Oct. 31, 1950 J. J. KOWALIK 2,528,473

SNUBBED TRUCK

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Fig. 1.

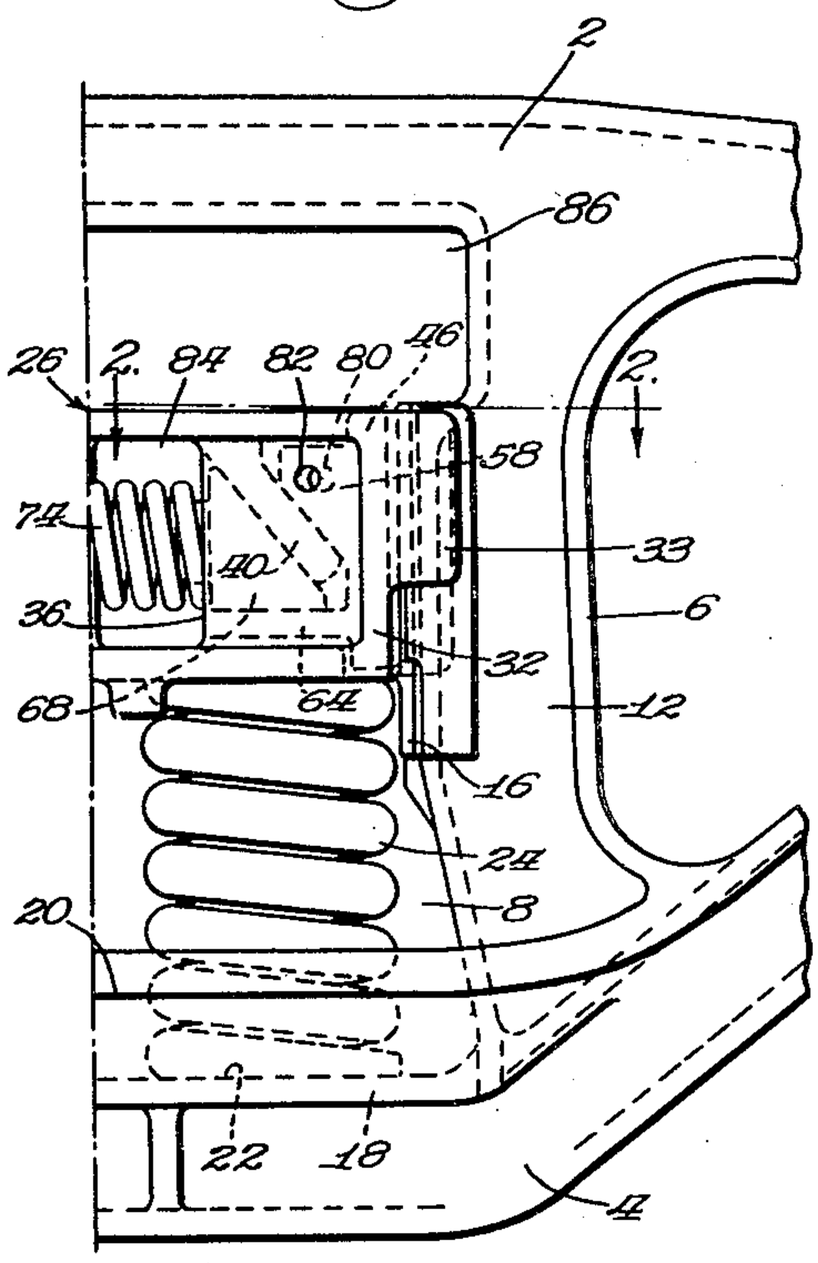
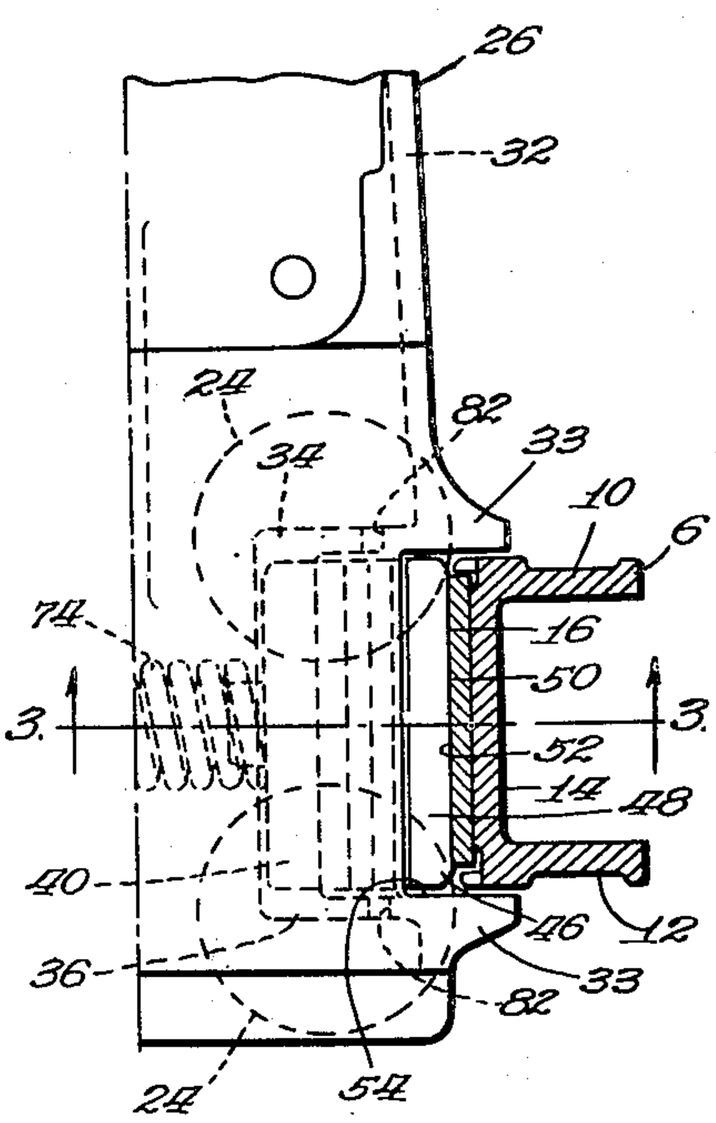


