

Jan 6, 1931.

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1,787,459

JOURNAL BOX CLOSURE

Filed July 29, 1925

2 Sheets-Sheet 1

Fig. 1.

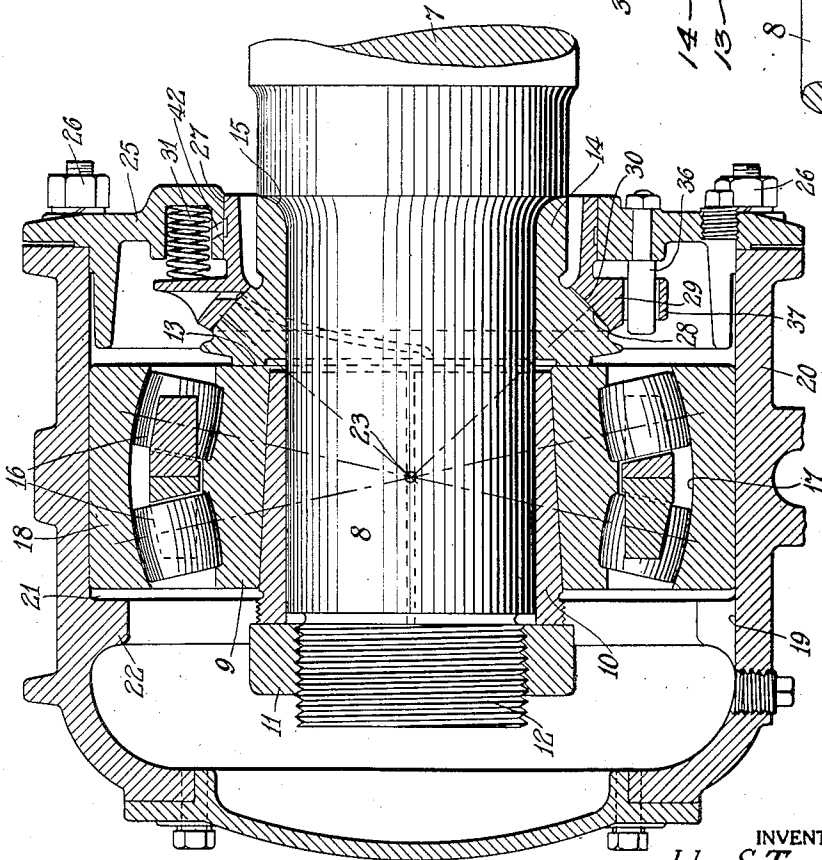
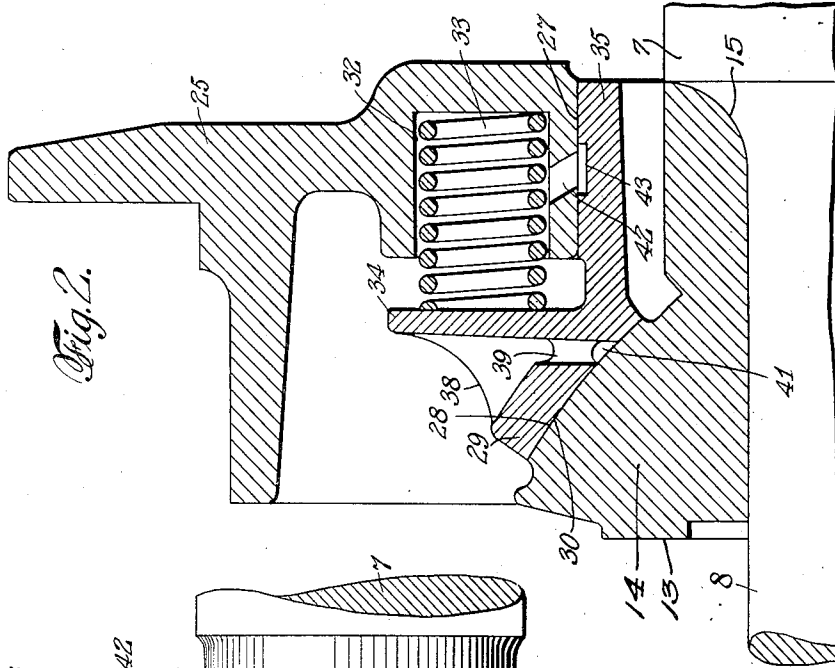


Fig. 2.



