Feb. 2, 1954 E. J. MAATMAN ET AL 2,667,845

SNUBBED TRUCK

Filed July 11, 1947 2 Sheets-Sheet 1

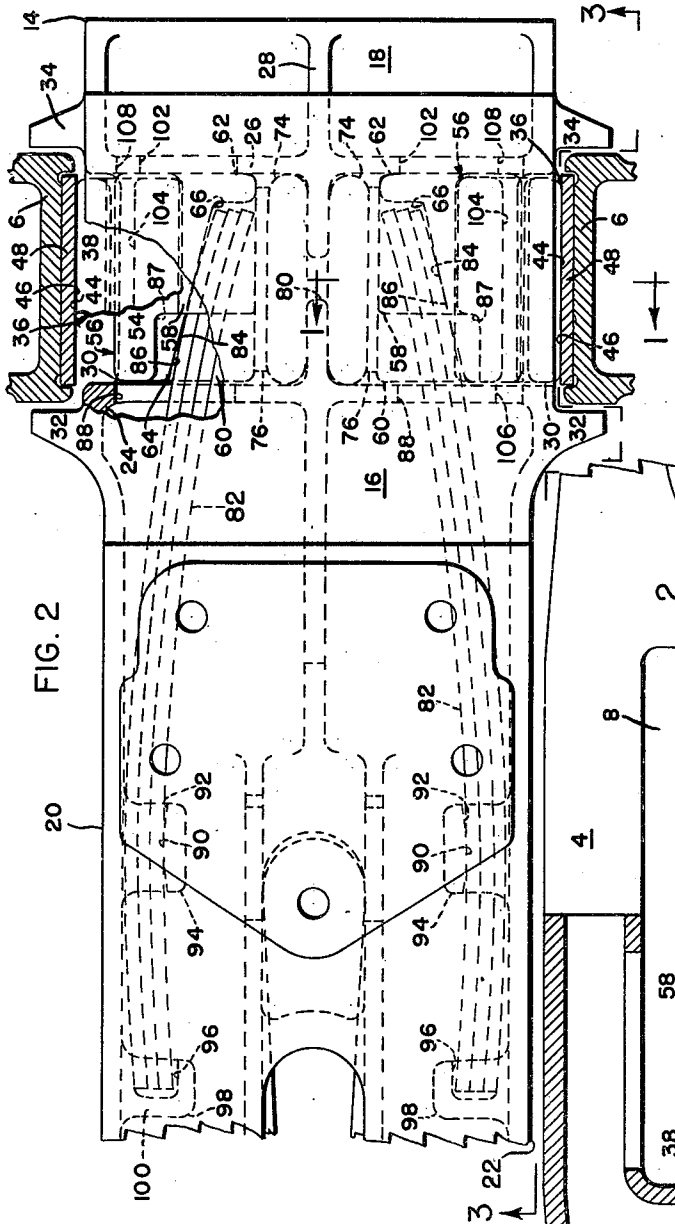


FIG. 2

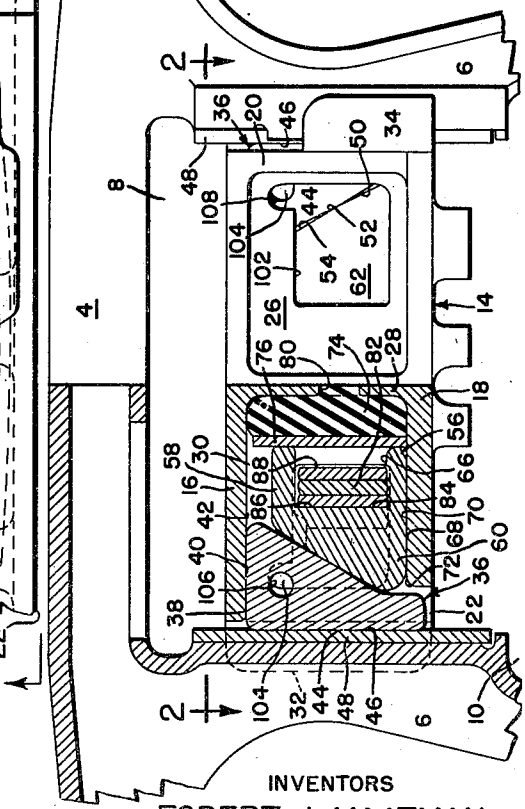


FIG. 1

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2 Sheets-Sheet 2

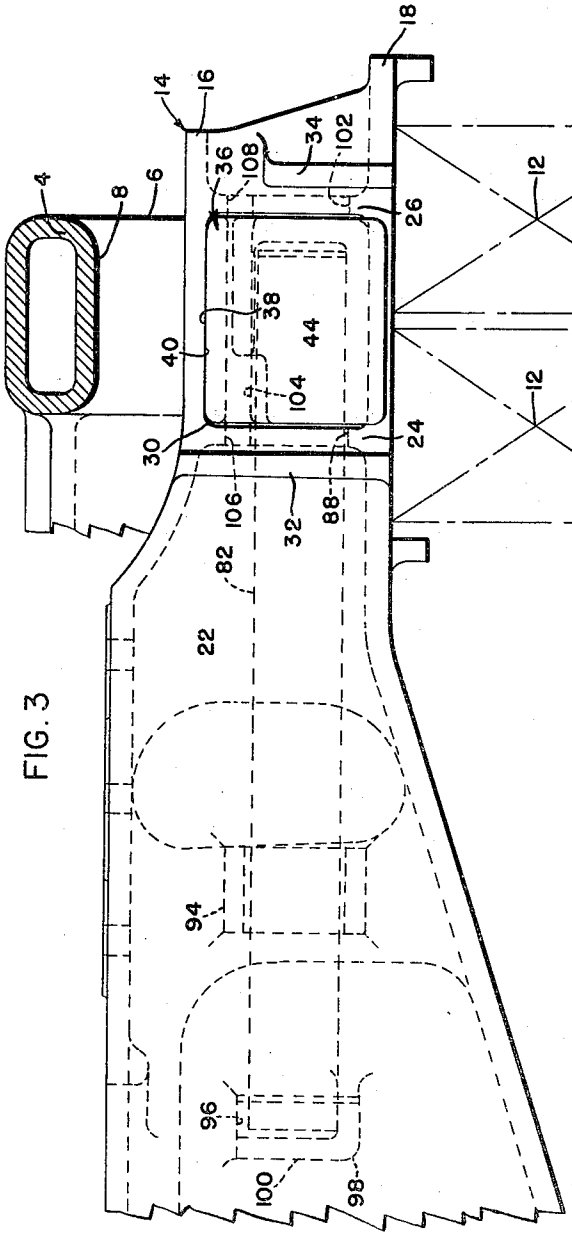


FIG. 3

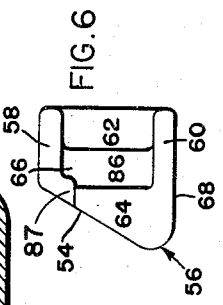


FIG. 6

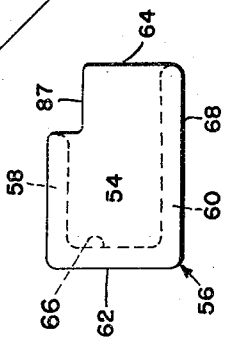


FIG. 5

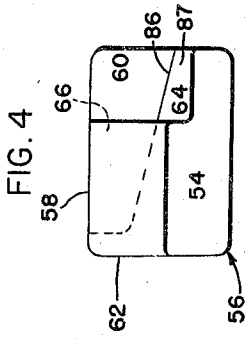


FIG. 4

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Patented Feb. 2, 1954 2,667,845

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2,667,845

SNUBBED TRUCK

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Application July 11, 1947, Serial No. 760,234

21 Claims. (Cl. 105—197)

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This invention relates to railway car trucks and more particularly to a novel snubbed truck comprising means for dampening the oscillations of the bolster-supporting springs.

The general object of the invention is to devise a truck of the type described incorporating friction means associated with the bolster and side frame columns for insuring substantially constant friction therebetween to thereby control the oscillations of the bolster-supporting spring group during operation of the truck.

