Nov. 4, 1941. G. R. ANDERSEN 2,261,789

JOURNAL BOX COVER SEAL

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Fig. 1

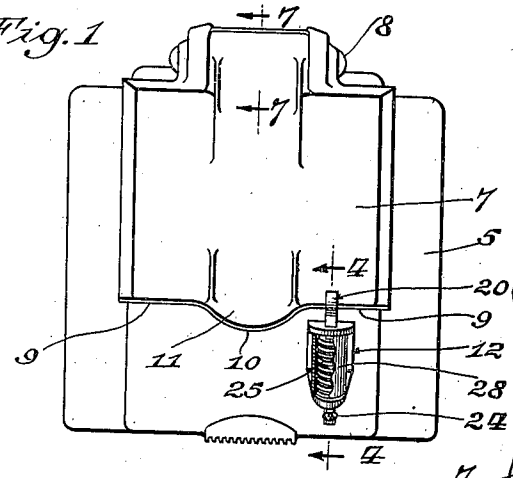


Fig. 7

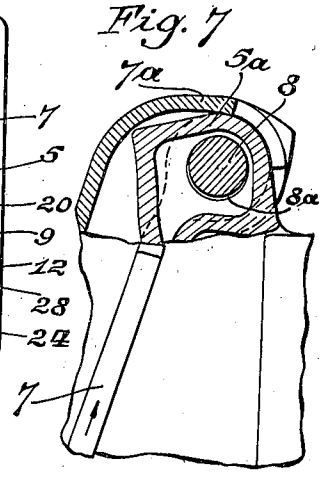
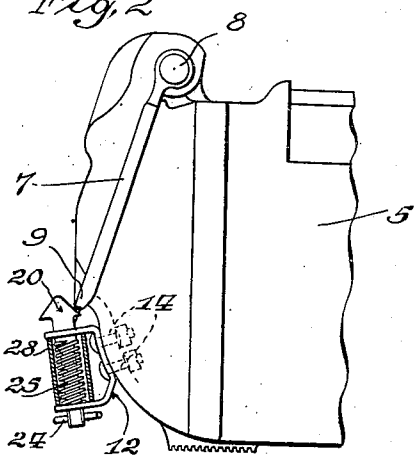


Fig. 2



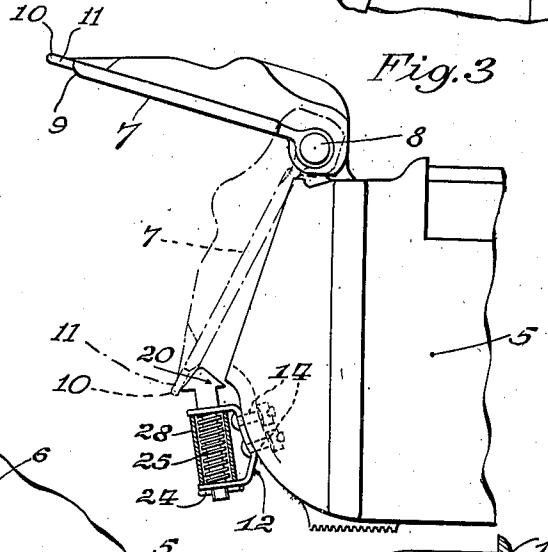


Fig. 3

Fig. 4

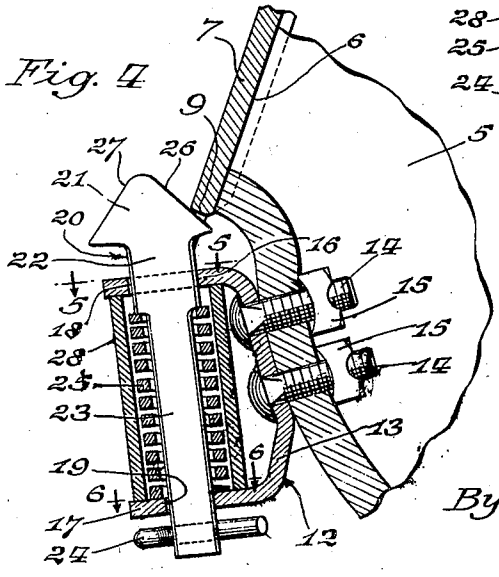


Fig. 5

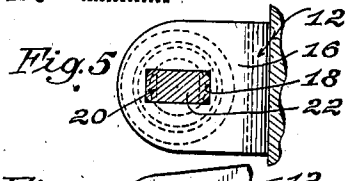
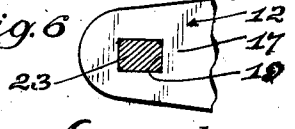


Fig. 6



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Fig. 8.

