July 14, 1964 J. E. STRICKLIN ETAL 3,140,903

SEAL FOR RAILWAY CAR JOURNAL BEARING

Filed June 13, 1962 2 Sheets-Sheet 1

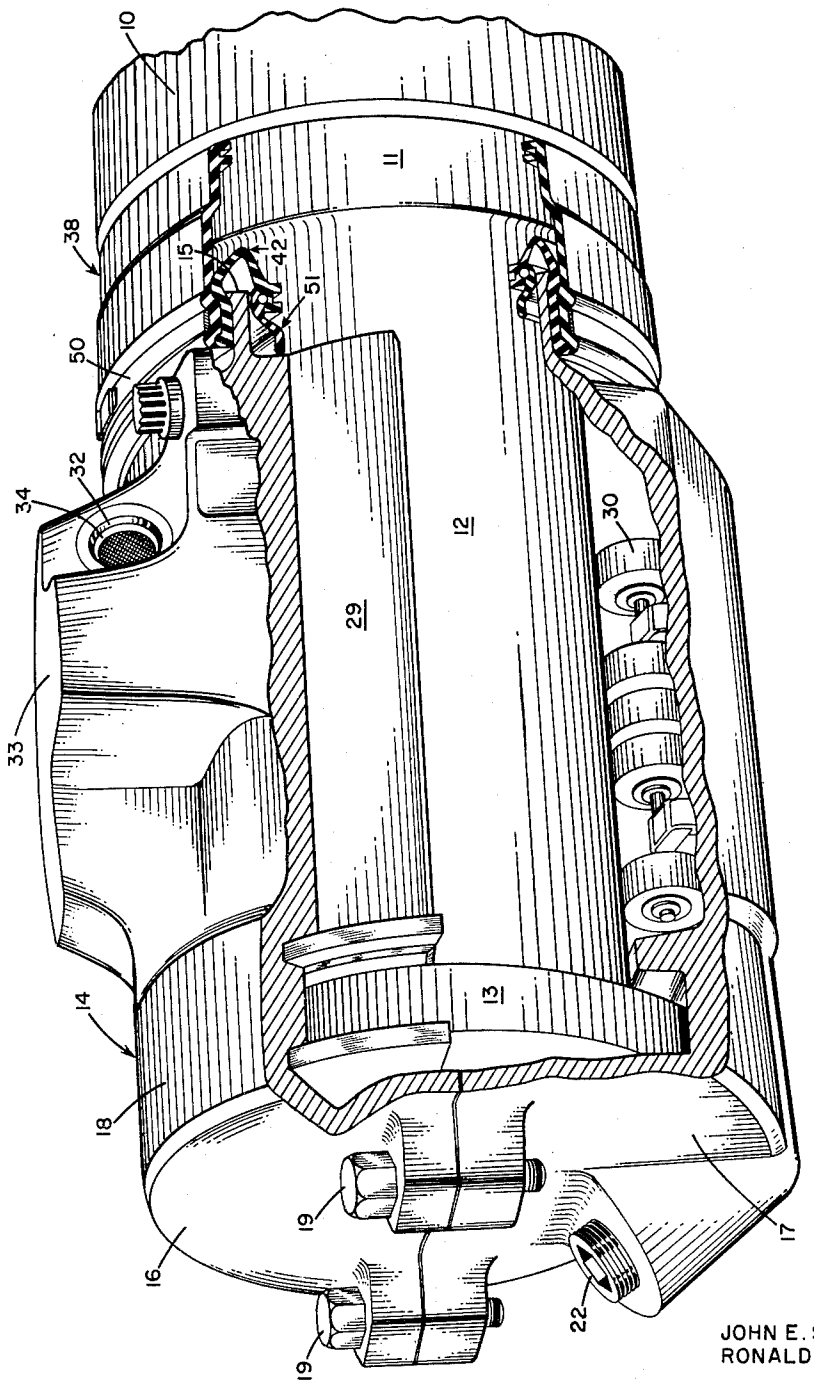


FIG. 1

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FIG. 2

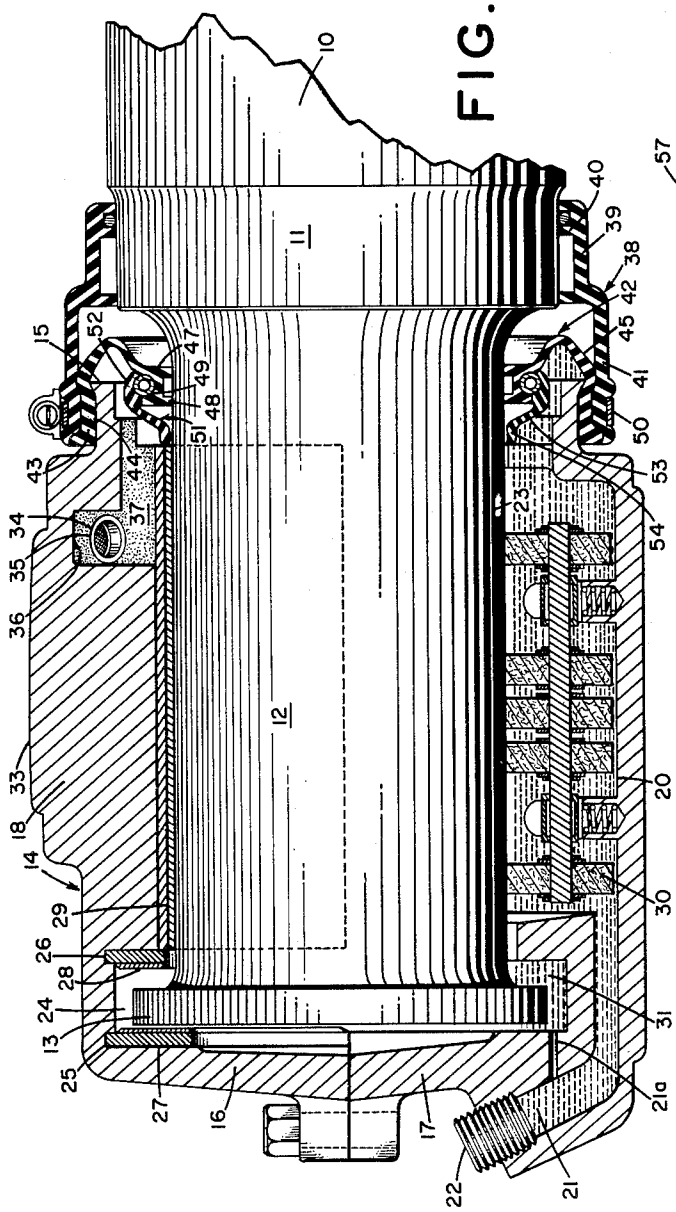


FIG. 4

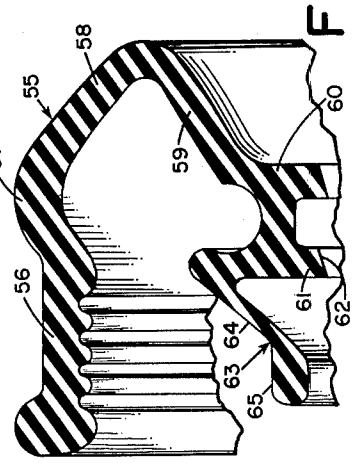
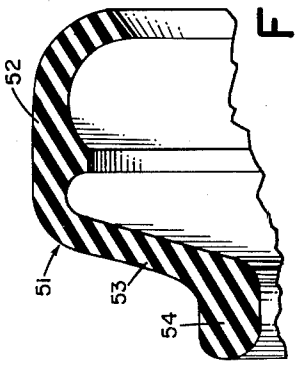


FIG. 3



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SEAL FOR RAILWAY CAR JOURNAL BEARING

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6 Claims. (Cl. 308—36.1)

This invention relates to railway car journal bearings and is primarily concerned with a seal for a railway car journal bearing.

An object of the present invention is to provide a seal to minimize the flow of lubricant particles out of the interior of the housing through the vent passage of a railway car journal bearing.

For a better understanding of the present invention, together with other and further objects thereof, reference is had to the following description taken in connection with the accompanying drawings, and its scope will be pointed out in the appended claims.

With reference to the drawings there is shown in FIGURE 1 an isometric partially cut-away drawing of a railway car journal bearing;

FIGURE 2 is a vertical sectional view of the railway car journal bearing below the longitudinal axis of the railway car axle and above the longitudinal axis of the railway car axle, a sectional view taken about 15° to the left or right of a vertical line through the center of the railway car axle;

FIGURE 3 is a fragmentary longitudinal sectional view of the oil lubricant mist leakage minimizing annular member; and

FIGURE 4 is a fragmentary longitudinal sectional view of an integral oil seal and an oil lubricant mist leakage minimizing member.

