

May 22, 1956

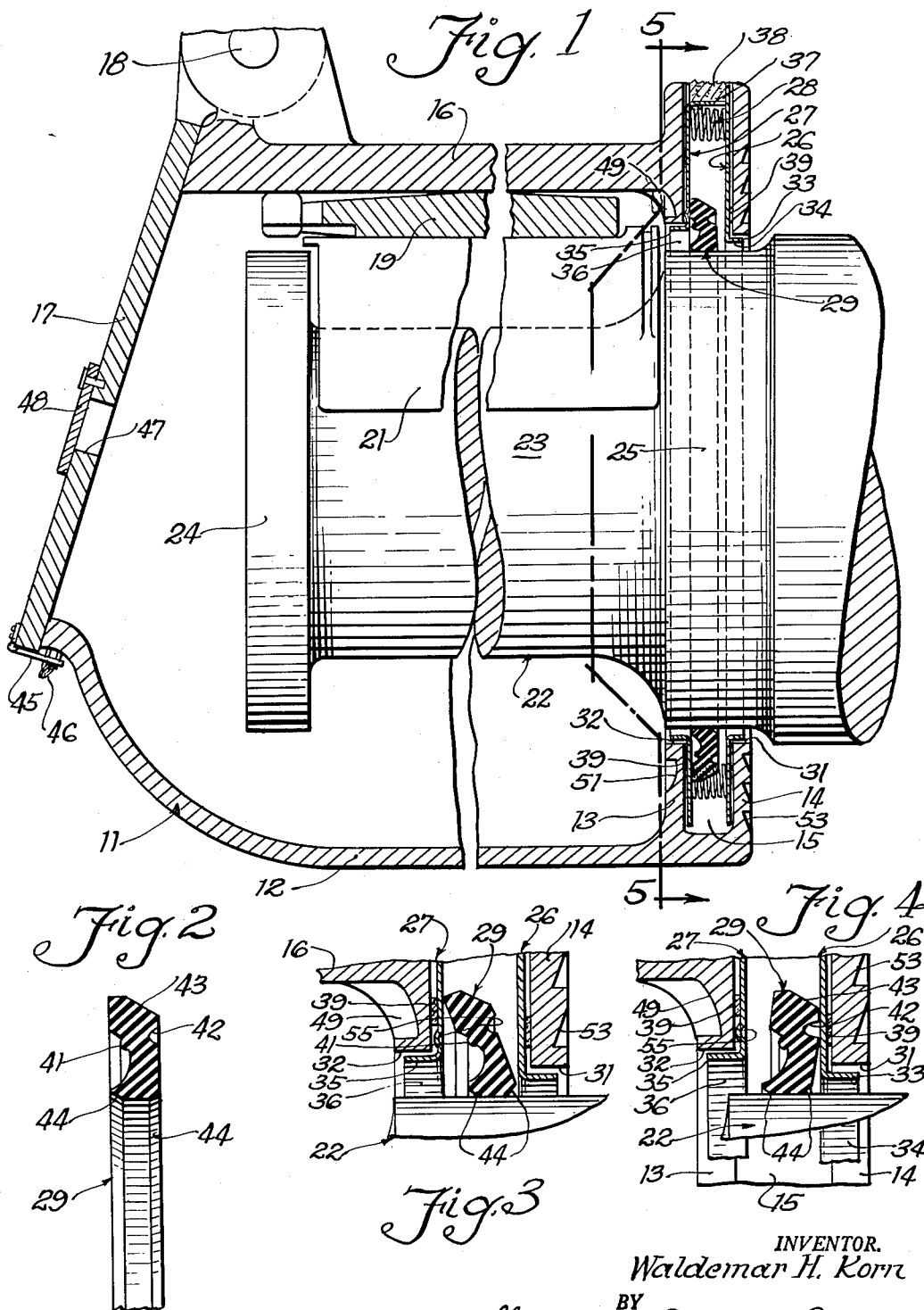
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GUARD AND OIL-RETAINING MEANS FOR RAILROAD JOURNAL BOX

