No. 690,483. Patented Jan. 7, 1902.

F. W. THOMAS.

JOURNAL BOX AND BEARING.

(Application filed Jan. 18, 1901.)

(No Model.)

Fig. 1.

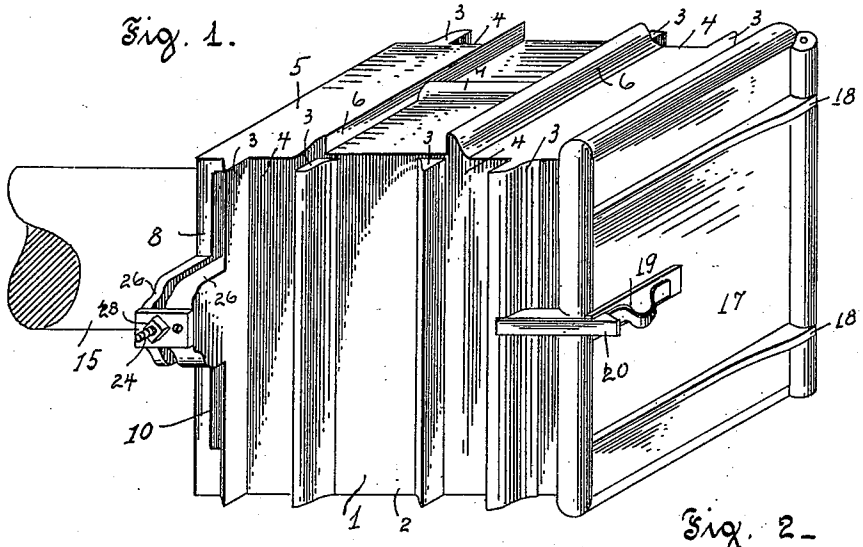


Fig. 2.

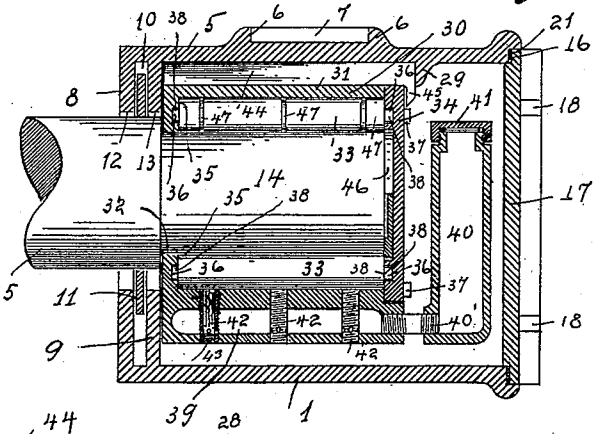


Fig. 5.

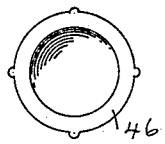


Fig. 3.

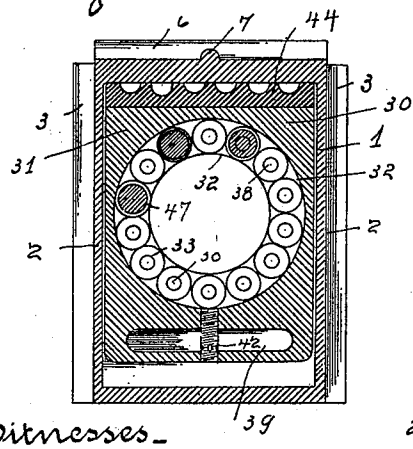
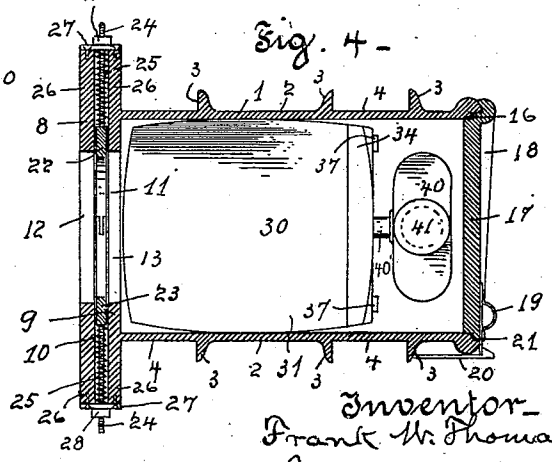


Fig. 4.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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JOURNAL BOX AND BEARING.