In the present invention, a housing is disposed over the end of a railway car axle and has a closed outer end. A lubricant occupies the bottom part of the housing. A dust seal is mounted on the railway car axle and the inner end of the housing and a lubricant seal is mounted on the railway car axle and the inner end of the housing. A vent passage in the upper portion of the end of the housing is in communication with the atmosphere. In practice the liquid lubricant forms a mist and flows out through the vent passage to the atmosphere. This causes a serious leakage and loss of liquid lubricant. To solve this problem an annular member surrounds the railway car axle and extends from the oil seal across the vent passage to the adjacent portion of the housing. Thus the escape of liquid lubricant mist from the interior of the housing through the vent passage to the atmosphere is minimized.

In the drawings, **10** designates a section of a railway car axle of one diameter while **11** designates a section of a smaller diameter than section **10** and **12** an end section a smaller diameter than section **11**. The section **12** of the railway car axle terminates at its outboard end in a thrust collar **13**. A housing **14** has one end **15** open and has a closed end **16** and includes a lower portion **17** and an upper portion **18** secured to the lower portion by bolts **19**. The housing **14** is positioned over the end section **12** of the railway car axle with its open end **15** disposed adjacent the section **11** of the railway car axle. The interior bottom surface **20** of the housing **14** forms a lubricant reservoir for a lubricant such as oil and the closed end **16** of the housing is provided with a hole **21** for the introduction of lubricant and the upper end of this hole is internally threaded and is closed by an externally threaded plug **22**. The reservoir **20** of the housing **14** is filled with a lubricant such as oil to the level **23** as shown in FIGURE 2.

At its closed end the upper housing portion **16** has a groove **24** which is wide and which has two accurately machined grooves **25** and **26** into which replaceable thrust washers **27** and **28** are positioned with their lower edges resting on the parting line surface of the lower housing portion **17**. Each of the thrust washers **27** and **28** preferably is formed of a steel backing portion with an integral bearing metal face portion in position to engage the thrust collar **13** as the railway car axle and collar moves axially in and out of the housing **14**. A semi-cylindrical bearing **29** is seated in a semi-cylindrical bore in the upper housing portion **16**, between the upper housing portion and the end section **12** of the railway car axle, and its parting line faces rest upon the parting line surfaces of the lower housing portion **17**. The semi-cylindrical bearing **29** is made of a hard outer layer of one material and a soft inner layer of a different material.

Means such as the spring biased felt roller device **30** is mounted in the reservoir **20** in the housing **14** and is maintained in contact with the underneath surface of the end section **12** of the railway car axle to apply lubricant thereto. When the reservoir **20** is filled with lubricant the plug **22** is removed and lubricant is introduced into the opening **21** and air in the housing first flows out through the hole **21***a* and opening **21** and then the auxiliary reservoir **31** is filled with oil. The lower end of the collar **13** runs in the oil in the auxiliary reservoir and carries oil continuously to the thrust washers **27** and **28**. Thus if the oil level is to be checked the plug **22** is removed and the inspector can immediately determine the oil level in the reservoir **20**.

With the substantially complete sealing of the end section **12** of the railway car axle within the housing **14**, it becomes very important to vent the housing. This need arises due to the piston-like action of the end section **12** of the railway car axle as it moves in and out of the housing **14** by a distance up to about ⅞ of an inch. Each longitudinal movement of the end section **12** of the railway car axle results in displacement of a quantity of air. In order to keep this displaced air from breaking through the oil seal with consequent oil pumping, a vent **32** has been provided in the housing **14** for venting the inside of the housing to the atmosphere. The vent **32** is located at the top of the upper housing portion **16** behind the thick cross-shaped load bearing member **33** so that the vent is almost completely protected from the elements when the journal housing is in place in a railroad journal box. Also, this location is important since it lies behind the semi-cylindrical bearing **29** at the top of the unit where the velocity of the oil particles moving around in the housing is at a minimum and consequently pumping air in and out of the vent at this location causes less loss of oil. The vent **32** comprises two sintered metal discs **34** pressed into a pair of opposed openings **35** in the upper housing portion **16** and in communication with a passageway **36**. The sintered metal discs **34** have a plurality of openings of such a size as to exclude all dirt particles which are .005″ or larger in size. A pair of slots **37** begin in spaced relation adjacent the open end **15** of the upper housing portion **16** and converge and merge at the same location with the passageway **36**.

