Sept. 15, 1942. R. B. COTTRELL 2,295,553

TRUCK

Filed Feb. 8, 1941 3 Sheets-Sheet 1

Fig. 1

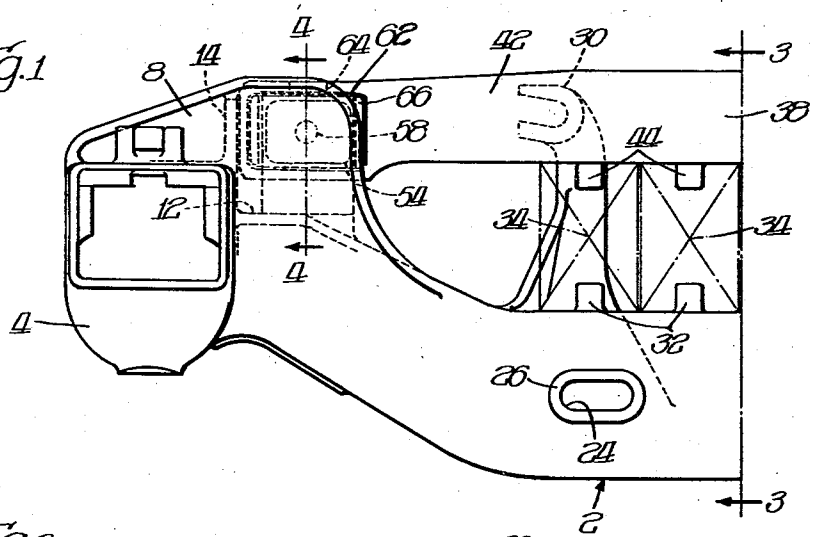


Fig. 3.

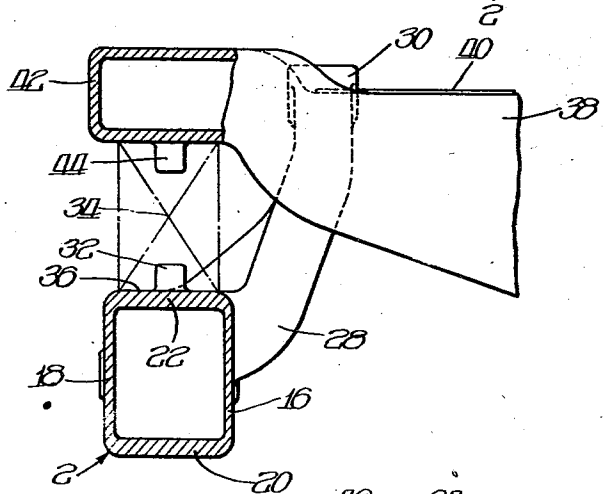
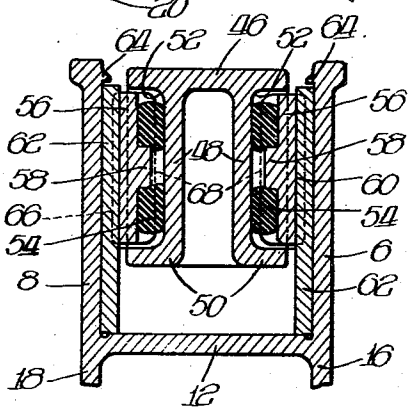


Fig. 4.



