July 20, 1943. G. G. GILPIN 2,324,921

RAILWAY CAR CONSTRUCTION

Filed May 1, 1941 2 Sheets-Sheet 1

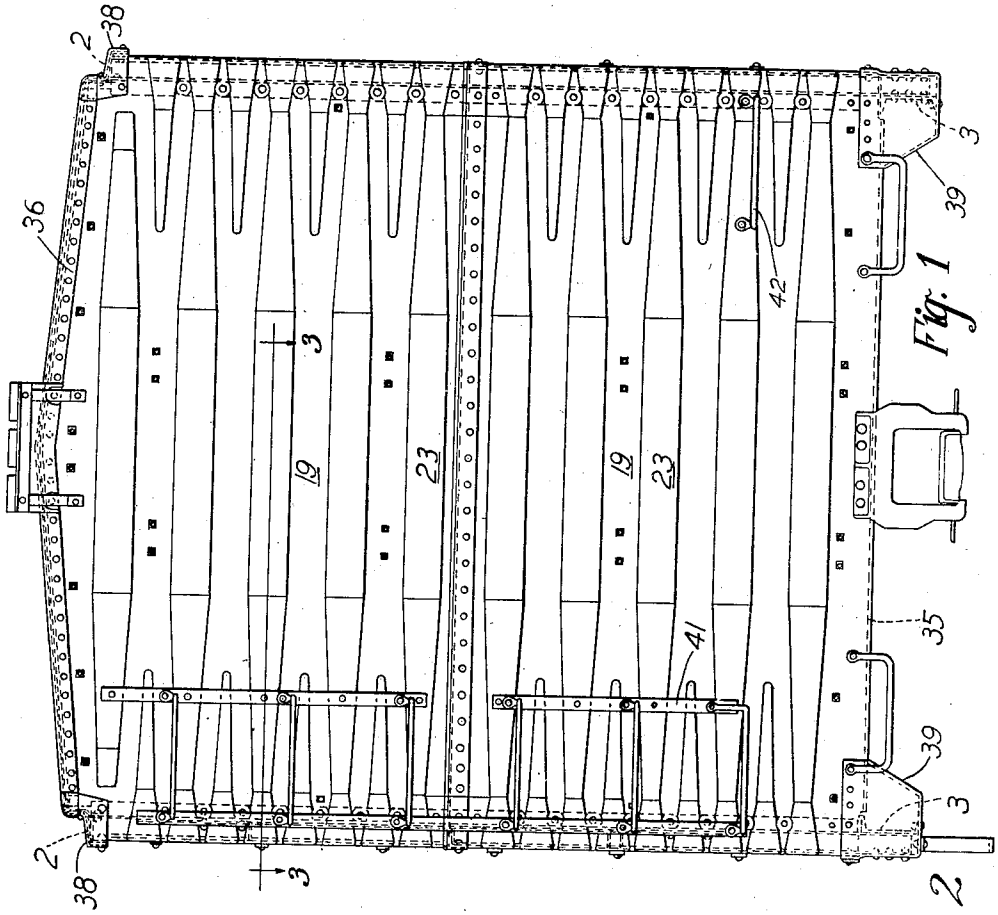


Fig. 1

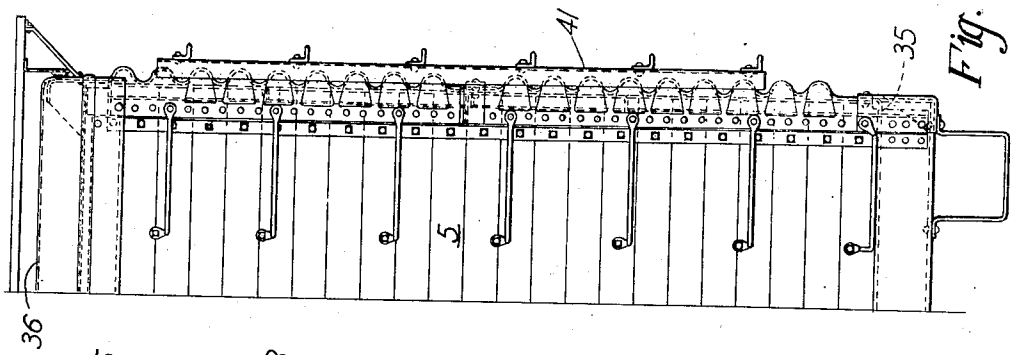


Fig. 2

