Sept. 14, 1948. L. A. LEHRMAN 2,449,305

SNUBBED TRUCK

Filed Jan. 1, 1945

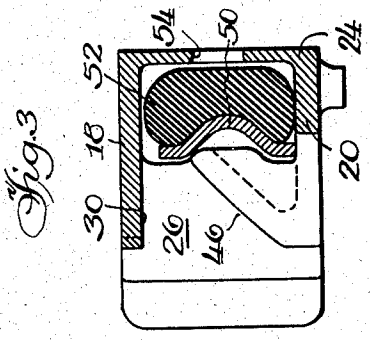


Fig. 3

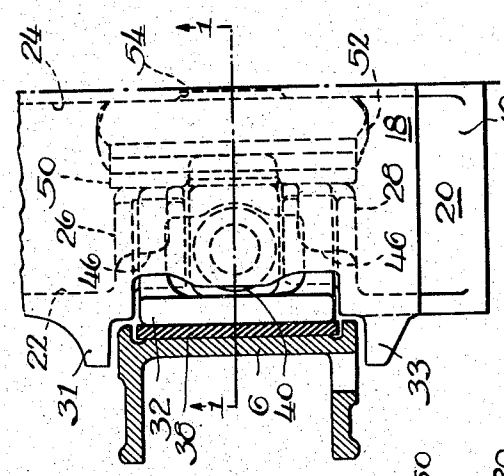


Fig. 2

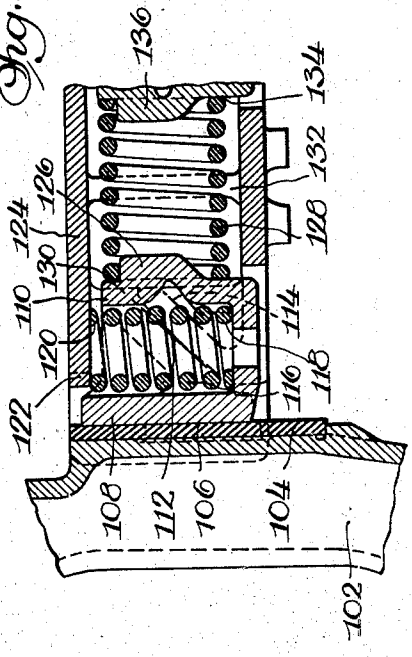


Fig. 4

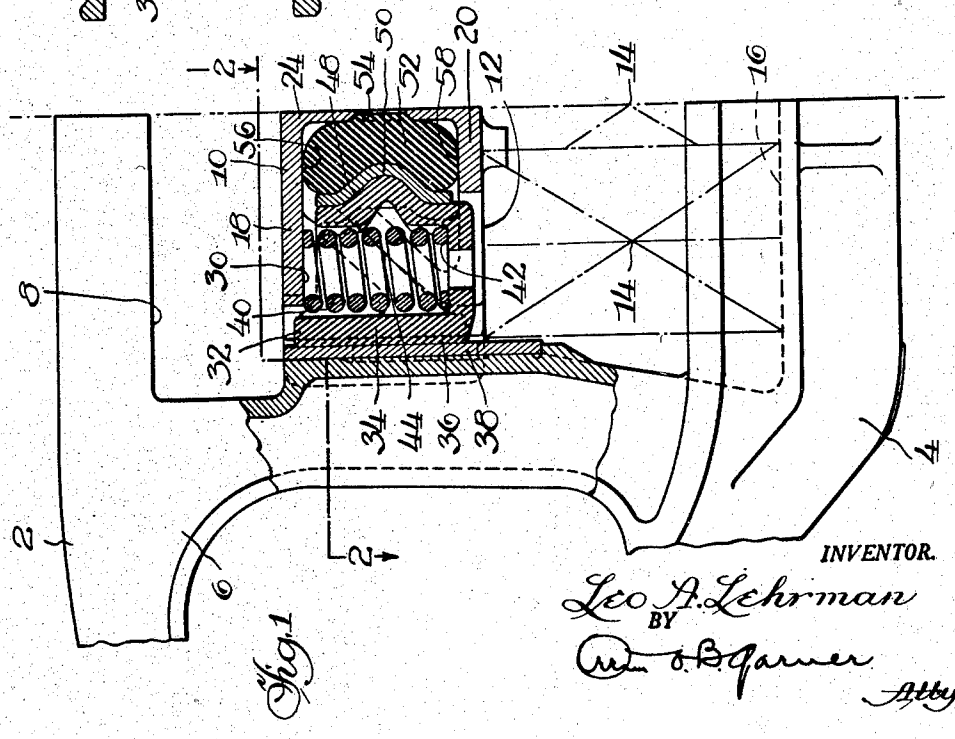


Fig. 1

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SNUBBED TRUCK

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29 Claims. (Cl. 105—197)

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My invention relates to a well known type of railway car truck having quick wheel change and snubbed features such as described in copending Light application Serial No. 436,731, which has since matured into U. S. Patent No. 2,378,414, granted June 15, 1945.

