March 14, 1944. W. R. ELSEY 2,344,034

RAILWAY CAR BOLSTER SUSPENSION

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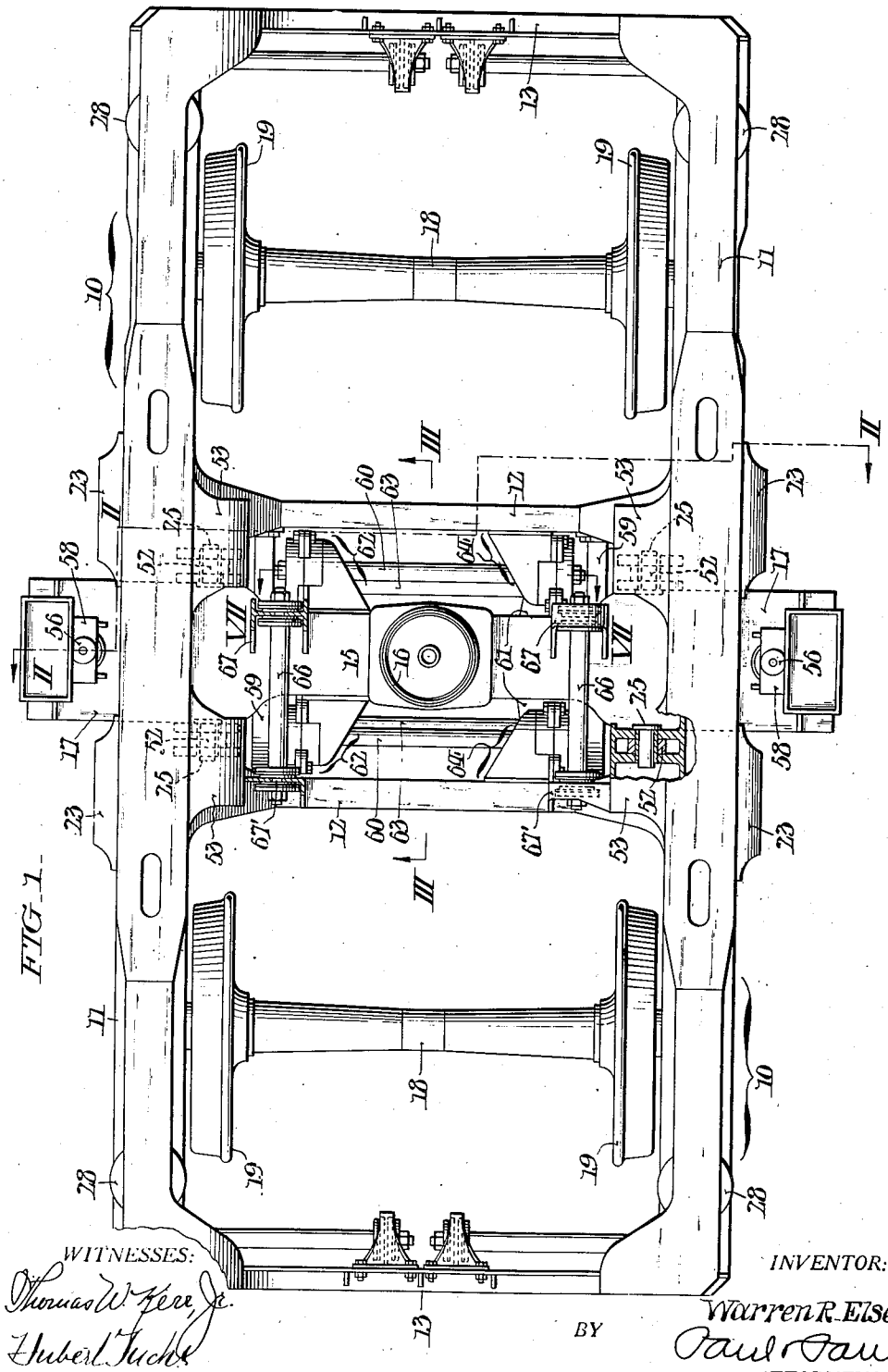


FIG. 1.

