June 26, 1962 J. J. BAYERL 3,041,091

DUST GUARD AND OIL SEAL FOR RAILWAY CAR JOURNAL BOXES

Filed May 25, 1959 2 Sheets-Sheet 1

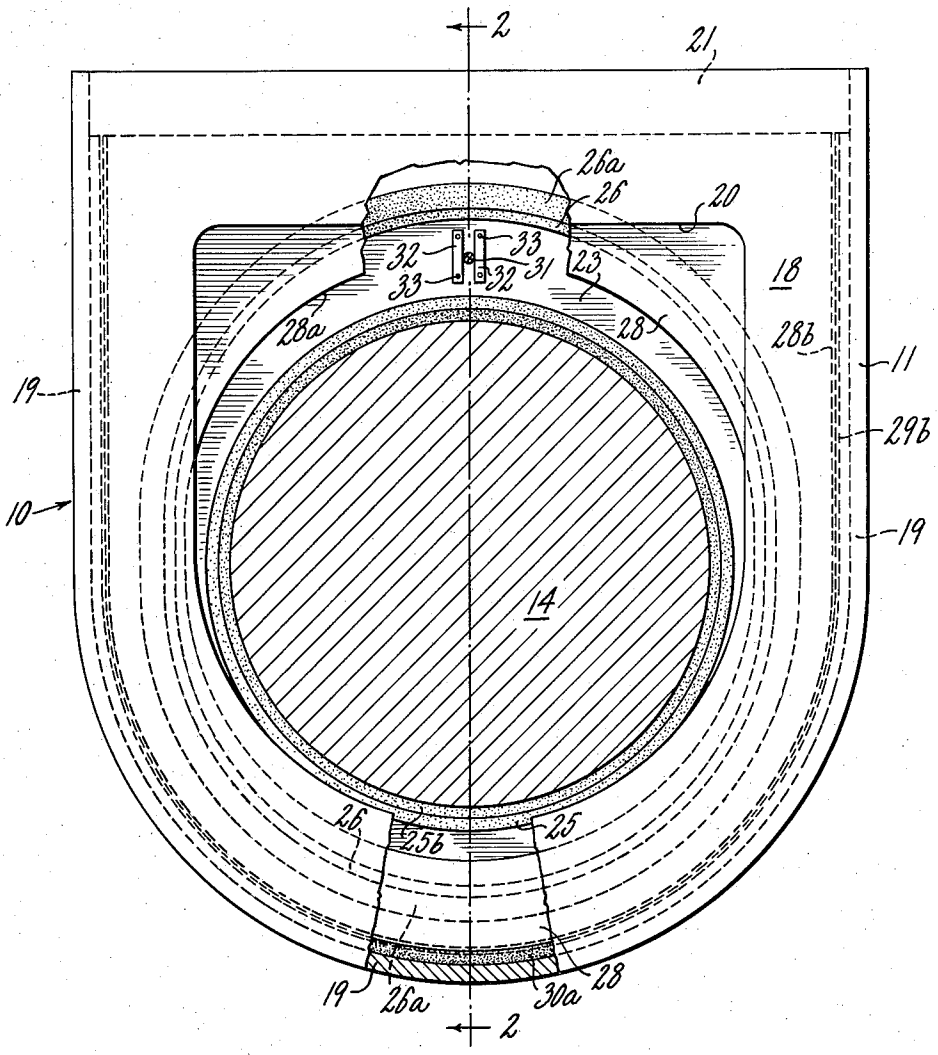


FIG. 1

INVENTOR.
JOSEPH J. BAYERL
BY
Robert J. Patterson
ATTORNEY

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Fig. 3

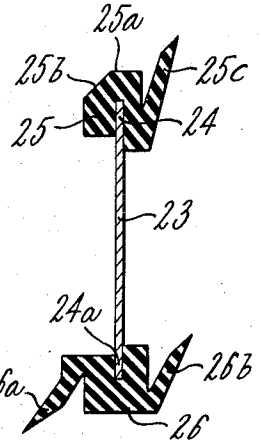
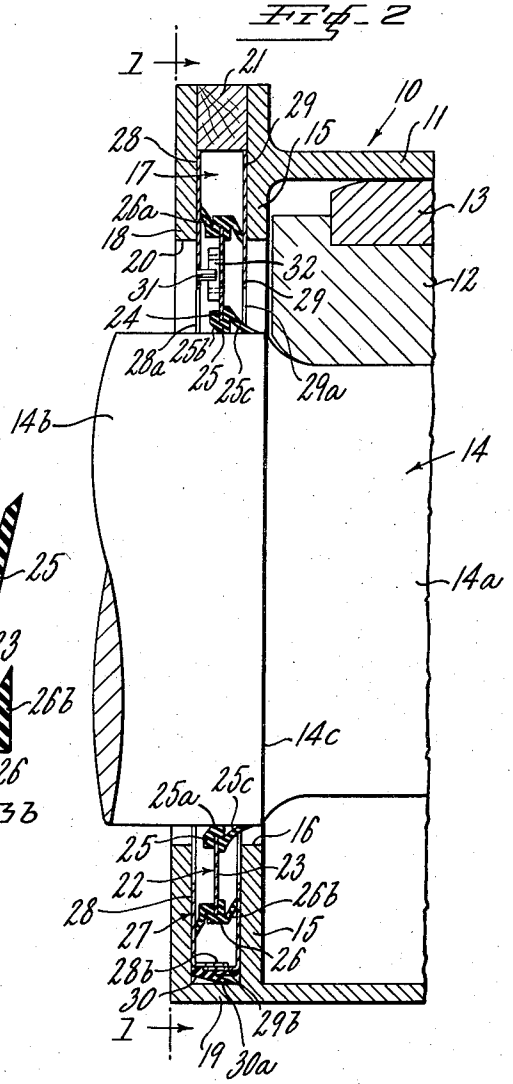


Fig. 2



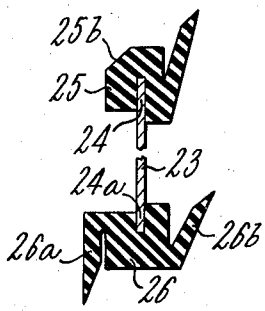


Fig. 3a

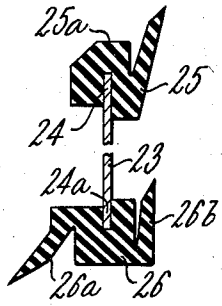


Fig. 3b

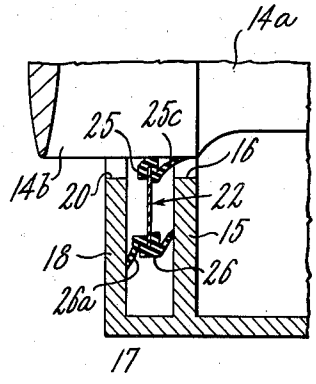


Fig. 4

INVENTOR.
JOSEPH J. BAYERL
BY
Robert J. Patterson
ATTORNEY

United States Patent Office

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DUST GUARD AND OIL SEAL FOR RAILWAY CAR JOURNAL BOXES

Joseph J. Bayerl, Wayne, N.J., assignor to United States Rubber Company, New York, N.Y., a corporation of New Jersey

Filed May 25, 1959, Ser. No. 815,580
2 Claims. (277—174)

This invention relates to an improved dust guard and oil seal adapted for insertion into the dust guard slot or well of a railroad car journal box.

The instant application is a continuation-in-part of my co-pending U.S. patent application Serial No. 743,292, filed June 20, 1958, which has now matured into United States Patent No. 2,960,355.

As presently prescribed by the Association of American Railroads, standard journal boxes must be constructed with a relatively large opening, as compared to the journal diameter, at the rear, i.e., the wheel side, of each box for ease of assembly and proper functioning of the unit. Such an opening permits vertical and horizontal movement of the journal relative to the box of up to 1⅛" in vertical and up to ⅞" in horizontal movement, depending on the extent to which the journal and/or the bearing therefor are worn. As will be readily appreciated, it is necessary to seal this large opening regardless of the position of the journal, under dynamic as well as static conditions.

The disadvantages inherent in known constructions designed to attain this result are manifold. As indicated in my aforesaid copending application, the loss of oil, as well as its contamination, presents a costly maintenance and wheel-to-track slippage problem. Oil loss in transit is estimated to be nine parts for every one part actually used for lubrication. Hopper cars which are turned upside down to be emptied lose practically all the oil in the reservoir of the journal box. Considerable maintenance is always necessary to prevent hot boxes. Oil splash from box to wheel to track causes inefficient engine operation, and contamination in the form of dust, dirt and water, for example, can cause oil film breakdown resulting in journal bearing damage. The foregoing are some of the major problems which have beset the railroad industry for many years.