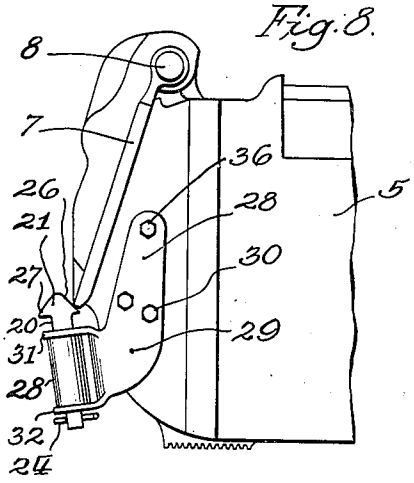
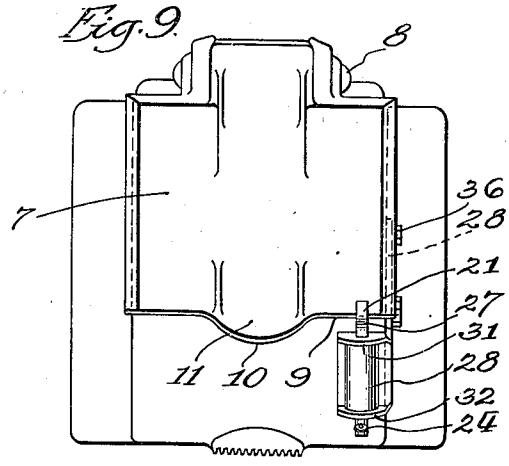


Fig. 9.



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UNITED STATES PATENT OFFICE

2,261,789

JOURNAL BOX COVER SEAL

George R. Andersen, River Forest, Ill.

Application March 18, 1939, Serial No. 262,600

4 Claims. (Cl. 308—51)

My invention relates to a journal box cover seal, i. e., a device which is associated with a railway vehicle journal box and cooperates with the box and its cover to hold such cover tightly sealed against the margins of the box opening with which such cover cooperates.

When a journal box cover is not effectively sealed in its closed position, dust, snow, sand, and other finely divided foreign matter thrown up from the roadbed, or carried by the wind, finds its way into the journal box to impair, and eventually destroy, the lubricating value of the oil therein contained, and oil also escapes from the box by splashing and dripping, a considerable portion of such escaping oil forming oily encrustations with dust and sand on the exterior of the box in the vicinity of the cover. The present invention is directed toward the elimination of these difficulties.

The journal box cover seal of the present invention performs another very important function. It acts to prevent vibration of the cover with respect to, or with, its pivot pin, and thus prolongs the life of the pivot pin and virtually eliminates the tendency of the pivot pin to wear to egg shape the initially round apertures, in cover and/or box top, through which the pin extends.

The present invention contemplates and provides an effective journal box cover seal in the form of a simple mechanical device, comprising but few parts which readily may be adapted and applied to a very large percentage of the journal boxes now in use and now being put into use in the United States.

Other advantages of the seal of the present invention are that it (*a*) assumes and performs its function as the direct result of the box cover being swung from its open position to its closed position, (*b*) does not require any significant increase in the force required to move the cover from its closed position, (*c*) does not itself require any attention or direct manipulation by a journal inspector, or other mechanic, opening and closing the box in the conventional manner, and (*d*) supplements the conventional box cover spring at the time when the pressure exerted upon the box cover by such spring is the least, i. e., when the cover is in its fully closed position.

Other features, objects, and advantages of the invention will appear from the following detailed description, wherein reference is made to the accompanying drawings, wherein

Fig. 1 is a front elevational view of a conventional journal box equipped with the cover seal of the present invention, the cover in this view being closed, and the plunger spring housing tube being partially broken away to reveal the spring which lies within it;

Fig. 2 is a side elevational view of the same parts with the plunger spring housing tube illustrated in axial section;

Fig. 3 is a view similar to Fig. 2, but illustrating the several movable parts in the positions which they assume when the journal box cover is in its open or raised position;

Fig. 4 is a fragmentary sectional view on larger scale than the preceding figures, taken in the vertical plane of the line 4—4 of Fig. 1, and looking in the direction indicated by the arrows;