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2 Sheets-Sheet 1



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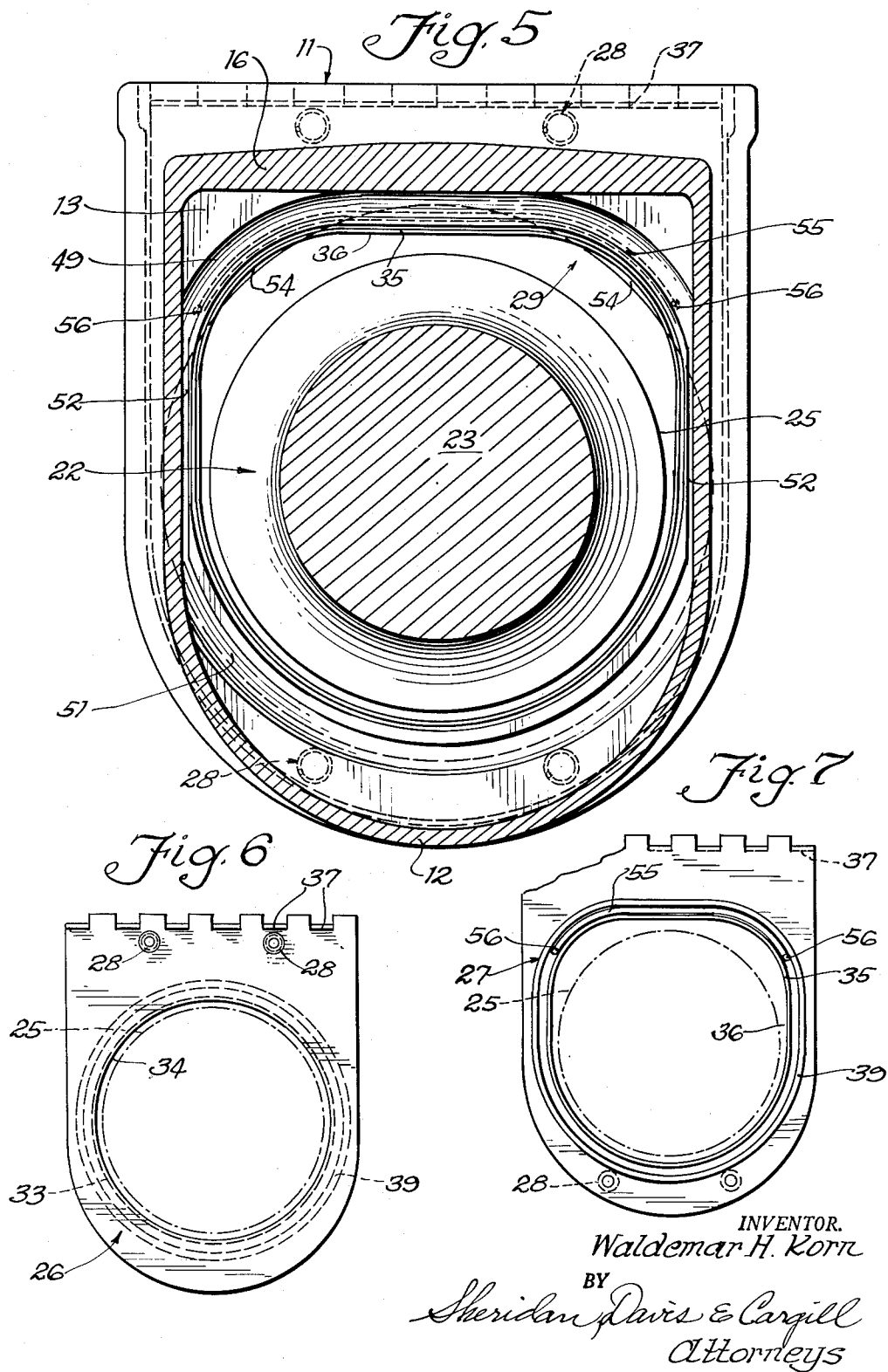
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GUARD AND OIL-RETAINING MEANS FOR RAILROAD JOURNAL BOX

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8 Claims. (Cl. 286—6)

This invention relates in general to railroad journal bearings, and more particularly to improvements for use in any standard type of journal bearing box.

A principal object of the invention is to provide a guard and oil-retaining means of relatively simple and cheap construction for use in any standard type of journal box to prevent the loss of oil therefrom and the introduction therinto of dirt, water and other foreign materials, while permitting "breathing" or the escape from the journal box of heated air.

These desired results are attained by a guard and oil-retaining means comprising a pair of pressure plates, preferably of metal, such as aluminum, which are mounted in spaced and opposed relationship to each other in the usual dust guard well of the journal box and are spaced from and surround the journal, and a ring of any suitable oil- and heat-resistant resilient material, such as a synthetic rubber having those characteristics, which is mounted on the journal for rotation therewith between the pressure plates and preferably has a cross section which is reduced laterally between its inner and outer diameters, with an inner diameter slightly smaller than the journal, so that it will assume either an outwardly or inwardly "dished" or concave shape, which concavity may be reversed in response to lateral axial shifting of the journal relative to the journal box, to insure contact with one or the other of the pressure plates.

Another object of the invention is to effect a "throwing" forwardly into the journal box of any oil trying to escape rearwardly therefrom, and rearwardly toward the associated wheel of any water or other liquid trying to enter the journal box, by forming annular grooves and chamfers on the lateral surfaces of the resilient ring which will present liquid-deflecting surfaces during rotation of the ring for properly directing the oil and water coming into contact therewith.

A further object is to insure retention of the pressure plates in proper position in the dust guard well of the journal box while preventing contact thereof with the journal, which is accomplished by providing forwardly and rearwardly extending flanges on the front and rear pressure plates, respectively, that define axle-clearance apertures and are engageable in the axle-receiving apertures in the box, and resilient means interposed between the inner surfaces of the plates.

