Oct. 24, 1939. J. J. LAZNA 2,176,909

CAR TRUCK

Original Filed March 31, 1934 4 Sheets-Sheet 1

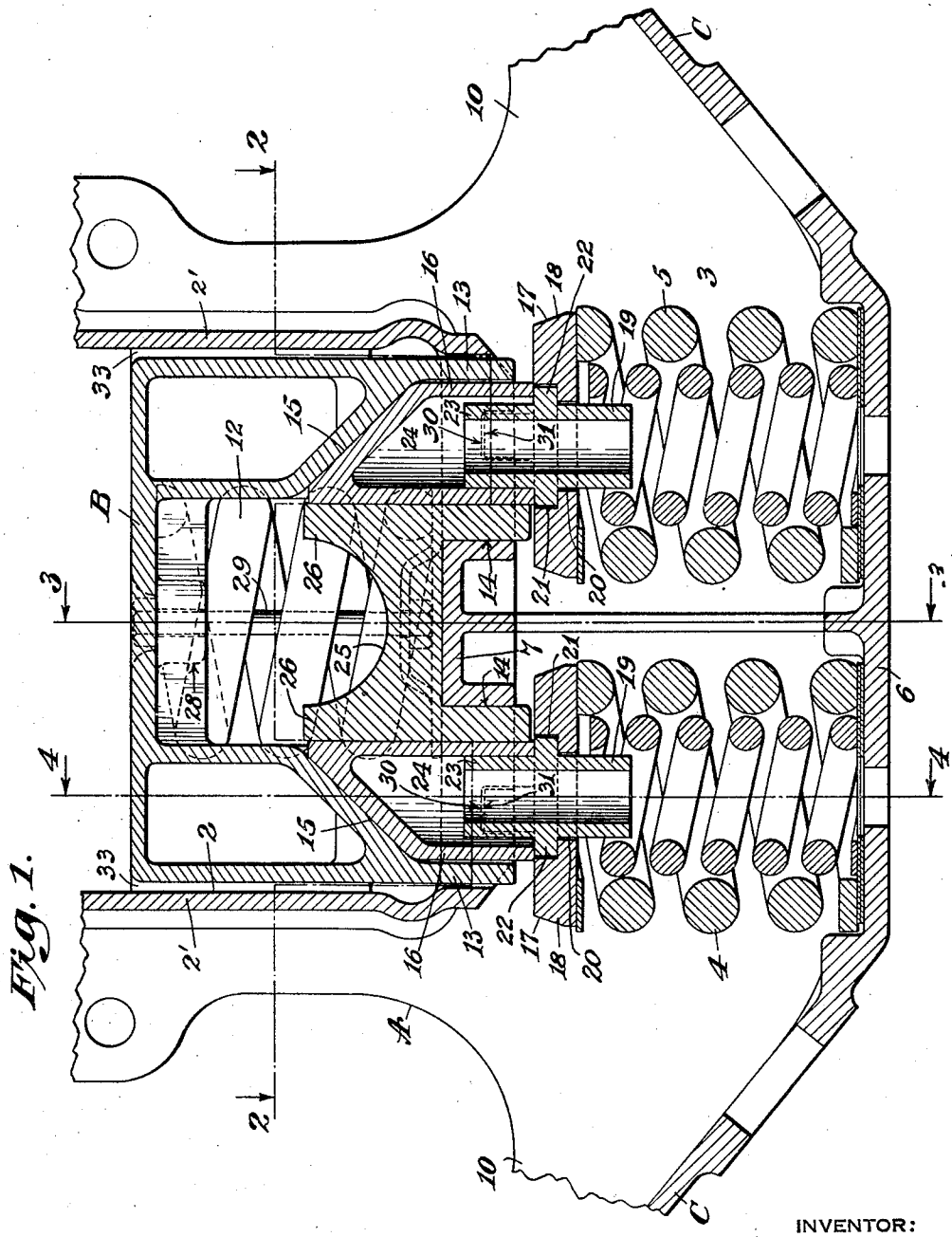


Fig. 1.

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Fig. 2.

