May 27, 1941. D. S. BARROWS 2,243,493

RAILWAY TRUCK

Filed Dec. 10, 1937 3 Sheets-Sheet 1

Fig. 1.

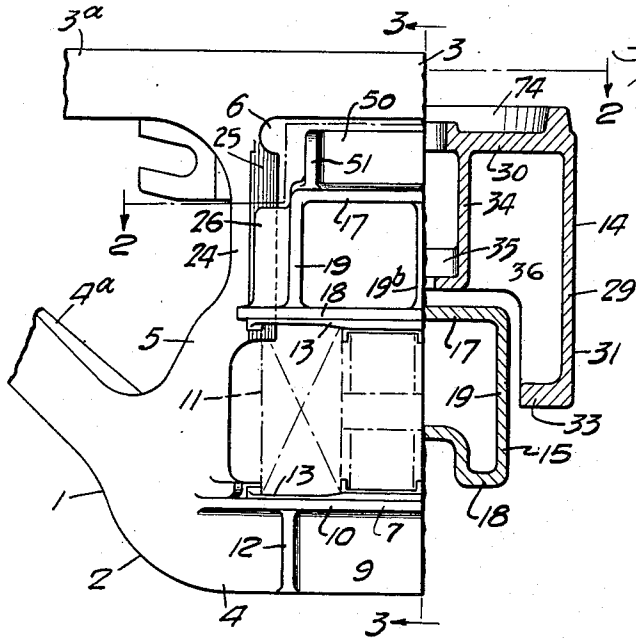
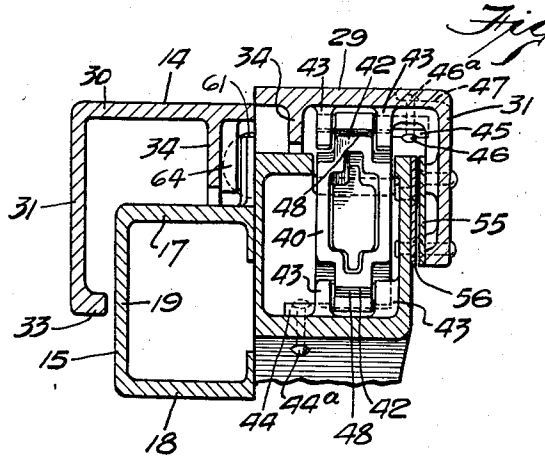


Fig. 4.



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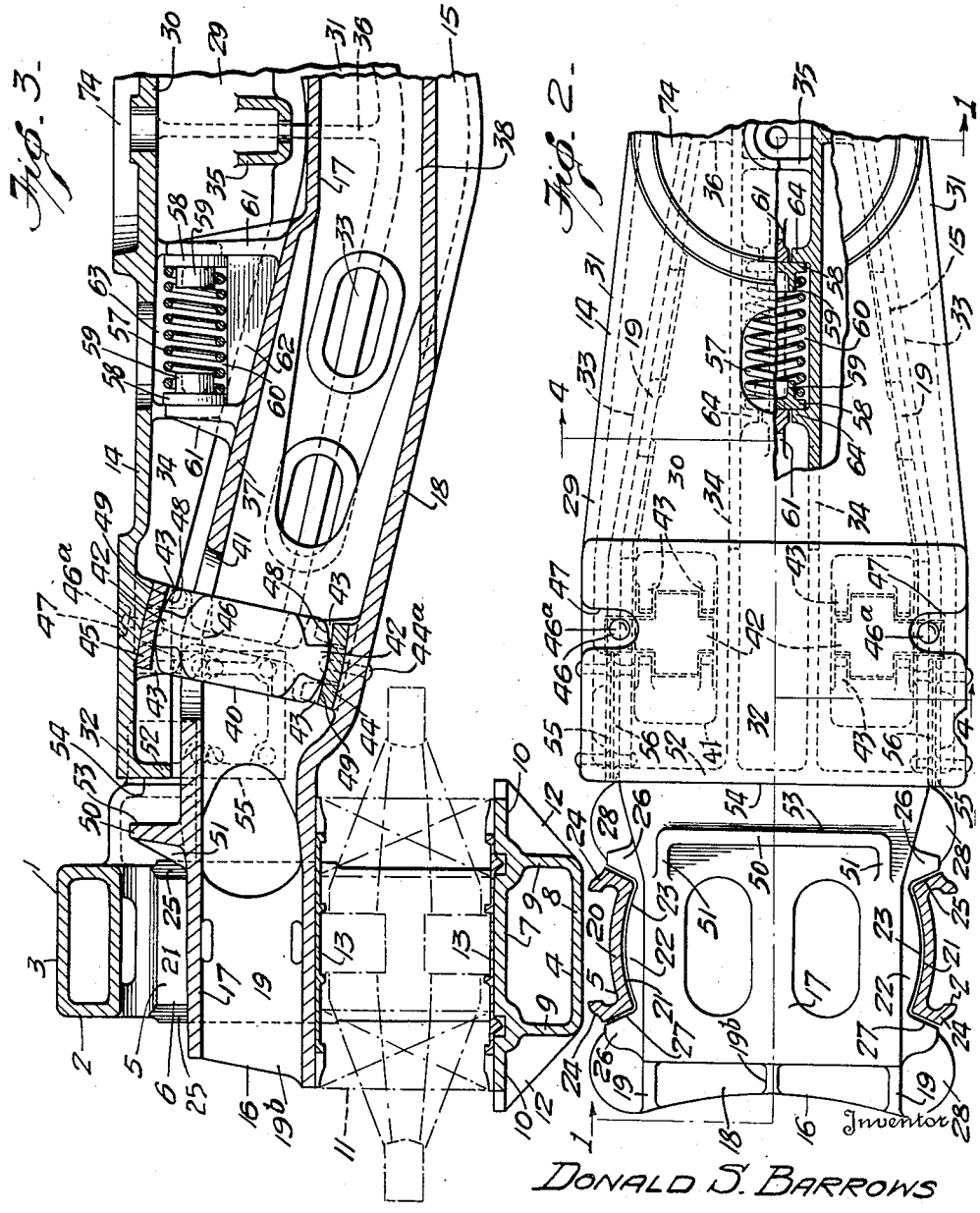
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May 27, 1941. D. S. BARROWS 2,243,493

RAILWAY TRUCK

Filed Dec. 10, 1937 3 Sheets-Sheet 2



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RAILWAY TRUCK

Filed Dec. 10, 1937 3 Sheets-Sheet 3

Fig. 5.

