

H. H. HEWITT.  
CAR AXLE JOURNAL BOX.  
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1,020,423.

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Fig. 1.

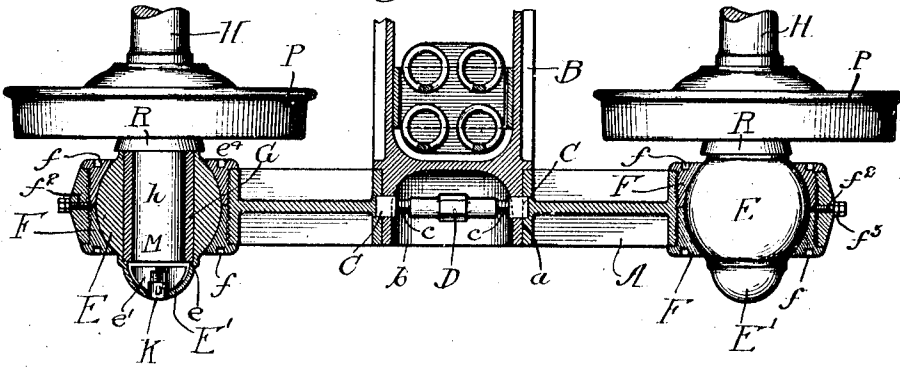


Fig. 2.

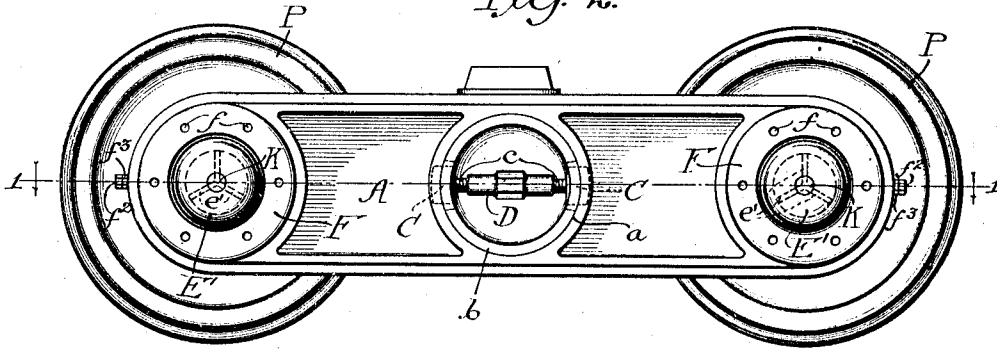
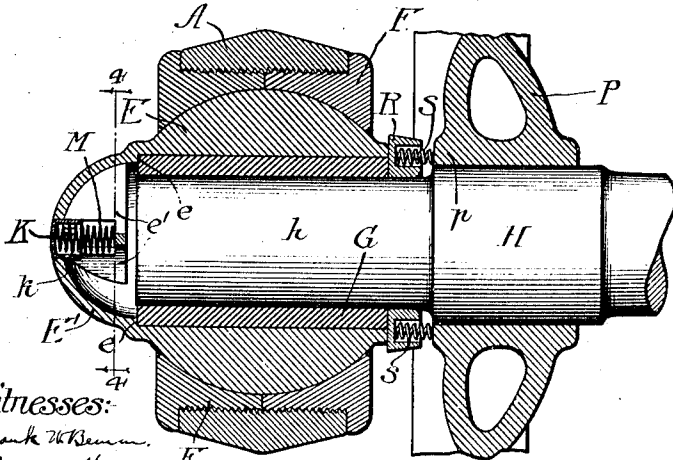


Fig. 3.



Witnesses:

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# UNITED STATES PATENT OFFICE.

HERBERT H. HEWITT, OF BUFFALO, NEW YORK.

## CAR-AXLE JOURNAL-BOX.

1,020,423.

Specification of Letters Patent. Patented Mar. 19, 1912.

Application filed March 7, 1910. Serial No. 547,862.

*To all whom it may concern:*

Be it known that I, HERBERT H. HEWITT, a citizen of the United States, residing at Buffalo, county of Erie, State of New York, have invented certain new and useful Improvements in Car-Axle Journal-Boxes, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification.