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RAILWAY CAR BOLSTER SUSPENSION

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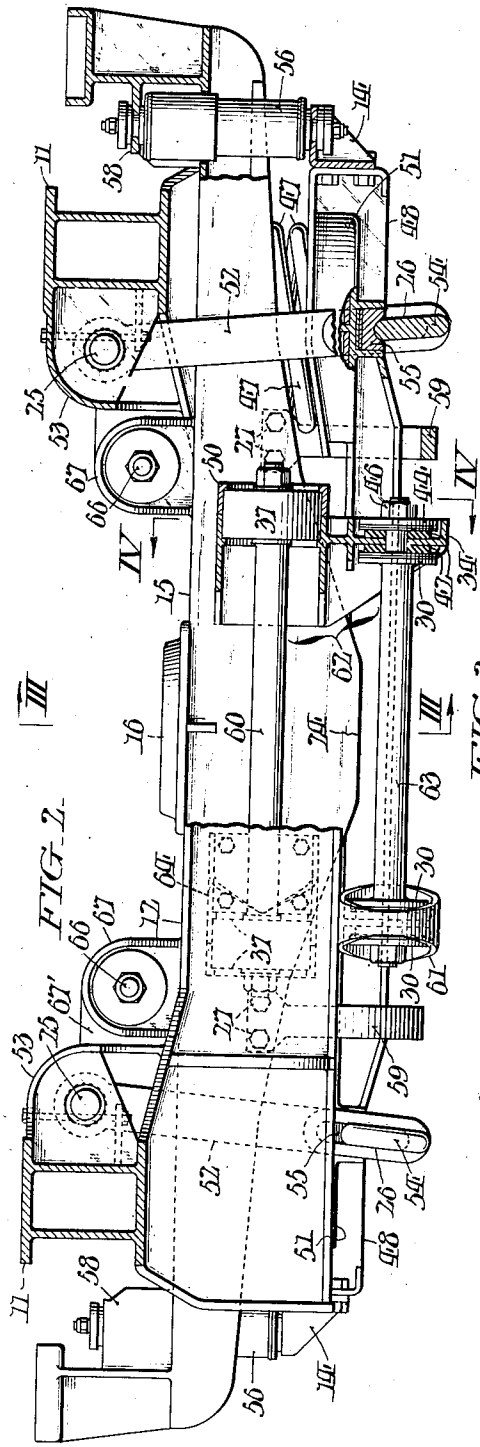


FIG. 2.

