

April 30, 1935.

A. CAMPBELL

1,999,651

BOLSTER CONSTRUCTION

Filed Oct. 15, 1931

3 Sheets-Sheet 1

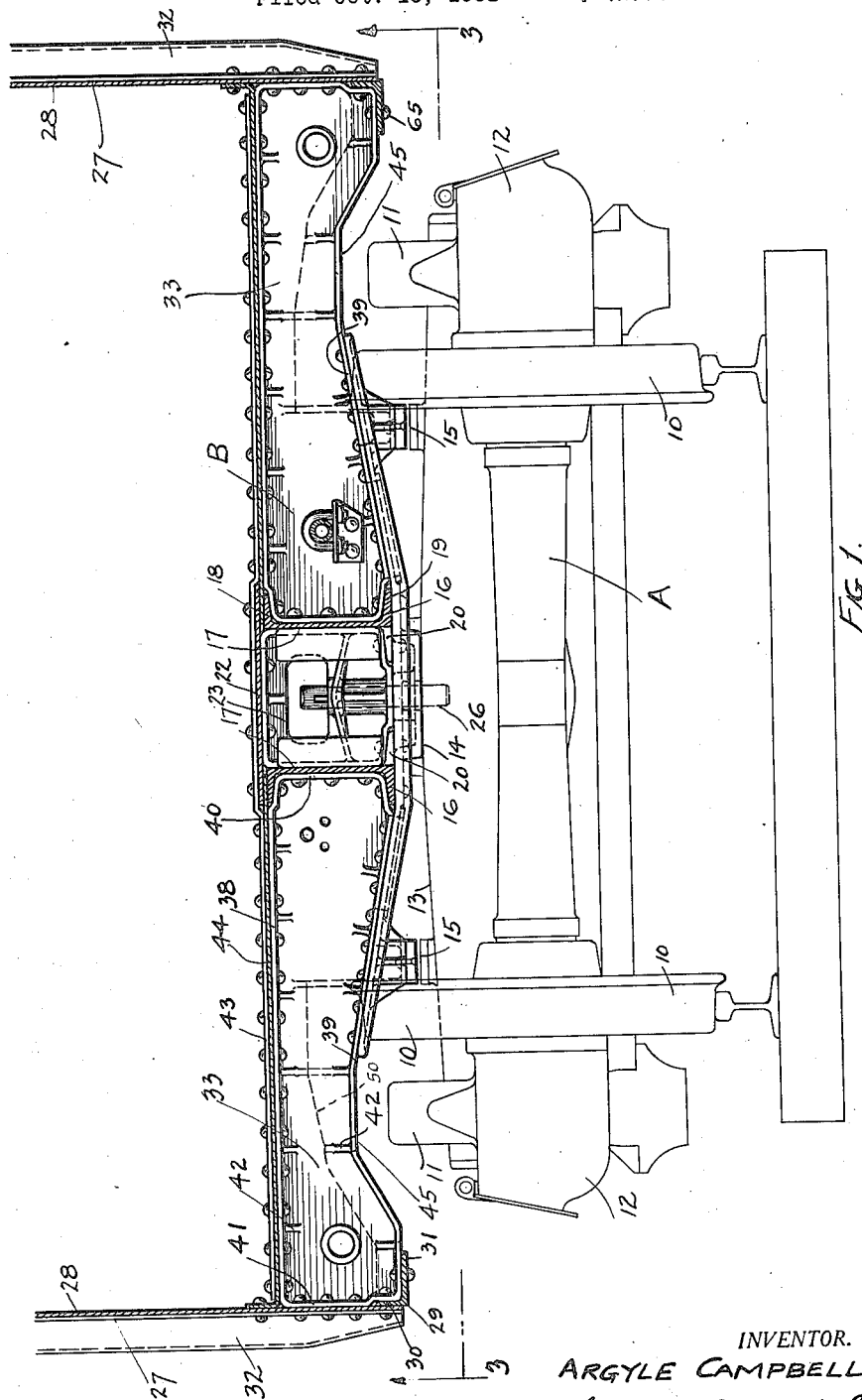


FIG. 1.

