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R. L. BAILEY

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RAILROAD JOURNAL BOX OILING STRUCTURE

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2 Sheets-Sheet 1

Fig. 1.

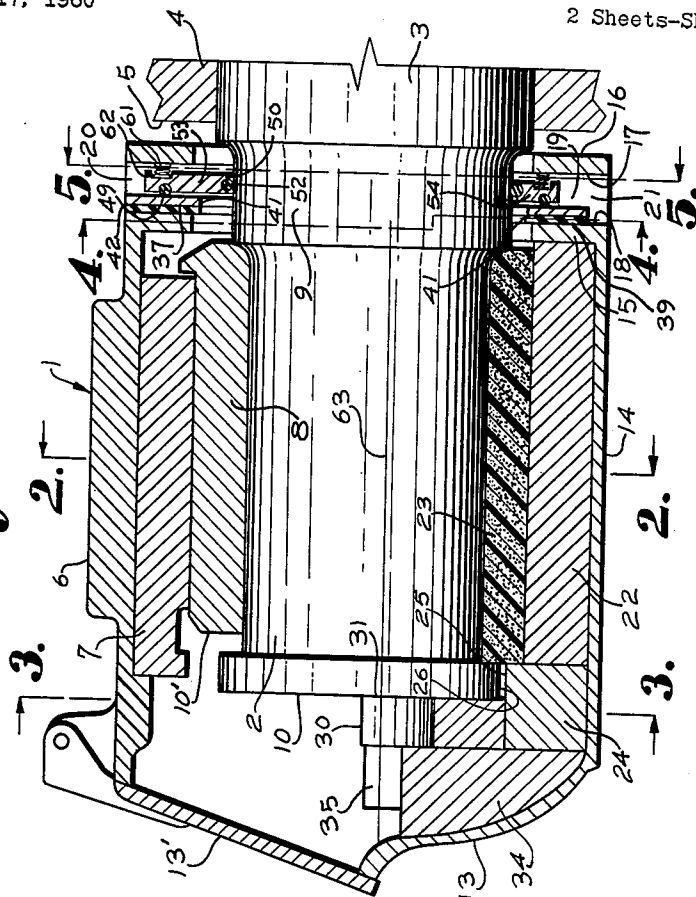
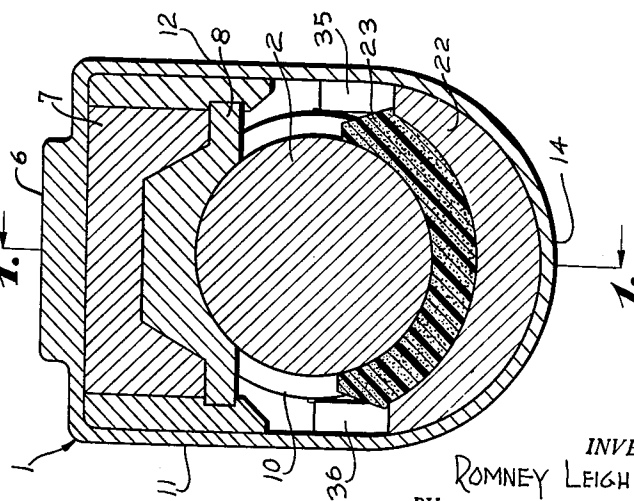


Fig. 2.