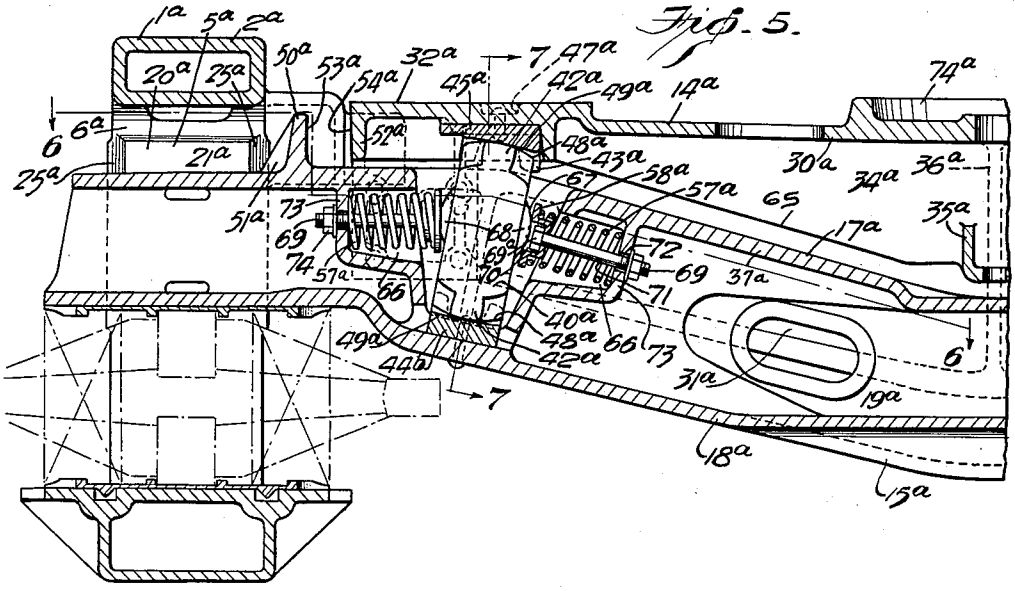


Fig. 6.

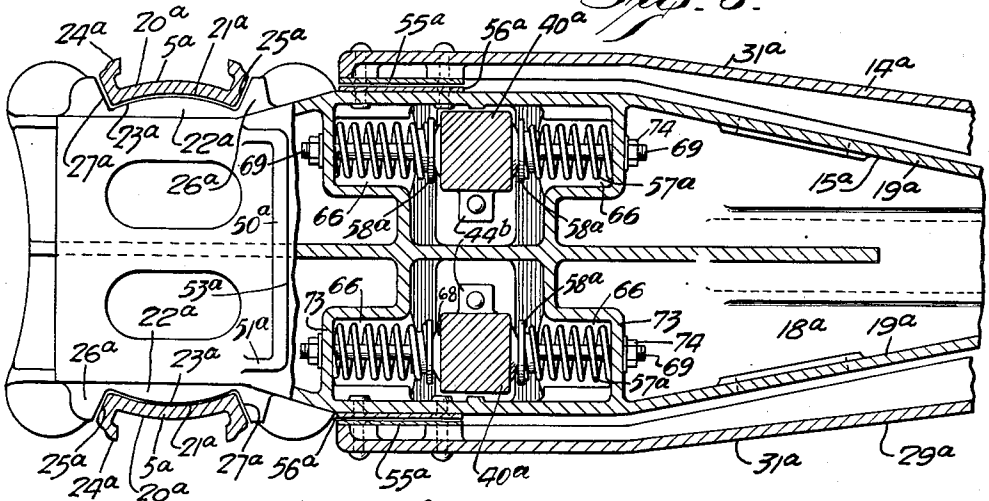
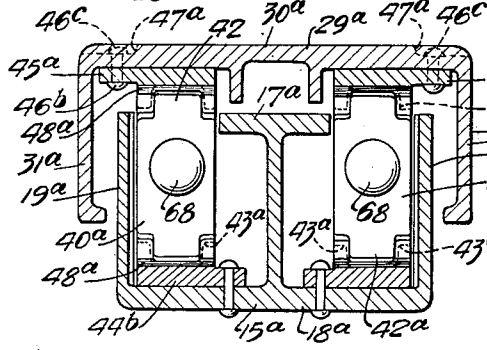


Fig. 7.



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Patented May 27, 1941

2,243,493

UNITED STATES PATENT OFFICE

2,243,493

RAILWAY TRUCK

Donald S. Barrows, Rochester, N. Y., assignor to The Symington-Gould Corporation, Rochester, N. Y., a corporation of Maryland

Application December 10, 1937, Serial No. 179,185

28 Claims. (Cl. 105—179)

This invention is a continuation-in-part of my copending application for Railway trucks, Serial No. 111,511, filed November 18, 1936, which has since matured into United States Letters Patent 2,180,933, granted November 21, 1939.

The invention pertains to railway vehicle trucks and more particularly to a type thereof which embodies a composite bolster structure having a transom bolster resiliently supported from associated side frames and a lateral motion bolster rockably associated with the transom bolster.

The primary object of the invention is to provide a railway vehicle truck of such construction and arrangement of associated parts so as to incorporate therein a desired degree of flexibility.

Another object of the instant invention is the provision, in a railway truck, of spaced side frames having a portion thereof formed by cylindrically concave faces engaged by correspondingly formed convex faces on a composite vertically acting bolster structure to permit a relative horizontal angling therebetween. The composite bolster structure preferably comprises a resiliently supported transom bolster rotatably connecting the side frame members and a relatively shorter lateral motion bolster rockably supported by the transom bolster.

A still further object of the invention is the provision of a composite bolster structure in a railway truck comprising a transom bolster provided with an upstanding flange adjacent each end thereof, said flanges each having an inner face angularly disposed to the longitudinal axis of the transom bolster and a relatively movable lateral motion bolster provided with a depending end web having an outer face thereof angularly disposed to and adapted to engage the upstanding flange face so as to stop or limit the lateral or transverse movement of the lateral motion bolster and at the same time provide surface contact between the respective faces.

Another object of the invention is to provide, in a railway truck, a composite bolster structure having a transom bolster resiliently supported from associated spaced side frames and a lateral motion bolster shorter than the transverse distance between the side frames; the transom bolster being preferably provided with a plurality of pockets having spring means positioned therein, the spring means being associated with the transom bolster, and vertically disposed means associated with the lateral motion bolster adapted to energize the springs upon relative transverse movement of the lateral motion bolster in either direction in order to provide means for returning or restoring the lateral motion bolster to normal position.

Another object of the invention is to provide, in a railway truck, a composite bolster comprising a transom bolster extending between and connecting spaced side frames and a relatively shorter lateral motion bolster partially embracing the transom bolster; the transom bolster being formed of spaced side walls and top and bottom walls extending between and connecting the side walls, an arcuate bearing plate removably secured to the bottom wall to provide an abutment for a vertically disposed rocker which extends through a suitable aperture in the top wall to engage an arcuate bearing plate removably secured to a top web of the lateral motion bolster, wear plates removably secured to the side walls of the transom bolster, juxtapositioned and adapted to engage wear plates removably secured to depending spaced flanges on the lateral motion bolster.