Fig. 5 is a fragmentary view, partly in plan and partly in section, which may be regarded as taken in the plane of the line 5—5 of Fig. 4, and looking in the direction of the arrows;

Fig. 6 also is a fragmentary view, partly in plan and partly in section, which may be regarded as taken in the plane of the line 6—6 of Fig. 4, and looking in the direction of the arrows;

Fig. 7 is a fragmentary vertical sectional view which may be regarded as taken in the plane of the line 7—7 of Fig. 1 and looking in the direction indicated by the arrows;

Fig. 8 is a side elevational view of an embodiment of my invention wherein the cover seal is carried by a bracket attached to the side of the journal box; and

Fig. 9 is a front elevational view of the combination of parts depicted in Fig. 8.

Similar characters of reference indicate similar parts throughout the several views.

In the several figures of the accompanying drawings, reference numeral 5 indicates a conventional journal box provided with the usual opening 6 normally closed by the usual cover 7, which, as is customary, has its upper edge hinged to the top of the box. In the case of the specific journal box exhibited in the drawings, the cover 7 is hinged to box 5 by a pivot pin 8 which extends through aligned apertures 8*a* in the hollow lug 5*a*, which is formed integral with the box top, and the upper edge 7*a* of the lid which embraces such hollow lug 5*a*. The four margins of opening 6 lie in a common plane inclined somewhat to the vertical, and constitute a continuous rectangular seat for cooperation with the inner surface of the cover. The end portions 9 of the lower edge of the cover are rectilinear, whereas the intermediate portion of such lower edge is downwardly convexly curved, as at 10, to present

the lip 11, which may be engaged by the usual hook when the cover is to be swung to its open position in the customary manner. The cover may be, and usually is, provided at or adjacent its pivotal axis, with spring means (not shown) which holds such cover in its open or raised position when opened, and acts very forcibly to swing it toward its closed position when given a start in that direction. The particular type of journal box which I have shown in the accompanying drawings is merely typical of the several styles of journal box, now employed on American railroads, to which the improvements of the present invention may be applied.

The sealing device of the present invention comprises a generally U-shaped bracket 12 which is rigidly secured to the outer surface of journal box 5 at a position below the opening 6 and beneath one of the rectilinear portions 9 of the lower edge of the cover 7. The web portion 13 of the bracket conveniently is provided with a pair of square apertures for the snug reception of the correspondingly shaped portions of the shanks of bolts 14 which extend through apertures in the adjacent wall of the box 5 for cooperation with speed nuts (lock nuts) 15. It should be noted that the specific means for attaching the bracket 12 to the journal box is not of vital importance so long as such attachment is rigid, secure, and so designed as not to permit the escape of oil from the well of the journal box at the point of attachment.

The parallel arms 16 and 17 of the bracket 12, which project away from the box, are provided with rectangular apertures 18 and 19, such apertures desirably being of the same width, but the aperture 18 in the upper bracket arm 16 being longer than the aperture in the lower arm 17.

Carried by, and mounted for longitudinal reciprocatory movement in bracket 12, is a metal plunger 20 which consists of three principal portions, i. e., the head 21, the larger shank portion 22, and the smaller shank portion 23. The larger shank portion 22 is slidably, but not rotatably, received by the aperture 18 of the upper bracket arm 16, and the smaller shank portion 23 is similarly received by the aperture 19 of the lower bracket arm 17. At its lower end, which extends beneath the lower bracket arm 17, the smaller shank portion 23 is provided with a stop member in the form of a cotter pin 24 extending through a transverse bore in such smaller shank portion 23.

A coiled compression spring 25 encircling smaller shank portion 23 and acting between the lower bracket arm 17 and the shoulders at the junction of shank portions 22 and 23, normally urges the plunger toward its uppermost position, depicted in Fig. 3, i. e., the position where cotter pin 24 engages against the under surface of lower bracket arm 17.

The head 21 of the plunger 20 is provided with two upwardly converging surfaces 26 and 27. With the parts assembled in the manner depicted in the accompanying drawings, the surface 26 properly may be called the "wedging surface" and the surface 27 properly may be called the "anvil surface." But when applying the sealing device to certain common types of journal box, it is desirable to reverse the plunger so that surface 27, which then lies nearest the journal box, becomes the "wedging surface" and the surface 26 becomes the "anvil surface." Surface 27 lies wholly on one side of the longitudinal axis of the plunger, whereas (in the specific form of plunger shown in the drawings) the upper end of surface 26 intersects such axis and the lower end of such surface 26 lies closer to such axis than does the lower end of surface 27. In other words, the surfaces 26 and 27 are preferably of substantially the same length and converge to an apex, preferably somewhat rounded, as shown, which is offset with respect to the longitudinal axis of the plunger.

