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HOUSE CAR END CONSTRUCTION

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The present invention relates to improvements in house car end construction and more particularly to an end construction for automobile freight cars which have substantially large swinging doors.

In a freight car construction in which the end doors open to substantially the width and height of the freight car it is desired that the end frame and door casing construction be sufficiently strong to withstand heavy stresses and to prevent side racking and it has, therefore, heretofore been proposed that an inverted U-shaped Z-bar member be utilized to form the door casing by being secured to the customary corner posts and to the lower edge of the end plate. In such construction the end sill and the end plate are of relatively deep formation in order to form wide securing portions for their connection to the corner posts. The Z-bar member by having its outer flange secured to the corner posts and end plate provides an inwardly directed L-shaped portion which extends along the top and sides of the door opening to form the door casing. The upper corners of the door casing are preferably rounded to more uniformly distribute the stresses. The construction is shown in the application of Goodwin, Serial No. 184,288, filed April 16, 1927. Such a construction has manifold advantages but it has been found that similar advantages will be present together with additional features of improvement in a somewhat modified form of construction which will substantially maintain the rigidity of the former construction.

It is, therefore, proposed in the present invention to utilize the former end frame construction consisting of a relatively deep end sill and end plate together with the corner posts, but to form the door casing by separate side strips which are secured to the corner posts and to the end plate and to form the lower edge of the end plate in such a manner that it will correspond to the contour of the side strips and thus form the substantially continuous L-shaped door casing.

A disadvantage of the former continuous inverted U-Z-bar member consists in its relatively large size, since it is usually 10' × 9', and it is, therefore, unhandy to transport or to assemble without deformation. By forming a door casing from separate side strips, the construction is made more simple and the parts are not so liable to deformation.

Furthermore, it should be noted that in the former construction the outer flange of the U-shaped member, where it is secured to the lower edge of the end plate, is exposed to the elements and subject to corrosion, whereas, by forming the upper side of the door casing by the lower edge of the end plate itself, there is no such opportunity for corrosion.

In the previous construction described there was provided means for weathering the vertical sides comprising the meeting edges between the swinging doors and the door casing but no such provision was made for the top edges or the upper curved corners.

It is, therefore, an object of this invention to construct the end frame and door casing in a form which is relatively easy to manufacture and assemble and which will be substantially rigid and will not provide so great an opportunity for corrosion.

It is further an object of the present invention to provide means for weathering the meeting edges between the upper ends of the doors and the end plate which weathering means is designed to baffle the elements, such as rain or dust, which may be driven in by the wind and to provide drainage means which will cause such collected matter to remain outside of the car.

It is further a purpose of the present invention to provide such construction for the end of a car of the type mentioned that neither direct light nor reflected light will pass inside of the car when the doors are in closed position.

Further objects and advantages will be more readily apparent as the invention is more fully described in connection with the attached drawings in which—

Figure 1 is a view in end elevation of a house car embodying the principles of the present invention.

Figure 2 is a sectional view taken on the plane indicated by 2—2 in Figure 1.

Figure 3 is a detail sectional view taken...
along the plane indicated by 3—3 in Figure 1 and illustrating one form of weathering means.

Figure 4 is a view somewhat similar to Figure 1 on a larger scale, parts being broken away and other parts removed for clarity.

Figures 5 and 6 are detail sectional views similar to Figure 3 illustrating modified forms of construction.

Figure 7 is a detail sectional view illustrating a further modification. Figure 8 is a detail section which illustrates a preferred form of weathering means.

Figure 9 is a vertical elevation on a large scale of a portion of Figure 1 illustrating the construction at the center of the end plate.

First having reference to Figure 1, 11 is the end sill of the freight car to which are connected the corner posts 12—12. The corner posts 12—12 are secured at their upper ends to the end plate 13. It will be noted that the end plate 13 is formed with curved corners adjacent to its connection with the corner posts. The end sills, corner posts and end plate form a substantially rigid frame but the construction is strengthened by the door casing. Thus there are provided side strips 14—14 which may have a Z-shaped section, as shown in Figure 2 and may be integral members or built up from angle bars. The outer flanges 15 of the end strips 14 are riveted to the vertical corner posts, as indicated by the rivets 16 in Figure 4. At their upper ends, the side strips 14—14 are secured to the end plate 13 by the rivets 17 and it will be noted that the upper ends of the side strips 14 are preferably curved, as indicated at 18 in Figure 4, to correspond with the curvature of the end plate. The inner flanges 19 of the side strips 14 continue up the sides of the corner posts and around the curved portions 18 to meet a corresponding flange 20 of the end plate. Thus the end plate may have a section, such as shown in Figure 3, in which there is a horizontal portion 21 inwardly extending from the vertical portion 22 to the depending flange 20. Thus the corresponding contour of the side strips 14 and the end plate 13 form the door casing and provide a substantially inverted U-shaped door opening.

