Dec. 17, 1946. C. P. LEESE 2,412,689

RAILWAY CAR TRUCK

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Fig. 2.

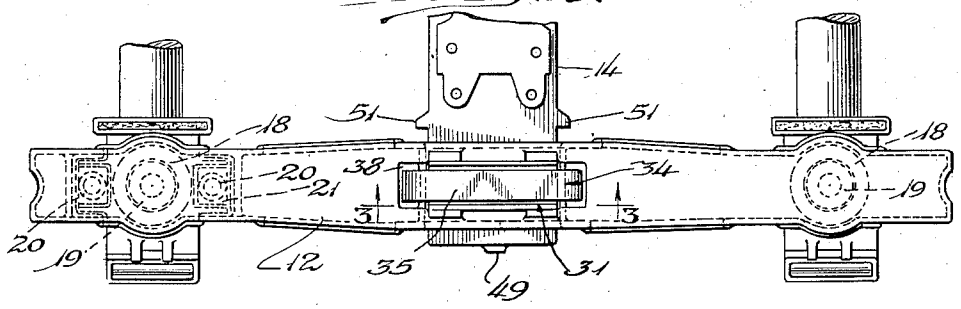
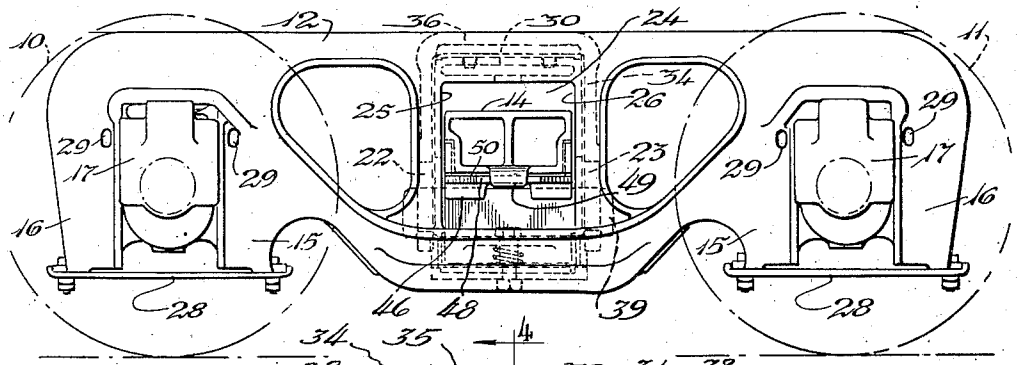


Fig. 1.



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Fig. 4.

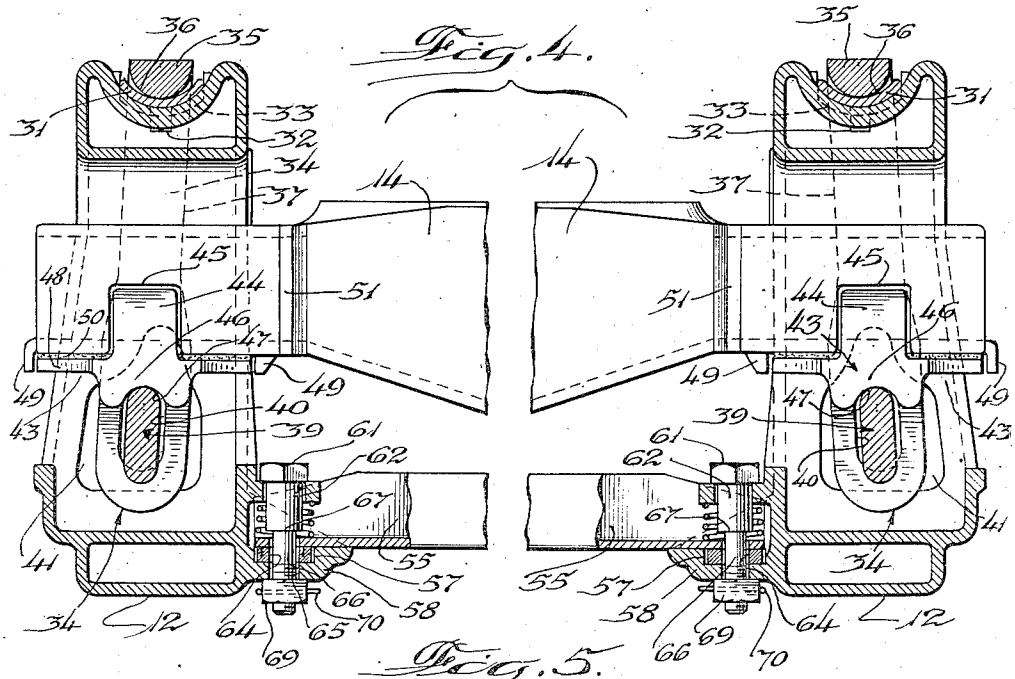


Fig. 5.