With the cooperating parts in the relative positions depicted in Figs. 2 and 4, the angularity between the wedging surface 26 and the plane of the cover 6 is somewhat less, but preferably not very much less, than 90°. By virtue of this arrangement, the pressure of spring 25, as applied through the plunger 20 to the adjacent lower edge portion 9 of the cover 7, is sufficient to hold the cover tightly sealed against the margins of opening 6. Nevertheless, when the cover 6 is opened, as, for example, with an inspector's hook, the pressure of the lower edge of the cover against the wedging surface 26 causes the plunger to recede to the end that the cover 6 may be moved from its closed position with the expenditure of but very little more manual effort than would be required in opening the cover if the sealing device were not present.

When the cover 7 is swung with great momentum from its open or raised position of Fig. 3, to its closed position of the other figures, the portion 9 of the lower edge of the cover (i. e., the portion 9 with which the wedging surface 26 normally cooperates), strikes the anvil surface 27 a sharp blow, with the result that the plunger 18 recedes against the pressure of its associated spring 25, to permit the cover to take its fully closed position. Spring 25 then immediately raises the plunger, and thereby causes the wedging surface 26 to cooperate with the lower edge of the cover to hold the cover tightly seated against the margins of the journal box opening 6, as previously explained.

It will be noted that the force exerted on cover 7 by spring 25, through plunger 22, has a very definite upwardly directed component. This upwardly directed component acts firmly to press the cover upwardly to take up mechanical slack, and thus eliminate vibration, at the cover axis, which otherwise would be possible because of the customary lack of tight fits between pin 8 and some or all of the apertures 8*a*, in upper portions of the cover and box, through which such pin extends to pivot the cover to the box. Thus the pin 8 is insured a longer period of usefulness than it otherwise would have, and the tendency for the apertures 8*a* to become worn to egg shape is practically eliminated. The aperture 8*a* which appears in Fig. 7 is slightly egg-shaped, and may be presumed to have been worn to that shape before the application of my improved seal to the journal box. The wearing to egg shape of the apertures 8*a* is a matter of very serious importance to American railroads, and one which in the past has required some very expensive journal box repairs. Hence the importance of the fact that my improved seal acts to prevent the wearing to egg shape of the apertures through which the cover pivot extends.

In most installations of my improved sealing device, I prefer to have the plunger spring 25 completely enclosed and protected at all times. Therefore, I provide a housing tube 28 which encircles the spring 25 and is press fitted between the upper and lower arms 16 and 17 of the bracket 12. Such housing tube 28 and the

upper and lower bracket arms 16 and 17, constitute a complete housing from which all dust and dirt is excluded, since the larger and smaller shank portions of the plunger at all times occupy and fill the apertures 18 and 19 of the upper and lower bracket arms.

In that embodiment of my invention which is depicted in Figs. 8 and 9, I provide a bracket 29 which performs the function of the U-shaped bracket 12 of the earlier figures. Bracket 29, however, is advantageous in that it may be secured to the side of box 5 rather than to the front thereof, as must be the U-shaped bracket 12 of the earlier figures. Such bracket 29, which is preferably formed of one piece of metal, is secured to the box side wall by bolts 30 and is provided with spaced-apart parallel arms 31 and 32 which correspond in function with the parallel arms 16 and 17, respectively, of the U-shaped bracket 12 to which I have previously alluded.

Having thus illustrated and described a preferred embodiment of my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. A journal box cover seal consisting of a single unit, attachable to a journal box as such, comprising: a substantially U-shaped bracket arranged and adapted to be secured, with its parallel legs disposed one above the other, to the exterior of a journal box at a position beneath a lower edge of the cover of said journal box; a reciprocatory plunger extending between, through and beyond the parallel legs of the bracket and held against rotation with respect to said bracket; a spring seat carried by the plunger and lying between the legs of the bracket; a coiled expansion spring encircling the plunger, acting between the aforesaid spring seat and the lower leg of the bracket, and resiliently urging the plunger upwardly; a tube encircling said spring and held out of contact therewith by being press-fitted between and in the embrace of the legs of the bracket to afford a readily separable substantially dustproof housing for said spring; a stop member carried at the lower end of the plunger arranged to engage the lower leg of the bracket to limit upward movement of the plunger under pressure of said spring; and a spear head carried at the upper end of said plunger; said spear head presenting two surfaces converging upwardly, one of said converging surfaces being arranged to press against the aforementioned lower edge of the cover resiliently to bias said cover both upwardly and to its seat, and to be biased resiliently downwardly when the cover is yanked to open position, the other of said converging surfaces constituting an anvil to be struck violently downwardly and out of the path of the aforementioned lower edge of the cover as such cover swings to closed position.

