April 20, 1965 F. JENSEN 3,179,068

FREIGHT CAR CONSTRUCTION WITH LADING TIE BARS

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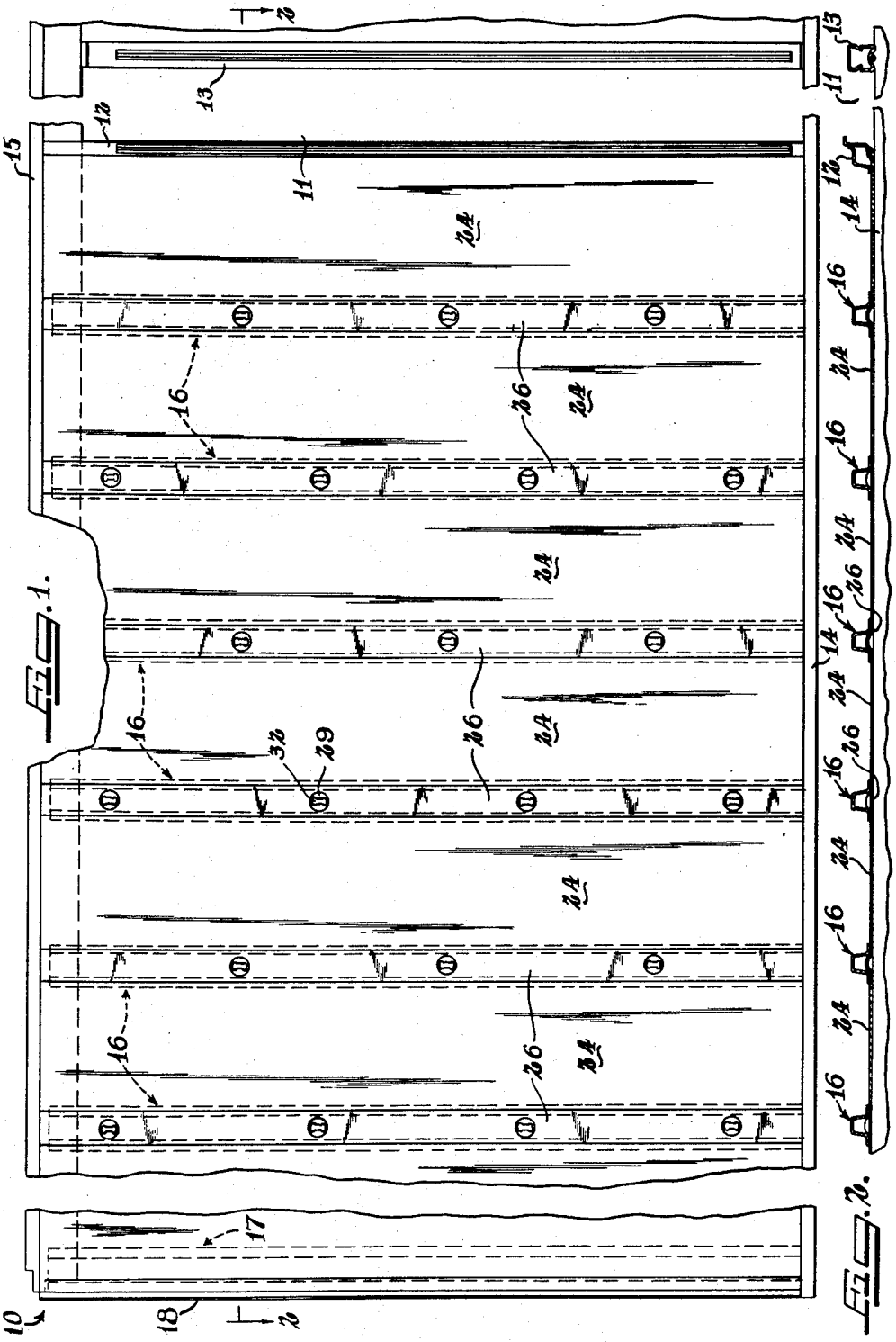


Fig. 1.

Fig. 2.

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FREIGHT CAR CONSTRUCTION WITH LADING TIE BARS

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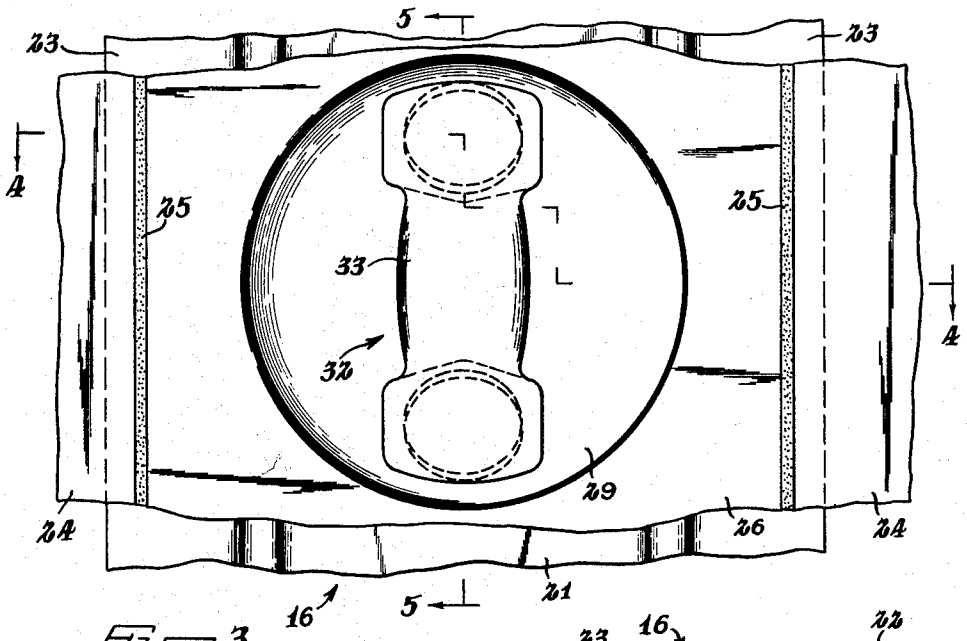


Fig. 3.

