

- [54] GONDOLA AND HOPPER CARS WITH IMPROVED CORNER WALL CONSTRUCTION**

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- [52] U.S. Cl..... 105/406 R, 296/28 M

- [51] **Int. Cl.**..... **B61d 7/00**

- [58] **Field of Search**..... 105/355, 406, 410,
105/409, 404, 396; 296/28 M, 29

[56] **References Cited**

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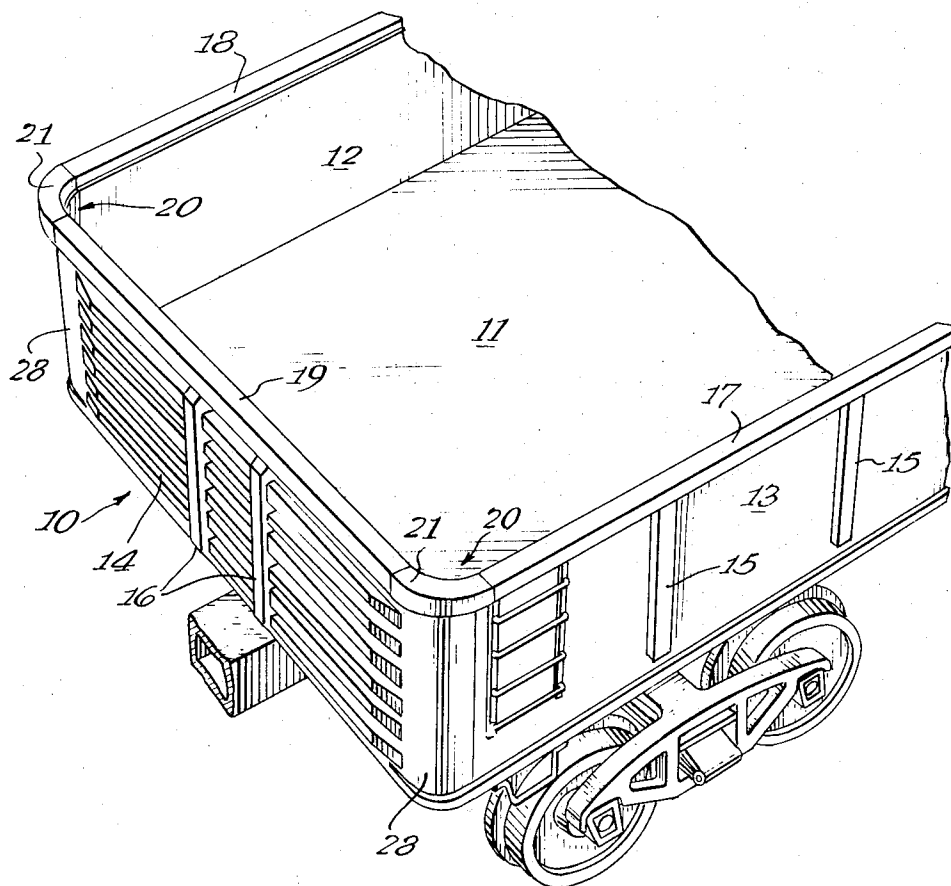
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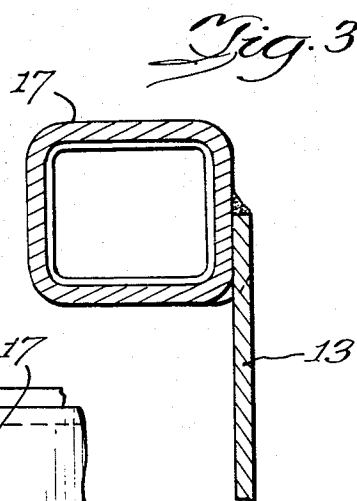
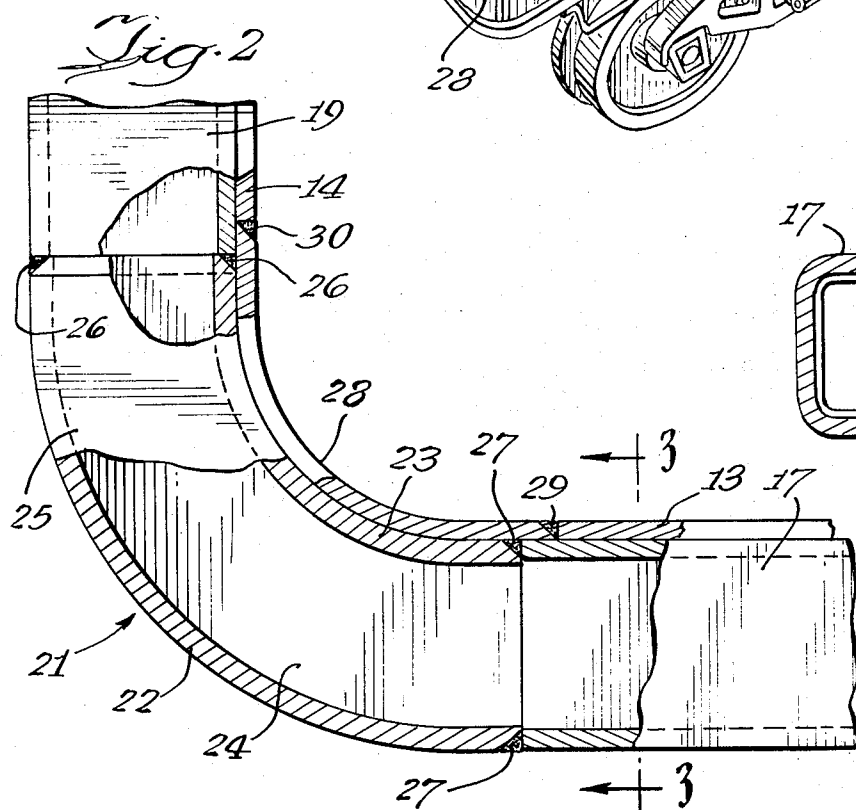
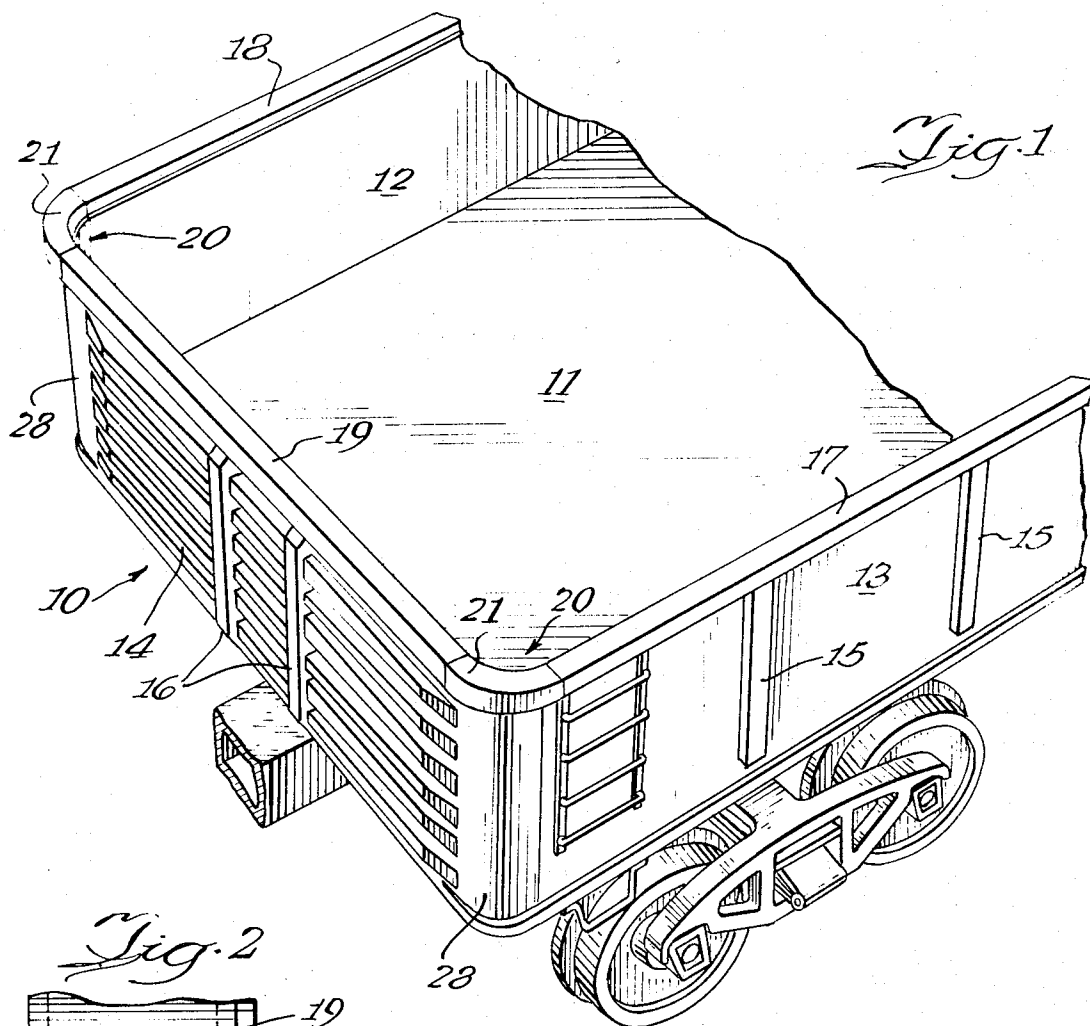
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[57] **ABSTRACT**

