April 19, 1932. W. E. WINE 1,855,080

RAILWAY CAR

Filed May 29, 1930 4 Sheets-Sheet 1

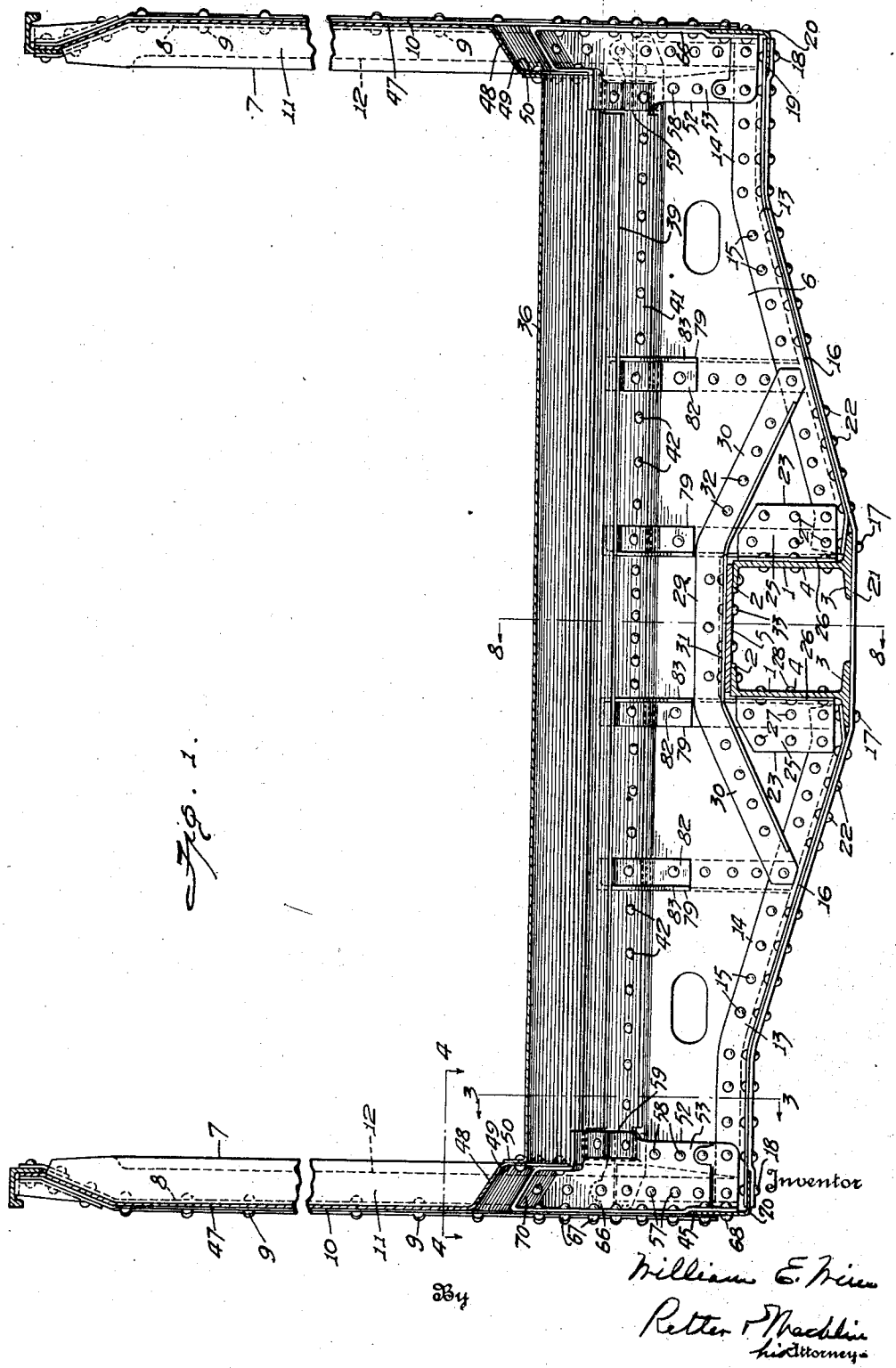

Fig. 1.

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his Attorneys

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RAILWAY CAR

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Fig. 2.