An annular member or circular hood **38** includes a circular portion **39** surrounding the section **14** of the railway car axle and integral annular fingers **40** project inwardly from the circular portion **39** and engage the section **11** of the railway car axle and a circular portion **41** of larger diameter than the circular portion **39** is integral with the circular portion **39** and the circular portion **41** extends over the open end of the housing **14**. The annular member **38** may be made of any suitable resilient material such as synthetic rubber. The annular member

38 is a dust seal and prevents dust from flowing between the railway car axle and the housing 14 into the interior of the housing.

Another annular member 42 has a circular portion 43 fitted between a reduced circular portion 44 on the housing 14 and the circular portion 41 of the annular member 38. The annular member 42 further includes a diagonal leg 45 integral with the circular portion 43 and another diagonal leg 46 integral with the diagonal leg 45 and a ring 47 is made integral with the diagonal leg 46 and has integral annular fingers 48 which project into engagement with the end section 12 of the railway car axle. The ring 47 has an annular groove in its periphery and a garter spring 49 is disposed in the annular groove and urges the annular fingers 48 into engagement with the end section 12 of the railway car axle. The annular member 42 may be made of any suitable resilient material such as synthetic rubber. The annular member 42 prevents the lubricant in the housing 14 from leaking between the end section 12 of the railway car axle and the housing 14 to the atmosphere. A circular metal band 50 holds both the dust seal 38 and the oil seal 42 on the circular portion 44 of the housing 14.

An annular member or ring 51 has a circular portion 52 of one diameter and a diagonal leg 53 integral with the circular portion 52 and a circular portion 54 of a smaller diameter than the circular portion 52 and integral with the diagonal leg. The circular portion 52 of the annular member 51 has an annular groove in its inner periphery to receive the outer portion of the garter spring 49. The circular portion 54 of the annular member 50 is in engagement with the end of the semi-cylindrical bearing 29. The annular member 51 may be made of any suitable resilient material such as synthetic rubber.

The pumping action of the railway car axle 10 in the housing 14 results in the flow of air in the housing below the parting line faces of the bearing 29. The air must then flow around the outer periphery of the annular member 51 into the passages 37 and then through the passage 36 and the discs 34 to the atmosphere. The inner periphery of the annular member 51 deflects oil mist downwardly and if any oil mist flows out of the housing it must follow the path of the air around the outer periphery of the annular member 51. Thus it will be seen that the annular member 51 minimizes the flow of oil mist from the interior of the housing 14 through the slots 37 and through the passageway 36 and through the sintered metal discs 34 to the atmosphere.

A modified form of the invention is shown in FIGURE 4. In this form of the invention the oil seal and the oil mist leakage minimizing member are made integral. An oil seal or annular member 55 includes a circular portion 56 and a larger diameter circular portion 57 integral with the circular portion 56 and a diagonal leg 58 integral with the circular portion 57 and another diagonal leg 59 integral with the diagonal leg 58. An annular member 60 is made integral with the diagonal leg 59 and has a pair of integral annular fingers 61 with sloping ends 62 for engaging the end section 12 of the railway car axle. The annular member 60 has an annular groove in its periphery for receiving a garter spring such as the garter spring 49. The oil mist leakage minimizer 63 is made integral with the oil seal 55 and includes a diagonal leg 64 made integral with the annular member 60 and a circular portion 65 made integral with the diagonal leg and engaging the end of the semi-cylindrical bearing 29. The advantages of an integral oil seal and oil mist leakage minimizer are that the integral arrangement is less expensive and is easier to assemble with the housing and there is no risk of the assembler forgetting to install the oil mist leakage minimizer with the housing and the oil mist leakage minimizer can be more accurately positioned with respect to the housing.

The term "mounted" as used in the claims means that the oil mist leakage minimizer may surround and snugly engage the oil seal as shown in FIGURE 2 or that the oil mist leakage minimizer may be made integral with the oil seal as shown in FIGURE 4.