The axle-receiving aperture in the inner wall defining the dust guard well customarily is enlarged at its upper end to provide clearance for the inner end of the journal bearing in the event of excessive inward or rearward movement thereof by and axially of the journal, due to wear. Consequently, the axle-clearance aperture in the inner or forward pressure plate is similarly shaped, rather than being circular as in the outer or rearward pressure plate nearest the wheel, so that the upper corner portions of this axle-clearance aperture normally extend radially of the axle a slightly greater distance than the outer diameter of the resilient ring to provide breathing spaces communicating with the interior of the journal box.

A further object of the invention is to prevent oil losses

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from the outer or front end of the journal box and unauthorized access to the interior thereof by sealing the usual cover plate, while, at the same time, permitting visual inspection of the oil supply in the box and the introduction of oil thereto, which is accomplished by providing two vertically spaced and normally closed ports in the cover plate.

Another object is to facilitate return to the bottom of the journal box of excess oil carried to the upper rearward portion thereof and to prevent such excess oil from flowing onto the journal rearwardly of the brass or bearing, so as to reduce the amount of oil which the resilient ring is required to restrain from escaping from the box.

A similar object of the invention is to reduce the amount of water and other liquids which the resilient ring is required to restrain from entering the rear or wheel end of the journal box.

These latter two objects are attained by providing liquid-collecting grooves in the inner vertical surface of the rear wall of the journal box, and in the outer vertical surface of the rear wall defining the dust guard well, respectively, which are substantially concentric to the axle, so as to collect such liquids in their upper portions and direct the downward flow thereof around the associated axle-receiving aperture.

Another object is to so design the instant guard and oil-retaining means that it may be substituted in any standard journal box for the dust board customarily employed therewith, while permitting use of the conventional dust guard well packing plug without interfering with the operation of the resilient ring forming a part of my device.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, when taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

In the drawings:

Figure 1 is a vertical section taken through a standard railroad journal box longitudinally of the journal showing a preferred embodiment of the instant invention;

Fig. 2 is an enlarged detail section through the resilient ring forming a part of the instant device to show the cross-sectional shape of the ring before mounting thereof on the journal;

Fig. 3 is an enlarged vertical section similar to Fig. 1 showing the resilient ring in a forwardly dished or concave position assumed in response to rearward axial movement of the journal relative to the box;

Fig. 4 is a view similar to Fig. 3 showing the resilient ring in a convex or rearwardly dished position assumed in response to forward movement of the journal to the left of its position of Fig. 3;

Fig. 5 is a vertical section transversely of the journal taken substantially on the line 5—5 of Fig. 1;

Fig. 6 is a detail elevational view of the outer pressure plate, as seen from the forward or inner side thereof; and

Fig. 7 is an elevational view of the inner pressure plate, as seen from the inner side thereof.

Referring more particularly to Figs. 1 and 5, reference numeral 11 indicates in general a railroad journal box of any standard construction which comprises an oil well or bottom portion 12, a vertical inner rear wall 13, an outer rear wall 14, which together with the wall 13 defines the usual dust guard well 15, and an upper wall 16, all of which are cast as an integral unit in well known manner. The open forward end (the left end in Fig. 1) of this journal box 11 normally is closed by a cover plate 17 pivotally attached at 18 in the usual manner to the upper wall 16. Interposed between the latter and a standard brass or bearing 19 is the usual wedge 21, and the brass is supported on the outer bearing portion of the

journal 22 in the customary way. The journal or axle 22, as best seen in Fig. 1, is of standard construction, including a reduced bearing portion 23 upon which the brass 19 is mounted, an outer flange 24 and an inner flange or collar 25 normally of substantially the same diameter as the outer flange 24, inwardly or to the right of which (Fig. 1) is mounted the car wheel (not shown). Normally included in the lower part 12 of the journal box 11 is any suitable device for delivering oil to the journal, such as a waste pack or lubricating pad (not shown), and the journal box 11 thus comprising the lubricating oil supply means for the journal 22 and its bearing 19.

The guard and oil-retaining means which constitutes the heart of the instant invention is adapted to be mounted in the dust guard well 15 in lieu of the standard dust guard, and preferably comprises a pair of outer and inner pressure or surface plates 26 and 27, respectively, resilient means 28 for maintaining the same in proper position therein, and a resilient ring 29 mounted on and frictionally engaging the inner flange or collar 25 of the journal and disposed between the two pressure plates. In some types of standard railroad journal boxes, the dust guard well 15 is substantially rectangular in cross section transversely of the journal, having a square bottom or lower end, as does the journal box itself, while in other types of standard construction, the journal box and the dust guard well are rounded at their lower ends in the manner herein illustrated. The outer shape and dimensioning of the plates 26 and 27 therefore will be dictated by the particular configuration and dimensions of the journal box in which they are to be installed. As best illustrated in Figs. 6 and 7, the pressure plates 26 and 27 of the instant embodiment are provided with rounded lower ends having a diameter somewhat less than that of the rounded bottom portion of the dust guard well 15. This difference in diameters is intentional in order to facilitate mounting of the pressure plates regardless of any irregularities in the conformation of the dust guard well which may result from the casting of the journal box or residual core sand left therein. While the lower portions of these pressure plates may be given a substantially rectangular shape, if the same are to be employed in a journal box having a flat-bottomed dust guard well, it will be appreciated that pressure plates having the shape illustrated in Figs. 6 and 7 may be employed equally well in such journal boxes.

