Feb. 14, 1950 C. P. LEESE 2,497,460

STABILIZED LATERAL MOTION TRUCK FOR RAILWAY CARS

Filed Nov. 6, 1946 2 Sheets-Sheet 1

Fig. 1.

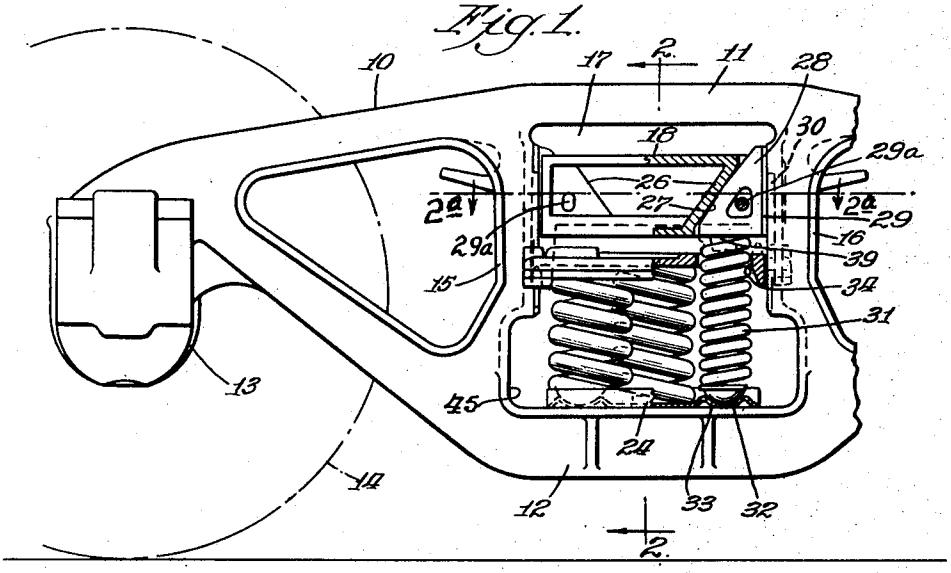


Fig. 2.

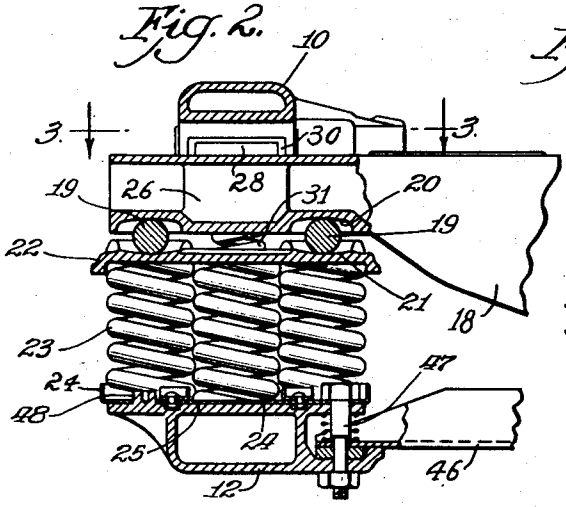
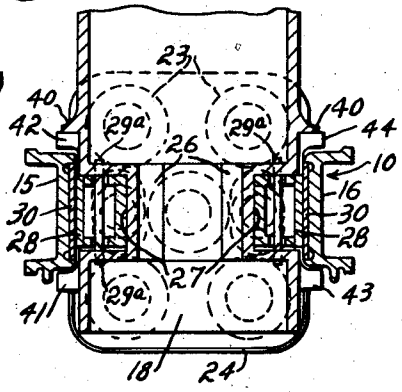


Fig. 2a



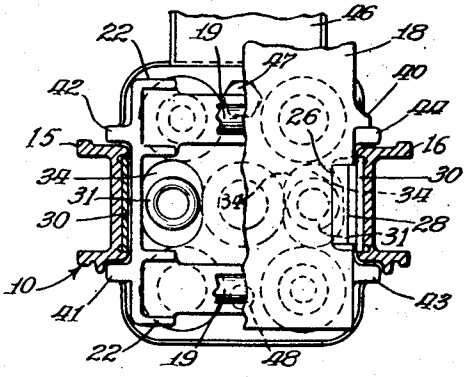


Fig. 3.