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3 Sheets-Sheet 2

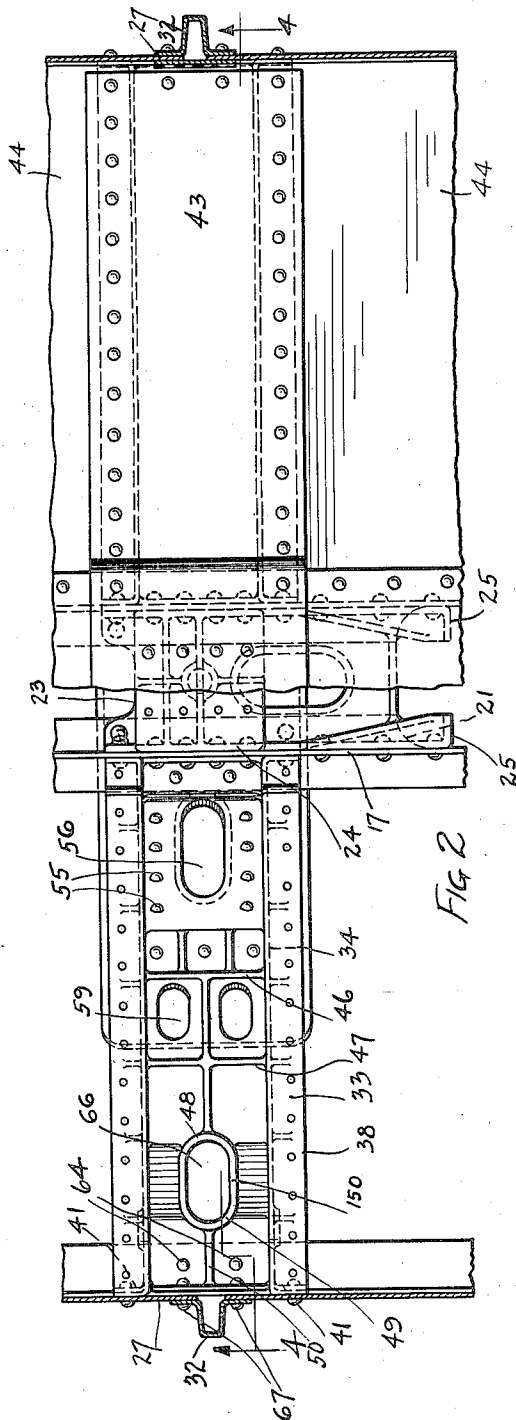


FIG 2

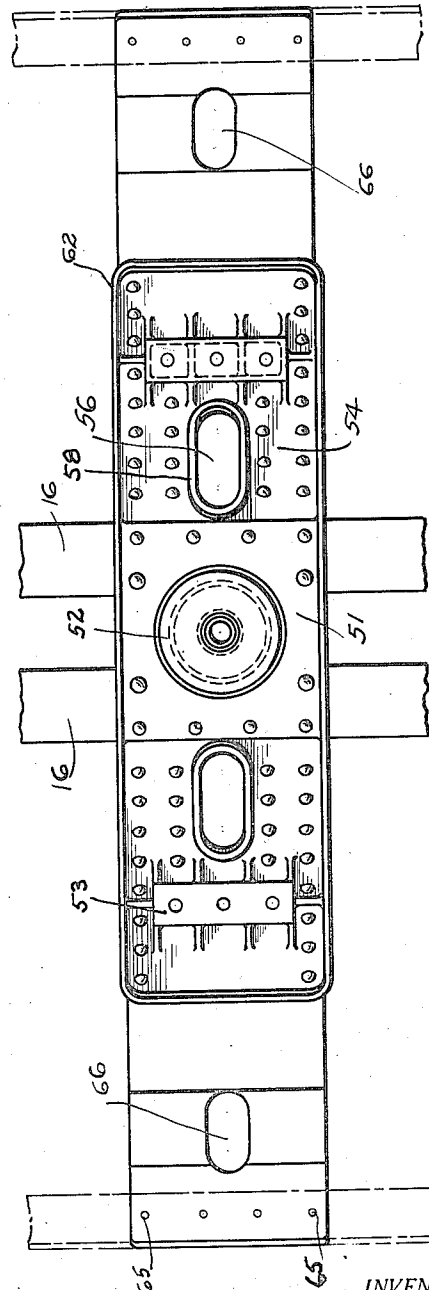


FIG 3.