Fig. 2.



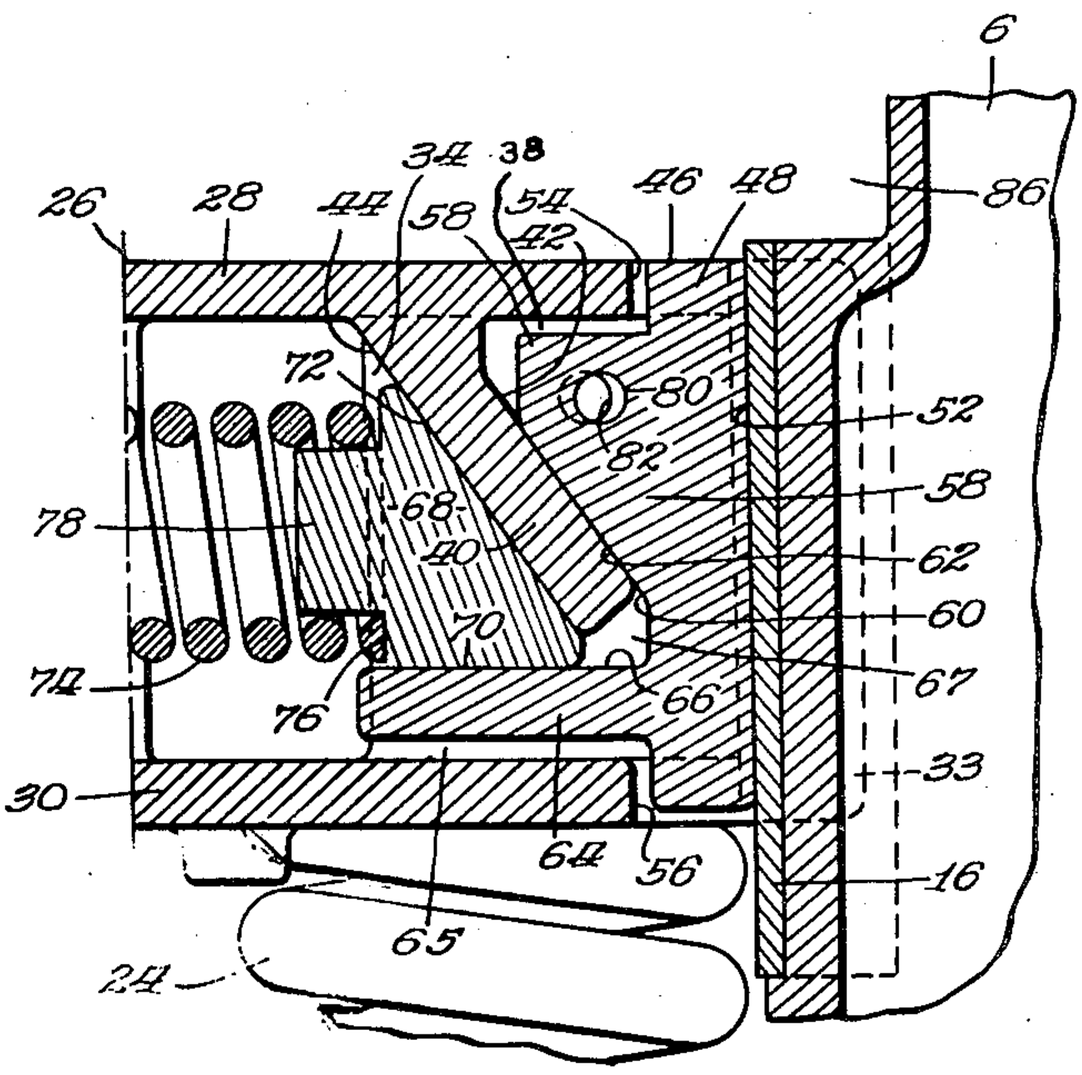


Fig. 3.

INVENTOR.

John J. Kowalik

BY

Wm O.B. Garner Atty.

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Fig. 4.