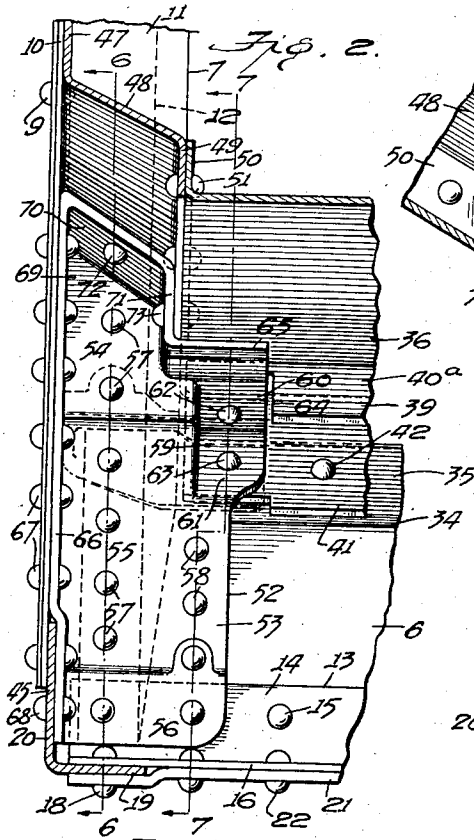


Fig. 3.

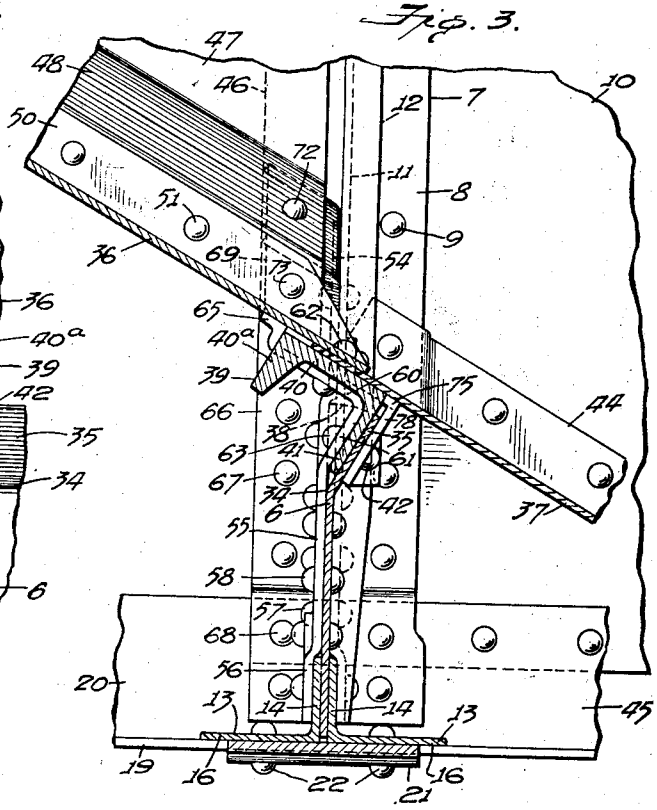


Fig. 5.

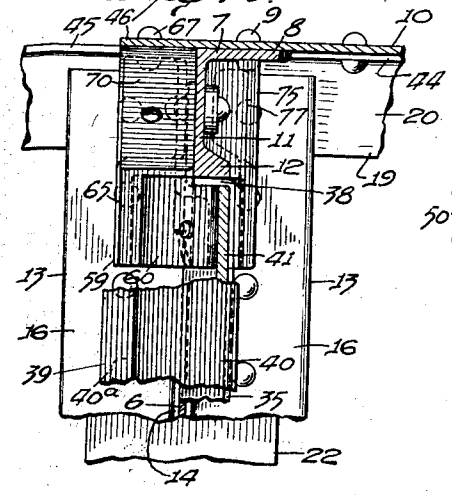
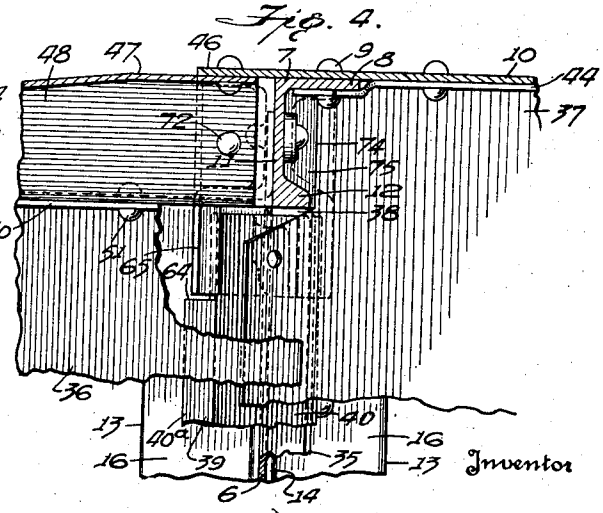


Fig. 4.



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RAILWAY CAR

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Fig. 6.

