Oct. 20, 1931. A. O. BUCKIUS 1,828,280

RAILWAY TRUCK

Filed March 5, 1928 3 Sheets-Sheet 1

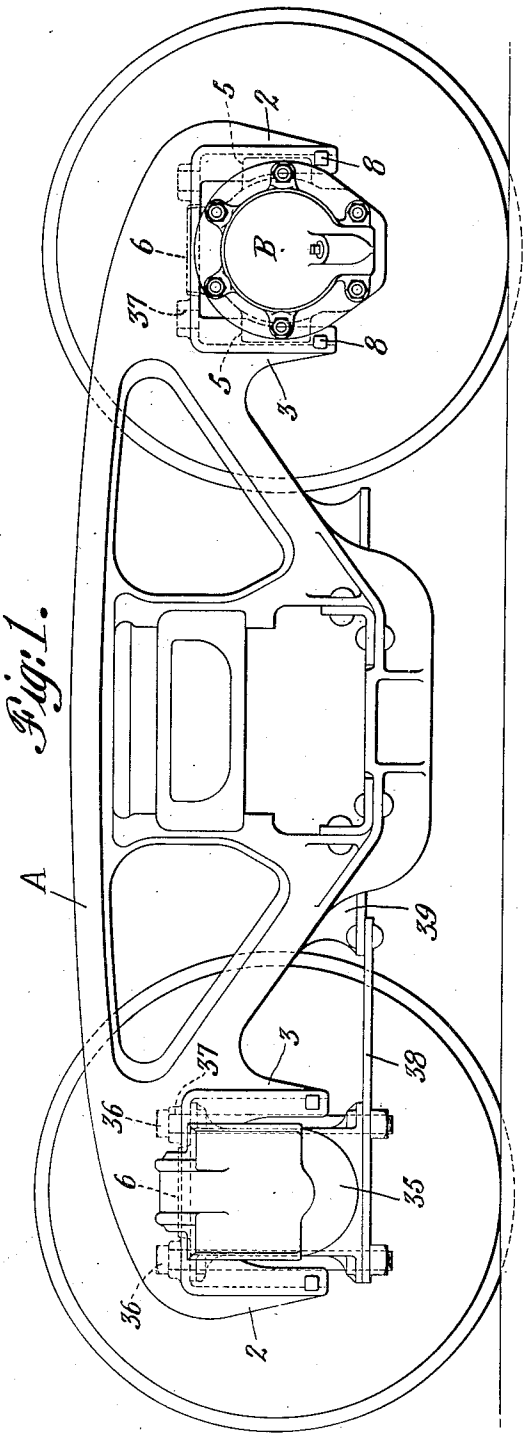


Fig. 1.