Attempts have been made heretofore to provide dust guards and oil seals made of wood synthetic rubber sponge or foams, and rubber-metal combinations. Invariably, however, these have failed to solve the aforesaid problems for a variety of reasons. Wood dust guards, for example, do not prevent oil loss and in addition have a very short useful life. All sponge or foam seals soak up oil which is squeezed out when the seal is under compression, and are also subject to damage by journal to box contact which occurs during transit. This latter defect is also found in the rubber-metal combinations known at the present time. Moreover, in many of these known dust guards and oil seals there is provided a flexible lip which bears against the journal so as to function as the actual journal seal and which at the same time is subjected to the full bearing force of the journal, whereby this lip is worn down and practically destroyed within a very short period of time.

One construction capable of overcoming these drawbacks and disadvantages is disclosed in my above-mentioned copending application and comprises a substantially annular curtain floatingly arranged within a sheet metal casing fixed in the dust guard slot of the journal box, the curtain itself being constituted by a rigid annular plate provided with an inner sealing ring having a radial lip on its inner periphery adapted to engage the journal and with an outer sealing ring having a pair of lips on its outer periphery adapted to engage the inner walls of the said

casing. The outer sealing ring is further equipped at its inner periphery with a pair of lateral projections adapted to serve as bumpers for absorbing the shocks of axial movement of the curtain relative to the journal box (either along or with the journal). Moreover, guide means in the form of a pin and slot connection between the casing and the curtain are provided to inhibit rotational movement of the curtain while nevertheless permitting vertical movement as well as some horizontal swinging movement of the curtain in the dust guard slot.

The present invention is an improvement of the structure disclosed in my aforesaid copending application, and thus its main object is again to provide an improved dust guard and oil seal so constructed and designed that it is effective in preventing oil loss and contamination by foreign matter such as dust, dirt and water, regardless of journal position relative to the box, under both dynamic and static conditions; eliminates porous sections; prevents seal damage during installation, as well as that caused by journal to box contact; prevents oil loss through the rear of the box even when the car is turned over for automatic dumping; is easily inserted into and fits standard journal boxes; and prevents undue strain on the sealing elements.

The foregoing and other objects, characteristics and advantages of the present invention will be more clearly understood from the following detailed description thereof when read in conjunction with the accompanying drawings, in which:

FIG. 1 is a vertical sectional view taken substantially along the line 1—1 in FIG. 2, with some portions broken away, and illustrates the rear or wheel side portion of a standard journal box, the journal, and the dust guard and oil seal constructed in accordance with the present invention and arranged in a casing mounted in the dust guard slot;

FIG. 2 is a sectional view taken along the line 2—2 in FIG. 1;

FIG. 3 is a radial sectional view, on a somewhat enlarged scale, of the lower section of the dust guard and oil seal shown in FIG. 2 and illustrates the sealing lips thereof in their normal positions;

FIGS. 3*a* and 3*b* are similar views of the dust guard, showing the outer sealing lips thereof out of their normal positions; and

FIG. 4 is a fragmentary sectional view (similar to FIG. 2) of the lower portion of a journal box, showing the dust guard mounted directly in the dust guard slot or well.

Referring first to FIGS. 1 and 2 of the drawings, it will be seen that the journal box 10 comprises an elongated housing 11, the outermost or front part of this housing (not shown) being, as usual, covered by a hinged door and having mounted therein a conventional bearing 12 and wedge 13. The journal 14 has a portion 14*a* of reduced diameter which is located within the confines of the housing 11, and a portion 14*b* of relatively larger diameter on which one of the wheels (not shown) is adapted to be mounted. In order to permit the journal 14 to be introduced into the journal box 10, the rear wall 15 of the housing 11 is provided with a relatively large opening 16. For the purpose of preventing the entry of dust and the like into the journal box and for simultaneously preventing the loss of oil from the journal box, the housing 11 is further provided with a dust guard well or slot 17 which is defined between the rear journal box wall 15 and an outer rear wall 18 which is connected to the remainder of the journal box by a short peripheral wall 19, the outer rear wall 18 being further provided with a large central opening 20 aligned with the opening 16 in the wall 15. As is well known in the art, the journal box 10 is a rough metal casting and is usually substantially D-shaped in plan and U-shaped in cross-section. The dust guard slot 17, of

course, is shaped like the remainder of the journal box **10** and is open across the top thereof, this opening (during use of the journal box) being closed in a conventional manner by means of a block of wood **21** wedged thereinto.

The dust guard seal according to the present invention basically comprises a curtain **22** the structure of which will be more fully described presently. The curtain is mounted in the dust guard slot **17** in such a manner as to be capable of movement in any manner upwardly, downwardly or sideways, but not rotationally. According to one embodiment of the present invention the curtain **22** may be mounted within an auxiliary casing which is itself mounted within the dust guard slot **17** (see FIG. 2), or the curtain may be mounted directly in the dust guard slot itself without the aid of an auxiliary casing (see FIG. 4).