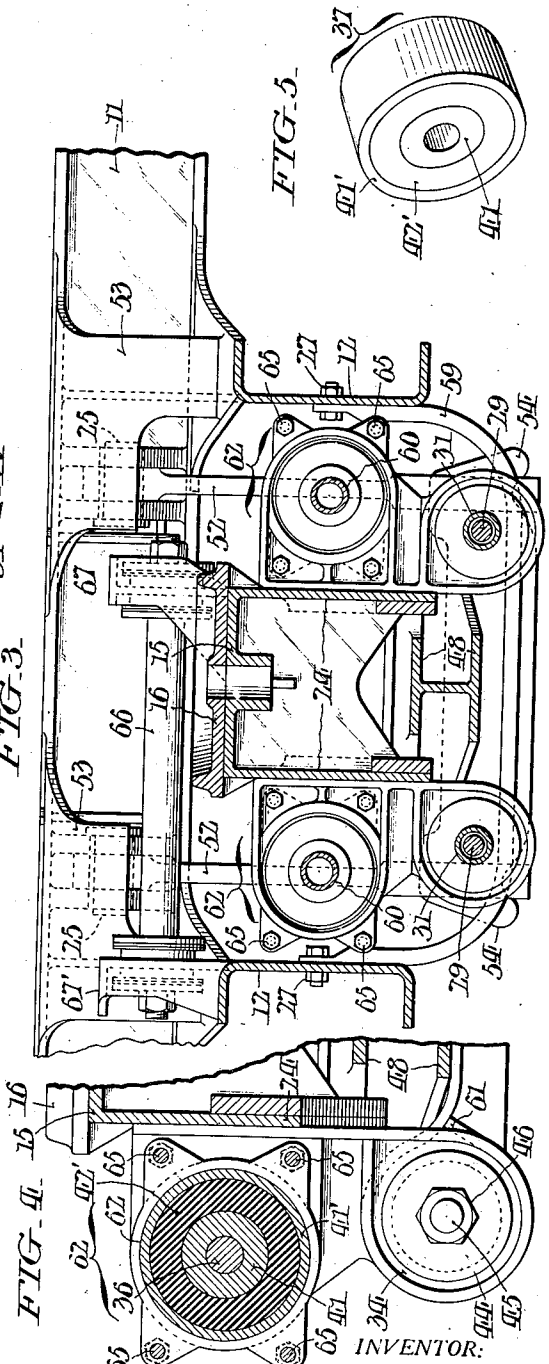


FIG. 3.

FIG. 4.

FIG. 5.

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RAILWAY CAR BOLSTER SUSPENSION

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FIG. 6.

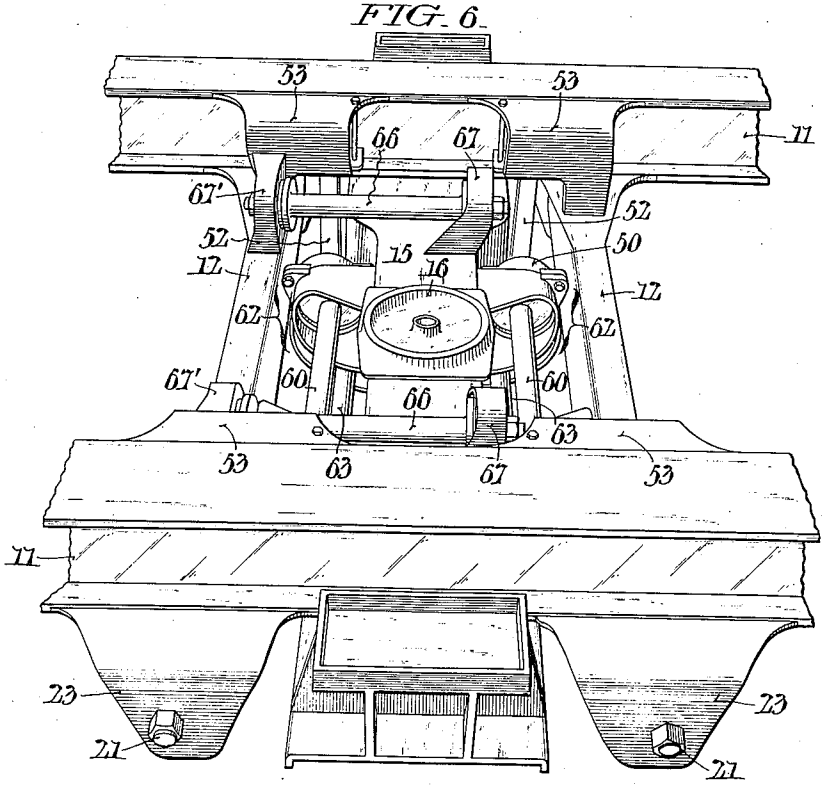
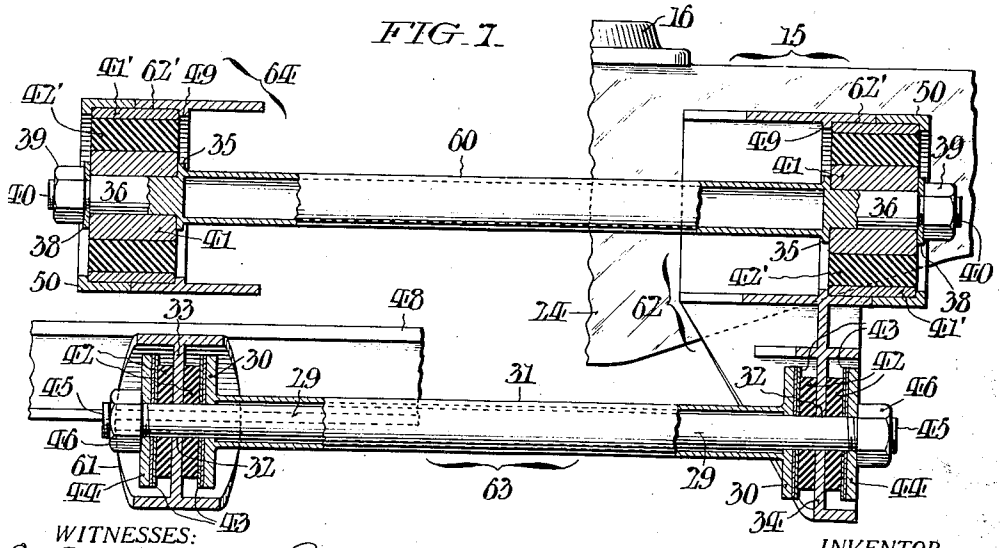


