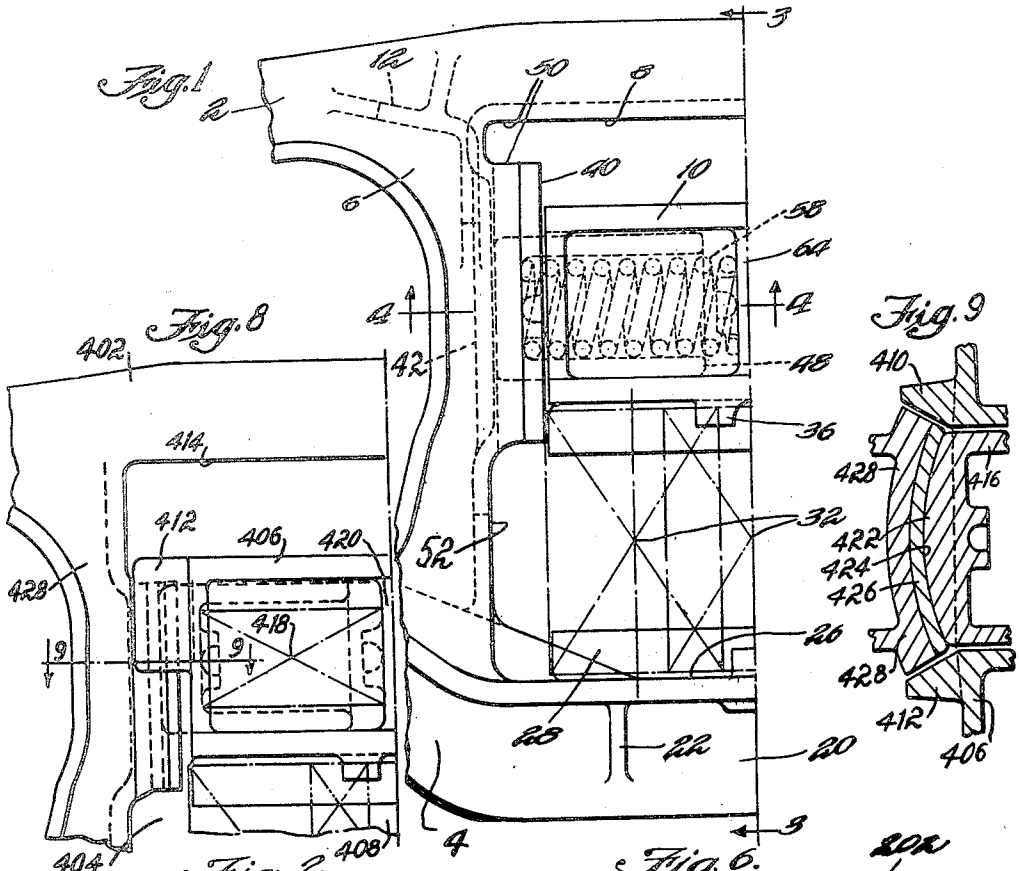
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Fig. 3.