Referring again to FIGS. 1 and 2, it will be seen that the curtain **22** comprises a substantially annular rigid member **23**, preferably made of steel, the inner periphery **24** of the member **23** being circular and the outer periphery **24***a* (FIG. 3) being substantially oval to ensure that the curtain has sufficient freedom of movement within the dust guard slot **17**. The inner peripheral edge **24** of the member **23** carries an inner or journal sealing ring **25**. The sealing ring **25**, which is preferably made of rubber and vulcanized or otherwise bonded to the curtain member **23**, is provided with an innermost flat bearing surface **25***a* extending substantially transversely to the plane of the member **23**, with a slanted surface **25***b* extending outwardly from the wheel-side edge of the bearing surface **25***a*, and with a sealing lip **25***c* which is connected to the body of the ring **25** at the radially outermost edge thereof and on the side remote from the slanted surface **25***b*. As best shown in FIG. 3, the lip **25***c* is essentially hinged to the member **25** and thus is freely displaceable relative thereto. The importance of this feature of the invention will be more fully explained hereinafter.

Bonded to the outer peripheral edge **24***a* of the member **23** is a rubber dust guard slot sealing ring **26** which is provided with a first sealing lip **26***a* connected to the body of the ring **26** at the innermost periphery thereof on the wheel side, and with a second sealing lip **26***b* connected to the outermost periphery of the ring **26** on the journal box side thereof. Both of the lips **26***a* and **26***b* are in essence hinged to the body of the ring **26** and, in their normal condition, extend angularly away from the body and in opposite directions. By virtue of this construction, the lips **26***a* and **26***b* can be folded flush against the body of the ring **26**, as illustrated in FIGS. 3*a* and 3*b*. The importance of this feature of the invention will also be more fully explained hereinafter.

In fabricating the curtain **22** with its inner and outer sealing rings **25** and **26**, it is preferred that these rings be extruded cold to form uncured strips having the desired cross-sectional shapes. The strips are thereafter cut to the appropriate lengths and applied to the inner and outer peripheral edges **24** and **24***a*, respectively, of the member **23**. The latter, with its edges embedded in the so-formed rings **25** and **26**, is then placed into a mold to produce the final bond between the rings and the member **23** and to cure the rings under heat and pressure.

Where it is desired to provide a smooth surface with which the sealing lips **26***a* and **26***b* are to cooperate in sealing the dust guard slot or well **17**, there is mounted in the slot **17**, as by being press-fitted thereinto, a substantially rigid hollow casing **27** open at the top. Casing **27** is preferably constructed from 21 gauge cold rolled steel sheet metal plates **28** and **29**. The plates **28** and **29**, which are substantially U-shaped and are punched out of sheet metal stock and provided with oval central openings **28***a* and **29***a*, respectively, are bent at their outer side and bottom peripheries to form a pair of flanges **28***b* and **29***b*, these flanges being welded together over the entire expanse thereof to complete the casing **27**. For the purpose of sealing the interior of the dust guard slot **17**, i.e., that portion thereof most remote from the openings **16** and **20**, there is provided an additional rubber sealing member **30** which is bonded to the outer periphery of the casing **27** defined by the welded flanges **28***b* and **29***b* and coextensive therewith, the sealing member **30** being provided with an integral coextensive lip **30***a* which projects angularly and outwardly therefrom toward the journal box side of the casing. In fabricating the casing **27**, after the flanges **28***b* and **29***b* have been welded together so that the plates **28** and **29** constitute the rear and front walls of the casing, the sealing member **30**, which together with the lip **30***a* is extruded cold to substantially the cross-sectional shape desired, is wrapped around the casing periphery **28***b*—**29***b* and the entire assembly is then placed in a mold to cure the sealing member **30** under heat and pressure while simultaneously bonding it to the casing **27**.

It is to be understood that the term "rubber" as used herein includes natural and synthetic rubber, as well as other suitable elastomers. The preferred material for the sealing rings **25** and **26** and the member **30** is a low compression set and heat resistant, butadiene-acrylonitrile compound, commercially sold under such trademarks as "Paracril" or "Hycar," and having excellent oil and water resistant properties. In addition, the ring **25** is impregnated with graphite to obtain a low coefficient of friction and thereby reduce heat build-up caused by the rotation of journal **14**.

