Sept. 17, 1935. D. S. BARROWS 2,015,025

RAILWAY VEHICLE

Filed Dec. 21, 1931 2 Sheets-Sheet 1

Fig. 1.

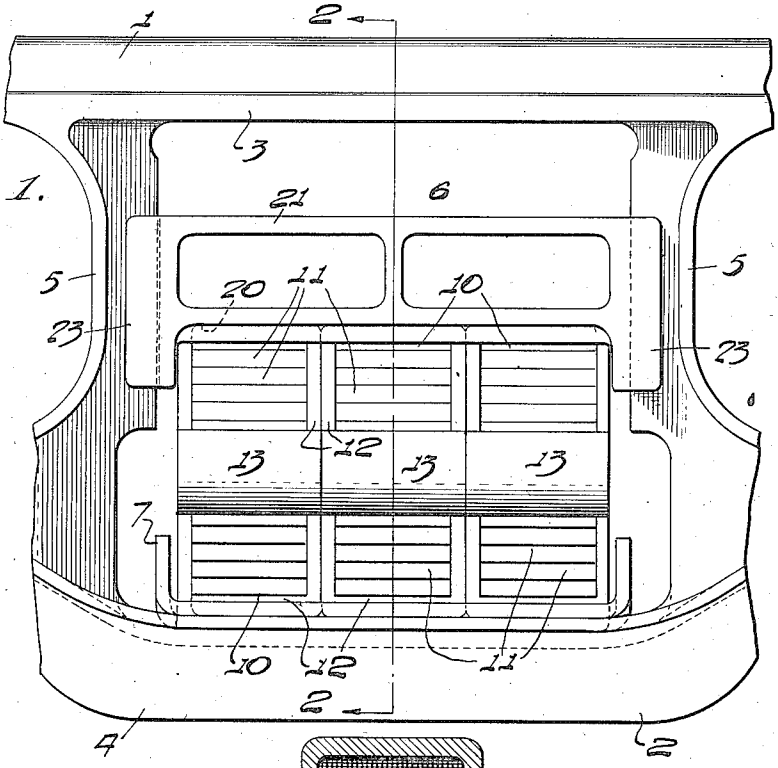
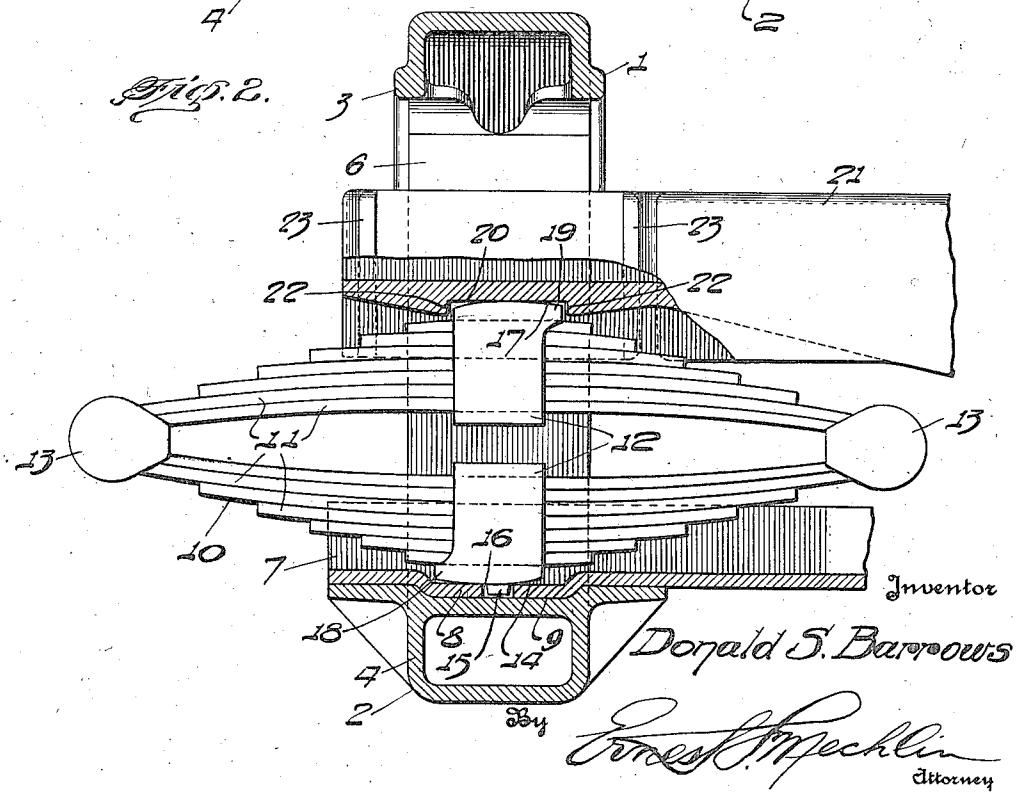


Fig. 2.