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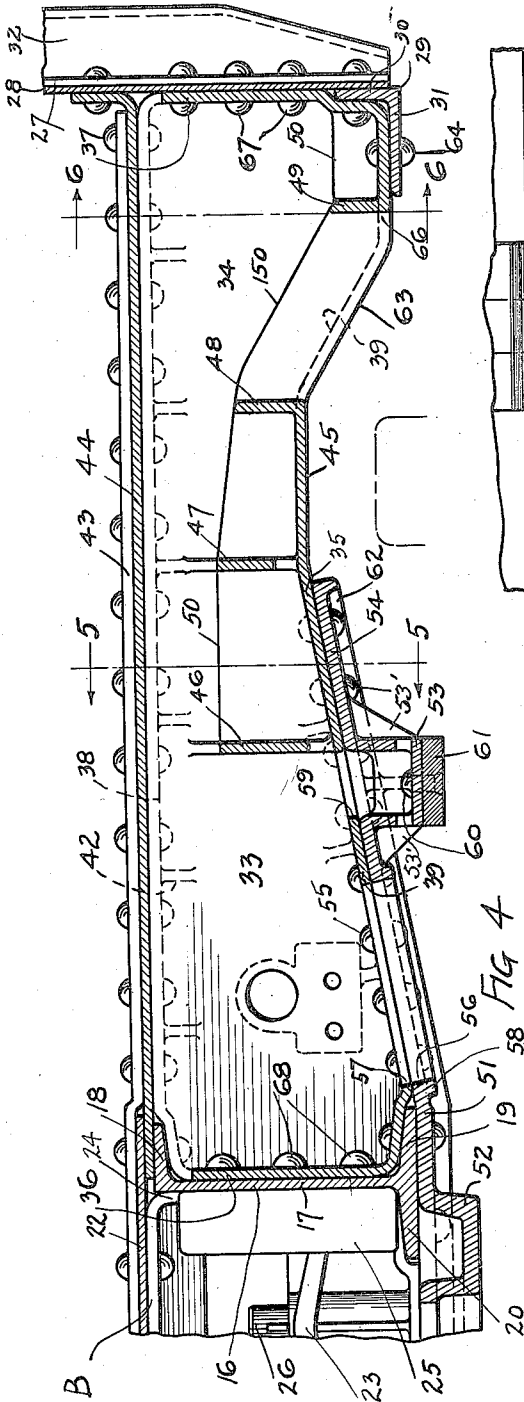
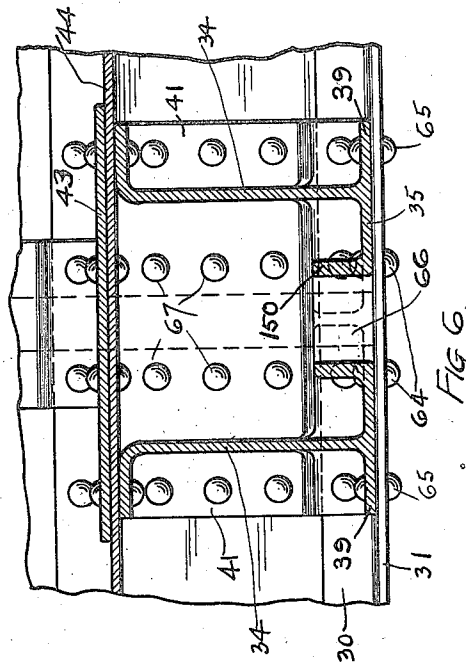
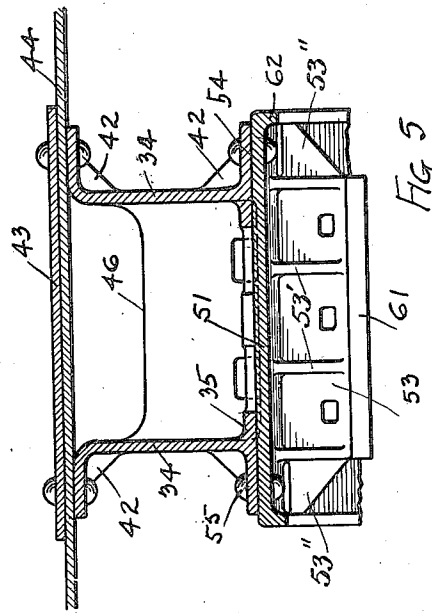
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3 Sheets-Sheet 3



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1,999,651

BOLSTER CONSTRUCTION

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Application October 15, 1931, Serial No. 568,997

13 Claims. (Cl. 105-228)

My invention relates to improvements in bolster construction for railway cars.