FIG. 7.



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RAILWAY CAR BOLSTER SUSPENSION

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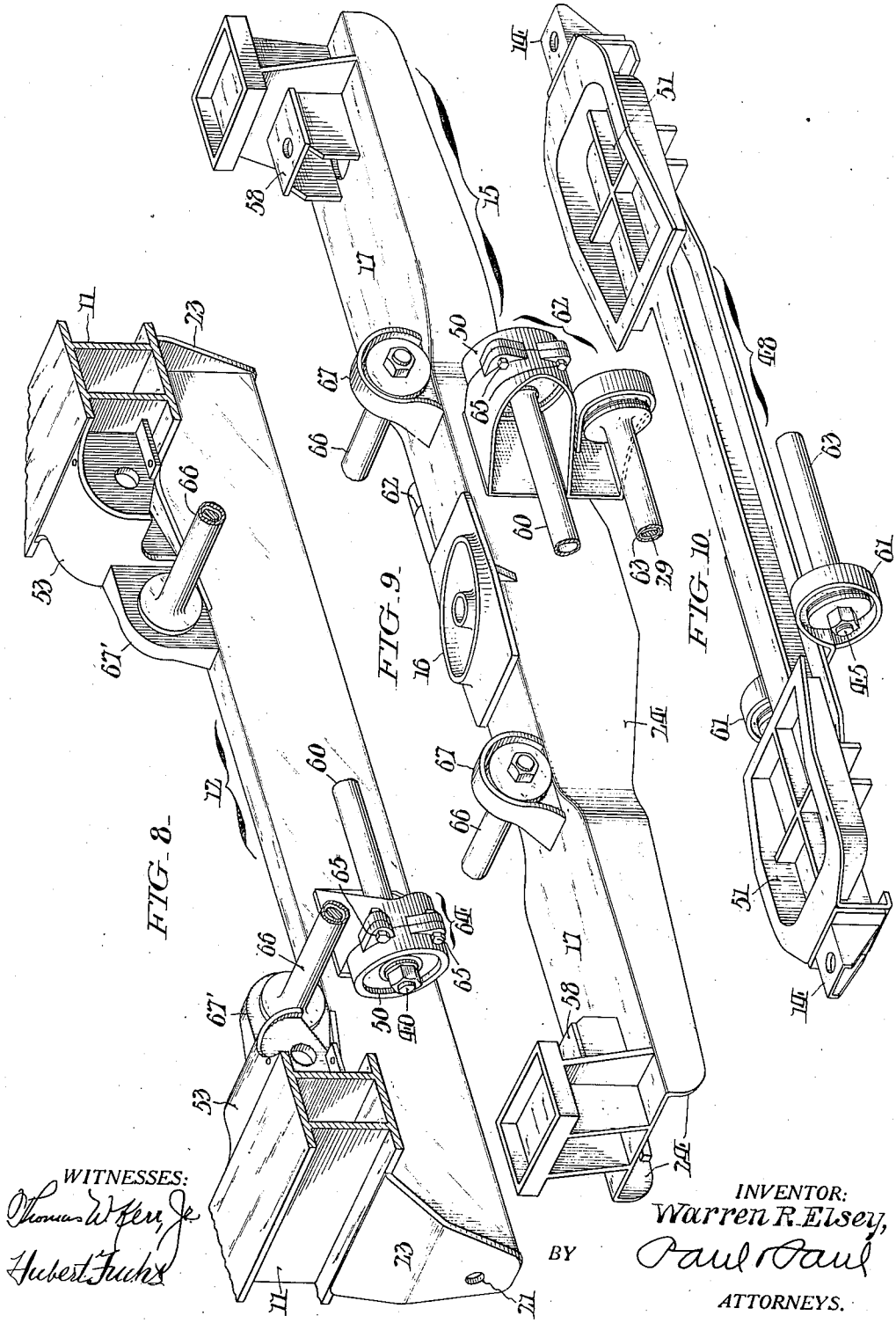