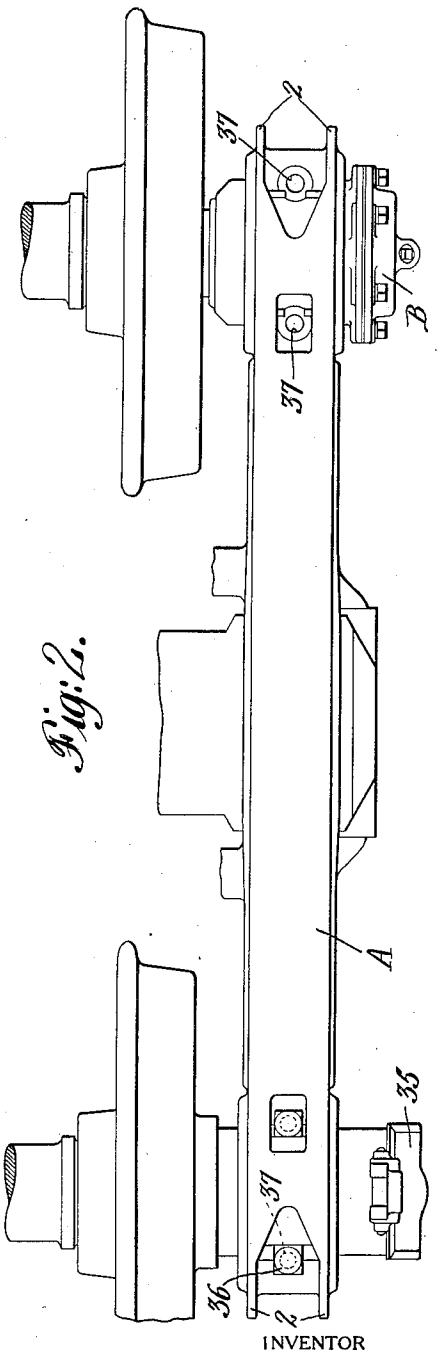


Fig. 2.

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RAILWAY TRUCK

Filed March 5, 1928 3 Sheets-Sheet 2

Fig: 3.

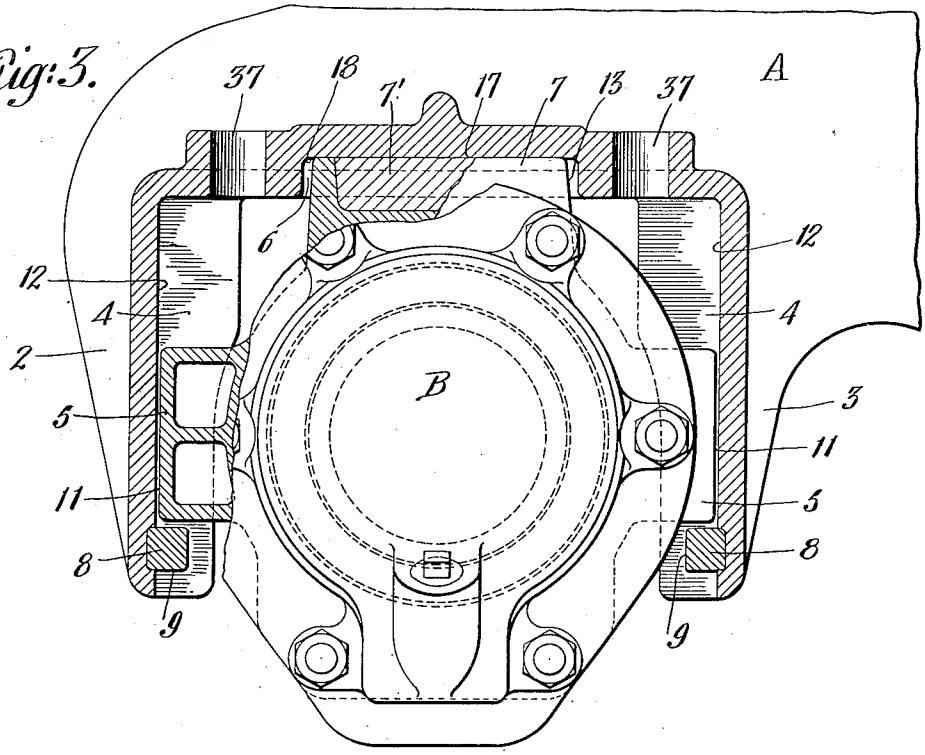
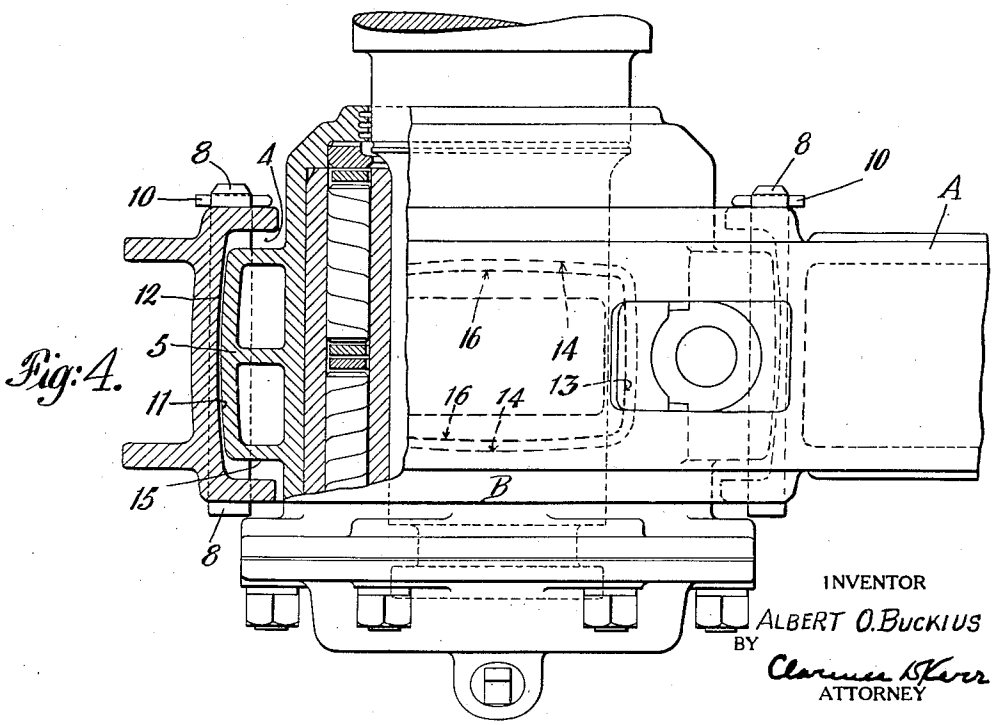