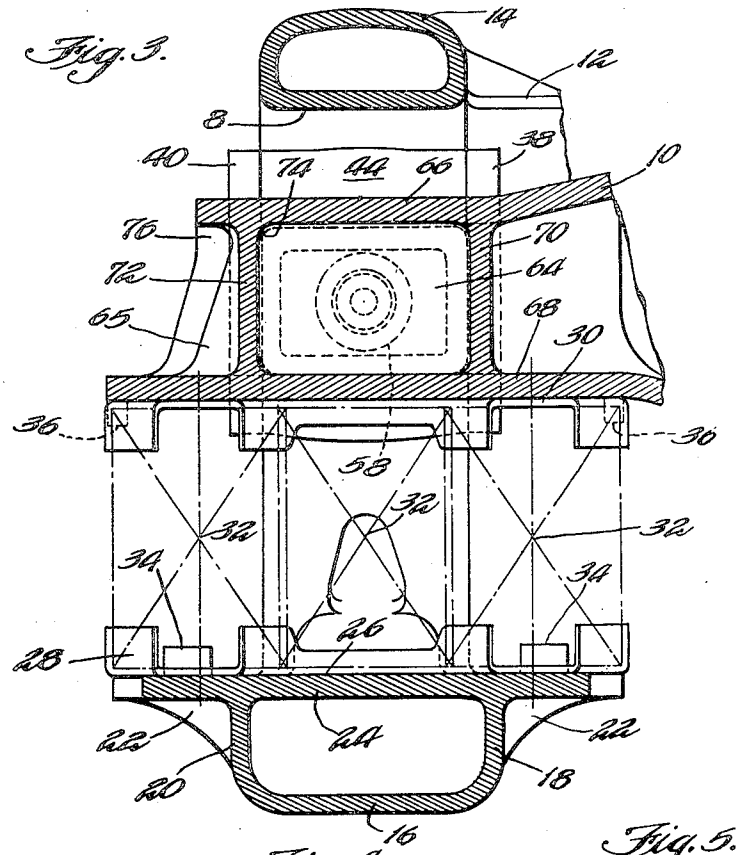


Fig. 4.

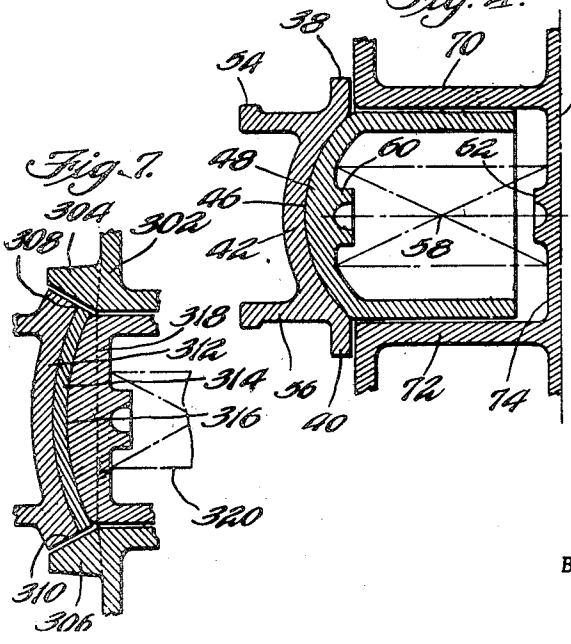


Fig. 5.

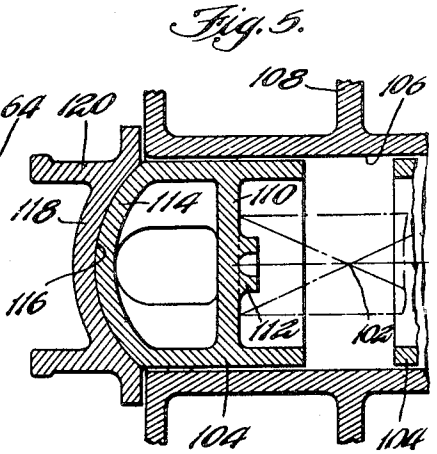


Fig. 7.

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Patented Feb. 20, 1945

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UNITED STATES PATENT OFFICE

2,370,105

CAR TRUCK

Carl A. Edstrom, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application November 13, 1941, Serial No. 418,924

24 Claims. (Cl. 105—197.2)

My invention relates to railway freight car trucks and especially to such a type of truck commonly designated spring plankless wherein spaced side frames may be held in squared relationship by a connecting bolster affording support in usual manner for a car body.

The general object of my invention is to devise a spring plankless freight car truck for use in high speed service wherein snubbing means may conveniently be associated with the side frame and bolster at their point of connection, said snubbing means assisting also in the squaring of the truck parts.

A specific object of my invention is to devise a novel form of railway car truck wherein the bolster may be tied to the side frame by means of lateral slidable followers which may have frictional engagement with complementary surfaces formed on the adjacent columns of the side frame.

My novel arrangement is readily adapted for use with quick wheel change type of trucks wherein the bolster may be removed from the bolster opening of the side frame or applied therein without disturbing the spring group upon which the bolster is normally seated.

A different object of my invention is to devise a novel form of bolster wherein may be housed followers in frictional engagement with the adjacent columns of the side frame and wherein said followers may be actuated by a single resilient means housed in said bolster or by a plurality of such means or less independently of each other as may be desired.