The above as well as various other objects will become apparent from the following description, considered together with the accompanying drawings, the latter of which illustrate exemplary forms of the invention.

In the drawings:

Figure 1 is a fragmentary side elevational view of a railway truck embodying a form of the invention, a portion of which is illustrated in vertical section.

Figure 2 is a horizontal view taken along the lines 2—2 of Figure 1, looking in the direction of the arrows, a portion of the view being in plan and another portion being in section.

Figure 3 is a transverse sectional view taken along the lines 3—3 of Figure 1, looking in the direction of the arrows.

Figure 4 is a sectional view taken along the lines 4—4 of Figure 2, looking in the direction of the arrows.

Figure 5 is a transverse sectional view corresponding in part with Figure 3 but showing a modification of the invention.

Figure 6 is a horizontal sectional view taken along the lines 6—6 of Figure 5, looking in the direction of the arrows.

Figure 7 is a vertical cross sectional view taken along the lines 7—7 of Figure 5, looking in the direction of the arrows.

Referring more in detail to the drawings, wherein like parts are designated by like reference characters, and considering initially the exemplary form illustrated by Figures 1 to 4, in-

clusive, there is shown a portion of a railway truck 1 comprising laterally spaced side frames 2, only one of which is illustrated. Each side frame comprises a compression member 3 and a tension member 4 connected together by longitudinally spaced and vertically extending guide columns 5 to form a window opening 6 therebetween. The portions 3a of the compression member, which extend outwardly from the guide columns, merge with upwardly or diagonally disposed portions 4a of the tension member adjacent the end portions of the side frame. The ends of the side frame may be provided with integrally formed journal boxes or journal box receiving jaws, neither of which are shown.

The tension member portion intermediate the guide columns is generally box-shaped in section, having a top web 7 and a spaced underlying bottom web 8 integrally joined by transversely spaced vertical connecting flanges 9. The top web 7 is extended laterally of the side frame beyond the connecting flanges 9, as at 10, to thereby provide sufficient or adequate bearing area for a superimposed set or nest of springs 11, the latter of which are illustrated diagrammatically and may be of any desired type or arrangement. The extensions 10 are rigidified by means of triangular gussets 12 which are formed integrally with the extensions and the adjacent flange 9. Upper and lower spring plates 13 may be associated with the springs 11 in order to retain the springs within the window opening as well as prevent relative shifting of the springs with respect to one another. The spring plates may take a form corresponding to any of the well known types thereof so long as they provide positioning means for the springs employed.

Extending between and flexibly connecting the side frames 2 is a load-transmitting member or bolster structure 14 which will be hereinafter referred to as a composite bolster and more fully described as the specification proceeds. The composite bolster, arranged for vertical movement with respect to the side frame, desirably comprises a lower or transom bolster 15 having end portions 16 extending within and normally occupying the upper area of the window opening 6 and supported by the upper spring plate 13 of the spring nest 11. The transom bolster is preferably box-shaped in section and is formed with an upper wall or web 17, a lower wall or web 18, the side edges of said walls being connected by the vertically and longitudinally extending side walls 19 and preferably by an intermediate web 19b.

In order to permit the composite bolster to angle horizontally with respect to the side frame to incorporate a desired degree of flexibility in the truck and at the same time provide surface engagement between intimately associated parts of the composite bolster and side frame, each of the guide columns has a transverse web portion 20 provided with an inwardly facing cylindrical concave surface 21. The vertical axis of the concave surface corresponds with the intersection of the planes of the transverse and longitudinal axes of the side frame, hereinafter referred to as the vertical axis of the side frame. Thus, as the guide columns are preferably spaced equidistant from the vertical axis of the side frame, the concave surfaces 21 will, therefore, be concentric or coaxial with respect to one another. In order to provide surfaces on the composite bolster to cooperate with the concave surfaces on the guide columns, the side walls 19 of the transom bolster have a portion thereof, which occupies the window opening, bulged or arcuately convoluted, as at 22, and provided with outwardly facing convex surfaces 23 which are concentric with the vertical axis of the side frame and, therefore, coaxial with the concave surfaces 21. By providing the engaging convex and concave surfaces on the transom bolster and guide columns, respectively, it will be appreciated that adequate engaging, wear and bearing surfaces have been arranged to compensate for and permit relative horizontal angling movement of the composite bolster with respect to the side frames.

As the concave and convex surfaces on the guide columns and transom bolster respectively permit a relative horizontal angling movement of the composite bolster with respect to the side frame, it is, therefore, desirable to further provide limiting or arresting means so as to permit the composite bolster to deviate from a true perpendicular relation with the associated side frame for only a predetermined degree, and by reason of the vertical movement of the composite bolster due to the supporting springs, the arresting means should desirably afford surface engagement or contact, in contradistinction to line contact.

For this reason, therefore, each of the guide columns is provided with spaced inner and outer flanges 24 directed away from the window opening and formed integrally with the transverse web portion 20. The flanges have outer vertically disposed surfaces 25 thereon, forming continuations of the concave surface 21, which are coradial with the vertical axis of the side frame and, as a result thereof, are coradial with respect to one another.

Vertically disposed inner and outer stop lugs 26 are formed on the bolster transom side walls and are positioned on either side of the guide columns to form means for limiting or arresting the transverse movement of the transom bolster with respect to the side frames. The stop lugs have inwardly facing surfaces 27 thereon which are also coradial with the vertical axis of the side frame and define the convex surfaces 23. The lug surfaces 27 are positioned adjacent the column flange surfaces and, being coradial therewith, the included angle between the adjacent surfaces is determinative of the degree of horizontal angling or rotative movement of the composite bolster with respect to the side frames. The bottom wall of the transom bolster has, in the proximity of the lower extremity of the stop lugs, outwardly projecting extensions 28 which reinforce the stop lugs as well as provide an adequate surface or bearing area for engagement with the top spring plate 13. Thus, it will be observed that the composite bolster and side frames have been arranged and constructed so as to permit the composite bolster to angle horizontally with respect to the side frames and thereby add a predetermined degree of flexibility to the truck structure.

In order to increase the flexibility of the truck structure to compensate for irregularities and curves in the tracks or rails over which the truck structure moves, and thereby relieve the associated truck members from sudden impacts and undue strains, the composite bolster is formed in part by a top transversely movable or lateral motion bolster 29 superimposed upon and rockably associated with the transom bolster 15. The lateral motion bolster, generally inverted U-

shaped in cross section and relatively shorter than the transom bolster, comprises a top, substantially horizontal web 30 overlying the top or upper wall of the transom bolster in spaced relation thereto and spaced side flanges 31 depending from adjacent the marginal side edges of the top web which partially embrace or overlie the side walls 19 of the transom bolster in spaced relation.

