Oct. 29, 1968 W. D. WALLACE ET AL 3,407,752

RAILWAY TRUCK BOLSTER SNUBBER

Filed March 22, 1966

Fig. 1.

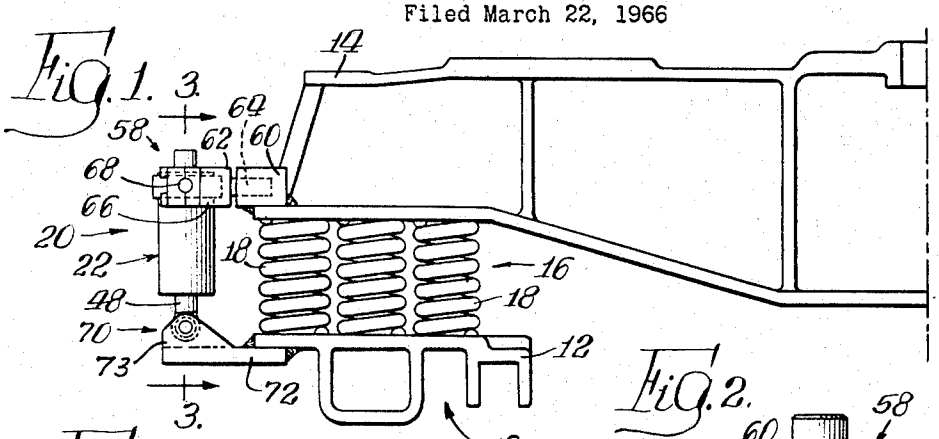


Fig. 2.

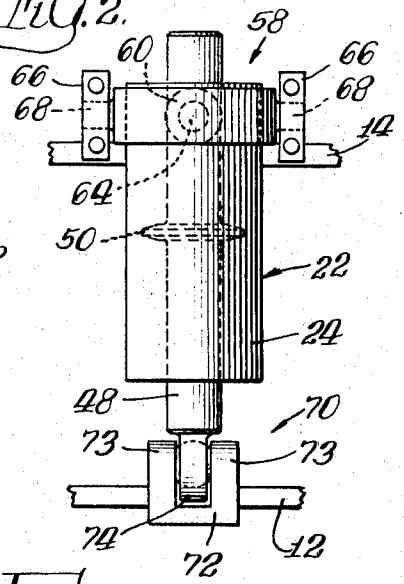


Fig. 3.