2. A journal box cover seal consisting of a single unit, attachable to a journal box as such, comprising: a substantially U-shaped bracket arranged and adapted to be secured, with its parallel legs disposed one above the other, to the exterior of a journal box at a position beneath a lower edge of the cover of said journal box; a reciprocatory plunger extending between, through and beyond the parallel legs of the bracket and held against rotation with respect to said bracket; a spring seat carried by the plunger and lying between the legs of the bracket; a coiled expansion spring encircling the plunger, acting between the aforesaid spring seat and the lower leg of the bracket, and resiliently urging the plunger upwardly, a stop member carried at the lower end of the plunger arranged to engage the lower leg of the bracket to limit upward movement of the plunger under pressure of said spring; and a spear head carried at the upper end of said plunger; said spear head presenting two surfaces converging upwardly, one of said converging surfaces being arranged to press against the aforementioned lower edge of the cover resiliently to bias said cover both upwardly and to its seat, and to be biased resiliently downwardly when the cover is yanked to open position, the other of said converging surfaces constituting an anvil to be struck violently downwardly and out of the path of the aforementioned lower edge of the cover as such cover swings to closed position, the aforesaid surfaces of the plunger spear head converging toward an apex displaced relatively to the axis of the plunger, and said plunger being reversible in the bracket so that either of said converging surfaces may be made to constitute an anvil as aforesaid.

3. A journal box cover seal consisting of a single unit, attachable to a journal box as such, comprising: a substantially U-shaped bracket arranged and adapted to be secured, with its parallel legs disposed one above the other, to the exterior of a journal box at a position beneath a lower edge of the cover of said journal box; a reciprocatory plunger extending between, through and beyond the parallel legs of the bracket and held against rotation with respect to said bracket; a spring seat carried by the plunger and lying between the legs of the bracket; a coiled expansion spring encircling the plunger, acting between the aforesaid spring seat and the lower leg of the bracket, and resiliently urging the plunger upwardly; a stop member carried at the lower end of the plunger arranged to engage the lower leg of the bracket to limit upward movement of the plunger under pressure of said spring; and a spear head carried at the upper end of said plunger; said spear head presenting two surfaces converging upwardly, one of said converging surfaces being arranged to press against the aforementioned lower edge of the cover resiliently to bias said cover both upwardly and to its seat, and to be biased resiliently downwardly when the cover is yanked to open position, the other of said converging surfaces constituting an anvil to be struck violently downwardly and out of the path of the aforementioned lower edge of the cover as such cover swings to closed position.

4. A journal box cover seal consisting of a single unit, attachable to a journal box as such, comprising: a substantially U-shaped bracket arranged to be located, with its parallel legs disposed one above the other, adjacent the front exterior surface of a journal box at a position beneath a lower edge of the journal box cover; an arm, in the nature of an integral extension of the web portion of the bracket, extending rearwardly and upwardly from the bracket for attachment by bolts to a side wall of the journal box at points spaced substantially above the bottom of the journal box; a reciprocatory plunger extending between, through and beyond the parallel legs of the bracket and held against rotation with respect to said bracket; a spring seat carried by the plunger and lying between the legs of the bracket; a coiled expansion spring encircling the plunger, acting between the afore-

said spring seat and the lower leg of the bracket, and resiliently urging the plunger upwardly; a stop member carried at the lower end of the plunger arranged to engage the lower leg of the bracket to limit upward movement of the plunger under pressure of said spring; and a spear head carried at the upper end of said plunger; said spear head presenting two surfaces converging upwardly, one of said converging surfaces being arranged to press against the aforementioned lower edge of the cover resiliently to bias said cover both upwardly and to its seat, and to be biased resiliently downwardly when the cover is yanked to open position, the other of said converging surfaces constituting an anvil to be struck violently downwardly and out of the path of the aforementioned lower edge of the cover as such cover swings to closed position.

GEORGE R. ANDERSEN.