April 15, 1930. W. E. WINE 1,754,705

RAILWAY CAR

Filed May 19, 1928 3 Sheets-Sheet 1

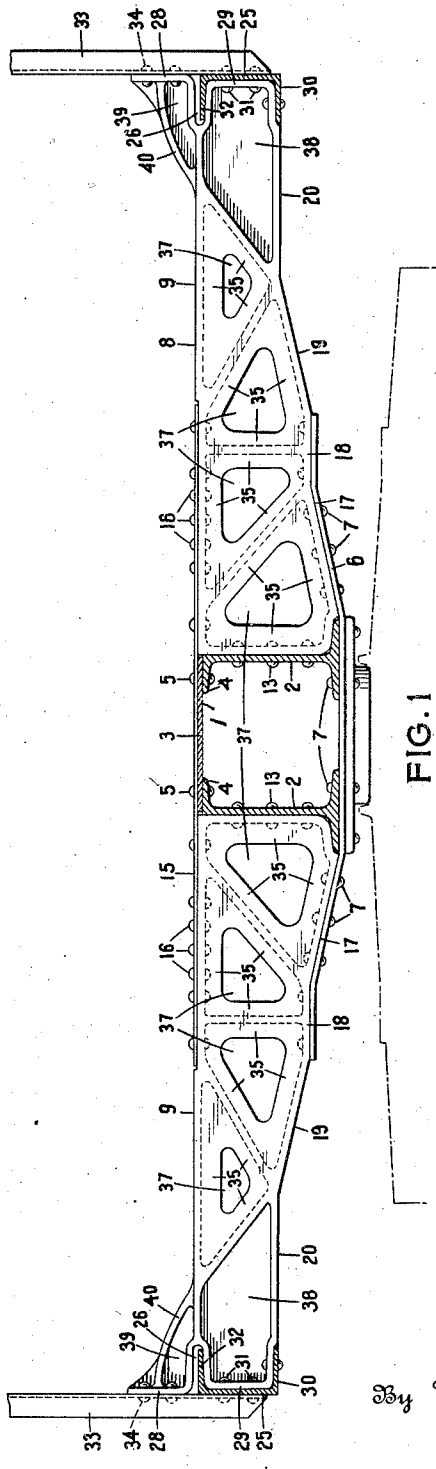


FIG. 1

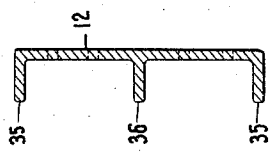


FIG. 6

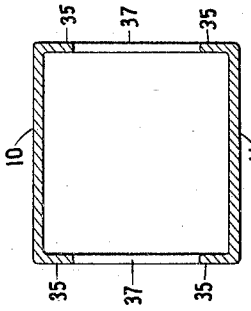


FIG. 5

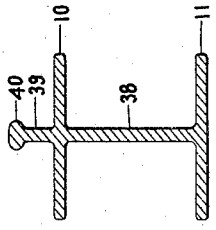


FIG. 4

Inventor

William E. Wine

By Fitler & Mechlin

his Attorneys

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RAILWAY CAR

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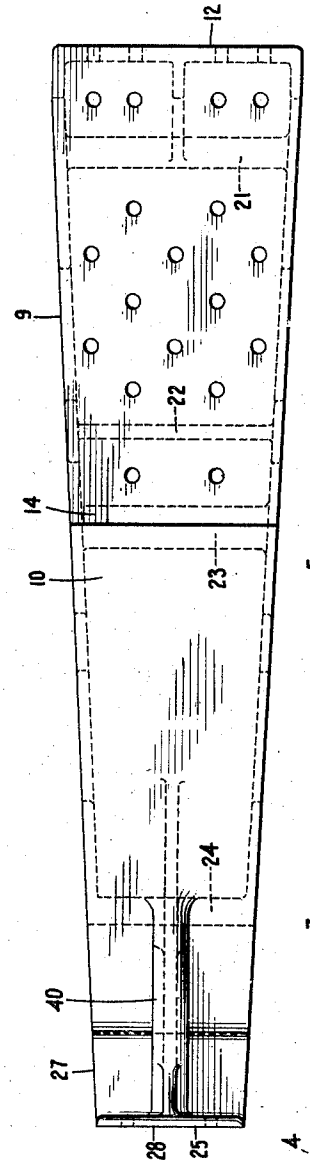