The outer rear wall 14 of the journal box 11 is provided with the usual journal- or axle-receiving aperture 31 (Fig. 1) which is circular in shape and substantially larger in diameter than the flange 25 of the journal, and the inner rear wall 13 likewise is provided with an axle-receiving aperture 32 (Fig. 5) coaxially aligned therewith relative to the journal. As previously noted, this axle-receiving aperture 32 in the inner wall 13 customarily is enlarged at its upper end, as compared with the outer axle-receiving aperture 31, to provide clearance for the inner end of the journal bearing 19 in the event of excessive rearward (to the right in Fig. 1) movement of the bearing by the outer flange 24 of the journal, which may result from excessive wear, particularly of the rounded bearing-engaging shoulder of the journal adjacent flange 25 at the opposite side of the car. In other words, the upper portion of this inner axle-receiving aperture 32 is enlarged, as best seen in Fig. 5, to avoid any possibility of breakage of the inner wall 13 by axial shifting of the brass 19.

Means are provided for maintaining the opposed pressure plates 26 and 27 in their proper assembled position of Fig. 1 in the dust guard well 15, in addition to the resilient means 28, which comprise a rearwardly extending flange 33 on the outer pressure plate 26 of slightly smaller diameter than the axle-receiving aperture 31, which defines a journal- or axle-clearance aperture 34 (Figs. 1 and 6), and a forwardly extending flange 35

on the inner pressure plate 27 of substantially the same axially-transverse shape as, and of somewhat smaller dimensions than, the inner axle-receiving aperture 32 and defining an axle-clearance aperture 36 (Figs. 5 and 7). In their assembled positions of Fig. 1, the pressure plates 26 and 27 are retained by their resilient means 28 to maintain these flanges 33 and 35 in their respective apertures 31 and 32 to prevent any appreciable movement relative to the journal box.

The upper edges of the pressure plates 26 and 27 preferably are provided with a plurality of cooperating tabs 37 (Figs. 1, 6 and 7) formed by being struck forwardly from the plate 26 and rearwardly from the plate 27 in staggered relationship relative to each other, with the tabs on one plate disposed in substantially the same horizontal plane, and alternately arranged, as those of the other. These tabs 37 are shorter from front to rear of the journal box than the flanges 33 and 35, for a reason to be later explained, and together define a horizontal shelf (Fig. 1) to prevent the usual or conventional dust guard well packing plug 38 from being driven downwardly into interfering relationship relative to the resilient ring 29. The outer surface of the pressure plate 26 and the inner surface of the plate 27 preferably are provided with suitable gasket means 39 disposed adjacent their respective flanges 33 and 35 for insuring liquid-sealing engagement of the pressure plates with their associated vertical walls 14 and 13 of the journal box, since the inner surfaces of these walls normally are of relatively rough conformation. The resilient means 28 for maintaining the pressure plates in such engagement with the vertical walls of the dust guard well 15 are illustrated herein as comprising a pair of coil springs attached by means of suitable rivets to the upper portion of the pressure plate 26 (Fig. 6) adjacent the tabs 37 and extending forwardly therefrom, and a similar pair of coil springs secured to the outer surface of the lower portion of the inner pressure plate 27 (Fig. 7). Any other suitable resilient means may be employed for this purpose, if desired, such as synthetic rubber cushions similarly mounted on the opposed pressure plates.

As previously noted, these pressure plates 26 and 27 preferably are stamped for a suitable metal, such as aluminum, and the ring 29 is formed from some oil- and heat-resistant resilient material, such as a synthetic rubber having those characteristics. Referring particularly to Fig. 2, the resilient ring 29 is given such a reduced cross-sectional shape that it will assume either an outwardly or inwardly dished or concave form when mounted on the collar 25 of the journal 22, in response to axial shifting of the journal relative to the journal box, so as to insure sealing contact with one or the other of the pressure plates 26, 27. To attain such functioning of the ring 29, its inner lateral surface is provided with an annular groove shaped to form therein an annular rib 41, its outer lateral surface is provided with an annular groove 42 of slightly greater median diameter than the rib 41, and the outer corner of this outer lateral surface is chamfered, as indicated at 43 in Fig. 2, so that the central portion of the ring is reduced in cross-sectional area. The inner diameter of the ring also is made slightly smaller than the outer diameter of the journal collar or flange 25. Consequently, when the ring is mounted thereon, as seen in Fig. 1, the resulting expansion of its inner diameter will cause the ring to assume a concave or dished shape, with its peripheral portion being disposed to the left or inwardly of its normal position relative to its inner portion. Such inwardly dished or concave form is best illustrated in Fig. 3. The inner circumferential surface of the ring 29 also is chamfered at each edge, as indicated by reference numeral 44. These chamfers better enable the ring to assume the desired concave position described, but they have a more important function which will be described hereafter.

