atmosphere when installed in operating position under the journal. In lieu of the filling spout provided with an opening for oil, a compression injection valve or grease fitting (not shown) is placed in the top wall part 31, in a position to be readily and easily connected to a grease pressure hose with a fitting for injecting grease under pressure into the reservoirs. Surplus air in the reservoirs is exhausted through a spring controlled valve (not shown) likewise installed in wall part 31. When the pressure hose is connected to the injection valve, grease is forced into the reservoirs and into contact with the lower portion of the journal face. When grease is forced into the reservoirs, the elastic properties of the body and reservoir walls permit a controlled amount of expansion of the reservoirs similar in effect to a distended diaphragm. The only escape of the compressed grease is by way of the film licked up and carried by the rotating journal 20 to the bearing 25 and as the grease adjoining the journal face is used up in lubricating the journal and bearing, the compression in the reservoir together with the contracting to normal position of the distended body and reservoir walls causes additional grease to shift to the face of the rotating journal.

Any well known suitable means may be used to raise and lower the journal, such as, for example, a jack or a crane. In this connection, the side frame of the truck (train) which includes the journal box for each end of each axle is jacked up or raised to a point say, $\frac{1}{2}$ " to 1" to loosen the wedge or key 27. This key is then removed from its working position in the journal box and this operation also frees up the bearing 25, FIG. 1, and the bearing is also removed from the journal box. Then the side frame of the truck and/or the included journal box or boxes are lowered as much as the frame will descend while the journal is still inside the box. When this has been done the space between the collar 22, and the bottom of the journal box 15 is increased enough to permit the insertion of the flexible lubricator device with a push-rod as described more particularly hereinafter. The journal box or side frame of the train truck is then jacked up again to a point high enough to re-install first the bearing and then the key or wedge. With these two parts re-installed in the working position the journal box or the truck side frame is lowered until the wedge and bearing is tightened up on the journal. This lowering of the box or side frame compresses the lubricator creating a seal against the inadvertent loss of oil in traffic, etc.

In such cases one lubricator may be installed in one box or one of the lubricators may be installed in the two journal boxes in each side frame of the train truck. The side frame may be jacked and/or lowered by the use of a jack underneath the spring plate support at the center of the side frame so that both boxes are manipulated at the same time. Likewise, a jack on each side of the car or truck would permit the installation of the lubricators on both sides of the truck or car at the same time. This would apply to the original installation into a fully assembled car without removing the truck from underneath the car. The entire train truck can be removed from the car by jacking up or lifting with a crane one end of car until the center pin is disengaged whereafter the truck is rolled out from underneath the car.

In fully new train trucks, which are assembled fully before being rolled underneath the raised car body, the

lubricators may be placed in position in the journal box underneath the journal prior to the installation of the bearing and the wedge. The lubricators may be inserted in the bottom of the journal box before the side frame is placed on and over the journals or axle ends, and the bearing and wedge thereafter installed. In such cases the side frame is usually handled by a crane.

In order to facilitate insertion of the lubricator device into the journal box in which it is formed to fit a metal cup 75 is provided having an outwardly extending annular flange 76, said cup being moulded into the end wall 77 of the body of the device, the open end of the cup facing the outer end of the body. Fabric reinforcing 100 may be moulded into the body and into the inner wall 77 surrounding the metal cup 75 or elsewhere as needed for additional strength in view of the pushing process. A push rod of suitable form and/or shape may be inserted through the segments of the arc of the groove 32, and between the wicks in the wick chamber 39, with the inner end positioned in said cup. With the journal positioned in the box as hereinbefore described this lubricator device is pushed into position without danger of injury to said device. The push rod may be in two parts pivotally or swivelly connected together.

In order to provide an effective dust seal or stop the body of the lubricator device has an arcuate, inwardly extending flange 79 which is formed integrally with said body. When in operative position, the flange 79 extends inwardly along the lower portion of the inner journal collar 24 and is in contact with the lower face of said inner collar and the outer face of inner wall of the "waste" chamber of the journal box, thereby preventing the entrance of foreign material into the journal box through the lower portion of the inner opening into said box. The flange 79, being resilient, and body 30 which is under compression when in operative position, provide compensation for wear and for journal "shift" so as to maintain an effective dust seal or stop adjacent the lower portion of the journal.