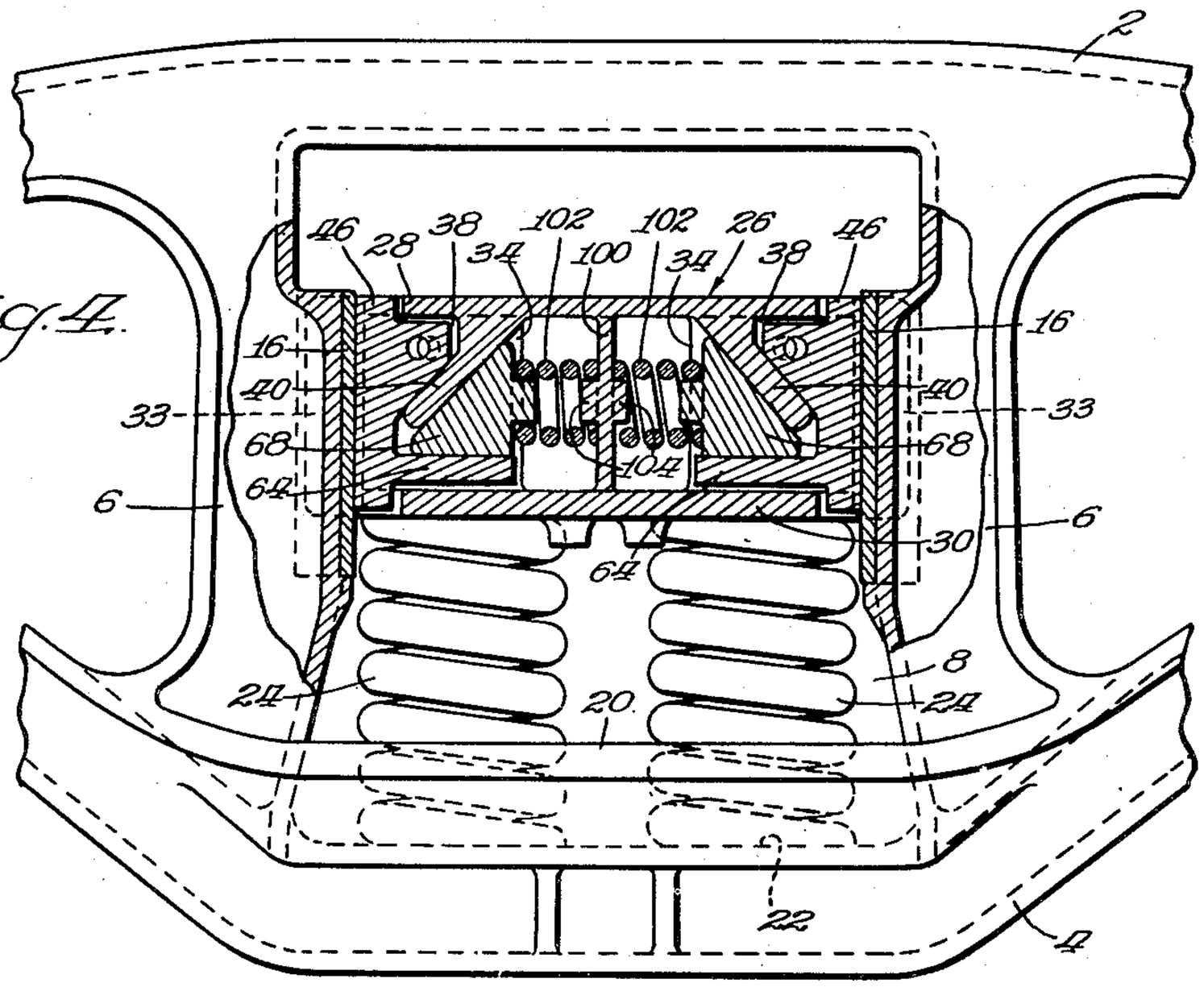


Fig. 5.