As previously noted, it is preferred that unauthorized

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access to the interior of the journal box 11 be prevented, and this is accomplished in the instant embodiment by providing a suitable hasp-lock 45, or the like, at the lower end of the cover plate 17 (Fig. 1) which may be sealed against unauthorized opening by means of a conventional metal seal 46. So sealing the cover plate of the journal box also prevents oil losses from the outer or front end thereof. However, it is essential that inspection personnel have ready visual and oil-introducing access to the interior of the box, so that the cover plate is provided with two horizontally spaced ports 47, each normally closed, as by means of a smaller cover plate 48 pivotally secured to the plate 17 in any suitable manner. With this arrangement, lateral swinging of the small plates 48 to open the ports 47 permits the introduction of a light beam, as from a flashlight, to the interior of the journal box through one of the ports to enable an inspector to ascertain the oil level in the bottom portion 12 through the other port 47. At the same time, additional oil may be introduced into the journal box through this other port, if necessary.

In order to reduce the quantity of oil required to be restrained from escaping from the rear end of the box by the instant oil-retaining means 26—29, it is preferred that the inner surface of the inner rear wall 13 be provided with an oil collection groove substantially concentric with axle-receiving aperture 32 therein. As best seen in Figs. 1 and 5, this groove comprises an upper portion 49 and a lower portion 51 interconnected at their ends by narrower vertical portions 52, the latter being bounded on their outer sides by the side walls of the journal box. Likewise, in order to reduce the amount of water and other liquids which the instant guard means 26—29 are required to restrain from entering the rear end of the journal box through the axle-receiving aperture 31, it is preferred that the outer rear wall 14 be provided with a plurality of liquid collecting grooves 53 (Figs. 1, 3 and 4) cast or otherwise suitably formed therein concentrically with each other and the aperture 31.

As previously noted, the axle-receiving aperture 32 in the inner vertical wall 13 of the journal box is enlarged at its upper end (Fig. 5) sufficiently to provide clearance for rearward movement of the brass or journal bearing 21 (to the right in Fig. 1). Such standard shape of the axle-receiving aperture 32 may be employed in conjunction with the instant box-closing means to insure "breathing" from the journal box, during operation when the resilient ring 29 is in contact with the inner pressure plate 27, by so dimensioning the ring 29 that it will not completely close this upper portion of the corresponding axle-clearance aperture 36 in the pressure plate 27. In other words, when the resilient ring 29 engages the inner pressure plate 27, a narrow breather space 54 (Fig. 5) will obtain between its outer periphery and the upper corner portions of the flange 35 of this inner pressure plate, if the ring is dimensioned relative thereto as shown in Fig. 5.

Since the outer end of the journal or axle 22 extends through the apertures 34 and 36 of the pressure plates 26 and 27, it will be understood that these plates must be mounted in the dust guard well 15 of the journal box 11 before the journal box is assembled on the axle. Such mounting of the pressure plates in the dust guard well is an extremely simple matter, since it is required only that the two plates 26, 27 be placed in proper opposed relationship relative to each other and the resilient means 28 compressed sufficiently to enable them to be moved downwardly into the dust guard well through its open upper end. This is the reason that the tabs 37 must be shorter in length than the flanges 33 and 35, and such compression of the resilient means 28 is permitted by virtue of the alternate arrangement of these tabs 37 on the two pressure plates. After the same have been inserted into the dust guard well a sufficient distance to align the flanges 33 and 35 with their cooperating

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apertures 31 and 32, the resilient means 28 will function to move the pressure plates to their operative positions of Fig. 1. At any time thereafter, the conventional dust guard well packing plug 38 may be driven into, or otherwise suitably mounted in, the upper end thereof to close the same, the tabs 37 then functioning to limit downward movement of such packing. It will be understood, of course, that the resilient means 28 will maintain the gaskets 39 in sealing engagement between the walls 13 and 14 and their associated pressure plates 26 and 27, and the flanges 33 and 35 of the plates will prevent contact of the plates with the journal by virtue of their being dimensioned only slightly smaller than the associated apertures 31 and 32.