FIG. 2

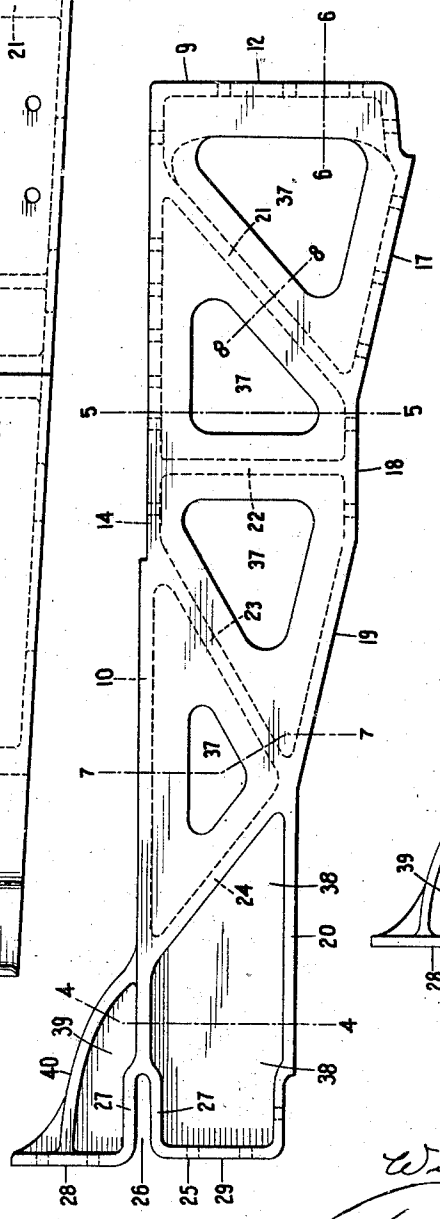


FIG. 3

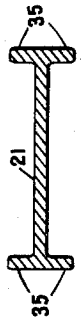


FIG. 8

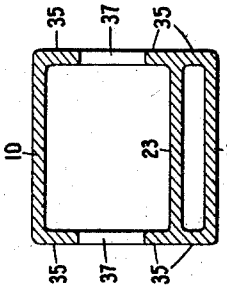


FIG. 7

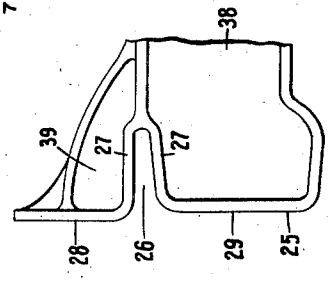


FIG. 9

Inventor

William E. Wine

By Ritter & Mechlin

His Attorneys

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RAILWAY CAR

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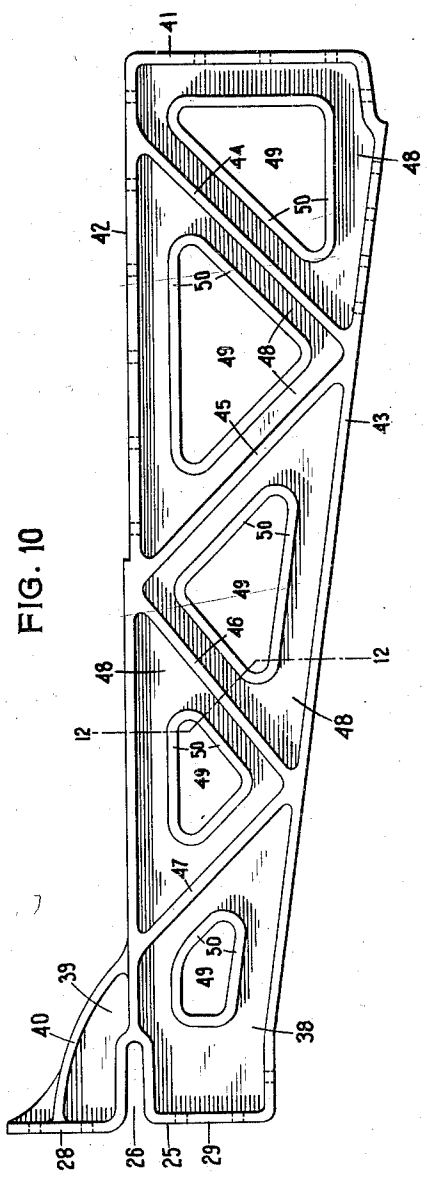