A specific object of the invention is to design a railway car truck such as described wherein friction means comprising a friction shoe and wedge may be pocketed in each side of the bolster and each wedge may be urged against its associated shoe by a resilient pad compressed between the wedge and the bolster and by a leaf spring housed in the bolster and anchored thereto at one end and flexed against the wedge at its other end.

Another object of the invention is to utilize a cantilever spring in an efficient manner for actuating the friction means.

A further object of the invention is to design a railway car truck of the type described wherein a friction shoe and wedge may be mounted in a pocket in each side of the bolster, and each wedge may be actuated into wedge engagement with the adjacent shoe and into frictional engagement with angularly related sides of the associated pocket by means of a cantilever spring housed entirely within the bolster and extending longitudinally thereof, each spring projecting at one end into one of the bolster pockets and bearing at opposite ends against the associated wedge and the bolster and bearing intermediate its ends against an abutment fixed to the bolster.

Another object of the invention is to devise friction means such as described wherein the actuating means therefor comprises a pair of cooperatively arranged angularly disposed springs housed in the bolster and each bearing at one end against the friction means and at the other end against the bolster.

The foregoing and other objects and advantages of the invention will become apparent from the specification and the drawings.

Figure 1 is a fragmentary side elevation of a car truck embodying the invention, the left half of the structure being shown in section taken substantially in the vertical plane as indicated by line 1—1 of Figure 2.

Figure 2 is a top plan view of the structure shown in Figure 1, partly in section, the section

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being taken approximately in the horizontal plane indicated by line 2—2 of Figure 1. Certain portions of the bolster and friction device are broken away to more clearly show the cooperation of the several parts of the device.

Figure 3 is a view taken in the transverse vertical plane substantially as indicated by line 3—3 of Figure 2.

Figures 4 to 6 illustrate one of the wedge members, Figure 4 being a top plan view thereof, Figure 5 being a front view thereof, and Figure 6 being a side elevation thereof, the view being taken from the inboard side thereof.

Describing the invention in detail, the truck comprises a side frame of conventional type having tension and compression members 2 and 4 (Figure 3) and spaced columns 6, 6 merging therewith to define a bolster opening 8 with a widened lower portion fragmentarily shown at 10 (Figure 1) to accommodate assembly and disassembly of a bolster with said side frame in the usual manner, as will be readily understood by those skilled in the art.

A plurality of springs, diagrammatically indicated at 12, 12 (Figure 3), are seated on the tension member 2 in a customary manner and afford support for a bolster generally designated 14.

The bolster is of box section with the end portion having top and bottom walls 16 and 18 merging with spaced side walls 20 and 22, spaced inboard and outboard transverse walls 24 and 26 and a longitudinal center rib or wall 28, said top and bottom walls 16 and 18, said transverse walls 24 and 26 and said center rib 28 defining a pocket 30 in each side of the bolster end, the side walls being cored away intermediate the walls 24 and 26.

The bolster 14 may have at each side thereof inboard and outboard gibs 32 and 34 for interlocking engagement with the adjacent column 6.

A friction shoe and wedge member are disposed in each pocket. The shoe, generally designated 36, is substantially triangular in section, as well seen in Figure 1, and comprises a horizontal surface 38 on the top thereof in slidable engagement as at 40 with a complementary surface 42 (Figure 1) on the top wall 16 of the bolster, said shoe having a vertical friction face 44 on one side thereof for engagement as at 46 with a friction plate 48 mounted on the adjacent side frame column 6 in any convenient manner, as by welding, and on the opposite or rear side thereof the shoe is provided with a wedge surface 50 slightly convex and sloping toward the adja-

cent column for engagement as at 52 with a flat, similarly sloping wedge surface 54 on the associated wedge member, generally designated 56.

Each wedge member 56, one of which is illustrated in detail in Figures 4–6, comprises top and bottom webs 58 and 60, a side web 62 on the outboard side thereof and a front web 64, on the external side of which the beforementioned wedge surface 54 is formed.

The front web 64 merges into said top, bottom and side webs and forms a pocket 66 therewith for a purpose hereinafter described.

