

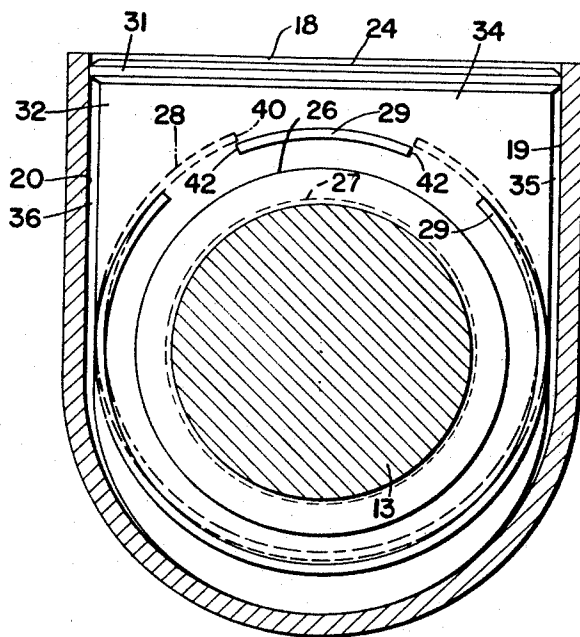
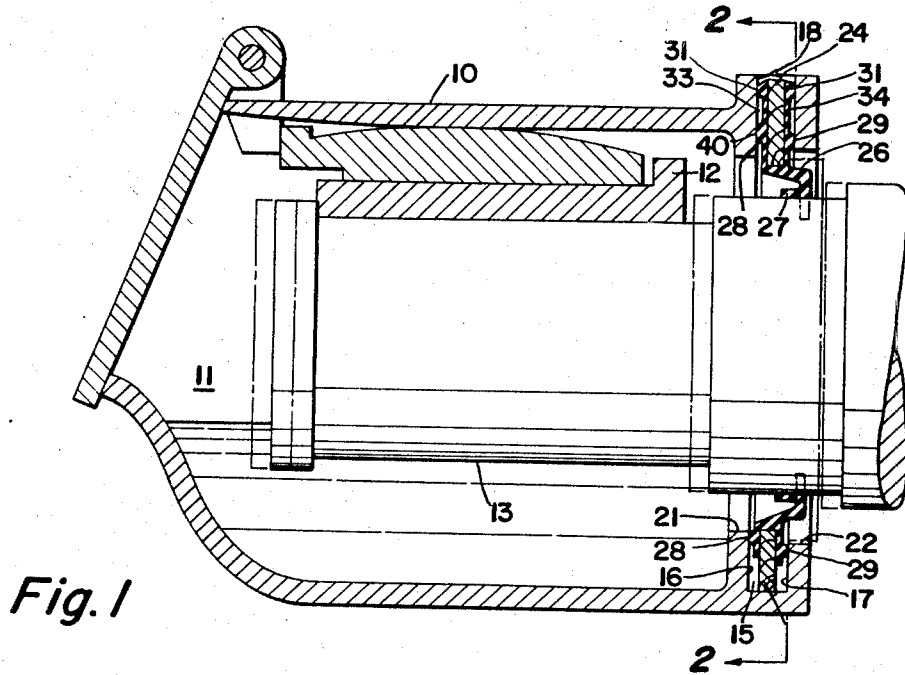
March 11, 1969

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3,432,173

JOURNAL BOX SEALING DEVICE

Filed Jan. 27, 1967



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JOURNAL BOX SEALING DEVICE

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Filed Jan. 27, 1967, Ser. No. 612,214

U.S. Cl. 277-29

Int. Cl. F16j 15/32, 15/10

11 Claims

ABSTRACT OF THE DISCLOSURE

A railway car journal box axle and dust sealing device that has vent passages to permit air to flow in and out of the box while maintaining the dust seal and the axle seal.

Background of the invention

In railroad cars the ends of the axles for the wheels are journaled within boxes that contain a liquid lubricant. The journal boxes are only partially filled with lubricant and thus contain air as well as liquid lubricant. To prevent loss of lubricant from the wheel side of the boxes a sealing device is inserted within a well formed in the box and makes sealing contact with the shaft and the walls of the well. It is also common practice to have the sealing device also seal the top of the well against the entrance of dust and other foreign matter.

The reciprocatory movement of the axle within the journal box alternately increases and decreases the space within the box that is occupied by air. When the box is tightly sealed this results in alternate increase and decrease in the pressure of the air which in turn makes it difficult to maintain a seal about the axle for retaining the lubricant. The present invention obviates this difficulty by venting the journal box to atmosphere in a particular manner.

A prior journal seal device shown in U.S. Patent 2,668,067 discloses passages for venting journal boxes but does not provide an effective dust seal nor do the vent passages provide enough flow capacity for effective functioning.

Summary of the invention

A railway car journal box sealing device that has one portion for sealing the top of the journal box well against entrance of dust and foreign matter and that has another portion for sealing between the well and car axle to prevent loss of lubricant, the device providing passages of sufficient flow capacity for effectively venting the interior of the box to atmosphere while still providing an effective seal against leakage of lubricant and entrance of dust and foreign matter.

Brief description of the drawing

FIG. 1 is a vertical section through the journal box showing the sealing device in use.

FIG. 2 is an end view of the wheel side of the sealing device with the journal box sectioned on line 2—2 of FIG. 1.