An object of my invention is to provide a bolster construction composed of relatively few parts and having the required strength to transmit load from the side walls to the center plate or from a point centrally of the car to the sides of the car as well, and also resist side bearing and buffing strains.

Another object of my invention is to provide bolster sections at each side of the centersills formed of integral cast members adapted to cooperate with an integral cast member extending transversely across the centersill and united to the respective bolster sections on the opposite sides of the centersill structure.

Still another object of my invention is to provide bolster members such as will transmit bearing and buffing strains direct from the center plate to the upstanding bolster sections on opposite sides of the centersills and to provide said upstanding sections with portions of increased strength adjacent their points of connection.

Another and more specific object of my invention is to provide bolster sections extending between the centersill and the sides of the car of trough shaped formation, and to form the same of cast metal whereby a concentration of metal may be employed at the locations of greatest strain.

Another and still more specific object of my invention is to provide a bolster construction formed of cast metal whereby certain parts may be conveniently made of reduced depth to conform to adjacent parts of the car structure, and to make said parts having the reduced depth of increased sectional area to compensate for weakness, thereby obtaining a beam of substantially uniform strength throughout its length irrespective of the depth and width thereof.

My invention further resides in certain improvements and detail of parts such as will be hereinafter fully pointed out and claimed.

For further comprehension of my invention reference may be had to the accompanying drawings wherein

Fig. 1 is a vertical transverse sectional view taken through the lower portion of a railway car adjacent to the trucks and bolster parts;

Fig. 2 is a plan view of that part of the body bolster construction illustrated in Fig. 1, said view illustrating certain of the parts broken away to better illustrate the construction;

Fig. 3 is a plan view of the bolster construction as viewed from beneath on a line 3-3 of Fig. 1;

Fig. 4 is a vertical transverse sectional view on an enlarged scale illustrating approximately one-half of the width of the car and taken on a line 4-4 of Fig. 2;

Fig. 5 is a vertical sectional view through the bolster taken on a line corresponding substantially to a line 5-5 of Fig. 4; and

Fig. 6 is a vertical sectional view taken through the bolster on a line corresponding substantially to a line 6-6 of Fig. 4.

In said drawings the truck parts are indicated by the reference character A and the body of the car at B. Said truck parts are shown as including the wheels 10, side frames 11, said side frames including the journal boxes 12. The truck bolster is indicated conventionally at 13, said truck bolster having center plate bearing at 14 and side bearings at 15-15, the latter being spaced outwardly on opposite sides of the center plate.

The car body construction B includes the longitudinally extending centersill beam members 16-16, each centersill beam member having a vertical web section 17 and outwardly extending flanges at the upper and lower portions as indicated at 18 and 19 respectively, each said centersill section also including an inwardly extending lower marginal flange 20. The flange 20 is cut away forwardly of the body bolster as indicated at 21 in the usual manner to accommodate the draft gear parts.

The pair of centersill members are united by a top cover plate 22. Between the said spaced centersill members there is disposed a center filler 23 provided with walls 24-24 which extend lengthwise of the centersill webs 17 and are secured thereto. The bolster filler is extended forwardly and formed with integral draft gear stops 25 adjacent one end thereof. Centrally of the bolster, the filler is formed to receive the usual bolster center pin 26 the axis of which constitutes the pivotal center around which the truck and body bolsters swivel.

Spaced outwardly from the centersills are the side walls 27 which each include a vertically disposed side plate 28 and a lower marginal reinforcement 29 having an upstanding flange 30 secured to the lower portion of the plate, and an inwardly directed horizontally extending marginal flange 31. On the outer side of each of said side plates 28 there is provided a vertically extending stake member 32 which is preferably disposed centrally of the bolster construction.