For the purpose of guiding the curtain **22** within and relative to the casing **27**, there is provided on the interior surface of the plate **28** a guide pin **31**, and on the adjacent surface of the member **23** a pair of guide rails **32** which may be parts of the same stamping as the member **23** but which preferably are made separately from heavy gauge steel plate and then secured to the curtain member **23** by means of rivets **33**, for greater strength. The pin **31**, likewise, may constitute a part of the same stamping as the plate **28**, but it is preferred that the pin be cut from cold rolled bar stock, forced through a hole in the plate **28**, and then welded to the latter for greater strength.

When it is desired to employ the curtain according to the present invention in combination with a metal casing **27**, it is found advantageous to mount the curtain in the casing prior to insertion of the latter into the dust guard slot **17**. To accomplish this, the uppermost ends of the plates **28** and **29** are slightly spread apart manually to permit insertion of the curtain **22** into the casing, i.e., to ensure that the pin **31** does not interfere with the passage of the lowermost portions of the sealing rings **26** and **25**. Care must, of course, be taken that the pin **31** is ultimately received in the space between the guide rails **32**, which automatically leads to the correct and desired orientation of the sealing lips **25***c*, **26***a* and **26***b* relative to the casing.

The entire assembly of casing **27** and curtain **22** is now inserted into dust guard slot **17** with that side of the curtain member **23** carrying the guide rails **32** facing rearwardly of the journal box **10**, i.e., toward the wheel side thereof. The various sealing lips **25***c*, **26***a*, **26***b* and **30***a* are, consequently, properly oriented relative to the journal box **10**. The casing **27**, the shape of which conforms closely to that of the interior of the dust guard slot **17**, is located in the proper fixed position in the latter merely by being pushed down until it is firmly seated, with the sealing lip **30***a* properly engaged with the inner surface of the peripheral slot wall **19**. The casing **27** is so dimensioned that its upper edge plane is substantially below the uppermost edge plane of the dust guard slot **17**.

At this point, the block of wood **21** is wedged into the top of the dust guard slot **17** between the walls **15** and **18**, preferably to such an extent that it engages the upper edges of the casing walls **28** and **29**, which provides additional means for keeping the casing in place. The block **21** and the upper edges of the walls **15** and **18** are covered

with a tarry substance (not shown) in order to prevent infiltration of foreign substances, such as dust and water, into the top of the dust guard slot **17**. This procedure, being well known in the art and standard practice in the railroad industry, forms no part of the present invention.

The journal box **10** is now in proper condition for mounting onto the journal **14** preparatory to being attached to the underside of a railroad car, all in a manner well known in the art. As best shown in FIG. 2, the inner sealing ring **25** is so dimensioned that the diameter of the horizontal bearing surface **25***a* thereof is substantially equal to the diameter of the enlarged portion **14***b* of the journal **14**, so that the latter extends through the sealing member **25** with a sliding fit. This ensures that the sealing lip **25***c*, which normally projects beyond the surface **25***a*, is bent out of its normal position (see FIG. 3) by the journal and into the position shown in FIG. 2 so as to be continually biased or pressed, due to its resilience, against the outer surface of the journal portion **14***b*.

It will be readily understood, therefore, that the sole function of the lip **25***c* is one of sealing. At no time does the lip take up any part of the load of the journal, such load being entirely taken up by the body of the sealing ring **25** through the bearing surface **25***a* thereof. As a result, the sealing lip **25***c* is subjected to considerably less wear and tear than it would be if subjected to the load of the journal as the latter moves up and down, sideways and/or axially whenever the car is in motion.

The sealing action of the lip **25***c* is mainly that of preventing the creeping of lubricant along the surface of the journal to the outside of the journal box, which would cause such lubricant to be irretrievably lost. This sealing action is enhanced with a further beneficial result by the presence of the bearing surface **25***a*. It is understood, of course, that some slight quantities of lubricant will migrate past the lip **25***c*, but this migration will not continue unhindered since the bearing surface **25***a* also acts as a seal tending to impede the flow of the lubricant along the journal portion **14***b*. Accordingly, a certain amount of the lubricant will be trapped and collected in the annular pocket or space between the lip **25***c* and the body of the sealing ring **25**. It will be readily appreciated that this small reservoir of trapped lubricant is in a position to provide lubrication for the journal due to the fact that with substantially every deformation of the ring **25** some of the lubricant will be squeezed out of the pocket. Under normal operating conditions, with an adequate supply of lubricant in the journal box **10**, the quantity of lubricant in the sealing ring pocket will remain about the same. In the event, however, that the lubricant normally contained in the journal box is completely used up, the pocket will provide extra lubricant at least for a limited period of time until the journal box can be refilled with lubricant. Thus, regardless of the movements of the journal when the railroad car is in service, an effective seal and effective lubrication are maintained around the journal. The opening **29***a* is, of course, sufficiently large not only to accommodate the maximum extent of vertical or lateral movement of the journal but also to avoid the sealing lip **25***c* becoming clamped or wedged between the inner peripheral edge of the plate **29** and the outer surface of the journal.