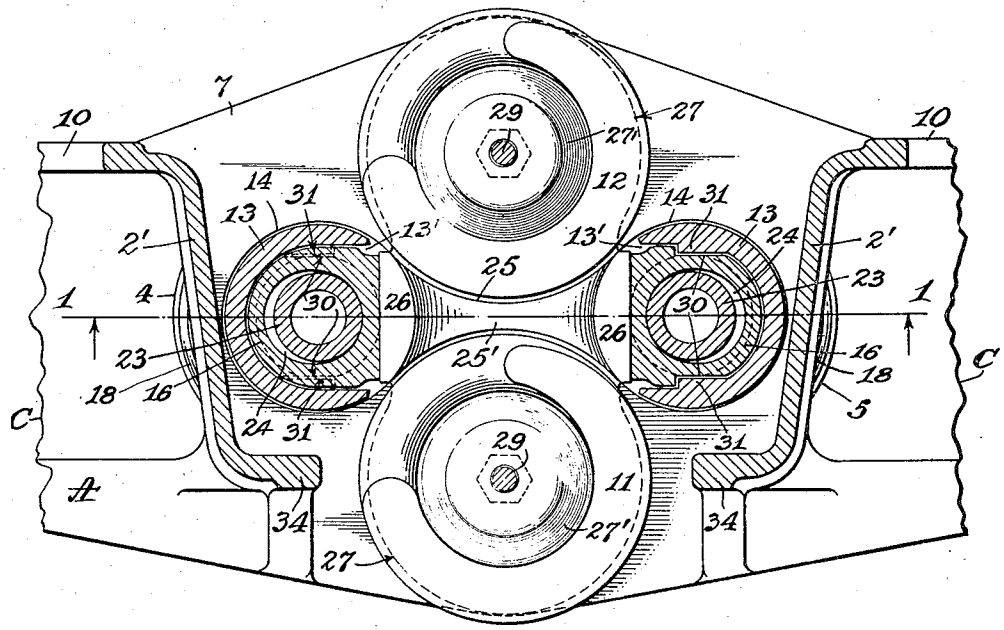
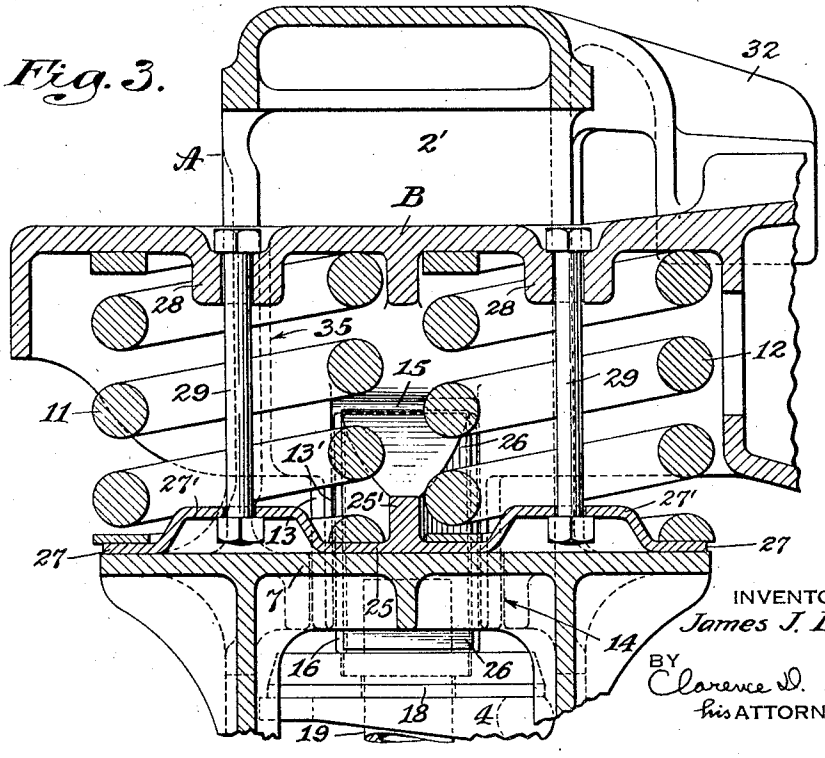


Fig. 3.



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Fig. 4.