Improvement in a railroad gondola or hopper car having metal end walls and metal side walls of metal plate, comprising horizontal tubular metal top chords at the outside top edges of the end walls and side walls, a hollow tubular corner connection having a quarter circle ring section, at each of the four corners of the car with one end portion of each connection joined to the end of a side wall tubular chord and the other end portion of the connection joined to the end of an end wall tubular chord, said corner connection between the ends of the chords joined thereto being at least as large externally in lateral section as the chord ends, and said chords and corner connection being rectangular in lateral cross-section.

2 Claims, 10 Drawing Figures





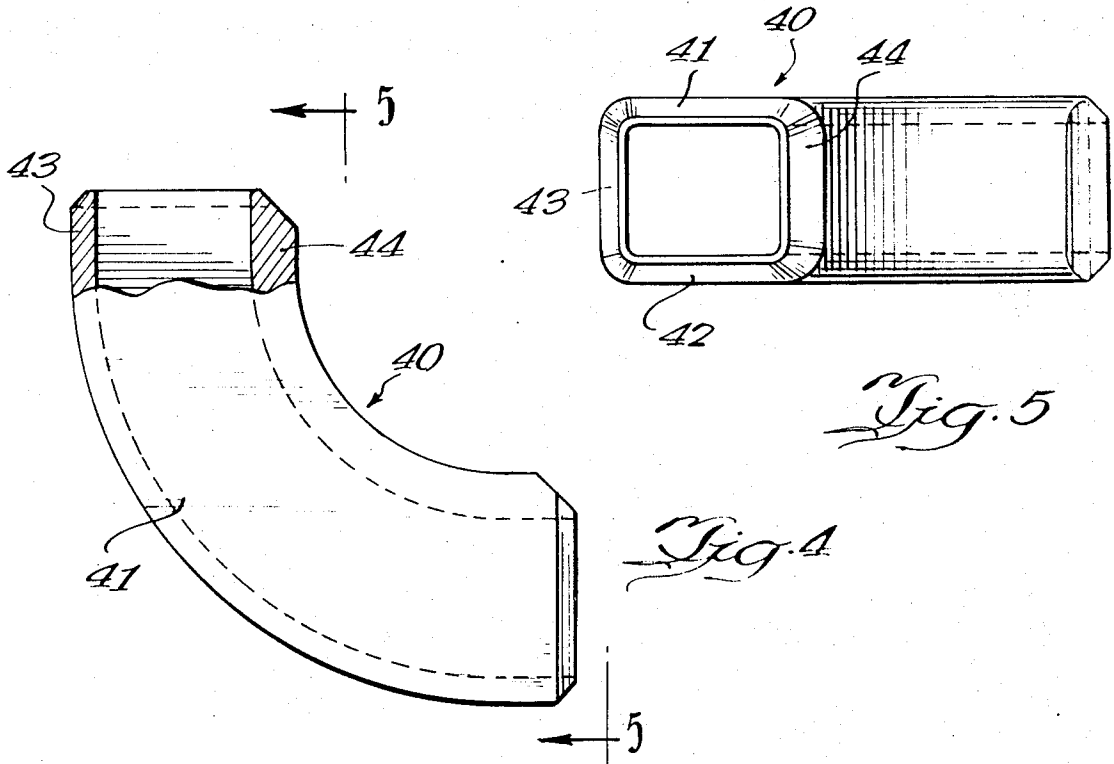


Fig. 5

Fig. 4

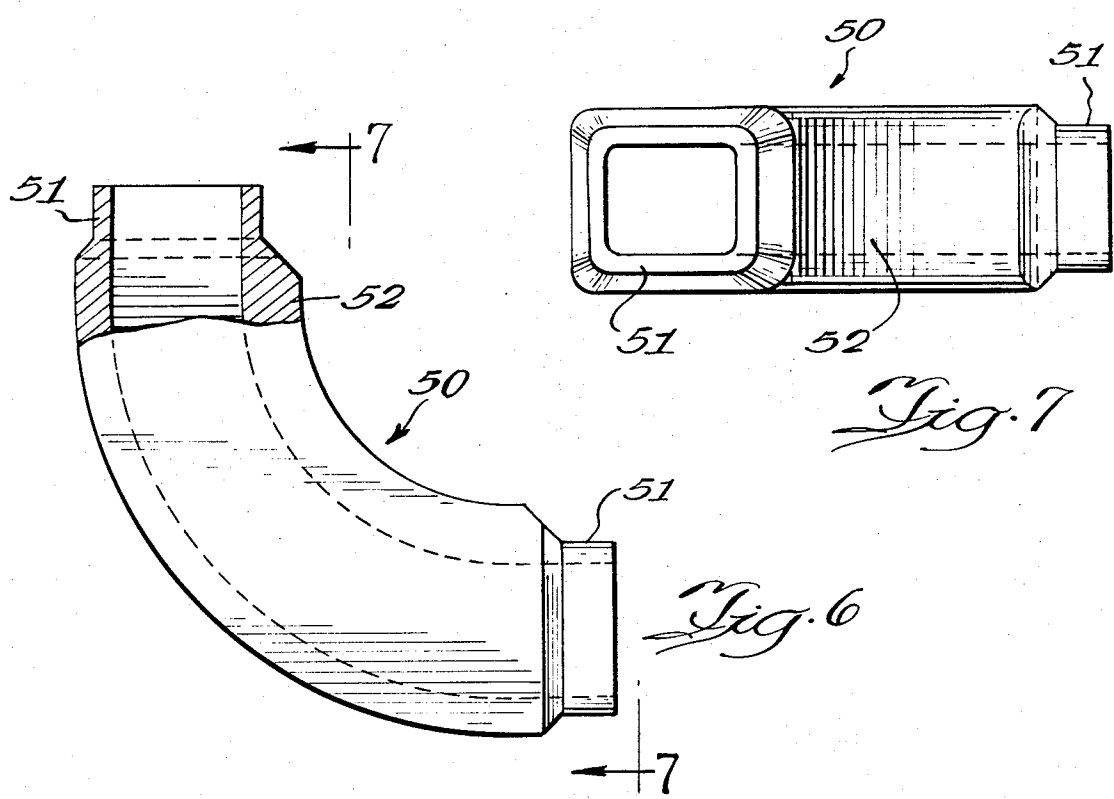
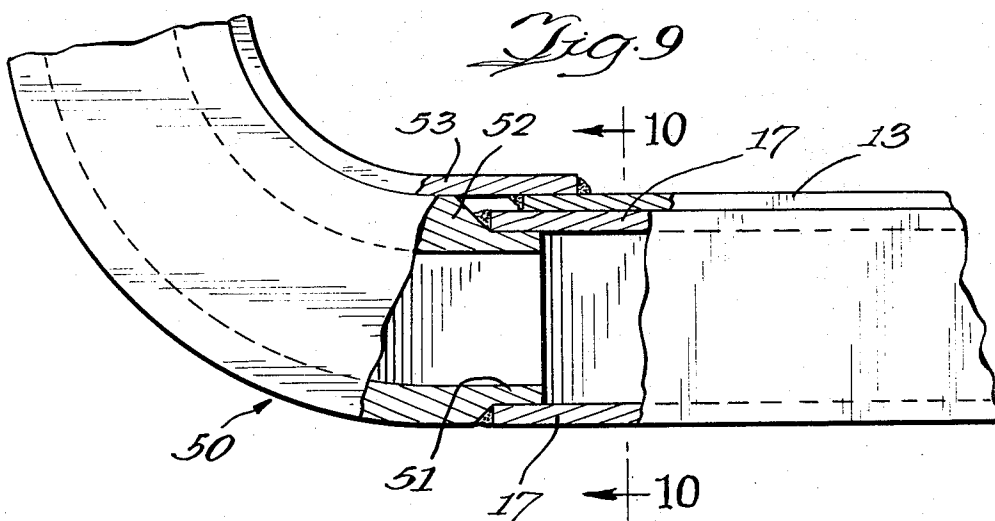
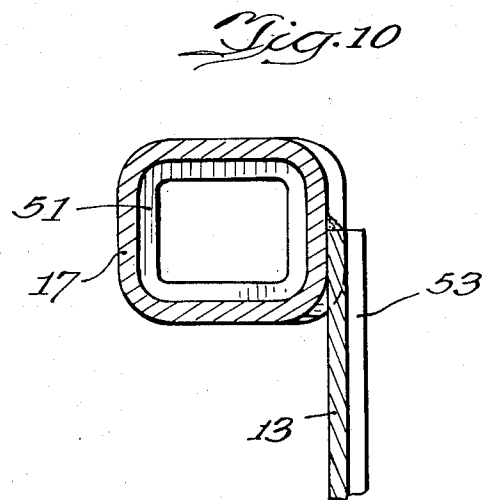
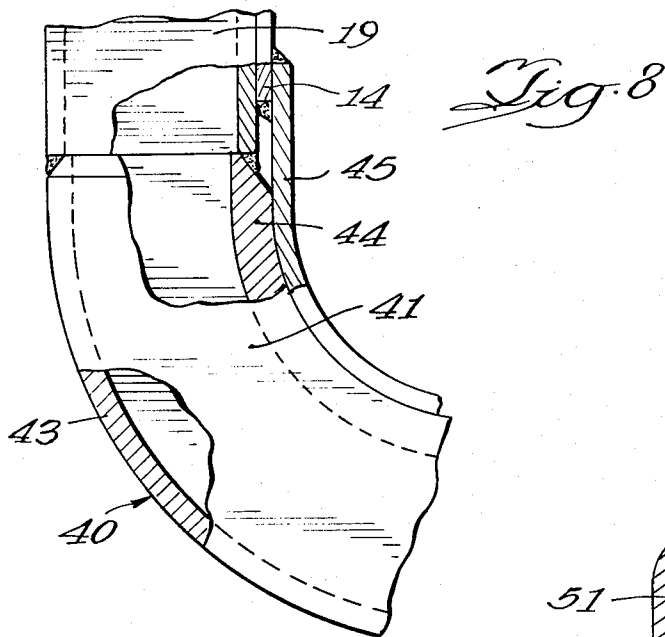


