June 22, 1948. L. A. LEHRMAN 2,444,011

RIDE CONTROL TRUCK

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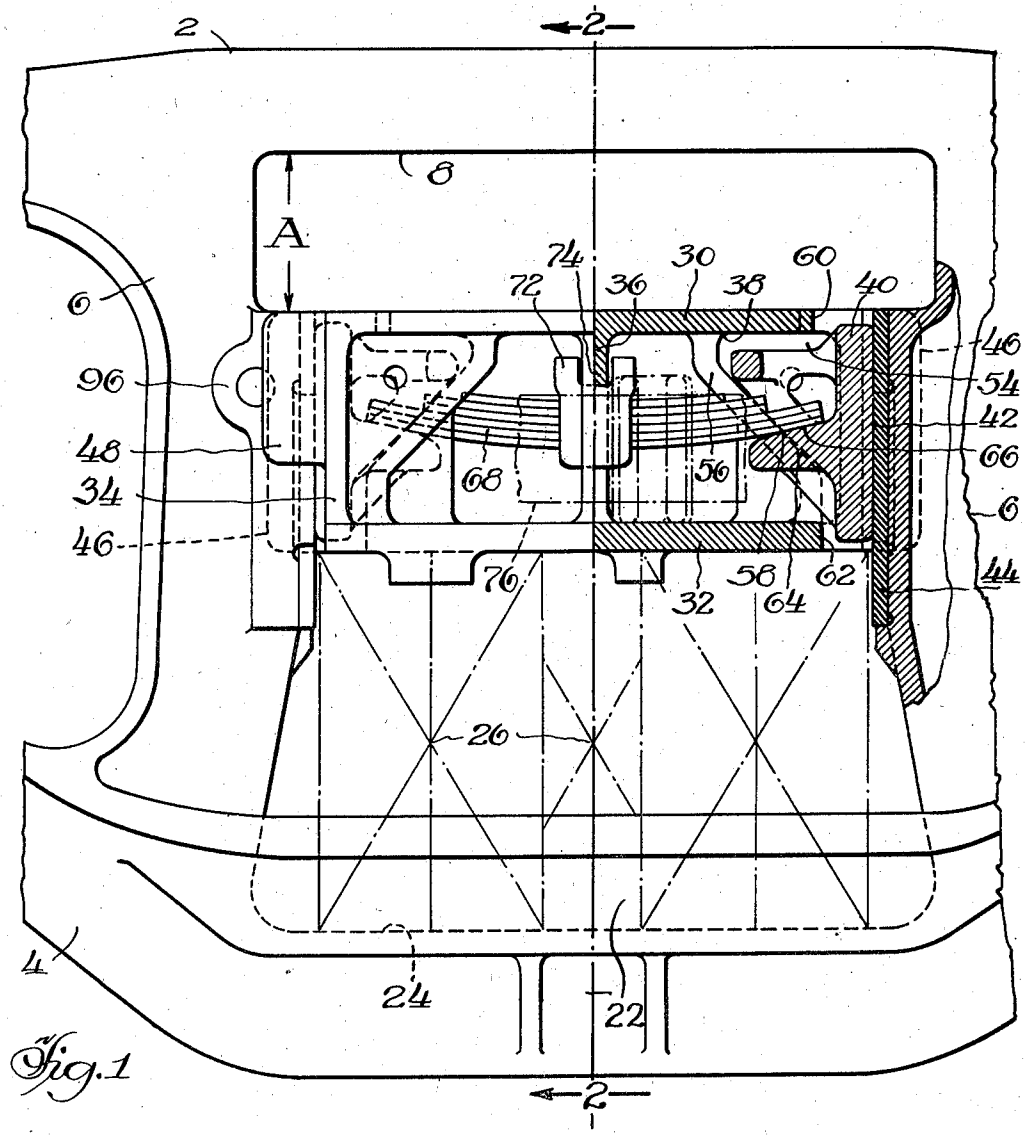