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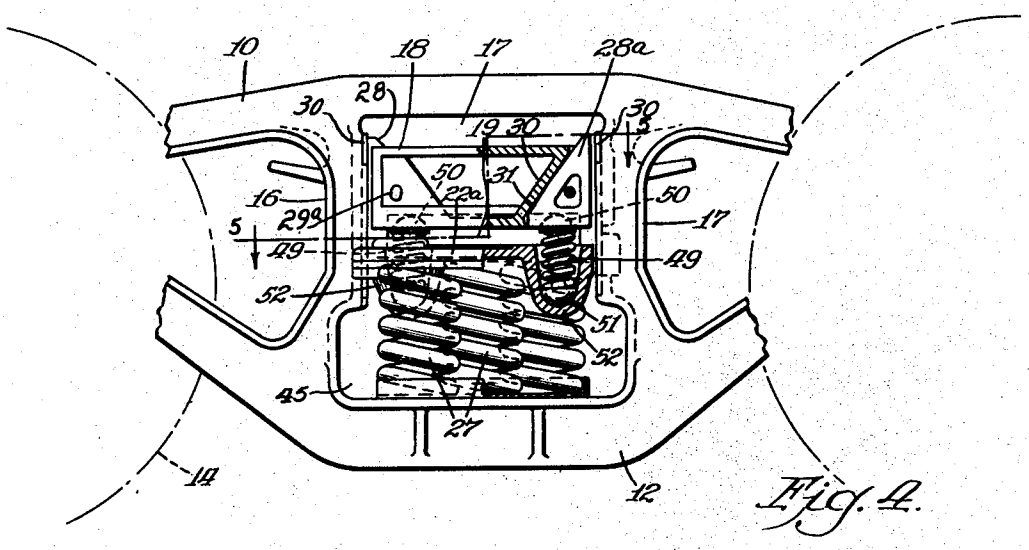


Fig. 4.

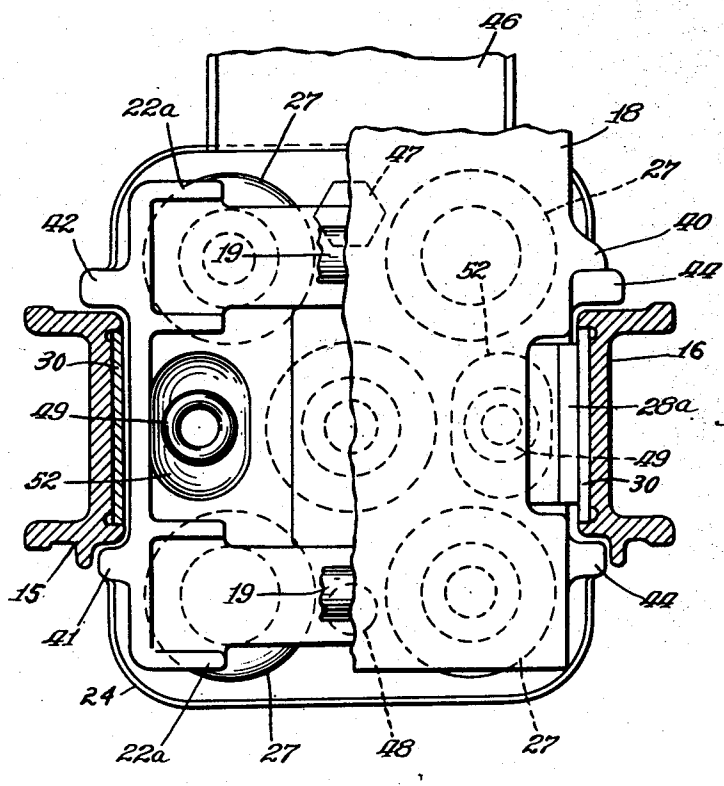


Fig. 5.

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UNITED STATES PATENT OFFICE

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STABILIZED LATERAL MOTION TRUCK FOR RAILWAY CARS

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Application November 6, 1946, Serial No. 708,132

8 Claims. (Cl. 105—186)

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This invention relates to improvements in railway car trucks and has to do more especially with that type of truck wherein the bolster is so mounted as to permit limited movement thereof laterally of the truck side frames.

A principal object of the invention is to provide novel and improved arrangements for damping both the vertical and the lateral movements of the bolster relative to the side frames of the truck.