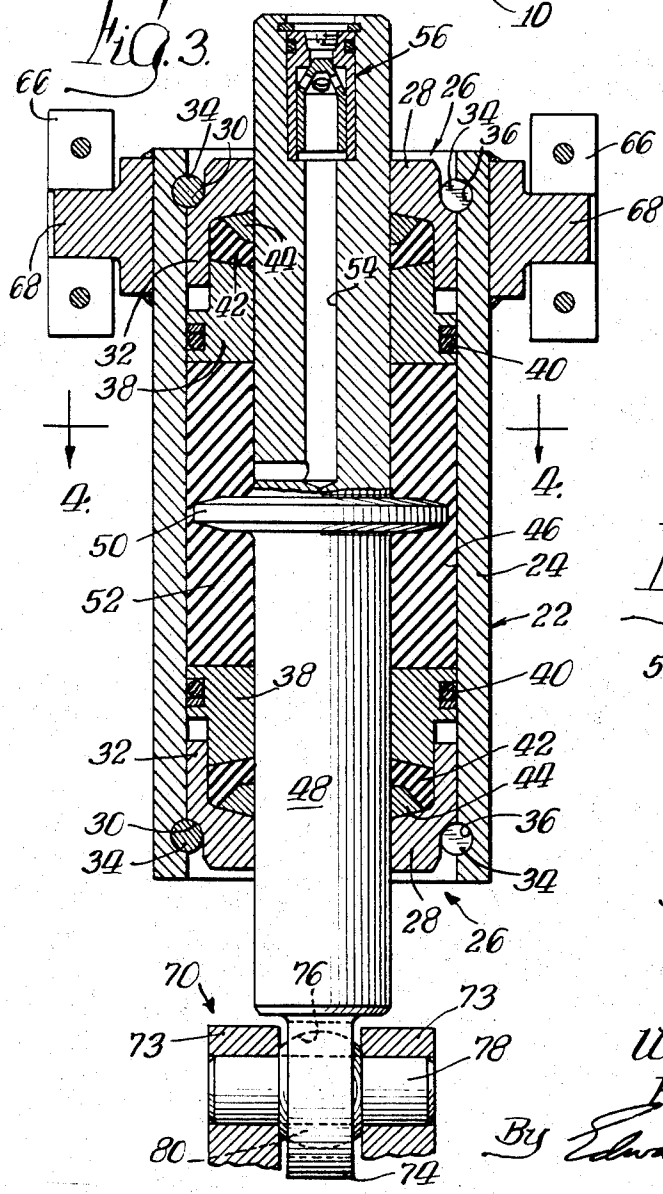
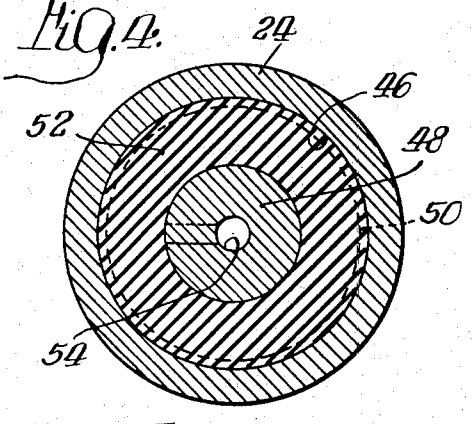


Fig. 4.



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United States Patent Office 3,407,752 Patented Oct. 29, 1968

3,407,752

RAILWAY TRUCK BOLSTER SNUBBER

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Filed Mar. 22, 1966, Ser. No. 536,414
3 Claims. (Cl. 105—197)

ABSTRACT OF THE DISCLOSURE

A snubber assembly mountable between the primary frame and the bolster frame of a railway car, wherein the mounting means accommodates universal movement of the damper relative to the frames, and wherein the snubber comprises a vertically disposed casing filled with a compressible solid and an orificed piston movable therethrough to dampen the oscillations of the bolster frame relative to the primary frame.

Our present invention relates to a snubber assembly adapted to be operatively associated in a railway truck between the primary frame and the secondary or bolster frame thereof.

It is an object of our present invention to provide a snubber assembly, as described, which is comprised of a novel form of damper and novel means for mounting the same between the primary frame and the bolster frame.

It is another object of our present invention to provide a snubber assembly, as described, wherein the damper incorporates a confined compressible solid for producing damping forces.

It is another object of our present invention to provide a snubber assembly, as described, wherein the damper is generally vertically disposed and serves to dampen oscillations of the bolster frame relative to the primary frame in both upward and downward directions.

It is a further object of our present invention to provide a snubber assembly, as described, wherein the mounting means accommodates substantially universal movement of the damper relative to the frames, for example, in planes extending longitudinally and transversely of the primary frame.

It is a still further object of our present invention to provide a snubber assembly, as described, which may be incorporated in a standard railway truck without modification of the spring means that resiliently supports the bolster frame on the primary frame.

Now in order to acquaint those skilled in the art with the manner of constructing and using snubber assemblies in accordance with the principles of our present invention, we shall describe in connection with the accompanying drawing a preferred embodiment of our invention.

In the drawing:

FIGURE 1 is a fragmentary view of a railway truck and a side elevational view of the snubber assembly of our present invention incorporated therewith;

FIGURE 2 is a front elevational view, on an enlarged scale, of the snubber assembly of FIGURE 1;

FIGURE 3 is a generally median sectional view, on a further enlarged scale, of the snubber assembly of FIGURE 1, taken substantially along the line 3—3 in FIGURE 1, looking in the direction indicated by the arrows; and

FIGURE 4 is a transverse sectional view, taken substantially along the line 4—4 in FIGURE 3, looking in the direction indicated by the arrows.