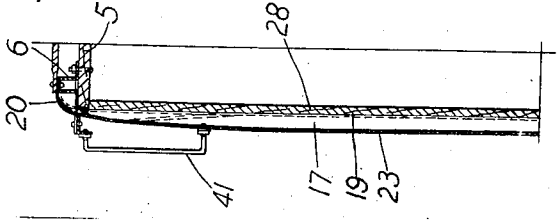


Fig. 3

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RAILWAY CAR CONSTRUCTION

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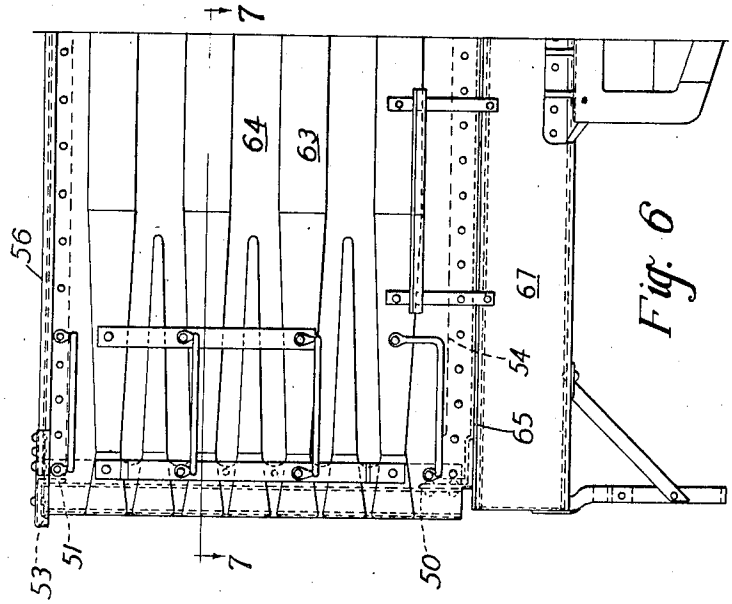


