May 29, 1956 C. L. HEATER ET AL 2,747,519

SNUBBED TRUCK

Filed Nov. 13, 1950 3 Sheets-Sheet 1

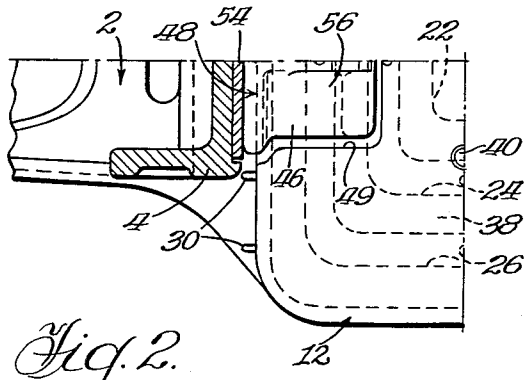


Fig. 2.

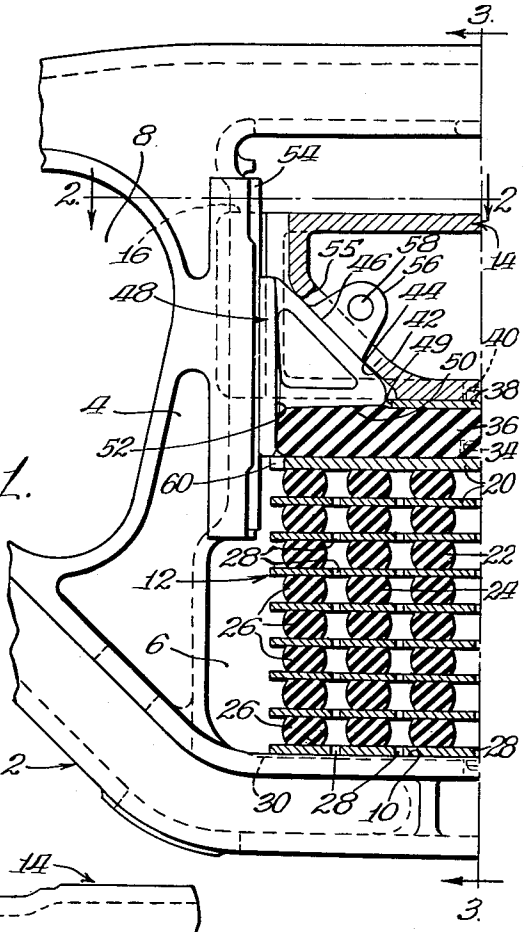


Fig. 1.

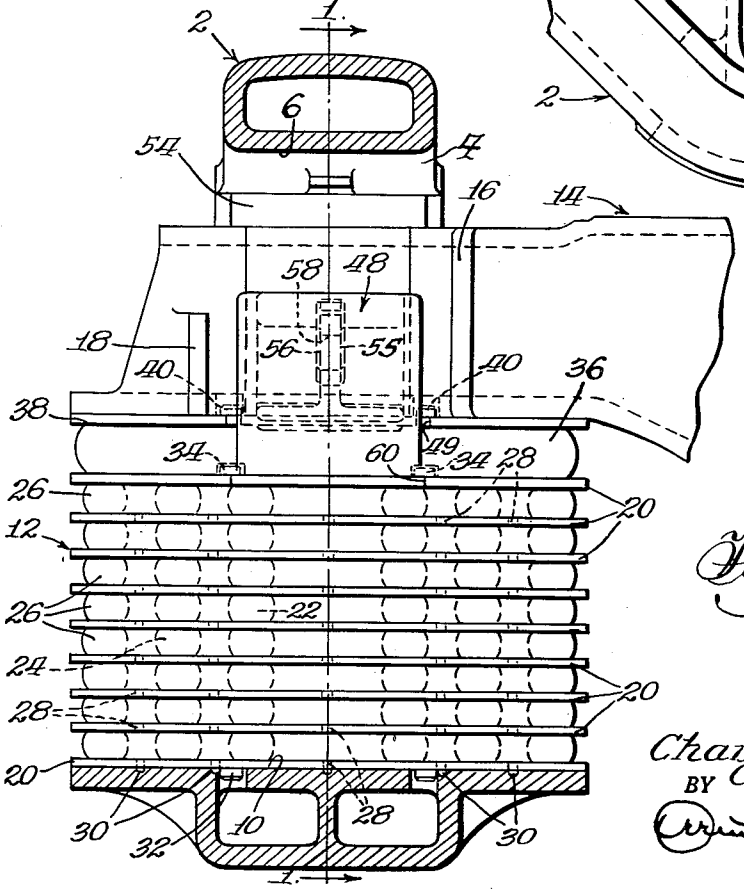


Fig. 3.

