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2,697,406

SNUBBED TRUCK

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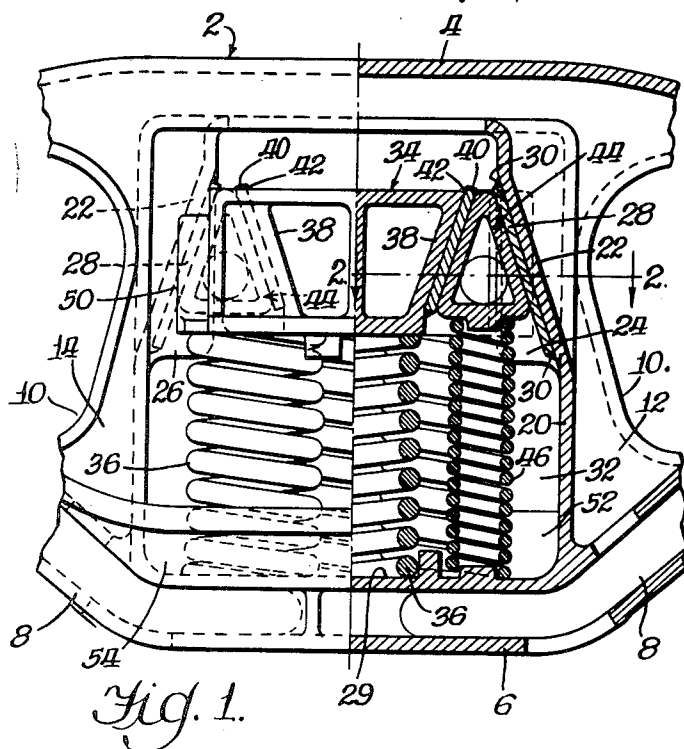


Fig. 1.

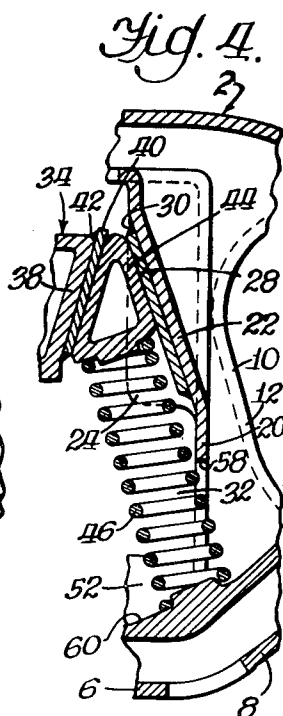


Fig. 4.

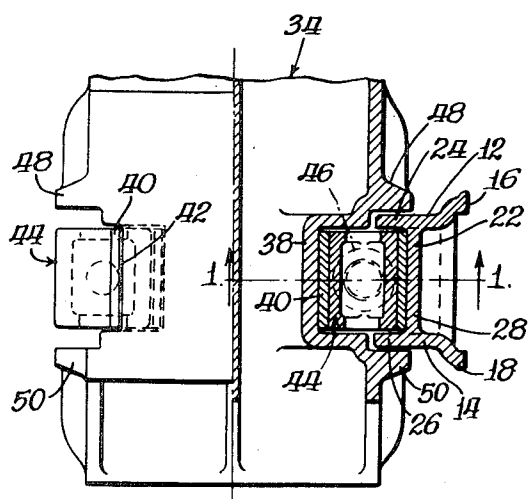


Fig. 2.

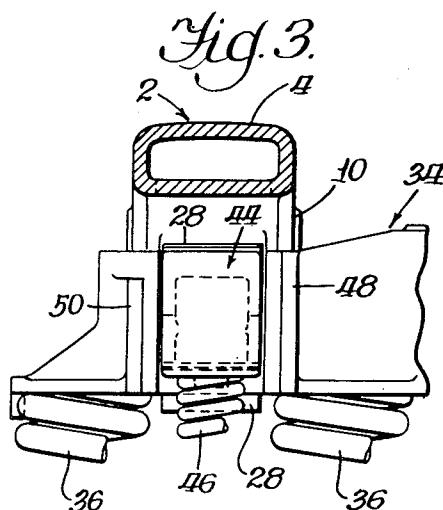


Fig. 3.

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1

2,697,406

SNUBBED TRUCK

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6 Claims. (Cl. 105—197)

This invention relates to railway car trucks and more particularly to a novel bolster snubbed truck wherein friction means are provided to damp various oscillations of the load-carrying bolster relative to its supporting frame structure.

In prior art arrangements bolster damped trucks have been classified into two principal types, one in which the damping friction is proportional to the bolster load, and the other in which such friction is substantially constant.