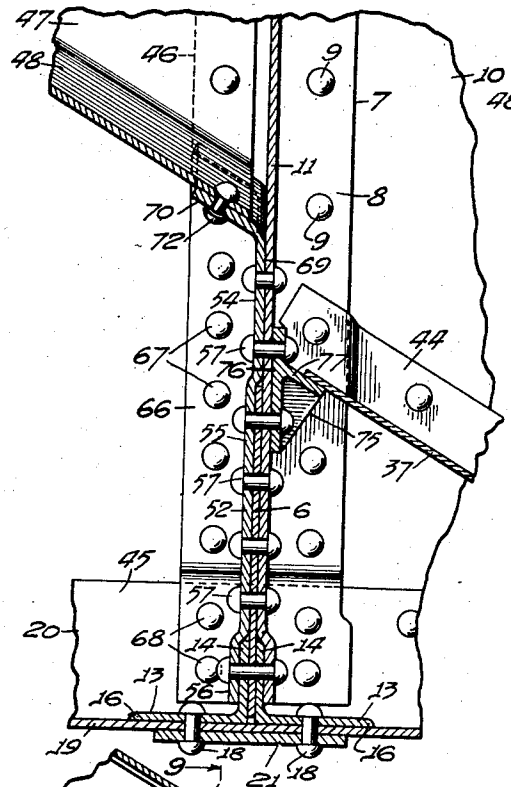


Fig. 7.

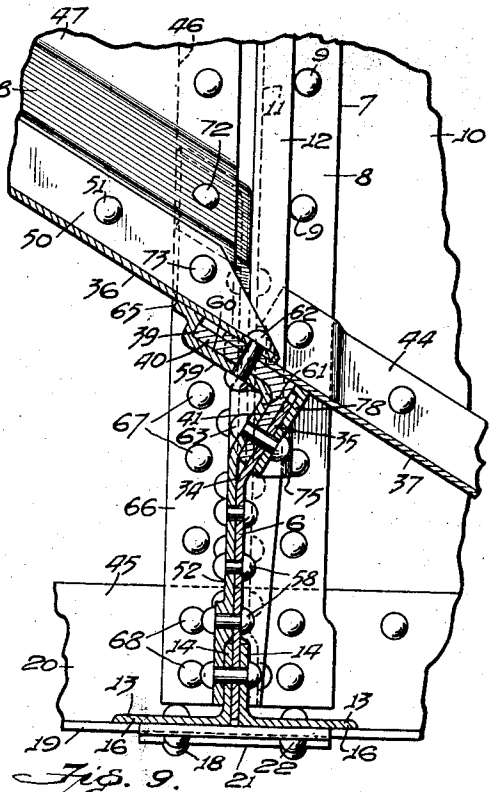


Fig. 8.

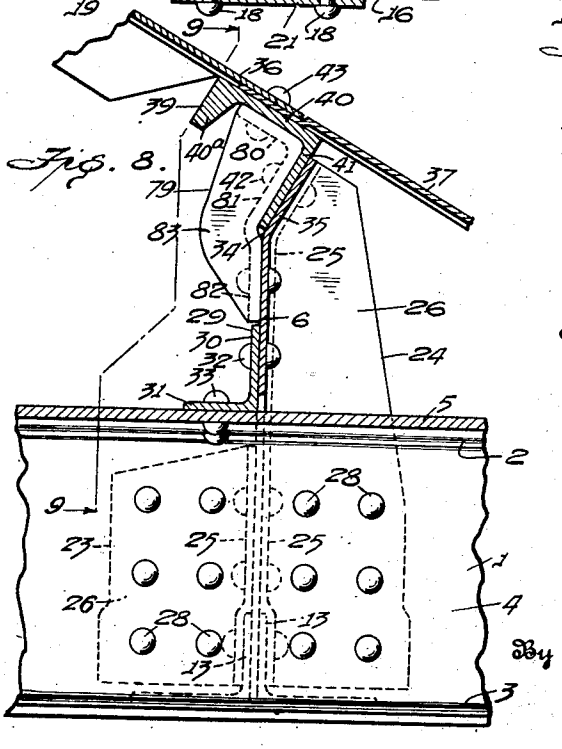
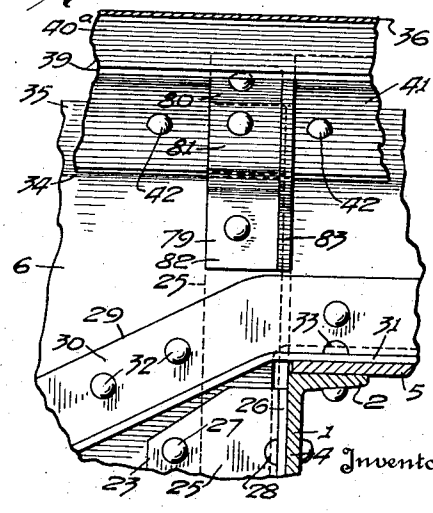


Fig. 9.



