Aug. 7, 1962 E. S. PEARCE ET AL 3,048,414

JOURNAL BOX DUST GUARD

Filed April 13, 1959

Fig. 2.

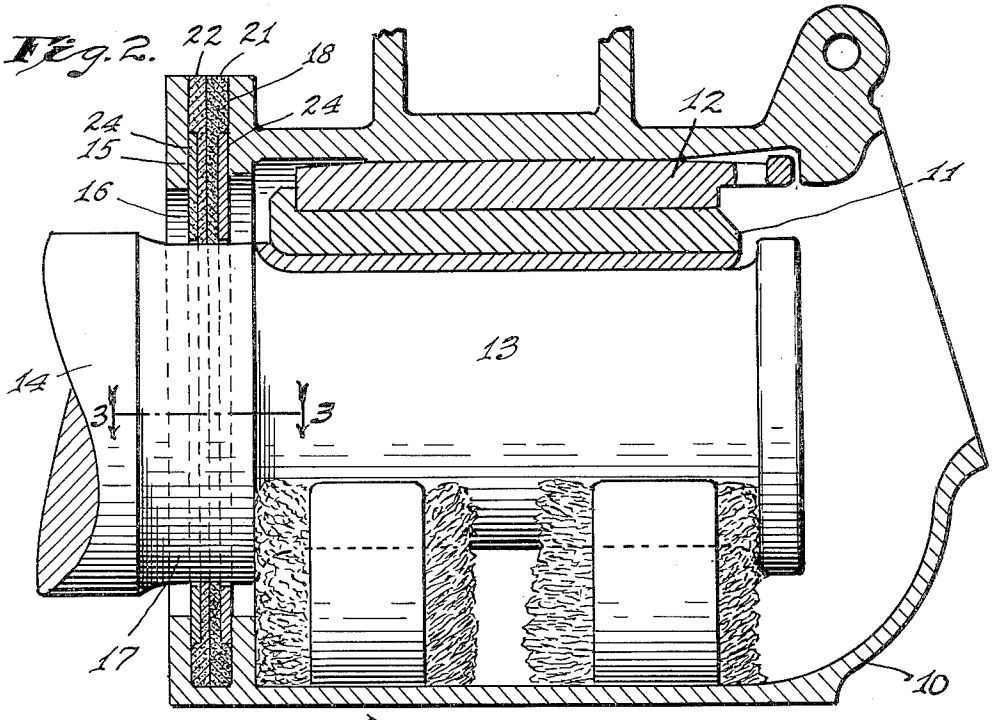


Fig. 1.

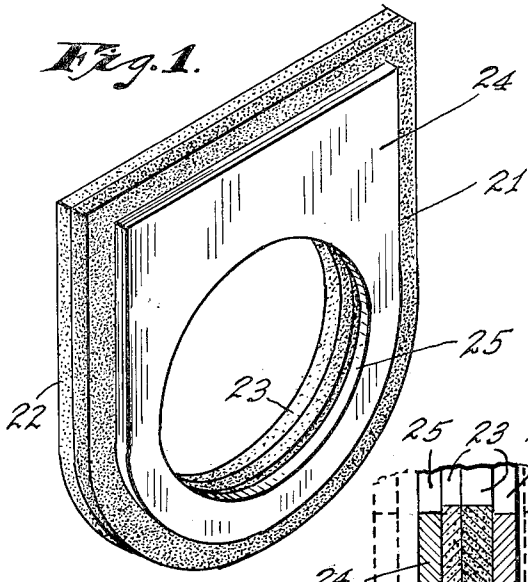


Fig. 3.

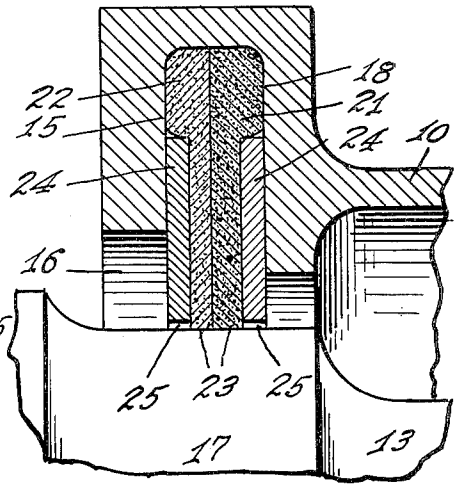
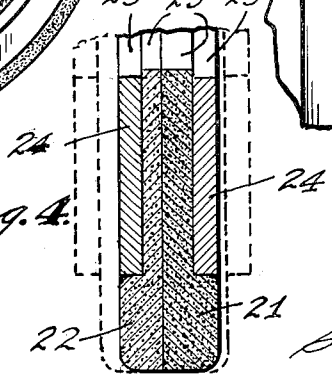


Fig. 4.