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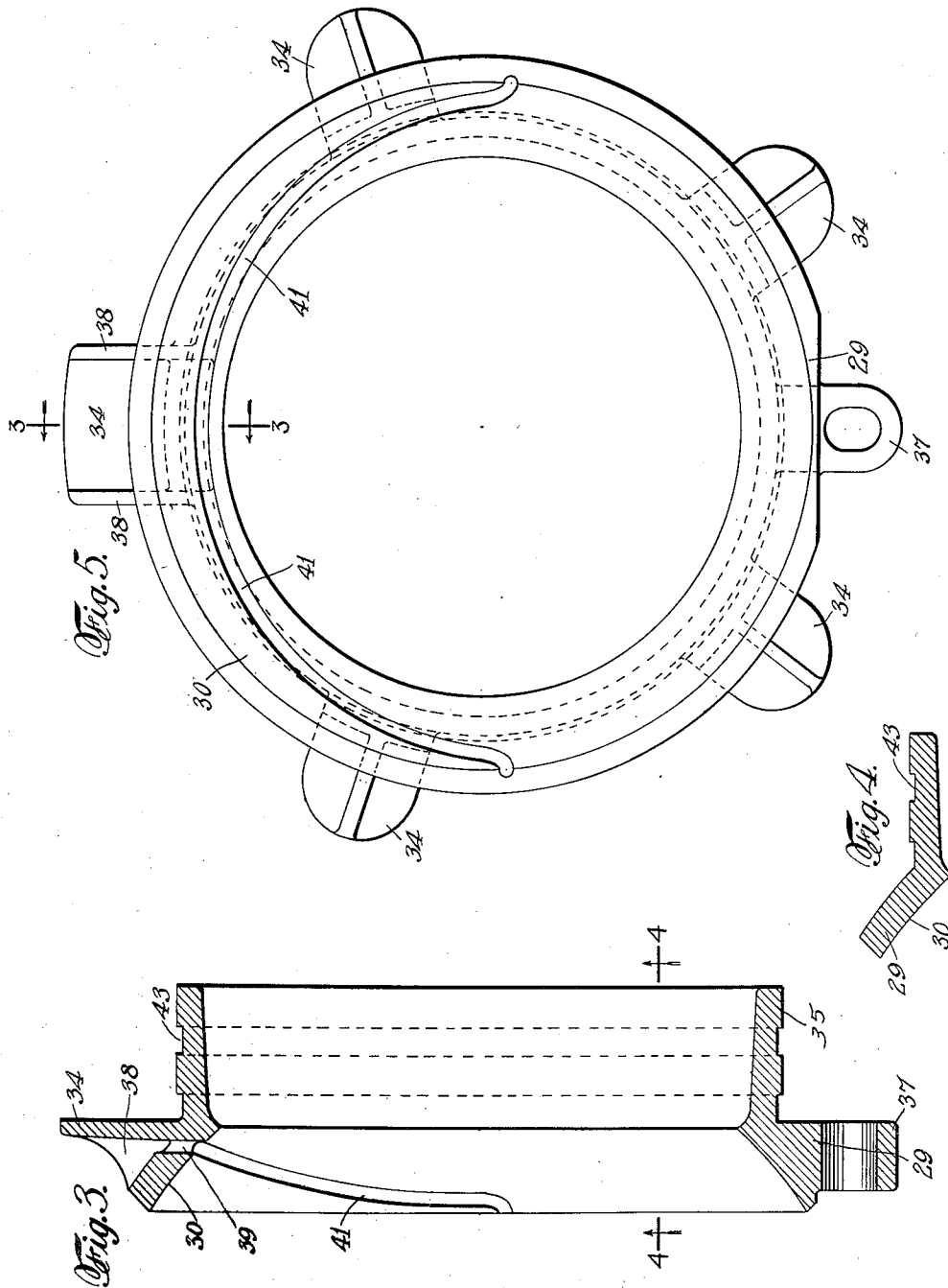
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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JOURNAL-BOX CLOSURE

Application filed July 29, 1925. Serial No. 46,722.