The general object of my invention is to devise such a railway car truck wherein suitable control means will be associated with the friction shoes to insure substantially constant frictional bearing of the shoes against the side frame columns throughout the life of the shoe and within the range of wear permitted on the friction parts.

A more specific object of my invention is to devise a railway car truck such as that described wherein friction shoes may be mounted at each side of each bolster end, each shoe being in wedge engagement with a bolster wall and in frictional engagement with the side frame column and wherein resilient means may be so associated with friction shoes as to insure simultaneous and sufficient bearing against the column and the bolster wedge surfaces.

In one modification I have illustrated a plurality of resilient means associated with each shoe for accomplishing this purpose and in another modification I have illustrated certain resilient means associated with both shoes and other resilient means independently associated with each shoe.

In the drawings, Figure 1 is a fragmentary side elevation of a railway car truck embodying my invention, the view being shown partly in section in order more clearly to illustrate the arrangement of the friction parts, said sectional view being taken approximately in the longitudinal vertical plane bisecting the side frame as indicated by the line 1—1 of Figure 2.

Figure 2 is a fragmentary top plan view of the car truck shown in Figure 1, partly in section, the view being taken approximately in the planes indicated by the line 2—2 of Figure 1.

Figure 3 is a fragmentary sectional view through the bolster in the same plane as the sectional view of Figure 1, showing the manner of mounting therein one of the resilient means and its associated spring plate.

Figure 4 is a further fragmentary sectional view comparable to that shown in Figure 1, illustrating a modified form of my invention.

In each of the views only one half of the bolster and side frame structures are shown inasmuch as the arrangement is similar at opposite ends and opposite sides of the truck.

Referring first to the modification illustrated

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in Figures 1 to 3, the side frame is of well known truss type having the compression member 2, the tension member 4, and the column 6, the bolster opening 8, the bolster 10 spring-supported as at 12 from resilient means diagrammatically indicated at 14, 14, said resilient means being positioned as at 16 on the spring seat portion of the tension member in well known manner.

The end portion of the bolster 10 may be of box section having a top wall 18, a bottom wall 20, a side wall 22, a center rib 24, and the spaced transverse webs 26 and 28 (Figure 2) defining with said top and bottom walls a friction shoe pocket 30 at each side of the bolster end, the adjacent side wall being cored away intermediate the webs 26 and 28. The bolster 10 may have the usual inboard and outboard column guides 31 and 33. Within each pocket 30 may be mounted a friction shoe 32, a cuplike structure of generally rectangular form having the vertical friction wall 34 bearing as at 36 against the wear plate 38 conveniently mounted on the intermediate guide portion of the adjacent column 6. Within each friction shoe 32 may be housed an auxiliary spring 40, the lower end of said spring being seated as at 42 on the bottom wall of said shoe and the upper end thereof bearing against the bolster top wall 18 at the top of the pocket 30. The friction shoe 32 is formed in well known manner with a lateral portion or wing at each side thereof, the lower surface of each wing being diagonally formed to afford a bearing as at 44 against the adjacent ledge 46 formed as an integral part of each of the transverse webs 26 and 28. Each ledge 46 is slightly crowned, as well appears in Figure 3, in order to permit some rocking action of the shoe as it seats on the spaced ledges, such rocking action being necessary in order to accommodate some tilting movement of the bolster with respect to the side frame while permitting the friction wall 34 to have full bearing against the adjacent column. The rear wall of the friction shoe 34 projects between the spaced ledges 46, 46 and may bear as at 48 against the central portion of the spring plate or spring seat 50, said spring seat extending longitudinally of the bolster, as clearly shown in the top plan view of Figure 2, in order to afford bearing for the full length of the resilient pad 52, one face of which may be vulcanized thereto. The opposite face of the rubber block or resilient pad 52 may bear against the center rib 24 and vertical expansion of said member 52 may be restricted by its bearing against the top and bottom walls of the bolster, as well seen in Figure 1. A portion of the center rib 24

may be cored away to form therein a longitudinal slot 54 (Figure 2) to accommodate flow of the member 52 under compression.