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TRUCK

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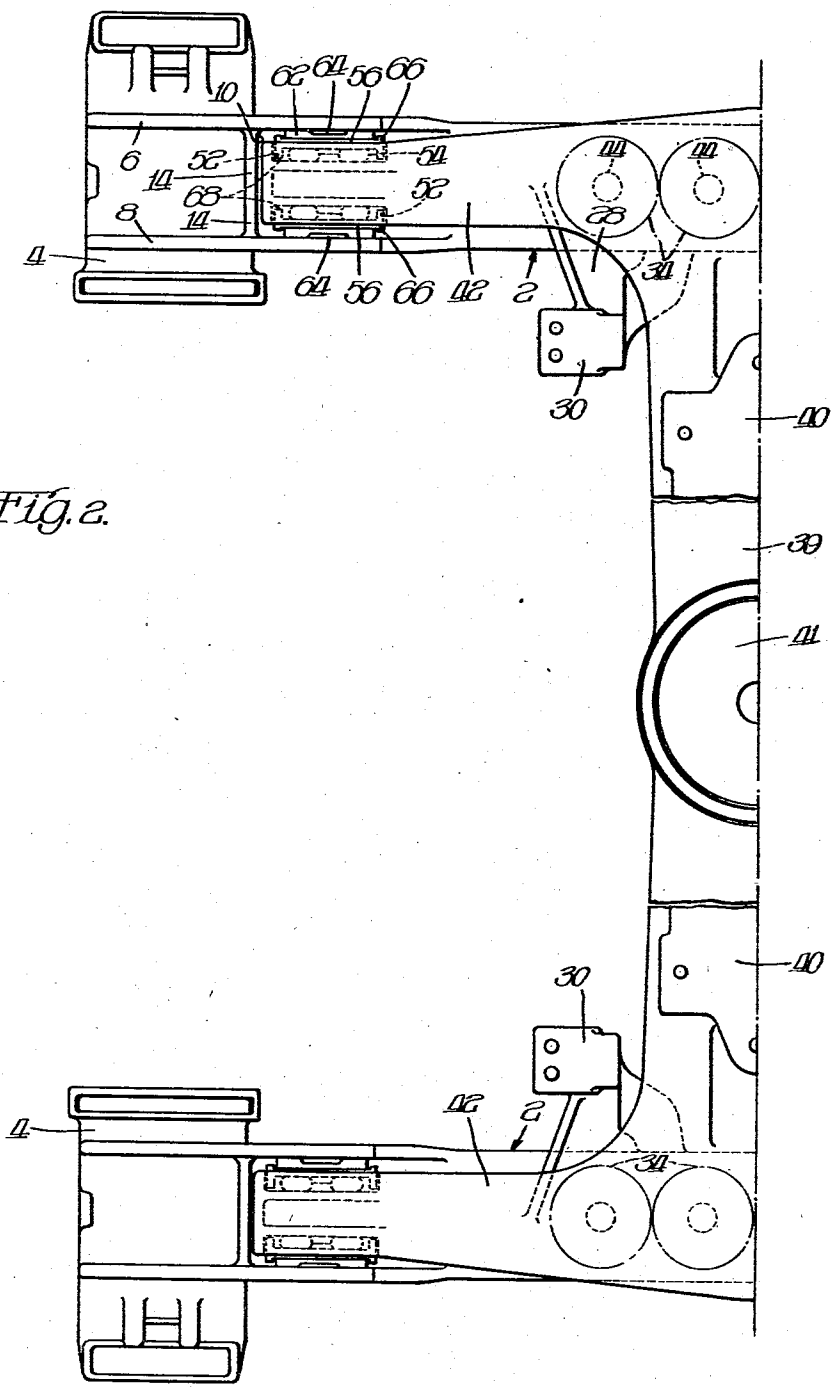


Fig. 2.