The top web 30 of the lateral motion bolster is preferably provided with an integrally formed truck center plate 74 intermediate the ends thereof adapted to receive an associated body center plate (not shown), while the end portions of the top web are slightly embossed or raised, as at 32, to accommodate a truck side bearing (not shown) which may be of any conventional type. The free or lower edges of the side flanges 31 are reinforced by an inwardly directed beading 33 which extends for the full length of the flanges.

The lateral motion bolster is reinforced against vertically acting superimposed loads by means of intermediate longitudinal flanges 34 which extend downwardly from the top web 30 and are spaced on either side of and adjacent to the transverse axis of the truck structure. The intermediate flanges are preferably connected integrally and intermediate their ends by an upwardly directed U-shaped tie 35 spaced a sufficient distance beneath the center plate to thereby add adequate strength and rigidity to the lateral motion bolster. The lateral motion bolster is further reinforced by vertically and centrally disposed ribs 36 which immediately underlie the truck center plate and extend between the side and intermediate flanges.

The transom bolster 15 is formed to slope downwardly from the end portions 16, as at 37, toward the longitudinal center of the truck structure to form a depressed or bowed portion 38 underlying and spaced from the intermediate flanges and tie 35 so as to prevent any interference between the bolsters upon any relative movement therebetween.

The lateral motion bolster is rockably supported on the transom bolster by means of vertically disposed gear rockers 40, a pair of which is associated with each end of the composite bolster on either side of the longitudinal center line thereof and the rockers of each pair desirably inclined at an angle to the perpendicular, the purpose of which will be hereinafter set forth. The rockers, positioned within the transom bolster inwardly of the side frames, extend through suitable apertures 41 provided in the upper wall 17 of the transom bolster. The rockers are provided with teeth 42 adjacent the ends thereof to thereby form, in effect, a gear. The lateral motion bolster and the transom bolster are likewise provided with spaced teeth 43 directed toward one another and positioned on either side of the rocker teeth to form, in effect, a rack and thereby prevent an unwarranted disassembly or accidental displacement of the rockers 40 with respect to the associated structure.

Suitable bearing plates 44, interposed between the lower end of each rocker and lower wall 18 of the transom bolster, may be and preferably are removably secured to the lower wall by means of rivets 44a, while similarly formed bearing plates 45 are interposed between the upper extremity of each rocker and the adjacent top web 30 of the lateral motion bolster. The plates 45 are also preferably and removably secured to the top web 30 by means of rivets 46 which have head portions 46a positioned in suitably provided recesses 47 in the top web, so as not to extend into the area provided for or interfere with the side bearings. The rockers are provided with end convex surfaces 48 adapted to bear against and engage arcuate concave surfaces 49 formed on the bearing plates 44 and 45. The radius of the concave surfaces of the bearing plates is desirably greater than the engaging convex surface of the rockers so that, in theory as well as in actual practice, by reason of the particular inclination of the rockers and formation of the engaging arcuate surfaces, any deviation of the lateral motion bolster in a transverse direction and away from its normally central position will result in one end of the lateral motion bolster raising or moving in a transverse and vertical direction away from the top wall of the transom bolster, while the other or opposite end of the lateral motion bolster will be lowered or approach the top wall of the transom bolster.

It will be observed, by referring to Figure 3 of the drawings, that the truck side bearing supporting area of the lateral motion bolster is immediately above the rockers 40 so that any vertical load imposed on the side bearings will be transmitted directly to the transom bolster through the rockers.

An abutment for limiting the transverse movement of the lateral motion bolster has been incorporated in the structure and desirably takes the form of an upstanding flange 50 positioned inwardly of the side frame and extending upwardly from the upper wall 17 of the transom bolster. Triangular and spaced ribs 51 reinforce the upstanding flange so as to overcome any hinging action of the flange which may result from the transmission of impacts thereto. An end rib 52, extending downwardly from the top web 30 and between the side flanges 31 of the lateral motion bolster, is spaced inwardly of the truck from the upstanding transom bolster flange a distance equal to the permissive or required transverse movement of the lateral motion bolster.

The upstanding flange 50 is provided with an inwardly facing surface 53 adapted to be engaged by an outwardly facing surface 54 on the lateral motion bolster rib 52. The surfaces 53 and 54 are desirably angularly disposed to one another so that upon engagement of these faces they will assume a coplanar relation and, as a result thereof, provide a surface engagement therebetween.

To prevent wear between the lateral motion bolster and the transom bolster there are provided removable wear plates 55 attached to the side flanges 31 inwardly thereof and oppositely disposed removable wear plates 56 attached to the side walls 19 outwardly thereof. The wear plates 55 and 56 are arranged so as to present engaging surfaces throughout the entire range of relative transverse movement of the lateral motion bolster upon any relative movement between the bolsters longitudinally of the truck structure.

Means has been provided in the present structure for resiliently resisting the transverse movement of the lateral motion bolster as well as returning same back to its original or normal position. It will be understood that the present application contemplates a cushioning means of any desired form, and it may be a unit such

as disclosed and claimed in my and Emil H. Blattner's copending application for Railway truck, Serial No. 113,495, filed November 30, 1936, which has since matured into United States Letters Patent 2,198,261, granted April 23, 1940.

The form of the cushioning means illustrated comprises helical springs 57 positioned on each side of the longitudinal axis of the truck structure. Each spring has a spring cap 58 associated with each end thereof. A ferrule 59 extends inwardly of the springs from each cap to form spring-positioning means and thereby prevent disassembly of the springs and associated caps. The units thus formed by the springs 57 and caps 58 are positioned in upwardly opening pockets 60 provided on the top wall of the transom bolster. The pockets 60 are defined by transversely spaced upwardly directed legs 61 forming abutments for and engaging associated spring caps to limit or restrict the expansive movement of the units from their normal position.

Centrally disposed ribs 62 extend between and connect the legs to underlie the units and thus form a vertical support therefor. Suitable unit or downwardly opening pockets 63 are also formed in the lateral motion bolster by means of the longitudinal flanges 34 which have inwardly directed and transversely spaced ribs 64, the latter of which are spaced on either side of the legs 61 and also abut the associated spring caps 58. The ribs 64 are preferably aligned with the legs 61 so as to form pockets of substantially equal length in both bolsters.

It will be observed from the above description that both of the units are energized upon any movement of the lateral motion bolster away from its normal central position, thereby forming means wherein both units are employed to return the lateral motion bolster to its normal position upon any relative movement between the bolsters while the spring means are fixedly associated with the transom bolster.