As is well known, the journal **14** in addition to moving up, down and/or sideways, very frequently is displaced axially relative to the journal box **10**. Thus, it might occur that at some time there would be sufficient relative movement between the journal box and the journal to dispose the line of juncture **14***c* between the journal portions **14***a* and **14***b* somewhat to the wheel side of the curtain member **23**, i.e., to the left of the sealing ring **25** as seen in FIG. 2. At such a time, the curtain **22** would slide downwardly within the casing **27** since the uppermost portion of the inner sealing ring would be resting on the smaller journal portion **14***a*. If there were now to occur a reverse relative movement between the journal box **10** and the journal **14** to bring the same back to their original relative position, the shoulder or fillet formed between the journal sections **14***a* and **14***b* would come into engagement with the sealing ring **25** and, if the cross-section of the latter were rectangular, would drag it and therewith the entire curtain **22** to the right as seen in FIG. 2, which might lead very easily to complete destruction of the curtain.

This potential defect is avoided, in accordance with the present invention, by the provision of the slanted surface **25***b* on the wheel side of the sealing ring **25**. It will be readily recognized that this slanted surface will act in the manner of a cam surface when engaged by the journal shoulder between the journal portions **14***a* and **14***b* so as to cause the curtain **22** to ride up along the outwardly curved section of the journal portion **14***a* until the bearing surface **25***a* again contacts the surface of the larger portion **14***b*.

The inner sealing ring **25** heretofore described in detail constitutes one part of the improved dust guard and oil seal according to the present invention, the other part of this seal being constituted by the outer sealing ring **26**. The function of this outer sealing ring is to provide a highly effective dynamic seal between the curtain **22** and the casing **27**. This is essential in view of the fact that the journal **14**, in moving vertically and/or horizontally with respect to the bearing **12** and the journal box **10**, also causes the curtain **22** to perform the same movements relative to the casing **27**. By way of contradistinction, the seal between the inner sealing ring **25** and the journal **14** is essentially a static one, as can best be understood by considering that the surface area of the journal portion **14***b* does nothing other than change its position relative to the sealing ring **25** during the rotation of the journal or during the relatively infrequent axial displacements of the latter, whereas the movement of the curtain relative to the casing walls **28** and **29** is constantly changing from horizontal to vertical and to combinations thereof.

In view of the critical nature of the sealing action afforded by the outer sealing ring **26**, care must be taken that the lips **26***a* and **26***b* are always maintained in contact with the associated walls of the casing **27**. To this end, the lips **26***a* and **26***b* are so formed during the initial production and molding of the ring **26** that the normal distance between the outermost tips of these lips is considerably larger than the space between the side walls **28** and **29** of the casing **27**. Accordingly, when the curtain **22** is inserted into the casing, the lips **26***a* and **26***b* will always be somewhat displaced from their normal positions toward the body of the ring **26**, and thus the inherent resiliency of the rubber or like material of which the ring is made will continually press the lips against the respective inner surfaces of the casing **27**.

For the purpose of illustrating the manner in which the lips **26***a* and **26***b* perform their sealing action, let it be assumed that the journal is merely reciprocating vertically and that the lubricant, say oil, in the bottom of the journal box casing **11** splashes over the wall **15** and through the opening **16** therein.

On the downstroke of the journal **14** and curtain **22**, the lowermost half of the lip **26***b*, which projects angularly inwardly toward the opening **16**, will slide downwardly along the associated portion of the casing wall **29**, and since it is still angularly oriented relative to the body of the sealing ring **26**, this lip can flex sufficiently toward the ring body to permit upward passage of any oil which has accumulated in the space between the sealing ring **26** and the casing flange **28***b*—**29***b* toward the opening **16**. This upward flow of oil is engendered by the lowermost half of the lip **26***a*, which projects angularly outwardly relative to the opening **20**, moving downwardly along the casing wall **28** and wiping the same clean so as to force the oil between the lip **26***b* and the casing wall **29**. On the upstroke of the curtain **22**, the lip **26***b* will now per-

form a wiping action along the wall 29 and thus force oil collected between the sealing rings 26 and 25 (on the right-hand side of the curtain member 23 as shown in FIG. 2) back into the journal box housing 11 through the opening 16. At the same time, the lip 26*a* will merely slide upwardly along the casing wall 28 and, although it offers little resistance to the upward movement of the curtain, will still be pressed against the wall 28 with sufficient force to prevent infiltration of foreign substances from the rear or wheel-side of the journal box through the opening 20.