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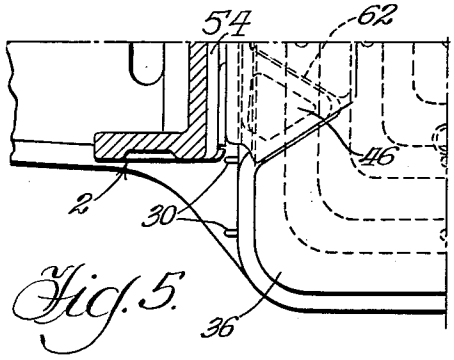


Fig. 5.

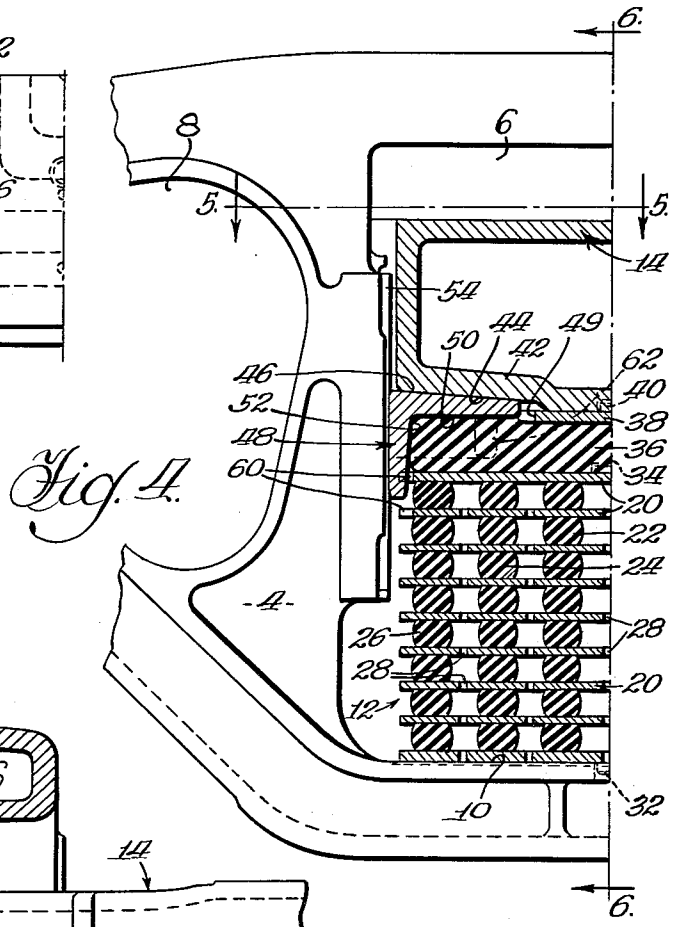


Fig. 4.