After the journal and the journal box have been brought into operative association, during the mounting of the latter, and before the introduction of the brass 21 and the wedge 19, the resilient ring 29 may readily be mounted upon the collar or flange 25 of the journal through the open forward end of the journal box. In other words, with the cover plate 17 raised and before positioning of the brass 21 and the wedge 19, it will readily be seen from Figs. 1 and 5 that a sufficient space exists between the upper portion of the aperture 36 in the inner pressure plate 27 and the axle flange 25 to permit squeezing of the resilient ring 29 therethrough in successive incremental portions as the same is rotated with or relative to the journal and relative to the journal box. It will be understood, of course, that in actual practice the journal is dropped from its normal operating position relative to the journal box, so that this upper space between it and the flange 35 of the inner pressure plate 27 is greater than that illustrated in Figs. 1 and 5. Likewise, if it should become necessary to replace the resilient ring 29 after a considerable period of use, this may be accomplished in the same manner by dropping the journal and removing the brass and wedge.

While the resilient ring 29 has an inner diameter which is slightly smaller than the outer diameter of the journal flanges 24 and 25, as previously described, nevertheless it is sufficiently resilient to enable it to be stretched over the outer flange 24 during such mounting thereof on the inner flange 25. Also, stretching of the resilient ring 29 as it is mounted on the journal collar 25, as previously noted, will cause it to assume a dish or concave position similar to that illustrated in Fig. 3. This is one of its normal positions during operation, and it rotates with the journal 22 and relative to the pressure plates 26 and 27. However, in such position of Figs. 1 or 3, the ring 29 maintains contact with the inner pressure plate 27 to prevent oil from escaping outwardly through the axle-receiving aperture 31 in the rear wall 14 of the journal box. At the same time, the chamfer 44 on the inner surface of the resilient ring 29 will function to deflect or throw back against the inner surface of the stationary flange 35 of the inner pressure plate any oil carried outwardly by the journal and into contact therewith. Such throwing action of this portion of the resilient ring will best be appreciated from the illustration given in Fig. 3. At the same time, the under surface of the annular rib 41 similarly will function to throw or re-direct oil back through the aperture 36 that has been splashed outwardly therethrough or otherwise finds its way into contact with the inner portion of the ring 29.

At the same time, the chamfer 44 in the outer surface of the ring 29 likewise functions to re-direct or throw water or other liquids back through the stationary aperture 34 in the rear pressure plate 26, during rotation of the ring by the journal. Thus the chamfers 44 define liquid-throwing surfaces, the extensions of which will intersect the inner surfaces of the pressure plate flanges 33, 35 in any position of the ring 29. It will be appreciated, of course, that the grooves 49, 51, 52 in the inner surface of the inner wall 13 will function to collect some of the oil which is splashed or otherwise carried into

the upper rear corner portions of the journal box and re-direct the same around the aperture 32 and back to the oil well 12 at the bottom of the box. Likewise, water or other liquid thrown against the outer surface of the rear wall 14, as by the car wheel which is rotating in close proximity thereto, in large measure will be collected by the concentric grooves 53 and by them directed around the aperture 31 to drain downwardly from the lower portion of the journal box.

As is well known, a railroad journal normally shifts and moves relative to its journal box during operation, such shifting including axial movement of the journal relative to the journal box. In Fig. 1, the journal is illustrated as in a substantially central position, and the inner wall of the resilient ring 29 is shown therein as having substantial surface contact with the inner pressure plate 27. Inward or rearward shifting (to the right) of the journal from this position of Fig. 1 relative to the journal box 11 will result in the resilient ring 29 assuming its position of Fig. 3, or one similar thereto, due to the reduction of the central portion of the cross-sectional area of the ring and its natural resiliency, as previously described. However, shifting of the journal outwardly or forwardly (to the left) from its position of Fig. 1 a sufficient distance will result in a toggle-like snapping of the outer peripheral portion of the resilient ring 29 from such forwardly directed concave position to a rearwardly directed dished or concave position, like that illustrated in Fig. 4. It will be understood that such change of position or shape of the resilient ring 29 will be effected at a particular critical point in its movement with the journal relative to the journal box and in an extremely rapid manner, so that there will be only an instantaneous period during which the outer portion of the ring is not in contact with either one or the other of the pressure plates 26, 27, the disposition of the groove 42 radially outwardly of the rib 41 facilitating such rapid directional reversals of concavity of the resilient ring. When the resilient ring 29 is in an outwardly directed concave position, such as that illustrated in Fig. 4, the inner chamfer 44 and the inner surface of the rib 41 will continue to function in the manner previously described to return leaking oil back into the box through the aperture 36 in the inner pressure plate 27. Any escaping oil not so returned will be thrown against the inner surface of the outer pressure plate 26 by the outer chamfered surface 43 of the ring, and such excess oil will be collected in the bottom of the dust guard well 15. After a sufficient quantity of oil thus is collected in the lower portion of the dust guard well to rise into contact with the rotating ring 29, any further amount so collected will be returned by the ring to the journal box through the aperture 36. It will be apparent that inadvertent introduction of too much lubricating oil into the journal box by operating personnel also may be the cause of oil collecting in the lower part of dust guard well 15. Also it will be apparent that, even without the provision of the breather spaces 54, normal movements of the journal will cause sufficiently frequent reversals of concavity of ring 29 between its positions of Figs. 3 and 4 to insure escape of heated air from the otherwise sealed journal box, first into the dust guard well when the ring engages the outer plate 26 (Fig. 4), and then out of the same when the ring engages the inner plate 27 (Fig. 3). At the same time, regardless of which plate happens to be engaged by the resilient ring, air-borne foreign material cannot enter the journal box through its axle-receiving end.

