

Dec. 6, 1938.

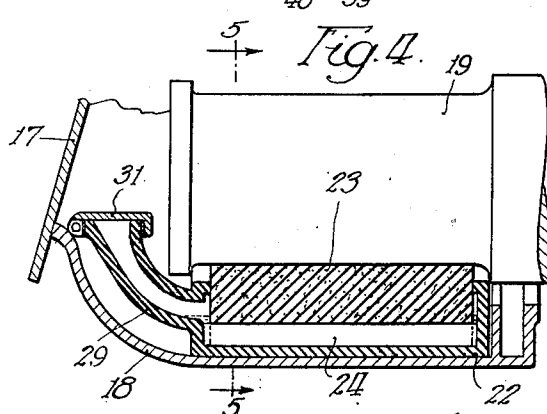
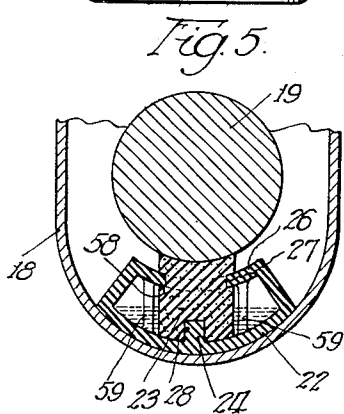
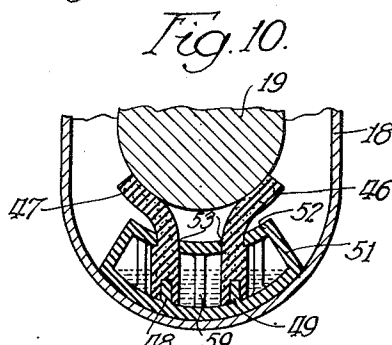
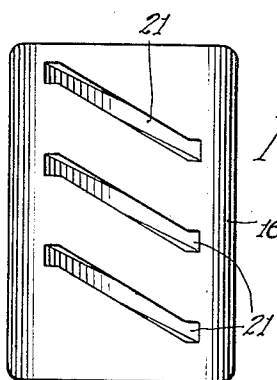
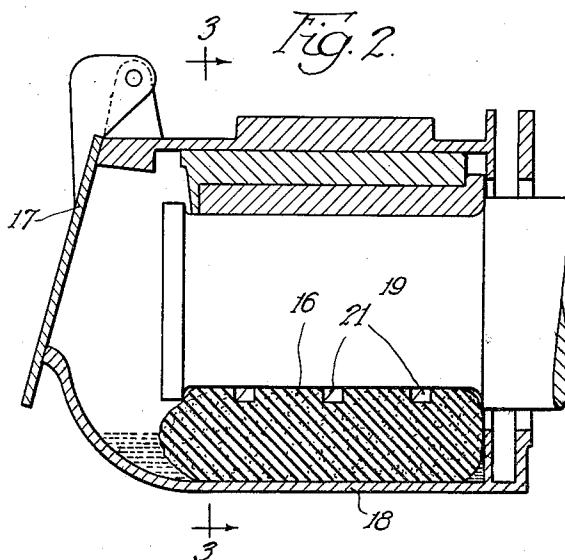
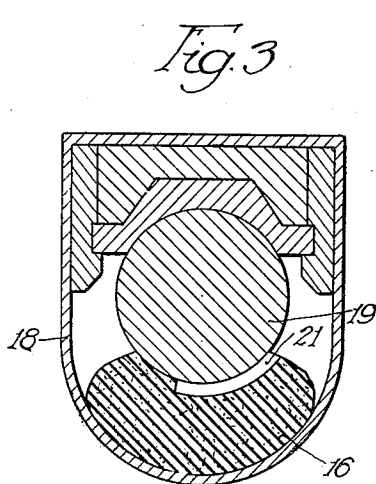
B. A. KEELER ET AL