Fig. 1

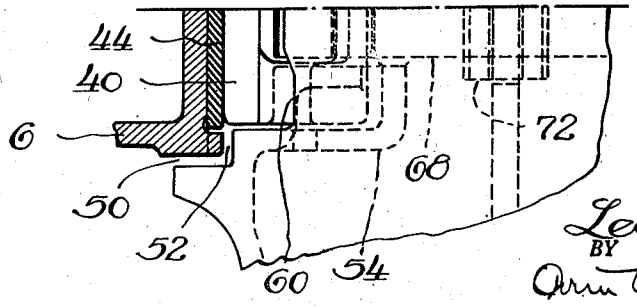


Fig. 3

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Fig. 2

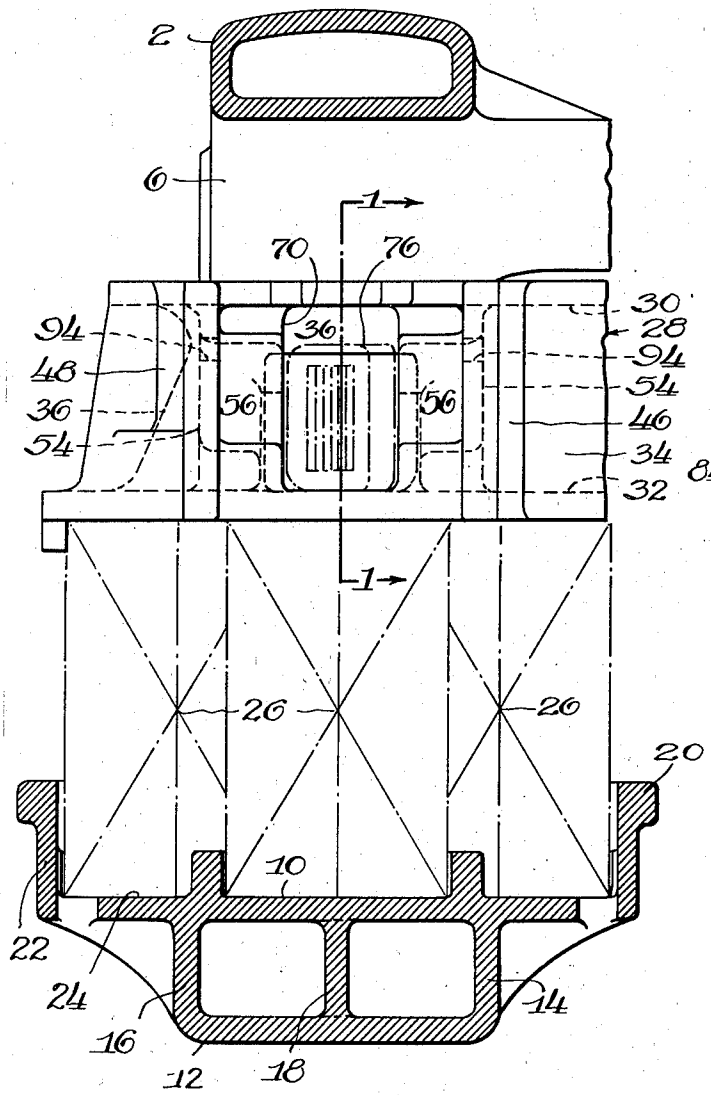


Fig. 4

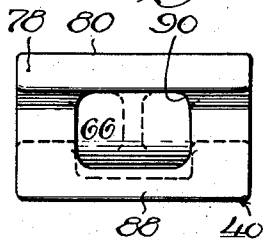


Fig. 5

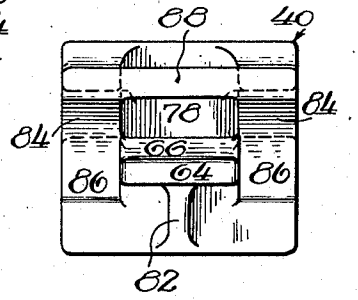
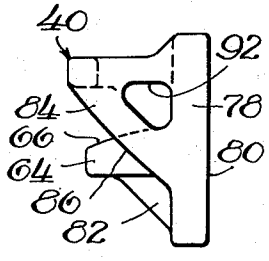