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RAILWAY CAR

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Fig. 10.

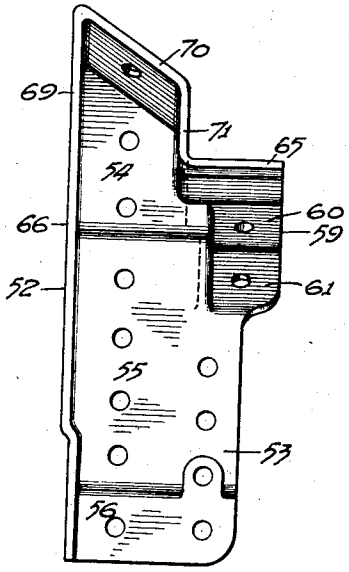



Fig. 11.

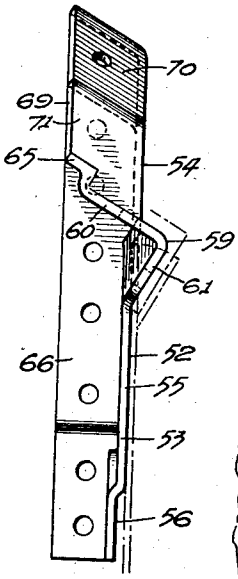



Fig. 12.

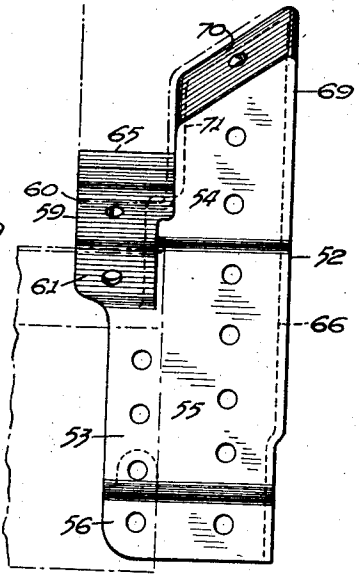



Fig. 13.

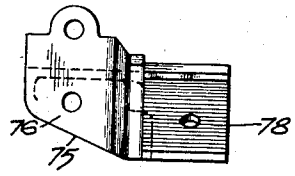



Fig. 14.

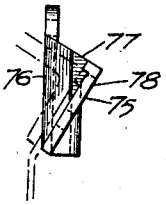



Fig. 15.

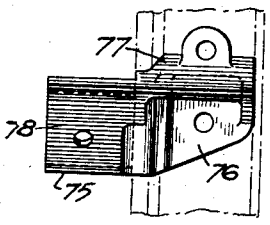



Fig. 16.

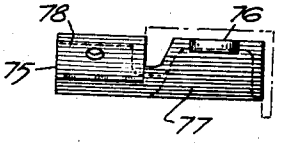



Fig. 17.

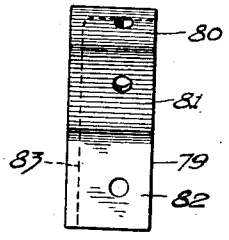
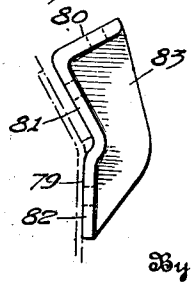



Fig. 18.

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Patented Apr. 19, 1932 1,855,080

# UNITED STATES PATENT OFFICE

WILLIAM E. WINE, OF TOLEDO, OHIO

## RAILWAY CAR

Application filed May 29, 1930. Serial No. 457,357.

My invention relates to railway cars and more particularly to improvements in body bolsters for railway cars of the hopper type.

A principal object of the invention is to provide means for rigidly securing the bolster to adjoining portions of the car.

Another object of the invention is to provide the upper portion of the bolster with a member for supportingly cooperating with the inclined floor of the car.

Another object of the invention is to provide means for connecting the ends of the angularly shaped floor sheet supporting member of the bolster to the side stakes of the car.

A primary feature of the invention consists in providing, in combination, a body bolster having an angularly shaped member extending along its upper edge for supportingly cooperating with an inclined floor sheet of the car, the member having a portion substantially normal to the inclined floor sheet and a portion substantially parallel thereto.