Fig: 4.



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RAILWAY TRUCK

Filed March 5, 1928 3 Sheets-Sheet 3

Fig: 5.

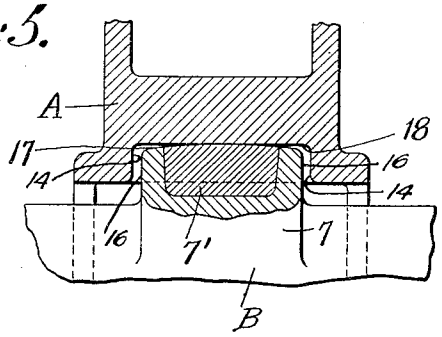


Fig: 6

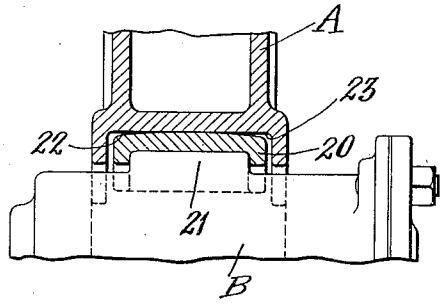


Fig: 7.

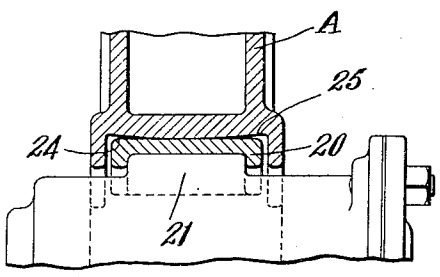


Fig: 8.

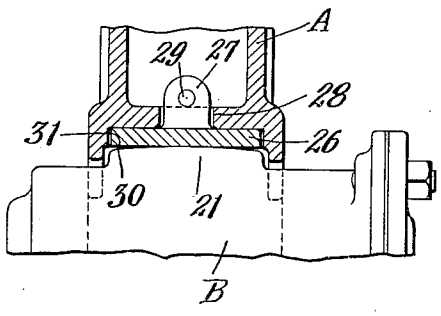
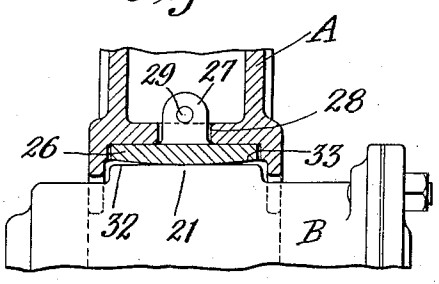


Fig: 9.