Fig. 6



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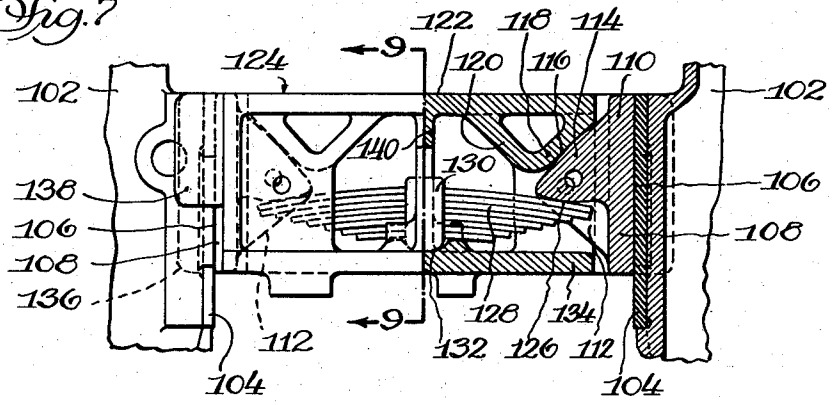
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Fig. 7



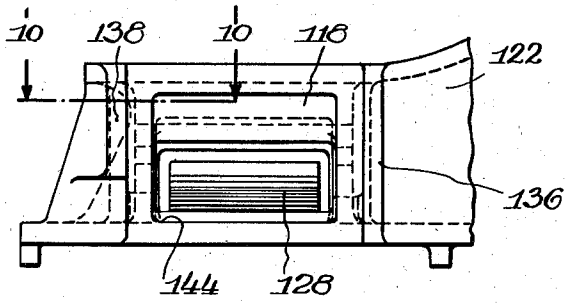
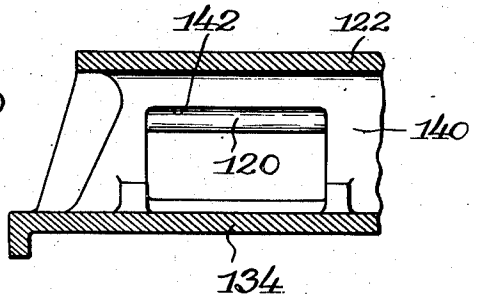


Fig. 8

Fig. 9



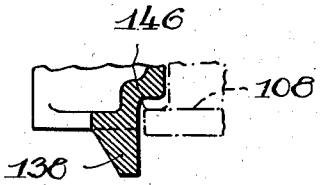


Fig. 10

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2,444,011

RIDE CONTROL TRUCK

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Application December 4, 1944, Serial No. 566,484

24 Claims. (Cl. 105—197)

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My invention relates to a railway car truck and more particularly to a four wheel freight car truck utilizing side frames and bolsters of more or less conventional type, and more particularly such a truck wherein snubbing means are mounted as a unit in each end of the bolster for frictional engagement with the side frame columns.

A specific object of my invention is to devise a quick wheel change snubbing truck having a side frame with spaced columns affording friction surfaces along which may engage friction shoes so supported in the bolster end as to be actuated by a single resilient means; said shoes and resilient means also being so mounted in the bolster end as to permit the bolster assembly, including said shoes and resilient means, to be handled as a unitary assembly. By such an arrangement it is possible to dismantle the side frame from the bolster end whenever it may be desirable for wheel change purposes without removing from the bolster end the friction shoes or the actuating means associated with said shoes.

A more specific object of my invention is to devise such a car truck as that described wherein friction means may be mounted in each end of the bolster in the form of a pair of friction shoes at each side of the bolster end with each shoe having diagonal face engagement along a wall of said bolster, and both of said shoes being actuated by a single resilient means mounted in said bolster end.

In one modification I have illustrated the friction shoes as being urged downwardly against a diagonal wall of the bolster, and in another modification I have illustrated the friction shoes being urged upwardly into diagonal walls of the bolster. In both modifications, the single resilient means consists of an elliptic spring, the center band of which is afforded a seat along the longitudinal center line of the bolster, in one case said seat being adjacent the bottom wall of said bolster, and in another case, in a plane intermediate the top and bottom walls.