Another feature of the invention consists in providing a body bolster with a substantially vertical plate having its upper portion disposed in a plane substantially normal to an inclined floor sheet of the car, an angularly shaped member being rigidly secured to said normal portion of the bolster for supporting the inclined floor sheet.

A further feature of the invention consists in providing a railway car having inside side stakes with a body bolster having an angularly shaped member extending from adjacent one side stake to the other for supporting an inclined floor sheet of the car, a member being rigidly secured to each side stake and to the adjoining end of the angularly shaped member.

A still further feature of the invention consists in providing bracing members for the angularly shaped floor sheet supporting member which has a portion parallel with the inclined floor sheet and a portion normal thereto.

Other and more specific features of the invention residing in advantageous forms, combinations and relations of parts will hereinafter appear and be pointed out in the claims.

In the drawings illustrating a preferred embodiment of the invention:

Figure 1 is a transverse vertical sectional view of a railway hopper car.

Figure 2 is an enlarged view of the construction illustrated in the left hand portion of Figure 1.

Figure 3 is an enlarged sectional view taken on line 3—3, Figure 1.

Figure 4 is an enlarged fragmentary sectional view taken on line 4—4, Figure 1.

Figure 5 is a view corresponding to Figure 4, the floor sheets and one of the side sheets of the car being omitted.

Figure 6 is a sectional view taken on line 6—6, Figure 2.

Figure 7 is a sectional view taken on line 7—7, Figure 2.

Figure 8 is an enlarged sectional view taken on line 8—8, Figure 1.

Figure 9 is a sectional view taken on line 9—9, Figure 8.

Figure 10 is a side elevational view of one of the members employed for connecting the bolster and side stakes.

Figure 11 is an end view of the member illustrated in Figure 10 as seen from the right hand side of that figure.

Figure 12 is a side elevational view of the same member from the opposite side of that illustrated in Figure 10.

Figure 13 is a side elevational view of one of the floor sheet supporting brackets.

Figure 14 is an end elevational view of this bracket as seen from the right hand side of Figure 13.

Figure 15 is a side elevational view of the bracket taken from the opposite side of that shown in Figure 13.

Figure 16 is a plan view of the bracket.

Figure 17 is a side elevational view of one of the brackets employed for bracing the floor sheet supporting member of the bolster.

Figure 18 is an end view of this bracket as viewed from the right hand side of Figure 17.

Referring more particularly to the drawings the center sill beams, designated by the reference numeral 1, are each formed with upper and lower laterally projecting flanges

2 and 3, respectively. The upper flanges, which extend inwardly with respect to the webs 4 of the beams, are connected by a top cover plate 5.

Extending transversely of the car is a body bolster which, although it may be formed of a plurality of substantially vertical plates, is preferably formed of a single vertical plate 6 which extends continuously between side stakes 7 disposed on opposite sides of the car. While the side stakes may be of any suitable shape those illustrated in the drawings are of angle shape and each is formed with a flange 8 for attachment by rivets 9 to an adjacent side sheet 10 of the car and with an inwardly extending flange 11 substantially normal to the latter. The free or inner edge of the flange 11 may be conveniently formed with a rigidifying bead or rib 12.

At its ends the bolster plate 6 is rigidly secured to the inwardly projecting flanges 11 of the side stakes while at its lower central portion it is recessed or cut away to receive the center sill structure. The lower portion of the bolster plate is preferably rigidified by two pairs of angle members 13 disposed on opposite sides of the center sill. The members of each pair having upstanding flanges 14 between which the adjoining portion of the bolster plate is rigidly clamped by rivets 15 and laterally extending flanges 16 which project on opposite sides of the bolster plate. At their inner ends the laterally extending flanges 16 rest upon and are secured by rivets 17 to the lower flanges 3 of the center sill while at their outer ends they are overlappingly secured by rivets 18 to the inwardly extending flanges 19 of the adjacent angularly shaped side sills 20. The angle members 13 on one side of the center sill are preferably connected to those on the other side by a bottom cover plate 21 which extends beneath the lower flanges 3 of the center sill and is secured to the lateral flanges 16 of the angle members by rivets 22 and to the flanges 19 of the side sills by the rivets 18 heretofore mentioned.