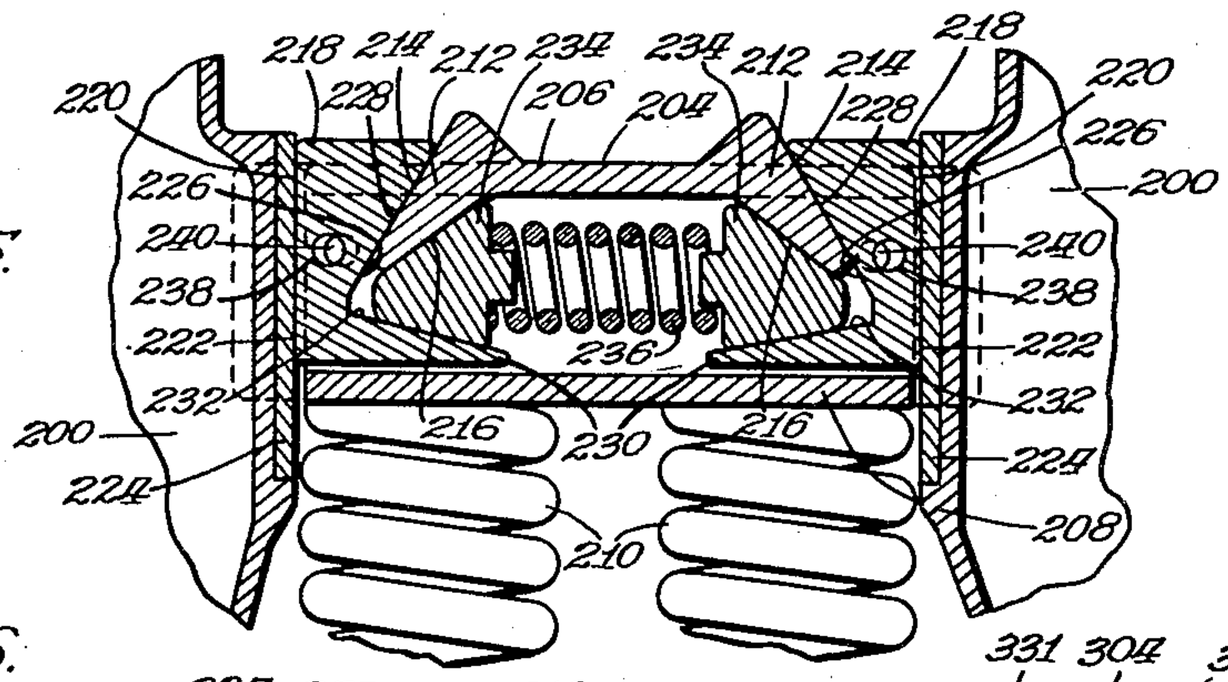
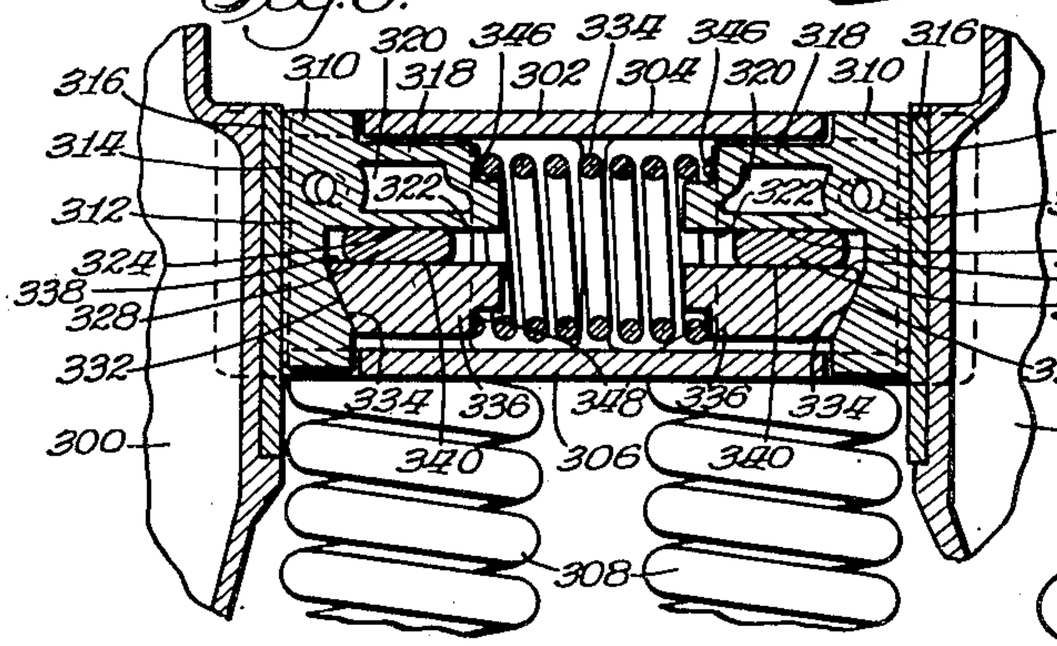


Fig. 6.



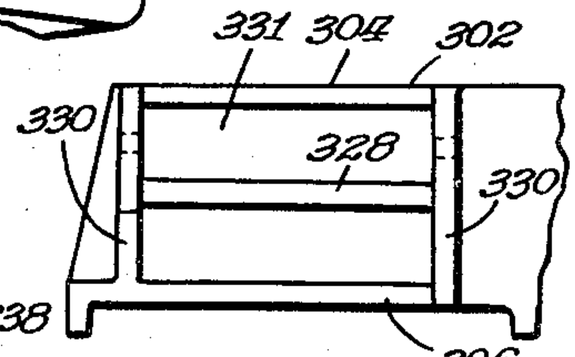


Fig. 7.

INVENTOR.

John J. Kowalik

BY

Wm O. B. Garner

Atty.

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UNITED STATES PATENT OFFICE

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SNUBBED TRUCK

John J. Kowalik, Chicago, Ill., assignor to American Steel Foundries, Chicago, Ill., a corporation of New Jersey

Application April 7, 1948, Serial No. 19,570

17 Claims. (Cl. 105—197)

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This invention relates to railway car trucks and more particularly to a truck with novel snubbing means.

The general object of the invention is to design such truck incorporating a snubbing device by means of which frictional control is afforded of oscillations of the bolster-supporting spring group.

Another object of the invention is to provide friction means of novel form which will effectively control lateral as well as vertical movements of the bolster and will serve as squaring instrumentalities in the truck.

A different object of the invention is to provide a novel bolster assembly including friction means wherein the friction means and the bolster are so arranged as to afford a compact structure.

