Aug. 11, 1942. D. S. BARROWS 2,292,920

JOURNAL BOX SEAL

Filed June 5, 1940

Fig. 1

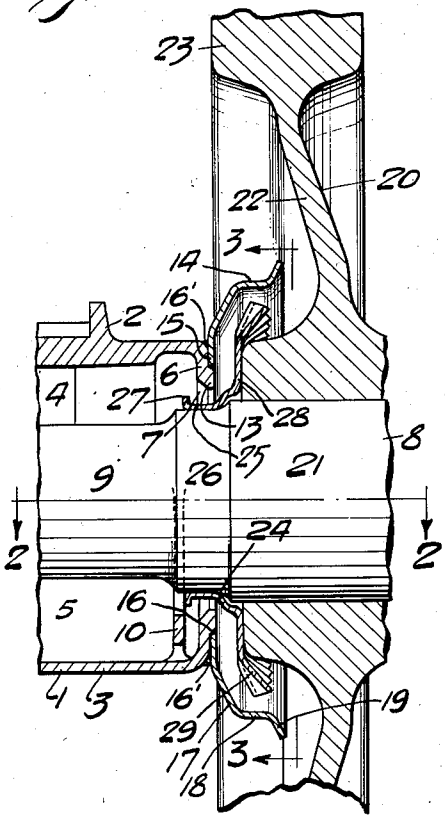


Fig. 3

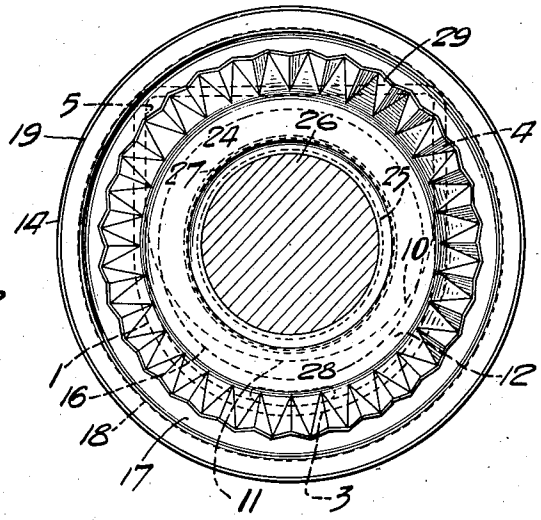
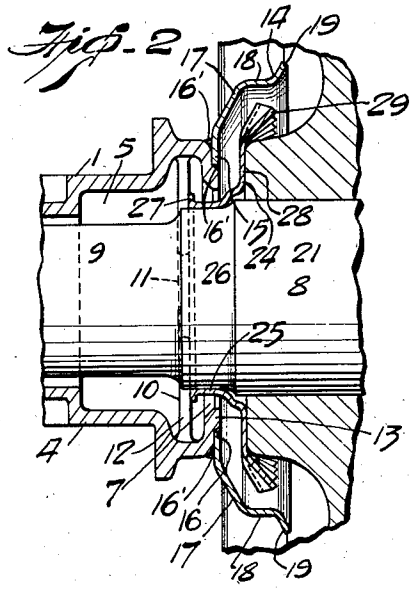


Fig. 2



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JOURNAL BOX SEAL

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6 Claims. (Cl. 286—5)

The invention relates to a journal box and associated structure used in railway vehicles and particularly to an arrangement and construction at the rear portion of the journal box.

An object of the invention is the provision, in a railway journal box assembly, of associated means to form an adequate seal against the ingress of foreign substance to the interior of the journal box or the egress of journal lubricant from the interior of the journal box.

Another object of the invention is to create a turbulence in the air structure in the immediate area of the rear extremity of the journal box so as to form a barrier between the interior and exterior of the journal box.

A further object of the invention is to provide a seal at the wheel adjacent extremity of a journal box which is simple in construction, of relatively few parts, positive in action, and arranged and constructed so that the relatively movable elements forming the seal are out of intimate contact with one another to thereby extend indefinitely the life of the seal forming elements.

The above objects as well as numerous others will become apparent from the succeeding detailed description of an exemplified form of the invention which is illustrated in the accompanying drawing wherein:

Figure 1 is a transverse vertical sectional view of a journal box and related structural elements embodying a form of the invention.

Figure 2 is a horizontal sectional view taken along the lines 2—2 of Figure 1, looking in the direction of the arrows.

Figure 3 is a vertical sectional view taken along the lines 3—3 of Figure 1, looking in the direction of the arrows.