2,138,971

LUBRICATOR FOR RAILWAY CAR JOURNALS

Filed May 22, 1935

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 7

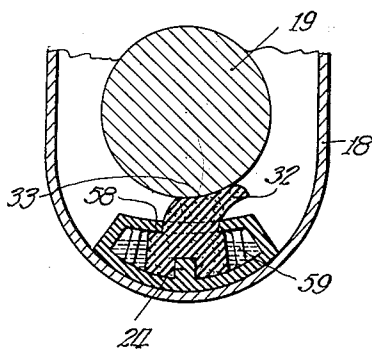


Fig. 6

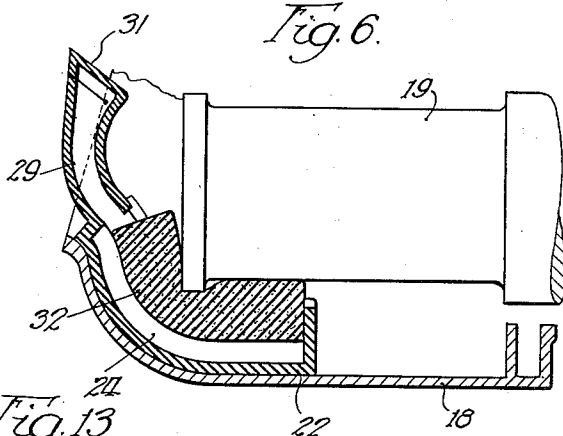


Fig. 13

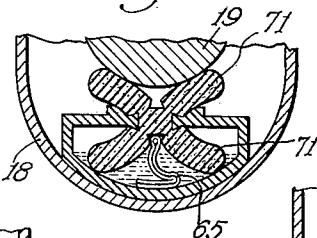


Fig. 8

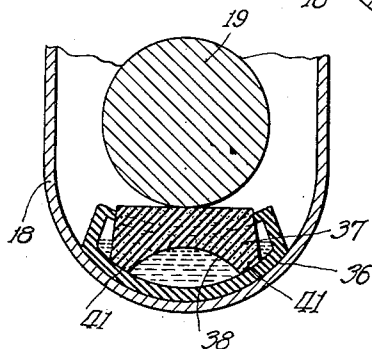


Fig. 9

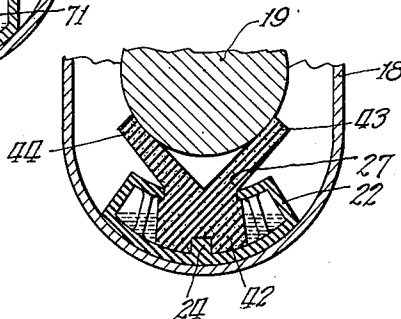


Fig. 11

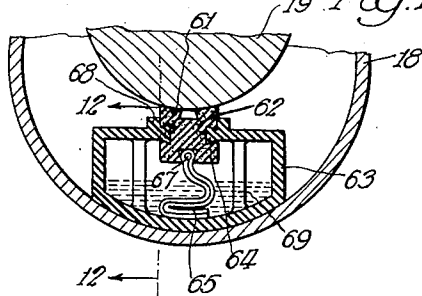
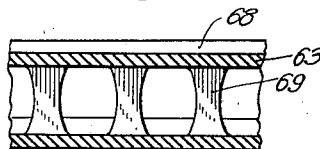


Fig. 12



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UNITED STATES PATENT OFFICE

2,138,971

LUBRICATOR FOR RAILWAY CAR JOURNALS

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Application May 22, 1935, Serial No. 22,792

14 Claims. (Cl. 308—87)

This invention relates in general to journal lubrication, and in particular to a lubricator for railway car journals, and other journals having similar problems of lubrication, especially those in which dirt, dust or moisture are likely to cause trouble.

Previously, oil saturated waste material or oil saturated felt pads have been introduced into the bearing box of the journals for the trucks of the railway cars to distribute the lubricant over the surface of the journal. Although a felt pad has been preferable to the use of ordinary waste, in the use of any fibrous material, it has been found that constant rotation of the journal shreds such material. Due to irregularities of the surface of the journal and perhaps due to other causes, any fibers, dust or dirt which may collect on the journal get between the bearing and the journal to eventually clog up the bearing, wiping the oil off of the journal. Furthermore, the waste or fabric becomes glazed along its top surface and sometimes carbonizes slightly to almost stop the flow of oil due to capillary action through the lubricator to the journal. In any such case the journal usually becomes hot and necessitates immediate attention. This type of a lubricator requires constant attention and a large amount of lubricant in order that the lubricator may properly perform its function of conveying lubricant from the bottom of the journal housing to the journal itself. This single problem of lubricating the journal on freight cars in particular has restricted the length of non-stop hauls on the railroads. It is necessary that the fabric lubricator be mounted in the journal box in a manner such that it will remain in uniform engagement with the journal and be spring pressed to take up wear in its use. Metal springs of one type or another have been employed to accomplish this purpose. The springs not only wear out and necessitate expensive replacement in maintenance, but are inefficient in operation, as dirt and dust collect in the journal box.