Referring now to the modification of the invention illustrated in Figures 5 to 7, inclusive, of the drawings, there is disclosed a railway vehicle truck 1^a having a pair of spaced side frames 2^a, only one of which is illustrated. Each side frame is provided with a window opening 6^a therein which is defined by spaced guide columns 5^a. The guide columns comprise a vertically disposed web 20^a having longitudinally disposed spaced side flanges 24^a extending outwardly of the window opening to form continuations of the webs. Inwardly facing cylindrically concave surfaces 21^a are formed on the guide columns which are coaxial with respect to one another as well as coaxial with the vertical axis of the side frame 2^a. The side flanges 24^a have outwardly facing surfaces 25^a which are vertically disposed with respect to the side frame and coradial with the vertical axis of the side frame.

The side frames are connected together intermediate their ends by a load transmitting member or multi-part bolster 14^a which generally comprises a bottom or transom bolster 15^a and a top or lateral motion bolster 29^a, the latter of which is relatively shorter than the transom bolster. The transom bolster is of general box shape in cross section and is formed of an upper or top wall 17^a and a lower or bottom wall 18^a, which are connected together along their adjacent side marginal edges by means of spaced side walls 19^a.

Like the composite bolster of the previously described structure, it is desired to arrange the present multi-part bolster so as to incorporate a desired degree of flexibility in the truck structure. To accomplish this result, each of the side walls of the transom bolster are bulged or convoluted as at 22^a adjacent the ends thereof. The convoluted portions have an outer cylindrically convex surface 23^a which is preferably coaxial with the vertical axis of the side frame and adapted to engage the concave column surfaces to thereby limit the longitudinal movement of the multi-part bolster with respect to the side frames. Inner and outer stop lugs 26^a extend outwardly of the side walls adjacent the convoluted portions thereof to embrace the side flanges of the guide columns therebetween. The stop lugs are provided with inwardly facing surfaces 27^a which define the convex surfaces 23^a and are coradial with respect to the vertical axis of the side frames. The lug surfaces are positioned in angular spaced relation to the column flange surfaces, and by this arrangement the multi-part bolster will be free to angle horizontally of the side frames through an arc equal to the included angle between the stop lug and column flange surfaces and thus provide a flexible connection between the multi-part bolster and the associated side frames.

The lateral motion bolster is arranged to move transversely of the truck structure and is preferably rockably supported by the transom bolster. The lateral motion bolster of the instant illustration also desirably takes an inverted U-shaped cross sectional form and comprises a top or upper web 30^a spaced above the top wall of the transom bolster. The top web has side flanges 31^a depending downwardly from adjacent the side marginal edges thereof to partially embrace and be positioned adjacent the transom bolster side walls. The top web of the present disclosure is also provided with an integrally formed center plate 74^a positioned intermediate the ends thereof. It will, of course, be understood that the center plate may be formed as a separate unit or casting and, as such, removably secured to the top web, if it is found desirable to do so for the accommodation of shims between the center plate and transom bolster to maintain or establish a desired center plate height from the top of the rails. The end portions of the top web are preferably raised as at 32^a to present a truck side bearing engaging and supporting seat.

In order to reinforce the lateral motion bolster against vertically imposed loads resulting from a superimposed vehicle body (not shown), spaced intermediate flanges 34^a project down from the top web inwardly of the lateral motion bolster and for substantially the entire length thereof. The lower or free marginal edges of the intermediate flanges 34^a are preferably bowed downwardly, as at 65, to assume their greatest depth immediately beneath the truck center plate so as to add rigidity and stiffness to the lateral motion bolster. The flanges 34^a are integrally connected together by means of a U-shaped tie 35^a which is positioned in spaced relation to and below the truck center plate. The lateral motion bolster is further reinforced by means of vertically disposed ribs 36^a which extend downwardly from the top web, immediately beneath the truck center plate, and extend from the intermediate flanges 34^a to the side flanges 31^a. The truck bolster is bowed or sloped downwardly, as at 37^a, intermediate the ends thereof to afford clearance for the intermediate flanges, tie 35^a and ribs 36^a, to thereby permit a free unrestricted and transverse move-

ment of the lateral motion bolster with respect thereto.

In order to provide wearing surfaces between the lateral motion and transom bolsters, which may form engaging surfaces therebetween upon a relative transverse movement of the lateral motion bolster with respect to the transom bolster, there is provided on, and outwardly of, the side walls 19a removably secured wear plates 56a spaced oppositely from similar wear plates 55a removably secured to, and inwardly of, the side flanges 31a. The wear plates are of sufficient dimensions and arranged so as to be adapted to engage throughout the entire range of longitudinal movement of the lateral motion bolster.

Means has been provided in the multi-part bolster to limit the movement of the lateral motion bolster. The disclosed means comprises an upstanding flange 50a positioned adjacent each end of the transom bolster and formed integrally with a top or upper wall 17a thereof. Each upstanding flange is reinforced by triangular and spaced gussets 51a and has an inwardly facing surface 53a preferably angularly disposed to the longitudinal axis of the transom bolster. The lateral motion bolster has depending from the top web, adjacent each end thereof, a rib 52a which extends between the side flanges 31a and is in horizontal spaced relation to the upstanding flange a sufficient distance to permit a predetermined movement of the lateral motion bolster. The rib 52a has an outer surface 54a thereof angularly disposed to the upstanding flange surface so that upon engagement of the surfaces, as a result of the transverse movement of the lateral motion bolster from its normal position, the surfaces will assume a coplanar relation and afford an adequate bearing area therebetween.

The lateral motion bolster 29a is movably supported by the transom bolster by means of vertically disposed rockers 40a which are inclined inwardly of the multi-part bolster from the transom bolster. A pair of such rollers are preferably interposed between each end of the lateral motion bolster and the associated portion of the transom bolster therebeneath and positioned on either side of the longitudinal center line of the multi-part bolster. The rockers are formed as gears by having teeth 42a formed therein and adjacent each end thereof. The lateral motion and transom bolsters are likewise formed with spaced teeth 43a directed toward one another and positioned on either side of the rocker teeth to form a rack or rocker teeth engaging means, to thereby prevent an unwarranted displacement of the rockers 40a.

A suitable bearing plate 44b, interposed between the bottom portion of each rocker and the lower wall 18a of the transom bolster, is removably positioned in suitable recesses formed on the lower wall while a similarly formed wear plate 45a is interposed between the top extremity of each rocker and the adjacent top web 30a of the lateral motion bolster. The wear plates 45a are removably attached to the top web, inwardly thereof, by means of rivets 46b which have their head portions 46c positioned in recesses 47a formed in the top web so as not to encroach on the area provided for the side bearing.