On each side of the centersill and extending between the same and the side wall of the car, a bolster section 33 is provided, the sections on the

opposite sides of the centersill being of substantially the same construction and differing only in certain details such as the spacing of holes adapted to accommodate piping or other parts such as air brake rods. In view of this similarity of construction the description herein will be confined to only one of such members.

The member 33 is preferably formed of an integral cast member having two upstanding web sections 34—34 extending lengthwise of the bolster, the said sections being spaced apart lengthwise of the car an appreciable distance. The pair of webs 34—34 are integrally united by a lower bottom wall 35, and at the opposite ends by inner and outer end walls indicated at 36 and 37 respectively, said end walls extending lengthwise of the car and cooperating with the webs 34—34 and bottom wall 35 to form a trough shaped structure. Each said web section 34 on its outer side is reinforced by a continuous outstanding marginal flange which, in combination with the web, forms a continuous pan shape. This continuous marginal flange includes upper, lower and opposite end flanges as indicated at 38, 39, 40 and 41 respectively, said respective walls 39, 40 and 41 being respectively in the planes of and forming continuations of the respective walls 35, 36 and 37.

The said outstanding walls 35, 36 and 37 are braced respectively to the web sections 34 by a series of integral bracket gusset portions 42. Each section 33 at its inner end is adapted to fit in the angles defined by the web of the centersill and the upper and lower flanges thereof. These integrally formed walls provide a strong continuous box-like section adjacent the corners. The outer upper outstanding flanges 38 are secured by a series of rivets to the bolster top cover plate 43 and the floor members 44, the former extending continuously from side to side of the car. The lower portion of the bolster is contoured to clear the truck side frame members 11 by having a relatively shallow portion 45 formed above the truck side frame parts in order to provide ample clearance.

Hitherto it has been customary to provide a continuous plate extending beneath the centersills and from side to side of the car and riveted throughout its entire length to the bolster sections. This necessitated a still shallower construction for the bolster, as it then became necessary for the truck parts to clear not only the bottom cover plate but also the connecting rivet heads. In my improved construction it is possible to dispense with the continuous cover plate inasmuch as a concentration of metal is employed in each bolster section at the portion of reduced depth by the use of additional ribbing extending lengthwise of the car and transversely thereto, said lengthwise ribbing being indicated at 46, 47, 48 and 49 and the transverse ribbing at 50. The ribbing 50 adjacent the outer end of the bolster is divided into two walls 150—150 for a limited distance to form an opening.

The outstanding lower flange 39 is secured to a bolster bottom member 51 which extends transversely across the plane of the centersill and incorporates an integral center plate bearing member 52 and integral side bearing brackets 53 on the opposite sides of the centersill. This bottom member includes the body section 54 by which a connection is effected with the lower bottom wall 35 of the respective bolster sections 33 through the medium of rivets 55. The bottom wall 35 and the body section 54 are each provided with a

large opening in the body thereof as indicated at 56 and 57, said respective opening being disposed in alignment thereby rendering the rivets 55 accessible both from the inside and outside of the bolster. The said openings 56 are reinforced around the margins by beading 58.

The side bearings 53 are of a box shaped section opened at the upper portion thereof, said openings registering with aligned openings 59 also formed in the bottom wall 35. These openings permit access to rivets 60 by which a wear plate 61 is secured to the lower portion of the side bearing. The said bottom member 51 is reinforced clear around its marginal edges by a beading 62. In order to compensate for the openings 59 in the bottom tie plate and bottom wall of the bolster, which provide for access to the depressed side bearings, I provide integral ribbing to continue the reinforcement between the tie plate and the bearing structure. In Figs. 4 and 5, integral outside ribs 53¹ extend diagonally between the vertical walls of the side bearings and the body section 54 of the bottom member 51, a number of these ribs being disposed in parallel relation and spaced apart throughout the width of the side bearing. In like manner, ribs 53² are provided outside of the side bearing at the ends thereof and extend between the end walls of the side bearings and the body section 54 of the bottom plate. Thus the advantage of the access opening 59 for the bearing is obtained without affecting the strength of the bottom member at this point.