From the foregoing, it will be readily understood that the action just described is essentially that of a differential pressure pump. On the downstroke of the curtain, the increased pressure on the oil in the decreasing space between sealing ring 26 and casing flange 28*b*—29*b* builds up a fluid head against the outer peripheral surface of the lip 26*a* to increase the seal between the same and casing wall 28 and to simultaneously force some of the oil from this decreasing space upwardly past the downwardly moving lip 26*b*. On the upstroke of the curtain, however, the pressure on the oil in this now increasing space is reduced and the fluid head is built up against the inner peripheral surface of the upwardly moving lip 26*b* by the oil located thereabove, which increases the seal of this lip with the casing wall 29 and forces the oil back through the opening 16 into the journal box housing 11.

Although for simplicity of illustration and understanding, the operation of the seal has been described with respect to a purely vertical movement of the journal 14, it will be clear to those skilled in the art that the lips 26*a* and 26*b* of the sealing ring 26 perform exactly the same functions irrespective of the direction in which the journal moves relative to the journal box. A detailed description of the sealing action of the ring 26 for such other directions of movement of the journal is, therefore, not deemed necessary herein.

As hereinbefore mentioned, the curtain 22 will at times move axially with the journal 14 and thus will be displaced laterally either toward the casing wall 28 or toward the casing wall 29. It is, consequently, necessary that the normal spacing of the sealing lips 26*a* and 26*b* (see FIG. 3) be sufficiently great to ensure that even if the curtain moves to such an extent as to completely flatten out either the lip 26*a* or the lip 26*b* against the body of the sealing ring 26 (see FIGS. 3*a* and 3*b*), the other of the two lips should still engage the associated casing wall 28 or 29. In this manner, no matter how far the curtain 22 is displaced from its median position within the casing 27, the seal between the ring 26 and the casing is always maintained in effect.

In view of the fact that the curtain does occasionally move for considerable distances toward one or the other of the casing walls 28 and 29, it is also necessary that means be provided for preventing any contact between the curtain member 23 and either the casing walls or the dust guard slot walls 15 and 18, which means must also serve for absorbing or cushioning the shock of any engagement between the curtain and any part of the dust guard slot. This function is also fulfilled by the sealing ring 26. As can be seen from FIGS. 3, 3*a* and 3*b*, the ring 26 is so shaped that the body thereof, when the lips are folded flush against it, constitutes a body of essentially rectangular cross-section which acts in the manner of a resilient bumper. Moreover, this type of construction enables the entire outer sealing ring 26 to act as a bumper, and inasmuch as the sealing lips themselves constitute a part of the bumper and partake in the shock-absorbing action upon being folded flat against the ring body, there is never any danger of either of the lips being crushed between the body of the sealing ring and the associated casing wall.

With respect to the embodiment of the invention illustrated in FIGS. 1 and 2, it is noted that the journal box 10 and therewith the dust guard slot walls 15 and 18 are constituted by a single casting the surfaces of which are relatively rough. Thus, the metal to metal contact between the journal box wall 15 and the casing wall 29 allows some oil to leak out from the journal box housing 11 and down between the walls 15 and 29. It is the function of the sealing member 30 and its sealing lip 30*a* to prevent any substantial loss of oil in this manner. This is accomplished by virtue of the fact that the lip 30*a* is strongly pressed against the inner surface of the peripheral dust guard slot wall 19 so as to provide a substantially hermetic seal therewith. Furthermore, any oil which leaks into the space below the casing flange 28*b*—29*b* builds up a static head on the edge of the lip 30*a*, thereby enchancing the seal between the latter and the slot wall 19. This enhanced seal not only prevents any leakage of oil past it but also prevents infiltration of foreign substances from the rear of the journal box.

Although the principles of the present invention have been described hereinabove as applied to a curtain floating within a metallic casing which is itself mounted in the dust guard slot of the journal box, it will be readily appreciated that the same principles are equally applicable to a journal box in which no metallic casing is mounted in the dust guard slot. A modification of the invention along these lines is illustrated in FIG. 4 where the curtain 22 is shown as being directly mounted in the dust guard slot 17 without the intermediary of any smooth-surfaced metallic casing. As previously noted, the interior surfaces of the dust guard slot are relatively rough, but this in no way detracts from the efficacy of the outer sealing ring 26 in maintaining the required dynamic seal between the curtain 22 and the slot walls 15 and 18.