A further object of the invention is to provide an improved form of car truck wherein the bolster may have pockets in the sides thereof housing friction shoes, each of which may be caused to frictionally cooperate with a wall of the bolster and an adjacent side frame column by means of a wedge between said bolster wall and a portion of the shoe, the wedge being urged into position by spring means reacting thereagainst.

Broadly, this invention contemplates an arrangement including a wall on a truck member and a friction assembly slidably embracing the wall therebetween and urged against another truck member for frictional engagement therewith.

Another object is to provide a friction assembly of novel form which will effectively resist movement of associated members toward each other.

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

These and other objects of the invention will be apparent from the specification and the drawings, wherein:

Figure 1 is a fragmentary side elevation of a railway car truck embodying one modification of the invention;

Figure 2 is a fragmentary sectional view taken substantially in the transverse horizontal plane indicated by the line 2—2 of Figure 1;

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Figure 3 is a sectional view taken approximately in the vertical longitudinal plane indicated by line 3—3 of Figure 2;

Figure 4 is a fragmentary side elevation of a railway car truck, partly in longitudinal vertical section, illustrating another embodiment of the invention;

Figure 5 is a fragmentary view similar to Figure 4 showing still another embodiment of the invention;

Figure 6 is a fragmentary view comparable to Figure 5, illustrating a further modification of the invention, and Figure 7 is a fragmentary side view of the bolster shown in Figure 6.

Describing the structure in detail and referring first to the modification illustrated in Figures 1 to 3, the invention is illustrated as embodied in a railway car truck including a side frame of generally conventional form comprising a compression member 2, a tension member 4, and a column 6 at each end thereof merging with the tension and compression members to define a bolster opening 8 of well-known form.

Each column 6 may have a general U section, as well illustrated in Figure 2, with an inboard flange 10, an outboard flange 12, and a transverse web 14 upon which may be mounted in any convenient manner, as by welding, a wear plate 16.

The tension member in the area at the bottom of the bolster opening may be of standard box section design including a widened top chord 18 and spaced inboard and outboard upstanding flanges as at 20 defining a spring seat 22 therebetween affording a seat for coil springs 24. The springs support an end of a bolster 26 positioned in the bolster opening 8 between the columns 6.

The bolster may be of box section with a top wall 28, a bottom wall 30, and a side wall 32 at each side thereof. At each side thereof the bolster may have inboard and outboard guide lugs or gibs 33, 33, embracing the associated column therebetween for interlocking the bolster with the frame in the usual manner. The bolster end may be provided at each side thereof with spaced inboard and outboard transverse webs or walls 34 and 36 merging with the top and bottom walls 28 and 30 to define therewith a pocket 38 and each side wall 32 may be cored away intermediate webs 34 and 36 so that each pocket 38 is open to the adjacent column 6. A friction element in the form or a web or wall 40 may be provided in each pocket 38, said web presenting top and bottom substantially parallel surfaces 42 and 44 (Figure 3) sloping downwardly toward the adjacent wear plate 16. Surface 42 faces the adjacent column 6 and surface 44 faces away

from said column. The web 40 is spaced vertically with respect to the bottom wall of the bolster and merges with the top wall 28 and the related vertical inboard and outboard webs 34 and 36 of the bolster. As best seen in Figure 3, each web 40 is at one side of the longitudinal vertical center plane of the bolster 26 indicated by the dot and dash line at the left of this figure, and thus the surfaces 42 and 44 of said web extend inwardly toward said plane.

Within the pocket 38 may be confined a friction shoe 46 having a substantially vertical friction wall 48 presenting a surface 50 on one side thereof in complementary frictional engagement as at 52 with the associated wear plate 16. The upper and lower ends of the wall 48 may extend into cored out openings 54 and 56 in the top and bottom walls of the bolster. At the rear of the friction wall 48 adjacent the upper end thereof may be formed a wedgelike projection or portion 58 presenting a downwardly facing diagonal friction surface 60 in complementary engagement as at 62 with the top surface 42 of web 40, thus accommodating sliding movement of the shoe diagonally toward the associated column 6. The shoe may be provided adjacent its lower end with a ledge or leg 64 integral with the rear side of the friction wall 48 substantially at right angles thereto. The leg 64 may extend beneath web 40 through an opening defined between the bottom wall of the bolster and the lower end of web 40, said leg being vertically spaced as at 65 (Figure 3) from the bottom bolster wall, and with wall 48 of the shoe being spaced from the lower edge of web 40 as at 67 to accommodate movement of the shoe into and out of pocket 38. The leg 64 provides a flat surface 66 on its upper side, and between surface 66 of the leg and surface 44 of the web 40 may be interposed an element in the form of a wedge 68 in complementary engagement as at 70 and 72, respectively, with said surfaces 66 and 44. A horizontally disposed spring 74 may be seated at one end as at 67 against the wedge 68 and positioned on said wedge by means of a boss 78 on the wedge. It will be understood that the spring extends transversely of the bolster and the opposite end thereof reacts against a similar wedge at the opposite side of the bolster, and when assembled with the wedges is under initial compression and urges each wedge transversely of the bolster against the associated surface 44, causing the wedges to slide diagonally downwardly along these surfaces and engage the adjacent portion or leg 64 of the associated shoe on surface 66 thereof. Each wedge urges the leg 64 of the related shoe in a direction generally downwardly toward the bottom wall of the bolster and thus causes the shoe to slide on its surface 60 against surface 42 diagonally outwardly of the pocket and frictionally engage the adjacent wear plate 16. It will be noted that the shoe and member 68 embrace web 40 therebetween, the member 68 being wedged between leg 64 of the shoe and web 40, so that during vertical movement of the bolster with respect to the side frame, the shoe is prevented from moving vertically. Lateral movement of the bolster, causing inward movement of the shoe, is constrained, not only by the frictional engagement between surfaces 60 and 42 on the shoe and web 40, but also by friction developed at 72 between the wedge and surface 44.