To more rigidly connect the bolster plate to the center sill two pairs of brackets 23 and 24 may be employed. Although the brackets of each pair are of substantially the same shape having flanges 25 and 26, respectively, brackets 24 extend from the lower portion of the center sill to the upper portion of the bolster plate while brackets 23 only extend from the lower to the upper portion of the center sill. The flange 25 of each bracket overlaps and is rigidly secured by rivets 27 to the adjacent portions of the bolster plate while the flange 26 overlaps and is rigidly secured by rivets 28 to the web 4 of the adjacent center sill beam. On the side of the bolster plate on which the brackets 23 are disposed is a reinforcing angle member 29 which affords additional means for connecting the bolster to the center sill. This member, which has flanges 30 and 31, extends across the top of the center sill and is bent downwardly on opposite sides of the latter for attachment to adjacent portions of the angle members 13. The flange 30 is secured to the bolster plate by rivets 32 while the flange 31 is secured to the top cover plate and the inwardly projecting flanges 2 of the center sill beams by rivets 33.

Intermediate the side stakes 7 the upper portion of the bolster plate 6 is bent as at 34 to afford a flange or portion 35 disposed in a plane substantially normal to that of the inclined floor sheets 36 and 37 of the car. The ends of the inclined flange 35 of the bolster plate are integrally connected to those portions of the plate secured to the side stakes by portions 38 of substantially triangular shape and disposed in planes substantially parallel with the side sheets 10. Extending continuously along the upper portion of the bolster plate from adjacent one side stake to the other is an angularly shaped member 39. This member is formed with a flange or portion 40 parallel with the inclined floor sheets for supportingly cooperating with the latter and with a flange 41 normal to the floor sheets and secured by rivets 42 to the inclined flange 35 of the bolster plate. If desired, the outer or free edge of the flange 40 may be formed with a rigidifying bead or flange 40a.

The floor sheets 36 and 37 have their adjoining ends disposed in overlapping relation and each is secured to the flange 40 by rivets 43. Along its side edges the floor sheet 37 is formed with upwardly projecting flanges 44 respectively rigidly secured to the adjacent portions of the flanges 8 of the side stakes and to the side sheets 10 in overlapping relation to the inner faces of each. The side sheets 10 extend below the plane of the floor sheet 37 and are rigidly secured to the upwardly extending legs 45 of the side sills 20.

The side sheets 10 extend beyond the side stakes to afford portions 46 to which adjoining side sheets 47 may be secured. At their lower portions the side sheets 47 are inclined downwardly and inwardly as at 48 and terminate in substantially vertical flanges 49 to which upwardly extending flanges 50, formed on the floor sheet 36, may be secured by rivets 51. The portions 48 which are inclined transversely of the car are in substantial alinement with the inwardly extending flanges 11 of the side stakes so as to prevent lading from being pocketed by the stakes as it is being discharged from the car.

In order to reinforce the bolster at the point where it is connected to the side stakes, members 52, preferably of cast metal, are employed. Each of these members is formed with a substantially vertical plate-like portion 53 having a plurality of offset portions

54, 55 and 56, all of which are rigidly secured to the inwardly extending flange 11 of the adjacent side stake by rivets 57. The offset portion 54 contacts directly with the flange 11, the portion 55 contacts with the bolster plate 6 and the portion 56 with the upstanding flange 14 of the adjacent angle member 13. Thus it will be seen that the bolster plate is firmly clamped between the side stake and the reinforcing member 52. The plate portion 53 may conveniently extend beyond the the inner edge of the side stake so that additional rivets 58 may be employed for connecting it to the bolster.

Adjacent its upper portion the member 52 is formed with a laterally projecting angularly shaped portion 59 having flanges 60 and 61. The flange 60 projects on opposite sides of the plate portion 53 of the member and underlies the flange 40 of the adjoining end of the angularly shaped member 39 of the bolster, being rigidly secured thereto by a rivet 62 while the flange 61, which is normal to the plane of the floor sheet overlaps and is rigidly secured, by rivets 63, to the adjoining end of the flange 41 of the member 39. The rigidifying bead or flange $40^a$ of the member 39 is, of course, cut away as at 64 inwardly of the angular portions 59 of the members 52 to permit the flanges 40 and 60 to be disposed in overlapping engagement. The flange 60 may be conveniently formed with an upwardly projecting portion 65 adapted to engage the underside of the adjacent portion of the inclined floor sheet 36.

Along its outer edge the member 52 is formed with a laterally projecting flange 66 for attachment by rivets 67 to the projecting end portion 46 of the adjacent side sheet 10. The lower portion of the flange 66 is preferably inwardly offset to overlap the inner face of the vertical leg 45 of the adjacent side sill 20 for attachment thereto by rivets 68. The upper portion of the member 52 is designed to extend upwardly between the vertical flange 49 of the adjacent side sheet 47 and the portion 46 of the side sheet 10. This upwardly extending portion of the member 52, designated by the reference numeral 69, is formed with a top flange 70 inclined transversely as well as longitudinally of the car to supportingly cooperate with the inclined portion 48 of the adjacent side sheet 47. The flange 70 is integrally connected to the flange 66 and is also integrally joined with the flange 60 of the angular portion 59 by a substantially vertical wall or flange 71. Adjoining portions of the side sheet 47 and the adjacent flange 50 of the floor sheet 36 are secured to the upwardly extending portion 69 of the member 52 by rivets 72 and 73 which respectively pass through flanges 70 and 71.