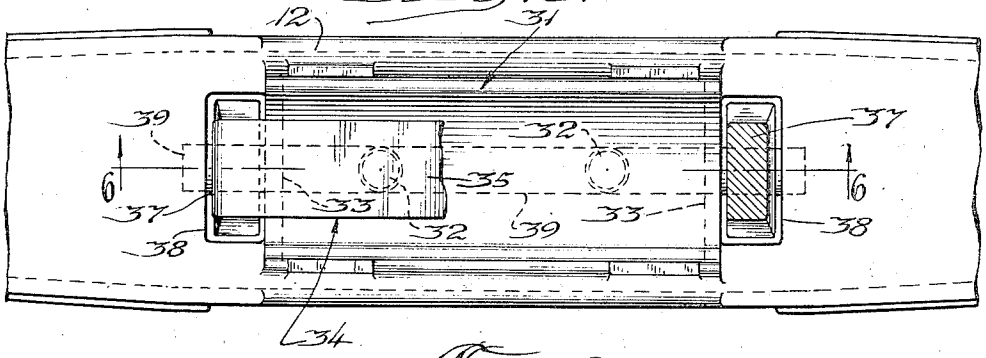


Fig. 6.

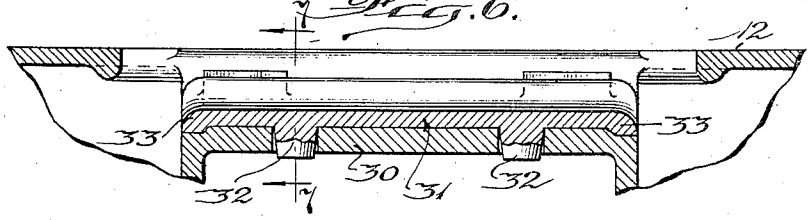
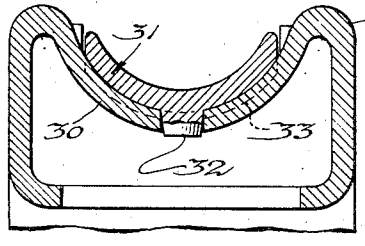


Fig. 7.



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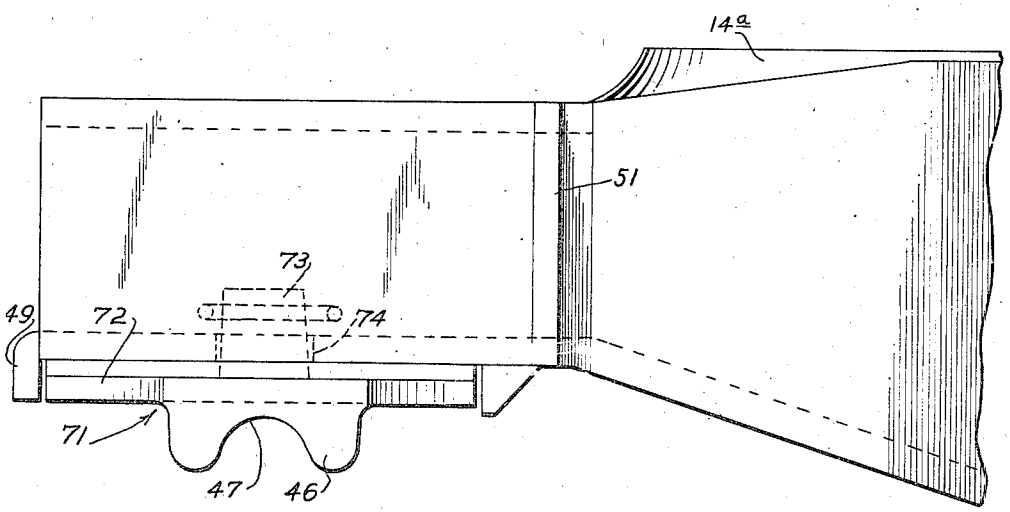


Fig. 8.