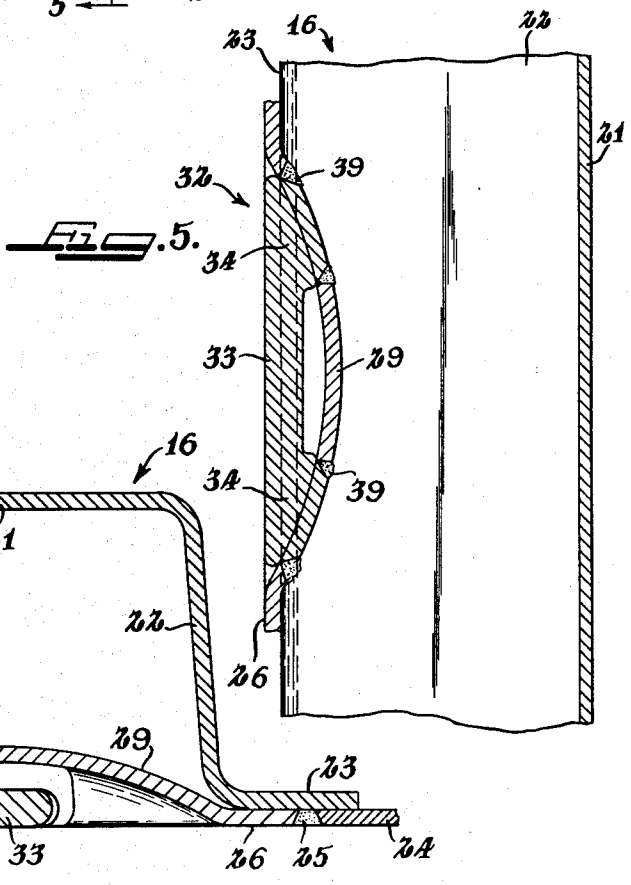


Fig. 5.

Fig. 4.

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FREIGHT CAR CONSTRUCTION WITH LADING TIE BARS

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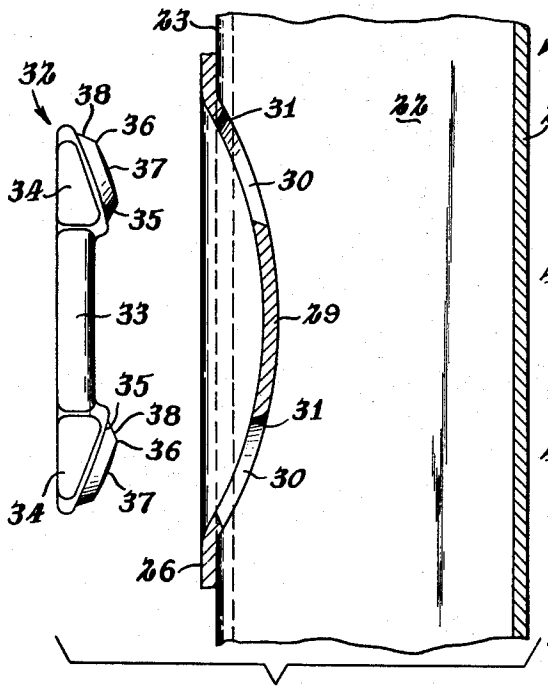


FIG. 6.

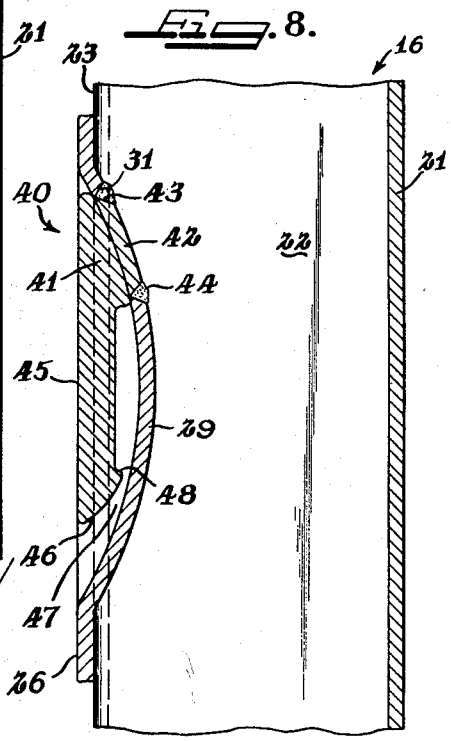
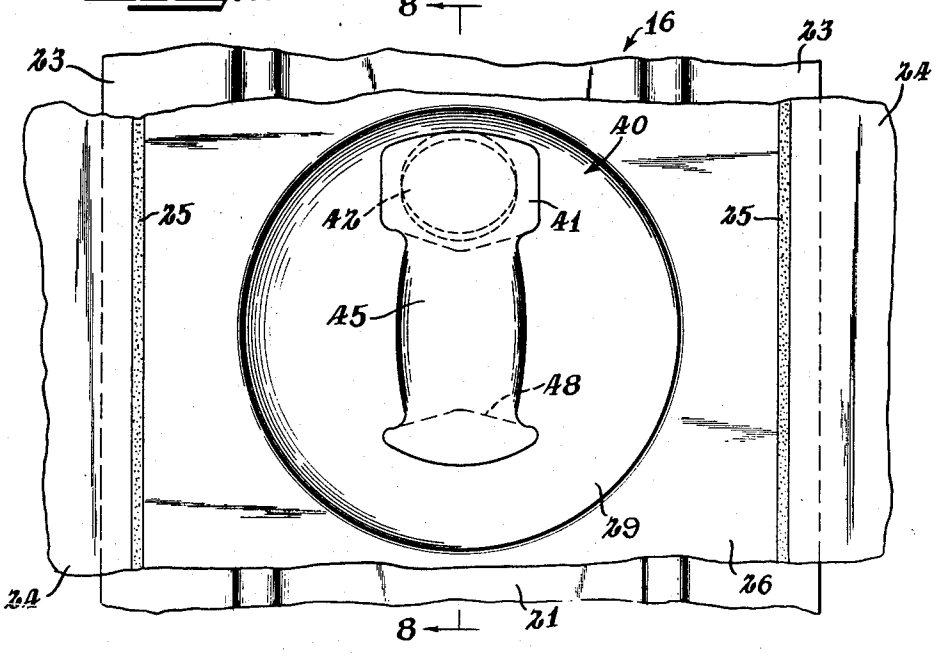


FIG. 8.

FIG. 7.