The configuration of the resilient member 52 and its position within the bolster prior to assembly of the friction shoe in the pocket is well shown in the fragmentary view of Figure 3. It will be seen that some clearance is afforded above and below the distortable block or pad 52, and likewise, the slot 54 affords additional space for such distortion and in such direction that the blocks at opposite sides of the truck might bear against each other under conditions of maximum distortion or flow of the resilient material. This member 52 will be subject to a certain amount of compression as soon as the friction shoe is mounted in the bolster end and assembled into operative position in abutment with the adjacent side frame column. The amount of compression of the member 52 will vary as the bolster moves laterally between the side frame columns and as wear of the friction face of the shoe takes place against the friction face of the column.

In this arrangement, the spring 40 is under such compression as to maintain the friction shoe 32 at all times seated against the spaced ledges 46, 46, urging the shoe downwardly into wedge engagement therewith and maintaining the friction wall 34 in engagement with the adjacent column. At the same time the resilient pad 52 is afforded such characteristics as will constantly urge the friction shoe outwardly and maintain it in a substantially vertical position regardless of such tilting action of the bolster as may be permitted within the existing tolerances under service conditions. The pad 52 is so formed as to afford bearing against substantially the full vertical height of the friction shoe at the back thereof, as well illustrated in Figure 1, and the upper and lower edges of the member 52 are brought into such bearing with the top and bottom walls of the bolster as at 56 and 58. It will be noted that the shoe is maintained in a central position between the walls 26 and 28 of the pocket by the pad 52 being placed in shear to yieldably resist lateral and vertical movement of the shoe in the bolster.

In the modification illustrated in Figure 4 the side frame and bolster and friction shoe structure is substantially the same as that of the modification previously described except for the configuration of the rear wall of the friction shoe. In the modification of Figure 4 the side frame column 102 is afforded a wear plate 104 against which may seat as at 106 the friction wall 108 of the shoe generally designated 110, said shoe having the general form of the previous modification with each lateral wing portion bearing as at 112 against the bolster ledge 114. As in the previous modification, the friction shoe houses a compression spring 116, the lower end of which may seat as at 118 against the bottom wall of the friction shoe and the upper end as at 120 against the top wall 122 of the bolster generally designated 124.

The form of the friction shoe 110 differs from that of the previous modification in that the back wall has on the outer face thereof the round lug 126 affording positioning means for the compression spring 128 which may bear as at 130 against the rear wall of the friction shoe. Said spring 128 may extend through an opening cored in the bolster center rib 132 and the opposite end thereof may bear as at 134 against the friction shoe 136, similarly mounted at the opposite side of the bolster.

In the modification of Figure 4, it will be apparent that the friction shoes are urged laterally of the bolster by the compression spring 128 compressed therebetween and extending laterally of the bolster, said spring 128 performing as a single unit the function performed by the two resilient members 52, 52 in the modification previously described. In the modification of Figure 4, the compression spring 128 will be under such compression and have such a capacity as will be sufficient to prevent the friction shoe from tilting away from the friction surface on the side frame column when relative movement of the bolster with respect to the side frame might tend otherwise to tilt said shoes. The spring 128 is afforded such diameter as to permit it to bear adjacent the upper and lower edges of each friction shoe, as well illustrated. At the same time, the compression spring 116 will be of such capacity as to maintain the wing portions of each friction shoe in engagement with the ledges 114, 114 at each side thereof, thus preventing vertical play between the bolster and the friction shoes housed therein.

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 side frame having spaced columns, a bolster supported on said frame with pockets adjacent said columns, a wedge surface in each pocket, a friction shoe bearing on said surface and against the adjacent column, resilient means within each shoe compressed between a wall thereof and a spaced wall of said bolster for urging said shoe along said wedge surface and against the adjacent column, and resilient means interposed between the shoes in respective pockets and operative to oppose movement of said shoes toward each other, said last-mentioned resilient means comprising distortable blocks, each block bearing against a plurality of angularly arranged walls of said bolster, and an opening in one of said bolster walls through which said distortable blocks may flow against each other.