FIG. 8.

FIG. 9.

FIG. 10.

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RAILWAY CAR BOLSTER SUSPENSION

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FIG. 11.

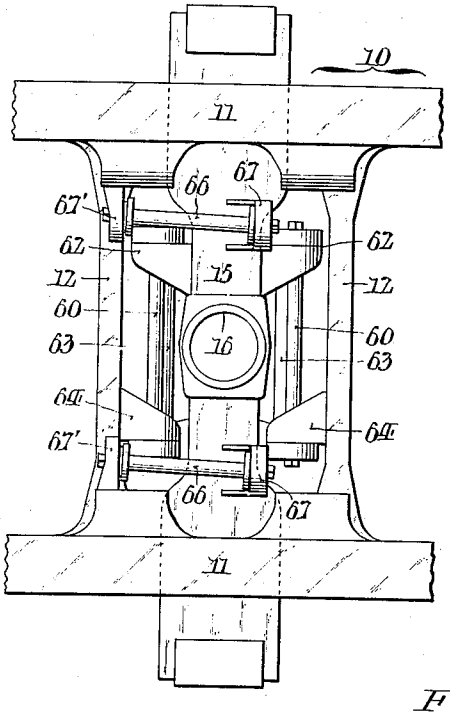


FIG. 12.

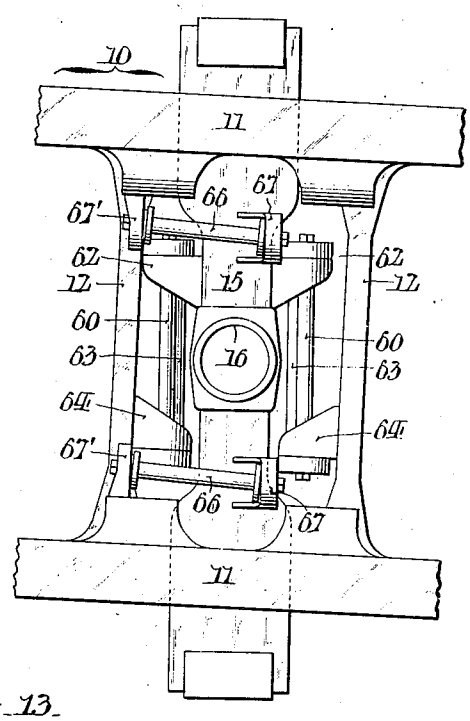


FIG. 13.