The rockers 40a are preferably provided with end convex cylindrical surfaces 48a adapted to bear against inwardly facing concave cylindrical surfaces 49a formed on the bearing plates 44b and 45a, respectively. The radii of the bearing plate concave surfaces are preferably greater than the radii of the rocker convex surfaces so that any movement of the lateral motion bolster away from its normally central position will result in one end of the lateral motion bolster lifting or moving away from the top wall of the transom bolster, while the other or opposite end of the lateral motion bolster will drop or approach the said top wall.

The instant construction also contemplates resiliently resisting the transverse movement of the lateral motion bolster and to accomplish this result the resilient means are associated directly with the rockers 40a. Oppositely and horizontally disposed pockets 66, arranged to face one another and positioned on either side of the rockers 40a, are provided within the transom bolster adjacent each end thereof. The pockets are occupied by oppositely acting helical springs 57a projecting outwardly therefrom and have, at the free ends thereof, suitable spring caps 58a which directly bear against convex surfaces 67 of oppositely disposed embossments 68 provided on the rockers intermediate the ends thereof. The springs are fixedly associated with the transom bolster by means of bolts 69 which have a head portion 69a thereof positioned in a suitable relief 70 formed in the spring caps. Each bolt has a stem portion 71 extending through an aperture 72 in a vertically disposed wall 73 which forms the spring resisting member of each pocket 66. Suitable nuts or bolt locks 74 are provided on the free ends of the bolts in arrear of the wall 73 and outwardly of the pockets in order to retain the springs in a predetermined normal position, or in other words, to limit the expanse of movement of the springs.

It will be observed that any movement of the lateral motion bolster from its normal position will, through the rockers 40a, energize all the springs on one side of the rockers, while all of the springs on the other side of the rockers will be prevented from expanding, due to the limiting means or bolts 69, thereby leaving the energized springs free to return the lateral motion bolster to its normal position.

It will, of course, be understood that various changes in construction and rearrangement of parts may be made to the disclosed structures without departing from within the scope of the appended claims.

I claim:

1. In a railway truck having a pair of spaced side frames and a transom bolster connecting said side frames, said transom bolster having end portions thereof disposed in bolster openings of said side frames and a lateral motion bolster superimposed on and rockably associated with said transom bolster, the combination of an upstanding flange on said transom bolster positioned adjacent each end thereof and having an inwardly facing surface angularly disposed to the longitudinal axis of said transom bolster, a depending flange on said lateral motion bolster having an outer surface thereof spaced from and normally angularly disposed to said upstanding flange surface so that, upon relative transverse movement of said lateral motion bolster, said depending flange surface will be adapted to engage and be coplanar with said upstanding flange surface, horizontally disposed pockets in said transom bolster positioned inwardly of the truck from said side frames, transversely acting spring means positioned in said pockets, means associated with said transom bolster for preventing the expansive movement of said spring means

from normal position, and means associated with said lateral motion bolster for energizing said spring means upon transverse movement of said bolster in either direction, whereby said spring means serve to resiliently maintain said lateral motion bolster in normal position.

2. In a railway truck, in combination, a pair of spaced side frames, a vertically movable transom bolster comprising a pair of spaced side walls and connecting said side frames, said transom bolster having end portions disposed in bolster openings of said side frames and being resiliently supported by said side frames, wear plates on said transom bolster side walls inwardly of the side frames, a lateral motion bolster rockably associated with said transom bolster and having a top web overlying said transom bolster and spaced depending side flanges partially embracing and positioned adjacent said transom bolster side walls, wear plates on said side flanges disposed adjacent and adapted to engage said transom bolster wear plates, horizontally disposed pockets in said transom bolster, spring means positioned in said pockets, means associated with said transom bolster for limiting the expansive movement of said springs, and vertically disposed means associated with said lateral motion bolster for engaging said spring means upon lateral movement of said bolster in either direction whereby said spring means serve to resiliently maintain said lateral motion bolster in normal position.

3. In a railway truck, in combination, a pair of spaced side frames having a composite bolster resiliently supported therefrom, said composite bolster comprising a transom bolster forming a movable connection between said side frames and having a bowed portion intermediate the ends thereof, a lateral motion bolster generally inverted U-shaped in cross section rockably supported on said transom bolster, said lateral motion bolster comprising a top web overlying said transom bolster in spaced relation thereto, and flanges depending from the side marginal edges of the top web partially embracing said transom bolster, a center plate on said top web intermediate the ends thereof, tie means underlying the center plate in spaced relation and connecting the depending flanges, said tie means being spaced above the transom bolster bowed portion, and spring means within said composite bolster to resiliently resist the transverse movement of said lateral motion bolster.

4. In a railway truck, in combination, a pair of spaced side frames having a composite bolster resiliently supported therefrom, said composite bolster comprising a transom bolster forming a movable connection between said side frames and having a downwardly bowed portion intermediate the ends thereof, a lateral motion bolster generally inverted U-shaped in cross section rockably supported on said transom bolster, said lateral motion bolster comprising a top web overlying said transom bolster in spaced relation thereto, and flanges depending from the side marginal edges of the top web partially embracing said transom bolster, tie means underlying the top web in spaced relation and connecting the depending flanges, said tie means being spaced above the transom bolster bowed portion, spring means associated with said composite bolster to resiliently resist the transverse movement of said lateral motion bolster, an upstanding flange on said transom bolster adjacent each end thereof, and a rib depending from said top web spaced from and adapted to engage said upstanding flange upon relative movement between said lateral motion and transom bolsters, beyond a predetermined position.

5. In a railway truck, in combination, a pair of spaced side frames having a composite bolster resiliently supported therefrom, said composite bolster comprising a transom bolster forming a movable connection between said side frames and having spaced top and bottom walls connected by side walls, a lateral motion bolster generally inverted U-shaped in cross section, means supporting said lateral motion bolster from said transom bolster, said lateral motion bolster comprising a top web overlying said top wall in spaced relation thereto, and flanges depending from the side marginal edges of the top web partially embracing said side walls, integral tie means underlying the top web in spaced relation and connecting the depending flanges, a downwardly opening pocket formed in said lateral motion bolster, an upwardly opening pocket formed in said transom bolster, and spring means positioned in said pockets and adapted to be energized upon movement of the lateral motion bolster in either direction transversely of the truck.

6. In a railway truck, in combination, a pair of spaced side frames having a composite bolster resiliently supported therefrom, said composite bolster comprising a transom bolster forming a movable connection between said side frames and having spaced top and bottom walls connected by vertically disposed side walls, a lateral motion bolster rockably supported on said transom bolster and comprising a top web overlying said top wall in spaced relation thereto, and flanges depending from the side marginal edges of the top web partially embracing said side walls, tie means underlying the top web in spaced relation and connecting the depending flanges, a downwardly opening pocket formed in said lateral motion bolster, an upwardly opening pocket formed in said transom bolster, and spring means positioned in said pockets and adapted to be energized upon movement of the lateral motion bolster in either direction transversely of the truck.