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Filed Dec. 21, 1931 2 Sheets-Sheet 2

Fig. 3.

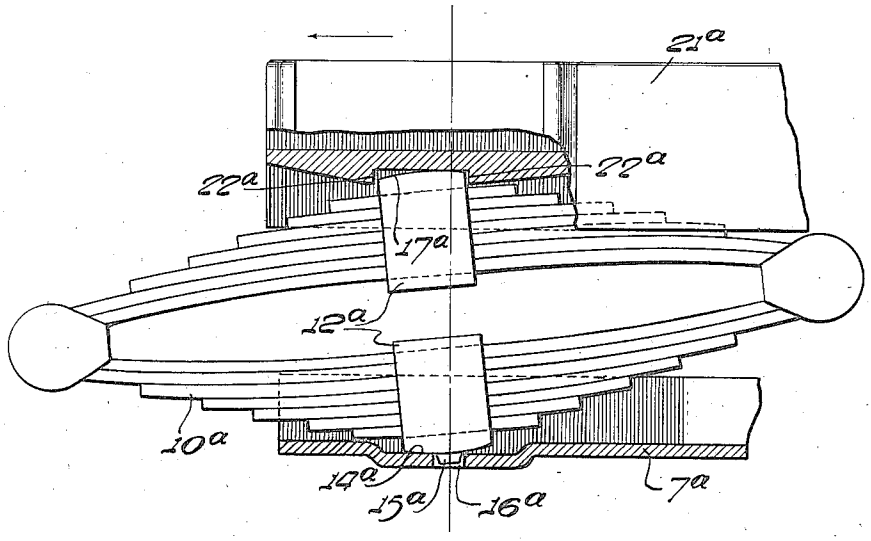
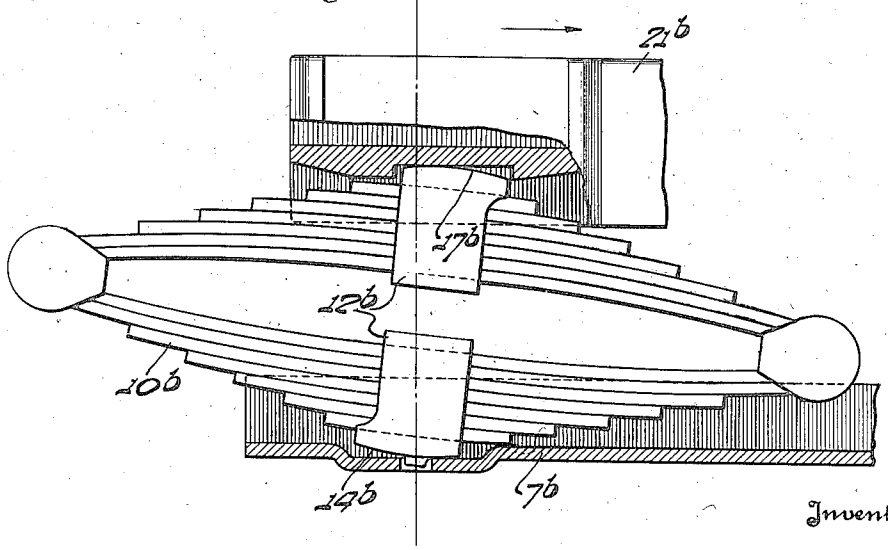


Fig. 4.



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2,015,025

RAILWAY VEHICLE

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Application December 21, 1931, Serial No. 582,473

10 Claims. (Cl. 105—187)

This invention relates to railway vehicles and, more particularly, to such having laterally movable bolsters.

The principal object of my invention, generally considered, is to provide a railway vehicle including side frames, a bolster, and resilient means operatively interposed between the bolster and the frames, and adapted to rock with respect to both to allow for lateral movement of the bolster.