My invention also contemplates an arrangement wherein the friction followers may serve as a sole means of tieing together the side frame and bolster or where desirable I may utilize additional guide lugs on the bolster for engagement with the side frame columns as illustrated.

Figure 1 is a fragmentary side elevation of a railway car truck embodying my invention.

Figure 2 is a fragmentary top plan view of the truck structure shown in Figure 1.

Figure 3 is a fragmentary sectional view taken substantially in the transverse vertical plane bisecting the truck as indicated by the line 3—3 of Figure 1.

Figure 4 is a further fragmentary sectional view taken substantially in the horizontal plane indicated by the line 4—4 of Figure 1.

Figure 5 illustrates a novel arrangement in which both followers may be actuated by a single spring.

Figure 6 illustrates a further modification showing how my novel form of truck may readily be adapted to accommodate quick wheel change.

Figure 7 illustrates a further modification wherein my novel truck may utilize inboard and outboard guide lugs on the bolster for engagement with the side frame columns.

Figures 8 and 9 show still another modification wherein the truck bolster is provided with guide lugs, said lugs and the bolster opening being formed and arranged to accommodate quick wheel change, Figure 8 being a fragmentary side elevation, and Figure 9 being a sectional view taken in the horizontal plane indicated by the line 9—9 of Figure 8.

Describing the structure in detail and referring first to the modification illustrated in Figures 1 to 4 inclusive, my novel truck structure may comprise a truss side frame having a compression member 2, a tension member 4, and an integral column 6 at each side of the bolster opening 8 within which may extend the bolster 10 in usual manner. Adjacent the juncture of the column 6 with the compression member 2 may be formed the usual brake hanger bracket fragmentarily indicated at 12. Over the bolster opening 8, the compression member 2 may have a box-section illustrated at 14 in Figure 3 and beneath said bolster opening the tension member likewise may have a box-section with a bottom chord 16, inboard and outboard walls 18 and 20 reinforced by the vertical ribs 22, 22, and a top chord 24 widened beneath said bolster opening to afford a spring seat 26 upon which may be supported a spring group in usual manner, said spring group comprising a bottom spring plate 28, a top spring plate 30, and a plurality of coil springs diagrammatically indicated at 32, 32, said top and bottom plates being flanged over to afford retaining means for said springs. Upstanding lugs 34, 34 on the spring seat 26 may afford positioning means for the spring group and likewise depending lugs 36, 36 on the bolster 10 may further position said spring group. The upper portion of each column may be widened somewhat by laterally projecting inboard and outboard vertical flanges 38 and 40 (Figure 2) and between said flanges the transverse web 42 of the column may be cylindrical in form affording an arcuate surface 44 (Figure 3) for engagement as at 46 (Figure 4) with a complementary friction surface formed on the spring cap follower 48 which may have vertical slidable movement with respect thereto. The bolster

guide surface on each column comprising the widened portion thereof and defined by the web 42 and the lateral flanges 38 and 40 may be spaced from the compression member as indicated at 50 in the side elevation of Figure 1, and below said guide portion the bolster opening may be widened considerably as indicated at 52 in order to facilitate application of the bolster at the bottom of the bolster opening after the spring cap followers and springs have been assembled in the end of the bolster. Thereafter, the bolster and follower assembly may be elevated into engagement with the guide surfaces of the columns and the spring group may be placed in normal position on the spring seat 26. It will be readily understood that this modification does not represent a quick wheel change arrangement.

Figure 4 well illustrates the structure of the column through the bolster guide surface, said column comprising the before-mentioned arcuate transverse web 42, the inboard wall 54, and the outboard wall 56. The spring cap follower 48 may be a cup-like structure rectangular in section with the before-mentioned friction surface in complementary engagement with the web 42 as at 46, said spring cap follower housing a compression spring 58 (diagrammatically indicated in Figure 4), one end of said spring being afforded positioning means 60 within said spring cap follower and the opposite end being afforded positioning means 62 on the longitudinal central web or wall 64 of the bolster 10.