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FREIGHT CAR CONSTRUCTION WITH LADING TIE BARS

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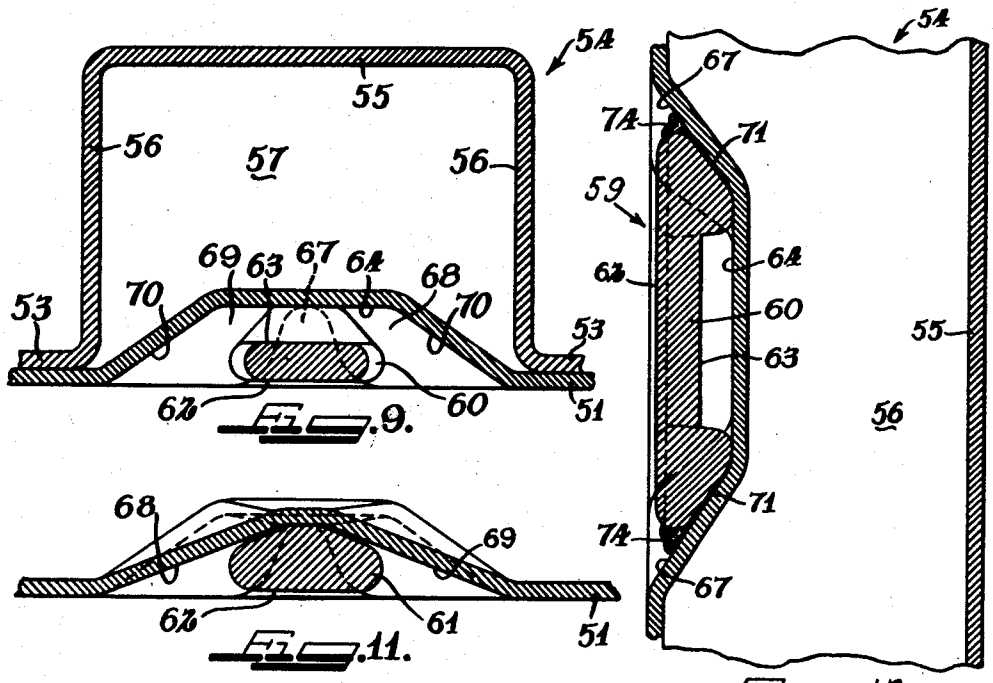


FIG. 9.

FIG. 11.

FIG. 12.

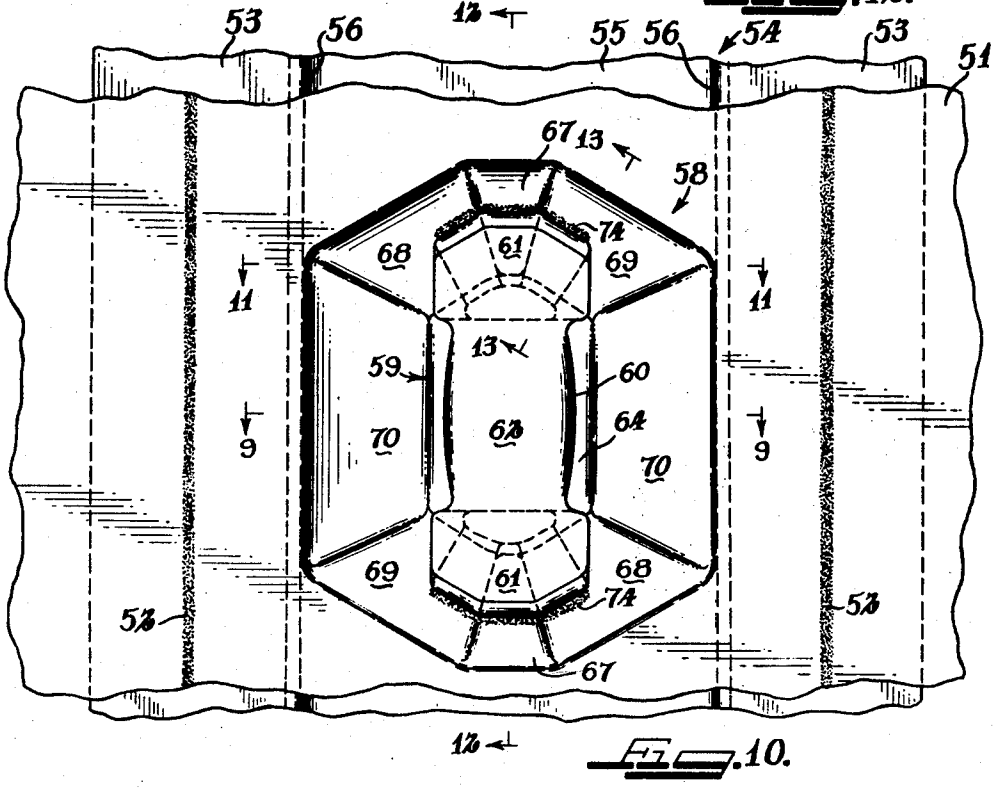


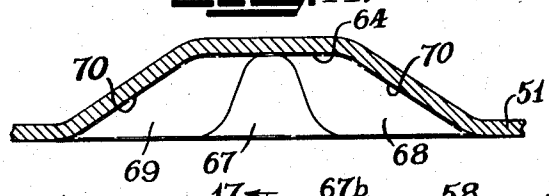
FIG. 10.

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FIG. 14.



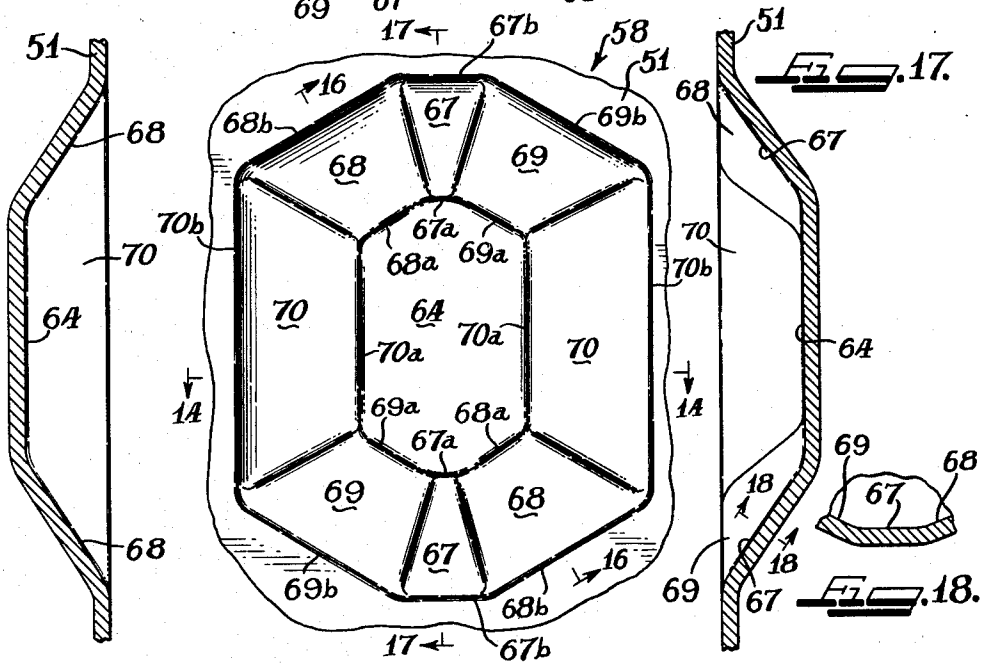
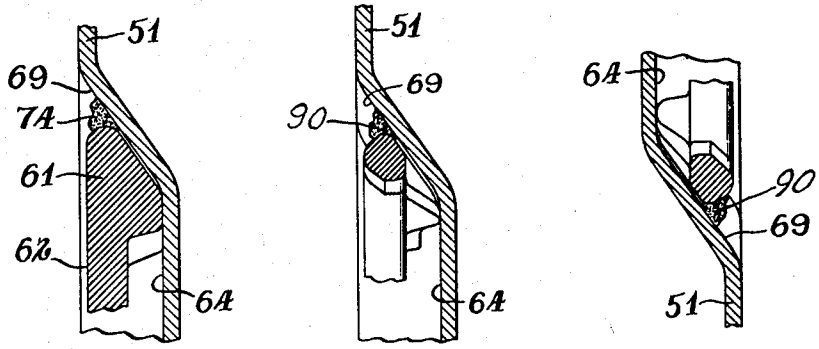