2. In a railway car truck, a side frame having spaced columns defining in part a bolster opening, a bolster resiliently supported on said frame between said columns, a pocket in each side of said bolster comprising spaced ledges with wedge faces, a friction shoe in each pocket intermediate said ledges with means bearing on said faces, said shoe having a wall engaging a friction surface on the adjacent column, and a plurality of resilient means associated with each shoe, one of said resilient means being interposed between a wall of said shoe and a spaced wall of said bolster and the other of said resilient means being interposed between another wall of said shoe and a wall of said bolster approximately at right angles to said first-mentioned bolster wall.

3. In a railway car truck, a side frame having spaced columns defining in part a bolster opening, a bolster supported on said frame between said columns, a pocket in each side of said bolster comprising spaced ledges with wedge faces, a friction shoe in each pocket with means bearing on said faces, said shoe having a wall engaging a friction surface on the adjacent column, and a plurality of resilient means associated with each shoe, one of said resilient means being interposed between spaced horizontal walls of said shoe and

said bolster and the other of said resilient means being interposed between spaced vertical walls of said shoe and said bolster.

4. In a railway car truck, a side frame having spaced columns defining in part a bolster opening, a bolster supported on said frame between said columns, a pocket in each side of said bolster comprising spaced ledges with wedge faces, a friction shoe in each pocket intermediate said ledges with means bearing on said faces, said shoe having a wall engaging a friction surface on the adjacent column, and a plurality of resilient means associated with each shoe, one of said resilient means being housed within said shoe and compressed between a wall of said shoe and a spaced wall of said bolster and the other of said resilient means being compressed between another wall of said shoe and another wall of said bolster.

5. In a railway car truck, a side frame having spaced columns, a bolster supported on said frame with pockets adjacent said columns, a wedge surface in each pocket, a friction shoe bearing on said surface and against the adjacent column, resilient means within each shoe compressed between a wall thereof and a spaced wall of said bolster for urging said shoe along said wedge surface and against the adjacent column, and resilient means interposed between the shoes in respective pockets and operative to oppose movement of said shoes toward each other, said last-mentioned resilient means comprising a block of distortable material having resilient bearing against angularly arranged walls of said bolster.

6. In a railway car truck, a side frame having spaced columns, a bolster supported on said frame with pockets adjacent said columns, a wedge surface in each pocket, a friction shoe bearing on said surface and against the adjacent column, resilient means within each shoe compressed between a wall thereof and a spaced wall of said bolster for urging said shoe along said wedge surface and against the adjacent column, and resilient means interposed between the shoes in respective pockets and operative to oppose movement of said shoes toward each other, said last-mentioned resilient means comprising distortable blocks, each block bearing against a plurality of angularly arranged walls of said bolster.

7. In a railway car truck, a side frame having spaced columns, a bolster supported between said columns with pockets adjacent thereto, a pair of wedge surfaces in each pocket, a friction shoe seated on each pair of wedge surfaces and engaging respective columns, resilient means associated with said shoes, certain of said resilient means bearing against respective shoes for urging them against said wedge surfaces and other of said resilient means being interposed between respective shoes and an intermediate wall of said bolster, and an opening in said wall through which said last-mentioned resilient means may flow to bear against each other.

8. In a railway car truck, a side frame having spaced columns defining in part a bolster opening, a bolster resiliently supported on said frame between said columns, a pocket in each side of said bolster comprising spaced ledges with coplanar wedge faces, a friction shoe in each pocket intermediate said ledges with means bearing on said faces, said shoe having a wall engaging a friction surface on the adjacent column, and a plurality of resilient means associated with each shoe and reacting against angularly arranged walls of said bolster, said resilient means being of different character and being operative respectively to urge said shoe downwardly and laterally of said bolster.

9. In a railway car truck, a side frame having spaced columns defining in part a bolster opening, a bolster resiliently supported on said frame between said columns, a pocket in each side of said bolster comprising spaced ledges with coplanar wedge faces, a friction shoe in each pocket with means bearing on said faces, said shoe having a wall engaging a friction surface on the adjacent column, and a plurality of resilient means associated with each shoe and reacting against angularly arranged walls of said bolster, one of said resilient means urging said shoe into wedge engagement with said faces and surface and the other of said resilient means urging said shoe into engagement with said surface.