It also will be apparent that the ring 29 can function in exactly the same manner as previously described without the pressure plates 26, 27, if the inner surfaces of the end walls 13 and 14 defining the width of the dust guard well 15 are made sufficiently smooth, the primary function of the surface plates 26, 27 being to insure a smooth surface for contact with the lateral surfaces or

edges of the resilient ring 29. The concave shape assumed by the ring 29 results in substantially line contact only between it and the one or the other of the surface plates 26, 27 most of the time, which reduces wear of these parts. Wear is further reduced and the life of these parts lengthened by the lubrication provided by the oil which they prevent from escaping from the journal box. Laboratory tests have established that oil adheres better to the rotating ring 29 than water, with the parts constructed as previously described, which perhaps is due to the difference in surface tensions between oil and water, with the results that water attempting to enter the box is very rapidly repelled and thrown outwardly therefrom, and that oil attempting to escape from the box which is not re-directed by the inner chamfer surface 44 and the inner surface of rib 41 directly onto the inner surface of flange 35 is thrown toward the inner surface plate 27, regardless of the direction of concavity of ring 29. In large measure this latter function is insured by the outer chamfer surface 43, together with the tendency of the oil which finds its way into the lower portion of the dust guard well 15 and is picked up therefrom by the rotating ring to adhere to, or follow the radially outward direction of, this outer surface 43 of the ring.

Consequently, it has proved advantageous to provide additional oil-collection means on the inner surface plate 27 which will collect such oil thrown against its upper portion and direct the same back into the interior of the journal box or oil supply means. The inner plate 27 (Figs. 3-5 and 7) may be provided for this purpose with a substantially arcuate groove 55 across the upper portion of its outer surface between the flange 35 and the gasket 39, preferably stamped or pressed into the plate, and an aperture 56 therethrough in each of the ends of such groove. Oil thrown onto the upper portion of the outer surface of the inner plate 27 thus will be collected by this groove 55, flow downwardly therein to the apertures 56, drain inwardly through the latter onto the outer surface of flange 35, and down the latter into the interior of the journal box, regardless of the direction of rotation of ring 29. As shown herein, the upper central portion of groove 55 is overlapped by the ring 29 (Fig. 3), but the major portion of its length is radially beyond the periphery of the ring (Fig. 5). The groove 55 may thus be positioned as low as possible on the plate 27 to insure collection of oil from the maximum portion of the upper part of its outer surface. However, the groove 55 may be disposed in its entirety beyond the periphery of the ring 29, if desired. Also, this oil-collection means for the inner surface plate 27 may take the form of a plurality of such grooves 55 spaced vertically from each other and either interconnected with each other and the lowermost groove 55 illustrated herein, or each provided with end drainage apertures 56, and the groove or grooves 55 may be formed as slots extending through the surface plate, if desired, instead of employing the apertures 56.

In the event of freezing of the ring 29 to either one of the plates 26 or 27 due to standing for some length of time under extremely cold weather conditions, no damage will result to the instant guard and oil-retaining means when the journal begins to rotate, since the ring may remain stationary relative to the journal, merely slipping on the flange 25, until a sufficient temperature has been generated in the journal box to permit the journal to break the ring free from the plate to which it is frozen. It has been found in actual use under such adverse conditions that the present device functions perfectly without any resulting damage. And from the preceding description, it will be appreciated that one of the primary advantages of this guard and oil-retaining means is its adaptability for use in any standard railroad journal box in place of the conventional dust guards presently employed.

It is thought that the invention and its attendant advantages will be understood from the foregoing descrip-

tion, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described and illustrated in the drawings being merely a preferred embodiment thereof.

I claim:

1. Guard and oil-retaining means for a journal box for a railroad car journal having a dust guard well and journal-receiving apertures extending therethrough, comprising a pair of pressure plates mountable in the dust guard well in opposed relationship and having flanges engageable in said journal-receiving apertures, resilient means interposed between said plates to maintain said flanges in said apertures, and a resilient ring disposed between said pressure plates and frictionally engageable on the journal for rotation therewith relative to said plates.