It is an object of our invention to provide an improved lubricator for railroad car journal bearings.

A further object is to provide a lubricator which may be easily inserted and removed from a journal box for general maintenance purposes.

Another object is to provide a lubricator for railroad car journal bearings which will not shred or wear so as to add shredded particles to the journal or bearings and clog the same to cause a hot box therein, nor glaze on the surface so as

to prevent passage of oil therethrough to the journal.

A still further object is to provide a lubricator of such material that it is non-soluble in oil and capable of long continued use.

It is also an object to provide a lubricator for railway car journals of such material and of such a structure as to promote capillary action of the oil therein to feed said oil to the journal.

Another object is to provide means for keeping water and other foreign matter out of the oil in the journal box.

A still further object is to provide a lubricator having a natural resiliency, such that it will take up wear and remain in uniform engagement over the surface of the journal to feed lubricant thereto.

Other objects and advantages will be apparent from the following description, taken with the drawings, in which:

Fig. 1 is a top plan view of a one-piece sponge rubber lubricator;

Fig. 2 is a longitudinal sectional view of the lubricator of Fig. 1 in position in a standard railway journal box;

Fig. 3 is a sectional view along the lines 3—3 of Fig. 2;

Fig. 4 is a longitudinal sectional view of a modified embodiment of our invention illustrating a lubricator mounted in a separate oil reservoir in a journal box;

Fig. 5 is a cross sectional view along the lines 5—5 of Fig. 4;

Fig. 6 is a sectional view illustrating the manner in which our lubricator is inserted in the journal box;

Fig. 7 is a sectional view of a modification of the lubricator similar to the structure of Fig. 5;

Fig. 8 is a sectional view of a still further modification of our invention;

Fig. 9 is a sectional view of a further modification showing a split rubber lubricator;

Fig. 10 is a cross sectional view of another embodiment of our invention;

Fig. 11 is a transverse cross sectional view of another modification of our invention; and

Fig. 12 is a longitudinal cross sectional view of the reservoir shown in Fig. 11.

In practicing our invention we provide a lubricator for railway car journals comprising a yieldable lubricant applicator, preferably a sponge rubber material non-soluble in oil, which is retained in a closed rubber oil reservoir. The oil reservoir and the applicator therein are yieldable to slip under the journal and positioned against

movement on the bottom of the journal housing. Oil is fed up through the applicator from the reservoir by capillary attraction assisted by the slight contraction and expansion of the sponge rubber applicator resulting from the movement of the journal in the bearing.

Referring now to the drawings, a sponge rubber applicator 16 in the general shape of a pad, is inserted through a hinge over 17 in a journal box 18 to lie between the bottom of the journal box and the journal 19 itself. The pad 16 is of such a length as to engage the surface of the journal over its entire length, as shown in Fig. 2, and wide enough to engage a substantial portion of the circumference of the journal, as shown in Fig. 3. Oil is fed to the journal box to lie in the bottom thereof, as shown in Fig. 2, and to travel by capillary attraction up through the pad 16 to the surface of the journal. The pad 16 is of such a height as to be slightly compressed when lying in operating position and resiliently engaging a portion of the surface of the journal.

In the operation of a railway car, dirt and grit collect in the journal box, and to prevent this dirt from engaging and remaining on the surface of the journal, inclined channels 21 are provided over the surface of the sponge rubber pad 16 to collect and retain the dirt out of contact with the surface of the journal. Collecting the dirt in this manner maintains the engaging surface of the pad comparatively clean to keep the pores of the rubber open for the movement of the oil, and prevents undue wear on the journal due to such foreign matter.