FIG. 16. FIG. 15. FIG. 17. FIG. 18.

FIG. 13. FIG. 23. FIG. 24.



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FREIGHT CAR CONSTRUCTION WITH LADING TIE BARS

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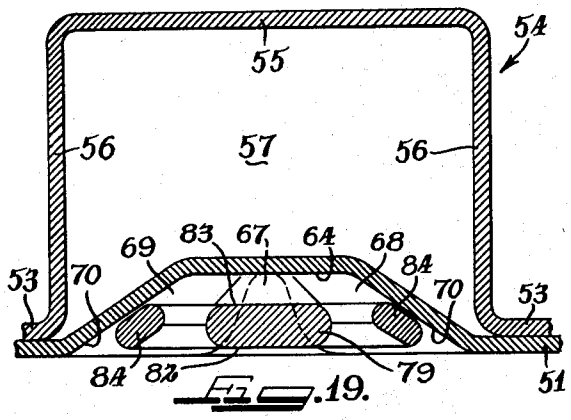


FIG. 19.

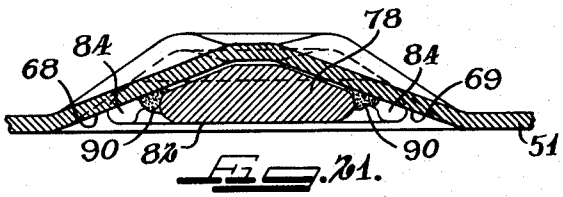


FIG. 21.

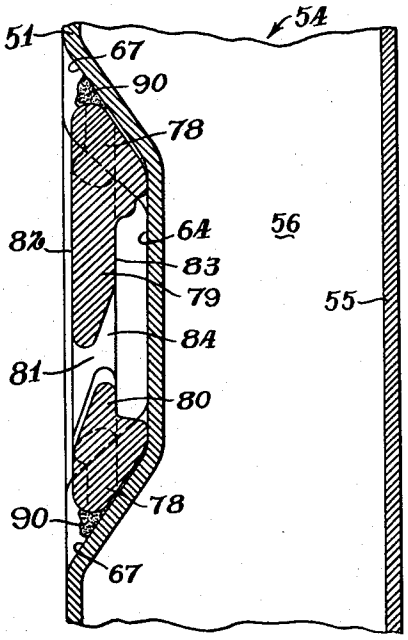


FIG. 22.

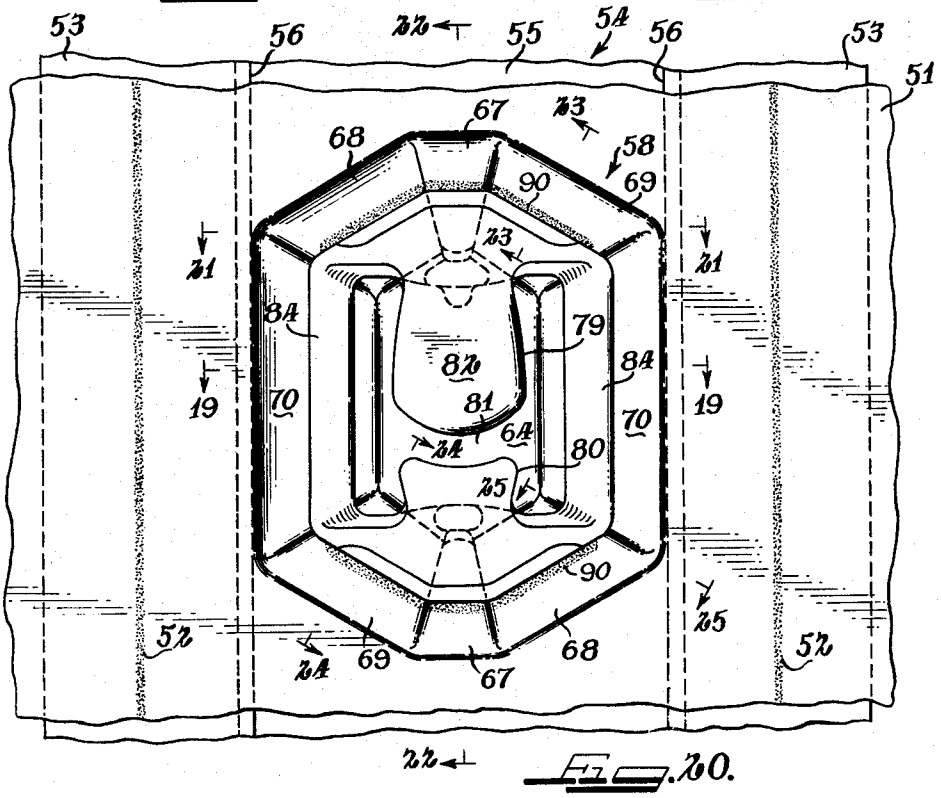


FIG. 20.

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FIG. 5.

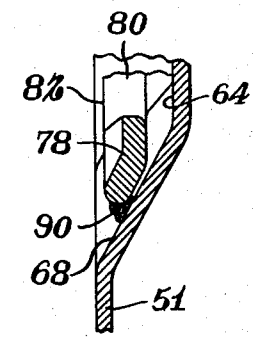


FIG. 6.