Adjacent its outer end each bolster section 33 increases in depth as it recedes from the truck side frame as indicated at 63, and the extreme outer corner of the bolster fits in the angle defined by the outstanding horizontal flange 31 of the car side and the upwardly extended portion of the car side wall. The instanding horizontal flange 31 of the car side wall is riveted to the bolster bottom wall 35 by rivets 64 and to the outstanding flange 39 of the bolster by rivets 65. The rivets 64 are rendered accessible by the opening 66, this opening also permitting access to rivets 67 which secure the outer flange 37 of the bolster to the side wall plate 28 and to the side stake 32. Adjacent the centersill, connection is effected between the bolster center filler 21 and the inner wall 29 of each bolster section 33 by means of rivets 68, said rivets 68 being rendered accessible through the medium of the aligned openings 56 and 57 respectively formed in the bottom member and bottom wall of the bolster.

The attachment of side stake member 32 directly to the end wall 28 of the bolster section by rivets 67 provides a strong anchorage construction for the side wall framing, for the reason that said wall 37 is braced relatively to the bolster bottom wall 35 and the inwardly directed flange 31 of the car side by the centrally disposed rib 50.

The ribbing 46, 47, 48, 49 and 50 commences adjacent the side bearing by the disposition of rib 46 substantially above said side bearing, while rib 47 is disposed adjacent the inner end of the shallow portion of the bolster. The ribbing 50 rigidifies the bolster section from a point adjacent the side bearing towards the side of the car and operates to rigidify the bolster beyond the end of the bottom tie member clear through to the side of the car, thus providing a strong structure from side to side of the car with comparatively few parts.

The construction further presents advantages for strengthening the car parts in the direction of

buffing strains between the body and truck of the car by virtue of the strong attachment between the bolster bottom tie member and the bolster sections, the latter in turn being rigidly secured to the car body at each end.

I claim:

1. In a railway car, the combination of a centersill structure, bolster sections on each side of said centersill, each said bolster section being of a box-shaped formation including spaced substantially vertical web sections extending continuously between the centersills and side walls of the car and united at their extreme ends by integral vertical end walls connected with the centersills and side walls of the car, said respective vertical end walls being respectively united with the centersill and side wall of the car; and lower integral bottom walls for the respective bolster sections connecting the web members thereof and united by a transversely extending bolster bottom tie member including an integral center plate bearing portion and integral side bearing portions.

2. In a railway car, the combination with the centersills and side walls spaced outwardly beyond said centersills; of a bolster section extending on each side of the centersill from the centersill to the side wall and including a pair of webs spaced lengthwise of the car from each other and extending continuously from centersill to side wall, said spaced webs being connected by connecting walls extending between and connecting said webs adjacent their lower marginal edges and connected by integral vertical walls at the extreme opposite ends of said sections, said respective connecting walls being respectively united with the bolster bottom member, the centersills and side walls, and said vertical end walls being united with said centersills and side walls.

3. In a railway car, the combination of a centersill construction including two longitudinally extending beam members spaced from each other; a filler casting disposed between the centersills, said filler including walls extending lengthwise in overlying relation with the centersill members; bolster sections disposed respectively on the opposite sides of the centersill, each said bolster section including a pair of web sections spaced from each other; and end walls at the respective ends of the bolster sections, and a bottom wall extending between said webs, said two end walls and bottom wall in cooperation with the vertical web sections providing an integral trough shaped construction; one of said end walls cooperating with the center filler and secured thereto and to the centersill web; and a bottom tie member extending across the plane of the centersill and secured to the bottom walls of the respective bolster sections.

4. In a railway car, the combination with a longitudinal centersill, of bolster sections on opposite sides of the said centersills, each said bolster section including a pair of spaced vertical web sections; integral walls connecting said pair of web sections, one of said walls being vertically disposed and secured to the centersill and another of said walls extending along the lower marginal edge of said section; and a connecting bottom member extending transversely of the car beneath the centersill and into overlying relation with and secured to the lower walls of the respective bolster sections, said overlying bottom member and the lower wall of the bolster section having openings to permit access to the securing means between the respective members, said

openings in the respective bolster members being disposed in an aligned relation.

5. In a railway car, the combination with the centersills; of body bolster sections on each side of the centersill extending outwardly therefrom towards the sides of the car; truck side frame members having portions extending upwardly above the lowermost portion of the centersill and into the plane of certain parts of the bolster sections, each said bolster section above the truck side frames having a saddle-like portion intermediate its ends straddling the side frame and thereby presenting a comparatively shallow portion; and means for reinforcing said bolster section adjacent its shallow portion, said means including a concentration of metal adjacent the lower marginal edge of said bolster section, and ribbing extending lengthwise and transversely of the bolster section.