SPECIFICATION forming part of Letters Patent No. 690,483, dated January 7, 1902.

Application filed January 18, 1901. Serial No. 43,706. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. THOMAS, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Improvement in Car-Axle Journal Boxes and Bearings, of which the following is a specification.

My invention relates to a car-axle journal box and bearing, and has for its objects to provide a box and bearing of the kind that will greatly reduce the friction of the journal and be economical in the use of oil; furthermore, that is adapted to allow lateral movement of the bearing by the axle within the box and to readily admit adjustment of the bearing to the journal and of its removal therefrom while the journal is in the box, and, finally, to provide a box and bearing of the kind the wearing parts of which may be readily and economically renewed without detaching the box from the journal or the truck. I accomplish these objects in the manner and by the means hereinafter described, and illustrated in the drawings.

In the drawings Figure 1 is an isometric view of my invention. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a cross-section of the same. Fig. 4 is a horizontal section through the top of the journal-box, showing top view of bearing and oil-reservoir; and Fig. 5 shows a detachable wear-plate.

In the drawings, 1 is the outer casing or journal-box, which is outwardly provided on the sides 2 with projecting ribs 3, forming channels 4, and on the top 5 with the ribs 6 and cross-rib 7, all cast integral with the box and forming the means of securing the box to the yoke of the truck. The rear end of the box is provided with the outer wall 8 and inner wall 9, forming a transverse chamber 10, left open at the ends for the introduction of the dust-guard 11, and through the walls 8 and 9 are the circular openings 12 and 13 for admitting the journal 14 of the axle 15, the diameter of the openings being adapted to allow limited lateral or vertical movement of the axle therein. The front end of the box 1 is open and provided with the door 17, which is hinged to one side of box 1 by hinges 18 and is also provided with a suitable latch 19, adapted to engage the spring-catch 20, secured to the box 1.

Within the box 1 is rectangular, and at the front end and projecting downward from the top is a flange 29, having an abutting face toward the rear of the box adapted to retain the bearing of the journal, as hereinafter described.

30 is the journal-bearing, comprising the oblong cage 31, having a cylindrical orifice 32 longitudinally through it, a plurality of rollers 33, and the end plate 34. Orifice 32, which at one end is of a diameter slightly greater than that of the journal, is counterbored the greater part of its length, forming the shoulder 35 at one end, which is provided with the annular groove 36, concentric with the orifice 32. The end plate 34, which is secured to the opposite end of cage 31 by bolts 37, is also provided with an annular groove 36. The rollers 33 are each provided with spindles 38 at each end, adapted to loosely enter the grooves 36 and are adapted in number and diameter to lightly touch each other, the journal, and the inner surface of the bearing-cage when aggrouped around the circumference of the journal in the counterbored portion of orifice 32. Thus placed, when plate 34 is secured to the outer end of cage 31, with the spindles of the rollers in the grooves 36, the bearing thus formed may be freely removed from the journal and replaced thereon, the grooves 36 being adapted to retain the rollers when the bearing is withdrawn from the journal, but being of such width and depth that when the bearing is in position on the journal the spindles of the rollers do not contact with the sides and bottoms of the grooves.

Underneath orifice 32 cage 31 is provided with a closed oil-chamber 39, which is connected by a nipple 40′ to a vertical reservoir 40, which is provided with a top closure 41. Extending through the bottom of cage 31 and oil-chamber 39 are tubes 42, each opening into orifice 32. These tubes are provided with perforations as to the portions within the oil-chamber and with lugs 43 at their outer ends. They are also provided with wicks to check the flow of oil when the reservoir is filled and to supply it by capillary action when the oil-supply is reduced.

The box 1 being secured to the truck with the journal in position therein, the bearing 30 may be inserted into the box 1 and placed in position on the journal. The box and truck then being slightly raised with a jack, wedge-block 44, having a depending end flange 45, is inserted on top the bearing 30 until the flange 45 engages the end plate 34. The box 1 being then lowered, the front end of the wedge abuts the flange 29 and the rear end the wall 9 of the box, thus securing the bearing in position on the journal and against longitudinal movement within the box.