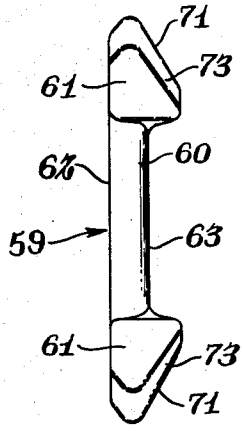


FIG. 7.

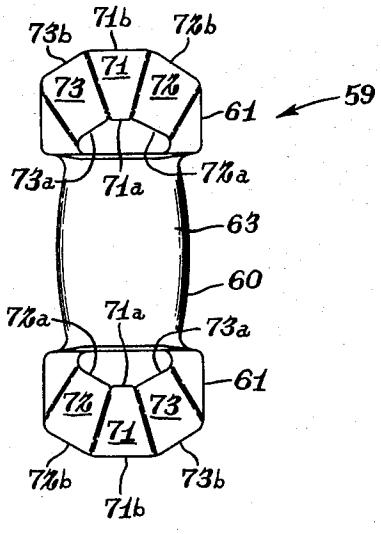


FIG. 8.

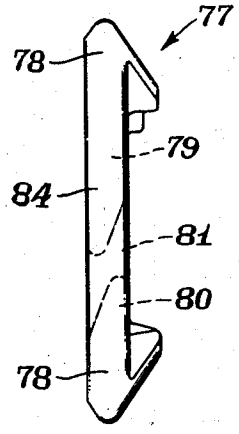
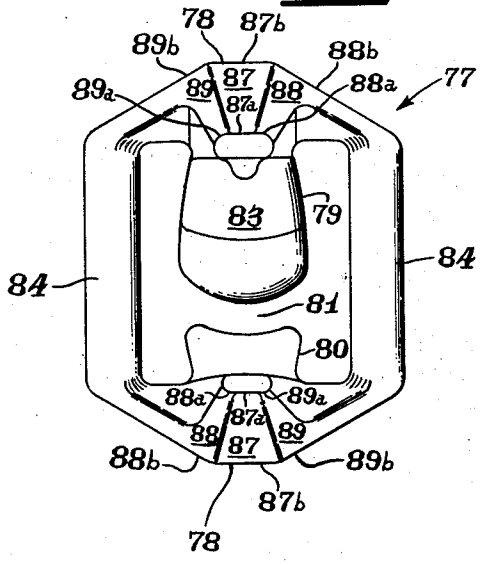


FIG. 9.



United States Patent Office 3,179,068 Patented Apr. 20, 1965

3,179,068

FREIGHT CAR CONSTRUCTION WITH LADING TIE BARS

Finn Jensen, Riverdale, Ill., assignor to Illinois Railway Equipment Company, Chicago, Ill., a corporation of Illinois

Filed June 3, 1964, Ser. No. 372,166
13 Claims. (Cl. 105—369)

This invention relates, generally, to freight car bodies and it has particular relation to load braces or lading tie bars therefor. This application is a continuation-in-part of application Serial No. 276,958, filed April 30, 1963, now abandoned.

Among the objects of this invention are: To provide for securing lading ties to the interior face of a wall of a freight car in a new and improved manner; to position the lading bars on closure plates that overlie channel shaped or hat shaped car side posts having secured to outstanding coplanar flanges thereof wall plates which, together with the closure plates, form the interior face of the car side wall and to secure the lading tie bars to the closure plates inside the respective car side post whereby, when this is accomplished by welding, the weld metal is located within the car side posts; to deform outwardly the interior face of the closure plate to receive each lading tie bar which has laterally extending support means and to provide one or two apertures in the deformed portion for receiving the laterally extending support means, one or two as the case may be; to secure the support means to the deformed portion of the closure plate within the respective channel shaped or hat shaped car side post where the weld metal cannot come in contact with the lading in the car; to form frusto-conical apertures in the deformed portions of the closure plate for receiving similarly shaped but oppositely inclined support means on the lading tie bars whereby generally V-shaped annular grooves are formed therebetween to facilitate deposition of weld metal; to provide each lading tie bar with a frusto-conical support at each end; to provide each lading tie bar with a frusto-conical support at one end whereby, when it is secured in position on a closure plate, it forms a cantilever and a lading tie can be inserted over the opposite end which is spaced from the adjacent surface of the closure plate; to merge the closure plates and wall plates into a single plate which forms the interior car side wall plate and which is secured, as by seam welding, to the outstanding coplanar flanges of the channel shaped or hat shaped car side posts; to deform one or more portions of the wall plate into the channel of one or more of the car side posts for receiving a lading tie bar in each deformed portion; to make the deformation and the lading tie bar to be received therein of such complementary configurations that the lading tie bar can be positioned in the deformation for welding attachment to the wall plate without requiring the use of a special jig to hold the lading tie bar in place while the welding operation is being performed; to provide each deformed section with wedge shaped surfaces for juxtaposition with correspondingly shaped surfaces on the lading tie bar so related as to locate the lading tie bar in the deformed section both endwise and sidewise; to locate the shorter edges of the wedge shaped surfaces at the bottom of each deformed portion with weld metal extending along the longer edges of the wedge shaped surfaces; to employ for the lading tie bar a member that extends uninterruptedly from one end to the other; and to employ for the lading tie bar a member that includes endwise spaced portions for receiving a lading tie therebetween and therearound.

In the drawings:

FIG. 1 is a view from the inside of a freight car, looking outwardly, and shows a vertical plan of one part of a car side wall including the doorway and a portion of the end wall.

FIG. 2 is a horizontal sectional view taken generally along the line **2—2** of FIG. 1.

FIG. 3 is a view, at an enlarged scale, showing how one embodiment of the lading tie bar construction is mounted on a closure plate which overlies a car side post.

FIG. 4 is a horizontal sectional view taken generally along the line **4—4** of FIG. 3.

FIG. 5 is a vertical sectional view taken generally along the line **5—5** of FIG. 3.

FIG. 6 is a view, similar to FIG. 5, and shows one embodiment of the lading tie bar in detached relation with respect to the deformed section of the closure plate to which it is to be secured.

FIG. 7 is a view, similar to FIG. 3, and shows a modified construction for the lading tie bar.

FIG. 8 is a vertical sectional view taken generally along the line **8—8** of FIG. 7.

FIG. 9 is a horizontal sectional view taken generally along the line **9—9** of FIG. 10.