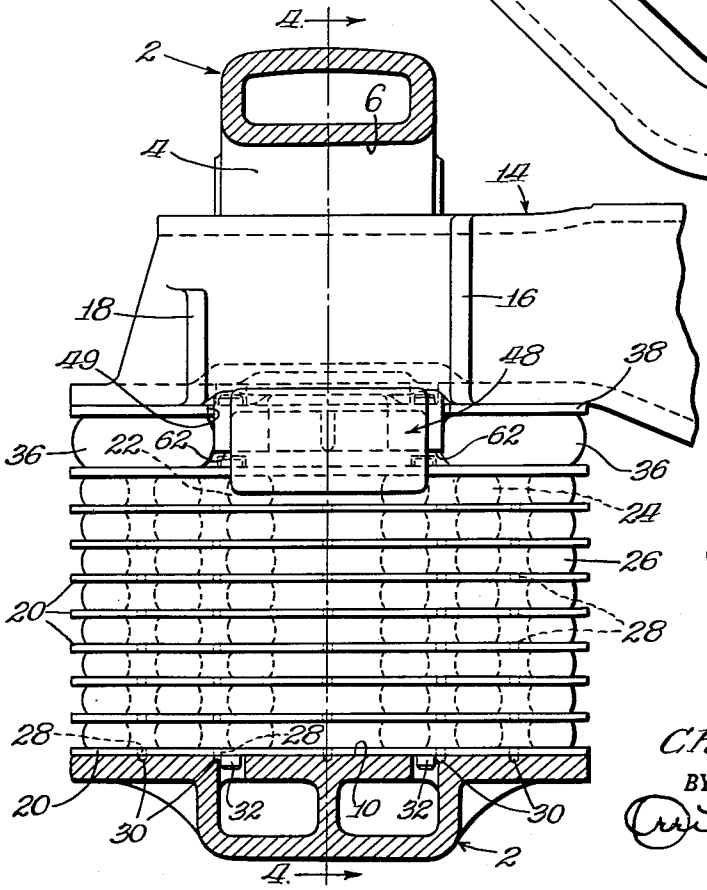


Fig. 6.

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SNUBBED TRUCK

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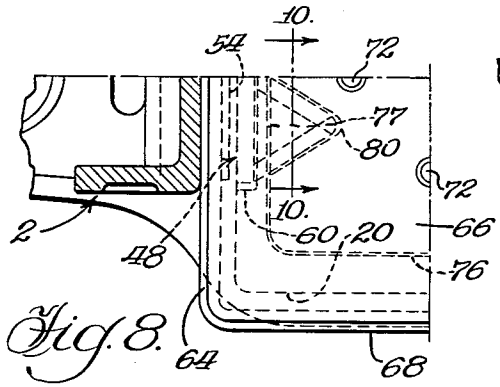


Fig. 8.

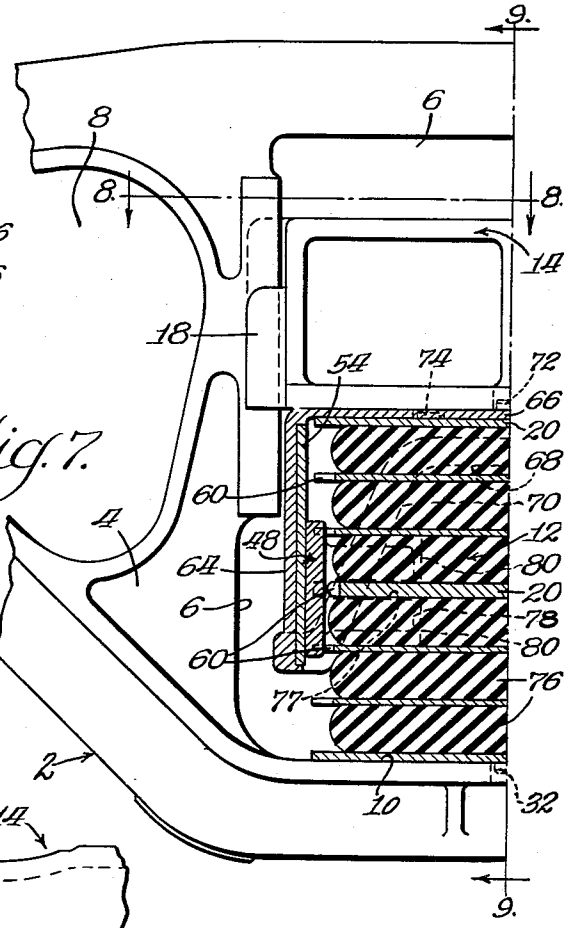
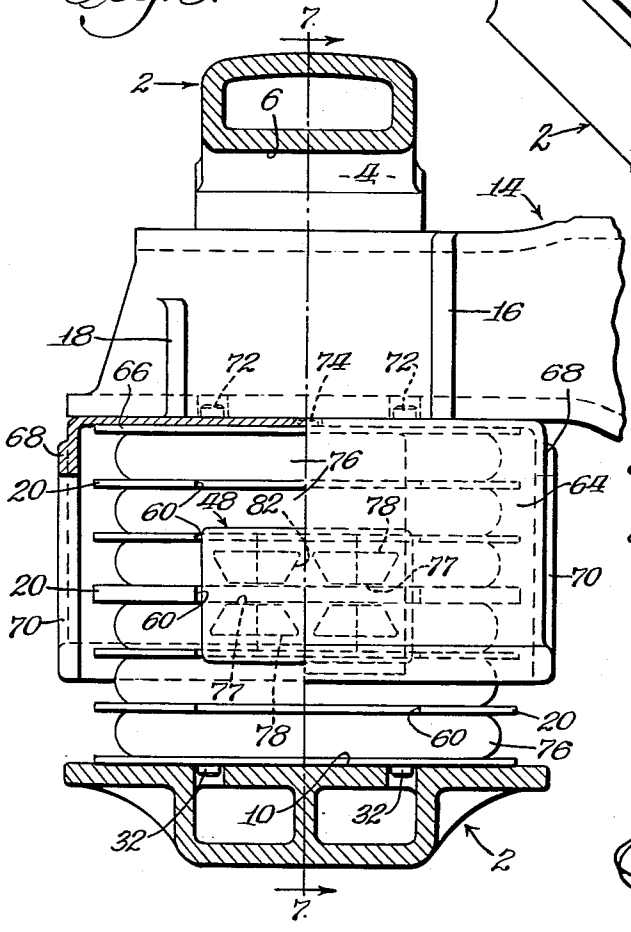