For assembly purposes the projection 58 of shoe 46 is provided with an opening 80 extending

longitudinally of the bolster, said opening being alignable with transverse openings 82, 82 in the inboard and outboard webs 34 and 36 of the associated pocket in the retracted position of the shoe for the reception of a bar therethrough for holding the shoe in retracted position within the associated pocket during assembly and disassembly of the bolster with the side frame.

In assembling the structure heretofore described, the friction shoe may be inserted into the pocket and seated on the web 40. The opening 80 in the shoe may be aligned with openings 82 in the adjacent transverse webs and a bar may be inserted through the openings. The wedge may then be inserted into the bolster from the outboard end thereof through opening 84 (Figure 1), defined between the top and bottom walls of the bolster and the outboard webs 36, and may be seated on surface 66 of leg 64 of the associated shoe and against surface 44 of the related web 40. The shoe and wedge at the opposite side of the bolster are similarly assembled. Thereafter, the spring may be inserted into the bolster through opening 84, preferably under compression in a suitable jig, and released between the wedges 68 at opposite sides of the bolster, whereupon the spring in expanding bears against the respective wedges and urges them into the wedged position thereof as hereinbefore explained. The bolster assembly may be then inserted endwise through the upper end of the bolster opening, it being noted that the outboard lugs 33 are of smaller depth than the widened upper portion 86 of the bolster opening 8. The bolster may then be lowered onto the supporting springs, the springs having been previously seated on the spring seat of the tension member. Thereafter, the bars or tools, extending through openings 80 and 82 in the respective shoes and transverse walls of the bolster, may be removed so that the shoes are permitted to move outwardly of their respective pockets against the related columns.

Referring now to the modification illustrated in Figure 4, the arrangement shown is substantially identical with that described in connection with Figures 1 to 3, and like parts are identified with the same reference numerals. The only difference between this modification and the one previously described is that the bolster 26 is provided with a central vertical web or rib 100 and at each side of the rib is disposed a coil spring 102 compressed between the rib and the adjacent wedge 68 and each spring is positioned by a boss 104 on each side of the rib. In all other respects the arrangement in both modifications is the same.

Referring now to the modification illustrated in Figure 5, the truck structure includes a side frame, which in general is the same as in the previous modifications, having the columns 200, 200 between which is interposed a bolster 204, the bolster having top and bottom walls 206 and 208, the bottom wall of the bolster being seated on springs 210 which are supported on the frame as hereinbefore noted in connection with the previous embodiments. In the present modification the bolster is provided at each side thereof with a pocket and within each pocket is formed a web 212 having upper and lower surfaces 214 and 216 converging toward the adjacent side of the bolster. Each web is integral with the top wall 206 of the bolster and with the inboard and outboard walls of the bolster, as described in connection with the previous modifications. In

the present instance, however, the webs 212 extend above the top of the bolster wall to provide larger wedge surfaces 214.

A friction shoe 218 is confined in each side of the bolster, the shoe being a solid body of metal and having on its forward side a friction surface 220 in engagement as at 222 with a wear plate 224 mounted on the associated column. On the rear side of the shoe is formed a diagonal surface 226 in complementary frictional wedge engagement as at 228 with the upper surface 214 of the associated web 212. Both of these surfaces 214 and 226 slope downwardly and are arranged to accommodate slidable movement of the associated shoe toward and away from the related column. On the rear side of the shoe at the lower end thereof is provided a leg 230 extending into the pocket between the lower edge of the adjacent web 212 and the bottom bolster wall 208. The leg 230 is provided on its upper side with a wedge surface 232 sloping diagonally upwardly toward the adjacent column and converging with surface 226 on the shoe toward the related column. Surface 232 is in complementary slidable engagement with a wedge 234, the wedge being in complementary slidable engagement with the under surface 216 of the adjacent web 212. Each wedge is urged into engagement with surface 216 and surface 232 on the related web 212 and shoe 218 by means of a horizontally disposed coil spring 236 which is compressed between wedges 234, 234 at opposite sides of the bolster.

In operation the spring urges the respective wedges toward the related columns and into engagement with the surfaces 216 on the respective webs 212 and urges the wedges diagonally along said surface 216 into engagement with the surfaces 232 on the legs 230 of the respective shoes 218. This causes the shoes to slide on the diagonal surfaces 214 toward the related columns 200. Lateral movement of the bolster is effectively resisted by the spring 236 and the friction developed between surfaces 214 and 226 on each wall 212 and related shoe and between the respective wedges 234 and related surfaces 216 and 232 on the walls and shoes.