Referring now to FIGURE 1, there is indicated generally by the reference numeral **10** a portion of a standard railway truck which includes a primary frame having

a longitudinally extending side frame element **12**, and a secondary or bolster frame **14** overlying and extending transversely of the primary frame **12**. The bolster frame **14** is resiliently supported at its ends on the primary frame **12** by conventional spring means **16** which may, for example, be in the form of a cluster of coil springs **18**. In accordance with the principles of our present invention, a snubber assembly, indicated generally by the reference numeral **20**, is incorporated between the primary frame **12** and the bolster frame **14**. More specifically, the snubber assembly **20** includes a damper **22** and means for mounting the same between the primary frame **12** and the bolster frame **14**.

As shown in FIGURES 3 and 4, the damper 22 comprises an elongated casing or cylinder **24**. Mounted within the casing **24**, adjacent each end thereof, is a guide and seal assembly **26**. Each assembly **26** comprises an outer piston rod bearing or gland **28** having an outwardly facing annular shoulder **30** and an inwardly extending annular flange portion **32**. The piston rod bearing **28** is restrained against outward movement by means of four ring segments **34** which engage the bearing shoulder **30** and are received in an annular groove **36** in the casing **24**. Slidably mounted in the bearing flange **32** is the reduced end of an inner annular floating sleeve member **38** which carries an O-ring or seal **40** that engages the inner wall of the casing **24**. Interposed between the bearing **28** and the sleeve member **38** within the confines of the flange portion **32** are a seal **42** formed of a soft pliable material such as Teflon impregnated asbestos, and an anti-extrusion ring **44**. The sleeve members **38** of each assembly **26** serve to define with the casing **24** a chamber **46**.

Slidably guided in the piston rod bearings **28** is a piston rod **48** of uniform cross-sectional area. The piston rod **48** extends through the chamber **46**, the sleeve members **38**, the seal **42**, and the anti- extrusion rings **44**. The piston rod **48** is provided, within the chamber **46** with a piston **50**. The periphery of the piston **50** is spaced from the interior of the chamber **46** to define an annular orifice therebetween. For damping purposes, as will be explained hereinafter, the chamber **46** is filled with a compressible solid or elastomer **52** such as silicone rubber. To permit the admission of compressible solid into the chamber **46**, and yet prevent the escape of compressible solid therefrom, we provide passageway means **54** and a check valve **56** in the piston rod **48**. The compressible solid **52** is preloaded to an initial pressure that is sufficient to maintain a positive force on both sides of the piston **50** at all times. Also, the compressible solid **52** imposes a pressure on the sleeve members **38** whereby the seals **52** and anti-extrusion rings **44** are maintained in sealing engagement with the adjacent peripheries of the piston rod **48**.

The damper **22** is normally vertically disposed as shown in FIGURES 1, 2 and 3, and the upper end of the casing **24** is adapted to be mounted to the bolster frame **14** by first mounting means indicated generally by the reference numeral **58**. The first mounting means **58** comprises first bracket means **60** suitably secured, as by welding, to the bolster **14**, and a yoke member **62** having a shank **64** rotatable in the first bracket means **60** about an axis extending transversely of the primary frame **12**. The yoke member **62** has bifurcated arms **66**, and opposed trunnions **68**, which are suitably secured to the casing **24**, are rotatable in the bifurcated arms **66** about an axis extending longitudinally of the primary frame **12**.

The lower end of the piston rod **48** is mounted to the primary frame **12** by second mounting means indicated generally by the reference numeral **70**. The second mounting means **70** comprises second bracket means **72** suitably secured, as by welding, to the primary frame **12**.

The bracket means **72** includes a pair of upstanding longitudinally spaced flanges **73**. The lower reduced end **74** of the piston rod **48** is formed with an open-sided spherical socket **76**. A shaft **78**, which is rotatable in the second bracket means **72** about an axis extending longitudinally of the primary frame **12**, is formed with a central spherical section **80** that is seated in the spherical socket **76**.