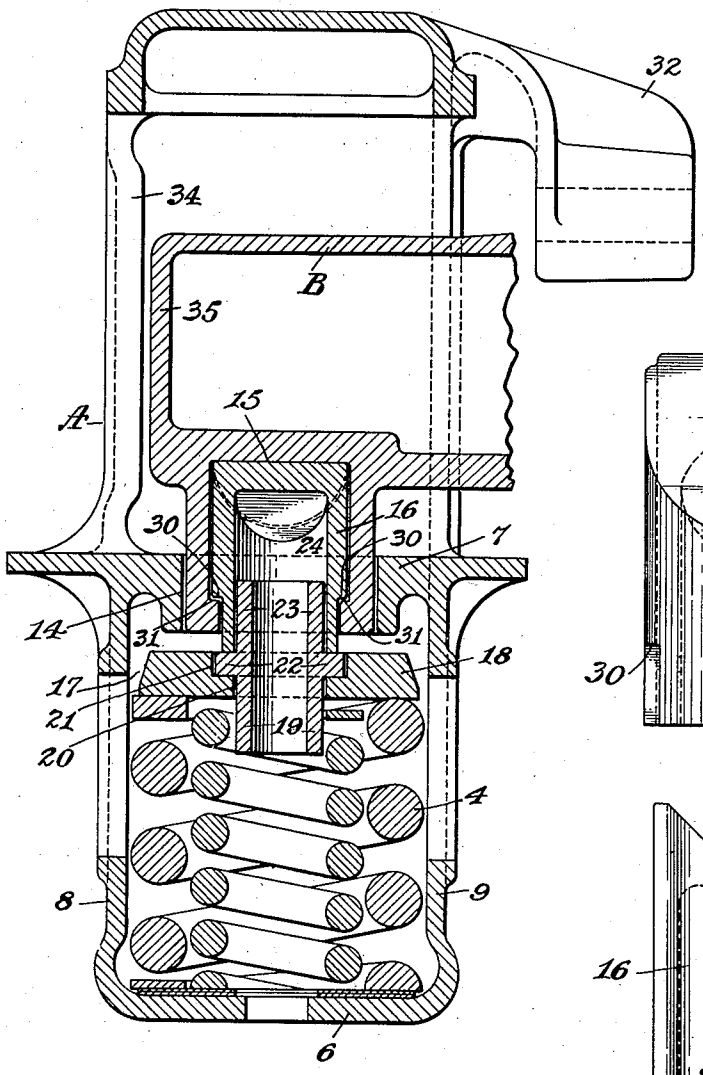


Fig. 5.

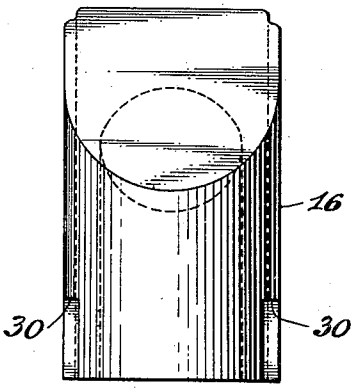
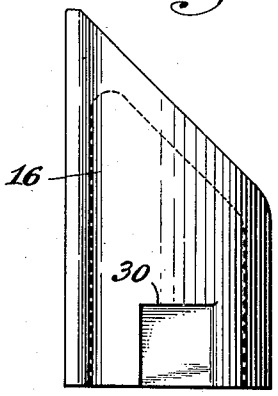


Fig. 6.



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Fig. 7.