Fig. 7.

Fig. 9.



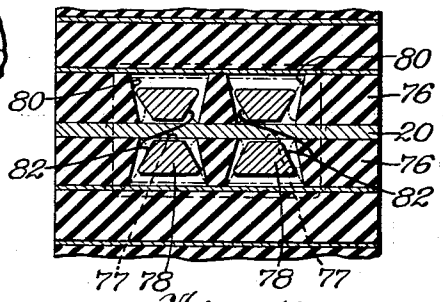


Fig. 10.

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2,747,519

SNUBBED TRUCK

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Application November 13, 1950, Serial No. 195,182

11 Claims. (Cl. 105—197)

This invention relates to railway car trucks, and more particularly to a novel friction damped spring suspension for a truck bolster which extends between the side frames and is adapted to support a railway car body.

A primary object of the invention is to devise a simple and economical resilient support for the ends of the bolster, without the necessity of utilizing the helical springs which are conventionally employed for this purpose.

A more specific object of the invention is to support the bolster by means of resilient units mounted on the side frames and comprising layers of flowable resilient material with spring plates sandwiched therebetween.

Another object of the invention is to devise resilient bolster supporting units, such as above described, comprising means for frictionally damping oscillation of the bolster relative to its supporting side frames.

A further object of the invention is to devise an arrangement wherein one or more of the resilient pads are compressed against converging surfaces on each of a plurality of friction shoes which are thus actuated into frictional engagement with friction surfaces, carried either by the frame or by the resilient unit to thereby damp oscillation of the bolster.

Still another object of the invention is to devise an arrangement, such as above described, wherein the resilient units which support the bolster are afforded maximum capacity within the space limitations of a conventional freight car truck.

The foregoing and other objects and advantages of the invention will become apparent from a consideration of the following specification and the accompanying drawings wherein:

Figure 1 is a fragmentary side elevational view of a freight car truck embodying the invention, portions of the structure being shown in vertical section on line 1—1 of Figure 3;

Figure 2 is a sectional view on line 2—2 of Figure 1 with the bolster removed;

Figure 3 is a sectional view on line 3—3 of Figure 1, with the bolster and its resilient supporting unit shown in elevation;

Figure 4 is a fragmentary side elevational view of a freight car truck embodying a modification of the invention with portions of the structure shown in section on line 4—4 of Figure 6;

Figure 5 is a sectional view on line 5—5 of Figure 4 with the bolster and top spring plate removed;

Figure 6 is a sectional view on line 6—6 of Figure 4, with the bolster and its support means shown in elevation;

Figure 7 is a fragmentary side elevational view of a freight car truck embodying still another modification of the invention, with portions of the structure in vertical section on line 7—7 of Figure 9;

Figure 8 is a sectional view on line 8—8 of Figure 7, with the bolster removed;

Figure 9 is a sectional view on line 9—9 of Figure 7, with portions of the structure shown in elevation for the sake of clarity; and

Figure 10 is a sectional view on line 10—10 of Figure 8.