In prior art trucks wherein the damping friction is proportional to the load on the bolster, the springs which actuate the friction means also carry at least a portion of the bolster load as, for example, in the arrangements disclosed by Goodwin Patents 2,053,989 and 2,053,991.

On the other hand, in prior art trucks wherein the damping friction is substantially constant, the friction means are actuated by springs which are entirely independent of the bolster load as, for example, in the arrangement disclosed by Light Patent 2,378,414.

A primary object of the present invention is to devise a bolster damped truck wherein the springs which energize the friction means also carry at least a part of the bolster load and wherein a considerably better approximation to a constant damping friction action can be obtained in a given amount of space as compared with prior art arrangements.

A further object of the invention is to decrease the amount of bolster load imposed upon the springs which energize the friction means.

Another object of the invention is to increase the heat dissipating effectiveness of the friction means by developing friction substantially equally along bolster and side frame surfaces.

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 side view of a railway freight car truck embodying the invention, the left half of the structure being shown in elevation and the right half being shown in section on the line 1—1 of Figure 2;

Figure 2 is a fragmentary top view of the structure shown in Figure 1, the left half of Figure 2 being a top plan view of the bolster and associated friction means, and the right half of this figure being a sectional view through the bolster and side frame taken on the line 2—2 of Figure 1;

Figure 3 is a side elevational view of the bolster and associated friction means with the side frame shown in section along its transverse vertical center plane, and

Figure 4 is a fragmentary sectional view corresponding to the right half of Figure 1 and illustrating a modification of the invention.

Describing the invention in detail and referring first to the embodiment illustrated in Figures 1 to 3, the side frame generally designated 2 comprises a compression member 4 and a tension member 6 having portions 8 sloping upwardly toward each end of the truck and merging with columns 10. Each column, as best seen in the right half of Figures 1 and 2, comprises inboard and outboard webs 12 and 14 having flared portions 16 and 18, respectively. The walls 12 and 14 are connected by a transverse wall or web 20 which extends vertically along the inner edges of the walls 12 and 14 and merges with a diagonal transverse web or panel 22. The web 22 merges with inboard and outboard extensions 24 and 26,

2

respectively, of the walls 12 and 14, and the web 22 is provided on its inner surface with a transverse friction plate 28 which may be secured in any desired manner as, for example, by welds 30 or may be integral with the web 22.

The columns 10 define a bolster opening 32 therebetween for the reception of a bolster, generally designated 34, which is directly supported by a plurality of load-carrying springs 36 seated in the usual manner on a spring seat 29 of the tension member 6. The bolster 34 is preferably a one piece structure and is provided with oppositely sloping downwardly converging side walls 38 having friction plates 40 secured thereto as by welding at 42 or, if desired, formed integral therewith.

The friction plates 28 and 40, as best seen in Figure 1, are arranged approximately at equal angles with respect to the vertical and are engaged with complementary sloping surfaces of a friction shoe, generally designated 44, supported by one or more auxiliary springs 46 carried by the tension member spring seat 29.

It will be noted that the springs 36 support the bolster 34 directly, that is, without the interposition of a friction mechanism therebetween; and the springs 46 support the bolster 34 indirectly through the friction shoes 44. The springs 36 and 46 are illustrated as conventional helical springs, however, it will be understood that they may be of any desired construction. In the preferred embodiment as illustrated in Figure 1, each spring 46 is seated against the spring seat 29 and against the related shoe 44 along substantially horizontal areas thereof.

Each web 22 and the merging extensions 24 and 26 of the walls 12 and 14 form a pocket or cavity partially housing the related friction shoe 44, as best seen in the right half of Figures 1 and 2; and these extensions also cooperate with inboard and outboard bolster gibs 48 and 50 to limit relative movement of the bolster 34 laterally of the truck and to limit out of square movement between the bolster 34 and side frame 2.

As best seen in Figure 3, the bolster 34 is supported at each end thereof by the springs 36 and 46 associated with a side frame 2; and, although fragmentarily shown in this figure, the opposite end (not shown) of the bolster is supported by another side frame in the same manner as that illustrated in Figure 3. It may also be noted in this figure that the outboard gibs 50 of the bolster are of reduced depth corresponding to the depth of clearance between the wall extensions 24 and 26 and the underlying inboard and outboard tension member flanges 52 and 54 (Figure 1) which confine and position the main bolster supporting springs 36 in well known manner.

Thus it will be understood that the bolster 34 may be disassembled from the side frame 2 by elevating the bolster to the top of the bolster opening 32 and removing the springs 36 and 46 and the shoes 44, whereupon the bolster 34 may be lowered to the bottom of the bolster opening 32, whereupon the lugs 50 may freely pass beneath the lower edges of the web extensions 24 and 26 and above the upper edge of the inboard spring positioning flange 52, as the side frame 2 is removed from the end of the bolster, to accommodate quick wheel change.