Description of the preferred embodiment

Journal box 10 has a chamber 11 containing a bearing 12 against which car axle 13 is journaled.

The wheel side of the box 10 has a well 15 formed by opposed spaced end walls 16, 17, the bottom and the sides of the well being closed and the well having an upper open end 18. Walls 16, 17 have annular openings 21, 22 therethrough through which axle 13 extends.

Mounted in well 15 is a sealing device 24 comprising a rigid member 25 of wood, plastic or other relatively inflexible material to which is bonded another member 26 of elastic rubber-like material. The elastic member 26 has

an annular lip portion 27 that initially extends in a radial direction, as shown by the dotted line in FIG. 1, but which when installed assumes a cylindrical shape as indicated by the solid lines. The lip maintains sealing contact with axle 13 in all movements of the latter to prevent the liquid lubricant, with which chamber 11 is partially filled, from leaking out of the chamber along the axle.

The resilient portion 26 of the sealing device 24 has an annular rib 28 on one side in sealing contact with wall 16 and another annular rib 29 on its other side in sealing contact with wall 17. Radially spaced from ribs 28, 29 is another rib 31 that encircles the upper end 32 of sealing device 24 and which makes sealing contact with walls 16 and 17 and the side walls 19, 20 of the well for the purpose of excluding dust and other foreign matter from the well. Rib 31, being spaced from ribs 28 and 29 forms channels 33 and 34 therebetween that are connected to each other by way of clearances 35, 36 between the sealing device and well side walls 19, 20.

The upper portion of rib 28 is cut away to provide a relatively wide slot or passage 40 therethrough communicating chamber 11 with channel 33. The upper portion of rib 29 has a pair of slots 42 offset from slot 40 and communicating channel 34 to atmosphere through opening 22. Slot 40 is substantially equal in length to the sum of the lengths of slots 42.

Operation

During operation of the railway car, axle 13 may have random axial reciprocation relative to journal box 10 from an inner position shown by solid lines in FIG. 1 to an outer position designated by the dotted lines. As the axle moves toward the inward position the volume of the air space within chamber 11 increases and as the axle moves toward its outer position such volume decreases.

If there is no vent passage for chamber 11 the pressure of the air contained therein tends to increase and decrease as much as .55 p.s.i. with such changes in volume. This results not only in difficulty in maintaining effective sealing contact between lip 27 and the axle but also results in excessive flexing of sealing lip 27 and consequent relatively short life. Thus, it has been found desirable to minimize increases and decreases of air pressure within the journal box. This may be accomplished by having slot 40 of substantially no less than 4" chordal length and of about .080" depth when the device is installed. Slots 42 have substantially the same depth and total chordal length as slot 40. Slots 40, 42 are of a size to provide sufficient flow of air to accommodate all conditions of axial reciprocation and to thereby avoid the difficulties caused by the aforementioned increases and decreases in air pressure.

As the axle moves outwardly, air within the journal box passes through opening 21 and slot 40 into channel 33 and through clearances 35, 36 to channel 34 and then through slots 42 and opening 22 to atmosphere. Rib 31 maintains continuous sealing contact about the well to prevent air from splashing out and to effectively prevent dust or dirt from falling in. Furthermore, because the air must pass upwardly through slot 40 then horizontally through clearances 35, 36 and then downwardly through slots 42 a labyrinth type passage is provided that prevents loss of the liquid lubricant from chamber 11 by splashing action.

I claim:

1. In the combination of a journal box and a sealing device therefor wherein the box includes a well having an open top and opposed first and second side walls with respective first and second openings therethrough for receiving an axle, and the device has a body with an annular portion for sealingly engaging the axle, the improve-

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ment comprising first means surrounding the first opening and projecting from one side of the body into sealing contact with the first side wall, second means projecting from the body on the second side thereof into contact with said second side wall, third means projecting from said body completely around the top end thereof and sealingly engaging said well for closing the top opening thereof, said third means being spaced from the first and second means so as to provide a channel therebetween that extends completely around said body, a slot through the first means connecting the first opening and the channel, and a slot through the second means connecting the channel with the second opening.

2. The combination of claim 1 in which the first means comprises a narrow rib of elastomeric material.

3. The combination of claim 1 in which said first and second means are of deformable elastomeric material.

4. The combination of claim 1 in which all of said means are narrow ribs of deformable elastomeric material.

5. The combination of claim 1 in which the first means has another slot connecting the first opening with the channel, and the slots in the first means are angularly displaced from the slot in the second means.

6. The combination of claim 5 in which the total area of opening through the slots in the first means is substantially equal to the area of opening in the slot in the second means.

7. The combination of claim 1 in which the slots are of substantially no less than .080" in depth and 4" in length.

8. The combination of claim 1 in which the third

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means is within the well and engages the surrounding walls thereof.

9. In a sealing device for a journal box wherein the device has a substantially U-shaped body with an opening therethrough and with a sealing portion surrounding the opening and with first and second ribs, one on each side of the body spaced from and substantially surrounding the sealing portion, the improvement of a third rib projecting from the body at the top thereof and completely surrounding the body, the third rib being spaced from the first and second ribs to provide a channel therebetween that extends completely around the body, and slot means through the first and second ribs communicating with said channel.

10. The device of claim 9 in which the slot means in the first rib are angularly offset from the slot means in the second rib.

11. The device of claim 9 in which the slot means in one of the ribs is located nearer to the upper end of the U-shaped body than the slot means in the other rib.

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U.S. Cl. X.R.

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