INVENTOR.
ROMNEY LEIGH BAILEY
BY
Eishburn & Kold
ATTORNEYS

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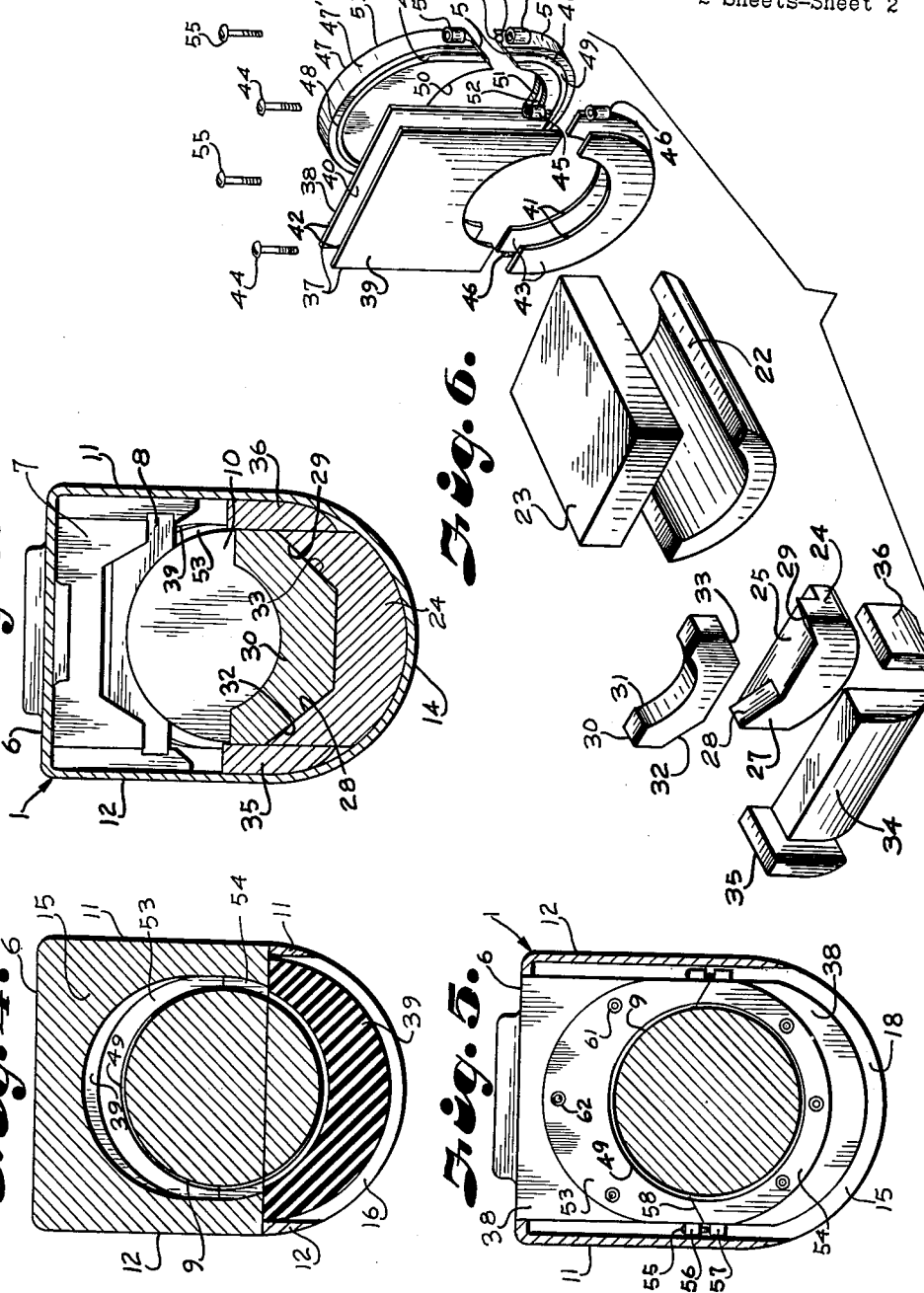
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Fig. 3.

Fig. 4.

Fig. 6.

Fig. 5.



INVENTOR.
ROMNEY LEIGH BAILEY
BY
Fishburn & Gold
ATTORNEYS

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3,092,426

RAILROAD JOURNAL BOX OILING STRUCTURE

Romney Leigh Bailey, 803 Franklin, Wichita, Kans.

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7 Claims. (Cl. 308-41)

This invention relates to an improvement in journal boxes and, more particularly, to an assembly for use with railroad journal boxes resulting in improved lubrication between the bearing and axle journal.

The principal objects of the present invention are; to provide an improved lubricating structure for railroad journal boxes which permits the use of a liquid oil level so positioned with respect to the journal that the journal is partially immersed therebeneath; to provide an oil seal which effectively prevents significant leakage past the journal fillet collar in the presence of a high oil level and relative movement between the journal and the journal box; to provide an oil seal which replaces the usual dust guard used in railroad journal boxes while maintaining the dust guard function; to provide a structure adaptable for assembly in a conventional railroad journal box which significantly reduces journal and bearing wear due to improved journal lubrication while reducing the possibility of damage due to "hot boxes"; to provide a railroad journal box with stop elements to reduce relative axial and radial movement of the axle and box; to provide such a structure in which the stop elements are removable and in assembling are inserted through the access opening of the journal box and arranged in said box and held in operative position by cooperative engagement; and to provide such a device which can be combined with railroad journal boxes without a major disassembly thereof from the frame.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings wherein are set forth by way of illustration and example certain embodiments of this invention.