Fig. 6

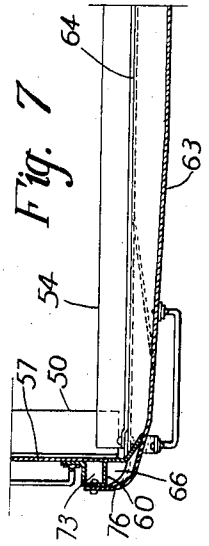


Fig. 7

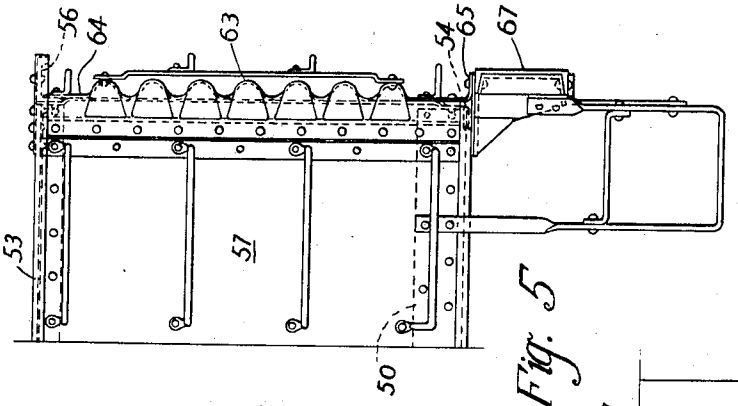


Fig. 5

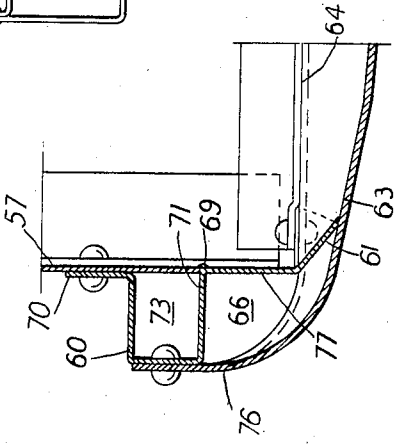


Fig. 8

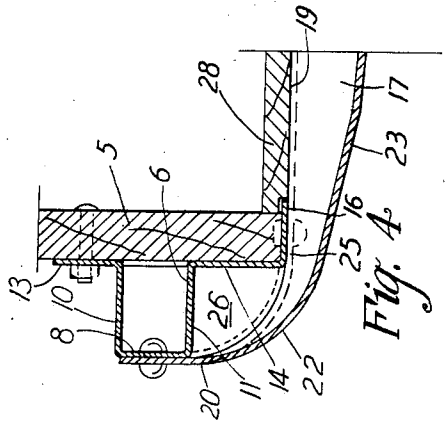


Fig. 4.

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UNITED STATES PATENT OFFICE

2,324,921

RAILWAY CAR CONSTRUCTION

Garth G. Gilpin, Riverside, Ill., assignor to Standard Railway Equipment Manufacturing Company, Chicago, Ill., a corporation of Delaware

Application May 1, 1941, Serial No. 391,267

7 Claims. (Cl. 105—410)

The invention relates to railway cars and has for its object to provide very strong corner posts for use with a car end wall made of metallic plates provided with a plurality of substantially parallel horizontal corrugations, which corrugations form a plurality of beams between the opposite corner posts of the car to resist a shifting load and to keep the car in square. More specifically the object of the invention is to provide a corner post which is so formed as to restrain the above mentioned beams to resist forces in any horizontal direction and to also secure the corner post to the car structure so as to prevent it from rotating about its vertical axis, or in other words, to resist torque.

A shifting load in a railway freight car often exerts a horizontal force against the end wall and if the end wall deflects outwardly the middle portions of opposite corner posts are pulled toward each other, while the tops and bottoms, respectively, of the corner posts are held in position and prevented from coming toward each other by the upper chord and end sill, respectively, thus causing a bowing tendency or beam action on each corner post. Railway cars are frequently "cornered" in service; that is, some outside object is thrown against the corner post (or the car is thrown against the outside object) causing a horizontal force to be exerted toward the inside of the car.

Each corner post is also a strut of the overhanging portion of the side truss of the car; (that is, the portion beyond the body bolster) and as such must act as a tension or compression member between the side plate and side sill of the car.

The invention is particularly related to so-called single sheathed cars. Examples of such cars are box or stock cars wherein the framing members, such as posts and diagonal braces, are disposed exterior of the car and the sheathing, which forms the car lining, is disposed on the inner side of the framing members and secured thereto. Another example is found in wood or steel sheathed gondola cars wherein the posts are on the outside of the car and the side wall plates extend between the posts on the inner side thereof.

A further object is to associate the vertical marginal portion of the corrugated metallic plate end wall with a vertical corner post member to form a hollow structural member which functions as a corner post to resist the forces heretofore mentioned, and a further object is to attach the ends of the corrugations (in the plate) to the opposite hollow structural members so as to cause the corrugations to function as restrained, or semi-restrained beams, thus materially increasing their beam strength.

A further object is to extend the corrugations in the above mentioned corrugated metallic plate end wall so that any load imposed thereon is transmitted partially to the corner post member adjacent the inner margin thereof and partially to the corner post member adjacent the outer margin thereof.

A further object is to form the vertical marginal portion of the corrugated end wall plate with a lateral flange formed on a relatively large radius to form in effect an arch between the vertical margins of the corner post member to resist exterior horizontal forces. Such large radius also enhances the appearance of the car.

A further object is to increase the section modulus of the corner post, thereby increasing the resistance of such a post to bowing inwardly upon a bulging of the car wall.

Another object is to form a corner post having a pair of hollow vertically extending parts, one of which parts functions as above described to partially restrain the end wall corrugations and the other of which cooperates with the side wall of the car to strengthen such side wall.