The present invention seeks to provide an improved construction of car axle journal box and bearing that shall permit the free movement of the car journals and bearings and thereby in great measure relieve parts of the car truck, journal boxes and bearings from the ill-effects of wear, shocks and strains to which it is subjected.

The invention consists in the various features of improvement hereinafter described, illustrated in the preferred form in the accompanying drawing and more particularly pointed out in the claims at the end of the specification.

Figure 1 is a view in horizontal section on line 1—1 of Fig. 2 through one of the side frames of a car truck and the parts connected therewith, the car wheels and certain other parts being shown in elevation. Fig. 2 is a view in side elevation of the parts illustrated in Fig. 1. Fig. 3 is an enlarged detail view in central vertical section through my improved journal box and parts adjacent thereto, the car-axle and its journal being shown in elevation.

A designates one of the side frames of the car truck that is formed with a central opening *a* to receive the cylindrical end *b* of the transom B. The end *b* of the transom B is revolvably mounted in the side frame A and is held therein against lateral displacement by means of locking bolts C to which are connected threaded rods *c* that are engaged by a turn-buckle D. When the bolts C are in the position illustrated in Fig. 1 of the drawing, the side frame A will be securely locked in engagement with the end of the transom B, but in such manner as to permit the side frame A to rotate within certain limits in vertical direction with respect to the transom B.

In each end of the side frame A is formed an opening to receive the journal box E. In the preferred form of my invention each of the journal boxes E has its body portion formed of spherical shape and preferably as

a single part. Each of the end openings in the side frame A is screw threaded and each journal box E is held within its appropriate opening of the side frame by means of a support or keeper consisting preferably of the annular supporting members or retaining rings F. The exterior of each of these supporting members or retaining rings F is screw threaded to engage the correspondingly threaded opening of the side frame and the interior surfaces of the rings or sections F are reversely curved, as clearly shown in the drawings, to engage the spherical exterior surface of the journal box E. Preferably, the outer face of each of the retaining rings F is formed with a series of holes or pockets *f* to receive a spanner wrench, whereby the retaining rings F may be conveniently screwed into place or withdrawn when desired. The outer portion of the retainer rings are preferably provided with shoulders or flanges that abut against the edges of the opening in the side frame A. To prevent any accidental working loose of the retaining rings F, I prefer to employ a set screw *f*<sup>2</sup> that passes through a threaded hole in the end of the side frame A. The pointed end of this set screw *f*<sup>2</sup> will embed itself in the inner adjacent edges of the retaining rings F and will hold these rings against rotation, and a lock nut *f*<sup>3</sup> on the screw *f*<sup>2</sup> will guard it against working loose. It will thus be seen that when the journal box has been placed within an end opening of the side frame A and the retaining rings or sections F have been screwed to place, as shown in Figs. 1 and 3, the box E will be securely held against lateral movement, while free to turn within the rings. In other words, the rings F form with the box E a ball and socket, or universal joint, which, as will presently appear, allows for varied movements of the parts.

Each of the journal boxes E is formed with a central transverse cylindrical chamber and within the chamber of each journal box is placed a cylindrical bearing sleeve G of suitable bronze or other wearing metal that fits loosely upon the journal *h* of the car-axle H. The outer end of each bearing sleeve G abuts against an annular shoulder *e* formed within the chamber of the journal box E. The outer portion of each of the boxes E is formed preferably with a curved extension or projecting hollow part E' forming a lubricant chamber within

which are cast the transverse webs  $e'$ , three of such webs being shown in the drawing. This enlargement  $E'$  affords a space for lubricant, such as grease or thick oil that will be admitted to the box through a central opening formed in the enlargement  $E'$ . The journal  $h$  rotates within the bearing sleeve  $G$  and also moves longitudinally there-through to a limited extent. The bearing sleeve  $G$  is not only loosely and rotatably mounted upon the journal  $h$  of the axle  $H$ , but is also loosely and rotatably mounted within the journal box  $E$ . As the result of this construction, the bearing sleeve  $G$  will creep or rotate within the journal box. It will be seen that this creeping or rotation, more or less, of the bearing sleeve  $G$  will bring a new surface of the sleeve in position to receive the weight of the load and will avoid the concentration of wear upon the bearing sleeve at any one point. So, also, inasmuch as the journal box  $E$  is rotatably mounted within the retaining rings  $F$ , any binding of the bearing sleeve  $G$  on the journal and within the journal box will cause a corresponding creeping or rotary movement of the journal box within the retaining rings. It will be seen that the inner end of the bearing sleeve  $G$  coincides with the reduced inner end  $e^*$  of the journal box  $E$ , so that a single guard ring or dust guard  $R$  (hereinafter described) will serve to effectively cover the exposed ends of both the bearing sleeve and the journal box.