FIG. 10 is a view in front elevation of a portion of a freight car inner side wall and shows another configuration of the deformed section for receiving a lading tie bar which has a complementary configuration.

FIGS. 11, 12 and 13 are sectional views taken generally along the lines **11—11**, **12—12** and **13—13** of FIG. 10.

FIG. 14 is a horizontal sectional view taken generally along the line **14—14** of FIG. 15.

FIG. 15 is a view, in front elevation, of the configuration that is formed by a die in that portion of the car side wall plate which overlies the channel in the hat shaped car side posts and is so formed as to hold the lading tie against both endwise and sidewise movement so that the welding operation can be performed without requiring a jig to hold the lading tie in position.

FIGS. 16 and 17 are sectional views taken generally along the lines **16—16** and **17—17** of FIG. 15.

FIG. 18 is a sectional view taken generally along the line **18—18** of FIG. 17.

FIG. 19 is a horizontal sectional view taken generally along the line **19—19** of FIG. 20.

FIG. 20 is a plan view, similar to FIG. 10 and showing a modified form of the lading tie anchor.

FIGS. 21, 22, 23, 24 and 25 are sectional views taken generally along the lines **21—21**, **22—22**, **23—23**, **24—24** and **25—25** of FIG. 20.

FIG. 26 is a view, in side elevation, of the lading tie bar that is shown in assembled relation in FIG. 10.

FIG. 27 is a view, in rear elevation, of the lading tie bar shown in FIG. 26.

FIG. 28 is a view, in side elevation, of the lading tie bar shown in assembled relation in FIG. 20.

FIG. 29 is a view, in rear elevation, of the lading tie bar shown in FIG. 28.

Referring now particularly to FIGS. 1 and 2 of the drawings, it will be observed that the reference character **10** designates, generally a portion of a wall of a freight car having a door opening **11** which is located between upstanding metallic door posts **12** and **13**. The wall **10** extends upwardly from a floor **14** to a top **15**. Intermediate metallic car side posts **16** are positioned in spaced relation along the wall **10** between the door post **12** and a metallic corner post **17** to which an end wall section **18** is joined.

As shown more clearly in FIG. 4 each intermediate metallic car side post **16** is generally channel shaped or hat shaped in cross section. The side post **16** is pro-

vided with a flat bottom wall 21 and outwardly flared side walls 22—22 having along their outer edges outstanding coplanar flanges 23—23. It is conventional to form the car side post 16 of ⅛" thick sheet steel.

Extending between the intermediate car side posts 16 and joined to the door post 12 and to the corner posts 17 are metallic wall plates 24 which may be sheet steel having a thickness of ⅛", As shown in FIGS. 3 and 4 the metallic wall plates 24 are secured, as by vertically extending weldments 25—25, to the respective outstanding coplanar flanges 23—23. Overlying each of the intermediate car side posts 16 and the corner posts 17 are metallic closure plates 26 which may be formed of ⅛" thick sheet steel with the edges overlying the outstanding coplanar flanges 23—23 and welded thereto by the weldments 25—25 at the time that the wall plates 24 are welded thereto. It will be understood that the metallic wall plates 24 and the closure plates 26 form the wall 10 of the freight car as supported by the intermediate car side posts 16 together with the metallic door post 12 and corner post 17. This assembly constitutes the entire construction for the wall 10 with one side of the wall plates 24 facing the interior of the car and forming together with the closure plates 26 the inner wall surface of the car. The outer surfaces of the wall plates 24 and the outer surfaces of the intermediate car side posts 16, of the door post 12, and of the corner post 17 form the outer surface of the wall 10.

It is desirable that provision be made for attachment of metallic lading ties to the wall 10. For this purpose certain of the metallic closure plates 26 are provided with spherically deformed sections 29. For example, as illustrated in FIG. 1, the six closure plates 26 counting from the door post 12 are provided with the spherically deformed sections 29. They can be staggered as shown here and the number provided depends upon the number of lading ties that are to be used.

When the sections 29 are spherically deformed, locator holes 30—30 also are formed therein as shown more clearly in FIG. 6. The locator holes 30—30 have frusto-conical surfaces 31 which are inclined outwardly toward the bottom wall 21 of the respective car side post 16.

Associated with each deformed section 29 is a metallic lading tie bar that is indicated, generally, at 32. Preferably the lading tie bar 32 is a steel forging and it has an intermediate lading tie receiving section 33 that is suitably curved in order to receive a metallic lading tie therearound. End portions 34—34 of the lading tie bar 32 have spherical surface portions 35—35 that conform to the curvature of the inner surface of the deformed section 29. Lateral support means 36—36 extends from these surface portions 35—35 for insertion into the locator holes 30—30. Their inner surfaces 37—37 have the same curvature as the outer surface of the deformed section 29 so that, when they are assembled, as shown in FIG. 5, the surfaces 35—35 and 37—37 conform to the inner and outer surfaces of the section 29. The lateral support means 36—36 are provided with frusto-conical surfaces 38 which are inclined in such manner with respect to the frusto-conical surfaces 31 along the peripheries of the locator holes 30—30 so as to provide an annular V-groove for receiving weld metal 39.

It will be understood that the metallic closure plates 26 have the sections 29 deformed therein and provided with the locator holes 30—30. Before the closure plates 26 are applied to the car side post 16, the lading tie bars 33 are applied and the weldments 39 are completed. After the lading tie bars 32 have been secured to the closure plates 26, they are positioned in overlying relation to the car side posts 16 together with the door post 12 and corner post 17 and the wall plates 24 are then assembled therewith. Using suitable clamps and welding equipment the weldments 25—25 are made to complete the assembly of the wall 10. The weldments 25—25 can be made with a minimum of splatter and it is a simple matter to clean and burnish them so as to provide a smooth interior wall for the freight car.

As shown in FIG. 5 the weldments 39 which secure each lading tie bar 32 in position on the respective deformed section 29 are located within the channel shaped or hat shaped car side post 16. Since these weldments 39 are not exposed to the interior of the car and thus are not in contact with the lading therein, it is unnecessary to clean and burnish them or to provide a smooth surface thereover. Moreover, it is unnecessary to remove any splatter of weld metal since the weldments 39 are completely concealed within the side post 16. Accordingly, there is a substantial reduction in manufacturing cost.