From a comparison of Figures 3 and 4, it may be noted that the end of the bolster 10 is a box-like structure comprising the top wall 66, the bottom wall 68, and the transverse webs 70 and 72 extending across said bolster end and defining with said top and bottom walls and with said web 64 a cavity 74 at each side of the bolster and within which may be housed a spring cap follower 48 for slidable movement therein. The bolster end structure may be reinforced by vertical ribs 76, 76 extending between the top and bottom walls of the bolster at the extremity thereof as well as by the continuation 65 of the intermediate wall 64.

The modification illustrated in Figure 5 differs from that illustrated in Figure 4 in that a single compression spring means 102 is positioned between the spring cap friction followers 104, 104 at opposite sides of the transverse pocket 106 in the bolster generally designated 108. In this arrangement each spring cap friction follower 104 is afforded an intermediate transverse wall 110 affording positioning means 112 on the inner face thereof for one end of the spring means 102. The said intermediate wall 110 may be spaced from the arcuate end wall 114 which may have frictional engagement as at 116 with a complementary transverse web 118 of the column generally indicated at 120, the engaging surfaces of the column and the follower being substantially identical with those described for the previous modification.

In the modification of Figure 5, the clearance between the inner ends of the friction followers 104, 104 is such that when the compression spring 102 is compressed to a maximum and the friction followers brought into abutment with each other, the column engaging ends thereof will still project sufficiently beyond the lateral walls of the bolster to prevent accidental disengagement of the bolster from the side frame columns. Similarly in the modification illustrated in Figure 4, the friction follower 48 may abut at its inner end against the bolster wall 64, said wall affording a stop therefor while the opposite arcuate column engaging end of the friction follower will still project beyond the lateral wall of the bolster and prevent accidental disengagement of the bolster from the column guide portion of the side frame.

In Figure 6, I have illustrated a modification of my novel form of truck adapted to quick wheel change. In this modification the side frame may be generally similar to that of the previous modification comprising the compression member 202 and the column 204 with the bolster opening 206 widened at the top as at 208 for a depth somewhat greater than that of the previous modification. In this modification the end portion 209 of the spring cap friction follower 210 having frictional engagement with the column guide portion 216 may be of restricted depth as indicated at B, said depth B being less than the vertical clearance indicated at A between the top of the bolster 212 and the compression member 202 thereabove to permit application or removal of the bolster at the top of the bolster opening. The spring cap friction follower 210 may be housed in the manner of the previous modification in the bolster end 212 for lateral movement therein under actuation by the compression spring diagrammatically indicated at 214. In this modification the other portions of the truck structure are substantially identical to those previously described, the bolster 212 being supported in usual manner on the spring group fragmentarily indicated at 218.

In Figure 7, I have illustrated in a fragmentary sectional view comparable to that of Figures 4 and 5 a further modification wherein the bolster 302 may be formed with vertical inboard and outboard guide lugs 304 and 306 which may have diagonal face engagement as at 308 and 310 with complementary surfaces formed at the inboard and outboard edges of the column 312, said column having a transverse web arcuate in shape as in the previous modifications to which may be secured in any convenient manner a wear plate 314 for frictional engagement as at 316 with a complementary surface on the end of the spring cap friction follower 318 which may be housed in the bolster 302 in the manner of the previous modifications and actuated by a compression spring diagrammatically indicated at 320. It will be understood that this modification may be used in the truck illustrated in Figure 1 wherein the bolster guide lugs 304 and 306 may extend for the depth of the bolster inasmuch as the bolster is to be removed at the widened portion at the bottom of the bolster opening.