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Patented Oct. 20, 1931 1,828,280

UNITED STATES PATENT OFFICE

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RAILWAY TRUCK

Application filed March 5, 1928. Serial No. 259,023.

The present invention relates to journal boxes of the type intended more particularly for use on freight car trucks and the present application is in part a continuation of application Serial No. 212,446, filed August 12, 1927. It is customary in journal boxes of the plain type, such as have been heretofore more commonly used in freight car service, to attach the journal box rigidly to the car side frame and to provide for the required flexibility between the side frame and the axle by crowning the journal wedge longitudinally of the car axle, that is to say, transversely of the car and allowing a certain amount of clearance between the sides of the wedge and the box so as to permit limited movements in both vertical and horizontal planes within the box.

When roller bearings are used, it is not practicable to provide the necessary flexibility between the axle and the journal box without unduly increasing the size and weight of the box. For this reason roller bearing journal boxes and the cooperating parts of the side frames have been so designed as to permit the necessary flexibility between these parts. The present invention provides an improved structure of this type.

Roller bearings have not yet become standard equipment to such an extent that small repair shops carry repair parts for substitution, but invariably they do carry the necessary equipment for replacing standard A. R. A. plain bearing journal boxes. It is desirable, therefore, that the roller bearing journal boxes and side frames be so designed that in case of damage the roller bearing journal box may be removed and a plain journal box may be substituted. The fact that the roller bearing journal box is designed to be so connected in the side frame that rocking movement of the box relative to the side frame is permitted whereas the plain journal box is designed to be rigidly secured in the side frame makes it necessary to provide for securing the two boxes by two substantially different methods.

The present invention provides an improved arrangement of journal box and side frame such that the roller bearing box and the plain bearing box can be interchangeably secured in one and the same frame.

The invention will be better understood from a consideration of a particular illustrative embodiment thereof for the purpose of which description reference should be had to the accompanying drawings forming a part hereof, and wherein—

Figure 1 is a side view of a side frame, the two ends of which are similar and in one end of which is shown a roller bearing box and in the other end of which is shown a plain bearing box, the two types of box being interchangeable,

Figure 2 is a top plan view of the same,

Figure 3 is an enlarged detail side view partly in section of the roller bearing journal box,

Figure 4 is a plan view partly in section,

Figure 5 is a detail sectional view taken centrally through the top lug, showing a hardened wear resisting insert, and

Figures 6, 7, 8 and 9 are detail sectional views of modified forms of top lugs.

In the structure shown for the purposes of illustration, the side frame A is provided with depending jaws 2 and 3, the inwardly facing parts of which are of channel shape so as to provide recesses 4 therein, to receive the side lugs 5 of the roller bearing journal box B. At the top of the opening between the jaws 2 and 3 the frame has a flat seat with a central recess 6 to receive a lug 7 formed on the top of the journal box B. Pins 8 are inserted through registering apertures 9 in the jaws 2 and 3 below the lugs 5 to prevent separation of the box from the side frame in case of derailment or during handling of the truck when disassembled from the car body. The pins may be held in position by the cotters 10.

To provide for the lateral movement of the frame A relative to the box B, the surfaces 11 on the lugs 5, which bear against the surfaces 12 on the frame are formed on radii preferably struck from the intersection of the center lines of box and frame, so that when the box is angled horizontally with respect to the frame there will be effective bearing contact between box and side frame on a pair of these surfaces. It will therefore

be seen that when one side frame advances slightly ahead of the other, due to the flexibility of the truck, as when the car is rounding a curve, an effective contact will be maintained between box and frame upon a pair of these surfaces. This is of particular importance when brakes are applied, and the momentum of the car thrusts forwardly against the axle, carrying the side frame against the journal box with great force.