Another object of my invention is the provision of railway vehicles each of which comprises a pair of side frames, a bolster extending therebetween, and springs, preferably of the elliptic type, operatively interposed between the bolster and said side frames, said springs being so mounted that they are rockable on the frames and bolster to provide for lateral movement of the bolster.

Other objects and advantages of the invention relating to the particular arrangement and construction of the various parts will become apparent as the description proceeds.

Referring to the drawings illustrating my invention, the scope whereof is defined by the appended claims:—

Figure 1 is a fragmentary side elevation of a railway vehicle or truck embodying my invention.

Figure 2 is a transverse sectional view on the line 2—2 of Figure 1, looking in the direction of the arrows, the springs and portions of the bolster being shown in elevation.

Figures 3 and 4 are views each corresponding to Figure 2, but showing another embodiment of my invention.

Referring to the drawings in detail, like parts being designated by like reference characters, and first considering the embodiment of my invention illustrated in Figures 1 and 2, a railway vehicle or car truck 1 is illustrated comprising side frames 2, only one of which is shown, each of said frames comprising a compression member 3, a tension member 4, and bolster guide columns 5 spacing intermediate portions of said compression and tension members, leaving a window or bolster opening 6 therebetween.

Supported on the tension member beneath the window opening is a spring plank 7, said plank, in the present embodiment, being downwardly embossed, as indicated at 8, to fit a corresponding depression 9 in the top of the tension member 4, whereby said spring plank and frame are properly interlocked. Resting on each end portion of the spring plank, preferably at the embossed portion 8 thereof, is spring means 10, which, in the present embodiment, involves a plurality of elliptic spring each comprising spring plates 11 held by intermediate bands 12 and end clips or connectors 13.

The lower bands 12 of the spring means 10 desirably have their lower surfaces curved, as indicated at 14, and are provided with depending teeth 15, the associated spring plank being apertured or pocketed, as indicated at 16, to receive the spring teeth 15, whereby the bands 12 are interlocked with respect to the spring plank and frame, and thereby prevented from bodily shifting with respect to said frame, while allowed to roll or rock thereon.

The upper spring band 12 of each spring 10 is desirably formed with an upper surface 17 of a curvature corresponding with that of the curvature 14 of the bottom spring band, said curvature, however, being opposite to that of the curvature 11 so that the portion inwardly or disposed toward the center of the bolster lies on a curve corresponding with the portion outwardly or disposed toward the outer ends of the springs on the lower spring band 12, the lower spring band being preferably unsymmetrical and provided with an outward extension 18 carrying the outer curved surface 14 and the upper spring band 12 being provided with an inner extension 19 carrying the inner portion of the curved surface 17.

The curved surfaces 17 of the upper spring bands 12 engage corresponding lower surfaces 20 on the bolster 21, said surfaces preferably being indented or disposed between shoulders 22 on the bolster, whereby bodily shifting of the bolster with respect to the upper spring bands 12 is prevented while rolling or rocking therebetween is provided for, the engagement of the bolster with the upper spring band 12 serving for the support of the bolster, while allowing lateral movement thereof. Each end of the bolster 21 is desirably provided with guiding ribs or flanges 23 disposed inwardly and outwardly of the guiding columns 5 and spaced therefrom an amount sufficient to allow for the desired lateral movement of the bolster, and at the same time prevent lateral movement beyond a predetermined desired amount.

The curvature of the surface 14 on the lower spring band 12 and that of the surface 17 on the upper spring band 12 is, in the present embodiment, such that a particular end of the bolster is raised when it moves outwardly with respect to the associated side frame, while no vertical movement takes place when it moves inwardly with respect to said side frame. This is provided by having the outer portion of the surface 17 and the inner portion of the surface 14

normally concentric with one another and having the curvature of the remainder of said surfaces of greater radius so that relative lateral movement of the bolster from normal on said surfaces of greater radius results in raising the bolster, as will be understood.