FIG. 1 is a sectional view taken on the line 1-1, FIG. 2, showing a conventional railroad journal box and journal, the box containing the journal movement limiting structure and the oil seal of this invention.

FIG. 2 is a sectional view through the journal and box taken on the line 2-2, FIG. 1, showing the position of an oil absorber and applicator.

FIG. 3 is a sectional view through the journal box taken on the line 3-3, FIG. 1, showing the position of a stop member on a support block.

FIG. 4 is a sectional view through the journal and box taken on the line 4-4, FIG. 1, showing the position of the oil seal with respect to the journal and journal box.

FIG. 5 is a sectional view through the journal and box taken on the line 5-5, FIG. 1, showing the oil seal springs.

FIG. 6 is an exploded perspective view showing the various parts forming the structure of this invention prior to assembly with a journal box.

Referring to the drawings in more detail:

The reference numeral 1 indicates generally a journal box designed for use on railroad box cars and the like. The journal box 1 houses a journal 2 of an axle 3 on which is mounted a wheel 4. A hub 5 of the wheel 4 is normally spaced from the box 1 to allow movement therebetween along the axle axis. The journal box 1 is supported by the top wall 6 thereof on a railway vehicle truck side frame (not shown) in the usual manner. The top wall 6 is supported on a wedge 7 mounted over a bearing 8 which rotatably engages the journal 2.

The axle 3 exhibits a fillet collar 9 positioned between

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the journal 2 and the wheel 4 and a cap collar 10 at the outer end of the journal 2 of larger diameter than the journal and projecting radially therefrom beyond the outer end 10' of the bearing 8.

5 The journal box has upright side walls 11 and 12, a forward wall 13, a hinged access door 13' and a bottom wall 14 respectively spaced from the journal 2. The journal box 1 also has formed integrally therewith longitudinally spaced flanges 15 and 16 which surround the fillet collar 9. The flange 16 exhibits a forwardly facing surface 17 and the flange 15 exhibits a rearwardly facing surface 18 forming a dust guard well 19 therebetween. The dust guard well 19 is open at the top 20 thereof and, for the purposes of this invention, is preferably open at the bottom 21 thereof for oil seal assembly as will become apparent hereinafter.

A contour block or element 22 is spaced beneath the journal 2 and rests upon the bottom wall 14 of the journal box 1. The contour block 22 supports an oil absorber and applicator 23 which is preferably a sponge-like member in partially compressed condition against the journal 2 and contacting the journal 2 substantially along the entire length thereof (FIG. 1). The sponge-like member 23 may be of foam plastic, synthetic sponge rubber or the like, the essential properties being elastic compressibility, inertness to oil and the ability to "wick up" the oil. One example of such a product is open cellular polyurethane.

A support block or element 24 rests on the bottom wall 14 forwardly of and in contact with the contour block 22 and beneath the cap collar 10. The support block 24 has a horizontally extending portion or face 25 which is slightly vertically spaced from the lowermost horizontal edge portion 26 of the cap collar 10 for a purpose explained hereinafter. The support block 24 also exhibits a portion 27 extending forwardly of the cap collar 10 and having upwardly and outwardly sloping side surfaces 28 and 29 (FIG. 6). A stop element in the form of a thrust bearing block 30 extends upwardly into axial alignment with the journal and includes a rearwardly facing surface 31 contacting the cap collar 10 and downwardly and inwardly sloping lower surfaces 32 and 33 which are adapted to nest between and engage the sloping surfaces 28 and 29 of the support block 24.

A wedge block or element is located between and in engagement with the thrust bearing block 30 and the forward wall 13 of the journal bearing box 1 and extends downwardly so as to engage the support block 24, thus preventing forward displacement of both the support block 24 and the thrust bearing block 30. Spacing blocks or elements 35 and 36 abut the respective journal box side walls 12 and 11 and contact opposite sides of the thrust bearing block 30 preventing lateral displacement due to rotational forces caused by contacting the rotating cap collar 10. It is apparent that the blocks described above are proportioned so as to be assembled with respect to the journal through the opening normally closed by the access door 13' without disassembly of the journal from the journal box.