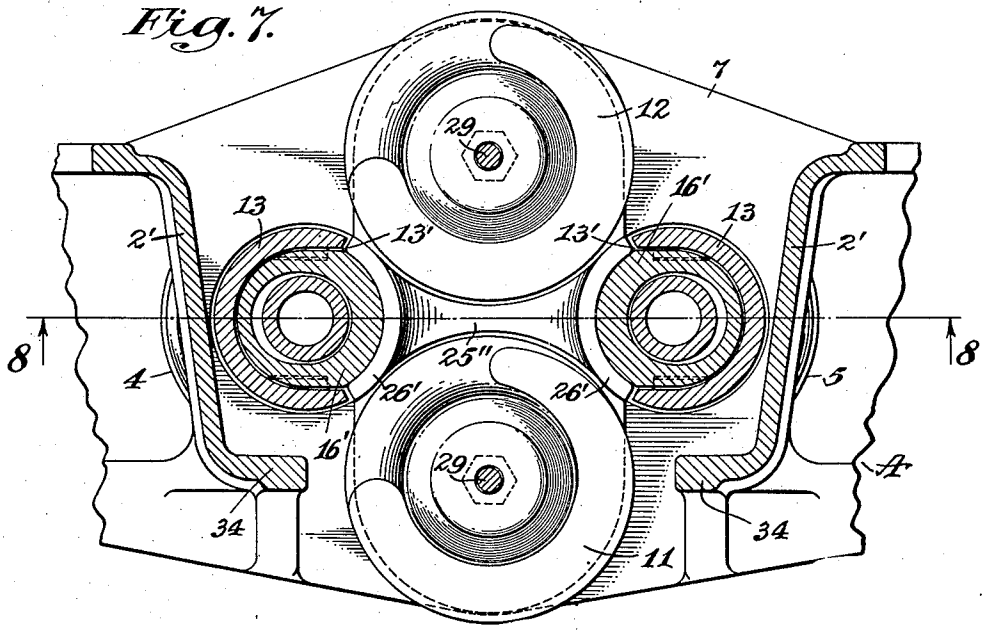
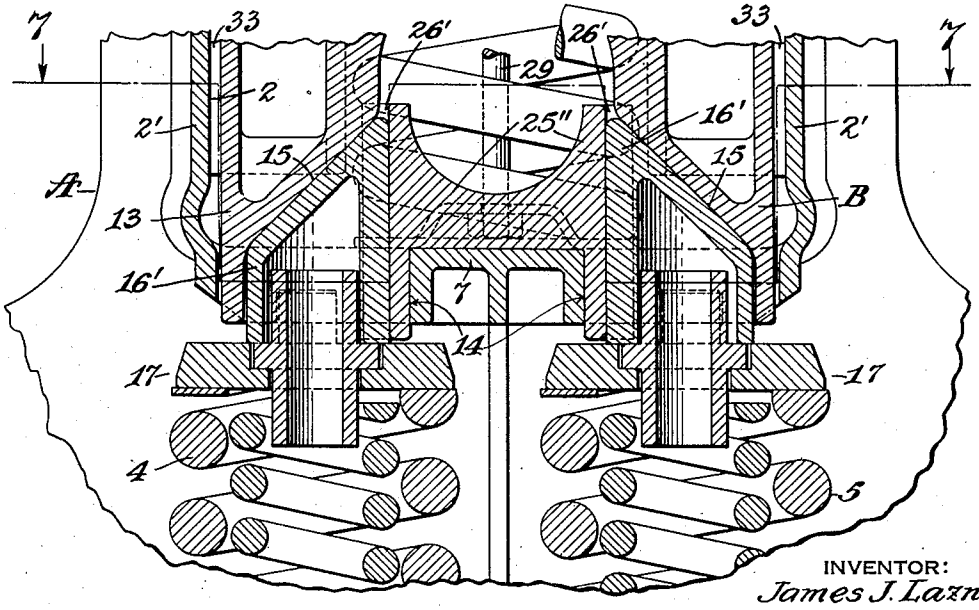


Fig. 8.



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UNITED STATES PATENT OFFICE

2,176,909

CAR TRUCK

James J. Lazna, Shaker Heights, Ohio, assignor to National Malleable and Steel Castings Company, Cleveland, Ohio, a corporation of Ohio

Application March 31, 1934, Serial No. 718,394
Renewed April 13, 1938

29 Claims. (Cl. 105—197)

This invention relates to railway car trucks, and has for an object the provision of novel means for effectively preventing the arising of harmonic vibrations of the bolster supporting springs. In this connection the invention provides means simple in construction and reliable in action for snubbing oscillations of said springs and thus preventing the occurrence of undesirable vibrations. The invention has been developed in conjunction with car trucks of the type shown in the James A. Shafer Patent No. 1,973,664, and is of particular utility with such trucks, enabling the retention of the advantages thereof while at the same time insuring in a novel manner against undesired spring oscillation. A more specific feature of the invention comprises friction shoes associated with the bolster, which shoes extend through openings in a shelf of the side frame and cooperate with springs below the shelf for supporting said bolster. The invention further provides a friction member on said side frame shelf, against which friction member the shoes are wedged by the bolster for generating friction to snub spring oscillations. Another particular feature of the invention resides in provisions for maintaining the bolster, friction shoes, friction member, and upper bolster-supporting springs in assembled relation, whereby these elements may be inserted as a unit into cooperative relation with the side frame. The invention additionally comprises a friction member adapted to cooperate with the shoes aforesaid, and so related to the upper bolster-supporting springs that the latter prevent upward movement with the friction shoes during recoil, and cause the grip of said shoes on said member to be broken. Other features and advantages of the invention will be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a view in side elevation, partly in vertical section, illustrating a portion of a car truck in which an embodiment of my invention is included, said view being taken on line 1—1 of Fig. 2.

Fig. 2 is a view in plan and horizontal section, taken on line 2—2 of Fig. 1.

Fig. 3 is a transverse vertical sectional view on line 3—3 of Fig. 1.

Fig. 4 is a transverse vertical sectional view on line 4—4 of Fig. 1.

Fig. 5 is a detail view in end elevation of one of the friction shoes.

Fig. 6 is a detail side-elevational view of said shoe.