Still another object of my invention is to devise a novel form of friction shoe particularly suitable for application to my novel form of car truck and of a form conveniently adapted to good foundry practice.

My invention also comprehends a certain novel bolster end structure which will be more particularly set forth hereafter.

In the drawings,

Figure 1 is a fragmentary side elevation, partly in section, illustrating one modification of my in-

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vention, the sectional view being taken approximately in the longitudinal vertical plane indicated by the line 1—1 of Figure 2.

Figure 2 is a fragmentary sectional view through the truck structure shown in Figure 1, the section being taken in the vertical plane approximately bisecting the truck transversely as indicated by the line 2—2 of Figure 1 with the bolster shown in side elevation.

Figure 3 is a fragmentary sectional view taken in a horizontal plane through the columns just over the bolster, the bolster and friction shoe being shown in top plan.

Figures 4, 5 and 6 illustrate one modification of my novel friction shoe, Figure 4 being a top plan view thereof, Figure 5 an elevation view of the bolster engaging face, and Figure 6 a side elevation thereof.

Figure 7 is a fragmentary view of another modification of my invention, the view being comparable to that shown in Figure 1, and the right half of the view being in section along a plane like that of Figure 1.

Figure 8 is a fragmentary side elevation of the bolster end assembly of the modification illustrated in Figure 7.

Figure 9 is a fragmentary sectional view through the bolster illustrated in Figures 7 and 8, the section being taken approximately in the longitudinal vertical plane bisecting the bolster as indicated by the line 9—9 of Figure 7.

Figure 10 is a further fragmentary view of the truck structure illustrated in Figures 7, 8 and 9 illustrating the relationship of the friction shoe to the bolster end, the section through the bolster being taken approximately in the horizontal plane indicated by the line 10—10 of Figure 8.

Referring in detail first to the modification illustrated in Figures 1–3, the cast steel side frame may be of well known form having the compression member 2, the tension member 4, spaced guide columns 6, 6 forming with said tension and compression members the bolster opening 8, said bolster opening having a relatively wide top portion having a depth indicated at A (Figure 1) somewhat greater than the depth of the outboard bolster guide lug in order to permit quick wheel change.

The tension member below the bolster opening 8 may be of well known form having a box section with the top web 10, the bottom web 12, the inboard wall 14, and the outboard wall 16, and the vertical central rib 18, said top web 10 being widened and formed with upstanding inboard and outboard flanges 20 and 22 defining

with said top chord 10 the spring seat 24 on which may be positioned a spring group of conventional form, the coils of which are diagrammatically indicated at 26, 26.

Upon the springs 26, 26 may be positioned the bolster end generally designated 28, said bolster end being of box-like form with the top wall 30, the bottom wall 32, side walls 34, 34, and a vertical longitudinal central rib 36.

At each side of the bolster end may be formed a pocket 38 for reception of a friction shoe 40 of the form and detail illustrated in Figures 4, 5 and 6, said friction shoe having a plane vertical face in frictional engagement as at 42 along the wear plate 44 fixed in any convenient manner on the face of the adjacent column 6 along the guide surface provided centrally thereof.

The bolster 28 is formed with inboard column guide lugs 46 and outboard lugs 48, said outboard lugs having a depth somewhat less than that indicated at A (Figure 1), as already indicated, said lugs also being afforded some clearance from the lateral edges of the guide columns as seen at 50 (Figure 3), and the bolster also being afforded a similar clearance as at 52 from the guide columns, said clearances affording such freedom of movement for the bolster between said columns as will conveniently accommodate the action of the snubbing parts associated therewith.

The form of the friction shoe pocket at each side of the bolster end is well seen from consideration of the views in Figures 1, 2 and 3. Said pocket 38 may be defined at either side thereof by a vertical L-shaped web 54, well seen in the plan view of Figure 3, each of said webs 54 merging with a diagonal web 56 at each side of said pocket (Figure 2), the upper surface of each diagonal web 56 affording an area along which the adjacent friction shoe may seat as at 58 (Figure 1) and have such slight sliding movement as will accommodate lateral movements of the bolster end between the side frame columns, as well as wear of the friction faces of the shoes against said columns. Some clearance at the top of each pocket 38 may be afforded in the top wall of the bolster as at 60 and likewise in the bottom wall of the bolster as at 62 (Figure 1) to accommodate vertical movement of the friction shoe 40 with respect to the bolster. Centrally of each friction shoe may be formed a projecting ledge 64, the upper face of which may afford a slidable seat as at 66 for the adjacent end of the semi-elliptic spring 68, said end projecting through the central opening 70 (Figure 2) in each pocket.