The bottom web 60 of each wedge member has a flat bottom surface 68 in slidable engagement as at 70 with a complementary surface 72 (Figure 1) on the bottom wall 18 of the bolster.

Each wedge member is urged against its associated friction shoe by a plurality of resilient actuating means, one of which is a rubber block or resilient pad 74 seated at one side against the center rib 28 and at its opposite side bearing against a spring seat or spring plate 76 to which said pad may be fixed as by vulcanizing, said pad urging said spring plate into abutment against the inner ends of the top and bottom webs and side web of the associated wedge member. Vertical and lateral expansion of the resilient pad 74 is restricted by its bearing against the top and bottom walls of the bolster and the transverse walls 24 and 26. A portion of the center rib 28 may be cored away to form an opening 80 to position the member 74 and to accommodate flow of said member under compression.

The configuration of the resilient member 74 and its position within the pocket is well shown in Figure 1. It will be seen that some clearance is afforded around the marginal edges of the pad 74 to accommodate distortion of the pad, and, likewise, the opening 80 affords additional space for such distortion so that the blocks at opposite sides of the center rib might bear against each other under conditions of maximum flow or distortion of the material and thus transmit forces against each other.

The other actuating means to actuate the wedge member is in the form of a leaf spring or cantilever spring 82, each spring having one end received within the pocket 66 in the associated wedge member and bearing as at 84 against a complementary flat diagonal surface 86 on the inner side of the front web 64 of said wedge member. It will be observed that the top web of each wedge member terminates short of the inboard side of the wedge member, and the front web is relieved as indicated at 87 to avoid thin metal section due to the convergence of surfaces 54 and 84. Each spring 82 extends into the bolster through a cored opening 88 in the inboard wall 24 and fulcrums intermediate its ends as at 90 against an arcuate surface 92 on a loop or fulcrum member 94 formed on the inner side of the adjacent side wall of the bolster, inwardly of the transverse wall 24.

The position of the springs 82, 82 is well seen in Figures 2 and 3 wherein it will be noted that each spring 82 extends longitudinally of the bolster and passes through the associated fulcrum member 94 and at its inner end extends into a socket 96 in an anchor member 98 also formed on the inner side of the adjacent side wall of the bolster in inwardly spaced relation with respect to the adjacent fulcrum member.

It will be observed that the openings 88, 88 are large enough to accommodate flexing of the springs 82, 82.

Endwise movement of each spring 82 is prevented by the web 62 on the associated wedge member and a portion 100 on the associated anchor member 98. Each spring 82, in addition to urging its related wedge member 56 outwardly of the associated bolster pocket, urges the same against a substantially vertical friction surface on the inboard side of the outboard transverse wall 26 of the bolster, as may be best seen in Figure 2, thus maintaining the wedge member in proper alignment with the associated friction shoe and preventing the wedge member from twisting out of position during operation. It may also be noted that movement of the bolster 14 between the columns is frictionally resisted by slidable engagement of the wedge members 56 along the substantially vertical inboard surfaces of the outboard wall 26.

In assembling my novel friction device with the bolster, the pads 74, 74 are inserted into respective bolster pockets and seated against the center rib 28. Thereafter the springs 82, 82 are inserted into the bolster by passing the same through openings 102, 102 formed at opposite sides of the center rib 28 in the outboard transverse wall 26 of the bolster, through the openings 88, 88 in the inboard transverse wall 24 of the bolster and through the respective fulcrum members 94, the springs 82, 82 being moved into the bolster until the inner ends thereof enter the sockets 96, 96 in the respective anchor members. As thus assembled with the bolster, the outer ends of the springs 82, 82 extend into the respective bolster pockets 30, 30. The associated wedge members 56, 56 are inserted into the respective bolster pockets and moved thereinto until the outer end of each spring 82 enters the pocket 64 in the associated wedge member. Thereafter the shoes 36, 36 are inserted into the respective bolster pockets 30, 30, each shoe being urged inwardly of its associated pocket with sufficient force to align an opening 104 extending therethrough with slots 106 and 108 on the inboard and outboard transverse walls 24 and 26 to accommodate insertion of a rod or assembly pin (not shown) through said slots and opening for maintaining the friction unit in assembly, so that the bolster may easily be assembled with the side frames after which the rods may be removed.