10. In a railway car truck, a side frame having spaced columns defining in part a bolster opening, a bolster supported on said frame between said columns, a pocket in each side of said bolster comprising spaced ledges with coplanar wedge faces, a friction shoe in each pocket intermediate said ledges with means bearing on said faces and having a wall engaging a friction surface on the adjacent column, and a plurality of resilient means abutting each shoe and reacting against angularly arranged walls of said bolster, one of said resilient means urging said shoe downwardly and the other of said resilient means urging it outwardly of said bolster.

11. In a railway car truck, a side frame having spaced columns, a bolster supported from said frame and having pockets adjacent said columns, friction shoes in said pockets in wedge engagement between bolster surfaces and said columns, and a plurality of resilient means associated with said shoes, one of said resilient means bearing against both of said shoes to urge them in opposite directions in a given plane and other of said resilient means being independently associated with each shoe and reactive against an adjacent bolster wall to urge said shoe in a direction angularly related to said plane.

12. In a railway car truck, a side frame having spaced columns, a bolster spring-supported on said frame with pockets adjacent respective columns, friction shoes in said pockets in wedge engagement with bolster walls in respective pockets and with said columns, and resilient means associated with said shoes, certain of said resilient means being compressed therebetween and other of said resilient means being independently associated with respective shoes to urge them into said wedge engagement, said last-mentioned resilient means being housed in respective shoes, and reacting against a horizontal bolster wall.

13. In a railway car truck, a side frame having a column member with a friction surface, a bolster spring-supported from said frame with a pocket adjacent said surface, spaced ledges in said pocket, a friction shoe in wedge engagement with said ledges and having a friction wall bearing against said surface, and a plurality of resilient means associated with said shoe and oriented in different directions and respectively compressed between said shoe and angularly arranged walls of said bolster, one of said resilient means being housed in said shoe.

14. In a railway car truck, a side frame having a column with a friction surface, a bolster spring-supported from said frame and having a pocket adjacent said surface, spaced ledges in said pocket having diagonally arranged crowned faces, a friction shoe within said pocket and hav-

ing means in wedge engagement with said faces and a wall engaging said surface, and a plurality of resilient means associated with said shoe and reacting against angularly arranged walls of said bolster, one of said resilient means urging said shoe against said faces and the other of said resilient means urging said shoe against said surface.

15. In a railway car truck, a side frame having spaced columns, a bolster supported from said frame with pockets adjacent said columns, friction shoes in said pockets in wedge engagement between bolster surfaces and said columns, and a plurality of resilient means associated with said shoes, certain of said resilient means being independently associated with respective shoes to urge them in a vertical direction and other of said resilient means being operative to urge said shoes in a horizontal direction.

16. In a railway car truck, a side frame having spaced columns, a bolster supported from said frame with pockets adjacent said columns, friction shoes in said pockets in wedge engagement between bolster surfaces and said columns, and a plurality of resilient means associated with said shoes, certain of said resilient means reacting against angularly arranged walls of said bolster and being compressible by said shoes to engage each other and other of said resilient means being housed in respective shoes and reacting against a common bolster wall.

17. In a railway car truck, a side frame having spaced columns, a bolster spring-supported on said frame with pockets adjacent respective columns, friction shoes in said pockets in wedge engagement with bolster walls thereof and with said columns, and resilient means associated with said shoes, certain of said resilient means being positioned intermediate said shoes and compressible thereby to abut each other and other of said resilient means being independently associated with respective shoes to urge them into engagement with said first-mentioned bolster walls and with said columns, certain of said resilient means reacting against a horizontal wall of said bolster and other of said resilient means reacting against a vertical wall and a horizontal wall thereof.

18. In a railway car truck, a side frame having spaced columns, a bolster supported between said columns with pockets thereadjacent, a pair of wedge surfaces in each pocket, a friction shoe seated on each pair of wedge surfaces in engagement with the adjacent column, and resilient means associated with said shoes, certain of said resilient means being positioned intermediate said shoes and compressible thereby to engage each other under certain operating conditions and other of said resilient means being associated with respective shoes and operative to urge said shoes along said wedge surfaces, said certain resilient means reacting against angularly arranged walls of said bolster and said other resilient means reacting against one of said walls.

19. In a railway car truck, a side frame having spaced columns, a bolster supported between said columns with pockets adjacent thereto, a pair of wedge surfaces in each pocket, a friction shoe seated on each pair of wedge surfaces, and resilient means associated with said shoes, certain of said resilient means reacting against angularly arranged walls of said bolster and being interposed between said shoes for urging them outwardly against said columns and other of said resilient means reacting against one of said bolster walls and being associated with respective shoes for urging them along said surfaces.