7. In a railway truck, in combination, a pair of spaced side frames having a composite bolster supported therefrom, said composite bolster comprising a transom bolster forming a movable connection between said side frames and having spaced top and bottom walls connected by vertically disposed side walls, a lateral motion bolster rockably supported on said transom bolster and comprising a top web overlying said top wall in spaced relation thereto, and flanges depending from the side marginal edges of the top web partially embracing said side walls, a downwardly opening pocket formed in said lateral motion bolster, an upwardly opening pocket formed in said transom bolster, spring means positioned in said pockets and adapted to be energized upon the movement of the lateral motion bolster in either direction transversely of the truck, an upstanding flange on said transom bolster positioned adjacent each end thereof and having an inwardly facing surface, a depending web on said lateral motion bolster positioned adjacent each end thereof and having an outwardly facing surface spaced from said flange surface, said surfaces being normally angularly disposed to one another so that upon a transverse movement of the lateral motion bolster to a predetermined position the surfaces will assume a coplanar relation.

8. In a composite bolster having end portions thereof adapted to be disposed in side frame bolster openings defined by cylindrical concave

surfaces, cylindrical convex surfaces on said composite bolster adapted to engage said concave surfaces, to thereby permit horizontal angling between said composite bolster and side frames, said composite bolster comprising a transom bolster having a pair of spaced vertically disposed legs adjacent each side of the transverse center line thereof to define pockets, spring means interposed between and engaging each pair of legs, a lateral motion bolster supported by and adapted to move longitudinally of said transom bolster, said lateral motion bolster having spaced depending webs normally in substantial transverse alignment with said vertical legs, and said webs being adapted to energize said spring means upon any relative longitudinal movement of said lateral motion bolster.

9. In a railway truck, in combination, a pair of side frames each having a window opening defined by guide columns, a composite bolster movably connecting said side frames, said composite bolster comprising a transom bolster having end portions thereof extending into said window openings and resiliently supported by said side frames, a pair of oppositely disposed pockets in said transom bolster adjacent each end thereof, spring means in each of said pockets, a rocker interposed between and normally engaging said spring means, and a lateral motion bolster relatively shorter than said transom bolster and supported by said rockers.

10. In a composite bolster, in combination, a transom bolster comprising spaced upper and lower walls connected by spaced side walls, a lateral motion bolster overlying said transom bolster and comprising a top web having side flanges depending from the marginal edges thereof to partially embrace said transom bolster side walls, a bearing plate having a concave surface and being removably secured to the lower wall inwardly of the transom bolster, a bearing plate having a concave surface and being removably secured to the top web inwardly of the lateral motion bolster, a rocker extending through an aperture in said top wall and between said bearing plates, said rocker having convex surfaces of less radius than and engaging the concave bearing plate surfaces, oppositely disposed pockets in said transom bolster opening toward one another, spring means in said pockets normally abutting said rocker, and means associated with said transom bolster for restricting the expansive movement of said spring means from their normal position.

11. In a railway truck, in combination, a pair of side frames each having a window opening defined by guide columns, a composite bolster movably connecting said side frames, said composite bolster comprising a transom bolster having an end portion thereof extending into each of said window openings and resiliently supported by said side frames, a pair of oppositely disposed pockets in said transom bolster adjacent each end thereof, spring means in each of said pockets, a rocker interposed between and normally engaging said spring means, a lateral motion bolster relatively shorter than said transom bolster supported by said rockers, bearing plates removably secured to said transom and lateral motion bolsters having arcuate concave surfaces, and arcuate convex surfaces on said rockers being of less radius than and in bearing relation with said bearing plate concave surfaces.

12. In a railway truck, in combination, a pair of side frames, a composite bolster connecting and arranged for horizontal angling with respect to said side frames, said composite bolster comprising a transom bolster having end portions thereof resiliently supported by said side frames, a pair of pockets in said transom bolster adjacent each end thereof, oppositely acting spring means in said pockets, a rocker interposed between and normally engaging said spring means, a lateral motion bolster relatively shorter than said transom bolster supported by said rockers, an upstanding flange on said transom bolster adjacent each end thereof, and a downwardly extending web on said lateral motion bolster adapted to engage said upstanding flange for limiting the transverse movement of said lateral motion bolster.

13. A composite bolster comprising a transom bolster having a pair of facing pockets adjacent each end thereof, oppositely acting spring means positioned in said pockets, rockers supported by said transom bolster interposed between and normally engaging said spring means, and a lateral motion bolster adapted to move relatively to said transom bolster and supported by said rockers, said rockers adapted to energize some of the springs upon transverse movement of said lateral motion bolster.

14. A composite bolster comprising a transom bolster having a pair of spaced pockets facing one another adjacent each end thereof, spring means positioned in said pockets, rockers supported by said transom bolster being interposed between and normally engaging said spring means, and a lateral motion bolster adapted to move longitudinally of said transom bolster and supported by said rockers, said rockers adapted to energize some of the spring means upon relative longitudinal movement of said lateral motion bolster.

15. A composite bolster comprising a transom bolster having a pair of spaced vertically disposed legs adjacent each side of the transverse center line thereof to define pockets, spring means interposed between and engaging said legs, a lateral motion bolster supported by and adapted to move longitudinally of said transom bolster, said lateral motion bolster having spaced depending webs normally in substantial transverse alignment with said vertical legs, and said webs being adapted to energize said spring means upon any relative longitudinal movement of said lateral motion bolster.

16. A composite bolster comprising a transom bolster having end portions associated with and supported by spaced side frames, a lateral motion bolster movably associated with and supported by said transom bolster, said lateral motion bolster being generally inverted U-shaped in cross section having a top web overlying the transom bolster in spaced relation thereto, and side flanges depending from adjacent the side marginal edges of said top web and outwardly of said transom bolster, a tie connecting the side flanges intermediate the ends thereof and spaced below said top web, spring means associated with said transom and lateral motion bolsters adapted to resist the transverse movement of said lateral motion bolster, said transom bolster having an intermediate depressed top portion spaced beneath said flange tie.

17. A composite bolster comprising a transom bolster having end portions associated with and supported by spaced side frames, a lateral motion bolster spaced above said transom bolster, rockers interposed between each end of said

lateral motion bolster and transom bolster, said lateral motion bolster being generally inverted U-shaped in cross section and having a top web overlying the transom bolster in spaced relation thereto, side flanges depending from adjacent the side marginal edges of said top web to partially embrace said transom bolster, a tie connecting the side flanges intermediate the ends thereof and spaced below said top web, spring means normally bearing against said rockers adapted to resist the transverse movement of said lateral motion bolster, said transom bolster having an intermediate depressed portion spaced beneath said side flange tie.