FIG. 10

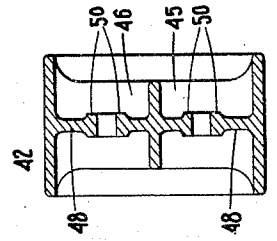


FIG. 12

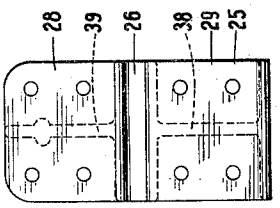


FIG. 11

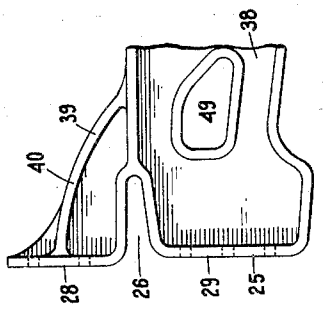


FIG. 13

Inventor

William E. Wine

By Potter & Mechlin

his Attorneys

Patented Apr. 15, 1930 1,754,705

UNITED STATES PATENT OFFICE

WILLIAM E. WINE, OF TOLEDO, OHIO

RAILWAY CAR

Application filed May 19, 1928. Serial No. 279,019.

My invention relates to railway cars and, more particularly, to improvements in body bolsters and other transverse members of the car underframe.

The principal object of the invention is to provide the car underframe with members of simple and rugged construction capable of effectively withstanding forces tending to distort them.

The principal feature of the invention consists in constructing a body bolster, having portions adapted to be secured to opposite sides of the car center sill, with top and bottom plate members and with a plurality of transverse webs connecting them, the webs and plate members being provided with rigidifying flanges.

Another feature of the invention resides in forming a body bolster with top and bottom plate members and with side portions respectively connecting the marginal edges thereof, a plurality of webs being employed for connecting the side portions, the latter being fashioned with a plurality of apertures of an outline similar to that formed by the adjacent portions of the top and bottom plate members and the neighboring webs.

A still further feature of the invention consists in forming the portion of the body bolster, adjacent the center sill, of box-like section and the portion thereof adjacent the side sill of substantially I-section.

A still further feature of the invention consists in constructing a transversely extending underframe member with an end portion and with top and bottom plate members, the top plate member intersecting the said end portion intermediate the ends of the latter and the portions of said end above and below the top plate affording means for attachment of a car side sill and a car side stake.

Other and more specific features of the invention residing in advantageous constructions and combinations of elements will hereinafter appear and be pointed out in the claims.

In the drawings illustrating preferred embodiments of the invention, Figure 1 is a fragmentary transverse sectional view of a gondola car provided with the improved form of bolster.

Figure 2 is a plan view of one of the bolster sections, neighboring parts of the car construction being omitted.

Figure 3 is a side elevational view of the construction illustrated in Figure 2.

Figure 4 is a sectional view taken on line 4—4, Figure 3.

Figure 5 is a sectional view taken on line 5—5, Figure 3.

Figure 6 is a sectional view taken on line 6—6, Figure 3.

Figure 7 is a sectional view taken on line 7—7, Figure 3.

Figure 8 is a sectional view taken on line 8—8, Figure 3.

Figure 9 is a fragmentary detailed view illustrating a modified end of the bolster.

Figure 10 is a side elevational view of one section of one of the transverse underframe members of the car which is disposed intermediate the body bolsters.

Figure 11 is an end elevational view of the construction illustrated in Figure 10.

Figure 12 is a sectional view on the line 12—12, Figure 10.

Figure 13 is a fragmentary elevational view illustrating a modified end for the construction shown in Figure 10.

Referring to the drawings, 1 indicates the box like center sill consisting of flanged members 2, and an upper cover-plate 3, the latter being connected to flanges 4 of the members 2 by any suitable means, such as rivets 5. The flanged bottom portions of the members 2 are connected by being secured to the bottom cover plate 6 by rivets 7, the opposite ends of the bottom cover plate 6 being also riveted to adjacent lower portions of the bolster 8.