A modification of our invention is illustrated in Figs. 4 and 5 in which a flexible rubber box and oil reservoir 22 is provided to slip through the hinge cover 17 of the journal box and under the journal to carry a sponge rubber applicator 23 removably mounted on a stub flange 24 on the bottom of the box and bear against the surface of the journal. A closed box 22 is provided, formed from a rubber compound non-soluble in oil. A cover 26 is provided for the box with a slot 27 over the length thereof to permit the projection of the rubber applicator 23. The applicator 23 is formed from sponge rubber non-soluble in oil in the shape of a rectangular block with a longitudinal channel 28 along the bottom surface adapted to fit over the flange 24 in the box. The applicator may be spread out slightly at the base so as to carry a greater amount of oil in the applicator itself to feed to the journal.

Oil is fed to the reservoir through an integral rubber neck 29 on the reservoir through the hinged cover 31 accessible from the hinge cover 17 of the journal box. With this construction the entire box is closed to dirt, grit, and water to keep the oil clean and prevent clogging of the pores of the applicator so as to stop movement of the oil and prevent its application to the journal. Serious difficulties are sometimes encountered in the winter when water in the present lubricator or oil reservoir freezes. As stated, any such a condition, in the prior art, coupled with glazing due to wear, and with carbonization, causes hot-boxes. The boxes and supported applicators are of different lengths to fit different sized journals. In a commercial embodiment of the invention we have found that a 7" x 9" box 22 with side walls approximately 2" high is very satisfactory for a 5" x 9" journal.

In the structure of Figs. 4 and 5, the oil is

fed upwardly through the lubricator 23 by capillary attraction, as previously described.

Figs. 6 and 7 illustrate a further modification of our invention with Fig. 6 also applicable to the structures of Figs. 4 and 5 as well as 8, 9 and 10, so far as illustrating the manner in which the device is inserted into the journal box and positioned under the journal. The oil reservoir of Figs. 6 and 7 is identical with that of Fig. 4. The sponge rubber applicator 32 is supported on the flange 24 in the manner previously described. The applicator 32 is slightly higher than the applicator 23 of Fig. 4 and considerably higher than the distance between the bottom of the box and the journal 19, and when positioned under said journal, lies to one side thereof to engage the journal in a wiping action, as shown. The top portion 33 is resiliently depressed and may be slightly curved and, when positioned on one side of the journal, engages the same over a comparatively wide surface. In this embodiment the oil is fed up through the applicator to the journal in the manner previously described. Although shoulders 58 and reinforcing tie members 59, both discussed hereinafter, have been illustrated in Figs. 4 and 7, they probably would not be needed, especially in the structure of Fig. 4.

A further embodiment of the invention is illustrated in Fig. 8 and includes an imperforate rubber box 36 similar to the box 22. A lubricator 37 in the form of a wide sponge rubber block with a longitudinal concave channel 38 in the bottom thereof is centered in the box 36 with a portion extending through the top 39 of the box and bearing against the journal 19. The lubricator 37 is supported on the legs 41 on each side of the channel 38 and is of a height so that the top surface bears against a substantial portion of the circumference of the journal as well as its entire length. Oil is supplied to the box 36, as shown by dotted lines, to stand slightly higher than the channel 38 when the box is finally positioned in the journal housing 18. The slight bumping of the journal at times, due to irregularities in the road bed, in turn exerts an irregular pressure against the lubricator 37. This causes a pumping action due to the channel 38 along the middle of the lubricator which assists in feeding the oil by capillary attraction up through the lubricator.

Fig. 9 illustrates a still further modification of our invention in which a sponge rubber applicator 42 is mounted in a box 22 in the same manner as the embodiment of Fig. 5. The lubricator is split over the upper portion thereof extending through the elongated aperture 27 in the top of the box to form a substantial Y-shape and bear against opposite surfaces of the circumference of the journal. This provides a rather broad wiping surface for the lubricator over which to apply oil to the journal, and provides a very satisfactory lubricating means. The natural resiliency of the sponge rubber causes the two legs 43 and 44 to bear against the journal in uniform engagement and take up any wear therein.