While there have been described what are at present considered to be the preferred embodiments of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and it is aimed, therefore, in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. A lubricant seal for bearing means for a railway car axle having a first section of one diameter and an end section of a smaller diameter, said bearing means comprising a housing having one end open and the other end closed and the housing being positioned over the end section of the railway car axle with its open end disposed adjacent the first section of the railway car axle and the interior bottom surface of the housing forming a lubricant reservoir and the upper portion of the open end of the housing being provided with a passage in communication with the atmosphere, a lubricant in the lubricant reservoir, said seal comprising a first annular member surrounding and in engagement with the first section of the railway car axle and extending over the open end of the housing to prevent dust from entering the housing, a second annular member surrounding and in engagement with the end section of the railway car axle and mounted on the open end of the housing to prevent lubricant from leaking from the interior of the housing, and a third annular member surrounding the end section of the railway car axle and in engagement with the housing and mounted on the second annular member to minimize lubricant particles flowing out through the passage to the atmosphere.

2. A lubricant seal for bearing means for a railway car axle having a first section of one diameter and an end section of a smaller diameter, said bearing means comprising a housing having one end open and the other end closed and the housing being positioned over the end section of the railway car axle with its open end disposed adjacent the first section of the railway car axle and the interior bottom surface of the housing forming a lubricant reservoir and the upper portion of the open end of the housing being provided with a passage in communication with the atmosphere, a lubricant in the lubricant reservoir, means disposed in the housing and in lubricant reseervoir and movably supported by the housing and in engagement with the end section of the railway car axle for applying lubricant to the railway car axle, said seal comprising a circular first annular rubber-like member surrounding and in engagement with the first section of the railway car axle and extending over the open end of the housing to prevent dust from entering the housing, a second annular rubber-like member surrounding and in engagement with the end section of the railway car axle and mounted on the open end of the housing to prevent lubricant from leaking from the interior of the housing, and a third annular rubber-like member surrounding the end section of the railway car axle and in engagement with the housing and mounted on the second annular member and extending inwardly of said housing to minimize lubricant particles flowing out through the passage to the atmosphere.

3. A lubricant seal for bearing means for a railway car axle having a first section of one diameter and an end section of a smaller diameter, said bearing means comprising a housing having one end open and the other end closed and the housing being positioned over the end section of the railway car axle with its open end disposed adjacent the first section of the railway car axle and the interior bottom surface of the housing forming a lubricant reservoir and the closed end of the housing being provided with a hole for the introduction of lubricant and the upper portion of the open end of the hous-

ing being provided with a pair of slots in communication with a pair of openings in communication with the atmosphere, a semi-cylindrical bearing disposed between the upper portion of the housing and the end section of the railway car axle, a lubricant in the lubricant reservoir, means disposed in the housing and in the lubricant reservoir and movably supported by the housing and in engagement with the end section of the railway car axle for applying lubricant to the railway car axle, said seal comprising a circular first annular member surrounding and in engagement with the first section of the railway car axle and extending over the open end of the housing to prevent dust from entering the housing, a second annular member surrounding and in engagement with the end section of the railway car axle and mounted on the open end of the housing to prevent lubricant from leaking from the interior of the housing, and a third annular ring member surrounding the end section of the railway car axle and in engagement with the semi-cylindrical bearing and mounted on the second annular member and extending inwardly of said housing and in engagement with said semi-cylindrical bearing to minimize lubricant particles flowing out through the pair of slots and the pair of openings to the atmosphere.

4. A lubricant seal for bearing means for a railway car axle having a first section of one diameter and an end section of a smaller diameter, said bearing means comprising a housing having one end open and the other end closed and the the housing being positioned over the end

section of the railway car axle with its open end disposed adjacent the first section of the railway car axle and the interior bottom surface of the housing forming a lubricant reservoir and the upper portion of the open end of the housing being provided with a passage in communication with the atmosphere, a lubricant in the lubricant reservoir, said seal comprising a first annular member surrounding and in engagement with the first section of the railway car axle and extending over the open end of the housing to prevent dust from entering the housing, and a lubricant seal and lubricant particles leakage minimizing means including a second annular member surrounding and in engagement with the end section of the railway car axle and mounted on the open end of the housing and a third annular member surrounding the end section of the railway car axle and in engagement with the housing and integral with the second annular member.

5. A lubricant seal for bearing means as set forth in claim 1, further characterized by said second annular member and said third annular member being integral.

6. A lubricant seal for bearing means as set forth in claim 2, further characterized by said second annular rubber-like member and said third annular rubber-like member being integral.

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