The snubber assembly **20** operates as follows. Upon impact of the damper **22** in either direction resulting from relative vertical movement between the primary frame **12** and the bolster **14**, the piston rod **48** and piston **50** are caused to move axially within the chamber **46** and relative to the casing **24**. During such movement, the piston **50** is forced through the compressible solid **52** while the latter is metered through the orifice surrounding the piston **50**. As a consequence, the compressible solid **52** produces a damping force on the piston and the piston rod whereby to dampen relative vertical oscillations between the primary frame **12** and the bolster **14**. The elements of the damper **22** are returned to, and normally maintained in, the neutral position shown in the drawing by the spring means **16**.

Our described snubber assembly **20** is velocity sensitive and dampens oscillations in both upward and downward directions. The degree of dampening required in a particular installation is determined by the mass of the railway car and the characteristics of the spring means **16**, and the amount of dampening afforded by the assembly **20** is a function of the area of the orifice surrounding the piston **50**. Additionally, by reason of provision of the novel first and second mounting means **58** and **70**, which include pivotal connections as described, substantially universal rocking movement of the damper **22** relative to the frame **12** and **14** is accommodated. Thus, the damper **22** has freedom of motion, for example, in planes extending longitudinally and transversely of the primary frame **12**. Still further, our snubber assembly **20** is adapted to be incorporated in a standard railway truck, and does not require any modification of the conventional spring means **16**. Also, because a confined compressible solid is used in the damper to produce damping forces, the assembly **20** requires minimum maintenance and has a long service life. Finally, as will be appreciated, a snubber assembly **20** may be mounted at each end of the bolster **14**.

While we have shown and described what we believe to be a preferred embodiment of our present invention, it will be understood by those skilled in the art that various rearrangements and modifications may be made therein without departing from the spirit and scope of our invention.

We claim:

1. In combination with a railway truck having a primary frame, a bolster frame overlying and extending transversely of the primary frame, and coil spring means disposed between said frames for resiliently supporting said bolster frame on said primary frame, a damper operably connected between said frames for damping generally vertical oscillations therebetween, said damper comprising a vertically disposed cylinder, piston rod guide means sealingly mounted in each end of said cylinder and defining a chamber therebetween, a double-ended piston rod of uniform diameter extending through said cylinder and both of said piston rod guide means and having an axially orificed piston on the portion thereof disposed in said chamber, and a compressible solid filling said chamber for providing a damping force on any relative axial movement between said cylinder and said piston and piston rod, first means for connecting the upper end of said damper to said bolster frame comprising a yoke member having a shank portion operably connected to said bolster frame for rotation about a horizontal axis extending transversely of said primary frame and having a pair of spaced arms provided with a pair of aligned bores, and a pair of diametrically opposite radially extending trunnions provided on the upper end of said cylinder and mounted in said aligned bores provided in said spaced arms of said yoke member for rotation about a horizontal axis extending longitudinally of said primary frame, and second means for operably connecting the lower end of said damper to said primary frame comprising a spherical socket formed in the lower end of said piston rod, and a shaft mounted on said primary frame for rotation about a horizontal axis extending longitudinally of said primary frame and having a spherical section seated in said spherical socket in the lower end of said piston rod, said first and second damper connecting means accommodating relative movement between said primary and bolster frames other than pure vertical movement.

2. The combination of claim **1** wherein each of said damper piston rod guide means comprises a piston rod guide bearing mounted in an end of said cylinder and having an annular recess formed on its inner face adjacent said piston rod, seal means disposed in said recess and about said piston rod, and a floating sleeve member disposed about said piston rod inwardly of said piston rod guide bearing and having a portion in sealing engagement with the inner surface of said cylinder and a reduced-in-diameter portion slidably receivable in said bearing recess for exerting sealing pressure on said seal means disposed therein.

3. The combination of claim **1** wherein the upper end portion of said piston rod is provided with passage means extending into said chamber and including check valve means whereby to facilitate filling said chamber with said compressible solid.

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