In Fig. 10 we illustrate another embodiment of our invention including a pair of sponge rubber lubricators 46 and 47 mounted on longitudinally extending beads 48 and 49 along the bottom of a rubber box or oil reservoir 51. The box is provided with a closed top 52 having a pair of slots 53 through which the lubricators extend. The lubricators are long enough to extend up practically to the midpoint of the journal and with the beads 48 and 49 formed inside the vertical plane of the two

opposite surfaces of the journal, the lubricators are bent outwardly slightly and engage the surface of the journal with sufficient resiliency to provide the desired effect noted above. This embodiment provides a double protection in that each lubricator is independent of the other, and even though the capillary action to feed the oil might fail in one, it is quite certain that it would be effective in the other to give certain lubricating to the entire journal.

It is thus seen that we provide a simple inexpensive lubricator which, because it is formed of sponge rubber, has a porous body with a maximum amount of capillary action to feed oil from a reservoir to the railway journal. In providing a resiliency in the body of the lubricator itself, the lubricator takes up wear and maintains a uniform engagement with the surface of the journal. The rubber oil reservoir provides a very satisfactory protection for the lubricator against dirt, dust and metal particles, and because of its flexibility may be readily inserted in and removed from the journal housing.

Wherever the shape of the lubricator is such that it should be anchored down, this may be accomplished by providing laterally extending shoulders 58 on the lower portion of the lubricator, engaging the under surface of the top of the reservoir. When this is done, and possibly at other times, it may be desirable to provide reinforcing tie members 59 between the top and bottom engagement with the surface of the journal. Such members shaped like the members 69 of Fig. 12.

It should also be noted that the portion of the lubricator above the reservoir may be extended slightly laterally, in all of the forms in which the rubber reservoir is used. If this is done when the portion of the lubricator below the top of the reservoir is also extended laterally, longitudinal grooves are thereby formed in which the edges of the slot or slots on the top extend.

Fig. 11 illustrates another modification of our invention in which an applicator 61 is provided which may be turned to four different positions so that, if one side becomes glazed or otherwise unsatisfactory, the applicator may be turned to a new position to present a fresh side to the journal 19. This applicator is preferably made of sponge rubber non-soluble in oil. Extending the length of each side of the applicator 61 is formed an undercut groove 62. The applicator is supported by a flexible closed rubber box and reservoir 63 having a central opening in its top for the reception of the applicator 61 and having longitudinal tongues 64 along the side of said opening to extend into the grooves 62. The tongues 64 are preferably thickened at their extremities, as illustrated.

Into the bottom groove 62 of the applicator 61 is fitted a feeder wick 65 which may be formed of any material which forms a good wick regardless of its wearing qualities. It is therefore possible to use the material which will make the best possible feeder regardless of other considerations. Such a material may, for example, be a felt or a woven fabric. It is preferably long enough so that its upper end may be drawn out of the box for insertion in the applicator 61 before the applicator is inserted in the box. The upper end of the wick 65 may be formed with an enlarged head by folding it over and inserting in the top of the fold a rod 67. Outstanding ribs may be formed on the top of the box 63 adjacent to the applicator 61 so as to reinforce the

same and to make the top of the box 63 somewhat firmer. To further support the top of the box 63 a longitudinally extending bridge should be provided comprising spaced pillars 69 separated by suitable holes through which the oil within the box 63 may pass to the wick 65. These holes, or some of them, should extend to the bottom of the inside of the box so that there will be no danger of oil being caught on the outside of the bridge.

In the event that one side of the applicator 61 becomes glazed or clogged up with dirt so that it no longer applies oil properly to the journal, the reservoir 63 with the applicator 61 therein may be removed from the journal box, the applicator 61 removed from the reservoir 63, the wick 65 shifted to a different groove in the applicator 61, and the applicator replaced in the reservoir with a different side up. It may be mentioned that, although the glazed face may be turned down, feeding of the oil to the applicator will not be interfered with since the inside surfaces of the slots 62 never contact the journal 19 and therefore never become glazed, and it is these inside surfaces which are contacted by the wick 65. With the applicator turned to a new position and in a place in the reservoir 63, the reservoir and applicator are again placed in the journal box, and the reservoir is again filled with oil.