In order to complete the dust seal over and around the upper portion of the journal adjacent the inner collar 24 the upper dust seal device shown in FIG. 6 is provided. This device is indicated generally at 81 and is of suitable material such as neoprene and is inserted in the conventional dust guard slot 80 of the journal box. The sides and ends of the top portion of the upper dust seal device are preferably slightly smaller than the inside dimensions of the slot 80 so as to facilitate insertion of the device. The upper portion 82 of the device 81 which enters the slot 80 is slightly larger than said slot so that the offset portion 82 requires a certain amount of force or driving to complete the installation of the upper portion of the seal. This will insure that the seal will not be inadvertently displaced or lost in traffic. The enlarged portion 84 has a lower or under face 85 which engages the upper wall of the journal box and thus provides an effective top seal against rain and dirt. The eye 86 is formed of wire or the like and has an end portion 87 anchored in the body of material forming the slab seal 81. This eye provides an easy and handy means for removing the upper part of the dust stop 81. The lower portions 81a of this seal in association with flange 79, completely encircles the inner collar 24 and closes the conventional inner opening into the journal box against the entrance of dust and eliminates the present method of sealing the top of the dust guard slot adjacent the inner end of the box 15 by the use of waste packing and asphaltic roofing cement.

Neoprene has been found to be a highly satisfactory material from which to construct the body and seal 81 of the present device as it is resistant to decay caused by oil.

Another advantage of the use of a material such as neoprene is the elimination of so called "smoke" or "stink" bombs which are presently in use on many trains to as-

sist in the detection of hot bearings or hot journals or hot boxes and the like. It has been found that the neoprene or synthetic rubber of the oil resistant type, when heated to a point well below the melting temperature of babbit, gives off a dense black smoke the odor of which is most offensive to the human sense of smell. In the event the present lubricator should run dry due to neglect, oversight, or any accidental or inadvertent cause, the material of which it is composed will heat up and give off the dense black smoke and offensive odor above referred to thereby giving warning of impending bearing trouble in time for the train crew to take corrective measures before really serious trouble develops.

Whereas the invention has been described with reference to specific embodiments, it is not intended to limit the scope of the invention to the details disclosed or otherwise than by the terms of the appended claims.

We claim:

1. The method of installing a removable lubricator of resilient material in a journal box, said lubricator having an oil space therein with an opening therefor, comprising the steps of: raising the journal to an upward position inside the box above the working position; pushing the lubricator into place beneath the journal; lowering the journal with relation to the box; and installing the brass and wedge of the journal box in position, the relative lowering of the journal in the box causing sealing engagement of the journal with the lubricator and compression of portions of the lubricator by the journal to form a static oil tight contact therewith, with the opening of the oil space providing communication between the oil space and the adjacent journal surface.

2. The invention defined by claim 1 wherein the lubricator has a flanged, outwardly facing metal cup embedded in the inner end wall thereof and the method includes inserting the end of a push rod into the cup through the oil space opening and said lubricator is pushed into the box under the journal when in the raised position, by means of said rod.

3. The method of installing a removable lubricator in a journal box, said lubricator having a wick reservoir and an opening therefor and said journal being in a raised position in the box, the steps of pushing the lubricator into place beneath the journal to rest on the bottom wall of the journal box; lowering the journal within the box; and installing the brass and wedge of the journal box into position, the journal sealingly engaging the lubricator and compressing same when said journal is in the lowered position.

4. The method of installing a removable lubricator of resilient material in a journal box, said lubricator having an oil space therein with an open therefor, comprising the steps of: raising the journal to an upward position inside the box above the working position; pushing the lubricator into place beneath the journal; lowering the journal with relation to the box; and installing the brass and wedge of the journal box in position, the relative lowering of the journal in the box causing sealing engagement of the journal with the lubricator and compression of portions of the lubricator by the journal to anchor said lubricator in working position and forming a static oil tight contact between perimeter portions of the lubricator and the journal, with the opening of the oil space providing communication between the oil space and the adjacent journal surface.