As shown in Figure 4, the side strips 14 are formed with portions 23 of the outer flange 15 which overlap the vertical portion 22 of the end plate 13 and are riveted thereto. It is apparent that if this outer flange 15 is carried across the entire lower edge of the end plate, it will be subject to corrosion but by forming the middle portion of the door casing integrally with the end plate, the opportunity for corrosion is reduced. However, in some instances, it may be desirable to form the end plate by a built up construction in which an angle bar is secured to the inner side of the end plate. Such construction is shown in the sectional views in Figures 5 to 8. The form of construction of the frame and door casing disclosed will be sufficiently rigid to prevent side racking.

The door opening so formed is closed by the swinging doors 24—24 shown in Figure 1, mounted by the hinges 25—25 which include plates 26 riveted to the corner posts 12—12 by the rivets 16 which secure the side strips 14 to the corner posts. Additional rivets 27 may be utilized to secure the hinge plates 26 to the corner posts 12. The hinges also include the plates 28 which are riveted to the doors 24 by the rivets 29. The doors may comprise any suitable construction and a locking bar 30 may be utilized cooperating with the locking plate 31 to hold the doors in closed position. The vertical meeting edges of the doors may be provided with any suitable sealing means which is not important insofar as the present invention is concerned. At the side edges of the doors 24—24 adjacent to the hinges 25 may be fastened vertical channel-bars 32 which include a flange 33 overlapping the outwardly swedged edges of the flanges 19 of the side strips 14 when the doors are in closed position in order to provide weathering means. It is obvious that such form of means can only extend upward to where the curve portion 18 of the door casing begins.

In the present invention means are also provided for weathering the top edges and the curved corners of the doors. In Figure 3 it will be noted that the top edge of a door 24 is provided with a channel-shaped member 34 which strengthens the edge of the door and has a rearward flange 35 which presses against the depending flange 20 of the end plate 13. But it is apparent that it is very difficult to obtain a tight fit between these flanges, and since the doors are not driven in, sufficient clearance must be allowed to the doors to become readily opened and closed, some means must be utilized to prevent the rain from being driven in by the wind and thereby injuring the contents of the car. Baffles have formerly been used secured to the outside of the end plate but these, as is obvious, cannot extend below the top edge of a door and therefore do not protect the car against the rain which may be swirled under the edge of the baffle by the wind. Thus it is the purpose of the present invention to provide cooperating members mounted on both the end plate and the doors that will protect the interior of the car against the intrusion of the elements. It is not practical to provide cooperating portions which have a tight fit when in closed position. Instead, in the present invention the rain is first baffled into a collecting trough which is not under the influence of the wind, then the collected water may either be drained through openings in the collecting
trough or pass to the sides of the door casing where it is removed. In general the door is provided with a channel-shaped portion which overlaps a flange or baffle of the door casing when the door is closed. Thus a contacting fit is not required.

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We, therefore, show in Figure 3, an angle bar 36 which has its inner flange 37 riveted to the end plate by the rivets 38 and the outer flange 39 slightly downwardly inclined to serve as a baffle. To the door there may be secured, as shown in Figure 3, a bar 40 which has its lower flange 41 held by rivets 42 to the door. The upstanding portion is channel-shaped and includes an inwardly inclined portion 43 which overlaps the lower edge of the baffle 36 when the doors are in closed position.

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It will be noted that the horizontal portion 44 of the bar 40 is lowered beneath the top of the door to form a trough to collect the water and drainage openings 45 may be formed in said horizontal flange to discharge the collected rain. Thus it will be apparent from the construction shown in Figures 3 and 8 that the rail will be directed by the baffle 36 into the troughs formed by the bars 40 which are secured to the doors and will be discharged through the drain openings 45 without being driven inward of the car.

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The construction just described is a preferred construction, but it is apparent that many modifications may be made to attain the same results. Thus we show in Figure 5 a modified form in which a member 46 is secured to the end plate and corresponds to the baffle 36 previously described and includes an upwardly extending flange 47 in order to form a collecting trough. The cooperating members which are secured to the doors 44 may take a form such as that shown in section in Figure 5 and are there designated as 48 and include a channel shaped portion 49 at their upper sides which overlap the trough formed by the member 46. The collected water will be directed by the trough 46 to the sides.

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As previously stated, instead of forming the end plate with an integral portion conforming to the side strips 14—14, as shown in Figure 3, a built-up construction may be utilized in which a separate Z-bar 60 is secured to the inner side of the end plate 13 at its lower edge by rivets 61, as shown in Figure 5, or by the rivets 38 which secure the baffle bars to the forward side of the end plate, as shown in Figure 8. In both cases the Z-bar 60 includes a downwardly extending flange 62 corresponding to the former integral flange 30 of the end plate 13.

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In Figure 7 there is shown a baffling trough 50 secured to the end plate and an overlapping collecting trough 51 secured to the door 24. In this construction the upper edges of the members 51 overlap the trough 50 similar to the manner shown in Figure 5, but it should be noted that both the members 50 and 51 are provided with drain openings 52—53 which permit the collected water to be removed without entering within the car.