In order that the floor sheet 37 may extend beyond the inner edges of the side stakes it is cut away as at 74. Underlying this floor sheet adjacent its cut out portions are bracket members 75 respectively formed with vertical portions 76 secured by two of the heretofore mentioned rivets 57 and with an inclined portion 77 for supporting portions of the floor sheet surrounding the adjacent cut out portion 74. These brackets not only serve to support the floor sheets but they prevent the escape of fine landing between the sheet and the side stake.

Each of the brackets 77 is formed with a laterally projecting portion 78 which extends beyond the inner edge of the adjacent side stake. This portion is disposed in a plane substantially normal to that of the inclined floor sheets and is overlappingly secured by the rivets 63 to the inclined flange 35 of the bolster plate and the flange 41 of the angular member 39. Thus it will be seen that the angular member 39 is firmly clamped between the brackets 75 and the members 52 which are respectively secured to opposite sides of the inwardly extending flanges of the adjacent side stakes. By connecting the bolster to the side stakes in the manner described it will be readily perceived that a very strong and rigid construction is produced.

Although the neutral axis of the angular member 39 is preferably disposed in the plane of the vertical plate of the bolster a plurality of brackets 79 may be conveniently employed for bracing it. Each of these brackets is formed with a portion 80 for attachment to the flange 40 of the member 39, a portion 81 for attachment to the flange 41 of the latter and a portion 82 for attachment to the bolster plate. All of these portions are integrally connected by a laterally extending flange 83 disposed in a plane substantially normal to that of the bolster plate. By forming and arranging the brackets in this manner the angular member 39 is effectively braced.

I claim:

1. In a railway car, the combination with an inclined floor sheet, of a body bolster having a substantially vertical plate portion extending transversely of the car, and an angularly shaped member extending along the top edge of said plate portion, said member having a portion substantially parallel with the inclined floor sheet and a portion substantially normal thereto, said inclined portion being in supporting cooperation with the floor sheet and having a downwardly extending rigidifying flange.

2. In a railway car, the combination with side sheets and an inclined floor sheet, of side stakes respectively secured to said side sheets and having portions projecting inwardly therefrom, a body bolster having a substantially vertical plate projecting beyond the inner edges of the said portions of the side stakes and rigidly secured thereto, and an

angularly shaped member secured to the upper portion of the bolster and extending continuously from a point inwardly of the said portion of one side stake to a point inwardly of the said portion of the other side stake for supportingly cooperating with the floor sheet, said member having a portion disposed in a plane substantially normal to the floor sheet and a portion disposed in a plane substantially parallel thereto.

3. In a railway car, the combination with side sheets and an inclined floor sheet, of side stakes respectively secured to said side sheets and having inwardly extending portions arranged substantially normal to the latter, a body bolster involving a substantially vertical plate rigidly secured to the inwardly extending portions of the side stakes, the upper portion of the bolster plate between said portions of the side stakes being inclined with respect to the portions of the bolster secured to the side stakes and being disposed in a plane substantially normal to the floor sheet, and an angularly shaped member rigidly secured to said inclined portion and extending continuously from adjacent one side stake to the other, said member having a portion substantially parallel with the floor sheet for supporting the latter.

4. In a railway car, the combination with side stakes and an inclined floor sheet, of a body bolster rigidly secured to said stakes, said bolster having an angularly shaped member extending continuously from adjacent one side stake to the other for supporting the inclined floor sheet, and a separable member overlappingly secured to each side stake and the adjoining end of the angularly shaped member.

5. In a railway car, the combination with side sheets and an inclined floor sheet, of side stakes respectively secured to said side sheets and having inwardly extending portions arranged substantially normal to the latter, a body bolster rigidly secured to the side stakes, said bolster having an angularly shaped member extending continuously from adjacent one side stake to the other for supporting the inclined floor sheet, and a separable member rigidly secured to the inwardly extending portion of each side stake and having a portion projecting beyond the inner edge thereof, said projecting portion being rigidly secured to the adjoining end of said angularly shaped member.