The opening in the enlargement or chamber  $E'$  is provided with a movable cap or thimble  $K$  which is yieldingly held by a coiled spring  $M$  in position to normally close the opening at the inner end of the journal box and between it and the hub  $p$  of the car wheel  $P$  is placed a guard ring  $R$ . This ring is forced normally against the inner ends of the journal box  $E$  and of the bearing sleeve  $G$  by means of coiled springs  $S$ . The means for lubricating and guarding the bearing against the escape of lubricant and the entrance of dust and dirt forms the subject-matter of a separate application for letters patent and need not be more fully described herein.

From the foregoing description it will be seen that when the car wheels  $P$  pass over obstructions or irregularities of the track the side frame  $A$  is permitted to rotate slightly in vertical direction with respect to the truck bolster  $B$ . When one of the wheels  $P$ , for example, is raised or lowered incident to an irregularity of the track, such raising or lowering of the wheel will cause a corresponding movement of its axle  $H$ , but inasmuch as the opposite end of the axle will be provided with a spherical journal box like that described, such end of the axle will have a universal movement with respect to the side frame wherein it is

held and, hence, any lifting or depression of a wheel at one end of the truck axle will not tend to strain the parts of the truck.

By means of my improved journal boxes and the devices for connecting them to the side frames, a universal movement of the journal boxes is effected, which insures that the journal bearings shall at all times be in proper alinement with the journals of the axles, and there is no danger of the journal bearings becoming displaced, nor is any wedge or journal bearing key required. Moreover, the freedom of the bearing sleeve to rotate or creep upon the journal and the freedom of the journal box itself to rotate or creep within its bearings insures that a new wearing surface shall be constantly presented, thereby greatly prolonging the life and effectiveness of the parts. So, also, inasmuch as the bearing sleeve  $G$  is rotatably mounted within the journal box  $E$ , the lubricant from the chamber  $E'$  will pass not only between the journal and the bearing sleeve, but, also, between the bearing sleeve and the interior surface of the box.

Inasmuch as the bearing sleeve  $G$  is loosely mounted upon the journal  $h$  and is free to creep or rotate within the box, it is formed of one piece and is inserted into the journal box  $E$  through the rear end of the latter. It is removably mounted upon the journal  $h$  and passes over the outer end of the journal which, contrary to the usual practice, is not provided with a collar and a shoulder at its outer and inner ends abutting against the ends of the bearing. In ordinary practice, the engagement of the journal bearing with the shoulder and collar of the journal, receive and limit the end thrust or play of the journal in this box. In the present construction, the end thrust is taken by the engagement of the guard ring  $R$  with the outer face of the wheel. This guard is held in place by a series of coiled springs  $S$  arranged in sockets in the guard and engaging the outer face of the wheel  $P$ . The ring is provided with a plane outer surface which bears against the annular, coincident, plane inner end faces of the sleeve  $G$  and journal box  $E$  and the springs  $S$  hold the guard ring in place with these faces snugly in engagement. This engagement of the annular guard  $R$  not only serves to exclude dust from the box, but also closes its inner end to prevent the escape of any large amount of lubricant and also serves to hold the bearing sleeve  $G$  in position with the outer end thereof engaging the shoulder  $E$ . The springs  $S$  also serve to cushion the lateral play of the car wheel and axle and the ring  $R$  receives the lateral thrust of these parts when the springs are compressed and the wheel engages the inner face of the ring.

Inasmuch as the journal box is free to shift within the supporting members or keepers F, the box moves with the axle H and the journal *h* and the guard R on the axle is thereby always maintained in snug engagement with the inner end faces of the box and bearing sleeve.

The hollow lubricant chamber or receptacle E is mounted directly upon the shifting journal box and moves therewith and is so arranged that it can most effectively lubricate the bearing surfaces between the journal and the sleeve and between the sleeve and the box. This projecting part E' also serves to close the outer end of the chamber wherein the bearing sleeve G is located. The distribution of the lubricant is effected by the longitudinal and rotary movement of the journal *h* within the sleeve G and by the rotary movement of the sleeve G in the box.