Another object of the invention is to provide in a truck of the above-indicated type improved arrangements and constructions whereby the bolster may be supported at opposite ends on rollers for movement transversely of the truck side frames and in which friction wedges are interposed between the bolster and the truck side frames so as to move with the bolster and press against the side frame.

Another object is to provide, in a truck of the above type having roller means for supporting the opposite ends of the bolster, improved arrangements and constructions whereby spring pressed friction wedges may be interposed between the bolster and adjacent portions of the truck side frame for damping the vertical oscillatory movements of the bolster.

Another object is to provide in a lateral motion truck of the above construction in which the wedges engage inclined wedging faces of the bolster and cooperate with stabilizing springs whereby the drag of the shoe as an incident to the resilient pressure exerted thereon increases the frictional function of the shoe when the bolster moves in one direction.

A further object contemplated by the invention is the provision of arrangements whereby the resilient force exerted on the friction wedges may be either constant or may progressively increase in relation to the extent of movement of the bolster.

The invention is illustrated in two specific embodiments in the accompanying drawings, wherein:

Fig. 1 is a fragmentary view, mainly in side elevation, but partly in section, of a railway car truck embodying one form of the invention.

Fig. 2 is a transverse section, partly in elevation, taken at line 2—2 of Fig. 1.

Fig. 2a is a fragmentary horizontal section taken on line 2a—2a of Fig. 1.

Fig. 3 is a fragmentary detail view taken at line 3—3 of Fig. 2.

Fig. 4 is a fragmentary view, mainly in elevation, but partly in section, of a railway car truck,

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illustrating a modified form of the invention; and

Fig. 5 is an enlarged detail view taken at line 5—5 of Fig. 4.

Referring first to Figs. 1 to 3 inclusive, the truck construction therein illustrated comprises a pair of cast steel frames 10, of which one only is shown. Each frame is of truss construction, having a top chord or compression member 11 and a bottom chord or tension member 12. At each extremity of each frame 10 there is formed a journal box 13. One of the truck wheels is outlined in dot-dash lines a 14.

Interconnecting upper and lower frame members 11 and 12 are two columns 15 and 16, respectively, constituting integral parts of the frame casting; and these are spaced apart horizontally to provide a window opening 17, of approximately rectangular form, through which the bolster 18 extends.

The bolster 18 is preferably of box-like cross-section and rests at each end on a plurality of hardened steel rollers 19 which operate in pockets 20 formed in the bottom surface of the bolster as shown in Fig. 2. The said rollers 19 are seated in similar recesses 21 formed in the top surface of a bearing plate 22, the latter of which is supported on a group of heavy coil springs 23. The lower ends of the load springs 23 rest on a spring centering plate 24 which, in turn, is mounted on the upper surface 25 of the lower chord 12 of the frame 10.

Each end of the bolster is provided with a recess at either side, which is defined by inclined walls 26 having outer inclined surfaces 27; and each recess is proportioned to receive a triangular wedge member 28 having an inclined surface complementary to surface 27 and engaged therewith. The vertical outer face 29 of each wedge bears against the adjacent surface of a wearing plate 30 which is welded or otherwise secured to the inner face of its associated columns 15 or 16. Each wedge is retained in its recess by a cotter pin 29a and is supported individually on a resilient element, preferably a spring 31 which seats on the lower chord of the truck side frame. The lower end of each spring 31 is provided with a hemispherical adapter 32 by means of which it is pivotally seated in a complementary hemispherical cup 33 formed in the spring centering plate 24. The stabilizing springs 31—31 at each end of the bolster pass through oval-shaped openings 34—34 as shown best in Fig. 3 of the drawings and are centered at their upper ends by means of bosses 39—39 forming integral parts of

wedges 28—28 and projecting downwardly therefrom into the bore of the springs.

By virtue of the ball-and-socket support at the lower end of each spring 31—31, the latter are free to rock pivotally about their lower ends in response to movements of the bolster laterally of the truck and thereby avoid undue lateral bending of the springs. The wedges move with the bolster during its vertical movements relative to the side frames of the truck and during the movements of the bolster on the rollers 19 in directions laterally of the side frames. Consequently, the pressure exerted by the springs 31—31 against the wedges 28—28 force the wedges against the wearing surfaces 30—30 of the truck frames. This wedging pressure provides friction which, in addition to damping the vertical movements of the bolster relative to the side frames of the truck, also resist lengthwise movement of the bolster laterally of the side frames of the truck.