Furthermore, it will be apparent that each shoe is prevented from moving vertically with respect to the bolster so that rattling between the shoes and bolster is eliminated.

Each shoe is provided with an opening 238 extending longitudinally of the bolster and the bolster is provided with openings 240 for the reception of a suitable tool, such as a bar, therethrough for holding the shoes in retracted position in the bolster away from the columns for purposes of assembly and disassembly.

Referring now to Figures 6 and 7 illustrating a further modification of the invention, the truck structure includes a conventional side frame, as heretofore described in connection with the previous modifications, including spaced columns 300, 300. Between the columns is interposed a bolster 302, said bolster having top and bottom walls 304 and 306 and at each side thereof carrying friction means between said walls as hereinafter described. The bolster is seated on a spring group comprising coil springs 308 which are supported in the usual manner from the truck frame.

Each of the friction means comprises a friction shoe 310 having a friction wall 312 in frictional engagement as at 314 with a wear plate 316 on the associated column. The shoe has on its rear side adjacent its upper end a lug or leg 318 which extends between the top and bottom bolster walls, said lug being cored away as at 320 to lighten the structure and having a flat surface 322 on its bottom side in slidable engagement as at 324 with a complementary flat top surface on a horizontally disposed web or wall 328 extending longitudinally of the bolster intermediate the top and bottom walls thereof and connected at opposite ends thereof to transverse inboard and outboard walls 330, 330 (Figure 7), the inboard and outboard walls merging with the top and bottom walls of the bolster and defining a pocket 331 therewith. Below the web the friction wall of the shoe is formed on the rear side thereof with an upwardly sloping wedge surface 332 in engagement as at 334 with a complementary diagonal surface on a wedge 336, said wedge having a flat surface 338 in frictional engagement as at 340 with a complementary flat surface on the opposite or under side of said web 328. A common spring 344 actuates the friction means at opposite sides of the bolster, said spring being housed between the top and bottom walls of the bolster and at each end thereof bears as at 346 and 348 against the associated shoe lug and wedge. Each shoe lug and wedge is provided with a boss which enters the spring and positions the same.

In operation the spring, which is under initial compression between the shoes and wedges, urges the shoes outwardly against the related columns and at the same time urges each wedge into wedge engagement with the wedge surface 332 on the related shoe causing each wedge to slide upwardly on the respective wedge surfaces of the shoes, whereby the wedges move toward the respective webs 328 and engage their surface 338 with the bottom surfaces of respective web 328. The wedges after engaging webs 328, cause the shoes to move downwardly and thus seat with their lugs 318 tightly against respective webs 328. Thus the shoes are held from rattling or moving vertically relative to the bolster. It will be noted that the wedges also transmit the reaction of the spring to the lower portions of the respective shoes and urge the same outwardly against the columns and the lugs transmit the reaction of the spring to the upper portions of the shoes and that the wedges and the shoes through the lugs thereon embrace the respective webs 328 tightly therebetween.

The forward edge of each web 328 is spaced transversely of the bolster from the rear of the associated shoe and the rear or inner edge of each web 328 is spaced from the adjacent end of the spring transversely of the bolster, whereby the shoes and wedges are accommodated movement on the respective webs 328 inwardly and outwardly of the bolster.

It will be appreciated that although this invention is illustrated in connection with a railway car truck, the arrangement may be used in connection with various other forms of friction devices such as are well known to those skilled in the art.

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 frame member having spaced columns, a bolster between said col-

umns, walls on said bolster adjacent respective columns and diagonal with respect thereto, a shoe and wedge element at opposite sides of one wall and in wedge engagement with each other, a shoe and wedge element at opposite sides of the other wall and in wedge engagement with each other, and resilient means reacting between said wedge elements for urging the same against respective walls and into said wedge engagement with respective shoes for urging said shoes into frictional engagement with the respective columns.

2. In a vehicle snubbing device, a pair of relatively movable members, a friction face on one member, friction means including an element connected to the other member, said element presenting friction surfaces at opposite sides thereof, each surface being in converging relationship with respect to said face, a shoe seated against one of said surfaces and in frictional engagement with said face, wedge means in engagement with the other surface and with said shoe, and spring means for urging said wedge means against said shoe and said other surface and sliding said shoe and wedge means along respective surfaces toward said face for engaging said shoe therewith.

3. In a truck, a side frame having a column, a bolster spring-supported from the frame, a wall on the bolster presenting friction surfaces on opposite sides thereof sloping toward said column, one of said surfaces facing the column, a shoe wedged between said column and said one of said surfaces, wedge means engaging the other of said surfaces and said shoe for urging said shoe into the wedged position thereof, and resilient means for urging said wedge means tightly against said other surface and said shoe.

4. A railway car truck bolster having a top wall and a spaced bottom wall adapted for support by an associated spring means, said structure containing a pair of friction webs between said walls and movable in unison therewith during oscillation of said structure on said spring means, opposite sides of each web having top and bottom friction surfaces, respectively.

5. In a vehicle snubbing device, relatively movable members, a friction surface on one member, a wall on the other member extending toward said surface, an element at each side of the wall and in frictional engagement therewith, said elements engaging each other, and resilient means reacting against at least one of said elements for sliding the same along said wall toward said surface for engaging one of said elements therewith.