Describing the invention in detail and referring first to the embodiment illustrated in Figures 1 to 3, the novel truck comprises a conventional side frame 2 having a column 4 adjacent each end thereof partly defining a bolster opening 6 and a window opening 8. It will be understood that the structure as shown in Figure 1 is symmetrical about the line 3—3, and for this reason, only one-half of the bolster and its supporting structure are illustrated.

The frame 2 is provided at the bottom of the bolster opening 6 with a spring seat 10, affording support for a resilient spring unit generally designated 12. The unit 12 is adapted to support a bolster generally designated 14 which, as best seen in Figure 3, is provided at each side thereof with inboard and outboard lugs or gibs 16 and 18, affording slidable interlock in the usual manner with the related side frame column 4.

It will be understood that only one end of the bolster 14 is shown in Figure 3 and that the bolster extends across the truck for support at its opposite end (not shown) by a side frame 3 and resilient unit 12, identical with those shown in Figures 1 to 3.

The unit 12 comprises a plurality of spring plates 20 which may be formed of steel or any other suitable material, and between each pair of plates 20 is sandwiched a plurality of spaced concentric annular pads, designated 22, 24 and 26, respectively. These pads are formed of any flowable material such as rubber and are spaced from each other to accommodate flow of material under the load of the bolster 14. It may also be noted, as best seen in Figure 1, that the plates 20 beneath the top plate are provided with breather openings 28, communicating with grooves 30 (Figure 3) in the seat 10 which are open to the atmosphere to prevent compression of air between the plates 20, under bolster load. The pads 22, 24 and 26 are preferably bonded to the plates 20 to afford a convenient unit for handling during assembly and disassembly of the truck.

As best seen in Figure 3, when the unit 12 is in assembled position, lugs 32 on the bottom plate 20 project into complementary openings of the side frame spring seat 10, and lugs 34 on the top plate 20 project into complementary openings in a thick resilient pad 36, formed of any suitable resilient flowable material, such as rubber, said pad affording a seat for a spring plate 38, supporting the bolster 14 and having positioning lugs 40 recessed in complementary openings in the bottom wall thereof.

The bolster 14 is provided at each side thereof with a diagonal wall 42 sloping upwardly and outwardly toward the related column 4 and having a crowned surface 44, as best seen in Figure 1, seated against a substantially flat diagonal surface 46 of a friction shoe generally designated 48. The shoe 48 is disposed within a recess 49 of the plate 38 and is provided on the bottom thereof with a spring seat surface 50, preferably sloping downwardly and outwardly toward the related column 4. The shoe is also provided on its rear or inner surface beneath the surface 50 with another spring seat surface 52. As best seen in Figure 1, the surfaces 50 and 52 converge toward the column 4, and the surfaces 46 and 50 diverge toward the column 4, whereby the load of the bolster on the friction shoe 48 and compression of the pad 36 against the surfaces 50 and 52, by reason of the bolster load imposed on said pad, urge the shoe 48 into frictional engagement with a wear plate 54, secured in any desired manner as by welding to the column 4.

Referring again to Figure 1, the wall 42 is preferably provided with a slot 55 receiving a lug 56 projecting upwardly from the shoe surface 46, and the lug is provided with an opening 58 for reception of a pin or other key means (not shown) adapted to lock the bolster 14 and

shoe 48 together for convenient handling as a unit during assembly and disassembly of the truck.

It may be noted that the top spring plate 20 is provided with a recess 60 on the edge thereof facing the column 4, whereby during compression of the unit 12, the portion of the friction shoe 48 on which the surface 52 is formed may move vertically through said recess 60.