Instead of forming the bolster as an integral casting, it is preferably constructed of two cast sections 9, which are respectively rigidly secured to opposite sides of the box-like center sill 1. Each of the bolster sections 9 are formed with top and bottom plate members 10 and 11, respectively, which extend continuously from their opposite ends. At their inner ends the top and bottom plate

members of each of the bolster sections are connected by plate portions 12 provided with a plurality of apertures to receive rivets 13 for respectively securing them to opposite sides of the car center sill.

The top members 10 are fashioned with offset portions 14 to receive a top connecting plate 15 which is secured to each of the bolster sections by rivets 16 and also to the upper cover plate 3 of the center sill by the rivets 5. The bottom plate member 11 inclines upwardly as at 17 from adjacent the lower end of the inner plate portion 12 and merges into a substantially horizontal portion 18, the latter constituting means for receiving a side bearing wear-plate (not shown). From this horizontal portion 18, the bottom plate again inclines upwardly and outwardly as at 19 and terminates in a substantially horizontal portion 20.

The top and bottom plate members of each of the bolster sections are preferably connected by a substantially continuous system of transverse webs 21, 22, 23 and 24 which define with the plate members a plurality of longitudinally disposed substantially triangular-shaped sections, the top and bottom plates alternately constituting the base of the triangular sections. The web 21 extends diagonally downward from adjacent the inner upper corner of the bolster section to a point adjacent the inner end of the horizontal portion 18 of the bottom plate member 11. From adjacent this point, but preferably centrally of the side bearing wear-plate attaching portion 18 of the bottom plate member, the web 22 extends substantially vertically upward. The web 23 which extends diagonally downward from adjacent the upper end of the web 22 intersects the bottom plate 11 at the inner edge of the horizontal portion 20 thereof and from this point the web 24 inclines upwardly and outwardly merging into the top plate member 10 inwardly of the outer end of the bolster section. Thus, it will be seen that the forces incident to the weight of the car and its contained lading, are transmitted through the body bolster to the car truck (not shown) in a manner such that they are evenly distributed throughout the bolster, thereby preventing concentration of these forces at particular points in the bolster sections.

At their outer ends each of the bolster sections is provided with a substantially vertical portion 25 of a width corresponding to that of the adjacent portions of the top and bottom plate members 10 and 11 respectively. The end portions 25 of the bolster sections are each fashioned with a recess 26, the latter being bounded by portions 27 of the top plate member which intersects the end portion 25 intermediate its ends. The recess 27 divides the end portion 25 into upper and lower portions 28 and 29 respectively, the latter affording a surface to which a car side sill 30 may be secured as by rivets 31 and the recess 26 constituting means for receiving the inwardly projecting flange 32 of the side sill. The lower portion 29 may be conveniently offset inwardly from the upper portion 28, so that the outer face of the side sill 30 is in alinement with the outer face of the upper portion 28. In this manner, the upper portion 29 and the side sill 30 present a relatively large and substantially continuous surface to which a car side stake 33 may be secured as by rivets, rivets 34 connecting the stake to the upper portion 28 and the rivets 31 serving to connect it to the side sill and lower portion 29. Since a major part of the force required for supporting the lading contained in the car is transmitted to the car side stakes and thence to the bolster, it will be appreciated that by virtue of affording a relatively large area to which the stakes may be secured, and thus being permitted to employ a greater number of rivets, a more rigid car construction is produced.

As is well understood, buffing forces to which railway cars are subjected are communicated to the car center sill and from there transmitted to the body bolsters and thence into adjacent parts of the car construction. Due to the inertia of the car body and because the outer ends of the bolsters are rigidly secured to the respective side sills of the car, the buffing forces thus communicated to the bolster induce severe bending stresses therein. To effectively resist these bending forces the top and bottom members 10 and 11, the inner end portions 12, and all of the transverse webs, are provided with marginal flanges 35, the flanges formed on the transverse webs 21, 22 and 23 projecting on opposite sides thereof. The flanges formed on the top and bottom members, the end portion 12 and the diagonal transverse web 24, project from one side only of each of these parts. Thus it will be seen that the transverse members 21, 22 and 23 are of I-section, while the other flanged portions of the bolster section just described, are of channel section. The inner portion 12 of each of the bolster sections, in addition to being fashioned with marginal flanges, is provided with an intermediate substantially vertical web 36 for further rigidifying these portions of the bolster.