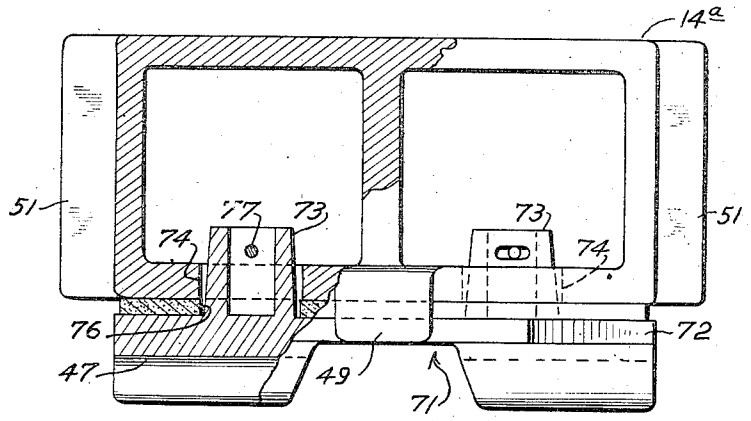


Fig. 9.

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UNITED STATES PATENT OFFICE

2,412,689

RAILWAY CAR TRUCK

Charles P. Leese, Chicago, Ill., assignor to Standard Car Truck Company, Chicago, Ill., a corporation of New Jersey

Application May 31, 1943, Serial No. 489,121

7 Claims. (Cl. 105—191)

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This invention relates to railway car trucks and particularly to the class of trucks in which a bolster or other member for supporting the car body is supported on the frame with capacity for substantially horizontal movement transversely of the truck.

Heretofore, swing hangers have been used in connection with car trucks of the transom type to suspend the truck center plate from the transoms, that is to say, from the rigidifying cross beams which so connect the truck side frames together as to provide a unitary frame structure. While car trucks of the above transom type presented many advantages incident to the provision of a rigid unitary frame, the trucks were objectionable because of their excessive weight and because of the difficulties encountered in partially or wholly dismantling the truck in connection with the repair and replacement of parts.

As a result of these objections, the transom type of truck has been superseded principally by trucks having a bolster supported in separately removable side frames.

The principal object of the invention is to provide, in a truck having separate side frame members, improved arrangements and constructions whereby a bolster member may be suspended directly from the upper central portion of the side frames and thereby provide a truck having all of the advantages of a swingably supported bolster (as distinguished from a bolster supported on rollers for transverse motion), and having all of the advantages of lightness and accessibility for repair which characterizes trucks having separately removable side frames.

It is a specific object of this invention to provide a truck having separate side frames, preferably, though not necessarily of the pedestal type, and a bolster suspended directly from the upper central portions of the side members by means of swinging link members.

Another object is to provide in a car truck having separately removable side frames and a transversely movable bolster, novel and improved means for suspending the bolster from the side frames, so that the weight of the car body will tend to prevent excess swinging movements of the bolster and will insure return movement thereof to its normal position after it has been displaced by lateral forces.

Another object is to provide in a car truck of the above character improved means for minimizing friction during the swinging movement of the truck bolster and to facilitate repair and replacement of those parts which will normally be

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subjected to the greatest wear. In this connection the invention includes the provision of links having rocker bearings as distinguished from bearings which pivot about fixed axes and the provision of bearing elements which are removably associated with the larger and more expensive members of the truck such as the side frames and the bolster.

Other objects and advantages of the invention will be readily apparent from the detailed description of the structures shown in the drawings.

In the drawings,

Fig. 1 is a side view of a railway car truck constructed in accordance with this invention.

Fig. 2 is a fragmentary plan view of a portion of the truck shown in Fig. 1.

Fig. 3 is a vertical section, on an enlarged scale, taken substantially on line 3—3 of Fig. 2 so as to illustrate the construction and cooperative relation of certain associated parts.

Fig. 4 is a cross section taken on line 4—4 of Fig. 3, but showing the bolster and bolster bearing in side elevation for the purpose of clearness.

Fig. 5 is a fragmentary plan view of a side frame member, a portion of the link for suspending the bolster being broken away in this figure.

Fig. 6 is a fragmentary sectional view taken on line 6—6 of Fig. 5, but omitting the link member.

Fig. 7 is a cross sectional view taken on line 7—7 of Fig. 6 to illustrate the welded connection of a renewable bearing member.