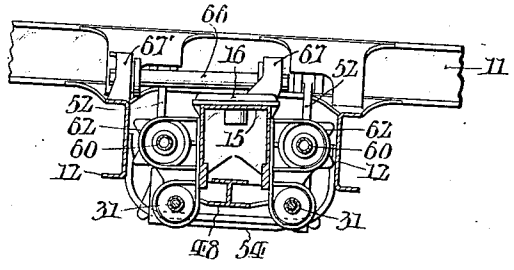
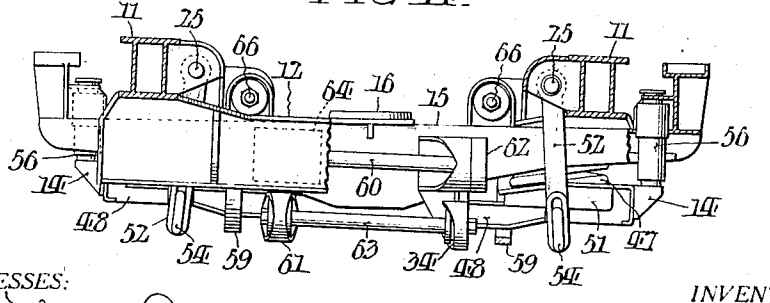


FIG. 14.



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Patented Mar. 14, 1944 2,344,034

UNITED STATES PATENT OFFICE

2,344,034

RAILWAY CAR BOLSTER SUSPENSION

Warren R. Elsey, Wynnewood, Pa., assignor to The Pennsylvania Railroad Company, Philadelphia, Pa., a corporation of Pennsylvania

Application October 3, 1942, Serial No. 460,589

3 Claims. (Cl. 105—193)

This invention has general reference to railway car trucks and is more especially concerned with the smooth riding qualities of such trucks. Accordingly, this invention is adaptable and advantageously applicable to the trucks of passenger cars, and it is hereinafter explained with particular reference to a bolster type truck; while the instant application, which is a continuation-in-part of a prior case with clarification of a detail therein previously unexplained, filed by the same applicant on November 20, 1940, under Serial No. 366,344, refers to a floating suspension for the bolster of such car trucks.

More concisely stated the primary object of the instant improvements is to resiliently coordinate the bolster with the car truck frame and spring-plank by novel stay means positively accommodating relative service movements as well as absorbing all vibrations.

While the above noted object is indicative, in a general way of the aim of this invention, other objects, with ancillary advantages, will become evident to those skilled in the art, upon a full undestanding of the construction, arrangement and operation of the floating bolster suspension hereinafter disclosed. This invention is susceptible of other embodiment than the one chosen for illustrative purposes in the accompanying drawings, and structurally modified forms come equally well within the scope of the concluding claims.

In the drawings:

Fig. 1 is a top plan view of a railway car truck embodying the improved floating bolster suspension of this invention, with a fragmentary portion removed and in section for clearer illustration of a detail hereinafter explained.

Fig. 2 is a staggered cross-section of the same, taken as conventionally indicated by the angle-lines and arrows, II—II in Fig. 1.

Fig. 3 is a fragmentary longitudinal section, taken approximately as indicated by the angled-arrows III—III in Figs. 1 and 2.

Fig. 4 is a fragmentary section, drawn to a larger scale, taken as indicated by the angled-arrows IV—IV in Fig. 2.

Fig. 5 is a perspective view of a flexible connector hereinafter fully described.

Fig. 6 is a fragmentary perspective view, looking downwards, of the mid-region of the truck frame and bolster.

Fig. 7 is a fragmentary part sectional, and part elevational, view taken approximately as designated by the angled-arrows VII—VII in Fig. 1.

Fig. 8 is a perspective view across the truck frame showing one of spaced mid-region connecting members and associated anchorage brackets, all of which are hereinafter fully described.

Fig. 9 is a similar view to the preceding of the bolster.

Fig. 10 is a corresponding view of the spring-plank.

Figs. 11 and 12 are fragmentary plan views similar to the mid-portion of Fig. 1 but showing the respective parts in different cooperative relation.

Fig. 13 is a somewhat reduced scale, longitudinal, fragmentary view similar to Fig. 3, but showing the parts in a different position; and,

Fig. 14 is a cross-sectional view similar to Fig. 2, likewise showing the parts in a different position.

In describing the form of this invention, exemplified in the above captioned drawings, herewith, specific terms will be employed for the sake of clarity, but it is to be understood the scope of said invention is not thereby limited; each such term being intended to embrace all equivalents which perform the same or analogous functions.