Figures 8 and 9 illustrate still another modification of my invention wherein the truck bolster is provided with interlocking lugs for cooperation with the side frame columns, the bolster opening of the frame having a widened upper portion of greater depth than that of the lugs to afford a quick wheel change, as hereinafter described. In this modification, the side frame 402 comprises the bolster opening 404 within which the bolster 406 is supported by a spring group 408, as in the previously described embodiments, said bolster being provided with inboard and outboard guide lugs 410 and 412 of less depth than the widened upper portion 414 of the bolster opening. Housed within the bolster at each side thereof, as in the previous embodiments, is a friction block or shoe 416 actuated by a spring diagrammatically indicated at 418 (Figure 8), said spring being compressed between the shoe and the center rib 420 of the bolster. The column engaging portion 422

of the shoe is in frictional engagement as at 424 (Figure 9) with a wear plate 426 mounted on the adjacent side frame column 428, and it will be understood from a consideration of Figure 8 that the portion 422 of the shoe terminates at its lower extremity at approximately the same level as that of the lower edges of the inboard and outboard bolster guide lugs 410 and 412. By means of this arrangement the bolster may be elevated in the bolster opening and removed from the widened upper portion thereof during a quick wheel change inasmuch as the lugs 410 and 412, as well as the column engaging portion 422 of the friction shoe 416, are of less depth than the widened upper portion 414 of the bolster opening.

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, a truss side frame having tension and compression members and spaced columns defining a bolster opening, a spring group on said tension member in said opening, a bolster end on said spring group, guide portions on said columns spaced from said tension and compression members, friction followers housed in said bolster end with cylindrical friction surfaces in frictional engagement with complementary surfaces on said guide portions, and spring means under compression between said friction followers, the column-engaging portions of said friction followers having a depth less than the clearance of said bolster end from the compression member thereabove to permit removal of said bolster end at the top of said bolster opening, and inboard and outboard column-engaging guide lugs on said bolster end having a depth no greater than the depth of the column-engaging portions of said friction followers, said guide lugs having diagonal face engagement with complementary surfaces at the edges of said columns.

2. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, a spring group on said tension member in said opening, a bolster end on said spring group, guide portions on said columns spaced from said tension and compression members, friction followers housed in said bolster end with cylindrical friction surfaces in frictional engagement with complementary surfaces on said guide portions, and spring means under compression between said friction followers, the column-engaging portions of said friction followers having a depth less than the clearance of said bolster end from the compression member thereabove to permit removal of said bolster end at the top of said bolster opening, and inboard and outboard column-engaging guide lugs on said bolster end having a depth no greater than the depth of the column-engaging portions of said friction followers.

3. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, a spring group on said tension member in said opening, each of said columns having bolster guide portions projecting into said opening and spaced from the compression member thereabove, a bolster on said spring group in said opening, and friction followers housed in said bolster and having end portions with arcuate faces in engagement with complementary surfaces on said guide portions, the vertical clearance of said bolster from said compression member being greater than the depth of the column-engaging portion of each of said friction followers and said column-engaging portions having a height less than the clearance between said bolster guide portions and said compression member to permit application or removal of said bolster at the top of said bolster opening.

4. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, a spring group on said tension member in said opening, each of said columns having a bolster guide portion projecting into said opening and comprising an arcuate web, each bolster guide portion being spaced from the compression member thereabove, a bolster end seated on said spring group in said opening, and friction followers resiliently mounted therein and having complementary frictional engagement with said arcuate webs, the column-engaging portions of said friction followers having a depth less than the clearance of said bolster end and said bolster guide portions from the compression member thereover to permit application or removal of said bolster end at the top of said bolster opening.

5. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, a spring group on said tension member in said opening, a bolster end on said spring group, guide portions on said columns spaced from said tension and compression members, friction followers housed in said bolster end with cylindrical friction surfaces in frictional engagement with complementary surfaces on said guide portions, and spring means under compression between said friction followers, the column-engaging portions of said friction followers having a depth less than the clearance of said bolster end from the compression member thereabove to permit application or removal of said bolster end at the top of said bolster opening.

6. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, a spring group on said tension member in said opening, each of said columns having a bolster guide portion projecting into said opening and comprising an arcuate web, a bolster seated on said spring group in said opening, and friction followers resiliently mounted therein and having complementary frictional engagement with said arcuate web, said bolster guide portion being spaced from said compression member and the column-engaging portions of said friction followers having a depth less than the clearance of said bolster from the compression member thereabove to permit application or removal of said bolster at the top of said bolster opening.

7. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, bolster guide portions along the upper parts of said columns, a spring group on said tension member in said opening, a bolster end seated on said spring group, and friction followers housed in said bolster end with friction surfaces in slidable engagement with complementary faces formed on said guide portions, the column-engaging portions of said friction followers having a depth less than the vertical clearance of said bolster

end from said compression member thereabove to permit application or removal of said bolster end at the top of said bolster opening.

8. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, a spring group on said tension member in said opening, each of said columns having bolster guide portions projecting into said opening and spaced from the compression member thereabove, a bolster on said spring group in said opening, and friction followers housed in said bolster and having end portions with arcuate faces in engagement with complementary surfaces on said guide portions, the column-engaging portions of said friction followers having a depth less than the clearance of said bolster from the compression member thereabove.

9. In a railway car truck, a side frame comprising spaced columns and an intervening bolster opening, resilient means on said frame in said opening, a bolster supported on said means, friction means for resisting vertical and lateral movement of said bolster with respect to said frame, said friction means being housed in the sides of said bolster in engagement with friction surfaces on the adjacent portions of said columns, and resilient means independent of the first-mentioned resilient means for urging said friction means into said engagement, said friction means being the sole means tying said bolster to said frame.

10. In a railway car truck, a side frame having a compression member and a tension member and spaced columns defining a bolster opening, a spring group on said tension member in said opening, bolster guide portions on said columns projecting into said opening and spaced from said compression member, each of said portions presenting an arcuate wear surface therealong, a bolster on said spring group, and friction followers mounted in said bolster with opposite ends in complementary frictional engagement with said wear surfaces, said followers being of less depth than the clearance of said guide portions and said bolster from the compression member thereabove, and resilient means under compression between said friction followers, said followers being the sole means tying said bolster to said frame.

11. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, a spring group on said tension member in said opening, a bolster end on said spring group, guide portions on said columns spaced from said tension and compression members, friction followers housed in said bolster end with cylindrical friction surfaces in frictional engagement with complementary surfaces on said guide portions, said followers being of less depth than the clearance of said guide portions and said bolster end from the compression member thereabove, and spring means under compression between said friction followers, said followers being the sole means tying said bolster end to said frame.

12. In a railway car truck, a side frame having a compression member and a tension member and spaced columns defining a bolster opening, a spring group on said tension member in said opening, bolster guide portions on said columns projecting into said opening and spaced from said compression member, each of said portions presenting an arcuate wear surface therealong, a bolster on said spring group, and friction followers having less depth than the clearance of said guide portions and said bolster from the compression member thereabove, said followers being mounted in said bolster with opposite ends in complementary frictional engagement with said wear surfaces, said followers being the sole means tying said bolster to said frame.

13. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, a spring group on said tension member in said opening, each of said columns having bolster guide portions projecting into said opening and spaced from the compression member thereabove, a bolster on said spring group in said opening, and friction followers housed in said bolster and having end portions with arcuate faces in engagement with complementary surfaces on said guide portions, said followers being of less depth than the clearance of said guide portions and said bolster from the compression member thereabove, and resilient means under compression between said friction followers, said followers being the sole means tying said bolster in said frame.

14. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, a spring group on said tension member in said opening, each of said columns having bolster guide portions projecting into said opening and spaced from the compression member thereabove, a bolster on said spring group in said opening, and friction followers having less depth than the clearance of said guide portions and said bolster from the compression member thereabove, said followers being housed in said bolster and having end portions with arcuate faces in engagement with complementary surfaces on said guide portions, said followers being the sole means tying said bolster to said frame.

15. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening having a widened upper portion, a spring group on said tension member in said opening, each of said columns having a bolster guide portion projecting into said opening and comprising an arcuate web, a bolster end seated on said spring group in said opening, and friction followers having depth less than that of said upper portion and less than the clearance of said bolster end from the compression member thereabove, said followers being resiliently mounted in said bolster end and having complementary frictional engagement with the adjacent arcuate webs, said followers being the sole means tying said bolster end to said frame.

16. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening, a spring group on said tension member in said opening, bolster guide portions on said columns presenting cylindrical friction faces therealong, a bolster on said spring group in said opening, and friction followers housed in said bolster with complementary friction surfaces in engagement with said cylindrical faces, resilient means housed in said bolster for urging said followers into said engagement, and stop means for the inner ends of said followers, said followers being the sole means tying said bolster to said frame.

17. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening having a widened upper portion, a spring group on said

tension member in said opening, bolster guide portions on said columns presenting cylindrical friction faces therealong, a bolster on said spring group in said opening, and friction followers having depth less than that of said upper portion and less than the clearance of said bolster from the compression member thereabove, said followers being housed in said bolster with complementary friction surfaces in engagement with said cylindrical faces, and resilient means under compression between said friction followers, said followers being the sole means tying said bolster to said frame.

18. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening having a widened upper portion, a spring group on said tension member in said opening, bolster guide portions on said columns presenting cylindrical friction faces therealong, a bolster on said spring group in said opening, and friction followers having depth less than that of said upper portion and less than the clearance of said bolster from the compression member thereabove, said followers being housed in said bolster with complementary friction surfaces in engagement with said cylindrical faces, said followers being the sole means tying said bolster to said frame.

19. In a railway car truck, a truss side frame having tension and compression members and spaced columns defining a bolster opening having a widened upper portion, bolster guide portions along the upper parts of said columns, a spring group on said tension member in said opening, a bolster end seated on said spring group, and friction followers having a depth less than that of said upper portion and less than the clearance of said bolster end from the compression member thereabove, said followers being resiliently housed in said bolster end with friction surfaces in slidable engagement with complementary faces formed on said guide portions, said followers being the sole means tying said bolster end to said frame.

20. In a railway car truck, a side frame comprising a bolster opening with spaced columns at opposite sides thereof, resilient means on said frame in said opening, a bolster supported from said resilient means, and friction means housed in said bolster and cooperating with said columns to frictionally resist vertical and transverse movements of the bolster with respect to said frame, said friction means comprising spaced friction shoes in frictional engagement with respective columns, and resilient means independent of the first-mentioned resilient means and urging said shoes into said engagement, said shoes being the sole means tying said bolster to said frame, and stop means associated with said shoes for limiting movement thereof inwardly with respect to said bolster whereby accidental disassembly of said frame and said bolster is prevented.

21. In a railway car truck, a side frame comprising spaced columns and an intervening bolster opening, resilient means on said frame in said opening, a bolster supported on said means, friction means housed in the sides of said bolster in engagement with friction surfaces on the adjacent portions of said columns, and resilient means for urging said friction means into said engagement, said bolster opening comprising a widened upper portion and said friction means having a depth less than that of said upper portion and less than the clearance of said bolster from the top of said bolster opening whereby said bolster may be elevated in said bolster opening and removed therefrom while the first-mentioned resilient means remains in assembled relationship with said side frame.

22. In a railway car truck, a side frame comprising a bolster opening with spaced columns at opposite sides thereof, resilient means on said frame in said opening, a bolster supported from said resilient means, guide surfaces on the adjacent edges of said columns, the distance between said surfaces being less at the inboard and outboard sides thereof than centrally thereof, friction shoes housed in said bolster in complementary frictional engagement with said surfaces for movement therealong during vertical and transverse movements of the bolster with respect to said frame, resilient means independent of said first-mentioned resilient means for urging said shoes into said engagement, said shoes being the sole means tying said bolster to said frame, and stop means on the bolster for limiting movement of said shoes inwardly with respect thereto.

23. In a railway car truck, a side frame comprising spaced columns and an intervening bolster opening, resilient means on said frame in said opening, a bolster supported on said means, and a friction unit housed in said bolster and cooperating with said columns for frictionally resisting vertical and transverse movement of the bolster with respect to said frame, said unit comprising spaced friction elements in frictional engagement with respective columns, and resilient means independent of the first-mentioned resilient means for urging said elements into said engagement, said elements being the sole means tying said bolster to said frame.

24. In a railway car truck, a side frame comprising spaced columns and an intervening bolster opening, resilient means on said frame in said opening, a bolster supported on said means, friction means for frictionally controlling vertical and lateral movements of said bolster with respect to said frame, said friction means being associated with said bolster at opposite sides thereof and in engagement with respective columns, and resilient means independent of the first-mentioned resilient means for urging said friction means into said engagement, said friction means being the sole means tying said bolster to said side frame.

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