Fig. 7 is a view similar to Fig. 2 but illustrating a modified form of the invention, said view being taken on line 7—7 of Fig. 8.

Fig. 8 is a vertical sectional view on line 8—8 of Fig. 7.

Referring to the drawings, there is shown at A a portion of a side frame of a car truck having a window 2 for the reception of the bolster B. The side frame illustrated is the same as those shown in the Shafer patent above specified; being formed below the window with a portion designated generally by the numeral 3, within which springs 4, 5, are adapted to be seated and housed, said portion 3 comprising a bottom shelf 6, a top flange or shelf 7, and side walls 8, 9. Said side walls are integral with said shelves 6, 7 and also with the side walls 10 of the inclined tension members C. It will, of course, be understood that a similar side frame cooperates with the opposite end of the bolster B; but for purposes of the present invention a consideration of the cooperation between one side frame and the bolster B is sufficient.

As in Patent No. 1,973,664 above mentioned, each end of the bolster B is hollow and receives a pair of springs 11, 12 arranged longitudinally of the bolster. Lugs or projections 13, integral with the bolster, extend downwardly therefrom through openings 14 in the shelf 7. These lugs 13, two of which are provided on each end of the bolster and project through openings in the shelf of the associated side frame, serve to tie the two side frames of the truck together, in the same manner as do the corresponding bolster lugs in the previously mentioned patent. In carrying out my present invention, however, the lugs 13 are not only hollow and open-ended, but are U-shaped or arcuate in cross section, providing an open side or slot 13', as shown in Fig. 2. Also the portion of the bolster at the base of each of said lugs is wedge-shaped as indicated at 15.

Within each lug 13 I mount a friction shoe member 16 having a wedge-shaped upper end for engagement with the corresponding wedge portion of the bolster. Each of said friction shoes 16 extends downwardly through the corresponding lug 13 and beyond the lower end thereof for engagement with a spring cap 17 on the corresponding spring 4 or 5. The spring caps 17 each comprise a main member 18 and a separate stud member 19. Said member 18 rests on top of the spring 4 or 5 and is provided with a hole 20 and a countersunk portion 21. Member 19 projects through hole 20 into the spring 4 or 5 and is provided with a flange 22 which fits into the countersunk portion of member 18. An extension 23

of member 19 projects upwardly into the hollow interior 24 of the associated shoe 16.

Seated on top of the shelf 7 and interposed between the springs 11, 12 is a friction member 25. This member comprises an intermediate web portion 25', curved on its sides to conform to the space between said springs (Fig. 2), and two vertically extending portions 26, 26, the opposite faces of sides of which provide friction surfaces engaged by the respective shoes 16, 16. Said portions 26, 26 are shown projecting downwardly through the holes 14 in the shelf 7 in engagement with the respective shoes aforesaid, the total vertical extent of each portion 26 being substantially that of the friction face of the adjacent shoe.

In addition to the vertical friction portions 26, 26, the member 25 comprises horizontal extensions or plate portions 27, 27, underlying the respective springs 11, 12. Each of said plates or extensions 27, 27 comprises an upwardly extending portion 27' projecting within the corresponding spring and serving to center the latter. Bosses 28, 28 also extend downwardly from the bolster into said springs and assist in the centering thereof. Bolts 29, each extending through a corresponding boss 28 and plate portion 27', maintain the springs 11, 12, and friction member 25, together with its friction portions 26 and spring plate portions 27, in assembled relation to the bolster.

Each shoe 16 may be readily inserted in its corresponding bolster lug 13 by slipping said shoe through the open side 13' of said lug until shoulders 30 on opposite sides of said shoe pass over inwardly extending ledges 31 on said lug 13. The ledges aforesaid, in cooperation with said shoulders, prevent the shoes 16 from dropping through the open ends of the lugs 13. After the shoes aforesaid are in place the assembly of the bolster and associated parts above described may be completed by positioning the springs 11 and 12 in the hollow end of the bolster; inserting the friction member 25 with its web 25' between said springs, its horizontal extensions 27, 27 underlying said springs, and its vertical extensions 26, 26 engaging the opposed faces of the respective shoes 16, 16; and then tying together the aforesaid extensions 27, 27 and the bolster by the bolts 29, 29. The springs, friction member, and friction shoes are now held as a unit in assembled relation to the bolster. The parts in the other end of the bolster, which are duplicates of those above mentioned, are assembled and held in the bolster in like fashion; and the bolster may then be fitted to the side frames by simply blocking up said bolster, slipping each side frame laterally over the corresponding bolster end, and then removing the blocking with consequent lowering of the bolster until the lugs 13 and shoes 16 pass through the holes 14 in the side frame shelves and rest upon the spring caps 17. The bolster is now supported on each side frame both by the upper springs 11, 12 thereof and by the lower springs 4, 5 in cooperation with the shoes 16.