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TRUCK

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Fig. 5

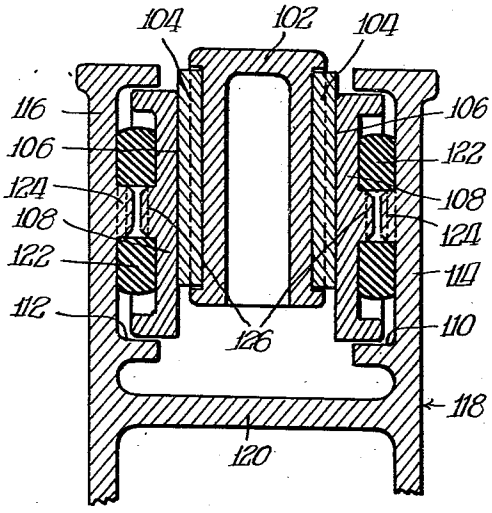


Fig. 6

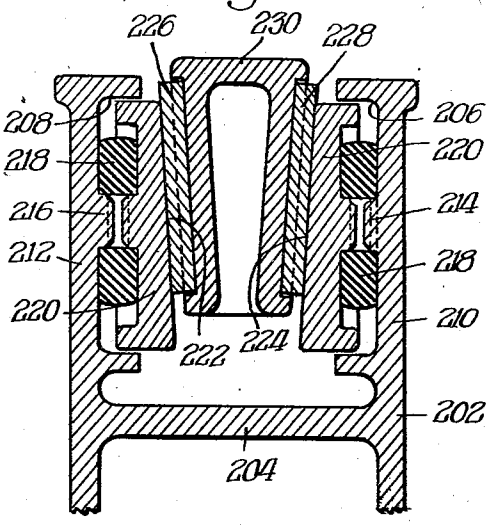
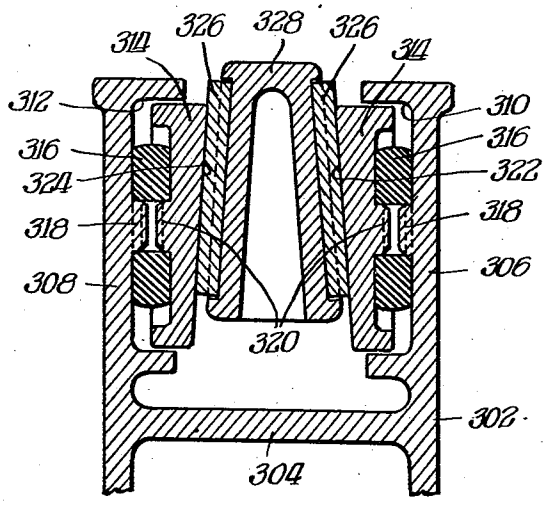


Fig. 7



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UNITED STATES PATENT OFFICE

2,295,553

TRUCK

Robert B. Cottrell, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application February 8, 1941, Serial No. 377,975

23 Claims. (Cl. 105—197)

My invention relates to a railway car truck and especially to a known form of such truck of four wheel type which comprises spaced side frames of beam type with integral journal boxes and pockets in said frames adjacent the journal boxes together with a bolster extending between said frames and formed with longitudinal beam portions at opposite ends thereof with the ends of said beams fixed in said pockets and spring groups supporting said bolster on said frames.

The general object of my invention is to provide ride control means in conjunction with such a type of truck in the form of friction absorbing devices associated with the side frames and beam ends of the bolster at their point of connection in the pockets adjacent the journal boxes.

My novel arrangement comprehends the provision of friction walls on the pockets of the side frame integrally formed thereon or fixed thereto in the form of wear plates and a plurality of friction shoes recessed in the beam members of the bolster and resiliently urged into frictional engagement with said friction surfaces.

An object of my invention is to devise such an arrangement as that described wherein a plurality of friction shoes will be spaced diametrically opposite each other in each of said pockets and whereby the associated resilient means will be effective to maintain said bolster in a normal position with respect to said side frame.

A different object of my invention is such an arrangement as that described whereby the friction units will be effective to space the side frame members from the bolster in such manner as to prevent wear therebetween.

A different object of my invention is to devise such a side frame as that described with ride control units associated with the beam ends of the bolster and the ends of the side frames in such manner as to permit slight play between said bolster and side frame longitudinally and laterally of the truck as well as normal vertical play therebetween while all of said movements are subjected to a resilient or frictional or a combination of resilient and frictional control.

In the drawings,

Figure 1 is a side elevation of a railway car truck embodying my invention, only one-half of the truck arrangement being shown inasmuch as the structure is similar at opposite ends thereof.

Figure 2 is a full top plan view of the truck structure shown in Figure 1, and Figure 3 is a fragmentary sectional view through the truck structure shown in Figures 1 and 2, the section being taken substantially in the vertical plane bisecting the truck transversely and as indicated by the line 3—3 of Figure 1.

Figure 4 is a fragmentary sectional view in the vertical transverse plane through the bolster and side frame ride control connection substantially as indicated by the line 4—4 of Figure 1.

Figures 5, 6, and 7 are sectional views comparable to Figure 4, but showing modified arrangements.