6. In a railway car, the combination with the centersill and bolster sections on each side thereof, each said section including a pair of web sections each having a continuous outstanding marginal flange on the outer side thereof, said pair of web sections being united by a lower wall and end walls; and a lower tie member extending transversely across the centersill beneath the respective bolster sections and united therewith by rivets extending through said lower walls and through said outstanding marginal flanges.

7. In a railway car, the combination with a centersill structure; of truck side frame members extending upwardly above the lower portion of the centersill; bolster sections forming a portion of the body of the car, each said section extending outwardly from the centersill beyond and above the truck side frame members, each said bolster section being of a depth corresponding substantially to the depth of the centersill and formed intermediate its ends with a portion of comparatively shallow depth for the purpose of clearing the truck side frame members, said bolster section adjacent its portion of reduced depth having a portion of increased sectional area to compensate for the reduced depth and thereby provide for substantially uniform strength throughout the entire length of said bolster member.

8. In a railway car, the combination with a centersill construction; of a bolster section disposed on each side of the centersill, each said bolster section including a pair of upstanding webs spaced lengthwise of the car from each other, said sections being provided with an integral uniting bottom wall extending between the web sections of the pair; a bottom tie plate extending transversely across the centersill and secured to the uniting bottom wall, each said pair of webs being also provided with an outstanding marginal flange adjacent the top edge; and a tie plate extending transversely across the car and united to said outstanding flange of the respective bolster sections on the opposite sides of the centersill, said bottom tie plate having side bearings of box-shaped formation formed integrally therewith.

9. As an article of manufacture a bolster section adapted to span the distance intermediate the centersill and the side of the car, said bolster section including spaced vertical web sections and connecting walls at the opposite ends and adjacent the bottom thereof, all of said walls being integrally formed with the web sections and forming therewith a trough-like shaped formation, said bolster section at an intermediate point

having a portion of reduced depth adapted to straddle a truck side frame; reinforcing means disposed within the bolster to compensate for the reduced depth; and an outstanding marginal reinforcing flange extending continuously on the outer side of the respective upstanding web sections.

10. As an article of manufacture, a bolster section of the type adapted to be positioned adjacent the centersill to extend outwardly towards the side of the car, said bolster section including a pair of vertical web sections spaced from each other lengthwise of the car and extending continuously from end to end of the bolster section and united at their extreme ends by upstanding wall sections and by upstanding walls intermediate the ends, said pair of web sections being further united by integral wall sections adjacent the lower margin thereof and providing therewith a trough-shaped construction.

11. As an article of manufacture a bolster section of the type adapted to be positioned adjacent the centersill to extend outwardly toward the side of the car, said section including a pair of web sections spaced from each other lengthwise of the car, said sections being united along the bottom marginal edges of the web by an integral bottom wall section, each said web being further provided around the top margin thereof with an outstanding marginal flange whereby connection is effected with a tie member extending across the plane of the centersill.

12. As an article of manufacture, a bolster sec-

tion adapted to span the distance intermediate the centersill and the side of the car, said bolster section including spaced marginal web sections and connecting walls at the opposite ends thereof and adjacent the bottom thereof, all of said walls being integrally formed with the web sections and forming therewith a trough-like formation, each said web section being further provided with an outstanding marginal flange extending continuously around the margins and forming with said web a pan-shaped construction, each said outstanding marginal flange around the top, sides and bottom of the bolsters providing means for attachment with a car body.

13. As an article of manufacture, a bolster section adapted to span the distance intermediate the centersill and the side of the car, said bolster section including spaced marginal web sections and connecting walls at the opposite ends thereof and adjacent the bottom thereof, all of said walls being integrally formed with the web sections and forming therewith a trough-like formation, each said web section being further provided on its outer side with an outstanding marginal flange extending continuously around the margins and forming with said web a pan-shaped construction, said connecting bottom wall and each of the said outstanding marginal flanges at the top, bottom and opposite ends of the bolster section being provided with means for attachment to the car body.

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