18. In a composite bolster, in combination, a transom bolster comprising spaced upper and lower walls connected by spaced side walls, a lateral motion bolster overlying said transom bolster and comprising a top web having side flanges depending from adjacent the marginal edges thereof, a bearing plate having a concave surface removably secured to the lower wall inwardly of the transom bolster, a bearing plate having a concave surface removably secured to the top web inwardly of the lateral motion bolster, a rocker extending through an aperture in said transom bolster and between said bearing plates, said rocker having convex surfaces of less radius than and engaging the concave bearing plate surfaces, oppositely disposed pockets in said transom bolster opening toward one another, and spring means positioned in said pockets normally abutting said rocker.

19. In a railway truck having a pair of spaced side frames and a composite bolster the latter of which is formed of a transom bolster connecting and resiliently supported by said side frames and a lateral motion bolster supported by said transom bolster; the combination of a flange upstanding from said transom bolster adjacent each end thereof and inwardly of said side frames, said flange having a surface angularly disposed to a horizontal plane, a rib depending from each end of a top web of said lateral motion bolster and having a surface angularly disposed to the transom bolster flange surface, said rib surface being adapted to engage and be coplanar with said flange surface so as to limit the movement of said lateral motion bolster, rocker means interposed between said lateral motion bolster and transom bolster and extending through an aperture in said transom bolster, bearing plates removably secured to said transom and lateral motion bolsters and provided with concave surfaces, convex surfaces on said rocker means in bearing relation with and being of less radius than said concave surfaces, horizontally disposed pockets in said transom bolster positioned inwardly of said side frames, spring means positioned in said pockets and associated with said lateral motion bolster, means secured to said transom bolster for preventing expansive movement of said spring means when said lateral motion bolster moves transversely of the truck from normal position, said spring means serving to resiliently maintain said lateral motion bolster in normal position.

20. A lateral motion bolster adapted to embrace a portion of a transom bolster and being generally inverted U-shape in cross section, said lateral motion bolster comprising a top web spaced above said transom bolster and side flanges spaced outwardly from said transom bolster depending from adjacent opposite edges of said top web, said side flanges having their greatest depth adjacent the center of said lateral motion bolster, a center plate formed integrally with said top web intermediate the ends thereof, tie means spaced beneath said center plate and connecting said side flanges adjacent the lower edges thereof, and a rib depending from said top web adjacent each end thereof for engaging a complementary portion of said transom bolster, in surface relation, to thereby limit the movement of said lateral motion bolster.

21. A lateral motion bolster comprising a top web and side flanges depending from adjacent opposite edges thereof, spaced longitudinally extending flanges depending from said top web intermediate said side flanges, tie means extending between said side flanges adjacent the lower free edges thereof, and transversely and longitudinally spaced ribs positioned on either side of the transverse center of said bolster forming pockets for the reception of spring means, said ribs extending inwardly of the bolster and toward one another from each intermediate flange.

22. In a railway truck having a pair of spaced side frames and a composite bolster, the latter of which is formed of a transom bolster connecting and resiliently supported by said side frames and a lateral motion bolster supported by said transom bolster by means of rockers; the combination of spaced flanges depending from a top wall of said transom bolster adjacent each end thereof, spring means each having one end thereof bearing against said flanges, a spring cap bearing against the other end of each spring means, said spring caps normally bearing against said rockers, and tie means connecting said spring caps and flanges for limiting the expansive movement of said spring means.

23. In a substantially open bottom bolster, in combination, a top web having spaced side flanges depending from the transverse edges thereof for substantially the full length of said bolster, said side flanges having their greatest depth adjacent the central portion of said bolster, longitudinally extending flanges depending from said top web intermediate and of less depth for their entire length than said side flanges, a U-shaped tie member joining said intermediate flanges adjacent their lower free edges and positioned centrally of the bolster, centrally disposed ribs depending from said top web and extending for substantially the full height of the intermediate and side flanges, said ribs being in substantial alignment with said tie means and joining said intermediate and side flanges, and transversely spaced means extending inwardly of said intermediate flanges and spaced on either side of said tie means and ribs to form abutments for associated spring means for resiliently resisting tranverse movement of said bolster.

24. In an inverted U-shaped bolster, in combination, a top web having spaced side flanges depending from transverse edges of said top web and having their greatest depth adjacent the transverse center line of said bolster, a pair of flanges depending from said top web intermediate and of lesser height than said side flanges, tie means positioned on said transverse center line joining said side and intermediate flanges adjacent the lower free extremities thereof, means extending inwardly of said bolster from said intermediate flanges and being spaced outwardly from said tie means to form abutments for associated spring means which resiliently resist transverse movement of said bolster, and wear plates removably associated with said side

flanges adjacent the extremities thereof and inwardly of said bolster; said wear plates being adapted to engage an associated transom bolster.

25. In a transom bolster adapted to form a movable connection between spaced side frames, in combination, vertically spaced top and bottom walls joined adjacent their transverse edges by vertically extending side walls, said top wall, intermediate its ends, being depressed to underlie and accommodate an associated lateral motion bolster, and longitudinally spaced legs upstanding from said top wall on either side of the transverse center line of said bolster to form spring pockets.

26. In a transom bolster adapted to form a movable connection between spaced side frames, in combination, vertically spaced top and bottom walls joined adjacent their transverse edges by vertically extending side walls, said top wall, intermediate its ends, being depressed to underlie and accommodate an associated lateral motion bolster, and spaced legs upstanding from said top wall on either side of the transverse center line of said bolster to form spring pockets; said top wall being apertured outwardly of said legs for the accommodation of lateral motion bolster supporting means.

27. In a transom bolster adapted to form a movable connection between spaced side frames, in combination, vertically spaced top and bottom walls, spaced side walls joining said top and bottom walls, said top wall being depressed intermediate its ends to accommodate an overlying lateral motion bolster, and longitudinally spaced vertical walls depending from said top wall adjacent each end thereof to form abutments for spring means, said top wall being apertured in a plane intermediate said spaced walls for the passage of lateral motion bolster supporting means.

28. In a transom bolster adapted to form a movable connection between spaced side frames, in combination, vertically spaced top and bottom walls, spaced side walls joining said top and bottom walls, pockets facing one another formed in said bolster adjacent each end thereof for the reception of oppositely acting spring means, said top wall being apertured in a plane intermediate associated pockets for the accommodation of lateral motion bolster supporting means, and a bearing plate removably secured to said bottom wall in substantially vertical alignment with an associated aperture.

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