Referring now in detail to the drawing wherein like reference characters indicate like parts, there is illustrated a journal box 1 and particularly the rear portion thereof. It is, for the present purpose, thought sufficient to disclose merely a portion of the journal box since the undisclosed part of the journal box may be of conventional form. The journal box comprises a top wall 2, spaced above a floor or bottom wall 3, and transversely spaced, vertically disposed side walls 4 extending between the top and bottom walls to confine an area or space 5 therebetween. The journal box is provided with a rear wall 6 substantially closing one extremity thereof. The rear wall has an aperture 7 through which a rotatable car axle 8 extends with sufficient clearance thereabout to prevent any interference between the axle and journal box rear wall. A journal 9 of the car axle is housed within the confines of the journal box, and there is desirably some medium (not shown) interposed between the bottom wall and journal forming a carrier for a lubricant for the journal. This medium, which may be any of the well-known or accepted devices or substances, is prevented from being moved by the action of the axle toward the rear wall from a predetermined position by means of a retainer bar 10 formed integrally with the journal box and positioned inwardly thereof from the rear wall. The retainer bar is desirably U-shaped in elevation and comprises a lower rib 11 formed integrally with the bottom wall and having a portion thereof spaced a predetermined distance above the bottom wall to permit the flow of journal lubricant therebeneath. The lower rib extends between the side walls where it merges with upstanding tapering arms 12 formed integrally with and outstanding from the side walls inwardly of the journal box. The arms 12 merely extend to a horizontal plane bisecting the axis of the axle since the medium hereinabove referred to is rarely disposed in an area or extended to a position above this plane.

The journal box rear wall has, in defining relation with the therein aperture, an annular shoulder 13 outstanding therefrom or directed away from the interior of the journal box. Since the rear wall aperture is of considerably greater diameter than the portion of the axle extending therethrough, means is provided to prevent the ingress of water, dirt or any foreign substance to the interior of the journal box as well as the egress of the journal lubricant from the interior of the journal box through the rear wall aperture. The means of the instant structure is designed primarily as a deflector to guard against foreign substance reaching the proximity of the rear wall aperture; particular attention being directed to the relationship and association of the relatively movable parts or elements, hereinafter described in detail, so that they will be out of contact with one another to thereby eliminate or avoid subjecting the several parts to wear. The above-mentioned means is formed in part by an outer fabricated circular plate 14, desirably dish-shaped in formation and facing or opening outwardly of the journal box away from the rear wall thereof. The circular plate is formed by an inner washer-like flange 15 bearing against the journal box rear wall and having an aperture 16 for the accommodation of the

shoulder 13. The inner flange may be secured to the rear wall by any approved method, such as the illustrated and preferred welds 16'. It will be here noted that the shoulder functions as a means whereby the welds 16' are relieved of stresses to which they might otherwise be subjected in service, such as those created by vibratory forces acting in a vertical plane. The free extremity of the inner flange merges into an inclined circular portion or inner deflector 17 directed away from the journal box and axle so that, upon a foreign substance being disposed thereon, it will flow from the circular plate and away from the rear wall aperture. Forming a continuation of the inner deflector is a ring-like shelf 18 which adds depth to the circular plate and terminates in an outer deflector flange 19 inclined or tapered in substantially the same general direction as the inner deflector in a direction away from the journal box rear wall and axle. The outer deflector also functions as a shield to direct foreign substance away from the interior of the circular plate and to prevent foreign substance from reaching the rear wall aperture where otherwise it would be free to enter the journal box.

Secured to the axle, in the proximity of the journal box, is a wheel 20 having its hub in intimate contact with the wheel seat 21 of the axle and a radiating wheel plate or web 22 inclined slightly toward the journal box to merge with a wheel rim 23. It will be noted that the circular plate 14 is substantially within the confines of the wheel and is thereby somewhat guarded from being struck by flying particles.

Associated with the axle is an inner fabricated plate 24 having a ring or collar 25 extending through the rear wall aperture and in tight engagement with a portion 26 of the axle positioned between the journal and wheel seat so that the inner plate will rotate upon rotation of the axle. A radial flange 27 is formed at the innermost extremity of the ring to be positioned in close proximity to the retainer rib 10 and preferably between the rib and the journal box rear wall. When the axle is idle the flange will function as a drip flange, and in this respect any journal lubricant which flows longitudinally of the axle toward the wheel will flow on to the radial flange and drop therefrom into the lower area of the journal box to pass beneath the retaining rib and be absorbed or taken up by the heretofore referred to medium. When the axle is rotating any lubricant reaching the radial flange will be thrown therefrom to be deposited on the top, bottom and side walls of the journal box and ultimately reach the lower portion of the journal box. In this manner, therefore, the egress of lubricant from the interior of the journal box through the rear wall aperture is prevented.