A first oil seal section 37 comprises a rigid plate 38 such as steel plate having smooth surfaces and a rubber-like sheet 39 formed of a flexible oil-impervious material such as neoprene. The plate 38 and rubber-like sheet 39 are secured in face-to-face relation by means of a suitable adhesive at 40 to form the first oil seal section 37. The first oil seal section 37 has a transverse bore 41 there-through of greater diameter than the fillet collar 9 so as to permit vertical and lateral movement of the fillet collar 9 without contacting same. The oil seal section 37 is transversely split into an upper portion 42 and a lower portion 43 retained together by means of screws 44 re-

ceived into bored ears 45 and threaded ears 46 respectively secured to the portions 42 and 43 along the side edges thereof by welding. A second oil seal section 47 comprises a plate 47' having a forwardly facing peripheral groove 48 surrounding said fillet collar and containing an elongated cylindrical sealing member 49 of resilient material such as neoprene. The oil seal section 47 has a transverse bore 50 therethrough of slightly greater diameter than the fillet collar 9, but of smaller diameter than the transverse bore 41 of the first oil seal section 37. The surface of the bore 50 presents an annular groove 51 containing a sealing member 52 similar to member 49 and adapted to seal against the fillet collar 9 while permitting longitudinal movement thereof. The oil seal section 47 is transversely split into an upper portion 53 and a lower portion 54 retained together by means of screws 55 received into bored ears 56 and threaded ears 57 respectively secured to the portions 53 and 54 along the side edges thereof by welding. It is preferable that the split edges of the section 47 be diagonal as indicated at 58 and that the lower split edges exhibit grooves 59 containing sealing members 60 similar to the member 49. The members 60 deform between the portions 53 and 54 to produce a seal with the member 49. The oil seal sections 37 and 47 are split transversely as indicated above to permit assembly thereof around the fillet collar 9, as indicated more fully hereinafter.

The oil seal sections 37 and 47 are positioned in the dust guard well 19 and surround the fillet collar 9 with the first oil seal section 37 having its rubber-like sheet 39 contacting the rearwardly facing surface 18 of the flange 15. The second oil seal section 47 is positioned so that the sealing member 49 contacts the rigid plate 38 of the first oil seal section 37. Helical spring members 61 are inserted into receiving indentations 62 contained on the section 47, and bear against the forwardly facing surface 17 of the flange 16, urging the second oil seal section 47 against the first oil seal section 37 to compress the sealing member 49 providing a sealing action therebetween which prevents radial oil leakage.

In operation, the first oil seal section 37 remains substantially stationary against the flange 15 because the rearwardly facing surface 18 thereof is rough due to the usual sand cast finish, thus prohibiting easy relative movement. The second oil seal section 47, however, is relatively free to move with respect to the first oil seal section 37 while maintaining a seal therebetween since the rigid plate 38 of the first oil seal section is smooth and flat permitting the sealing member 49 of the second oil seal section to move thereacross while maintaining sealing contact therewith. It is thus apparent that cooperation between the journal box flanges 15 and 16 and the seal sections 37 and 47 will maintain oil at a level above the under surface of the fillet collar 9, even though there may be axial and radial movements of the fillet collar with respect to the journal box.

Relative movement between the fillet collar 9 and the journal box 1, however, will cause wear and deterioration of the oil seals, so for maximum service such relative motion must be held to a reasonable minimum. To accomplish this, the blocks or elements above described are positioned in the journal box 1. Limiting excess axial motion of the journal with respect to the journal box is achieved by thrust bearing blocks or stop elements 30 positioned on opposite ends of an axle 3 in opposed journal boxes, each thrust bearing block acting to prevent excess motion in opposite axial directions. The horizontally extending portion 25 of the support block 24 cooperates with the bearing 8 to limit excess vertical or lateral movement (radial movement) of the journal with respect to the journal box.

With the improvement in journal boxes described above, the oil level 63 therein may be maintained substantially above the under surface of the fillet collar 9 without significant oil leakage. Thus, the journal actually rides in

oil to obtain maximum oil coverage and thus adequate lubrication. In case the oil level does drop below the lowermost point on the journal, the sponge-like member 23 will wick up the remaining oil to keep the journal sufficiently lubricated until the deficiency is discovered and remedied.

It is to be understood that while I have illustrated and described one form of my invention, it is not to be limited to the specific form or arrangement of parts herein described and shown except insofar as such limitations are included in the claims.