Fig. 8 is a fragmentary sectional view similar to Fig. 4, but showing certain modifications of the end portion of the bolster and of the bolster bearing associated with said end portion; and

Fig. 9 is an end view, partly in section, of the bolster and bolster bearing shown in Fig. 8.

The drawings illustrate only one side of a truck. However, it will be understood that both sides of the truck are identical and that the constructions of one side only are shown herein merely for brevity.

The truck shown in the drawings may be briefly described as comprising two pairs of wheels 10 and 11, separate side frames 12—12, and a truck bolster 14 which extends transversely of the truck and is swingably suspended at its opposite ends from the side frame members so as to swing in a substantially horizontal plane transversely of the truck. The side frames are of identical construction and are preferably, though not necessarily, of the pedestal type. When they are of the pedestal type, they include the spaced apart pedestal jaws 15—16 which embrace suitable journal boxes 17. Load supporting springs 18—19 are

interposed between the top portion of the journal boxes and portions of the top chord of the side frames. The arrangement of the springs 18—19 and likewise the arrangement and construction of suitable stabilizing springs 20 and their cooperating wedges 21 are the same in all respects as the springs and stabilizing wedges shown in my co-pending application Serial No. 430,889, February 14, 1942, which has since matured into U. S. Patent No. 2,355,450, granted August 8, 1944. It is unnecessary, therefore, to describe these elements in detail in the present application.

The important feature of the present invention is the arrangement and means of swingably supporting the bolster directly from the center portion of the side frames of the truck. In this connection each side frame is of unitary construction and includes columns 22—23 spaced apart and united with the upper and lower chords of the frame so as to define a rectangular central opening 24 for receiving an end portion of the bolster 14. The width of the said opening in the side frames is sufficient to provide but slight clearance between the inner vertical faces 25—25 of the columns 22—23, and the opposite side faces 27—27 of the bolster. This close fit serves to prevent any substantial angular movement of the truck side frames about a vertical axis and also prevents rotational movement of the bolster.

The side frames are separately removable and can be readily removed from their position on the journal boxes 17 by merely removing the pedestal tie bars 28—28 and then elevating the frame until the journal boxes will clear the lower end of the pedestal jaws. The springs and wedges of the stabilizing mechanism are retained in their positions during the removal of the frame by inserting bars or rods (not shown) into the openings 29 of the frame as described in said Patent No. 2,355,450. In some instances it may be desirable to remove the journal boxes from the wheel axles along with the side frame. This may be accomplished by merely removing the brass journal bearings and their cooperating wedge members (not shown) from the journal boxes. The side frame and journal box assembly may be then removed from their operative position by lateral movement of the side frame.

The upper chord portion of each side frame, at a location above said rectangular opening 24, is provided with channel portion 30 which extends lengthwise of the side frame. The channel is of curved configuration in cross section and receives a correspondingly curved bearing member 31 of hardened metal. The bearing member is removably fitted in the channel 30 and is held in position therein by means of dowel studs 32—32 formed on the bottom of the bearing and fitting in openings formed in the channeled portion 30 of the frame. As a further means for retaining the bearing member 31 in position, its opposite ends are formed with flanges 33—33 which fit into correspondingly formed recesses in the frame. The said studs 32—32 and flanges 33—33 maintain the metal bearing 31 firmly in position, but at the same time permit it to be readily removed for purpose of replacement in the event of excessive wear. The bolster 14 is swingably supported from the side frame members by means of inverted U-shaped links 34—34, each of which is provided with a central bearing portion 35 adapted to engage the hardened metal bearing 31. The radius of the bearing surface 36 of the link is preferably less than the radius of the top bearing surface of the hardened metal bearing 31. Consequently, the links have a rocking engagement on the hardened bearing surface rather than a sliding or frictional movement. The depending arms 37—37 of the link members extend through openings 38—38 in the top chord portion of the side frames and lie within the vertical channels of the columns 22—23 of the frame. The arms of the links are of sufficient length to extend substantially to the lower chord of the frame. Key members 39, one for each link, extend through openings 40—40 in the arms of the link and through openings 41—42 in the columns 22—23 so as to extend entirely across the central rectangular opening 24 in the frame. The said keys serve as bearings for supporting the opposite ends of the bolster. The openings 41—42 in the said columns are of sufficient width to permit substantial swinging movement of the links.