Other objects and advantages of my invention will be apparent from the following detailed description by referring to the accompanying drawings.

In the drawings:

Fig. 1 is an end elevation of a railway car embodying my invention.

Fig. 2 is a side elevation of a portion of the car shown in Fig. 1.

Fig. 3 is a plan section on line 3—3 of Fig. 1.

Fig. 4 is an enlarged view of a portion of Fig. 3.

Fig. 5 is a side elevation of a portion of a gondola car embodying my invention.

Fig. 6 is a partial end elevation of the car shown in Fig. 5.

Fig. 7 is a plan section on line 7—7 of Fig. 6.

Fig. 8 is an enlarged view of a portion of Fig. 7.

Figs. 1 to 4 illustrate a single sheathed car having wood sheathing, which type of car is commonly used as box cars and stock cars. Each side wall of the car is comprised of a side plate 2 at the upper part thereof and a side sill 3 at the lower part thereof, which sill 3 also constitutes a part of the under frame of the car. Side posts extend between the plate 2 and sill 3 and sheathing 5 is secured to the side posts on the side thereof toward the interior of the car.

The corner post member 6, as shown most clearly in Fig. 4, is comprised of a web 8, spaced apart flanges 10, 11 extending from the web 8 toward the sheating 5 and oppositely directed reflanges 13, 14 disposed flatwise with the outer side of the sheating 5. The reflange 14 is provided with a second reflange 16 extending in the general direction of the car end wall 17. The corner post member 6 is rigidly secured at the top and bottom thereof to the side plate 2 and side sill 3 respectively.

The end wall 17 is formed of a metallic plate 19 having flanges 20 on the opposite vertical margins thereof, which flanges 20 are formed on curves 22 of relatively large radius. The plate 19 is provided with horizontally extending corrugations 23 which extend at their opposite ends at least partially around the curved parts 22 of the flanges 20 and merge into such flanges.

Each flange 20 of the end wall plate 19 is secured to the web 8 of the corner post member 6 and the body part 25 of the wall plate 19 adjacent the flange 20 is secured to the reflange 16 of the corner post member 6, thereby forming a hollow corner post 26. The side sheathing 5 is secured, preferably by bolts, to the reflange 13 of the corner post member 6 and extends substantially to the end wall 17 to form an uninterrupted lining for the car. The end lining 28 is arranged on the inner side of the corrugated end wall plate 19 and abuts the side sheathing 5.

The lower margin of the end wall plate 19 is preferably flanged inwardly to form the end sill 35 of the car and the roof 36 of the car is secured to the upper part of the end wall plate 19. Corner caps 38, which are commonly pressed members, are used to reinforce the upper corners of the car and push pole pockets 39, which are either castings or pressings, reinforce the lower corners of the car. The usual ladders 41 and grab irons 42 are shown applied to the car.

Figs. 5 to 8 show a steel sheathed gondola car, wherein the side sill is an angle member 50 and wherein the upper chord of the side wall is a bulb angle 51 with the bulbed leg 53 extending outwardly. The end sill 54 and end chord 56 are similar members. Side posts extend between and are secured to the side sill 50 and side upper chord 51 and a steel side sheathing 57 is secured to the side posts on the side thereof adjacent the interior of the car.

The corner post member 60 shown in Figs. 5 to 8 is similar to that shown in Figs. 1 to 4. The reflange 61, however, is corrugated with the corrugations formed therein extending outwardly in substantial conformity with the corrugations 63 in the end wall plate 64. The corrugations of the reflange 61 may be welded to the end wall plate 64. It is necessary to thus corrugate the reflange 61 of the corner post member 60 because, in a gondola car, lining is not provided for the end walls and the use of corner post members of the type disclosed in Figs. 1 to 4 would permit certain types of bulk lading, such as sand, to escape down through the hollow corner posts 66 to the exterior of the car. It is also common to use heavier gauge metal in the end walls and corner posts of gondola cars than in box cars because of the rough usage commonly accorded gondola cars.