Describing the structure in detail, this form of car truck comprises a beam type side frame generally indicated 2 of box-section as best seen in the sectional view of Figure 3, each end portion of said frame being diagonally arranged with respect to the middle portion thereof and being integrally formed with the journal box 4. The juncture of the beam portion of the frame with said journal box 4 may be reinforced by upstanding inboard and outboard vertical flanges 6 and 8 extending from the outer edge of the box over the inner edge thereof and continued inwardly therefrom to define the inboard and outboard walls of the pocket 10 formed adjacent said box. The bottom of said pocket is defined by the horizontal web 12 and one side thereof may be defined by the vertical web 14 which is substantially in alignment with the inner edge of the journal box 4. As already indicated, said beam type side frame is of box-section comprising the inboard wall 16, the outboard wall 18, the bottom web 20 and the top web 22, and said outboard wall 18 may be cored away as at 24 and beaded therearound as at 26 for convenient foundry practice. Merging with the top web 22 and the inboard wall 16 of said side frame is the usual brake hanger bracket 28 integrally formed with said frame, the outer end of which may be formed in the hanger supporting jaw-portion 30. Adjacent the transverse center line line of the truck the top web 22 of the frame may be formed with spaced lugs 32, 32 affording positioning means for spaced spring groups diagrammatically indicated at 34, 34 which may be supported as at 36 on spring seats formed on said top web. The bolster 38 is of known form and comprises the central transverse portion 39 extending between the spaced side frames 2, 2 and provided with the usual center bearing 41 and the spaced side bearings 40, 40. Said bolster may be formed with downwardly projecting spring positioning lugs 44, 44 in vertical alignment with the before-mentioned upstanding

lugs 32, 32 on the side frame. Said lugs 44 afford positioning means for the springs 34, 34 upon which said bolster is supported. Integrally formed with the transverse portion 39 of said bolster are end beam portions 42, 42 which may be positioned in parallel arrangement with said side frames on which they are superposed, and the end portion of each beam is normally received between the inboard and outboard flanges 6 and 8 defining the before-mentioned pocket 10.

In my novel arrangement the end of each bolster beam portion 42 is formed with a top web 46 (Figure 4) and spaced parallel longitudinal ribs 48, 48 with oppositely turned horizontal flanges 50, 50 at their lower edges defining with said top web rectangular pockets in opposite sides of said end portion as indicated at 52, 52. In each pocket may be housed a resilient member or rubber pad 54, the inner face of which is seated against the adjacent web 46 and the outer face of which abuts the friction shoe 56 and is positioned thereagainst by a positioning means 58 centrally formed on said friction shoe. The outer face of the friction shoe may abut as at 60 a friction surface here shown as on a wear plate 62 seated against the side wall of the side frame pocket and confined against upward movement with respect thereto by the lug 64 formed at the upper edge of said side wall or flange. The wear plate 62 may be confined against lateral movement by the vertical flanges 66, 66 formed along the outer face of each friction shoe at opposite edges thereof. The flanges 66 extend across the end of each shoe and continue into the inwardly directed flanges 68, 68 which serve to confine the rubber pads 54, 54 and as stops to limit the compression thereof.

In assembly the friction shoes 56, 56 may be clamped tightly against the rubber pads 54, 54 assembled therewith against the webs 48, 48 of the end portion of each bolster beam member 42 compressing said rubber pad sufficiently to permit the insertion of the beam end with the assembled control unit between the wear plates 62, 62 which may theretofore have been mounted in the pockets of the side frame. Thereafter normal vertical movement of the bolster with respect to the side frame upon the supported springs 34, 34 will be permitted by the control unit but such movement will be damped somewhat by the amount of friction developed and this may be modified to suit varying conditions; at the same time the ends of the beam portions 42, 42 of the bolster will be snugly held and a restraining force will be set up between four control units mounted at respective corners of the truck structure so that the bolster and side frame will tend to maintain their normal assembled relationship with respect to each other.

In the modifications shown in Figures 5, 6 and 7, the pockets for the friction shoes and the rubber pads associated therewith are formed on the side frame instead of on the beam end of the bolster.