The invention includes certain novel constructions with the view of simplifying the work in connection with the making of repairs and the replacement of worn parts. In this connection the opposite ends of the bolster 14 are provided with removable bolster bearings 43. Each bolster bearing, as shown in Figs. 1, 3 and 4, includes a plate portion formed at opposite edges with upstanding lugs 44 which fit within recesses 45—45 formed on opposite faces of the bolster. This interlocking engagement between the bolster and the bolster bearing prevents any substantial sliding movement of the bolster relative to the bearing member. The lower face of the bolster bearing is provided with spaced apart lugs 46—46, each of which is formed with curved grooves 47 (Fig. 4), adapted to fit over the curved upper edge of a key member 39. The curvature of the said grooves 47—47 is of greater radius than the curvature of the upper edge of the key 39 so that the bearing engagement between the two members is in the nature of a rocker bearing. The plate portion 48 of the bolster bearing 43 is also held in place by means of depending lugs 49—49 formed on the bolster. A sound deadening pad 50, preferably of compressed fibre or other suitable material, is interposed between the bottom surface of the bolster 14 and the top surface of the bolster bearing 43. In the drawing only one pad 50 is shown. However, additional pads may be readily inserted between the bolster and the bolster bearings of the truck so as to compensate for wear of the wheels and other parts of the truck which tend to lower the center line of the car couplers relative to the top surface of the rails. When the bolster is supported in its normal position, the link members 34 normally stand at a slight angle outwardly (Fig. 4) from a vertical plane passing through the center of the hardened metal bearing member 31. With this arrangement, any outward swinging movement of the bolster is resisted by the load, since such swinging movement will involve moving the links in an upwardly directed arc at one side of the truck. The swinging movement of the bolster is limited by means of buffer lugs 51—51 positioned at opposite sides of the bolster adjacent each side frame so as to abut against the inner face of the side frame. The key members 39 are preferably inserted in their operative position, as indicated by the dotted lines in Fig. 3, through openings 52 or 53 in the side frames.

In order to avoid any transverse tilting of the separable side frame members of the truck, the lower intermediate portions of the frames are

connected by means of a tie brace 54. The tie brace is attached to each of the side frames in a manner to permit relative vertical movements of the frames and at the same time resist transverse tilting of the frames or relative lengthwise movement thereof. The tie brace preferably consists of a channel member 55 which extends across the truck beneath the bolster. Each end portion of the channel member has a cleat 56 secured thereto and adapted to seat within a recess 57 formed in the upper surface of flange 58 which is formed on the adjacent side frame of the truck. The cleats 56 extend the full width of the channel member so as to provide connections between the tie bar and side frames of sufficient length to prevent transverse skewing of the side frames or any substantial lengthwise movement of one side frame relative to the other. However, there is sufficient clearance between the cleats 56 and the walls of the cleat receiving recesses 57 to permit sufficient flexibility to allow the side frames to move vertically relative to each other and at the same time prevent objectional tilting, skewing or other movements of the truck side frames which would interfere with the proper operation of the moving parts of the truck. Each end of the tie brace is secured in position by means of a bolt 61 which extends through an opening 62 in an upper lug 63, and through coinciding openings 64 and 65 formed in the tie brace and flange 58, respectively. The lower portion 66 of the bolt is reduced in diameter so as to provide a shoulder 67 which normally stands a slight distance above the top surface of the tie brace 54 so as to permit slight vertical movements of the tie brace relative to the side frame 12. A coil spring 68 surrounds the bolt 61 and is interposed between the top surface of the tie brace 54 and the bottom surface of the upper lug 63 so as to exert resilient pressure against the tie bar and thereby hold the cleat 56 in proper position in its cooperating recess 57. A nut 69 is threaded on to the lower end of the bolt and is locked thereon against the bottom of the flange 58 by means of a cotter key 70.

It will be seen, from the construction above described, that the side frames 12—12 can be readily removed by merely disconnecting the tie brace 54 and jacking up the truck bolster so as to relieve the weight from the key member 39 of the link member 34, whereupon the frame 12 may be removed laterally, as previously described. It will also be observed that when it is necessary to remove and replace the key 39, it may be inserted and removed through the openings 41—53 or 42—52 in the frame, as indicated in Fig. 3 of the drawings.