Referring to the embodiment of my invention illustrated in Figure 3, a construction is there disclosed which is identical with that of Figure 2, except that the bolster 21ª is shown in extreme outer position with respect to the associated spring plank 7ª and frame (not shown), and the spring means 10ª has bands 12ª with the upper surface 17ª of the upper band 12ª and the lower surface 15ª of the lower band 12ª curved uniformly so that the bolster 21ª is raised an equal amount upon moving laterally from normal in either direction. Such a condition is provided for by having the curvature of the surfaces on a radius greater than half the normal distance between said surfaces. On account of the relatively small radius of curvature in the present embodiment, the spring bands 12 are not provided with extensions, as in the first embodiment, the lower spring band, however, being desirably provided with a tooth 15ª interlocking with respect to an aperture or pocket 16ª in the associated spring plank 7ª, as in the previous embodiment, the upper spring band 12ª being desirably received in a pocket between shoulders 22ª on the bolster 21ª.

Referring now to the embodiment of my invention illustrated in Figure 4, a construction is there disclosed corresponding with the embodiment of Figure 2, except that the bolster 21ᵇ is shown in the extreme innermost position with respect to the associated spring plank 7ᵇ and side frame (not shown), and the curvature 14ᵇ on the lower spring band 12ᵇ, as well as the curvature 17ᵇ on the upper spring band 12ᵇ of the spring means 10ᵇ, corresponds with the curvatures 14 and 17 of the first embodiment, except that all portions of the curved surfaces have radii greater than half the normal distance between said surfaces, the curvature of the outer portion of the upper surface 17ᵇ and the curvature of the inner portion of the lower surface 14ᵇ being on radii preferably equal and shorter than the radius of curvature of the remainder of the surfaces, so that although the inwardly moving end of the bolster raises to a slight extent, it is not raised as much as the outwardly moving end thereof. This provision for raising of the bolster upon relative movement thereof with respect to the side frames is in order to make the bolster self-centering and provide for the return thereof to normal position, it being noted that all three embodiments disclosed provide this self-centering feature.

From the foregoing disclosure, it will be seen that I have provided springs preferably of the elliptic type serving for supporting a bolster from associated side frames and adapted to rock with respect to said side frames, so that the bolster is allowed to move laterally a predetermined limited amount. It will be seen that the spring means employed for supporting the bolster perform the double function of lateral motion rockers and springs, and as the bolster moves laterally one way or the other, the springs tilt to one side or the other until the motion is checked by the bolster flanges 23 which straddle the guide columns of the side frames.

Although preferred embodiments of my invention have been illustrated, it will be understood that modifications may be made within the spirit and scope of the appended claims, and that the terms which I have employed are used for purposes of description and not of limitation.

I claim:—

1. Bolster spring means comprising a plurality of resilient plates and upper and lower bands connecting said plates and forming an elliptic spring, the upper surface of the upper band and the lower surface of the lower band being curved to respectively allow a supported bolster to roll thereon and to roll with respect to an associated side frame, the curvature of the band surfaces varying on opposite sides of the center of said spring so that said bolster is raised when rolled in one direction a predetermined amount above the elevation at which it stands when rolled in the other direction a similar amount.

2. A railway vehicle comprising side frames, each frame having a compression member, a tension member and guide columns defining a bolster opening, a bolster with its ends received in said openings, a spring plank disposed below said bolster and with its ends received in said openings, the upper surfaces of the side frame tension members beneath the bolster openings having upwardly opening pockets, said spring plank having downwardly embossed portions nesting in said pockets for interlocking with respect to said frames, springs for yieldingly supporting said bolster, and a plurality of rockers also functioning as spring bands respectively interposed between the bolster and the springs and said spring plank and springs, the lower rockers engaging said spring plank at the downwardly embossed portions thereof.

3. A railway vehicle comprising side frames, each frame including a compression member, a tension member, guide columns defining a bolster opening, a bolster with its ends received in said openings, a spring plank disposed below said bolster and with its ends received in said openings, the upper surfaces of said side frame tension members beneath the bolster openings having upwardly opening pockets and the spring plank being formed with downwardly extending portions nesting in said pockets to normally prevent disengagement between said spring plank and frames, springs disposed in said bolster openings for yieldingly supporting said bolster above said plank, a plurality of rockers performing the additional function of spring bands respectively interposed between the bolster and the springs and said spring plank and springs, and means for preventing bodily shifting of the lower rockers along said spring plank.