What I claim and desire to secure by Letters Patent is:

1. In a railway journal box for a railway axle having a journal, a bearing contained in said box and contacting said journal, said journal entering said box from the rear and having a cap collar at its outer end of greater diameter than the journal and projecting radially therefrom beyond the end of said bearing, said journal box having side walls and a forward wall and a bottom wall respectively spaced from the journal, the combination of; an oil absorbing member, means supporting said oil absorbing member against said journal along the underside thereof, a support block resting on said bottom wall forwardly of said oil absorbing member and closely spaced beneath said cap collar, said support block having a portion extending forwardly of said cap collar, a thrust bearing block on the forwardly extending portion of said support block and extending upwardly into axial alignment with said journal, and means maintaining said thrust bearing block in axial alignment with said journal, whereby said journal is limited in relative axial, vertical and lateral movement with respect to said box.

2. In a railway journal box for a railway axle having a journal, a bearing contained in said box and contacting said journal, said journal entering said box from the rear and having a cap collar at its outer end of greater diameter than the journal and projecting radially therefrom beyond the end of said bearing, said journal box having side walls and a forward wall and a bottom wall respectively spaced from the journal, the combination of; a contour block resting on said bottom wall and spaced beneath said journal, a sponge-like member supported in partially compressed condition between said contour block and journal and contacting said journal, a support block resting on said bottom wall forwardly of said contour block and closely spaced beneath said cap collar, said support block having a portion extending forwardly of said cap collar, a thrust bearing block resting on the forwardly extending portion of said support block and extending upwardly into axial alignment with said journal, and means maintaining said thrust bearing block in axial alignment with said journal, whereby said journal is limited in relative axial, vertical and lateral movement with respect to said box.

3. In a railway journal box for a railway axle having a journal, a bearing contained in said box and contacting said journal, said journal entering said box from the rear and having a cap collar at its outer end of greater diameter than the journal and projecting radially therefrom beyond the end of said bearing, said journal box having upright side walls and a forward wall and a bottom wall respectively spaced from the journal, the combination of; a contour block resting on said bottom wall and spaced beneath said journal, a sponge-like member supported in partially compressed condition between said contour block and journal and contacting said journal substantially along the entire length thereof, a support block resting on said bottom wall forwardly of said contour block and closely spaced beneath said cap collar, said support block having a portion extending forwardly of said cap collar, a thrust bearing block resting on the forwardly extending portion of said support block and extending upwardly into axial alignment with said journal and contacting said cap collar, a wedge block located between said thrust bearing

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block and said forward wall, and spacing blocks abutting respective side walls of said box and contacting opposite sides of said thrust bearing block, whereby said journal is limited in relative axial, vertical and lateral movement with respect to said box.

4. In a railway journal box for a railway axle having a journal, a bearing contained in said box and contacting said journal, said journal entering said box from the rear and having a cap collar at its outer end of larger diameter than the journal and projecting radially therefrom beyond the end of said bearing, said journal box having upright side walls and a forward wall and a bottom wall respectively spaced from the journal, and a dust guard well surrounding a portion of said journal, the combination of; a sponge-like member, means supporting said sponge-like member in partially compressed condition against said journal along the underside thereof, a support block resting on said bottom wall forwardly of said sponge-like member and closely spaced beneath said cap collar, said support block having a portion extending forwardly of said cap collar, a thrust bearing block on the forwardly extending portion of said support block and extending upwardly into axial alignment with said journal, means maintaining said thrust bearing block in axial alignment with said journal, and an oil seal in said dust guard well.

5. In a journal box the combination of; a railway axle having a journal and a fillet collar adjacent thereto, said journal entering said box from the rear, a bearing contained in said box and contacting said journal, said box having flanges spaced longitudinally of said journal and surrounding said fillet collar, said flanges exhibiting a forwardly facing and a rearwardly facing surface forming a dust guard well therebetween, a first and second oil seal section, said first section comprising a rigid plate and a rubber-like sheet secured thereto in face-to-face relation, said first oil seal section having a transverse bore therethrough of greater diameter than said fillet collar, said second oil seal section comprising a plate having a forwardly facing peripheral groove surrounding said fillet collar and containing an elongated sealing member, said second oil seal section having a transverse bore therethrough presenting a surface having an annular groove therein containing a sealing member adapted to seal against said fillet collar, said first and second oil seal sections being positioned in said dust guard well with said fillet collar extending through said bores, said first oil seal section rubber-like sheet contacting said rearwardly facing flange surface and said second oil seal section elongated sealing member contacting said first oil seal section plate, and spring members between said forwardly facing flange surface and said second oil seal section for urging said seal sections together and toward said rearwardly facing flange surface whereby the oil level in said box may be maintained at a level substantially above the under surface of said fillet collar without significant leakage.