Fig. 7

Fig. 6



GONDOLA AND HOPPER CARS WITH IMPROVED CORNER WALL CONSTRUCTION

This invention relates to railroad cars. More particularly, this invention relates to railroad gondola and hopper cars, and particularly to an improvement in the corner construction of such cars where the car side walls and end walls meet.

Railroad gondola and hopper cars are widely used for hauling miscellaneous cargo, particularly cargo which does not have to be protected from the weather such as coal, stone, scrap materials and various types of equipment and machinery. Although there are different types of gondola and hopper cars, they all have in common parallel vertical opposing metal side walls which extend the length of the car, and vertical metal end walls at each end of the car which join the side walls. The side walls and end walls of the cars are generally made of metal plate of about three-sixteenths to three-eighths inch in thickness. Usually a number of spaced-apart vertical posts or braces are used to reinforce the side walls and end walls and to unite the walls to the floor structure. In addition, it is conventional to position a reinforcing metal chord member around the top edge of the side walls and the end walls to provide needed bracing for the plates used in the wall construction. The chord members now are usually made of metal tubular sections, although they used to be made primarily of angles and channel members. The tubular chord members are positioned horizontally along the outside top edges of the end and side walls. At each corner of the car, the horizontal tubular chords meet and conventionally are joined together by laterally butting the end of one chord against the side of the other chord and butt welding the chords together to complete the joint or by mitering the ends of the chords to 45° angles and welding the ends together. Although the tubular chords are made of rather large sized members, such as from 4 to 6 inches in cross-sectional dimension in the form of a rectangle or a square, the structural corner joints just described, and the entire corner construction, are not as structurally strong as desired and often fail during hard use of the car. In addition, fitting up of the corner joints is difficult with such construction.

According to the present invention, there is provided an improved wall corner construction for gondola and hopper cars. The railroad gondola and hopper cars of this invention are provided with a curved wall corner arced about a vertical axis. Instead of having a conventional perpendicular or lateral butt joint at the corner intersections of the horizontal tubular chords located along the top edges of the side walls and end walls or a mitered joint, the corner construction of the subject invention employs a hollow tubular curved corner connection which is preformed, and advisably is a metal casting. The tubular corner connection has a quarter circle rectangular tubular ring section and, advisably, short straight end portions extending therefrom. One end portion of the corner connection is joined to the end of a side wall tubular chord and the other end portion of the corner connection is joined to the end of an end wall tubular chord. The corner connection between the ends of the chords joined thereto is at least as large externally in lateral section as the chord ends so as to facilitate joining wall plates to the chords and the corner connection. The chords and corner connec-

tion are advisably rectangular in lateral cross-section. They can also be square in cross-section since a square is simply a form of rectangle.