INVENTORS
EDWIN S. PEARCE
LESLIE G. TAYLOR and
THOMAS R. BOOTH,
BY Ashley, Scales & Julian
ATTORNEYS.

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JOURNAL BOX DUST GUARD

Edwin S. Pearce, Leslie G. Taylor, and Thomas R. Booth, Indianapolis, Ind., assignors to Railway Service and Supply Corporation, Indianapolis, Ind., a corporation of Indiana

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This invention relates to dust guards for the journal boxes of railway cars. In the conventional journal-box construction, the axle projects into the journal box through an opening in the rear wall of the journal box, which opening is substantially larger than the axle in order to permit relative movement both horizontally and vertically of the journal box and journal. To prevent dirt from entering the journal box through such opening, it is customary to provide a dust guard which closely surrounds the axle and which is received in a cavity formed in the rear wall of the journal box. As such guards seat against unfinished surfaces on the journal box, the matter of providing an effective seal against the entrance of dirt presents a problem. Moreover, the necessity for accommodating for relative movement of the axle and the journal box usually involves movement of the dust guard in the journal box and, in so moving, the dust guard pumps oil out of the journal box.

It is an object of the invention to provide an improved dust guard which will effectively inhibit the passage of dirt into the journal box, which will not interfere with or be damaged by relative movement of the axle and journal box, and which will not act in operation to pump oil from the journal box.

Our improved dust guard comprises a pad of foamed, oil-resistant elastomeric material adapted to be received in the conventional dust-guard cavity of the journal box and provided with an opening which snugly receives the axle. Surrounding such opening on both faces of the guard are plate-like elements of rigid, preferably non-metallic material. The thickness of the guard is such that its pad will be compressed when introduced into the guard-receiving cavity of the journal box. An important charactertistic of our dust guard is that the elastomeric material forming the pad is not of uniform compressibility throughout its thickness. Conveniently, the pad is formed of two layers of elastomeric materials of different compressibility, and the guard is so positioned in respect to the journal box that the material of lesser compressibility is located adjacent the interior of the journal box. We have found that the use of a pad so constructed and arranged relative to the journal box practically eliminates all pumping of oil from the journal box.

Further objects and features of the invention will become apparent from the more detailed description which follows and from the accompanying drawings, in which:

FIG. 1 is an isometric view of a complete dust guard;

FIG. 2 is a vertical section through a journal box showing the dust guard in position;

FIG. 3 is a fragmental section on the line 3—3 of FIG. 2; and

FIG. 4 is a fragmental section through the dust guard showing in full lines the form it assumes when positioned in the journal box and, in dotted lines, the form it assumes when in unstressed condition.

The journal box construction illustrated in FIG. 2 is more or less conventional. The journal box **10** is provided with the brass **11** and wedge **12** through which the load is transmitted to the journal **13** of a railway car axle **14**. The rear wall **15** of the journal box, or that wall nearest the wheel, has an opening **16** which receives

with considerable clearance a machined collar **17** on the axle **14** and is also provided with a cavity **18** adapted to receive a plate-like dust guard which closely surrounds the collar **17**.

The improved dust guard which is illustrated in its entirety in FIG. 1, comprises a compressible pad made up of two layers **21** and **22** of foamed oil-resistant elastomer, preferably of approximately equal thickness. The two layers **21** and **22** are cemented together throughout their extent and have an exterior form adapting them for a snug reception within the cavity **18** of the journal box. Both layers are provided with registering holes **23** adapted to snugly receive the collar **17**. On each face of the resilient pad is a plate **24**, conveniently of non-metallic material, provided with a central opening **25** somewhat larger than the opening **23** in the resilient pad. The plates **24** desirably have the same general shape as the pad **21—22** but are smaller than the pad to leave the marginal portions of the pad projecting outwardly beyond the margins of the plates. The plates are held in position on the pad by cementing them thereto preferably over their entire extent.