4. A railway vehicle comprising side frames, each frame being formed with a bolster opening, a bolster with its ends received in said openings, a spring plank disposed below said bolster and with its ends received in said bolster openings, and spring means disposed in said openings for supporting said bolster above said plank, said spring means at each end comprising a plurality of resilient plates and upper and lower bands connecting said plates and forming an elliptic spring, the upper surface of the upper band and the lower surface of the lower band being curved to respectively allow the bolster to roll thereon and to roll on said spring plank, said bolster being pocketed to receive a portion of the upper band and the spring plank pocketed to receive a portion of the lower band, whereby bodily shift-

ing of said elliptic springs with respect to said bolster and spring plank is prevented.

5. In combination with a railway vehicle side frame having a compression member, a tension member, and guide columns defining a bolster opening, a bolster with an end received in said opening, a spring plank with an end disposed beneath said bolster and received in said opening, the tension member beneath the bolster opening having an upwardly opening pocket, said spring plank having a downwardly embossed portion nesting in said pocket for interlocking with respect to said frame, a spring for yieldingly supporting said bolster, and upper and lower rockers for said spring and respectively interposed between the bolster and said spring and said spring plank and spring, the lower rocker engaging said spring plank at the downwardly embossed portion thereof.

6. In combination with a railway vehicle side frame having a compression member, a tension member, and guide columns defining a bolster opening, a bolster with an end received in said opening, a spring plank with an end disposed beneath said bolster and received in said opening, the tension member beneath the bolster opening having an upwardly opening pocket, said spring plank having a downwardly embossed portion nesting in said pocket for interlocking with respect to said frame, a spring for yieldingly supporting said bolster, and a plurality of rockers for said spring and respectively interposed between the bolster and said spring and said spring plank and spring, the curvature of the rocking surfaces varying on opposite sides of the center of the spring so that said bolster is raised when rolled in one direction a predetermined amount above the elevation at which it stands when rolled in the other direction a similar amount, the lower rocker engaging said spring plank at the downwardly embossed portion thereof.

7. In combination with a railway vehicle side frame formed with a bolster opening, a bolster with an end received in said opening, a spring plank disposed beneath said bolster and with an end received in said opening, and spring means disposed in said opening for supporting said bolster above said plank, said spring means comprising a plurality of resilient plates and upper and lower bands connecting said plates and forming an elliptic spring, the upper surface of the upper band and the lower surface of the lower band being curved to respectively allow the bolster to roll thereon and to roll on said plank, the radii of curvature of said rolling band surfaces being greater than half the normal distance between said surfaces, so that the bolster end is raised when rolled in either direction from its normal position, said bolster being formed to receive a portion of the upper band and the spring plank being formed to receive a portion of the lower band.

8. In combination with a railway vehicle side frame having a compression member, a tension member, and guide columns defining a bolster opening, a bolster with an end received in said opening, a spring plank with an end disposed beneath said bolster and received in said opening, the tension member beneath the bolster opening having an upwardly opening pocket, said spring plank having a downwardly embossed portion nesting in said pocket for interlocking with respect to said frame, a spring for yieldingly supporting said bolster, and a plurality of rockers for said spring and respectively interposed between the bolster and said spring and said spring plank and spring, the radii of curvature of the rocking surfaces being greater than half the normal distance between said surfaces, so that the bolster end is raised when rolled in either direction from its normal position, the lower rocker engaging said spring plank at the downwardly embossed portion thereof.

9. In combination with a railway vehicle side frame formed with a bolster opening, a bolster with an end received in said opening, a spring plank disposed beneath said bolster and with an end received in said opening, and spring means disposed in said opening for supporting said bolster above said plank, said spring means comprising a plurality of resilient plates and upper and lower bands connecting said plates and forming an elliptic spring, the upper surface of the upper band and the lower surface of the lower band being curved to respectively allow the bolster to roll thereon and to roll on said plank, the curvature of the rolling band surfaces varying on opposite sides of the center of the spring so that said bolster is raised when rolled in one direction a predetermined amount above the elevation at which it stands when rolled in the other direction a similar amount, said bolster being formed to receive a portion of the upper band and the spring plank being formed to receive a portion of the lower band.

10. Bolster spring means comprising a plurality of resilient plates and upper and lower bands connecting said plates and forming an elliptic spring, the upper surface of the upper band and the lower surface of the lower band being curved to respectively allow a supported bolster to roll thereon and to roll with respect to an associated side frame, the radii of curvature of the band surfaces being greater than half the normal distance between said surfaces so that said bolster is raised when rolled in either direction from its normal position.

DONALD S. BARROWS.