FIGS. 7 and 8 show a modification of the lading tie bar and the manner in which it is secured to a deformed section 29. Here the metallic lading tie bar 40 is a metallic forging and it has an upper end portion 41 that is similar to or identical with the end portion 34 of the lading tie bar 32. The upper end portion 41 has lateral support means 42 extending therefrom which is provided with a frusto-conical surface 43 that corresponds to the frusto-conical surface 38. As described above, this arrangement provides an annular V-groove along which the weldment 44 can be made. In this embodiment the weldment 44 constitutes the sole support for the lading tie bar 40 since the intermediate lading tie reeciving section 45 extends in cantilever fashion from the upper end portion 41 with its lower end 46 spaced, as indicated at 47, from the adjacent inner surface of the deformed section 29. This arrangement permits the application of a metallic lading tie through the space 47 and an inwardly extending protuberance 48 from the rear side of the lower end 46 serves as a shoulder to limit the downward movement of the lading tie.

If desired, the single opening in the deformed section 29 for receiving the lading tie bar 40 can be somewhat larger than the locator hole 30 with a corresponding increase in the diameter of the lateral support means 42. The dimensions, of course, depend upon the stress to which the lading tie bar 40 is likely to be subjected and provision is made in the design of the parts to resist such stress.

Referring now particularly to FIGS. 9–13 of the drawings, a wall plate 51 is shown which can be formed by merging the metallic wall plates 24 and the metallic closure plates 26 so that the inner side wall of the freight car is formed by the single continuous wall plate 51. This avoids the necessity of making the welds as indicated at 25 between the metallic wall plates 24 and the metallic closure plates 26. The wall plate 51 is secured, as by seam welding as indicated at 52 in FIG. 10, to outstanding coplanar flanges 53—53 of a hat shaped car side post as indicated, generally, at 54. The car side post 54 includes a bottom wall 55 and side walls 56—56 which together define a channel 57.

In those portions of the wall plate 51 that overlie the channel 57 of the several car side posts 54, arranged as indicated for the car side post 16 in FIGS. 1 and 2 of the drawings, generally rectangularly deformed sections are formed by a suitable die one of which is indicated at 58. The deformed sections 58 are provided for receiving metallic lading tie bars one of which is indicated, generally, at 59. The lading tie bar 59 includes an intermediate uninterrupted lading tie receiving section having end portions 61—61. The outer surface 62 of the lading tie 59 is flush with or sightly below the plane of the surface of the wall plate 51 surrounding the deformed section 58. The under surface 63 of the lading tie 60 is spaced, as indicated in FIG. 12, from the flat bottom surface 64 of the deformed section 58 in order to receive an end of the lading tie that is passed around the lading tie receiving section 60.

It is desirable that the configuration of the deformed

section 58 be such that the lading tie bar 59, when positioned therein, is automatically properly positioned for subsequent welding without requiring the use of special jigs to hold it in place.

For this purpose the particular configuration, seen best in FIGS. 14–18 of the drawings, is employed. Here it will be observed that the generally rectangularly deformed section 58 is provided with wedge shaped end surfaces 67—67 that are inclined from the outer surface of the wall plate 51 toward the flat bottom surface 64. The shorter edges 67*a*—67*a* lie along the flat bottom surface 64 while the longer edges 67*b*—67*b* lie along the undeformed surface of the wall plate 51. The wedge shaped end surfaces 67—67 are flanked by wedge shaped surfaces 68—68 and 69—69. Their shorter edges 68*a*—68*a* and 69*a*—69*a* lie along the flat bottom surface 64 while their longer edges 68*b*—68*b* and 69*b*—69*b* lie in the outer surface of the wall plate 51. The wedge shaped surfaces 68—68 and 69—69 are inclined as seen in the several figures of the drawings and they are interconnected by inclined wedge shaped side surfaces 70—70 the short edges 70*a*—70*a* of which lie along the flat bottom surface 64 while the longer edges 70*b*—70*b* lie in the underformed surface of the wall plate 51. These several inclined wedge shaped surfaces and the flat bottom surface 64 are formed by the application of a correspondingly shaped die under sufficient pressure to the wall plate 51.

FIGS. 26 and 27 show that the end portions 61—61 of the lading tie bar 59 are provided with surfaces that are complementary to the wedge shaped surfaces 67—67, 68—68 and 69—69 at the ends of the deformed section 58. Here it will be noted that wedge shaped end surfaces 71—71 are formed on the under sides of the end portions 61—61 and are inclined to correspond to the inclination of the wedge shaped end surfaces 67—67 as is apparent from FIG. 12. Flanking the wedge shaped end surfaces 71—71 are wedge shaped inclined surfaces 72—72 and 73—73 which correspond in inclination, respectively, to the wedge shaped surfaces 68—68 and 69—69 of the deformed section 58. The shorter edges 71*a*—71*a* of the wedge shaped end surfaces 71—71 are arranged to overlie the shorter edges 67*a*—67*a* of the wedge shaped end surfaces 67—67. Likewise the shorter edges 72*a*—72*a* and 73*a*—73*a* are arranged to overlie the shorter edges, respectively, 68*a*—68*a* and 69*a*—69*a* of the wedge shaped surfaces 68—68 and 69—69 of the deformed section 58.

When the lading tie bar 59 constructed as described is positioned in the deformed section 58, as shown in FIG. 10, the wedge shaped end surfaces 71—71 position it endwise since they are juxtaposed to the inclined and oppositely facing wedge shaped end surfaces 67—67. The lading tie bar 59 also is positioned sidewise since the wedge shaped surfaces 72—72 and 73—73, which are inclined away from the end surfaces 71—71 are juxtaposed to the wedge shaped surfaces 68—68 and 69—69 of the deformed section 58. These cooperating inclined surfaces guide the lading tie bar 59 to the proper position in the deformed section 58 and it is unnecessary to provide a special jig for holding it in this position. Weld metal then is deposited as indicated at 74—74 along the longer edges 71*b*—71*b*, 72*b*—72*b* and 73*b*—73*b* to hold securely the lading tie bar 59 in the respective deformed section 58.

Referring now particularly to FIGS. 28 and 29 of the drawings, it will be noted that the metallic lading tie bar shown generally at 77 here can be applied to the generally rectangularly deformed section 58 in the wall plate 51 in lieu of the lading tie bar 59 previously described. The lading tie bar 77 includes end portions 78—78 from one of which an upper tie bar section or post 79 depends while from the other a lower tie bar section or post 80 projects upwardly leaving a space 81 between these endwise related sections or posts for receiving a lading tie (not shown) therethrough and therearound. When the lading tie bar 77 is positioned in the deformed section 58, as shown in FIG. 22, the outer surface 82 is in the plane of or slightly below the plane of the undeformed surface of the wall plate 51. The under surface 83 is spaced from the flat bottom surface 64. Prior to application of the lading tie bar 77 to the deformed section 58 its end portions 78—78 which carry the upper and lower tie bar sections 79 and 80 are interconnected by side bars 84—84 which serve to maintain these parts in proper spaced relation.