The spring 68 may have a central spring band and saddle casting 72, the slot in the upper portion whereof may receive as at 74 a portion of the vertical rib or central web 36 of the bolster, said web thus affording a seat on which said spring may fulcrum.

In Figures 1 and 2 there is illustrated in phantom lines as at 76 the position which may be assumed by the semielliptic spring 68 when being inserted into the bolster prior to the mounting therewithin of the friction shoes. As illustrated, said spring may enter the opening in the bolster end with the spring leaves on edge and moved to the position illustrated in phantom lines in Figure 1, after which the spring may be rotated to its operating position illustrated in full lines in Figure 1.

My novel friction shoe 40 is shown in detail in Figures 4, 5 and 6. It is of generally rectangular form in plan and elevation, the friction wall 78 thereof affording a plane friction surface 80 for engagement with the adjacent side frame column. On the opposite face of the shoe and centrally thereof is the before-mentioned ledge 64 on the upper surface of which may be formed the arcuate seat 66 for the adjacent end of the elliptic spring 68. The ledge 64 may be reinforced centrally thereof by the gusset 82 merging with the rear wall 78. At either side of the central ledge 64 may be formed a sloping web 84 and on the bottom face of each web 84 may be formed an arcuate seat 86 which may bear upon the beforementioned diagonal webs 56, 56 on the bolster at either side of the pocket 38. The webs 84, 84 at either side of the shoe may be joined adjacent the top outer edge thereof by the tie bar 88, thus leaving a rectangular opening 90 cored out of the top of said shoe, as well as an opening between the tie bar 88 and the ledge 64 for reception of the adjacent end of the elliptic spring. Each web 84 of the friction shoe may also be cored out as at 92 centrally thereof, not only to reduce the weight, but also to accommodate a bar or pin which may be inserted therethrough and passed through the aligned openings 94, 94 in the side walls of each bolster pocket, thus affording means of retaining the friction shoes in assembly within the bolster. Said pin means (not shown) may be utilized when the snubbing means is assembled in the end of the bolster preparatory to mounting the bolster in position in the side frames. After the bolster is in position the pins may be removed, permitting the friction shoes to move outwardly into engagement with the adjacent columns. This pin means may also be used when it is desirable to disengage the bolster from the side frame for purposes of wheel change, and I have provided on each column laterally of the normal bolster position a loop 96 which may afford a fulcrum having a pinch bar to urge the bolster laterally of the side frame, thus moving the shoes to a position to accommodate entrance of the pin for locking them in position.

In Figures 7–10 inclusive I have illustrated a modification of my invention wherein each friction shoe is urged upwardly into engagement with the diagonal web of the bolster instead of downwardly into engagement with such a web as in the modification first described. In the modification of Figure 7 the side frame columns are fragmentarily illustrated at 102, 102 with wear plates on their inner faces as at 104, 104 affording friction surfaces as at 106, 106 for engagement of the respective friction shoes 108, 108. Each friction shoe 108 may be generally rectangular in elevation with a friction wall 110 and vertical lateral walls 112, 112 at each side thereof, said walls being of triangular form. The upper diagonal edges of said walls are coplanar with the central ledge 114 of each shoe, said ledge affording an arcuate face as at 116 which may have slidable engagement along the abutting flat face of the adjacent leg 118 of the V-shaped web 120 integrally formed with the top wall 122 of the bolster generally designated 124. On the bottom face of the ledge 114 of each shoe intermediate the lateral walls 112, 112 may be afforded a seat as at 126 for the adjacent end of the semielliptic spring 128, the central band 130 whereof may be afforded a fulcrum as at 132 on the bottom wall 134 of said bolster.