Referring now to the modification of the invention illustrated in Figures 4 to 6 inclusive, the parts thereof corresponding to those of Figures 1 to 3, are identified by corresponding numerals, and it is noted that this modification is substantially identical with the embodiment previously described, except that the wedge surface 44 of the bolster wall 42 is flat and is disposed at a greater angle with respect to the vertical. Also the portion of the shoe 48 above its wedge surface 46 is eliminated, and the portion of the shoe on which the spring seat surface 52 is formed is of somewhat greater depth than in the previously described embodiment, so that the top two plates 20 are recessed at 60 to accommodate vertical movement of the shoe 48, with respect to the bolster supporting resilient unit 12.

It may also be noted that in the modification of Figures 4 to 6, the shoe 48 is provided at each side thereof with a triangular wedge lug 62 beneath the surface 50 and received within a complementary recess of the pad 36. This arrangement not only interlocks the shoe 48 and pad 36 against relative movement laterally of the truck, but affords additional bearing surface for the pad 36 as the latter is compressed by the bolster 14 to actuate the shoe 48 into frictional engagement with the liner 54 mounted on the column 4.

Referring now to the embodiment of Figures 7 to 10 inclusive, parts thereof corresponding to those of the previously described embodiments are identified by corresponding numerals.

In the modification of Figures 7 to 10, each friction plate 54 is mounted on a depending end wall 64 of a bolster supporting spring plate 66 which is seated on the top plate 20 of the resilient bolster supporting unit 12.

The plate 66 is provided with beaded flanges 68 at the inboard and outboard sides thereof, said flanges being connected to the end walls 64 by gussets 70. The plate 66 is provided with positioning lugs 72 recessed in the bottom wall of the bolster 14, and the top plate 20 is provided with positioning lugs 74 received within complementary openings or holes through the plate 66.

In the embodiment of Figures 7 to 10, the resilient unit 12 comprises solid pads 76 of flowable resilient material, such as rubber, interposed between the spring plates 20 and preferably bonded thereto as by vulcanizing. The center plate 20, as best seen in Figure 7, is thicker than the other plates and is received within slots 77 in a pair of rearwardly tapering substantially triangular wedge lugs 78 formed on the rear surface of each friction shoe 48.

As best seen in Figure 10, the lugs 78 of each shoe are received within openings or recesses 80 in the pads 76 seated against the top and bottom sides of the center plate 20; and each lug 78 is provided with grooves 82 at the inboard and outboard sides thereof, said grooves preferably being V-shaped in vertical cross section and tapering toward the center plate 20, as best seen in Figure 10, to accommodate actuation of the shoes by expansion of the flowable resilient material against the lugs 78 within the slots 80, as shown in phantom lines in that figure.

As will be clearly seen in Figures 7 and 9, all of the plates 20 except the top and bottom plates are provided with recesses 60 for reception of the friction shoe 48 as the resilient unit 12 is compressed during vertical oscillation of the bolster 14 within the bolster opening 6.

We claim:

1. In a friction snubbing device for a railway car truck having a bolster structure moveable within a bolster opening of a frame member; the combination of a composite resilient unit supporting said structure from said frame member, said unit including a plurality of spaced resilient pads of flowable material with spring plates sandwiched therebetween, friction surfaces at opposite sides of said opening, friction shoes engageable with respective surfaces, and operating means for each shoe comprising at least two angularly related surfaces on a resilient pad acting against angularly related surfaces of the shoe for thrusting the shoe against the related friction surface.

2. A friction damping unit for a railway car truck having a bolster within an opening of a frame member; the combination of a resilient member supporting the bolster from the frame member, said resilient member having a plurality of alternately arranged spring plates and resilient pads of material flowable under the load of the bolster, friction surfaces carried by one of the members at opposite sides of the opening, friction shoes engageable with respective surfaces, and actuating means for each shoe comprising angularly related surfaces on at least one of said pads engageable with angularly related surfaces of the shoe for urging it against the related friction surface.

3. A friction damping device for a railway car truck having a bolster structure moveable within a bolster opening of a frame unit; the combination of a resilient unit supporting the bolster structure from the frame unit and comprising a plurality of vertically spaced resilient pads of material flowable under the load of said bolster structure, friction surfaces supported by one of the units at opposite sides of the bolster opening, friction shoes engageable with respective surfaces, and actuating means for each shoe comprising a pair of angularly related surfaces thereon converging toward the related friction surface and engaged by at least one of the pads during compression of the resilient unit by the load of said bolster structure.