Referring now to the bolster and bolster bearing assembly shown in Figs. 8 and 9 of the drawings: The bolster designated 14a is of known construction. It includes the spaced lugs 49—49 and the buffer lugs 51—51 of the previous embodiment, but it does not include the recesses 45, shown in Fig. 4, since the modified bolster bearing designated 71 does not include lugs such as shown at 44 in Fig. 4 for interlocking with the bolster. In the modified assembly, the bolster bearing 71 includes a plate portion 72 which is formed intermediate its edges with upstanding studs 73—73. These dowel studs have cored centers and project into the interior of the bolster through openings 74—74 formed in the bottom face thereof. A pad designated 75 is interposed between the bolster and the bolster bearing. The studs 73—73 of the bolster bearing extend through openings 76 in the pad and serve to hold the pad in proper position. The bolster bearing may be locked in its assembled position by inserting suitable cotters in the holes 77 formed in the studs 73.

While the invention has been illustrated herein as consisting of certain preferred constructions, it will be obvious that variations in arrangements and constructions of the various parts may be made, within the scope of the appended claims, without departing from the spirit or intent of the invention.

The tie brace structure shown in the drawings, in combination with the side frames of the truck, is not claimed specifically herein. This subject matter is disclosed and claimed in co-pending application Serial No. 616,238, filed September 14, 1945, as a continuation-in-part of the present application.

I claim:

1. A railway car truck having separate side frames provided with central openings therein, a bolster structure extending through said openings, bearing members of hardened metal removably seated on the upper central portion of the side frames and formed with depending retaining studs for engaging portions of the side frames, and link members of inverted U-form engaging said bearing members and the opposite ends of the bolster structure for suspending the bolster structure from said frames.

2. In a railway car truck having separate side frames provided with spaced columns defining central openings therein, a bolster structure extending through said openings, bearing members of hardened metal removably seated on the upper central portion of the side frames and the frames having apertures therein adjacent the opposite ends of said bearing members, and link members of inverted U-form, each provided with a center rocker bearing for engaging the removable bearing member of an adjacent side frame and spaced link portions adapted to be inserted through said apertures to their applied positions, a removable key member engaging an adjacent end of the bolster structure for suspending the bolster structure from the side frames.

3. In a railway car truck having separate side frames provided with spaced columns defining rectangular openings therein, a bolster structure extending through said openings and means for suspending said bolster structure from the side frames comprising link members of inverted U-form positioned to embrace the spaced columns, key members extending through the lower ends of said link members for engaging the under side of the bolster structure, there being openings in the side frames to permit insertion and removal of said key members.

4. In a railway car truck of the type in which opposite ends of a truck bolster extend through openings in side frame members and are swingably supported in said openings by means of hangers extending beneath the bolster ends, removable bolster bearing members located in the said openings in the side frame members and interposed between said hangers and the bolster and having upwardly extending means thereon loosely fitting into receiving holes formed in the bolster to provide an interlock with the bolster having capacity for relative vertical movements.

5. In a railway car truck of the type in which opposite ends of a truck bolster extend through openings in side frame members and are swingably supported in said openings by means of hangers extending beneath the bolster ends, re-

movable bolster bearing members located in the said openings in the side frame members and interposed between said hangers and the bolster, and a pad member interposed between the bolster bearing members and adjacent surfaces of the bolster; the said bolster bearing members having upwardly projecting means thereon loosely fitting into receiving holes formed in the bolster to provide an interlock with the bolster having capacity for relative vertical movements and for retaining said pads in position.

6. In a railway car truck having separate side frames having upper chords formed with open channels extending lengthwise of the chords, a bolster and hanger for swingably suspending the bolster from portions of the side frames, removable bearing members positioned in said channels between the hangers and adjacent portions of the side frames; the said bearing members being formed with integral studs which extend through openings in the side frames to hold the bearing members in proper position.

7. In a railway car truck of the type in which opposite ends of a truck bolster extend through openings in side frame members and are swingably supported in close relation to adjacent portions of the side frame members by means of hangers extending beneath the bolster ends, removable bolster bearing members located in the said openings in the side frame members and interposed between said hangers and the bolster and having upwardly extending means thereon interposed between opposite side walls of the bolster and adjacent portions of the side frames; the side faces of the bolster having recesses therein for receiving the said upwardly extending means to provide an interlocking engagement between the bolster and the bolster bearing members, and a pad member interposed between the bolster bearing members and the adjacent surfaces of the bolster.

CHARLES P. LEESE.