The bolster 124 may have the usual inboard and outboard guide lugs 136 and 138. A longitudinal sectional view through the bolster is shown in Figure 9 wherein it may be noted that

the longitudinal center rib 140 of said bolster is cored away as at 142 to form a rectangular opening for accommodation of the spring 128. Similarly, each side wall of the bolster is cored away adjacent the lower edge thereof as at 144 to form an opening through which the semielliptic spring may be entered, as well as to accommodate the friction shoe therewithin.

The fragmentary sectional view of Figure 10 shows a portion of the friction shoe 138 in top plan view and illustrates the manner in which each projecting vertical lateral edge of said shoe is accommodated at the corner of each column as at 146.

In each of the above modifications I have illustrated a novel arrangement in which a pair of friction shoes may be mounted in each end of a bolster for engagement with respective columns of an adjacent side frame with both shoes of each pair urged into frictional engagement with an adjacent bolster web and side frame column by a single resilient means mounted within the bolster.

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 tension and compression members and spaced columns defining a bolster opening, a spring seat on said tension member, a bolster spring-supported from said seat in said opening, said opening having a relatively wide top portion of restricted depth, and said bolster having outboard guide lugs suitable for accommodation within said restricted depth to afford quick wheel change, said bolster having a box-section end portion with a top chord, a bottom chord, lateral walls, a center rib, and diagonal webs at opposite sides thereof, aligned openings cored through said rib, walls, and webs, friction shoes mounted in said aligned openings of said walls, a resilient member fulcrumed centrally of said bolster in said aligned openings and operative to urge said shoes downwardly into engagement with said webs and laterally into engagement with the adjacent columns at opposite sides of said bolster, the diagonal web at each side of said bolster affording spaced seats for the adjacent friction shoe, and said resilient member bearing against each shoe intermediate said last-mentioned seats.

2. In a railway car truck, a side frame having tension and compression members and spaced columns defining a bolster opening, a spring seat on said tension member, a bolster spring-supported from said seat in said opening, said opening having a relatively wide top portion of restricted depth, and said bolster having outboard guide lugs suitable for accommodation within said restricted depth to afford quick wheel change, said bolster having a box-section end portion with a top chord, a bottom chord, lateral walls, a center rib, and diagonal webs at opposite sides thereof, aligned openings cored through said rib, walls, and webs, friction shoes mounted in said aligned openings of said walls, a resilient member fulcrumed centrally of said bolster in said aligned openings and operative to urge said shoes downwardly into engagement with said webs and laterally into engagement with the adjacent columns at opposite sides of said bolster, the diagonal web at each side of said bolster affording spaced seats for the adjacent friction shoe.

3. In a railway car truck, a side frame having tension and compression members and spaced columns defining a bolster opening, a spring seat on said tension member, a bolster spring-supported from said seat in said opening, said opening having a relatively wide top portion of restricted depth, and said bolster having outboard guide lugs suitable for accommodation within said restricted depth to afford quick wheel change, said bolster having a box-section end portion with a top chord, a bottom chord, lateral walls, a center rib, and diagonal webs at opposite sides thereof, aligned openings cored through said rib, walls, and webs, friction shoes mounted in said aligned openings of said walls, and a resilient member fulcrumed centrally of said bolster in said aligned openings and operative to urge said shoes into engagement with said diagonal webs and said columns at opposite sides of said bolster.

4. In a railway car truck, a side frame having tension and compression members and spaced columns defining a bolster opening, a spring seat on said tension member, a bolster spring-supported from said seat in said opening, said opening having a relatively wide top portion of restricted depth, and said bolster having outboard guide lugs suitable for accommodation within said restricted depth to afford quick wheel change, said bolster having a box-section end portion with a top chord, a bottom chord, lateral walls, a center rib, and diagonal webs at opposite sides thereof, aligned openings cored through said rib, walls, and webs, friction shoes mounted in said aligned openings of said walls, a resilient member fulcrumed centrally of said bolster in said aligned openings and operative to urge said shoes downwardly into engagement with said webs and laterally into engagement with the adjacent columns at opposite sides of said bolster.