In Fig. 13 is illustrated a form of the invention, the applicator 71 of which has most of the advantages of both the Fig. 9 form and the Fig. 12 form, being changeable to four positions and yet resiliently embracing the journal and extending down into the oil. In Fig. 13 the applicator is illustrated as depressed in use. In its natural shape its four arms are straight and at right angles to one another. The use of the wick 65 is optional and, if it is not used, the applicator may have a more simple X shape, and be stronger at its center than with the grooves as shown. The applicator 71 may be made of sponge rubber or felt or of fabric wrapped around an X-shaped metal frame.

Although one of the important features of this invention is the use of a sponge rubber unaffected by oil, some of the advantages may be secured even though the applicator is made of a different material, such as felt. This is particularly true with respect to the structures of Figs. 11 and 13 in which the applicator may be turned to present fresh faces to the journal when needed. It is also within the scope of this invention to use ordinary rubber for the oil reservoir, coating its inner surfaces and any other surfaces which are likely to contact the oil with an oil resisting material, such as a rubber unaffected by oil or any flexible oil resisting paint or varnish. Such coating may be applied in any suitable manner, as by spraying. Furthermore, it should be understood that by the term "rubber" is meant either a compound made mainly from natural rubber or any substitute therefor having the desired qualities thereof.

The chief commercial rubbers which we contemplate using in the applicator and to form any other rubber surfaces exposed to oil are a polymerized chloroprene mixed with suitable compounding ingredients and known commercially as "Duprene", or an olefin-polysulfide reaction product mixed with suitable compounding ingredients and known commercially as "Thiokol", or a chlorinated rubber such as rubber hydrochloride. Of course, when the sponge rubber is molded to shape and a skin therefore formed on the applicator, the skin should be removed.

Likewise it may be mentioned that in any modification the reservoir or box may be made of metal, preferably having either a rubber top or a rubber rim around the hole through which the lubricant applicator passes, this rubber top or rim gripping the applicator and sealing the box. The resilient or flexible lubricator also assists in sealing this hole by bearing resiliently against the sides thereof. If the box is not made of metal, any portions thereof which are likely to contact the axle at the ends of the journal should be made of metal or sheathed with metal to prevent their being cut by said axle.

Although the spiral grooves for cleaning foreign matter off of the journal have been shown only in Fig. 1, it should be realized that such grooves or any other grooves extending more or less transversely to the movement of the surface of the journal may be provided in the upper surface of the applicators in any of the modifications. Furthermore, in such structures as that shown in Fig. 4, where the side of the applicator is vertical or steeply inclined and has its upper edge contacting the journal, this upper edge will to a large extent clean foreign matter off of the journal.

In Fig. 6 the cap of the reservoir has been shown as a rubber cap 31 formed integrally with the neck 29. It should be realized that in all of the modifications for reservoirs, the reservoir may be provided with either style of cap.

The drawings have illustrated the reservoirs as containing a substantially free body of oil. In many instances, as where the lubricator is to be used in an inverted or steeply inclined position, it will be desirable to fill the reservoir with cotton waste so that the oil will not be spilled.

Although we have described our invention in its preferred embodiment, it is understood that we are not limited thereby, but limit our invention only by the scope of the appended claims.

We claim:

1. In a railway journal box, a flexible and removable inner box forming a reservoir for oil and lubricating means within said inner box for raising the oil by capillary attraction and applying it to a journal, said inner box having a flexible top having a longitudinally extending hole formed therein and said lubricating means including an applicator extending through said hole and having lateral extensions beyond said hole and under said top whereby said applicator is anchored in said box.

2. In a railway journal box, a flexible and removable inner box forming a reservoir for oil and an applicator within said inner box for raising the oil by capillary attraction and applying it to a journal, said applicator having a longitudinally extending channel therein and said box having a longitudinally extending rib thereon projecting into said channel for properly positioning the applicator in said box.

3. In a railway journal box, a lubricant applicator having longitudinal grooves along its sides; and a pair of spaced parallel tongues supported within said journal box and extending into said grooves for properly positioning said applicator, said applicator raising oil from below at least one of said tongues by capillary attraction.

4. In a railway journal box, a lubrication applicator having longitudinal grooves along its sides; and a pair of spaced parallel tongues supported within said journal box and extending into said grooves for properly positioning said applicator, said applicator raising oil therein by

capillary attraction and having a plurality of sets of such grooves whereby it may be turned to position any one of a plurality of faces uppermost.