4. In a friction damping device, a railway car truck having a bolster structure moveable within a bolster opening of a frame unit; the combination of a resilient unit supporting the structure from the frame unit and comprising a mass of resilient material flowable under the load of the bolster structure, friction surfaces carried by one of the units at opposite sides of the bolster opening, friction shoes engageable with respective surfaces, and actuating means for each shoe comprising a pair of faces thereon, converging toward the related friction surface and engaged with said mass during compression thereof under load of the bolster structure.

5. In a friction damping device for a railway car truck having a bolster structure moveable within an opening of a frame unit; the combination of a resilient unit supporting said structure from said frame unit, said resilient unit comprising a mass of flowable resilient material, a friction surface supported by one of the units at one side of the transverse center line of said opening, and a friction shoe engageable with the surface, said shoe having a pair of faces converging toward the surface and engaged with said material upon compression thereby under the load of the bolster structure.

6. In a friction snubbing device for a railway car truck having a bolster structure within a bolster opening of a frame unit; the combination of a resilient unit supporting the bolster structure from the frame unit and comprising a mass of flowable resilient material, with spaced spring plates interposed between the top and bottom of the mass, friction surfaces supported by one of the units at opposite sides of the resilient unit, friction shoes engageable with respective surfaces, each of said shoes having a pair of faces engageable with the mass and converging toward the related surface, at least one of the plates having recesses facing respective surfaces and generally complementary to the shape of the related shoes, the shoes being receivable within respective recesses during relative movement between the shoes and said one plate,

in response to compression of said resilient unit by the load of said bolster structure.

7. In a friction snubbing device for a railway car truck having a bolster moveable within an opening of a side frame unit; the combination of a resilient unit supporting the bolster and comprising a mass of flowable resilient material, friction surfaces carried by one of the units at opposite sides of the resilient unit, and friction shoes carried by the resilient unit in frictional engagement with respective surfaces, said mass affording a force path between the shoes, between each shoe and the bolster structure, and between each shoe and the frame unit.

8. In a friction snubbing device for a railway car truck having a bolster structure moveable within a bolster opening of a side frame unit; the combination of a resilient unit supporting the bolster structure, friction surfaces disposed in spaced parallel planes carried by the resilient unit at opposite sides thereof, said unit comprising a mass of resilient material flowable under the load of such structure, and friction shoes engageable with respective surfaces and engaged with said mass for actuation thereby upon compression of said resilient unit by the load of said structure.

9. A friction snubbing device for a railway car truck bolster supported by a resilient unit within a bolster opening of a frame unit, said device comprising friction surfaces carried by one of the units at opposite sides of the resilient unit, friction shoes engageable with respective surfaces and vertically spaced horizontal layers of flowable resilient material constituting portions of said resilient unit, a pair of angularly related surfaces on each shoe converging toward the associated friction surface, certain of said layers of flowable resilient material being compressed against said angularly related surfaces on each shoe.

10. In a friction snubbing device for a railway car truck having a bolster structure within a bolster opening of a frame unit; the combination of a resilient unit supporting a bolster from the frame unit and comprising vertically spaced horizontal layers of resilient flowable material, friction surfaces caried by one of the units at opposite sides of the resilient unit, friction shoes engaged with respective surfaces, angularly related surfaces on each shoe, said angularly related surfaces engaging at least one of said vertically spaced layers whereby imposition of a load on said bolster structure compresses said layers between said shoe surfaces, said structure and said frame unit.

11. In a friction snubbing device for a railway car truck having a bolster structure movable within an opening of a side frame unit; the combination of a resilient unit supporting the structure in the side frame unit and comprising a mass of flowable resilient material, a portion of said mass being flowable independently of the other portion of said mass, friction surfaces at opposite sides of said resilient unit, friction shoes having wedge engagement with said bolster structure, angularly related surfaces on each shoe converging on the related friction surface, and means on one of said portions engaging the surfaces on each shoe whereby upon compression of said one portion it urges the shoes into engagement with the related friction surfaces.

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