5. In a railway car truck, a supporting member having spaced columns defining in part a bolster opening, a member spring-supported in said opening, said supported member having a box-section end portion with a top chord, a bottom chord, lateral walls, a center rib, and diagonal webs, aligned openings cored through said walls, said webs and said rib, a resilient member fulcrumed on said rib in certain of said aligned openings, and friction shoes seated on said diagonal webs in said wall openings, said resilient member bearing on said friction shoes and urging them into frictional engagement with said webs and with the adjacent columns.

6. In a railway car truck, a supporting member having spaced columns defining in part a bolster opening, a member spring-supported in said opening, said supported member having a box-section end portion with a top chord, a bottom chord, lateral walls, a center rib, and diagonal webs, aligned openings cored through said walls, said webs and said rib, a resilient member fulcrumed centrally of said bolster in certain of said aligned openings, and friction shoes seated on said diagonal webs in said wall openings, said resilient member bearing on said friction shoes and urging them into frictional engagement with said webs and with the adjacent columns.

7. In a railway car truck, a supporting member having spaced columns defining in part a bolster opening, a member spring-supported in said opening, said supported member having a box-section end portion with a top chord, a bottom chord, lateral walls, a center rib, and diagonal webs,

aligned openings cored through said walls, said webs and said rib, a resilient member fulcrumed from one of said chords in said aligned openings, and friction shoes seated on said diagonal webs in said wall openings, said resilient member bearing on said friction shoes and urging them into frictional engagement with said webs and with the adjacent columns.

8. In a railway car truck, a side frame having spaced columns defining in part a bolster opening, a bolster spring-supported on said frame in said opening, and friction means mounted in the end of said bolster for engagement with said columns, said friction means comprising friction shoes pocketed in said bolster end in slidable engagement with diagonal webs thereof and with the adjacent columns, and a single resilient member operable to urge both of said shoes into engagement with the adjacent webs and columns, said resilient member comprising a semi-elliptic spring having a center band rockably fulcrumed on a vertical rib of said bolster.

9. In a bolster, a box-section end portion having top and bottom walls, lateral walls, and a vertical center rib, diagonal webs at each side of said bolster end defining with the top wall and side walls thereof a pocket for an associated friction shoe, said diagonal webs, lateral walls, and center rib being cored away to accommodate an associated semielliptic spring, and a fulcrum seat on said rib for said spring, said diagonal webs affording seats at opposite sides of the cored openings therethrough for said associated friction shoes.

10. In a railway car truck, a side frame having spaced columns, a bolster end spring-supported intermediate said columns, said bolster end having lateral walls, diagonal webs, and a center rib, aligned openings cored through said walls, webs and rib, shoes pocketed in said wall openings, and a resilient member fulcrumed centrally of said bolster in said aligned openings and operative to urge said shoes against said webs and against the adjacent columns at respective sides of said bolster.

11. In a bolster, a box-section end portion having top and bottom walls, side walls, and a longitudinal vertical center rib, aligned openings cored in said side walls and center rib for accommodation of an associated semielliptic spring, a seat on one of said walls for said spring, and integrally formed webs depending from said top wall and affording on the remote faces thereof seats for associated friction shoes.

12. In a bolster, a box-section end portion having top and bottom walls, lateral walls, and a vertical center rib, diagonal webs at each side of said bolster end defining with the top wall and side walls thereof a pocket for an associated friction shoe, said diagonal webs, lateral walls, and center rib being cored away to accommodate an associated semielliptic spring, and a fulcrum seat on said rib for said spring.

13. A friction shoe of generally rectangular form having a vertical wall affording a plane friction face, a ledge projecting from the opposite face of said shoe centrally of said wall and affording a seat for an associated resilient means, triangular walls at opposide sides of said ledge affording on the bottom faces thereof diagonally arranged seats for said shoe, and tie means between said triangular walls remote from said friction face, said ledge having a crowned top surface.

14. In a bolster, a box-section end portion having top and bottom walls, side walls, and a longitudinal vertical center rib, aligned openings cored in said side walls and center rib for accommodation of an associated semielliptic spring, a seat on one of said walls for said spring, and V-shaped webs depending from said top wall and affording seats for associated friction shoes.