The sides and ends of the bearing 30 are slightly curved outward, so that only their central portions contact with the inner faces of the walls of the box 1 and with the flange of the wedge 44 when the bearing is in its normal position. By this construction the lateral movement of the axle within the box necessary to reduce strain on the bearing in passing around curves is provided for.

The plate 34 is preferably provided with a detachable wear-plate 46, against which the end of the journal will bear in passing around curves instead of the shoulder of the journal, thereby reducing the friction, and when the plate is worn a new one can be readily and economically supplied without removing the box 1 from the truck and journal. Alternate rollers 33 are preferably provided with the annular incuts 47, into which the gummy impurities of the oil are crowded by the action of rollers, preventing clogging of the rollers.

By the use of the rollers 33 the friction and wear of the journal and bearing are greatly reduced and much less oil is required for the journal. The oil is taken up by the rollers from the wicks of the tubes 42 as they slowly revolve around the journal. The oil reservoir and chamber being closed, access of dust thereto and waste of oil is prevented.

It is apparent that the bearing 30, as shown and described, may be used with other forms of axle-boxes. I therefore in the use of said bearing do not confine myself to the special form of axle-box herein shown.

Having thus described my invention, what I claim is—

1. The combination of a journal-box having rectangular interior walls, of a bearing-cage, cylindrical within and open at the rear to receive the journal, and rectangular without and having outwardly-curved sides and ends adapting the cage to lateral movement within the journal-box while in position on the journal and in contact with the walls of the box; rollers disposed around the journal within the cage, and a closed oil-chamber beneath the cage, connected with an oil-reservoir and with the interior of the cage.

2. In a journal-box, the combination of an outer casing, having its front end open and provided with a closure, and its rear end closed and provided with an opening adapted to freely admit the journal and a portion of the axle within the casing, a bearing for the journal, comprising a rectangular cage of equal length with the journal, outwardly curved as to its sides and rear end, adapting them for central vertical contact with the side and rear walls of the casing, when in position therein on the journal, and having an upper longitudinal cylindrical bore through it to receive the journal, and counterbored from the front toward the rear, forming a shoulder at the rear, and having a closed oil-chamber underneath the counterbore, means for supplying oil thereto, tubes opening into the oil-chamber and into the counterbore, provided with wicks, a detachable closure-plate secured to the front end of the cage, having its lateral face laterally curved outward, there being circular grooves of equal diameter cut oppositely in the faces of the front plate and in the interior shoulder, concentric with the journal, a plurality of rollers, of the length of the counterbore, disposed around the journal in the counterbore, having spindles at each end adapted to loosely enter the grooves and support the rollers within the counterbore, when the bearing is removed from the journal.

3. In a journal-box, the combination of an outer casing having its front end open and provided with a closure, and its rear end closed and provided with an opening adapted to freely admit the journal and a portion of the axle within the casing, a bearing for the journal, comprising a rectangular cage of equal length with the journal, outwardly curved as to its sides and rear end, adapting them for central vertical contact with the walls of the casing, when in position therein on the journal, and having an upper longitudinal cylindrical bore through it to receive the journal, and counterbored from the front toward the rear, forming a shoulder at the rear end, and having a closed oil-chamber underneath the counterbore, tubes provided with wicks and connecting the oil-chamber with the counterbore, a detachable oil-reservoir secured to the cage and connected with the oil-chamber, a detachable closure-plate secured to the front end of the bearing-block, having its outer face curved laterally outward, there being circular grooves of equal diameter cut oppositely in the faces of the front plate and in the interior shoulder concentric with the journal, a plurality of rollers, of the length of the counterbore, disposed around the journal in the counterbore, having spindles at each end adapted to loosely enter the grooves and support the rollers within the counterbore, when the bearing is removed from the journal, alternate rollers being also provided with annular incuts at intervals.

In witness whereof I have hereunto set my hand this 11th day of January, A. D. 1901.

FRANK W. THOMAS.

Witnesses:
F. S. MACOMBER,
CHAS. A. BOAKE.