Referring to Figure 5, the beam end portion 102 has wear plates 104, 104 on opposite sides thereof which have frictional engagement as at 108, 108 in spaced parallel vertical planes with the friction shoes 108, 108 which are positioned within the pockets 110 and 112 formed in the inboard and outboard walls 114 and 116 of the side frame generally designated 118, said side frame having a horizontal transverse web 120 below the before-mentioned pockets 110 and 112. Between the shoes 108, 108 and the adjacent side walls 114 and 116 are compressed the rubber springs or pads 122, 122, and positioning means 124, 124 are formed on said walls in alignment with positioning means 126, 126 formed on said shoes for proper seating of said rubber pads.

In this modification, as shown in Figure 5, the friction developed is substantially constant whether the movement be up or down as distinguished from the modifications next considered in one of which the friction increases on the downstroke and in the other of which the increment occurs on the upstroke.

In the modification shown in Figure 6, the side frame 202 has the transverse web 204 above which are formed pockets 206 and 208 in the side walls 210 and 212 respectively, said side walls having the lugs 214 and 216 serving as positioning means for the rubber pads 218, 218 housed in said pockets respectively. Abutting the opposite faces of said pads are the friction shoes 220, 220 having diagonal face engagement as at 222 and 224 respectively with wear plates 226 and 228 recessed on the inboard and outboard faces of the bolster beam end portion 230. In this arrangement the friction surfaces at 222 and 224 are diagonally arranged with respect to each other, and the beam end portion of the bolster is wedge shaped so that as the bolster moves downwardly with respect to the side frame the frictional resistance offered by the snubbing arrangement herein shown gradually increases, while a reducing amount of friction is offered on the upward stroke.

The modification illustrated in Figure 7 show a friction arrangement substantially the reverse of that shown in Figure 6. In Figure 7 the side frame structure 302 comprises the transverse web 304 joining the inboard and outboard walls 306 and 308. In said walls may be formed pockets 310 and 312 respectively and within said pockets may be recessed friction shoes 314, 314 with the rubber pads 316, 316 in compression between said shoes and said respective walls with positioning means 318, 318 on said walls and 320, 320 on said friction shoes for said rubber pads. Said friction shoes may have diagonal friction face engagement as at 322 and 324 respectively with wear plates 326, 326 recessed in the opposite faces of the bolster beam end portion 328. In this modification the bolster beam end portion is also wedge shaped with the wider portion at the bottom so that there is a steady increment of friction as the bolster moves upwardly with respect to the side frame, while said friction decreases when said movement is reversed.

It is to be understood that I do not wish to be limited by the exact embodiments of the device shown which are merely by way of illustration and not limitation as various and other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a railway car truck, spaced side frames of beam type having elevated end portions with integral journal boxes and spaced flanges forming pockets adjacent said boxes, spring seats on said frames adjacent the transverse center line of said truck, springs thereon, a bolster extending between said frames and seated on said springs with beam type end portions extending above said frames with the extremities thereof housed in said pockets, friction means in said pockets restricting relative movement of said beam extremities with respect to said side frames,

each of said friction means comprising friction shoes recessed in opposite side walls of the adjacent bolster beam extremity, and resilient means under compression between each shoe and the adjacent side wall.

2. In a railway car truck, spaced side frames of beam type having elevated end portions and integral journal boxes, inboard and outboard flanges on said frames defining pockets adjacent said boxes, a bolster resiliently supported on said frames adjacent the transverse center line of the truck and having beam end members in longitudinal alignment with said side frames, said beam members having their ends received in said respective pockets, friction means associated with the ends of said beam members and the side walls of said pockets, each of said friction means comprising friction shoes at opposite sides of the associated beam member, and resilient means supported from said last-mentioned member and urging said shoes into engagement with the side walls of the adjacent pocket.