By way of résumé, therefore, it will be seen that the present invention provides a highly effective dust guard and oil seal which comprises a substantially rigid member provided with a central opening and with flexible sealing sealing rings attached to the member at the inner and outer peripheral edges thereof. The inner sealing ring is shaped to provide a radially innermost flat bearing surface the generatrix of which is parallel to the axis of the aforesaid opening, and a slanted guide or cam surface starting at one edge of the said flat bearing surface and extending toward the radially outermost edge of the inner sealing ring on the side thereof which is ultimately to face away from the journal box. The inner sealing ring is further shaped to provide a flexible sealing lip which is effectively hingedly connected to the body of the sealing ring adjacent the radially outermost edge thereof and on the side which is ultimately to face the journal box, this lip extending angularly away from said sealing ring body and past the aforesaid flat bearing surface. The lip of the inner sealing ring is so arranged that when a journal extends through the rigid curtain member in contact with the flat bearing surface, the lip is deflected from its normal position toward the journal box and is continually urged into engagement with the journal due to its inherent resilience and tendency to regain its normal position.

The outer sealing ring, on the other hand, is shaped to provide a pair of sealing lips one of which is effectively hingedly attached to the outer sealing ring at the radially innermost edge thereof, on the side which is to face away from the journal box, and extends angularly radially outwardly of the sealing ring, the other lip being effectively hingedly attached to the radially outermost edge of the outer sealing ring, on the side which is to face the journal box, and extending angularly radially inwardly of the outer sealing ring. The lips of the outer sealing ring extend in opposite directions away from the said ring in such a manner that the normal or perpendicular distance between the outermost edges of these sealing lips is appreciably greater than the perpendicular distance between the front and rear inner faces of the dust guard slot in which the curtain member is to be mounted. Accordingly, the outer sealing lips are always urged into contact with

the aforesaid inner faces of the journal box dust guard slot (or of an auxiliary casing mounted in this slot), even if the curtain member as a unit tends to move toward one or the other inner face of the dust guard slot. The overall cross-sectional shape of the outer sealing ring, furthermore, is such that upon such movement of the curtain member one or the other of the lips of the outer sealing ring is folded flush against the body of the latter and constitutes therewith a bumper or cushion designed to prevent contact of the rigid curtain member with any part of the dust guard slot.

While a preferred embodiment of the dust guard and oil seal according to the present invention has been described herein, it is to be understood that a number of changes and modifications of the component parts thereof may be undertaken without involving any departure from the spirit of my invention or the scope thereof as defined by the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A dust guard and oil seal curtain for a railway car journal box, comprising a substantially rigid plate member movably positioned in the journal box dust guard slot and having a central opening for accommodating a journal, an outer sealing ring having a substantially rectangular cross section carried by the plate member at the outer peripheral edge thereof, said sealing ring being provided with first and second journal box dust guard slot sealing lips effectively hingedly connected thereto at first and second side surfaces thereof, respectively, the effective hinge connection of said first sealing lip to said first side surface being radially inwardly of the effective hinge connection of said second sealing lip to said second side surface, said first sealing lip extending angularly radially outwardly from said first side surface, said second sealing lip extending angularly radially inwardly from said second side surface, each of said first and second sealing lips being constructed and arranged to be folded flush against its associated side surface of said sealing ring to constitute therewith a unitary bumper for cushioning possible movements of said plate member toward one or the other inner face of the journal box dust guard slot in which the curtain is mounted.

2. A dust guard and oil seal curtain for use with a stepped journal in a railway car journal box, comprising a substantially rigid plate member movably positioned in the journal box dust guard slot and having a central opening for accommodating a journal, and an inner sealing ring carried by said plate member at the inner peripheral edge thereof, said sealing ring being provided with a flat horizontally extending bearing surface that is concentric with said opening in said plate member and is of substantially the same diameter as the journal for retaining the curtain in fixed concentricity with the journal irrespective or relative transverse movement between the journal and the journal box, said sealing ring being also provided with a journal sealing lip effectively hingedly positioned on a side surface of said sealing ring, the effective hinge diameter being greater than the diameter of said bearing surface, said sealing lip extending angularly radially inwardly from said side surface to a diameter less than that of said bearing surface such that an annular chamber is formed between said side surface and said journal sealing lip, said sealing ring being further provided with a camming surface extending angularly radially outwardly from an edge of said bearing surface remote from said journal sealing lip to another side surface of said sealing ring.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,041,091 June 26, 1962

Joseph J. Bayerl

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 1, line 47, after "wood" insert a comma; column 10, line 14, for "or" read -- of --.

Signed and sealed this 16th day of October 1962.

SEAL)
ttest:

RNEST W. SWIDER
ttesting Officer

DAVID L. LADD
Commissioner of Patents