The invention will be described further in conjunction with the attached drawings in which:

FIG. 1 is a partial isometric view of the end of a railroad gondola car having a wall corner construction according to the invention;

FIG. 2 is a plan view partially in section of the corner wall joint of the gondola car of FIG. 1 and specifically is a sectional view taken along the line 2—2 of FIG. 3;

FIG. 3 is a sectional view taken along the line 3—3 of FIG. 2;

FIG. 4 is a tubular corner connection in the form of a quarter circle tubular ring section intended to be joined to the ends of horizontal tubular chords by butt welds;

FIG. 5 is an end elevational view taken along the line 5—5 of FIG. 4;

FIG. 6 is a plan view, partially in section, of a corner connection having end stubs which telescope into the ends of the chords at the top edges of the side wall and end wall;

FIG. 7 is an end elevational view taken along the line 7—7 of FIG. 6;

FIG. 8 is a plan view, partially in section, of a wall corner construction in a gondola car using the corner connection of FIGS. 4 and 5;

FIG. 9 is a plan view, partially in section, of a wall corner construction employing the corner connection of FIGS. 6 and 7; and

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

So far as is practical, the same or similar parts or elements which appear in the different drawings shall be identified by the same numbers.

With reference to FIG. 1, gondola car 10 has a flat bottom 11, vertical side walls 12 and 13 and an end wall 14, it being understood that the end of the car not shown has a similar end wall construction. Braces 15 support the side walls and braces 16 support the end walls.

Side wall 13 has a horizontal metal hollow tubular chord 17 positioned along but outside its top edge, and side wall 12 has a similar chord 18 along but outside its top edge. End wall 14 also has a horizontal tubular metal chord 19 along but outside its top edge. Walls 12, 13 and 14 are made of metal plate of about three-sixteenths to three-eighths inch in thickness for normal car usage. End wall 14, as shown in FIG. 1, has horizontal corrugations to provide stiffening and added strength so that impact which develops by shifting of loads in the car can be adequately resisted. The corrugations however terminate prior to the wall corner so that a smooth curved or arced connection of the wall can be made.

The two wall corner constructions 20 shown in the end of the gondola car of FIG. 1 are identical. As shown in FIGS. 1 to 3, each wall corner construction 20 has a tubular corner connection member 21 which has a shape in plan view of a quarter circle tubular ring with short straight end portions. Outer curved vertical wall 22 of the corner connection 21 is the same height as inner curved vertical wall 23. Top 25 and bottom 24 of the corner connection member 21 are of the same width and are slightly wider in dimension than the height of the walls 22 and 23 thereby defining a tubular

connection member which is slightly rectangular in shape rather than square. Chords 17 and 19 have external dimensions essentially corresponding to the external dimensions of corner connection 21. The end of cord 19 is joined by butt weld 26 to one end of corner connection 21 and the end of chord 17 is joined by butt weld 27 to the other end of the corner connection. As a result, the inner vertical face of the corner connection 21 joins each of the chords in essentially the same plane as the inner vertical faces of the chords. Side wall 13 is welded to the inner vertical face of chord 17 and end wall 14 is welded at its top edge to chord member 19. Curved plate 28 is welded at its top edge to corner connection 21 and at its vertical edges to walls 13 and 14 by welds 29 and 30. The thickness of curved plate 28 may be the same as walls 13 and 14 to thereby provide a smooth wall corner surface; however, they need not be the same thickness. The bottom of the wall corner construction can be joined to floor 11 by any suitable means and such construction is not considered an integral part of the subject invention since this invention is directed primarily to improvements in the upper wall corner construction of gondola cars, and hopper cars.

The wall corner construction described with respect to FIGS. 1 to 3 is very strong and is capable of withstanding much larger forces than the prior art wall corner construction in which the chords 17 and 19 are simply butt welded together.

FIGS. 4, 5 and 8 illustrate another embodiment of a corner connection and wall corner construction for a gondola car. Corner connection 40 is a tubular member having the general shape of a quarter circle rectangular ring with the ends extending straight for a short distance. Corner connection 40 has a top 41 and a bottom 42 of the same size, and an outer curved vertical wall 43 and an inner curved vertical wall 44 each of the same height. The top 41 and bottom 42 are somewhat wider than the height of walls 43 and 44 so that the corner connection 40 is rectangular in cross-section. Inner curved vertical wall 44 is considerably thicker than top 41, bottom 42 and outer curved wall 43. Wall 44 is of a thickness advisably about equal to the thickness of the vertical inner walls of chord 17 or 19 as shown in FIG. 1 plus the thickness of the metal plate used in the side wall 13 or end wall 14. The ends of chords 17 and 19 are placed in abutting relationship with the ends of corner connection 40 and are butt welded thereto. The ends of corner connection 40 are bevelled to facilitate making the necessary butt welds.