Radiating from the outer extremity of the ring or collar, outwardly of the journal box, is a circular disk or blade 28 in intimate contact with the wheel hub and spaced a predetermined distance from the inner flange 15. The disk has a peripheral portion 29 inclined away from the journal box rear wall and axle so as to be disposed substantially parallel with and spaced from the inner deflector 17. The peripheral portion 29 terminates short of the ring-like shelf and is convoluted or sinuous in formation to present vanes or paddles intermittently spaced about the free extremity of the blade. As the disk is entirely within the confines of the outer or dished plate the rotation of the axle will cause a like rotation of the blade to create or set up a turbulence in the air structure within the dished plate and thus form a barrier between the interior and exterior of the journal box. In the event foreign substance finds its way between the outer deflector flange 19 and the wheel plate while the axle and associated structure are idle, it will deposit on the portion of the wheel hub adjacent the blade but will be prevented from entering the journal box through the rear wall aperture because of the peripheral portion 29 of the disk. If the foreign substance continues to move from the hub to the blade the particular disposition of the periphery of the blade will cause it to be directed outwardly of the journal box away from the rear wall to be intercepted by the outer deflector 19 and again directed away from the rear wall aperture. It is also to be noted that in the event the axle is rotating when foreign substance finds its way to the proximity of the rear portion of the journal box, the disk will not only set up a turbulence in the air structure within the dished portion but will also set up a current of air in a direction parallel with the disposition of the outer deflector 19 to carry the foreign substance away from the rear extremity of the journal box.

It will be noted that various changes and alterations may be made to the illustrated and described construction without departing from within the spirit and scope of the appended claims; the species disclosed being merely for the purpose of illustration and not intended as a limitation of the invention.

I claim:

1. A device of the character described, in combination, a journal box having an apertured rear wall, a bottom wall, and spaced side walls extending forwardly from said rear wall, a rib having a portion thereof spaced above said bottom wall and extending between said side walls, a rotatable axle extending through said rear wall aperture, a dished circular plate facing away from said journal box and welded to said rear wall, said plate having an inner and an outer deflector connected by a laterally directed shelf, said outer deflector being positioned in the proximity of a web of an associated wheel and in telescoping relation to a hub of said wheel, means extending through said rear wall aperture secured to and rotatable with said axle, said means having a radial flange, inwardly of said journal box, positioned between said rib and rear wall, and a radial circular blade spaced from and within the confines of said dished circular plate, said blade having a sinuously formed portion directed away from said journal box rear wall and axle in the same general direction as said outer deflector.

2. A device of the character described, in combination, a journal box having an apertured rear wall, an apertured dished circular plate opening away from said journal box and welded to said rear wall, said plate having an inclined peripheral flange positioned in the proximity of a web of an associated wheel, a rotatable axle extending through said rear wall and dished plate apertures, means rotatable with said axle, said means comprising a collar extending through said rear wall and dished plate apertures and secured to said axle, and a radial disk within the confines of and spaced from said dished plate; said disk having an inclined peripheral portion sinuously formed and disposed in overlapping relation to a hub of said wheel so that upon a

rotation of said axle a turbulence of the air structure within the dished plate will be created to form a barrier to exclude foreign substance from the interior of the journal box.

3. In a device of the character described, in combination, a journal box having an apertured rear wall, an apertured dished circular plate opening away from said journal box rear wall and secured thereto, a rotatable axle extending through said apertures, said dished plate having an outer inclined deflector directed away from said axle and journal box rear wall, and means rotatable with said axle and comprising a radial disk within the confines of and spaced from said dished portion; said disk having a peripheral portion sinuously formed and extending in substantially the same direction as and in substantial alignment with said plate deflector so that upon a rotation of said axle a turbulence of the air structure within the dished plate will be created to form a barrier to exclude foreign substance from the interior of the journal box.

4. In a device of the character described, in combination, a journal box having an apertured rear wall, an apertured dished plate opening away from said journal box rear wall and secured thereto by welds, said dished plate having a laterally directed shield terminating in an inclined deflector, means extending through said apertures and rotatable with said axle, a radial rib on said means inwardly of said journal box from said rear wall, and a radial disk spaced from and within the confines of said dished plate; said radial disk having its peripheral portion sinuously formed and in substantial alignment with said deflector so that upon rotation of said axle a turbulence will be created in the air structure within the dished plate.

5. In a device of the character described, in combination, a journal box having an apertured rear wall, a shoulder outstanding from said rear wall, a plate having an aperture for the accommodation of said shoulder and being welded to said rear wall, an axle extending through said apertures, said plate having an intermediate portion spaced from and substantially parallel to said axle, a terminating flange outstanding from said intermediate portion and being inclined away from said journal box rear wall and axle, and a rotatable means extending through said apertures and having a radial disk within the confines of and spaced from said plate, said disk having a peripheral sinuous portion extending in substantially the same direction as said terminating flange.

6. In a device of the character described, in combination, a journal box having an apertured rear wall, an annular shoulder outstanding from said rear wall defining said aperture, a plate having an aperture accommodating said shoulder and being welded to said rear wall, a rotatable axle extending through said apertures, said plate being dished and facing away from said rear wall, means rotatable with said axle, said means comprising a collar extending through said apertures and secured to said axle, a flange positioned inwardly of said journal box from the rear wall thereof and forming the inner extremity of said collar, and a disk radiating from said collar and positioned outwardly of said journal box; said radial disk having its periphery sinuously formed and in substantial alignment with a portion of said plate so that upon rotation of said axle a turbulence of the air structure within said disked plate will be created.

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