The lading tie bar 77 is provided with special configurations on the under sides of the end portions 78—78 in order to automatically center it in the deformed section 58. This special configuration includes wedge shaped end surfaces 87—87 which correspond to the wedge-shaped end surfaces 67—67 of the lading tie bar 59. The shorter edges 87*a*—87*a* of the wedge shaped inclined end surfaces 87—87 are arranged to overlie the shorter edges 67*a*—67*a* respectively of the wedge shaped end surfaces 67—67, FIG. 15. When the end surfaces 87—87 overlie the wedge shaped end surfaces 67—67, the lading tie bar 77 is properly positioned endwise. In order to position it properly sidewise the wedge shaped end surfaces 87—87 are flanked by wedge shaped surfaces 88—88 and 89—89 which are oppositely inclined with respect thereto and are arranged to overlie the wedge shaped surfaces 68—68 and 69—69, respectively, of the deformed section 58, FIG. 15. Their shorter edges 88*a*—88*a* and 89*a*—89*a* are arranged to overlie, respectively, the shorter edges 68*a*—68*a* and 69*a*—69*a* of the wedge shaped surfaces 68—68 and 69—69. These surfaces serve to properly position the lading tie bar 77 sidewise.

When the lading tie bar 77 is positioned in the deformed section 58 in the manner described, it is unnecessary to provide a special jig for holding it in its proper position. The inclined surfaces just referred to serve this purpose. The lading tie bar 77 then can be secured in place by welding as indicated at 90—90 in FIG. 20. The welding 90—90 extends along the longer edges 87*b*—87*b* of the wedge shaped end surfaces 87—87 and along the longer edges 88*b*—88*b* and 89*b*—89*b* of the wedge shaped surfaces 88—88 and 89—89.

What is claimed as new is:

1. In a freight car construction:
   (*a*) spaced vertical metallic channel shaped car side posts having outstanding coplanar flanges along their edges,
   (*b*) metallic wall plate means overlying and secured to said coplanar flanges,
   (*c*) that portion of said metallic wall plate means between a pair of said coplanar flanges having one or more sections deformed into the channel of the respective car side post with each section having an aperture in one side, and
   (*d*) a metallic lading tie bar within each deformed section having: a lateral support at one end extending into said aperture thereof and secured thereto by weld metal whose exposed surface is within said channel, a surface on one side substantially coplanar with the undeformed surface of said metallic wall plate means facing the interior of said freight car, a surface on its opposite side spaced from the surface of said deformed section to receive therearound a lading tie adjacent said lateral support, and the other end spaced from the juxtaposed surface of said deformed section.

2. A lading tie bar comprising:
   (*a*) an elongated metallic member having an intermediate lading tie receiving portion and at one end a laterally extending support portion,
   (*b*) said support portion being generally frusto-conical in configuration to facilitate welding thereof to a support.

3. The invention, as set forth in claim 2, wherein the elongated metallic member has a frusto-conical support portion at each end.

4. In a freight car construction:

(*a*) spaced vertical metallic channel shaped car side posts having outstanding coplanar flanges along their edges,

(*b*) metallic wall plate means overlying and secured to said coplanar flanges,

(*c*) that portion of said metallic wall plate means between a pair of said coplanar flanges having one or more unperforated sections deformed into the channel of the respective car side post,

(*d*) a metallic lading tie bar within each deformed section and secured thereto with the intermediate portion spaced from the bottom thereof to receive a lading tie therearound,

(*e*) opposite end surfaces of each unperforated deformed section being inclined and providing a pair of surfaces facing each other to locate said lading tie bar endwise,

(*f*) those pairs of surfaces of each deformed section adjacent to said end surfaces being inclined and facing each other to locate said lading tie bar sidewise, and

(*g*) the end surfaces of each tie bar being shaped to be juxtaposed to the respective surfaces of the respective deformed section for surface engagment therewith.

5. In a freight car construction:

(*a*) spaced vertical metallic channel shaped car side posts having outstanding coplanar flanges along their edges,

(*b*) metallic wall plate means overlying and secured to said coplanar flanges,

(*c*) that portion of said metallic wall plate means between a pair of said coplanar flanges having one or more sections deformed into the channel of the respective car side post,

(*d*) a metallic lading tie bar within each deformed section and secured thereto with the intermediate portion spaced from the bottom thereof to receive a lading tie therearound,

(*e*) opposite end surfaces of each deformed section being inclined to locate said lading tie bar endwise,

(*f*) those surfaces of each deformed section adjacent to said end surfaces being inclined to locate said lading tie bar sidewise,

(*g*) the end surfaces of each tie bar being shaped to be juxtaposed to the respective surfaces of the respective deformed section,

(*h*) the opposite end surfaces of each deformed section and the surfaces thereof adjacent thereto together with the corresponding juxtaposed surfaces on the ends of the tie bar being generally wedge shaped surfaces with the shorter edges at the bottom.

6. The invention, as set forth in claim 5, wherein each lading tie bar is secured in its respective deformed section by weld metal extending along the longer edges of the wedge shaped surfaces.

7. The invention, as set forth in claim 6, wherein each lading tie bar extends uninterruptedly from one end to the other.

8. The invention, as set forth in claim 6, wherein each lading tie bar includes endwise spaced portions for receiving a lading tie therebetween.

9. A lading tie bar comprising an elongated metallic member having an intermediate lading tie receiving portion and at one end at least having an inclined central wedge shaped planar surface and an inclined wedge shaped planar surface on each side of said central wedge shaped planar surface and oppositely inclined with respect thereto.

10. The invention, as set forth in claim 9, wherein each end of the lading tie bar is provided with the wedge shaped planar surfaces.

11. The invention, as set forth in claim 10, wherein the lading tie bar extends uninterruptedly from one end to the other.

12. A lading tie bar comprising a pair of endwise spaced portions for receiving therebetween and therearound a lading tie, joined by at least one side bar member, and having at one end at least an inclined central wedge shaped planar surface flanked by inclined wedge shaped planar surfaces oppositely inclined with respect to said central wedge shaped planar surface.

13. The invention, as set forth in claim 12, wherein the endwise spaced portions are joined by a pair of side bar members and each of said portions is provided with the wedge shaped planar surfaces.

References Cited by the Examiner

UNITED STATES PATENTS

2,716,383	8/55	Johnson	105—369
3,089,436	5/63	Buckley	105—369

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