5. The method of installing a capillary type lubricator in a journal box, when the journal is in a raised position in said box above the working position, the steps of: pushing the lubricator into place beneath the journal; lowering the journal within the box; and installing the brass and wedge of the journal box, the journal operably engaging the lubricator and compressing same when said journal is in its operating position.

6. The method of installing a lubricator device in a journal box when the journal is in a raised position in

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said box, the steps of: inserting the lubricator into place beneath the journal; lowering the journal within the box; and installing the brass and wedge, the journal operably pressing the lubricator when the said journal is in its operating position to limit the application of lubricant to the face of said journal to a thin film.

7. In a method of installing a lubricator device in a journal box when the journal is in a raised position in said box, including the steps of: inserting the lubricator into the journal box and onto the bottom thereof in operative position beneath the journal; and lowering the journal within the box, the journal operably engaging the lubricator when said journal is in its operating position and compressing said lubricator between said journal and journal box bottom.

8. The method of installing a capillary lubricator device in a journal box for lubricating a journal, said lubricator device having a lubricant chamber and a lubricant way, and said journal being displaced from the normal working position, the steps of: shoving the lubricator device into the journal box; and fastening the journal and bearing to the side frame of a truck by supporting a portion of the side frame on the bearing and journal, with the journal contacting the lubricant in the lubricant way when the journal is in working position.

9. In a method of installing a lubricating device having resilient characteristics for a friction bearing and journal when said journal is out of its operating position in an integral side frame of a railroad truck, the steps of: inserting said lubricating device into position underneath said journal; restoring the journal and bearing with the lubricating device to operating position whereat a portion of said side frame is supported on said journal and bearing and said side frame has fastening relation with said bearing and journal when operatively supported thereon.

10. In a method of installing a lubricating device with a sealable upper perimeter and having resilient characteristics for a friction bearing and journal when said journal is out of its operating position in an integral side frame of a railroad truck, the steps of: installing said lubricating device into position underneath said journal whereat said device is compressed and prepared for operation; and restoring the journal and bearing with the lubricating device to operating position whereat a portion of said side frame is supported on said journal and bearing and said side frame having fastening relation with said bearing and journal when operatively supported thereon.

11. In a method of installing a lubricating device with a sealable upper perimeter for a friction bearing

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and journal when said journal is out of its operating position in a side frame of a railroad truck, the steps of: installing said lubricating device into position underneath said journal; and restoring the journal and bearing with the lubricating device to operating position whereat a portion of said side frame is supported on said journal and bearing and said side frame having fastening relation with said bearing journal when operatively supported thereon.

12. In a method of installing a lubricating device: raising the side frame and journal box sufficiently to remove the wedge; removing said wedge; removing the bearing; lowering the side frame and journal box to provide a space for inserting a hollow flexible lubricator; then inserting the lubricator to rest on the bottom of the journal box beneath the journal by a push rod with one end thereof inserted in a metal cup moulded into said lubricator; lowering the journal to cause sealing engagement of the lubricator with the journal and to provide space for insertion of the bearing and wedge; and installing the bearing and wedge.

13. The invention defined by claim 4 including positioning an associated cooperating member in contact with the inner portions of the lubricator adjoining the journal in a circumferential manner to form an oil seal around the journal adjacent the inner portion of the box.

14. In a method of installing a lubricating device in journal boxes of railroad cars and the like: raising the side frame and journal box sufficiently to remove the wedge; removing said wedge; removing the bearing; lowering the side frame and journal box to provide space for inserting a hollow flexible lubricator; inserting the lubricator to rest on the bottom of the journal box beneath the journal by means of a push rod; lowering the journal to cause sealing engagement of the lubricator with the journal and to provide space for insertion of the bearing and wedge; and installing the bearing wedge.

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