6. In a journal box the combination of; a railway axle having a journal and a fillet collar adjacent thereto, said journal entering said box from the rear, a bearing contained in said box and contacting said journal, said journal box having upright side walls and a forward wall and a bottom wall respectively spaced from the journal, said box having flanges spaced longitudinally of said journal and surrounding said fillet collar, said flanges exhibiting a forwardly facing and a rearwardly facing surface forming a dust guard well therebetween, means cooperating with said walls for limiting relative axial, vertical and lateral movement of said journal with respect to said box, a first and second oil seal section, said first section comprising a rigid plate and a rubber-like sheet secured thereto in face-to-face relation, said first oil seal section having a transverse bore therethrough of greater diameter than said fillet collar, said second oil seal section comprising a plate having a forwardly facing peripheral groove surrounding said fillet collar and con-

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taining an elongated sealing member, said second oil seal section having a transverse bore therethrough presenting a surface having an annular groove therein containing a sealing member adapted to seal against said fillet collar, said first and second oil seal sections being positioned in said dust guard well with said fillet collar extending through said bores, said first oil seal section rubber-like sheet contacting said rearwardly facing flange surface and said second oil seal section elongated sealing member contacting said first oil seal section plate, and spring members between said forwardly facing flange surface and said second oil seal section for urging said seal sections together and toward said rearwardly facing flange surface whereby the oil level in said box may be maintained at a level substantially above the under surface of said fillet collar without significant leakage.

7. In a journal box the combination of; a railway axle having a journal and a fillet collar adjacent thereto, said journal entering said box from the rear, a bearing contained in said box and contacting said journal, said journal having a cap collar at its outer end of larger diameter than the journal and projecting radially beyond one end of the bearing, a wedge on the bearing, said journal box having a top wall supported on the wedge and upright side walls and a forward wall and a bottom wall respectively spaced from said journal, said journal box having flanges spaced longitudinally of said journal and surrounding said fillet collar, said flanges exhibiting a forwardly facing and a rearwardly facing surface forming a dust guard well therebetween, a contour block resting on said bottom wall and spaced beneath said journal, a sponge-like member supported in partially compressed condition between said contour block and journal and contacting said journal, a support block resting on said bottom wall forwardly of said contour block and closely spaced beneath said cap collar, said support block having a portion extending forwardly of said cap collar, a thrust bearing block resting on the forwardly extending portion of said support block and extending upwardly into axial alignment with said journal and facing the lower forward surface of said cap collar, means maintaining said thrust bearing block in axial alignment with said journal, a first and second oil seal section, said first section comprising a plate having a transverse bore therethrough of greater diameter than said fillet collar, said second oil seal section comprising a plate having a transverse bore therethrough presenting a surface mounting an annular sealing member adapted to seal against said fillet collar, said first and second oil seal sections being positioned in said dust guard well with said fillet collar extending through said bores, one side of said first oil seal section plate facing said rearwardly facing flange surface and said second oil seal section plate facing the other side of said first oil seal section plate, sealing means between said rearwardly facing flange surface and said one side, sealing means between said second oil seal section plate and said other side, and resilient members between said forwardly facing flange surface of said dust guard well and said second oil seal section plate for urging said seal sections together and toward said rearwardly facing flange surface whereby the oil level in said box may be maintained at a level substantially above the under surface of said fillet collar without significant leakage.

References Cited in the file of this patent

UNITED STATES PATENTS

1,967,512	Pilcher	July 24, 1934
2,114,662	Barrows	Apr. 19, 1938
2,261,124	McBride	Nov. 4, 1941
2,361,289	Harrington	Oct. 24, 1944
2,657,102	Johnson	Oct. 27, 1953
2,657,958	Togliaferrri et al.	Nov. 3, 1953
2,733,966	Ryan	Feb. 7, 1956
2,840,396	Hennessy	June 24, 1958