6. In a railway car truck, a side frame having a column, a bolster spring-supported from said frame, a wall on said bolster extending diagonally toward said column, a friction shoe having a portion in engagement with one side of said wall, a wedge element engaging another portion of said shoe and in engagement with the other side of said wall, and resilient means reacting against said wedge element for urging the same into said engagement with said wall and said shoes.

7. In a vehicle, a pair of relatively movable members, a friction face on one member, a wall on the other member with surfaces on opposite sides thereof converging toward said face, an element in wedge engagement with one of said surfaces and in frictional engagement with said face, wedge means between the other surface and said element, and a spring reacting against said wedge means for urging the same tightly against said other surface and against said element for sliding said element and wedge means along respective surfaces toward said face for engaging said element therewith.

8. In a friction assembly, a member having a pocket, and a friction member in said pocket presenting inner and outer surfaces on opposite sides thereof extending toward the open end of said pocket, shoe means engaging the outer surface, wedge means engaging the inner surface and said shoe means, and resilient means operatively associated with said wedge means for urging said wedge means into tight engagement with said shoe means and said inner surface and for sliding said shoe means and wedge means along said surfaces toward the open end of said pocket.

9. In a railway car truck, a side frame having a friction surface, a bolster spring-supported from the frame and having a web adjacent said surface, said web presenting top and bottom faces extending toward said surface in converging relationship therewith, a shoe interposed between said web and said surface and engaging the latter, said shoe having upper and lower portions extending above and below said web, respectively, said upper portion slidably engaging said top face, a member in wedge engagement with said bottom face and the lower portion of said shoe and slidably engaging the same and effective to hold said upper portion of said shoe against said top face, and means for urging said member into said engagement and for sliding the same and said upper portion of the shoe along said faces for urging said shoe against said surface.

10. In a railway car truck, a side frame with a friction surface, a bolster having a horizontally disposed web adjacent said surface, a friction shoe and wedge means bearing against opposite sides of said web and in wedge engagement with each other, and resilient means reacting against said shoe and wedge means for urging the same into said engagement and tightly against respective sides of said web and said shoe against said surface.

11. In a railway car truck, a frame with spaced columns, a bolster having a horizontally disposed friction wall adjacent each column, a friction shoe and wedge means seated against opposite sides of each wall and in abutment with each other, and resilient means reacting against said friction shoes and said wedge means urging the same into said abutment and said shoes against the respective columns.

12. In a railway car truck, a side frame having a friction surface, a bolster having a friction member adjacent said surface, top and bottom faces on said member angularly related to said side frame surface in converging relationship therewith, a shoe engaging said side frame surface and slidably engaging said top face, a surface on said shoe below said bottom face facing the same and angularly related thereo, a member interposed between said bottom face and said shoe surface and in complementary engagement therewith, and resilient means for urging said shoe against said side frame surface and said member against said shoe surface and said bottom face, said member in cooperation with said bottom face and said shoe surface urging said shoe against said top face.

13. In a friction assembly, a member having spaced walls and a friction web intermediate said walls, a friction shoe element slidably seated against one side of said web, a wedge element fitted between the opposite side of said web and a portion of said friction element, and resilient

means for urging said wedge element against said shoe element and said web and moving said elements along said web.

14. A railway car truck comprising a side frame with spaced columns and a bolster opening therebetween, a bolster spring-supported by said frame between said columns for movement in both directions upwardly and downwardly therebetween, said bolster having at each side thereof an integral web with a pair of top and bottom surfaces extending inwardly of the bolster toward its longitudinal, vertical center plane, and a friction device associated with each column comprising a shoe engaging a friction area of the column and one surface of the adjacent pair and having a wedge surface arranged at an acute angle to the other surface of the adjacent pair, a wedge interposed between and bearing against the wedge surface and said other surface and spring means compressed against the wedge for tightly wedging the same against said wedge surface and said other surface, all of said surfaces converging with respect to said column area in one of said directions.

15. In a truck, a side frame and a bolster, a friction surface on the frame, a wall on the bolster, each side of the wall having a face in converging relationship with respect to said surface, a shoe in engagement with the face at one side of the wall and with said surface, wedge means in engagement with said shoe and with the face at the opposite side of said wall, and compression spring means for tightly wedging said wedge means against said shoe and said wall and urging said shoe against said wall and against said surface, the compressional axis of said spring means intersecting said surface.

16. A bolster having an end portion with spaced top and bottom walls and spaced inboard and outboard transverse walls defining pockets in opposite sides of the bolster, friction webs in respective pockets, said webs being disposed between the transverse walls and being connected to certain of said walls and spaced from said bottom wall, and oppositely facing friction surfaces on the top and bottom sides respectively of each web for associated friction means.

17. A railway car truck bolster having top and bottom walls and spaced side walls, at least one side wall having an opening therethrough communicating with a friction shoe pocket in said bolster between said top and bottom walls, said bolster having a friction web in said pocket, said web having a top friction surface facing the top wall and having a bottom friction surface facing the bottom wall, both of said surfaces being formed and arranged for slidable frictional engagement with associated friction means.

JOHN J. KOWALIK.

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