The vertical bearing faces 16 at the sides of the top lug 7 and the corresponding surfaces 14 are also formed on equal radii so as to provide effective contact between a pair of such surfaces when box and frame are also angled in a horizontal plane. These surfaces 16 and 14, shown in dotted outline in Figure 4, also serve to limit the transverse movement of the box with respect to the side frame, and hence clearance is provided at the sides 15 of the lugs 5 and ends 13 of the lug 7 to avoid contact of such surfaces with the side frame under normal conditions. All clearances are made sufficient to prevent binding in all relative positions of the journal box and frame; that is to say, the cooperating surfaces are spaced to allow the limited bodily movement of the journal box in the frame. The clearances between these curved surfaces should preferably be more than sufficient to permit freedom of movement of these parts during angling and the like. This is for the purpose of normally maintaining these surfaces out of contact and for permitting relative lateral and longitudinal movements between the journal box and frame during certain conditions of operation which result in bringing some of the surfaces together; for example when the brakes are suddenly applied the surface 12 of the frame at the rear of the journal box will be brought up against the surface 11 on the box. A similar condition arises as the car truck passes over curved section of track. The lug 7 is preferably provided with a wear resisting insert 7', as shown in Fig. 5.

To provide for vertical angling the top surface 17 of the lug 7 may be convex longitudinally of the axle on a suitable radius so that the box may move relative to the flat bearing surface 18 by which the box B supports the side frame A.

In Figs. 6, 7, 8 and 9 is shown the top portion of the journal box lug formed of a separate member. In Fig. 6 the separate member 20 seats over an upward projection 21 on the box and has an arc shaped upper surface 22 which engages a flat surface 23 on the side frame. In Fig. 7 the upper surface 24 of the separate member is flat, while the corresponding surface 25 on the frame is arc shaped. In Fig. 8 the separate member 26 is secured to the side frame by a projection 27 held in a slot 28 by a pin 29. Here the top surface 30 of the box is arc shaped and cooperates with the flat under surface 31 of the separate member. In Fig. 9 the top surface 32 of the box is flat while the bottom 33 of the separate member is arc-shaped.

The purpose of employing a separate piece as shown in Figs. 6, 7, 8 and 9 is to relieve the journal box and the side frame of wear. The wear is taken on separable pieces which can be replaced or which can be made hard enough to withstand wear.

The structure of the side frame is such that the roller bearing journal box may be removed and a plain bearing journal box substituted in its place. In Fig. 1 at the left a plain bearing journal box 35 is shown in position. As there shown, said journal box is held rigidly in position in the side frame by bolts 36 extending through bolt holes 37, the side frame and journal box and through a tie bar 38, which, at its inner end, is riveted to a lug 39 formed on the side frame for this purpose. The journal box 35 seats against the main flat portion of the seat formed between the two depending jaws 2 and 3, in the center of which flat seat is found the recess 6. If desired, the recess 6 may be filled with a plate of a thickness equal to the depth of the recess in order to provide additional bearing between the side frame and the top of journal box 35. The space between the jaws 2 and 3 is sufficient to provide room for the plain journal box of standard size and of the type that is universally available in railway repair shops.

The foregoing specific description is illustrative merely and is not intended as defining the limits of the invention.

I claim:

1. The combination with a roller bearing journal box of a side frame in which said journal box is mounted, said side frame having depending guides on opposite sides of said journal box and an intermediate flat seat with a central recess, said journal box being formed with a projection having longitudinally convex bearing contact in said recess to permit relative rocking movement and with projections engaging said guides to hold the journal box in position therein having longitudinally arcuate surfaces cooperating with corresponding surfaces in said depending guides to permit relative angular movement, said flat seat being formed to receive a plain journal box and having bolt holes for bolts securing such plain journal box in position, substantially as described.