5. In a railway journal box, a lubrication applicator having longitudinal grooves along its sides; and a pair of spaced parallel tongues supported within said journal box and extending into said grooves for properly positioning said applicator, said applicator raising oil therein by capillary attraction and having a plurality of sets of such grooves whereby it may be turned to position any one of a plurality of faces uppermost, and a wick engaging a lower portion of said applicator to supply oil thereto.

6. In a railway journal box, a lubrication applicator having longitudinal grooves along its sides; and a pair of spaced parallel tongues supported within said journal box and extending into said grooves for properly positioning said applicator, said applicator raising oil therein by capillary attraction and having a plurality of sets of such grooves whereby it may be turned to a position any one of a plurality of faces uppermost, and a wick secured in one of said grooves left vacant by said tongues for supplying oil to said applicator.

7. In a railway journal box, a flexible and removable inner box forming a reservoir for oil and lubricating means within said inner box for raising the oil by capillary attraction and applying it to a journal, said inner box having a flexible top having a longitudinally extending hole formed therein and said lubricating means including an applicator extending through said hole and having lateral extensions beyond said hole and under said top whereby said applicator is anchored in said inner box, and reinforcing connecting members extending between the top and bottom of said inner box and spaced from the side walls thereof.

8. In a railway journal box, a flexible and removable inner box forming a reservoir for oil and a wick within said inner box for raising the oil by capillary attraction and applying it to a journal, said inner box having a flexible top having a longitudinally extending hole formed therein and said wick extending through said hole and having lateral extensions beyond said hole and under said top whereby said wick is anchored within said box, and reinforcing connecting members extending between the top and bottom of said inner box and spaced from the side walls thereof, said reinforcing means comprising a bridge extending the length of said box and formed integrally therewith but provided with openings through which oil may pass from one side of the bridge to the other.

9. In combination with a railway car journal, a bearing for said journal, a journal box enclosing said bearing and said journal, lubricating oil in said journal box, and lubricating means in said journal box including an applicator for raising oil by capillary attraction and having an upper surface in contact with said journal for applying the oil thereto, and having an upwardly extending surface forming a sharp angle with said upper surface and forming therewith a corner in contact with said journal and extending along it lengthwise thereof to remove foreign matter therefrom.

10. In combination with a railway car journal, a bearing for said journal, a journal box enclosing said bearing and said journal, lubricating oil in said journal box, and lubricating means in said

journal box including an applicator for raising oil by capillary attraction and having an upper surface in contact with said journal for applying the oil thereto, and having an upwardly extending surface forming a sharp angle with said upper surface and forming therewith a corner in contact with said journal and extending along it lengthwise thereof to remove foreign matter therefrom, and said lubricating means forming a pocket for receiving said foreign matter and retaining it separate from said oil.

11. In a journal lubricating apparatus for use with a journal and a journal box therefor, an apertured partition for providing a lubricant reservoir at the bottom of said journal box, a lubricant applicator including a bi-part assembly having a sponge rubber lubricant conducting part removably retained in said aperture and bearing against said journal and a fabric lubricant conducting part lying in the lubricant in said reservoir and in engagement with said first part to conduct the lubricant thereto.

12. In combination with a railway car journal, a journal box for said journal and a one-piece rubber oil reservoir for collapsible insertion in the journal box and adapted to expand to normal size upon complete positioning within the box, a

combination oil feed and journal lubricant applicator retained in said reservoir with a portion extending through said reservoir comprising a multi-part assembly with one part comprising a sponge rubber material and another part comprising a fabric material in direct connection and cooperating to lubricate the journal.

13. In a journal box, a lubricator including a lubricant reservoir having a pair of spaced apart parallel flanges on the top thereof, an applicator for said reservoir grooved on four sides thereof in a manner whereby two oppositely disposed grooves fit into said flanges to be supported thereby, and a lubricant feed device removably secured in another of the grooves on said applicator and extending into the lubricant supply to feed lubricant to the applicator.

14. A lubricant feed device in the combination defined in claim 13 comprising a fabric member having a rod retaining fold in the top thereof, and a rod for insertion in said fold for supporting said fabric at that portion for removable insertion of the feed device at that portion in another of the grooves of the applicator.

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