As all of the flanges on each side of each bolster section are in alinement and thus lie in the same plane they, in effect, constitute apertured sides for the bolsters, the apertures 37 each being in outline similar to that formed by adjacent portions of the top and bottom members 10 and 11 and the neighboring transverse webs.

As the portions of the bolster sections adjacent the respective side sills are in practically simple shear, the bending moments be-

ing reduced to a minimum, it is unnecessary that these portions be rigidified by flanges. It is for this reason that the flanges formed on the top and bottom members terminate at the diagonal web 24 and that the flanges of this latter member project only on one side thereof. The outer end of each of the bolster sections is, however, provided with a longitudinal, preferably centrally disposed web 38 which extends continuously from the lower portion 29 to the diagonal transverse web 24. Thus, at those points where the bending moments are the greatest, the bolster is of box-like section while, at those points where the bending moments are negligible, such as portions adjacent the side sill, the bolster is of I-section.

The upper end portion 28 of each of the bolster sections may also be advantageously provided with a longitudinal web 39 for connecting it to the top plate member 10. This web 39 is preferably disposed in the same plane as the web 38 and its upper edge is enlarged as at 40 to form a reinforcing or rigidifying bead. The formation of the ends of the bolster sections illustrated in Figures 1 and 3 is such as to accommodate the standard seven inch A. R. A. side sill and Figure 9 discloses how the bolster ends may be modified to accommodate the standard nine inch U. S. R. A. side sill.

The construction illustrated in Figures 10 to 13 inclusive represents one section of one of the transversely extending underframe members of the car which are employed intermediate the bolsters. These underframe members are secured to the center sill in a manner similar to the bolsters. As with the bolster sections the transversely extending underframe section 41 is provided with top and bottom plate members 42 and 43, respectively. A plurality of transverse flanges 44, 45, 46 and 47 are employed for connecting the top and bottom plate members, these flanges being similar to webs 21, 22, 23 and 24 of the bolster section, except that the flange 45 which corresponds with the web 22 of the bolster section, may be inclined inasmuch as the section 41 is not intended for cooperation with the truck side bearings. Since these transverse members of the car underframe are not subjected to as severe buffing shocks as the bolsters, instead of fashioning them with the rigidifying flanges 35, a centrally disposed longitudinal web 48 may be employed for connecting all of the various parts of these members.

To reduce the weight of each section 41 the webs may be apertured as at 49, the portions of the web bordering the apertures being slightly enlarged as at 50. The outer ends of the transverse section 41 are constructed in a manner identical with the outer ends of the bolster sections, the end of the section disclosed in Figure 10 being adapted for cooperation with the standard seven inch A. R. A. side sill, while the end disclosed in Figure 13 is adapted to cooperate with the standard nine inch U. S. R. A. side sill.

From the foregoing it will be seen that by incorporating in the car underframe the transverse members disclosed in the drawings an extremely rigid car construction will be produced.

I claim:

1. A railway car body bolster having portions adapted to be secured to opposite sides of the car center sill and provided with top and bottom plate members and with a plurality of transverse webs connecting the plate members, the webs and plate members being provided with marginal flanges.

2. A railway car body bolster having portions adapted to be secured to opposite sides of the car center sill and provided with top and bottom plate members having oppositely extending spaced flanges, and transverse webs connecting said plate members and their respective flanges, said webs being provided with spaced flanges constituting continuations of the flanges of said top and bottom members.

3. A railway car body bolster having portions adapted to be secured to opposite sides of the car center sill and provided with top and bottom plate members and with spaced side portions connecting the top and bottom plate members, and a plurality of transverse webs connecting said side portions, said side portions being apertured intermediate each of said transverse webs.

4. A railway car body bolster having portions adapted to be secured to opposite sides of the car center sill and provided with top and bottom plate members and with side portions respectively connecting the marginal edges of the top and bottom plate members, and a plurality of webs connecting the side portions, the latter being fashioned with a plurality of apertures, the outline of said apertures being similar to that formed by the adjacent portions of the top and bottom plate members and the neighboring webs.

5. A railway car body bolster having portions adapted to be secured to opposite sides of the car center sill and provided with top and bottom plate members and with transverse webs connecting said plate members, said webs and plate members being provided with spaced flanges respectively constituting the sides of the bolster, one of said webs being substantially vertical and being disposed adjacent the point of attachment of the side bearing wear plate.