The overall thickness of the pad **21—22** is desirably somewhat greater than the width of the cavity **18**, while the overall thickness of the dust guard (over the plates **24**) is still greater. In conventional railway car journal boxes, the width of the cavity **18** is approximately ¾ of an inch. We therefore prefer to make the pad **21—22** so that, when unstressed, its thickness is about one inch, while a preferred thickness for each of the plates **24** is approximately 3/16 of an inch. When the dust guard is inserted into the cavity **18** it is compressed axially of the journal to a thickness corresponding to the width of the cavity **18**. Because of the thickness of the plates **24**, the material between them is compressed to a greater extent than the marginal portions of the pad **21—22**; but the pad material possesses sufficient resilience to enable the marginal portions of the pad to bear against the opposed walls of the dust-guard cavity.

A preferred material for each layer of the pad **21** and **22** is a foamed urethane derivative, but the materials for the respective layers **21** and **22** are selected so that such layers have different resistance to compressive forces. For the layer **21**, which is disposed toward the interior of the journal box, a preferred material is an open-cell polyurethane foam of the polyester type having, when unstressed, a density of about 2.2 lbs. per cubic foot. A preferred material for the rear layer **22** is an open-cell polyurethane foam of the polyether type having, when unstressed, a density of approximately 2.2 lbs. per cubic foot. These two polyurethane foams exhibit substantially different responses to compressive forces. If a pad comprising two equal-thickness layers **21** and **22**, respectively of the polyester and polyether types of polyurethane foam, is subjected to a progressively increasing compressive force, the reduction in the thickness of the pad during the initial stage of compression will be represented almost entirely by a reduction in the thickness of the polyether layer **22**. At a pressure of 0.5 p.s.i., the polyether layer will be reduced to about one-half its original thickness, while the polyester layer will retain about 90% of its thickness. At 0.8 p.s.i., the polyether layer will be reduced to about 25% of its original thickness and the polyester layer to about 40%. At 1.3 p.s.i., both layers will have a thickness about 20% of the original.

A preferred form of guard, embodying ½ inch layers **21**, **22** of the polyurethane foams above described and plates **24** of 3/16 inch thickness will be subjected to a pressure of about 0.75 p.s.i. in a cavity **18** of ⅞ inch thickness and to a pressure of about 1.0 p.s.i. in a cavity of ¾ inch thickness. In the former case, the polyether layer **22**

will represent about 30%, and in the latter case about 40%, of the total thickness of the compressible pad between the plates 24. When the guard is in place, the marginal portions of the pad beyond the edges of the plates 24 will of course be subjected to less pressure than the center portion of the pad between the plates.

When a dust guard of the materials and dimensions above set forth is compressed and positioned in a dust-guard cavity 18 approximately ¾ of an inch in width, the polyether layer 22 will be about one-half as thick and twice as dense as the polyester layer 21. In practice, the width of dust-guard cavities varies between about $1\frac{1}{16}$ and about $1\frac{3}{16}$ of an inch. Owing to the high compressibilities of the foam layers, our guard accommodates itself to such variations with relatively minor changes in the pressure exerted by the guard on the walls of the cavity. Thus, tests indicate that a pressure of about 0.75 p.s.i. will compress the guard described to an over-all thickness of $1\frac{3}{16}$ of an inch, while a pressure of 0.80 p.s.i. is more than enough to compress it to a thickness of $1\frac{1}{16}$ of an inch.

We claim as our invention:

1. In combination with a railway-car journal and its associated journal box, said box having a dust-guard cavity in its inner wall and said journal having a collar in the plane of said cavity, a dust-guard located in said cavity, said dust-guard comprising a compressible pad having a central opening snugly receiving said collar, said pad comprising two layers of differentially compressible material compressed axially of the journal by confinement of the dust-guard within its cavity, the layer of lesser compressibility lying toward the interior of the journal box with respect to the other layer.

2. The combination set forth in claim 1 with the addition of two rigid plates secured to the opposite faces of said pad, the margins of said pad extending outwardly beyond the margins of said plates.

3. The combination set forth in claim 1 with the addition that said two layers, when unstressed, are of approximately equal thickness whereby, when the dust-guard is positioned in its cavity, the layer of lesser compressibility will be substantially thicker than the other layer.

4. The combination set forth in claim 1 with the addition that each of said layers is a sheet of an open-cell elastomer foam.

5. The combination set forth in claim 4 with the addition that said two layers, when unstressed, are of approximately equal thickness.

6. The combination set forth in claim 4 with the addition that one of said layers is of polyurethane foam of the polyester type and the other is of a polyurethane foam of the polyether type.

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