3. In a railway car truck, spaced side frames of beam type having elevated end portions with integral journal boxes and spaced flanges forming pockets adjacent said boxes, spring seats on said frames adjacent the transverse center line of said truck, springs thereon, a bolster extending between said frames and seated on said springs with beam type end portions extending above said frames with the extremities thereof housed in said pockets, friction means in said pockets restricting relative movement of said beam extremities with respect to said side frames, each of said friction means comprising friction shoes recessed in opposite side walls of the adjacent bolster beam extremity, resilient means under compression between each shoe and the adjacent side wall, and positioning means on each shoe for the adjacent resilient means.

4. In a railway car truck, spaced side frames of beam type having elevated end portions with integral journal boxes and spaced flanges forming pockets adjacent said boxes, spring seats on said frames adjacent the transverse center line of said truck, springs thereon, a bolster extending between said frames and seated on said springs with beam type end portions extending above said frames with the extremities thereof housed in said pockets, friction means in said pockets restricting relative movement of said beam extremities with respect to said side frames, each of said friction means comprising spaced friction shoes having slidable engagement with friction surfaces on said flanges, and resilient means urging said shoes into engagement therewith.

5. In a railway car truck, spaced beam type side frames having diagonally arranged end portions with integral journal boxes and pockets on said frames adjacent said boxes, each of said pockets being defined by inboard and outboard flanges, a bottom web, and a transverse flange over the adjacent box, a bolster extending between said frames and resiliently supported thereon, said bolster having at its opposite ends beam portions extending over said frames with ends positioned in said pockets, control units mounted in said pockets to restrict the movements of said bolster with respect to said side frames, each of said control units comprising friction shoes engaging friction surfaces on the adjacent inboard and outboard flanges of the side frame, and resilient means under compression between said shoes and the adjacent beam portion end.

6. In a railway car truck, spaced beam type side frames having diagonally arranged end portions with integral journal boxes and pockets on said frames adjacent said boxes, each of said pockets being defined by inboard and outboard flanges, a bottom web, and a transverse flange over the adjacent box, a bolster extending between said frames and resiliently supported thereon, said bolster having at its opposite ends beam portions extending over said frames with ends positioned in said pockets, and control units resiliently mounted in said pockets at each side of said beam portions to restrict the movements of said bolster with respect to said side frames.

7. In a railway car truck, spaced beam type side frames having diagonal end portions with integral journal boxes and vertical flanges defining pockets adjacent said boxes, a transverse bolster extending between said frames with beam end members aligned with said frames and extending into said pockets, control units mounted in each of said pockets restricting relative movement between said beam members and the associated frames, each of said control units comprising a plurality of oppositely spaced friction shoes, resilient means urging said shoes into engagement with said flanges, and positioning means on said shoes for said resilient means.

8. In a railway car truck, spaced beam type side frames having diagonal end portions with integral journal boxes and vertical flanges defining pockets adjacent said boxes, a transverse bolster extending between said frames with beam end members aligned with said frames and extending into said pockets, control units mounted in each of said pockets restricting relative movement between said beam members and the associated frames, each of said control units comprising a plurality of oppositely spaced friction shoes, and resilient means supported from opposite sides of the associated member and urging said shoes into engagement with said flanges.

9. In a railway car truck, spaced side frames a beam type having elevated end portions and integral journal boxes, inboard and outboard flanges on said frames defining pockets adjacent said boxes, a bolster resiliently supported on said frames adjacent the transverse center line of the truck and having beam end portions in longitudinal alignment with said side frames, said portions having their ends received in said respective pockets, and friction means associated with the ends of said portions and the side walls of said pockets, said means comprising friction elements supported respectively from said side walls and said beam end portions, and resilient means between certain of said elements and the supporting members.

10. In a railway car truck, a side frame having friction device support means adjacent opposite ends thereof, friction shoes therein, and a bolster resiliently supported on said side frame with oppositely arranged arms, each of said arms extending between the associated shoes, and resilient means between each shoe and the associated arm.

11. In a railway car truck, spaced beam type side frames having diagonal end portions with integral journal boxes and vertical flanges defining pockets adjacent said boxes, a transverse bolster extending between said frames with beam end members aligned with said frames and extending into said pockets, and control units

mounted in each of said pockets restricting relative movement between said beam members and the associated frames, each of said control units comprising inboard and outboard friction shoes resiliently mounted in opposite walls of each end member in slidable engagement with friction surfaces on said flanges.