FIG. 8 illustrates the joint between an end of chord 19 and corner connection 40 and it should be understood that a similar joint is made between the other end of the corner connection and chord 17. End wall 14 is welded to chord 19. Curved corner plate 45 is then welded in face-to-face contact with the inner curved vertical wall 44 of corner connection 40 and lap welded over the end of end wall 14. By having inner wall 44 of corner connection 40 project inwardly equal to the thickness of the metal plate used for side wall 13 and end wall 14, the curved corner plate 45 can be welded securely in position in nesting contact with the corner connection, the side wall and the end wall, it being understood that a similar joint arrangement joins side wall 13 and chord 17 to corner connection 40 and corner plate 45.

FIGS. 6, 7, 9 and 10 illustrate another embodiment of the invention. Corner connection 50 is very similar to corner connection 40. However, corner connection 50 has a stub 51 at each end thereof which telescopes into the ends of chords 17 and 19 before the corner connection and chords are welded together. The stub ends 51 have an external size and shape which correspond to the internal size and shape of the tubular chords so that a snug telescoping fit is achieved. Only the stubs project into the chord ends. Further penetration is stopped by the enlarged body portion of the corner connection with the bevelled edges which are provided to aid in making the welds. Inner vertical wall 52 of corner connection 50 projects inwardly from the outer vertical surface of stub 51 a distance equal to the thickness of the wall of chord 17 and the thickness of the metal plate constituting side wall 13. The result is that the inner vertical wall 52 of the corner connection lines up at its end in alignment with the inner surface of side wall 13 to provide a more or less continuous backing for curved corner plate 53 which is welded to corner connection 50 and lap welded over the ends of the plate forming side wall 13. It should be understood that a similar joint construction unites corner connection 50 to end wall chord 19 and end wall 14.

Although the invention has been described with specific reference to use in a gondola car, it is equally useful in railroad hopper cars since the upper wall and wall corner construction of such cars is similar.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, as modifications will be obvious to those skilled in the art.

What is claimed is:

1. In a railroad gondola or hopper car having metal end walls and metal side walls of metal plate, the improvement comprising:

horizontal tubular metal top chords at the outside top edges of the end walls and side walls;

a hollow tubular corner connection, having a quarter circle ring section, at each of the four corners of the car, with one end portion of each connection joined to the end of a side wall tubular chord and the other end portion of the connection joined to the end of an end wall tubular chord;

the inner vertical face of the corner connection joining each of the chords in essentially the same plane as the inner vertical faces of the chords;

said corner connection between the ends of the chords joined thereto being at least as large externally in lateral section as the chord ends; and said chords and corner connection being rectangular in lateral cross-section.

2. In a railroad gondola or hopper car having metal end walls and metal side walls of metal plate, the improvement comprising:

horizontal tubular metal top chords at the outside top edges of the end walls and side walls;

a hollow tubular corner connection, having a quarter circle ring section, at each of the four corners of the car, with one end portion of each connection joined to the end of a side wall tubular chord and the other end portion of the connection joined to the end of an end wall tubular chord;

the inner vertical face of the corner connection being spaced inwardly from each of the chord ends a dis-

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tance substantially equal to the thickness of the metal side wall and end wall plates;
a curved corner plate contacting and joined to the corner connection inner face and overlapping and lap welded to the side wall and end wall plates;
said corner connection between the ends of the

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chords joined thereto being at least as large externally in lateral section as the chord ends; and said chords and corner connection being rectangular in lateral cross-section.

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