2. In a box for a journal bearing having a dust guard well of a width defined by end walls spaced from each other axially of the journal with journal-receiving apertures therethrough; guard and oil-retaining means for preventing entrance of foreign material into, and leakage of oil from, the box through said apertures, comprising a resilient ring narrower in width than said dust guard well and mounted on the journal for rotation therewith in said dust guard well, said resilient ring having an inner diameter somewhat smaller than that of said journal and the central portion of said ring being substantially reduced in cross section on one side only, whereby said ring assumes a concave shape directed toward one of said end walls to maintain a peripheral portion of said side thereof in sealing engagement with that end wall outwardly of its said aperture, and axial movement of the journal toward that end wall of sufficient magnitude will effect reversal of concavity of said ring to cause it to similarly engage the other one of said end walls.

3. Guard and oil-retaining means for mounting in a railroad car journal box having a dust guard well at its inner end defined by spaced inner and outer walls with apertures for receiving the outer end portion of a standard journal having a reduced bearing portion defined by outer and inner flanges, comprising a resilient ring narrower in width than the space between said walls and having an inner diameter smaller than the diameter of said inner flange and an outer diameter substantially larger than that of said apertures, and said ring having a cross-sectional area before mounting on the journal substantially smaller on one side of its normal center line than on its other side thereof, said ring thereby being adapted to be forced over said flanges, when the journal box is raised to space it from the journal, and through the aperture in said inner wall into the dust guard well and onto said inner flange, whereby said ring assumes a concave shape directed toward one or the other of said walls for contact therewith to seal the said aperture therein when mounted on said inner flange for subsequent rotation with the journal in the dust guard well.

4. Guard and oil-retaining means according to claim 3, including a pair of pressure plates mountable in the dust guard well in opposed relationship and having flanges defining apertures therethrough and engageable in the apertures in said inner and outer walls, respectively, and resilient means interposed between said plates to maintain said flanges in said wall apertures, said plates providing finished surfaces for sealing contact by said ring, and said ring being mountable through a said plate aperture.

5. Oil-retaining means for a rotatable journal and its lubricating oil supply means, comprising a stationary apertured pressure plate mounted in oil-sealing engagement with the oil supply means and in spaced relationship

to the journal, and a resilient ring having an inner diameter smaller than the diameter of the journal adjacent said plate and mounted on said journal for rotation therewith relative to said plate, said resilient ring having a cross-sectional area before mounting on the journal substantially smaller on that side of its normal center line adjacent said plate than on the other side of said center line, whereby said ring alone assumes a concave shape directed toward said plate when mounted on the journal to engage said plate outwardly of the aperture therein to prevent leakage of oil between said plate and said journal.

6. Guard and oil-retaining means for a journal box for a railroad car journal having a dust guard well and journal-receiving apertures extending therethrough, comprising a pair of pressure plates mountable in the dust guard well in opposed relationship and having flanges engageable in said journal-receiving apertures, resilient means interposed between said plates to maintain said flanges in said apertures, and a resilient ring disposed between said pressure plates and frictionally engageable on the journal for rotation therewith relative to said plates, said ring having an inner diameter somewhat less than the diameter of that portion of the journal engaged thereby, and the central portion of said ring being substantially reduced at one side in cross section axially of the journal by an annular groove in a lateral surface thereof, so that said ring assumes a concave shape in a direction toward said groove to engage the outer portion of said lateral surface with the adjacent said pressure plate and axial movement of the journal of sufficient magnitude in said direction will effect reversal of concavity of said ring to cause its engagement with the other of said pressure plates.

7. Guard and oil-retaining means according to claim 6, wherein the lateral edges of the inner peripheral surface of said ring are chamfered to provide liquid-throwing surfaces, extensions of which intersect the inner surfaces of said pressure plate flanges.

8. Oil-retaining means for a rotatable journal and its lubricating oil supply means, comprising a stationary plate engaging the oil supply means and surrounding and spaced from the journal and providing a smooth outer surface, a resilient ring mounted on the journal for rotation therewith and engaging said outer surface to prevent escape of oil between the journal and said plate, and oil-collection means formed in the upper portion of said plate to collect oil thrown thereon and return the same to said oil supply means, said oil-collection means comprising a substantially arcuate groove formed in the outer surface of said plate and an aperture extending through said plate in each of the ends of said groove.

References Cited in the file of this patent

UNITED STATES PATENTS

356,333	Randolph	Jan. 18, 1887
693,997	Brown	Feb. 25, 1902
1,348,433	Mackin	Aug. 3, 1920
1,659,450	Stromeier	Feb. 14, 1928
1,674,256	Nelson	June 19, 1928
1,908,739	Eveno	May 16, 1933
1,931,733	Leibing	Oct. 24, 1933
1,975,170	Olson	Oct. 2, 1934
2,177,606	Bigelow	Oct. 24, 1939
2,252,240	Tschappat	Aug. 12, 1941
2,377,387	Stromeier	June 5, 1945
2,445,410	Smith	July 20, 1948
2,488,162	Bigelow	Nov. 15, 1949
2,528,253	Sullivan	Oct. 31, 1950
2,553,801	Witthofft	May 22, 1951
2,561,694	Gilbert	July 24, 1951
2,571,015	Columbus	Oct. 9, 1951