It is to be understood that we do not wish to be limited by the exact embodiment of the device shown which is 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.

We claim:

1. In a railway car truck, a side frame having spaced columns with friction faces, a bolster spring-supported between said columns with inboard and outboard guide means for engagement therewith, pockets in each side of the bolster between said guide means opposite said faces, each of said pockets being defined by an inboard and an outboard web and an intermediate web merging with top and bottom walls of said bolster, a friction shoe and wedge means in each pocket, said friction shoes bearing against said faces respectively and against one of the walls of said bolster, horizontally acting resilient means under compression between each of said wedge means and said intermediate web, each of said wedge means having frictional engagement with the associated shoe and with the other wall of said bolster, and leaf springs housed within said

bolster and extending longitudinally thereof and operatively associated with respective wedge means for urging the same in cooperation with said resilient means along the associated wall of said bolster and into said engagement with the respective of said shoes.

2. In a railway car truck, a side frame with spaced columns, a bolster resiliently supported therebetween, a pocket in said bolster adjacent each column, each of said pockets being defined by an inboard and an outboard web merging with the top and bottom walls of said bolster, a friction unit in each pocket, each friction unit comprising a shoe, a wedge, and actuating means therefor, the shoe slidably engaging the adjacent column and one of said bolster walls and having a diagonal face at the rear thereof sloping toward the adjacent column, the wedge slidably engaging the other bolster wall and having a wedge surface sloping toward the adjacent column and engaging said face, the actuating means comprising a leaf spring and a pad of rubber, the rubber pad being compressed between said intermediate web and the associated wedge, the leaf spring extending through said inboard web into the bolster and having one end pocketed within the associated wedge and having its other end anchored to said bolster.

3. In a railway car truck, a side frame having spaced columns, a bolster resiliently supported from said frame between said columns and having top and bottom walls and spaced side walls merging into said top and bottom walls, pockets in said bolster adjacent said columns and defined by inboard and outboard webs and an intermediate web merging with said top and bottom walls of said bolster, said side walls being cored away intermediate said inboard and outboard webs, friction means in each pocket comprising a friction shoe in frictional engagement with said top wall and the adjacent column and a wedge member in wedge engagement with said shoe and in frictional engagement with said bottom wall, a flexible element extending through said inboard web and having one end bearing against said wedge member and having its other end anchored to the adjacent side wall of said bolster, and fulcrum means on said side wall affording a fulcrum for said flexible member at a point intermediate the ends thereof.

4. In a railway car truck, a side frame having spaced columns, a bolster resiliently supported from said frame between said columns and having top and bottom walls and spaced side walls merging into said top and bottom walls, pockets in said bolster adjacent said columns and defined by inboard and outboard webs and an intermediate web merging with said top and bottom walls of said bolster, said side walls being cored away intermediate said inboard and outboard webs, friction means in each pocket comprising a friction shoe in frictional engagement with said top wall and the adjacent column, a wedge member in each pocket in wedge engagement with the associated shoe and in frictional engagement with said bottom wall, and flexible elements extending through said inboard web and having one end bearing against the adjacent wedge member and having the other end anchored to the adjacent side wall of said bolster.

5. In a railway car truck, a side frame with spaced columns presenting friction walls, a bolster spring-supported between said columns with pockets opposite said walls, a friction device in each pocket comprising friction shoe means and wedge means and a plurality of resilient means reacting against said wedge means, said resilient means including a resilient pad under compression between the associated wedge means and said bolster and a cantilever spring housed in said bolster and slidingly bearing at one end against the associated wedge means and anchored at the other end to said bolster, each of said friction shoe means engaging the adjacent column wall and a surface of said pocket and having a diagonal surface engaging the adjacent wedge means, said wedge means slidably engaging other surfaces of said pocket, certain of the resilient means associated with respective wedge means being oriented to urge the same into said engagement with said other surfaces of the related pocket and all of the resilient means associated with respective wedge means being oriented to urge the same against the related shoe means.