The retaining rings F are exact duplicates one of the other and, hence, are interchangeable, and this is a feature of advantage in the assembling and repair of the parts. So, also, the bearing sleeve G is a simple cylindrical sleeve and can be placed in position, either end first, or can be reversed if any excess of wear should develop adjacent one or the other of its ends.

The bearing sleeve G is securely supported within the central, cylindrical chamber of the journal box E and cannot get out of place. This arrangement of the bearing sleeve renders it peculiarly effective for taking the side thrusts due to the pressure of the trucks upon the car wheels. The supporting members or keepers having the spherical concave faces fit about the spherical journal box and securely support the same, while at the same time permitting the shift of the journal box with the axle, so that there is no strain or binding between the journal and its bearing sleeve.

In the form shown, the supporting members or keepers are fixed within openings at the ends of the swivelled side frames *a* of the truck. These supporting members may be otherwise mounted, since the improved journal box and bearing can be applied to advantage to other forms of truck. It is also obvious that changes may be made in the precise details set forth without departure from the essentials of the invention as defined in the claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:—

1. The combination with a car axle having a wheel thereon and a projecting journal at its end, of a journal box having a cylindrical chamber therein, a cylindrical bearing sleeve rotatably mounted within said chamber, said projecting end journal being rotatable within said sleeve, and a support

whereon said journal box is mounted to shift universally with said axle to thereby maintain said bearing sleeve and journal in proper alinement, substantially as described.

2. The combination with a car axle having a wheel thereon and a projecting journal at its end, of a journal box having a cylindrical chamber therein, a one-piece cylindrical bearing sleeve removably mounted on said projecting end journal and removably mounted within the chamber of said journal box, said journal being rotatable within said sleeve and said sleeve free to rotate within said chamber, and vertically movable supporting members wherein said journal box is movably mounted to shift universally with said axle to thereby maintain said bearing sleeve and journal in proper alinement, substantially as described.

3. The combination with a car axle having a wheel thereon and a projecting journal at its end, of a journal box having an annular, spherical body portion and a central, transverse cylindrical chamber, a cylindrical bearing sleeve rotatably mounted within said chamber, said projecting end journal being rotatable within said sleeve, and supporting members or keepers having spherical concave faces engaging said journal box, the latter being free to shift universally within said supporting members or keepers to thereby maintain said bearing sleeve and journal in proper alinement, substantially as described.

4. The combination with a car axle having a wheel thereon and a projecting journal at its end, of a journal box having an annular, spherical body portion and a central, transverse cylindrical chamber closed at its outer end, a one-piece cylindrical bearing sleeve removably mounted upon said journal and removably mounted within the chamber of said journal box, said journal being rotatable within said sleeve and said sleeve free to rotate within said journal box, and vertically movable supporting members or keepers having spherical concave faces forming a seat for said journal box and wherein the same is universally shiftable to thereby permit the free, transverse, rocking movement of said axle and maintain said sleeve and journal in alinement, substantially as described.

5. The combination with a car axle having a wheel fixed thereto and a projecting journal at its end, of a journal box having an annular, spherical body portion and a central, transverse cylindrical chamber, a cylindrical bearing sleeve for said journal arranged in said chamber, said sleeve being free to rotate upon said journal and within said chamber and supporting members or keepers having spherical concave faces forming a seat for said journal box wherein the same is free to rotate or creep and to shift

universally with the axle, substantially as described.

6. The combination with a car axle having a wheel thereon and a projecting journal at its end, of a journal box having a cylindrical chamber therein, a bearing sleeve for said journal rotatable within said chamber, said box and said sleeve having annular, coincident, plane faces at their inner ends, an annular, axially spring-pressed guard on said journal and bearing upon the coincident inner end faces of said box and bearing sleeve, and a support whereon said box is movably mounted to shift with said axle to thereby maintain said bearing sleeve and journal in proper alinement and said guard in engagement with the inner end faces of said box and sleeve, substantially as described.