20. In a railway car truck, a side frame having a column member with a friction surface, a bolster supported from said frame with a pocket adjacent said surface, spaced diagonal ledges in said pocket, a friction shoe in engagement with said ledges and having a friction wall bearing against said surface, and a plurality of resilient means associated with said shoe and oriented in different directions and respectively compressed between said shoe and angularly arranged walls of said bolster.

21. In a railway car truck, a side frame having spaced columns, a bolster supported from said frame with pockets adjacent said columns, friction shoes in said pockets in wedge engagement between bolster surfaces and said columns, and a plurality of resilient means associated with said shoes, certain of said resilient means being independently associated with respective shoes to urge them in a vertical direction and other of said resilient means being operative to urge said shoes in a horizontal direction, said last-mentioned resilient means being positioned intermediate said shoes and reacting against each other under conditions of maximum compression.

22. In a railway car truck, a side frame having spaced columns, a bolster spring-supported on said frame with pockets adjacent said columns, friction shoes in said pockets in wedge engagement with bolster walls in respective pockets and with said columns, and resilient means associated with said shoes, certain of said resilient means being positioned intermediate said shoes and under certain operating conditions compressible thereby to engage each other and other of said resilient means being independently associated with respective shoes to urge them into said wedge engagement.

23. In a railway car truck, a side frame having spaced columns, a bolster spring-supported on said frame with pockets adjacent said columns, friction shoes in said pockets in wedge engagement with bolster walls in respective pockets and with said columns, and resilient means associated with said shoes, certain of said resilient means being positioned intermediate said shoes and under certain operating conditions compressible thereby to engage each other and other of said resilient means being independently associated with respective shoes to urge them into said wedge engagement, said last-mentioned resilient means being housed in respective shoes and reacting against adjacent bolster walls.

24. In a railway car truck, a side frame, a bolster spring-supported therefrom, and friction means comprising a shoe wedged between the bolster and a friction surface on the frame extending transversely thereof, and actuating means for said shoe comprising two independent springs compressed between the bolster and the shoe and acting thereon in angularly related lines of force.

25. In a railway car truck, a side frame comprising spaced columns, a bolster supported from said frame between said columns, a pocket in said bolster adjacent each column, wedge surfaces in each pocket, a friction shoe in each pocket in engagement with said surfaces and engaging the adjacent column, a resilient member compressed between said shoe and a spaced wall of said bolster urging said shoe along said surfaces, a resilient pad compressed between a portion of said shoe extending between said surfaces and another wall of said bolster and urging said shoe outwardly of

said pocket, and a plate interposed between said pad and said shoe portion and secured to said pad, said plate and said shoe portion having engagement along surfaces formed and arranged to place said pad in shear to yieldingly resist vertical and lateral movement of said shoe in said pocket.

26. In a railway car truck, a side frame comprising spaced columns defining a bolster opening, a bolster spring-supported from said frame in said opening between said columns, and friction means comprising pockets in opposite sides of said bolster, friction shoes in respective pockets and wedged between said bolster and respective columns, resilient means carried by the bolster for urging said shoes to the wedged positions thereof, and horizontal resilient means independent of the first-mentioned resilient means and housed within the bolster and compressed against said shoes for urging the latter against respective columns.

27. In a railway car truck, a side frame comprising a column, a bolster spring-supported from said frame, a friction shoe in wedge engagement with wedge means on the bolster and in frictional engagement with the column along a surface extending transversely of said frame, spring means compressed between the bolster and the shoe for urging the latter into said wedge engagement, and horizontal spring means independent of the first-mentioned spring means and compressed between the bolster and the shoe for urging the latter against said column independently of said wedge means.

28. In a railway car truck, a side frame, a bolster spring-supported therefrom, a friction shoe in wedge engagement with the bolster and in frictional engagement with the frame along a surface extending transversely thereof, and actuating means for said shoe comprising two independent springs compressed thereagainst and against the bolster, one of said springs acting horizontally on said shoe and the other acting vertically thereon.

29. In a railway car truck, a side frame comprising spaced columns, a bolster spring-supported from said frame between said columns, and friction means comprising pockets in opposite sides of said bolster, friction shoes in respective pockets wedged between said bolster and respective columns, resilient means carried by the bolster and urging said shoes to the wedged positions thereof, and horizontally acting spring means independent of said resilient means and housed within the bolster for urging each shoe against the adjacent column.

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