6. In a railway car truck, a side frame with spaced columns, a box-section bolster resiliently supported between said columns and comprising spaced top and bottom walls and spaced inboard and outboard walls defining a pocket in each side of said bolster adjacent respective columns, friction shoe means in each pocket bearing against one of said first-mentioned walls and frictionally engaging the adjacent column, wedge means in each pocket in wedge engagement with the associated shoe means and frictionally engaging the other of said first-mentioned walls and one of said second-mentioned walls, and spring means operatively associated with each of said wedge means and reacting between the same and said bolster for urging the former into said engagement and against the related shoe means.

7. A bolster of box section, spaced guide lugs on each side of said bolster at each end thereof for cooperation with associated side frame columns, said lugs defining in part pockets recessed in the side walls of said bolster, each of said pockets comprising inboard and outboard vertical webs aligned with said lugs and an intermediate web merging with top and bottom walls of said bolster, openings in said inboard and outboard webs for accommodating insertion of spring means into said bolster from the outboard end thereof for actuation of friction means enclosed in said pockets, and a fulcrum member and an anchor member on the inner side of each of said side walls formed and arranged to afford a fulcrum and anchor for the associated of said spring means.

8. In a railway car truck, a side frame with spaced columns, a bolster therebetween resiliently supported from said frame, a pocket in each side of said bolster adjacent respective columns, friction means in each pocket comprising a friction shoe and wedge member, said shoe having frictional engagement with the adjacent column and a surface of said pocket and having wedge engagement with said wedge member, said wedge member having frictional engagement with an opposed surface of said pocket and with a surface of said pocket intermediate said named surfaces, and resilient means housed in said bolster and directly bearing against said wedge member along a surface disposed at an obtuse angle with respect to said third-named surface.

9. A wedge member having a front web, a sloping face on the external side of said front web, top and bottom webs and a side web, disposed at one side of said member, said front web merging into said top and bottom webs and said side web and defining a pocket there-

with for reception of associated spring means, and a flat diagonal surface on the internal side of said front web intermediate said top and bottom webs, said surface being disposed at an obtuse angle with respect to the plane of said side web.

10. In a railway car truck, a side frame, a bolster resiliently supported thereby, friction shoe means bearing against a surface of said bolster and frictionally engaging the frame, wedge means in complementary wedge engagement with said shoe means and bearing against a plurality of angularly related internal surfaces of said bolster, and spring means reacting between the bolster and wedge means for urging the latter against the related surfaces and against the shoe means, said wedge means and spring means slidingly engaging along surfaces disposed at an angle with respect to one of said angularly related internal bolster surfaces.

11. A railway car truck comprising spaced columns, a hollow box-section bolster disposed therebetween, resilient means for supporting said bolster from said frame, a leaf spring extending longitudinally of said bolster and housed therewithin, the inner end of said spring bearing against the bolster, friction shoe means bearing against the outer end of said spring and frictionally engaging one of the columns, and a fulcrum in said bolster bearing against said spring intermediate its ends.

12. A railway car truck comprising spaced columns, a bolster resiliently supported therebetween, an elongated resilient member flexible transversely thereof housed within said bolster and anchored therewithin at a point inboardly of said frame, and friction means carried by said member, said member being flexed to urge said friction means against one of said columns.

13. A railway car truck comprising a side frame with spaced columns, a bolster resiliently supported from said frame between said columns, a pair of cantilever springs housed within the bolster and extending longitudinally thereof, friction means carried by the springs in engagement with respective columns, each of said springs being flexed between the associated friction means and spaced abutments in the bolster.

14. In a railway car truck, a side frame having a friction face, a bolster spring-supported from the frame and having a pocket adjacent said face, a friction element in engagement with said face and a surface in said pocket, a single wedge member within said pocket, and resilient means housed within the bolster and arranged to urge said wedge member into frictional engagement with a plurality of other angularly related surfaces in said pocket and to move said wedge member laterally of the bolster along said surfaces against said friction element.