15. A friction shoe of generally rectangular form having a vertical wall affording a plane friction face, a centrally positioned ledge projecting from the opposite face of said shoe and affording a seat for an associated resilient means, a vertical rib integral with said ledge and wall for reinforcement thereof, and triangular walls at opposite sides of said ledge affording on the bottom faces thereof diagonally arranged seats for said shoe, said ledge projecting beyond said triangular walls.

16. A friction shoe comprising a rectangular vertical wall affording a friction face, a central ledge projecting from the opposite face of said wall and affording a diagonally arranged seat for an associated resilient member, and reversely diagonally arranged webs at opposite sides of said ledge affording spaced seats for said shoe, certain of said seats being of arcuate form, said ledge projecting beyond said webs.

17. A friction shoe comprising a rectangular wall affording a friction face, a central ledge projecting from the opposite face of said wall and affording an arcuate diagonal seat for an associated resilient member, and reversely diagonally arranged webs at opposite sides of said ledge affording spaced seats for said shoe.

18. In a railway car truck, a supporting member with spaced columns, a member spring-supported between said columns, friction shoes seated on diagonal walls of said supported member, and a single resilient element having a center band in the form of a saddle casting fulcrumed on said supported member, said resilient element bearing upon said shoes to urge them along said walls into engagement with said columns.

19. In a railway car truck, a supporting member having spaced columns, a member supported thereon intermediate said columns with diagonal webs adjacent respective columns, shoes bearing on said webs and against respective columns, and a resilient element having a center band rockably fulcrumed in said supported member, said element having its ends extending through openings in said webs to bear upon said shoes urging them into engagement with respective webs and columns.

20. In a railway car truck, a side frame comprising a friction surface, a bolster resiliently supported by said frame, said bolster comprising a pocket and spaced walls in said pocket defining an opening therebetween, said walls having wedge surfaces sloping toward said friction surface, friction shoe means engaging all of said surfaces, and actuating means for said shoe means comprising a spring housed within the bolster and engaged therewith, said spring extending outwardly through said opening toward said friction surface and bearing directly against said shoe means for urging the same into said engagement with said surfaces.

21. In a railway car truck, a side frame comprising a friction surface, resilient means carried by said frame, a bolster supported by said resilient means, said bolster comprising a pocket and spaced walls within said pocket, said walls defining an opening therebetween and having wedge surfaces sloping toward said friction surface, friction shoe means engaging all of said surfaces, and a spring bearing against said bolster adja-

cent the longitudinal center line thereof, said spring extending toward said friction surface through said opening into said pocket and being engaged with said shoe means for urging the latter into said engagement with said surfaces.

22. In a railway car truck, a side frame comprising a friction surface, a hollow bolster member resiliently supported by said frame and comprising spaced internal walls defining an opening therebetween, said walls comprising wedge faces sloping toward said surface, a friction shoe member engaging both faces and said surface, a downwardly facing spring seat on one of said members, an upwardly facing spring seat on the other member, and a spring flexed between said seats and bearing thereagainst to urge said shoe into said engagement with said faces and said surface, said spring being housed within said bolster and extending outwardly through said opening from the bolster member spring seat toward said friction surface.

23. In a railway car truck, a side frame comprising a column with a friction surface, a hollow bolster resiliently supported by said frame adjacent said column, spaced walls within said bolster comprising wedge faces sloping toward said surface, friction shoe means engaging said faces and said surface, and a flexible member within said bolster bearing thereagainst and extending outwardly between said walls toward said

column, the outer end of said member bearing against said shoe means for actuation thereof.

24. In a railway car truck, a side frame comprising spaced columns, a bolster movably supported between said columns, and a friction device at each side of said bolster comprising a pocket therein, spaced walls integrally formed with said bolster within said pocket, said walls defining an opening therebetween and having wedge faces sloping toward the adjacent column, a friction shoe engaged with said faces and with said adjacent column, and a spring bearing against the bolster and extending through said opening toward said adjacent column and into said pocket, the end of said spring adjacent said column being engaged with said friction shoe for actuation thereof.

LEO A. LEHRMAN.

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