If the bolster now moves downwardly from its normal position shown in Fig. 1, such downward movement is resisted not only by the springs 4, 5, and 11, 12, but also by the friction generated between the shoes 16 and the cooperating faces of the friction member portions 26, said shoes being forced into intimate frictional engagement with said friction faces by the wedge surfaces 15 of the bolster and the cooperating wedge surfaces of said shoes. The friction developed between said shoes and the friction member 25 not only augments the action of the springs in absorbing impacts or shocks applied to the bolster, but also by snubbing the downward movement of the bolster, prevents the arising of harmonic or otherwise undesirable vibrations of the springs. During the recoil of the springs, the shoes 16 are also pressed against the friction surfaces of the member 25 with resultant generation of friction and absorbing of energy, whereby said recoil is dampened. It will be apparent that, if desired, the friction surfaces of the extensions 26, 26 could be tapered inwardly from top to bottom, and the friction shoe surfaces correspondingly tapered, with consequent provision of greater friction during upward movement of the shoes than during their downward movement, though untapered surfaces as illustrated provide a substantial dampening of the spring recoil and also develop greater friction during downward movement of the shoes than would be obtained if they were tapered as mentioned above. If desired, the friction surfaces of member 26, 26 can be tapered outwardly from top to bottom, thus increasing the snubbing action upon downward movement of the bolster.

The extensions 27, 27 of the friction member not only serve to receive the lower ends of the springs 11, 12, but also in cooperation with said springs prevent said friction member from moving upwardly with the shoes 16 during recoil of the bolster-supporting springs. Through the action of the springs 11, 12 on said extensions, the friction member 25 is continuously pressed downwardly against the shelf 7, whereby the grip of the shoes 16 on the friction portions 26, 26 of said friction member during rising of said shoes is broken and said friction member is held against rising with said shoes. Generation of friction between said shoes and friction member for snubbing the spring recoil is thus assured.

It may be noted that during wear of either shoe 16 the latter moves inwardly or laterally in its associated bolster lug 13 permitting the bolster to move downwardly and lowering the retaining ledge 31 in said lug. Said ledge thus does not prevent the shoe from performing its functions during wearing away thereof.

To disassemble the truck for wheel change or other purposes, the usual journal wedges and brasses are withdrawn, and the customary brake hangers disconnected from the hanger brackets 32 on the side frames. The bolster is then raised until the shoes 16 clear the shelf 7, after which the side frames may be readily removed.

The columns 2' of the side frame are shown Z-shaped in cross section and as converging from the inside of said side frame to the outside thereof; and the sides 33, 33 of the end portion of the bolster similarly converge to correspond with the angle of said columns 2'. The lateral lugs 34 of said columns are adapted to be engaged by end portions 35 of the bolster on opposite sides of the spring 11, upon endwise thrust of the bolster, at the same time that the converging sides 33 of said bolster engage the inclined columns aforesaid. This arrangement of side frame columns and bolster contour is the same as that disclosed in Figs. 7, 8, and 9 of the aforesaid Patent No. 1,973,664.

In the embodiment of my invention illustrated in Figs. 1–6 the friction surfaces of the shoes 16 and friction member extensions 26 are shown as extending in straight vertical planes. These surfaces may, however, be curved as shown in

Figs. 7 and 8. In the latter views the parts are the same as those illustrated in Figures 1–6, with the exception that the friction faces of the respective shoes 16' in Figs. 7 and 8 are curved, and the cooperating faces of the vertical extensions 26' of the friction member 25'' are correspondingly curved. Elements in Figs. 7 and 8 corresponding to those in Figs. 1–6 are designated by the same reference numerals, except the shoes 16', friction member 25'' and extensions 26' aforesaid.

It will be apparent that the shoes and friction member of my invention may be readily replaced when necessary. Also it may be noted that through my invention the prevention of undesirable oscillations of the bolster supporting springs is effectively accomplished without sacrifice of the advantages of car trucks of the type disclosed in the previously mentioned patent.

Matter disclosed but not claimed herein is claimed in Patent No. 1,973,664, above specified.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

I claim:

1. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening, spring means on said side frame above and below said shelf for supporting said bolster, friction means, and wedge means on said bolster coacting with said friction means in response to relative movement of said bolster and side frame for snubbing oscillations of said spring means.

2. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening, spring means on said side frame below said shelf for supporting said bolster, friction means on said side frame above said shelf, a portion of said friction means extending through said shelf and into engagement with said spring means, and wedge means coacting with said friction means in response to relative movement of said bolster and side frame for snubbing oscillations of said spring means.

3. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening, spring means on said side frame entirely below said shelf for supporting said bolster, a friction member on said side frame above said shelf, a friction element movable with respect to said member, and wedge means on said bolster for causing said member and element to generate friction in response to relative movement of the bolster and side frame for snubbing oscillations of said spring means.

4. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening, spring means on said side frame entirely above and entirely below said shelf for supporting said bolster, a friction member on said side frame, a friction element movable with respect to said member, and wedge means on said bolster for causing said member and element to generate friction in response to relative movement of the bolster and side frame for snubbing oscillations of said spring means.

5. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening, means projecting from said bolster through an opening in said shelf, spring means on said side frame below said shelf and cooperating with said projecting means for supporting the bolster, a friction member on said side frame above said shelf, and wedge means for forcing said projecting means into frictional engagement with said friction member during movement of said bolster with respect to said side frame.

6. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening, means projecting from said bolster through an opening in said shelf, spring means on said side frame above and below said shelf for supporting the bolster, and friction means cooperating with said projecting means and said side frame for snubbing oscillations of said spring means.

7. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening, said bolster having a wedge portion, an element extending through an opening in said shelf, spring means on said side frame below said shelf and cooperating with said element for supporting said bolster, said element having a wedge portion cooperating with the wedge portion of said bolster, and a friction member on said side frame above said shelf and engaged by said element for snubbing oscillations of said spring means.

8. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening, an extension projecting from said bolster through an opening in said shelf, said extension having a hollow interior and an open side, a member in the interior of said extension and projecting downwardly therethrough and outwardly through the open side thereof, said member having a wedge shaped upper end and the bolster having a wedge portion engaged thereby, spring means below said shelf and cooperating with said member for supporting the bolster, and a friction element on the side frame above said shelf and engaged by said member to generate friction during relative movement of the bolster and side frame for snubbing oscillations of said spring means.

9. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening, extensions on said bolster each having a hollow interior and an open side, a plurality of members each mounted in a corresponding one of said extensions, each of said members projecting downwardly through an opening in the side frame shelf and outwardly through the open side of the corresponding extension, each of said members further having a wedge surface cooperating with a corresponding wedge surface on the bolster, spring means on the side frame beneath said shelf and cooperating with said members for supporting the bolster, and friction means on the side frame above the shelf interposed between and engageable by said members for generating friction during relative movement of the bolster and side frame for snubbing oscillations of said spring means.

10. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening and having extensions projecting through openings in said shelf, each extension having a hollow interior and an open side, a plurality of members each posi-

tioned in a corresponding one of said extensions, each said member extending downwardly through the corresponding extension and outwardly through the open side thereof, each extension having means preventing the corresponding member from dropping out of said extension, spring means on the side frame below said shelf and cooperating with said members for supporting said bolster, friction means on the side frame above said shelf and engageable by said members, and wedge means on the bolster for forcing said members into frictional engagement with said friction means.

11. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening, members extending downwardly through openings in said shelf, spring means on the side frame below said shelf and cooperating with said members for supporting the bolster, a friction element mounted on said shelf and having side portions engaged by said members, and wedge means on the bolster cooperating with said members for forcing the latter into frictional engagement with said friction element.

12. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening, a friction member on said shelf and having extensions, spring means interposed between said extensions and said bolster, means connecting said extensions with said bolster and limiting relative movement therebetween, elements disposed at opposite sides of said friction member and extending through openings in said shelf, spring means on the side frame below the shelf for cooperating with said elements to support the bolster, and wedging means on said bolster cooperating with said elements for forcing the latter into frictional engagement with said friction member.

13. A bolster having a downwardly opening hollow end portion, a pair of coil springs in said hollow end portion, a friction element having extensions underlying said springs and having vertically extending friction surfaces intermediate said springs, and means maintaining said friction element and said springs in vertically assembled relation to said bolster.

14. A bolster having a downwardly opening hollow end portion, a plurality of coil springs in said portion, a friction element having extensions underlying said springs and vertically extending friction surfaces intermediate said springs, and bolts passing through said bolster and said extensions for maintaining said bolster, springs, and extensions in vertically assembled relation to each other.

15. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening and having a hollow end portion, springs above said shelf portion of the side frame and within the hollow end portion of the bolster for supporting said bolster, a friction member seated on said shelf portion, said friction member having extensions underlying said springs and vertically extending friction surfaces intermediate said springs, friction shoes projecting through openings in said shelf, wedge means on said bolster cooperating with said shoes for forcing the latter into engagement with said friction member, and spring means on the side frame below said shelf for cooperating with said friction shoes to support the bolster.

16. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, a bolster extending into said opening, a friction member, friction shoes extending through openings in said shelf, spring means on said side frame below said shelf and cooperating with said shoes for supporting said bolster, wedging means on said bolster for forcing said shoes into frictional engagement with said friction member to snub oscillations of said spring means, and spring means above said shelf for resisting rising of said friction member with said shoes during recoil of the first mentioned spring means.

17. In a car truck, a side frame having a bolster receiving opening with a shelf therebelow, a bolster extending into said opening, spring means on said side frame below said shelf for supporting said bolster, friction shoe means exterior to said spring means and engaging the same, a friction member, wedging means for forcing said friction shoe means into frictional engagement with said friction member to snub oscillations of said spring means, and means resisting rising of said friction member with said friction shoe means during recoil of said spring means.

18. A car truck bolster having a lug depending from an end thereof, said lug having a hollow interior and an open side, and a friction shoe in said lug.

19. A car truck bolster having a hollow lug depending from an end thereof, said lug having an open side and being open at its lower end, a friction shoe in said lug and projecting through said end, and means for preventing said shoe from dropping through said end.

20. A car truck bolster having a lug depending from an end thereof, said lug having a hollow interior and an open side, and a friction shoe in said lug, said bolster having a wedging engagement with said shoe.

21. In a car truck, a side frame having a bolster receiving opening with a shelf therebelow, a bolster extending into said opening, spring means on said side frame below said shelf for supporting said bolster, a friction member above said shelf, friction shoe means engaging said spring means, wedging means for forcing said friction shoe means into frictional engagement with said friction member to snug oscillations of said spring means, and means resisting rising of said friction member upon upward movement of said shoe means during recoil of said spring means.

22. A bolster having a downwardly opening hollow end portion, a plurality of coil springs in said portion, friction shoes within said portion, a friction element having extensions underlying said springs and vertically extending friction surfaces intermediate said springs, and means cooperating with said bolster and said extensions for maintaining said bolster, springs, shoes and friction member in assembled relation to each other.

23. A bolster having a downwardly opening hollow end portion, a plurality of coil springs and friction shoes in said end portion, means on said bolster for maintaining said friction shoes therein, a friction element having extensions underlying said springs and vertically extending friction surfaces intermediate said springs, and means passing through said bolster and said extensions for maintaining said bolster, springs, shoes and friction member in assembled relation to each other.

24. A car truck bolster having a pair of hollow downwardly extending lugs at one end thereof, said lugs being provided with inclined wedge surfaces.

25. A car truck bolster having a pair of hollow downwardly extending lugs at one end thereof, said lugs being provided internally with inclined wedge surfaces.

26. A car truck bolster having a pair of hollow downwardly extending lugs at one end thereof, at least a portion of said lugs being arcuate in cross-section and adapted to internally receive and cooperate with friction shoes.

27. A car truck comprising a side frame having a bolster receiving opening, a bolster, a plurality of spring means for supporting said bolster in said opening, means between said bolster and certain of said spring means for damping oscillations of all of said spring means, said bolster being so constructed and arranged that it may be directly supported on all of said spring means upon removal of said damping means.

28. In a car truck, a side frame having a bolster receiving opening and a shelf therebelow, said shelf having apertures therein, a bolster having an end extending into said opening, said bolster having projections extending downwardly into said apertures for tying said side frame and bolster together, said bolster having wedging means associated therewith, spring means on said side frame above and below said shelf for supporting said bolster, and friction means at least partially supported on said lower spring means cooperating with said wedging means in response to relative movement of said bolster and side frame for snubbing oscillations of said spring means.

29. In a car truck, a side frame having a bolster receiving opening and a hollow spring receiving portion therebelow, a bolster having an end extending into said opening and a depending projection extending into said spring receiving portion, spring means on said side frame for supporting said bolster, a friction member supported by said side frame, another friction member supported by certain of said bolster supporting spring means in frictional engagement with said first named friction member, and wedge means associated with said bolster for actuating said second named friction member to snub oscillations of all of said spring means.

JAMES J. LAZNA.