2. The combination with a roller bearing journal box of a side frame in which said journal box is mounted, said side frame having depending guides on opposite sides of said journal box and an intermediate flat seat extending from one guide to the other, said journal box being formed with a top projection having longitudinally convex bearing contact with said side frame to per-

mit relative rocking movement and with lateral projections engaging said guides to hold the journal box in position therein having longitudinally arcuate surfaces cooperating with corresponding surfaces in said depending guides, said flat seat being formed to receive a plain journal box in substitution for said roller bearing journal box and having bolt holes for bolts adapted to secure such plain journal box rigidly against said flat seat, substantially as described.

3. The combination with a roller bearing journal box of a side frame in which said journal box is mounted, said side frame having depending guides on opposite sides of said journal box and an intermediate flat seat with a central recess, said journal box being formed with a top projection fitting within said recess, said projection and recess having relatively convex engaging surfaces to permit relative angular movement, said flat seat being formed to receive a plain journal box and having bolt holes for bolts to secure said plain journal box to said seat, substantially as described.

4. A side frame of the character described arranged to receive interchangeably a roller bearing journal box or a plain bearing journal box, said frame being formed with depending guides and an intermediate flat bearing seat therebetween having a central recess to receive a roller bearing journal box projection and to provide a rocking bearing therefor and said depending guides having arcuate bearing seats for engagement by corresponding projections of a roller bearing box and said flat seat being formed to receive a plain journal box and having bolt holes to facilitate securing said journal box rigidly in position thereon, substantially as described.

5. In a railway car truck, a side frame arranged to receive interchangeably a roller bearing journal box and a plain bearing journal box, said frame being provided with integral pairs of depending guides and an intermediate bearing seat therebetween to receive a roller bearing journal box and to provide a flexible connection therebetween, said depending guides being arranged to alternatively receive a journal box of American Railway Association type for rigid connection to the side frame.

6. A side frame for car trucks of railway cars having associated therewith integral pairs of guides for flexible connection with a roller bearing journal box and bolt-receiving apertures for rigid connection with a plain bearing journal box, said guide means being spaced to receive therebetween said plain bearing journal box.

7. In an alternate combination, a journal box flexibly connected to a car axle for relative movement in both vertical and horizontal planes, a second journal box inflexibly connected to a car axle, and a side frame provided with one type of connecting means for rigid connection with said first-mentioned journal box and with another type of connecting means for flexible connection with said second journal box.

8. In a device of the class described a frame member having depending recessed guides, a journal box adapted to fit between said guides, projections extending laterally from said box into the recesses in said guides, the ends of said projections and the co-operating surfaces of said guides being arcuately formed to permit angling and being normally spaced to permit relative lateral movement between said box and frame, said frame being adapted to receive a plain journal box and means for securing the latter against relative movement in the frame.

9. A journal box and side frame connection comprising curved surfaces on said frame adapted to co-operate with corresponding curved surfaces on a journal box of one type to permit angling, said co-operating surfaces being normally spaced apart to permit bodily lateral movement between said frame and box, and means on said frame adapted to receive devices for clamping another type of journal box to said frame against relative movement.

10. A journal box and side frame connection comprising curved surfaces on said frame, certain of said surfaces being at substantially a right angle to others and all being adapted to co-operate with corresponding surfaces on a journal box of one type to provide angular flexibility, and means on said frame adapted to receive means for securing a journal box of another type against movement relative to the frame.

11. A side frame having journal box receiving portions adapted to receive without alteration, a journal box for either rigid or flexible connection with the side frame, said portions being adapted to receive different means for retaining a box, depending upon whether the box is to be rigidly or flexibly connected, whereby said frame is adapted for alternative use with a journal box having a flexible connection with an axle and with a journal box having a substantially inflexible connection with the axle.

In testimony whereof, I have signed my name to this specification this 29th day of February, 1928.

ALBERT O. BUCKIUS.