Referring more in detail to the drawings and by way of facilitating comparison with the parent application, previously identified, like reference characters will be hereinafter used, irrespective of consecutive order, and dissimilar ones applied to the details forming the important features of the instant subject-matter.

The truck frame 10 comprises side, intermediate and end members 11, 12 and 13 respectively; a load-carrying bolster 15 substantially mid-way transverse to the lengthwise dimension of the frame 10, said bolster extending across and under the hollow side members 11 and having a center provision 16 for pivoting the truck 10 to the associated car body, not shown; while axles 18 with wheels 19 afford running support for the truck on the railway track. The axles 18 are conveniently supported by aid of vertically movable mountings, pivoted to depending brackets 23, from the frame side members 11, and cushioned outwardly of the wheels 19 by spring devices 28; all as in the hereinbefore referred to application.

Referring now to the bolster suspension, forming the instant subject-matter, it is to be first re-

marked, by reference to Figs. 1–3 and 9, more particularly, that the bolster 15 is of inverted channel-section and provided at the ends with brackets 58 affording connection for the upper ends of hydraulic shock-absorbers 56, the lower ends whereof are attached to brackets 14, rigid with the ends of the spring plank 48, Fig. 10, said plank embodying socket sections 51 for reception of the lower portions of conventional compression springs 47, one only being indicated in Figs. 2 and 14, which resiliently support said bolster from the truck frame 10 in accordance with the above referred to prior application. In addition the bolster 15 is furnished with spaced rigid anchorages 67 on the web portion 17, as well as flanking anchorage brackets 62, preferably, permanently attached to the side flanges 24 of said bolster; while the spring plank 48 is mainly of I-section, see Figs. 2, 3 and 10 and provided with anchorages 61. The spring plank 48 is conveniently suspended from the truck frame 10 by transversely swingable suspension-links 52 hung, by pivot means 25, Figs. 1–3 and 14, from brackets 53 on the truck-frame side members 11; said links or swing-hangers 52 having slotted connection at 26, Figs. 2, 3 and 14, with the ends of the yoke 54 rockably engaged below a bearing 55 inserted in a pocket on the underside of the spring plank 48; while emergency supports 59 are secured intermediate the frame cross-members 12 by means 27, under said spring plank, to prevent the latter from falling on the track should the supporting means 52, 53, 54 fail.

For resiliently coordinating or controlling the position of the bolster 15 and the spring plank 48 transversely of the truck frame 10 or, in other words, their lateral and longitudinal movements, use is made respectively of fore-and-aft resilient stay elements 66 and transverse resilient stay elements 60, 63, now to be described.

The fore-and-aft elements 66 are flexibly connected intermediate the anchorage brackets 67 on the bolster 15 and somewhat similar anchorage brackets 67' upstanding from one of the truck-frame cross-members 12 as clearly understandable from Figs. 1 and 3. Stay elements 60 are intermediate side bracket-anchorages 64 on the cross-members 12 to flexibly connect with the anchorage brackets 62 on the bolster 15; while stay elements 63 flexibly connect intermediate the bolster brackets 62 and the spring-plank anchorages 61.

In view of the fact that the stay elements 63 and 66 are structurally similar an explanation of one of the same is herein deemed sufficient and, for such purpose, reference is made more particularly to Fig. 7 and from which it will be observed that each stay 63 or 66 comprises an axis rod 29 engaged through the flanged ends 30 of a concentrically related tubular component or spacer 31, and corresponding apertures 32 in the diaphragm portions 33, 34 of the respectively associated anchorage 67' or 61 and the bolster anchorage bracket 67 or 62. Incidentally, it is to be here remarked that all of the anchorages 61, 67, 67' as well as the anchorage brackets 64 are, individually, of cupped formation; while the anchorage brackets 62 are multiple-cupped, for a purpose later on explained. Apertured rubber discs 42 having adjustment shims 43 are located at opposite sides of the anchorage diaphragms 33, 34 between the tubular component flanges 30 and clamping washers 44 with associated lock-nuts 46, on the screw-threaded outer ends 45, of the axis rod 29.