The lower margin of the end wall plate 64 is flanged outwardly (65) and secured to an end channel 67 which forms a part of the underframe of the car. The metallic side sheathing 57 is secured, preferably by riveting, to the reflange 70 of the corner post member 60 and secured, preferably by welding, (69) to the flange 71 of the corner post member 60, thereby forming a hollow metallic post 73 which reinforces the side wall of the car. The hollow post 66 is formed by the flange 76 of the end wall plate 64 in cooperation with the flange 71 and reflange 77 of the corner post member 60, which hollow post functions to restrain the beams formed by the corrugations in the end wall plate.

The accompanying drawings illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof, within the scope of the claims, will occur to persons skilled in the art.

I claim:

1. In a railway car, an end wall comprising a metallic plate having a vertical margin thereof flanged, a corner member comprising a vertically extending channel facing toward the interior of the car and comprising a web and spaced apart inner and outer flanges, said inner flange having a reflange, means to secure said plate flange to said web, mean to secure said reflange to the body part of said plate thereby forming a hollow corner post, and side sheathing having its end portion extending between said channel flanges and secured to said outer flange.

2. In a railway car, an end wall comprising a metallic plate having a vertical margin thereof flanged on a curve of relatively large radius, said plate formed with a plurality of substantially horizontal corrugations which merge into said flange, a corner member comprising a vertically extending channel facing toward the interior of the car and comprising a web and spaced apart inner and outer flanges, said inner flange having a reflange, means to secure said plate flange to said web, means to secure said reflange to the body part of said plate thereby forming a hollow corner post, and side sheathing having its end portion extending between said channel flanges and secured to said outer flange.

3. In a railway car, an end wall comprising a metallic plate having a vertical margin thereof flanged, a corner member comprising a vertically extending channel facing toward the interior of the car and comprising a web and spaced apart inner and outer flanges, said inner flange having a reflange, means to secure said plate flange to said web, means to secure said reflange to the body part of said plate thereby forming a hollow corner post, said last mentioned means comprising a second reflange formed on the first mentioned reflange and secured to said plate, and side sheathing having its end portion extending between said channel flanges and secured to said outer flange.

4. In a railway car, an end wall comprising a metallic plate having a vertical margin thereof flanged, a corner member comprising a vertically extending channel facing toward the interior of the car and comprising a web and spaced apart flanges, said flanges having oppositely projecting reflanges, means to secure said plate flange to said web, means to secure one of said reflanges to the body part of said plate thereby forming a hollow corner post, and side sheathing having its end portion extending between said flanges, said sheathing being secured to the reflange most remote from said end wall.

5. In a railway car, an end wall comprising a metallic plate having a vertical margin thereof

flanged, a corner member comprising a vertically extending channel facing toward the interior of the car and comprising a web and spaced apart flanges, said flanges having oppositely projecting reflanges, means to secure said plate flange to said web, means to secure one of said reflanges to the body part of said plate thereby forming a hollow corner post, and side sheathing having its end portion extending between said flanges, said sheathing being secured to the reflange most remote from said end wall and to the flange which is adjacent said end wall.

6. In a railway car, an end wall comprising a metallic plate having a vertical margin thereof flanged, a corner member comprising a vertically extending channel facing toward the interior of the car and comprising a web and spaced apart flanges, one of said flanges having a reflange, means to secure said plate flange to said web, means to secure said reflange to the body part of said plate thereby forming a hollow corner post, side sheathing having its end portion extending between said flanges, and means to secure said sheathing to the free ends of said flanges.

7. In a railway car, an end wall comprising a metallic plate having a vertical margin thereof flanged on a curve of relatively large radius, said plate formed with a plurality of substantially horizontal corrugations which merge into said flange, a corner member comprising a vertically extending channel facing toward the interior of the car and comprising a web and spaced apart flanges, said flanges having oppositely projecting reflanges, means to secure said plate flange to said web, means to secure one of said reflanges to the body part of said plate thereby forming a hollow corner post, said last mentioned means comprising a second reflange formed on the first mentioned reflange and secured to said plate, and side sheathing having its end portion extending between said flanges, said sheathing being secured to the reflange most remote from said end wall.

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