It has been discovered, according to the present invention, that the novel arrangement of the friction plates 28 and 40 at approximately equal angles to the vertical and converging upwardly, in combination with friction shoes 44 engaging said plates and urged thereagainst by springs 46, provides an arrangement in which a better approximation to constant frictional control of bolster oscillations is afforded than by any prior art arrangement in which a portion of the bolster load is carried by the friction actuating springs.

It may also be noted that the novel arrangement of friction surfaces not only reduces bolster load on the springs 46 but also develops friction approximately equally along the plates 28 and 40 and the contacting surfaces of the shoes 44, thereby increasing the heat dissipating effectiveness of the damping means for the bolster 34, and reducing wear.

Furthermore, the novel construction of the side frame 2 not only accommodates quick wheel change in which

3

the bolster 34 is removed from the bottom of the bolster opening 32, as above described, but also affords an unusually compact and sturdy column construction which is of approximately H section as shown in the right half of Figure 2.

Referring now to Figure 4, a modification of the invention is shown wherein each shoe actuating spring 46 is arranged diagonally so that its compressional axis is approximately parallel to the friction surface of the related column plate 28. In this embodiment of the invention, parts corresponding to those of the previously described embodiment are identified by corresponding numerals, and it will be understood that the embodiment of Figure 4 is identical to that previously described except for the diagonal arrangement of the spring 46 and an opening 58 in the column web 20 to accommodate reception of the lower end of the spring 46 within the column 10. Also, the sloping portion 8 of the tension member 6 is provided with a diagonal spring seat 60 for the lower end of the spring 46.

In each of the disclosed embodiments, the bolster and friction shoes move vertically at equal frequencies but at different amplitudes, and the springs 46 which actuate the friction shoes are compressed and released at a different rate than the springs 36 which support the bolster independently of the friction shoes.

We claim:

1. A railway car truck comprising a frame structure, a plurality of springs carried thereby, a bolster, friction shoes carried by certain of said springs, each of said shoes engaging the bolster and structure along upwardly converging surfaces arranged at substantially equal angles to the vertical, said shoes being disposed at opposite sides of the bolster, whereby said bolster is supported indirectly by said certain springs, said bolster being directly supported by the other of said springs, said certain springs being the sole means for urging said shoes against the related surfaces, whereby downward vertical movement of said bolster is frictionally resisted by substantially equal movement of each shoe along both of the related surfaces.

2. A railway car truck, according to claim 1, wherein said certain springs are engaged with substantially horizontal areas of the shoes and frame structure, respectively.

3. A railway car truck, according to claim 1, wherein said certain springs are arranged with their compressional axes approximately parallel to the related surfaces of the frame structure.

4. A railway car truck comprising a frame structure, a bolster structure, a plurality of springs supported by said frame structure and directly supporting said bolster structure, said frame structure having columns at opposite sides of said bolster structure, shoes at opposite sides of the bolster structure, respectively, each shoe engaging

4

the bolster structure and one of said columns along upwardly converging surfaces, respectively, said last mentioned surfaces being arranged at approximately equal angles with respect to the vertical, and spring means supported by said frame structure for urging said shoes into engagement with said surfaces, said spring means being the sole means for actuating said shoes, whereby downward vertical movement of said bolster structure is frictionally resisted by substantially equal movement of each shoe along both of the related surfaces.

5. A railway car truck comprising a frame structure, a bolster structure, a plurality of springs supported by the frame structure and supporting said bolster structure for compression and release thereby at a certain rate, said frame structure having columns at opposite sides of the bolster structure, shoes at opposite sides of the bolster structure, respectively, each shoe engaging the bolster structure and one of said columns along upwardly converging surfaces of the column and bolster structure, respectively, arranged at approximately equal angles to the vertical, other springs supported by substantially horizontal areas of said frame structure and engaged with downwardly facing substantially horizontal areas of the shoes for compression and release thereby at another rate during vertical oscillations of the bolster structure, said other springs being the sole means for urging the shoes against the related surfaces.

6. A railway car truck comprising a frame structure, a bolster structure, springs supported by said frame structure and resiliently supporting said bolster structure for vertical oscillation at certain frequencies and amplitudes, friction shoes at opposite sides of the bolster structure, each shoe engaging both structures along upwardly converging surfaces thereof, respectively, arranged at approximately equal angles to the vertical, and other springs carried by the frame structure and supporting said shoes in engagement with said surfaces, said other springs being the sole means for urging the shoes against the surfaces whereby the shoes oscillate vertically with the bolster structure at said frequencies but at different vertical amplitudes, downward vertical movement of said bolster structure being frictionally resisted by movement of each shoe equally along both of the related surfaces.

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