It will be observed that the compression of springs 31—31 during the downward movement of the bolster, progressively increases the frictional pressure of the wedges against the inner faces of the columns 15 and 16 of the truck side frames.

The movement of the bolster transversely of the side frames in addition to being restrained by the frictional bearing of the wedges 28—28 against the wearing plates 30—30, is limited by abutment lugs 40—40 at opposite ends of the bolster adapted to engage inner faces of the truck frames. The forward and rear edges of the roller supporting plate 22 are formed with spaced lugs 41—42 and 43—44 which fit over the side faces of the vertical columns 15 and 16, respectively, as shown in Figs. 1 and 3. In order to simplify the installation of the said bearing plate 22, the lower portion 45 of the bolster window 17 is made somewhat wider than the upper portion so that the plate may be positioned horizontally between the columns in the widened portion 45 of the window and then moved vertically to its operation position.

The side frames 10 are held in proper relation to each other by means of a tie-bar 46 which engages the inner portion of the lower chord of each frame member. The particular form of tie-bar 46 forms no part of the present invention, since this element is disclosed and claimed in my co-pending application 616,238, filed September 14, 1945. However, the bolt 47 of the tie-bar structure, together with studs 48 which project upwardly through openings formed in the spring centering plate 24, function to hold the said centering plate in its applied position.

In the modified or alternative construction shown in Figs. 4 and 5 of the drawings, the stabilizing springs 31—31 are replaced with two short springs 49—49 of smaller diameter. Each end of each said springs 49—49 is provided with hemispherical adapters 50 and 51, the upper adapter 50 being seated in a hemispherical socket formed in the bottom of the associated wedge 28*a* while the lower adapter 51 is seated in the hemispherically shaped bottom of an elongated pocket 52 formed in the bearing plate 22*a*.

In the modified embodiment the coil springs 49—49 supporting the friction wedges 28*a* function at all times to press the latter upwardly into firm contact with the inclined surface 27 of the bolster, thus causing the wedges to be forced outwardly against the adjacent wearing plates 30. Each downward movement of the bolster causes a corresponding downward movement of the

wedges but the force exerted by the wedges 28*a* remains substantially constant since the springs 49—49 move downwardly with the bolster and the bearing plate 22*a*. However, there is an increase in the friction exerted during the downward movement of the bolster because of the increased drag of the wedges on the faces of the columns 15—16 of the side frame as an incident to the resilient pressure exerted by the springs 49—49 and the co-acting wedging of the inclined faces of the wedges 28*a* and the inclined faces 27 of the wedge retaining recesses formed on the bolster.

I claim:

1. In a railway car truck, a side frame having a bolster window therein; a bolster extending through said window and having recesses in portions of its opposite faces; means for supporting said bolster in the window for movement laterally of the side frame; wedge members positioned in said recesses for frictionally engaging the said portions of the side faces of the bolster and adjacent portions of the frame; and resilient means interposed between the wedge members and a supporting structure for forcing the wedges into said frictional engagement with said portions of the side faces of the bolster and said adjacent faces of the frame; the said spring supporting structure including means providing rocker bearings for the resilient means to permit the resilient means to move to angular positions in response to the movements of the bolster laterally of the frame.

2. In a railway car truck, a side frame having a bolster window therein; a bolster extending through said window and having recesses in its opposite faces; means for supporting the bolster within said window for movement laterally of the side frame; wedge members positioned in said recesses for frictionally engaging the inner faces of the recesses and adjacent faces of the frame; and coil springs interposed between the wedge members and a supporting structure for forcing the wedges into frictional engagement with said inner faces of the recesses and said adjacent faces of the frame; the said spring supporting structure including means providing a rocker bearing at the lower ends of said springs, whereby the springs assume angular positions in response to movements of the bolster laterally of the frame.

3. In a railway car truck, a side frame having a bolster window therein; a bolster extending through said window and having recesses in portions of its opposite side faces; means for supporting a bolster for movement laterally of the side frame comprising a roller bearing plate disposed within the window beneath an end portion of the bolster, rollers interposed between the bearing plate and the bolster, and resilient means supporting said bearing plate; wedge members positioned in said recesses clear of said rollers at locations above said roller bearing plate and frictionally engaging the said recessed portions of the side faces of the bolster and adjacent surfaces of the frame; and resilient means interposed between and engaging the wedge members and the frame for forcing the wedge members into frictional engagement with said recessed portions of the side faces of the bolster and the adjacent surfaces of the frame.