6. In a railway car, the combination with side sheets and an inclined floor sheet, of side stakes respectively secured to said side sheets and having flanges extending inwardly therefrom, and a body bolster rigidly secured to the side stakes, said bolster having an angularly shaped member extending continuously from adjacent one side stake to the other for supporting the inclined floor sheet, and a member overlappingly secured to the flange of each stake and having a portion projecting inwardly therefrom, said portion being of angular shape and rigidly secured to the adjoining end of said angular member.

7. In a railway car, the combination with side sheets and an inclined floor sheet, of side stakes respectively secured to said side sheets and having flanges extending inwardly therefrom, a body bolster rigidly secured to said side stakes, an angularly shaped member extending continuously from adjacent one side stake to the other, said member having a portion rigidly secured to the bolster and a portion affording a support for the inclined floor sheet, and a member rigidly secured to the flange of each side stake and having angularly disposed portions respectively secured to the said portions of the angularly shaped member.

8. In a railway car, the combination with side sheets and an inclined floor sheet, of side stakes respectively secured to said side sheets and having flanges extending inwardly therefrom, a body bolster rigidly secured to said side stakes, an angularly shaped member extending continuously from adjacent one side stake to the other, said member having a portion substantially normal to the floor sheet and rigidly secured to the bolster and a portion substantially parallel to the floor sheet for supporting the latter, and a member overlappingly secured to the flange of each side stake and having portions overlappingly secured to both of said portions of the angularly shaped member.

9. In a railway car, the combination with side sheets and an inclined floor sheet, of side stakes respectively secured to said side sheets and having flanges extending inwardly therefrom, a body bolster rigidly secured to said side stakes, an angularly shaped member secured to the bolster and extending continuously from adjacent one side stake to the other, said member having a portion disposed in a plane substantially parallel to the floor sheet for supporting the latter, and a member rigidly secured to the flange of each side stake and having a portion underlying and rigidly secured to the said portion of the angularly shaped member.

10. In a railway car, the combination with an inside side stake, of a side sheet and floor sheet, one of said sheets having a portion inclined transversely of the car in alinement with the side stake, a body bolster rigidly secured to said side stake, and an integral member rigidly secured to the side stake and the adjoining end of the bolster, said member having an inclined portion underlying and supporting the said transverse incline of one of said sheets.

11. In a railway car, the combination with side sheets and an inclined floor sheet, of side stakes respectively secured to said side sheets

and having flanges extending inwardly from the latter, a body bolster rigidly secured to said side stakes, said bolster having an angularly shaped member extending along its upper edge and terminating inwardly of the side stakes, and an integral member rigidly secured to the flange of each side stake and the adjoining side sheet, each integral member having a portion rigidly secured to the adjoining end of the said angular member of the bolster.

12. In a railway car, the combination with side sheets and an inclined floor sheet, of side stakes respectively secured to said side sheets and having flanges extending inwardly from the latter, a body bolster rigidly secured to said side stakes, an angularly shaped member secured to the bolster and extending continuously from adjacent one side stake to the other, and an integral member secured to the flange of each side stake and having an inclined surface for supporting an inclined portion of an adjacent sheet of the car, said integral member being formed with a laterally projecting portion extending beyond the inner edge of the flange of the adjacent side stake and rigidly secured to the adjoining end of the angle shaped member.

13. In a railway car, the combination with side sheets and inclined floor sheets, of side stakes secured to the side sheets and having flanges extending inwardly from the latter, a body bolster rigidly secured to the side stakes, an angularly shaped member secured to the bolster and extending continuously from adjacent one side stake to the other for supporting the inclined floor sheets, said member having a portion disposed in a plane substantially normal to the floor sheets, and members secured to opposite sides of the flange of each stake and respectively having portions rigidly secured to the said normal portion of the angularly shaped member.

14. In a railway car, the combination with an inclined floor sheet, of a body bolster having a substantially vertical web portion extending transversely of the car, said bolster being provided with a portion susbtantially normal to the inclined floor sheet and a portion substantially parallel thereto, said parallel portion extending on opposite sides of the vertical web of the bolster and being adapted to supportingly cooperate with the floor sheet, and means rigid with said web and parallel portion of the bolster for bracing the latter, said means including a flange substantially normal to the web.

15. In a railway car, the combination with an inclined floor sheet, of a body bolster having a substantially vertical plate extending transversely of the car, an angularly shaped member secured to the upper portion of the bolster for supportingly cooperating with the floor sheet, said member having a portion substantially normal to the floor sheet and a portion substantially parallel thereto, and a plurality of angularly shaped brackets secured to the parallel portion of said member for bracing the latter, said brackets being also secured to the normal portion of the said member and the plate of the bolster.

In testimony whereof I affix my signature.

WILLIAM E. WINE.