12. In a railway car truck, a side frame having friction device support means adjacent opposite ends thereof, friction shoes therein, resilient means associated with each shoe, and a bolster resiliently supported on said frame and having an arm carrying the shoes in each support means and clamped by and between the resilient means associated with said last-mentioned shoes.

13. In a railway car truck, a side frame having friction device support means adjacent opposite ends thereof, a bolster extending between said frames and having members extending into said support means, laterally spaced friction elements supported respectively from said members and from said means, and resilient means interposed between certain of said elements and their means of support.

14. In a railway car truck, spaced side frames having pockets adjacent their ends, friction devices housed in said pockets, a bolster resiliently supported on said frames and extending therebetween with beam end members in longitudinal alignment with said frames and extremities engaging said friction devices, each of said friction devices comprising friction shoes at opposite sides of the associated member and engaging friction surfaces on the adjacent frame, and resilient means supported from said last-mentioned member in abutment with said friction shoes.

15. In a railway car truck, spaced side frames having integral journal boxes, pockets in said frames adjacent said boxes, friction devices housed in said pockets, a bolster extending between said frames with beam end portions extending above said frames and engaging said friction devices, each of said friction devices comprising resilient means housed in the extremity of the adjacent beam end portion, and friction shoes engaging friction surfaces on the side walls of the adjacent pocket.

16. In a railway car truck, a side frame having a pocket adjacent the end thereof, a bolster resiliently supported from said frame and having an arm extending into said pocket, laterally spaced friction means including friction elements supported respectively from a wall of said pocket and from said arm, and resilient means between certain of said elements and its means of support.

17. In a railway car truck, spaced side frames having pockets adjacent the ends thereof comprising spaced vertical walls, a bolster extending between said frames having end portions in said pockets, and friction means in said pockets, said means comprising friction elements supported respectively from inboard and outboard sides of said end portions and from said walls, and resilient means interposed between certain of said elements and their supporting members.

18. In a railway car truck, a side frame having a pocket adjacent the end thereof, a bolster supported from said frame and having an arm extending into said pocket, laterally spaced friction means including friction elements supported respectively from a wall of said pocket and from said arm, and resilient means compressed by and between certain of said elements and its supporting member.

19. In a railway car truck, spaced side frames having pockets adjacent the ends thereof comprising spaced vertical walls, a bolster extending between said frames and having end portions in said pockets and friction devices in said pockets comprising friction panels removably mounted on certain of said walls, and friction shoes in engagement with said panels and resiliently mounted on said end portions.

20. In a railway car truck, spaced side frames having pockets adjacent the ends thereof comprising spaced vertical walls, a bolster extending between said frames and having end portions in said pockets, and friction devices in said pockets comprising friction panels removably mounted in certain of said walls, and friction shoes in engagement with said panels and resiliently mounted on said end portions, said shoes having vertical flanges affording positioning means for said panels.

21. In a railway car truck, spaced side frames having pockets adjacent the ends thereof comprising spaced vertical walls, a bolster extending between said frames and having end portions in said pockets, and friction devices in said pockets comprising friction panels removably mounted on certain of said walls, friction shoes in engagement therewith, and resilient means compressed between said end portions and respective shoes, said shoes having spaced vertical flanges affording positioning means for said panels, positioning means for said resilient means, and stop means preventing overcompression thereof.

22. In a railway car truck, a side frame having a pocket adjacent the end thereof, a bolster resiliently supported on said frame and having an arm extending into said pocket, laterally spaced friction means including friction elements supported at opposite sides of said arm from walls of said pocket and from said arm, and resilient means between certain of said elements and their means of support.

23. In a railway car truck, a side frame having a pocket adjacent each end thereof, a bolster resiliently supported on said frame and having arms extending into said pockets, laterally spaced friction means inclosing friction elements supported at opposite sides of each arm from the walls of the associated pocket, friction elements supported from opposite sides of said last-mentioned arm, and resilient means between certain of said elements and their supporting members.

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