7. The combination with a car axle having a wheel thereon and a projecting journal at its end, of a journal box comprising a spherical body having an axial cylindrical chamber therein, a cylindrical bearing sleeve for said journal removably and rotatably mounted on said journal and in said chamber, said box and said sleeve having annular, plane faces at their inner ends and said box having a shoulder against which the outer end of said sleeve abuts with the inner ends of said box and sleeve coincident, an annular, axially yielding guard mounted upon and rotating with said journal and interposed between said wheel and box, said guard having a plane outer surface bearing upon the coincident inner end faces of said box and bearing sleeve and being free to move laterally across said face as the bearing sleeve wears, and supporting members having spherical concave faces forming a seat for said box and wherein the same is universally shiftable, substantially as described.

8. The combination with a car axle having a wheel thereon and a projecting journal at its end, of a journal box comprising a chambered, spherical, body wherein said journal is rotatably mounted, said box having an annular plane face at its inner end, an annular, axially spring pressed guard mounted on and rotating with said journal and interposed between said wheel and box, said guard having a plane outer face bearing upon the inner end face of said box, and vertically movable supporting keepers having concave spherical faces forming a seat for said box and wherein the latter is universally shiftable with said axle to thereby maintain said guard and box in proper engagement, substantially as described.

9. The combination with a car axle having a wheel thereon and a projecting, collarless journal at its end, of a journal box comprising a spherical body having an axial, transverse chamber closed at its outer end, a

one-piece cylindrical bearing sleeve removably and rotatably mounted upon said journal and within said chamber, said sleeve and box having coincident, annular plane faces at their inner ends, an annular axially spring-pressed guard on said axle between said wheel and box and bearing upon the coincident inner end faces of said box and sleeve, said guard being arranged to cushion and arrest the endwise movement of said axle, substantially as described.

10. The combination with a car axle having a wheel thereon and a projecting journal at its end, of a journal box having a transverse cylindrical chamber, a support whereon said journal box is mounted to shift universally with said axle, a bearing sleeve for said journal rotatably mounted within said chamber, and a projecting journal having a part on the outer end of said journal box closing the outer end of said chamber and extending over the outer ends of said bearing sleeve and journal, said part being hollow to form a lubricant receptacle, substantially as described.

11. The combination with a car axle having a wheel thereon and a projecting journal at its end, of a journal box comprising a spherical body having a transverse, cylindrical chamber, a bearing sleeve removably and rotatably mounted upon said journal and within said box, said journal box having a projecting hollow, lubricant receptacle closing the outer end of said chamber and an annular shoulder about the inner portion of said receptacle against which the outer end of said bearing sleeve abuts, and supporting members having spherical concave faces forming a seat wherein said journal box is universally shiftable and free to creep or rotate, substantially as described.

12. The combination with a car axle having a wheel thereon and a projecting journal at its end, of a journal box comprising a spherical body having a transverse cylindrical chamber, a bearing sleeve removably and rotatably mounted in said chamber, said journal being rotatable and longitudinally movable within said sleeve, said journal box having a projecting lubricant receptacle closing the outer end of said chamber and an annular shoulder about the inner portion of said receptacle against which the outer end of said bearing sleeve abuts, an annular, axially spring-pressed guard on said journal between said wheel and box and bearing upon the inner ends of said box and said sleeve to hold the latter in position against said shoulder, and supporting members having spherical concave faces forming a seat wherein said journal is movably mounted, substantially as described.

13. The combination with a car axle having a wheel fixed thereto and a projecting

journal at its end, of a journal box comprising an annular body having a spherical outer surface and a transverse, axial cylindrical chamber adapted to receive said journal, a bearing sleeve loosely and rotatably mounted upon said journal and within said cylindrical chamber, means for holding said sleeve in position within said chamber and vertically movable supporting members having an annular, spherical concave seat wherein said box is mounted to shift universally and thereby permit the free transverse rocking movement of said axle, substantially as described.

15 14. The combination with a car axle having a wheel fixed thereto and a projecting journal at its end, of a journal box com-

prising a spherical body having an axial, cylindrical chamber for receiving said projecting journal, a bearing element for said journal within said chamber, said journal box having a projecting hollow portion closing the outer end of said cylindrical chamber and arranged to receive lubricant and supply the same directly to the bearing within said chamber, and supporting members or keepers having spherical concave faces forming a seat wherein said journal box is universally shiftable and free to creep or rotate, substantially as described.

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