This invention relates to a lubricant retaining and dust excluding closure for self-aligning bearing housings, and is particularly adaptable for use as a journal box closure in railway trucks wherein the box so houses a self-aligning bearing as to permit a limited lateral movement of the box or axial movement of the journal, such relative movement being independent of the aligning movement.

In the preferred form of the invention the box is closed at its inner or wheel side by a removable annular plate which carries a rim formed with a spherical face engaging a similar face formed on a collar carried by the journal; the spherical surface being concentric with the center about which the bearing aligns. The ring of which the rim forms a part has a sliding fit in the hub of the plate to provide for lateral movement as the car weaves on the axle. Springs are preferably employed for keeping the spherical surfaces in close contact. The various details of construction and the lubrication features will be described in the body of the specification.

In the drawings accompanying this specification one practicable embodiment of the invention is illustrated, in which drawings

Figure 1 shows the broken away journal end of a railway car axle and a journal box, and self-aligning antifriction bearing shown in vertical section; my invention as shown applied to this box also being in vertical section.

Fig. 2 is an enlarged detail illustration of a portion of the invention.

Fig. 3 is a vertical section of the rim carrying ring detached from the closure plate.

Fig. 4 is a section taken at about the plane of the line 4—4 of Fig. 3 and

Fig. 5 is a face view of the ring illustrated in Fig. 3, the section of Fig. 3 being illustrated on Fig. 5 by the dotted line 3—3.

In the drawings one end only of car axle, 7, is illustrated. The journals, 8, the bearings, and associated parts are assumed to be substantially the same at both ends of the axle. In the present illustration the inner ring, 9, of self-aligning roller bearing is shown mounted upon the journals, 8, by the interposition of a taper adapter sleeve, 10,

which is held in place by means of a suitable nut, 11, engaging the screw threaded end, 12, of the journal. The nut is shown as forcing the taper adapter sleeve into the taper bore of the ring, 11, and forcing this ring against a suitable shoulder, 13, formed on a ring, 14, presently to be described in more detail, but for the present it will be stated to have a sufficiently snug fit upon the inner end of the journal, 8, and to engage the shoulder, 15, formed on the axle by the reduction of the journal portion. Two sets or rows of rollers, 16, are shown mounted upon the inner ring, 9, of the bearing and engaging the spherical track face, 17, formed on the outer ring, 18, which outer ring is shown as having a substantial cylindrical outer perimeter mounted in the cylindrical bore, 19, of the journal box, 20, which constitutes the housing for the bearing and the working parts of the invention.

The box or housing at each end is intended to be mounted on or secured to a truck frame in some suitable or well known manner and to be so mounted that initially there is a small amount of clearance, 21, between the outer end of each antifriction bearing ring, 18, and a suitable shoulder, preferably a face formed upon an inwardly directed flange, 22, cast with the box. The outer bearing ring, 18, is so mounted in the bore, 19, that it may move therein in a direction laterally of the box and axially of the journal and axle. This shoulder is for the purpose of assuming thrust upon a predetermined amount of axial movement of the axle or lateral weaving of the truck or car body.

The position of the center of the spherical surface, 17, is indicated by the reference character, 23. The center point remains, of course, substantially fixed in respect of the journal during self-alignment and also during axial adjustment of the bearing, as this moves in the housing with the journal.

The self-aligning bearing as such and the lateral adjustment of the bearing as such are well known features yet these parts have been described in detail because of the fact that my invention particularly relates to a closure for the inside end of the box, which

has an adjustable or flexible rim designed for adjusting itself by these two movements—self-aligning and laterally of the box in respect of the journal. In the illustrated form of carrying out my invention I provide a closure plate, 25, secured to the box in some suitable manner, for instance, by means of stud bolts and nuts, 26. The plate is provided with a central opening having a substantially cylindrical bore, 27, surrounding the journal, and in the illustration located outwardly of a portion of the member, 14.

This member, 14, is shown formed with a spherical face, 28, having its center at 23. The flexible rim, 29, is shown also having a spherical face, 30, engaging the face, 29. In effect this rim and the journal may be regarded as being formed with faces meeting on a spherical surface concentric with the center about which the bearing aligns or upon which the journal aligns within the box.