15. In a railway car truck, a side frame having a friction face, a bolster spring-supported from the frame, friction means carried by the bolster and engaging said face, and actuating means for said friction means comprising resilient means extending lengthwise longitudinally of the bolster and reacting against the bolster and said friction means transversely of said bolster.

16. In a railway car truck, a side frame having a friction face, a bolster spring-supported from the frame, a friction surface on the bolster facing longitudinally thereof, friction means carried by the bolster in engagement with said surface and said face, and a single spring reacting directly between the bolster and said friction means and oriented to simultaneously urge said friction means longitudinally of the bolster against said surface and transversely of said bolster against said face.

17. In a railway car truck, a side frame member, a bolster member resiliently supported therefrom, a generally vertical friction surface on one member, a substantially vertical friction face on the other member friction means carried by the other member and engaged with said face and said surface, and spring means reacting between said other member and said friction means for urging said friction means into said engagement, said spring means being oriented to exert forces directed diagonally toward said face and said surface.

18. In a railway car truck, a side frame having a transverse, substantially vertical friction face, a bolster spring-supported from the frame, friction means engaging said face and pocketed within the bolster and in slidable engagement with said bolster along a plurality of surfaces, one of said surfaces being disposed outboardly of said friction means, and spring means within the bolster extending inboardly of said friction means and engaging said friction means along a substantially vertical surface angularly arranged with respect to said face and said one bolster surface, and urging said friction means against all of said surfaces and laterally outwardly of the bolster against said face.

19. In a railway car truck, a side frame, a bolster spring-supported therefrom, friction means carried by the bolster and engaging said surface, and actuating means for said friction means comprising a spring member reacting between said friction means and said bolster for moving the same solely laterally outwardly of the bolster against said surface, and resilient means reacting between the friction means and the bolster arranged to urge said friction means longitudinally of the bolster into engagement with a surface thereon and also laterally outwardly of the bolster, said resilient means being slidable against said friction means longitudinally of the bolster, said spring member being effective, on movement of the friction means outwardly laterally of the bolster, to reduce the wear between said resilient means and said friction means due to the sliding action therebetween by aiding in such outward movement of the friction means and thus relieving the contact pressure between said resilient means and friction means.

20. In a vehicle, relatively movable members, friction means carried by one member in engagement with the other for yieldingly controlling the movements of said members, and a plurality of resilient means reacting against substantially vertical surfaces of said friction means and formed and arranged to cooperatively urge said friction means into said engagement, certain of said resilient means slidingly frictionally engaging said friction means to frictionally resist movement of said friction means in a direction loading said certain spring means, and the other of said spring means being arranged to urge said friction means in a direction unloading said certain spring means to reduce the frictional resistance between said certain means and said friction means during movement of the latter in said last-mentioned direction.

21. In a damping mechanism for a railway car

truck, a side frame provided with spaced guide columns, a bolster having an end portion extending between said guide columns, a substantially horizontal top wall and a substantially horizontal bottom wall on the bolster, a centrally disposed substantially vertical rib arranged longitudinally of the end portion of said bolster connecting the top and bottom walls thereof, spring means supported by said frame and supporting the bottom wall of said bolster, an inboard transverse wall at one side of the bolster connecting the top and bottom walls, and outboard transverse wall at said side of the bolster connecting the top and bottom walls, a wedge member mounted between the top and bottom walls of the bolster and between said transverse walls, a spring carried by the bolster and extending between said rib and the adjacent column, said spring being stressed against the bolster and wedge member for urging the latter towards said adjacent column, an inclined surface on the wedge member having the same slope throughout the space between said transverse walls, a friction shoe having a flat face arranged along said adjacent guide column, a substantially horizontal surface on the friction shoe arranged along one of said top and bottom walls substantially throughout the space between the inboard and outboard transverse walls, an inclined surface on the friction shoe having the same inclination throughout the space between the transverse walls and engaging the inclined surface of the wedge member,

whereby the spring moves the friction shoe into engagement along said flat face thereof with said adjacent guide column and the reaction set up between the inclined surfaces urges the horizontal surface on the shoe into engagement with said one bolster wall and urges a portion of the wedge member into engagement with the other of said top and bottom bolster walls.

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