4. In a railway car truck, a side frame having a bolster window therein; a bolster extending through said window and having recesses in portions of its opposite sides, the inner faces of which recesses incline upwardly toward adjacent

faces of the frame; means for supporting the bolster for movement laterally of the side frame comprising a bearing plate disposed within the window below the bolster, rollers interposed between the plate and the bolster, a plurality of load springs for supporting the plate; wedge members positioned in said recesses at locations above said bearing plate and having inclined surfaces engaging the inclined inner faces of said recesses; springs interposed between the wedges and another portion of the truck for forcing the wedge member into frictional engagement with the said inclined inner faces of the recesses and adjacent faces of the frame; and means providing a rocker bearing for said springs whereby the springs assume angular positions to compensate for the movements of the bolster laterally of the side frame.

5. In a railway car truck, a side frame having a bolster window therein; a bolster extending through said window and formed with recesses in portions of its opposite side faces and formed with inclined inner walls; a bearing plate disposed within said window beneath an end portion of said bolster; a roller bearing resting on said plate and supporting said bolster; a plurality of coil springs positioned in said bolster window for supporting said bearing plate; wedge members located above said bearing plate having inclined surfaces for engaging said inclined walls of the recesses, said wedge members having vertical surfaces frictionally engaging wearing surfaces on vertical faces of said window, and auxiliary coil springs supporting said wedge members, means providing rocker bearings for the lower ends of said auxiliary springs, whereby these springs are pivotally supported to permit them to rock about their lower ends in response to horizontal movements of said wedge members and bolster.

6. In a railway car truck, a side frame having an upper chord and a lower chord spaced apart vertically, and a pair of vertical columns spaced horizontally and united with said chords, said chords and columns defining a window opening, a bolster having one end disposed within said window opening, a roller bearing plate formed with spaced openings therein and disposed within said window opening and underlying said end of the bolster, a roller bearing interposed between the plate and the bolster, a plurality of coil springs disposed within said window and resting on said lower chord, said bearing plate resting on the upper ends of said springs and supported thereby, a pair of wedges positioned between portions of the side faces of said bolster and the adjacent faces of said vertical columns, said portions of the side faces of the bolster being recessed to receive said wedges and are inclined for engaging correspondingly inclined surfaces on said wedges, and a pair of auxiliary coil springs each resting at one end on said lower chord and extending upwardly therefrom through an opening in said bearing plate and pressing upwardly against said wedges.

7. In a railway car truck, a side frame having a window opening, a bolster having one end disposed within said window opening, a pair of wedges situated within said window at the sides of said bolster, each wedge having an inclined surface in frictional engagement with a complementarily inclined surface on said bolster, each wedge having a vertical surface in frictional engagement with a stationary wearing plate, a roller bearing plate underlying said bolster and said wedges within said window opening, roller means mounted on said roller bearing plate and supporting said bolster for movement laterally of the side frame and said roller bearing plate, a plurality of coil springs located within said window opening below said roller bearing plate for supporting the bearing plate and bolster, and a pair of auxiliary coil springs underlying and supporting said wedges and being themselves supported on said roller bearing plate.

8. In a railway car truck, a side frame having a window opening, a bolster having one end disposed within said window opening, a pair of wedges situated within said window opening at the sides of said bolster and seated in recesses formed in said bolster, each wedge having an inclined surface in frictional engagement with a complementary inclined surface on said bolster, and each wedge having a vertical surface in frictional engagement with a vertical face of an adjacent portion of the frame, a roller bearing plate underlying said bolster and said wedges within said window opening, roller means carried by said roller bearing plate and supporting said bolster for movement laterally of the side frame and said roller bearing plate, coil spring means supporting said roller bearing plate, a pair of auxiliary coil springs each supporting one of said wedges; the said roller bearing plate having a pair of pockets in each of which one of said auxiliary springs is seated, and means providing rocker bearings for the lower ends of said auxiliary coil springs, to permit these springs to rock about their lower ends in response to movement of the wedges and bolster laterally of the roller bearing plate.

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