6. A railway car body bolster having portions adapted to be secured to opposite sides of the car center sill and provided with top and bottom plate members having oppositely extending spaced flanges and with a plurality of webs connecting said plate members and

their respective flanges, said webs also having spaced flanges, one of said webs being substantially vertical and being disposed adjacent the point of attachment of the side bearing wear plate and another of said webs extending diagonally upward from adjacent the vertical web to a point adjacent the portion of the bolster adapted to be secured to the car center sill.

7. A railway car body bolster having portions adapted to be secured to opposite sides of the car center sill and provided with top and bottom plate members having oppositely extending spaced flanges and with a plurality of flanged webs connecting said plate members and their respective flanges, the flanges of the plate members and webs respectively constituting the sides of the bolster, said top and bottom plate members and webs defining a plurality of longitudinally disposed substantially triangularly-shaped sections, the top and bottom plate members alternately constituting the base of the triangular sections.

8. A railway car body bolster having substantially vertical portions adapted to be secured to opposite sides of the car center sill, and provided with top and bottom plate members, said vertical portions being provided with marginal flanges and with a web intermediate said flanges for connecting the said top and bottom plate members.

9. A railway car body bolster involving two sections respectively having portions adapted to be secured to opposite sides of the car center sill, the portion of each bolster section adjacent the center sill being of box like section and the portion thereof adjacent the side sill being substantially of I-section.

10. A railway car body bolster having substantially vertical portions adapted to be secured to opposite sides of the car center sill, and provided with top and bottom plate members, the portions of said plates adjacent the car side sill being solely connected by a longitudinally extending substantially centrally disposed web and the portions of the plates adjacent the center sill being connected by transversely extending webs having spaced flanges projecting in opposite directions therefrom.

11. A body bolster for railway cars having portions adapted to be secured to opposite sides of the car center sill and provided with top and bottom plate members, a plurality of transverse webs connecting said plate members intermediate the ends of the bolster, and a longitudinal substantially centrally disposed web extending from each end of said bolster to the adjacent transverse webs for connecting said plate members adjacent the ends of the bolster, the marginal edges of the other of said transverse webs being provided with oppositely extending flanges.

12. A transversely extending underframe member for railway cars having an end plate portion and provided with top and bottom plate members, the top plate member intersecting the said end plate portion intermediate the ends of the latter, the portions of said end plate above and below the top plate respectively affording means for attachment of a car side stake and a car side sill.

13. A railway car body bolster having a substantially vertical end plate portion and provided with top and bottom plate members, the top plate member intersecting the said end plate portion intermediate the ends of the latter and the portions of said end plate above and below said upper plate being connected thereto by longitudinally extending webs and respectively affording means for attachment of a car side stake and a car side sill.

14. A transversely extending underframe member for railway cars having a substantially vertical end plate portion, said portion being recessed intermediate its ends for receiving an inwardly projecting portion of a neighboring part of the car structure.

15. A transversely extending underframe member for railway cars having a substantially vertical end portion, said end having offset portions, one for attachment of a car center sill and the other for attachment of a car side stake, said end being recessed intermediate said offset portions for receiving an inwardly projecting portion of the car side sill.

16. A transversely extending underframe member for railway cars having a substantially vertical end portion, and provided with bottom and top plate members, the latter intersecting the vertical end portion intermediate its ends, the portions of said end above and below said top plate being connected thereto by longitudinal webs, the upper marginal edge of the web connecting the upper portion of the vertical end to the said plate being fashioned with an enlarged rigidifying bead.

17. A railway car body bolster having portions adapted to be secured to opposite sides of the car center sill and provided with top and bottom members and with intermediate upright connecting members, said top and bottom members being of channel section and said upright connecting members being of I-section.

18. A railway car body bolster having portions adapted to be secured to opposite sides of the car center sill and provided with top and bottom members and with a plurality of upright connecting members, said top and bottom members and one of said upright members being of channel section, other of said upright members being of I-section.

19. A railway car body bolster having portions adapted to be secured to opposite sides of the car center sill and provided with top and bottom members and with a plurality of

upright connecting members, one of said last named members being substantially vertical and others being diagonal, said top, bottom and one of said diagonal members being of channel section and others of said upright connecting members being of I-section.

In testimony whereof I affix my signature.

WILLIAM E. WINE.