On the other hand the stays 60 are, preferably, of tubular section with end-closing flanges 35 and axially-aligned solid extensions 36 affording support for resilient units or flexible connector elements 37, see Fig. 5. Each such unit or element 37 is clamped in position by a washer 38 and lock-nuts 39, on the screw-threaded reduced end 40 of the stay extension 36; and such unit or element 37 comprises inner and outer concentric thick and substantially thinner sleeves 41, 41' respectively, with an intervening stout rubber bushing 42' suitably adhered to said sleeves. These units 37, it will be seen, seat intermediate inner annular shoulders 49 in the associated bracket anchorages 64 on the frame cross-member 12 and the upper cupped portion 62' of the bolster flanking anchorage bracket 62, and angular section rings 50 attached to the anchorages 62, 64 by securing means 65, said rings being clampingly coactive with the outer sleeve 41' of the device 37, in an obvious manner.

From the foregoing it will be readily apparent that the bolster 15 is resiliently coordinated to, or floatingly suspended from, the car truck frame 10 by means of the fore-and-aft and transverse stays 66, 60, respectively; whereas the spring plank 48 is similarly coordinated by the transverse stays 63, to the bolster 15 while being pivotally supported from the truck frame 10 through the medium of the swing-hangers 52 and yoke 54. Furthermore, it will be apparent that by virtue of the substantial differences in size or thickness of the respective rubber discs 42 and bushings 42' there will be a relatively different degree of movement afforded by the three sets of stay elements 60, 63 and 66. In other words, the dimensional differences between the discs 42 and bushings 42' positively insure for the lateral-movement "damping" of the bolster 15 relative to the spring plank 48. Also, in view of the load-sustaining bolster 15 being pivoted to the car body by the center provision 16, it will be understood on reference to Figs. 11 and 12 that any directly lateral or angular movement of the truck frame 10, respectively, due to trackway planar deviations from the normal are compensatively absorbed by the several stays 60, 66 and 63 without transmittal of any strain or vibration to the car body through the bolster 15. Similarly from Figs. 13 and 14 it will be seen that any tilting or "canting" of the truck-frame 10 longitudinally or transversely caused by trackway undulations or when rounding curves are compensatively absorbed by the stays 60, 66 and 63 without displacement of the spring plank 48 relative to the bolster 15 and car body. In other words, the bolster 15 is floatingly suspended in respect to the car truck frame 10 at all times, irrespective of any abnormal running conditions, while being definitely connected with said frame and the spring plank by flexible coordinators.

Having thus described my invention, I claim:

1. In a railway car truck, a frame comprising side longitudinals and connecting cross members; an inverted channel-section load carrying bolster; a spring plank of mainly I-section suspended from the frame beneath the bolster and supporting the latter at its ends with interposition of spring means; stays including rubber bushing and apertured-disc elements, respectively in shear and compression, connecting the bolster to the truck frame and the spring plank to said bolster for cushioning their movements laterally of the truck, said bushing elements serving to allow a greater amount of movement

than the apertured-disc elements; and stays including apertured-disc rubber elements, also in compression, connecting the bolster to the truck for controlling movement of the bolster longtudinally of the truck, said last mentioned disc elements being arranged to limit such longitudinal movement of the bolster to an extent less than that allowed for its lateral movement.

2. The combination of claim 1, wherein the stays connecting the bolster to the truck frame are of tubular section and have end-closing flanges with axially-aligned solid extensions; each associated rubber bushing respectively includes an inner and an outer concentric thick and substantially thinner rigid sleeve suitably adhered thereto; and means clamp the bushings to the stay solid extensions aforesaid.

3. The combination of claim 1, wherein the stays connecting the bolster to the spring plank each comprise an axis rod, a concentric tubular component about said rod and having end flanges; the associated rubber apertured-disc elements in compression are clamped on the axis rod end portions with their inner faces abutting a rigid projection from the bolster and the spring plank respectively; and corresponding stays further connect the bolster to the truck frame for controlling its movement longitudinally of the truck.

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