The rim, 29, is kept in engagement with the journal, or the member, 14, interposed between it and the journal by spring means, there being shown in the present instance a plurality of springs, 31, for this purpose (five in the illustration) the plate, 25, being formed with that number of spring pockets, 32, in which coiled compression springs, 33, are mounted and engaging suitable lugs, 34, formed on the rim member, 29. This rim member is annular and is shown formed with a body portion, 35, formed to fit the bore, 27, of the closure plate within which it has a certain amount of movement in a direction axially of the journal or substantially so, and laterally of the closure plate and box. This lateral movement is to accommodate the weave, and the spherical faces to accommodate the self-alignment. The closure plate, 25, and the rim member, 29, are shown preferably so formed and mounted that one of the spring pockets, 32, is in the upper portion of the structure and substantially above the axis of the journal. The lower portion of the plate is shown carrying a bolt, 36, engaging a hole in a lug, 37, dependant from the rim member, 29. This is for the purpose of preventing rotation or misplacement of the rim member relatively to the closure plate. The uppermost lug, 34, is shown somewhat wider than the others and webs, 38, are shown connecting its ends to the rim, 29, thereby forming a reservoir located in position to receive the splash of lubricant from the rollers. A duct, 39, is shown running from the bottom of this reservoir and communicating with a duct, 41, having two arms extending downwardly and inwardly along the inner surface of the member, 29, for carrying the oil or other lubricant in position to lubricate the spherical surface of these parts which have not only aligning

movement, but also a relative rotary movement.

The uppermost spring housing, 32, is also located in position to receive spatters of lubricant from the bearing and this housing is shown having an opening, 42, located in position to communicate with a circumferential groove, 43, formed in the body portion, 35, of the rim member. This groove is for the purpose of supplying lubricant to the meeting faces between the portion, 35, and bore 27.

Although but one embodiment of the invention has been illustrated, which at the present time is the preferred form of construction, it is apparent that various changes in detail may be made as occasion may demand within the scope of the claims without departing from the spirit of my invention.

Having thus described my invention, I claim:

1. The combination with a housing and a journal, of a self-aligning anti-friction bearing uniting these, a closure for the housing, comprising a plate provided with a bore surrounding the journal, a member having a body mounted for axial movement in such bore having an annular rim, the said rim and journal being formed with faces meeting on a spherical surface concentric with the axis upon which the bearing aligns, means carried by the plate for holding the rim member from rotation, the closure plate being formed with a plurality of spring pockets, one of these pockets being located adjacent the upper portion of the rim and in position to receive spatters of oil from the bearing, a circumferential duct formed in the outer perimeter of the rim and a passage-way from the said spring pocket communicating with the duct, and springs in the various pockets for pressing upon the rim to hold the said faces in engagement.

2. The combination with a housing, and a horizontally disposed journal, of a self-aligning antifrication bearing upon the journal and mounted in the housing; a closure comprising a plate provided with a bore surrounding the journal, a member having a body mounted for axial movement in such bore and having an annular rim, the said rim and journal being formed with faces meeting on a spherical surface concentric with the axis upon which the bearing aligns, and means carried by the plate for holding the rim member from rotation, the upper portion of the rim member being formed with an oil reservoir open to the splash from the bearing and also having a pair of ducts leading downwardly and inwardly therefrom upon the respective sides and open to the said spherical meeting faces, the closure plate being formed with a spring pocket located adjacent the upper portion of the rim and in position to receive spatters of oil

from the bearing, there also being formed a circumferential duct in the outer perimeter of the rim and a passageway from the spring pocket communicating with the duct.

3. The combination with a housing, and a horizontally disposed journal, of a self-aligning anti-friction bearing upon the journal and mounted in the housing; a closure for the housing, comprising a plate having a bore surrounding the journal, a member having a body mounted for axial movement in such bore and having an annular rim, the rim and journal being formed with faces meeting on a spherical surface concentric with the axis upon which the bearing aligns, means for holding the rim from rotation, and springs disposed between the rim and closure plate for holding the said faces in engagement, the upper portion of the rim being formed with an oil reservoir open to the splash from the bearing, and a pair of ducts leading downwardly and inwardly therefrom upon the respective sides and open to the said meeting faces.

Signed at the city of New York, N. Y., this twenty-seventh day of July, 1925.

JOHN S. TAWRESEY.

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