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The constructions thus far described have been secured to the outside of the end plate and of the door members, but in Figure 6 we show a further modified form in which the inner side of the door is provided with a cut-out portion 54 which cooperates, when in closed position, with the angle bar 55 secured to the inner depending flange of the end plate, or, as shown, with the flange 62 of the attached Z-bar. The angle bar 55 includes an outwardly and upwardly curved lip 56 which forms a collecting trough. The water collected by this trough may be directed toward the sides of the doors and fall through the vertical opening 57 shown in Figure 2 and thus be maintained outside of the weathering means disclosed by the cooperating flanges 19 and 33.

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The weathering means described may be carried down around the curved corners 18 of the door casing to the points where the vertical weathering means end and therefore entirely protect all the sides of the door casing. It should also be noted that none of the forms disclosed will allow reflected light to pass within the car.

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It is understood that various other modifications of the present invention will occur to those skilled in the art and it is intended all such modifications as come within the spirit of this invention as expressed in the appended claims.

We claim:

1. House car end construction comprising a frame formed by an end sill, corner posts and an end plate secured together and side strips joined to said corner posts and end plate defining together with said end plate a door-receiving opening.

2. House car end construction comprising a frame formed by an end sill, corner posts and an end plate secured together and side strips joined to said corner posts and end plate, said side strips and said end plate having cooperating portions forming a continuous flange substantially in a vertical plane and defining a door-receiving opening.

3. House car end construction comprising a frame formed by an end sill, corner posts and an end plate secured together and side strips joined to said corner posts and end plate, said side strips and said end plate having portions forming a continuous flange substantially in a vertical plane and defining a door-receiving opening, said side strips including inwardly extending L-shaped portions and said end plate having a section on its lower edge conforming to said side strips.

4. House car end construction comprising a frame formed by an end sill, corner posts...
and an end plate secured together, side strips joined to said corner posts and said side strips and said end plate having portions forming a continuous flange substantially in a vertical plane, said side strips and end plate having cooperating portions forming curved upper corners and defining a door-receiving opening.

5. House car end construction comprising a frame formed by an end sill, corner posts and an end plate secured together and side strips joined to said corner posts and to said end plate, said side strips having overlapping portions connected to said end plate.

6. House car end construction comprising a frame formed by an end sill, corner posts and an end plate secured together and side strips comprising Z-bars secured to said corner posts and having curved upper corners and horizontal portions secured to said end plate, said end plate having a conformation on its lower edge conforming to said Z-bars.

7. House car end construction comprising an end sill, corner posts and an end plate forming a frame and vertical members secured to said corner posts and to said end plate, said vertical members and end plate including flanges directed inwardly and transversely of the car to define a door-receiving opening.

8. House car end construction comprising an end sill, corner posts and an end plate forming a frame, vertical members secured to said corner posts substantially co-extensive therewith and to said end plate, said vertical members and end plate including flanges directed inwardly and transversely of the car to define a door-receiving opening and swinging doors fitting within said door-receiving opening and hinged to the sides thereof.

9. House car end construction comprising an end sill, corner posts and an end plate forming a frame, vertical members secured to said corner posts and to said end plate, said vertical members and end plate forming an inwardly flanged door-receiving opening, the connection between said vertical members and end plate comprising cooperating curved portions.

10. House car end construction comprising a frame formed by an end sill, corner posts and end plate secured together and defining a door receiving opening, swinging doors mounted on the sides of said opening and an angle member secured to the outside of said end plate, said member including an outwardly directed flange portion and cooperating members secured to the upper edges of said doors having inwardly directed channel portions adapted to overlap the flange portions of said angle bars when the doors are in closed position, said members secured to said doors including a horizontal portion having drainage openings therein.

11. House car end construction comprising a door casing having a curved upper corner, a door hinged to the side of said door casing and having a curved corner between its hinged side and its upper edge fitting said door casing, said door including an inwardly directed channel-shaped portion extending across its upper edge and around said curved corner and said door casing including an outwardly directed flange extending across its upper edge and around its curved corner adapted to be received within said channel-shaped portion when said door is in closed position and forming a weathering protection for the interior of the car.

12. House car end construction comprising a door casing, a door hinged to the side of said door casing, said door including an inwardly directed channel-shaped portion formed on the outer side of its upper edge, said channel-shaped portion being spaced slightly below the upper edge of said door to form a trough and said door casing including an outwardly directed flange adapted to be received within said channel-shaped portion when said door is in closed position for forming a weathering protection for the interior of the car.

13. House car end construction including a door casing, and a door hinged to the side of said door casing, said door casing including a flange on its vertical side having an outwardly swaged edge and an outwardly directed flange extending across the upper edge of said door casing, said door including a vertical member on its hinged side adapted to inwardly overlap said swaged edge of the vertical flange portion of said casing when said door is in closed position and said door including a channel-shaped portion extending across its upper edge adapted to overlap said outwardly directed flange portion of the upper edge of said door casing when said door is in closed position, the cooperating portions between said door casing and said door forming a weathering protection for the interior of the car when said door is in closed position.

14. Car door construction comprising a door casing, a door fitting within said door casing, an outwardly directed flange carried by the upper portion of said door casing, a channel member carried by said door adapted to overlap said flange when said door is in position forming a weathering protection and means for draining fluid collecting in said channel member and permitting the escape of such collected fluid outside of said door.

15. A car door construction comprising a door casing including a substantially L-shaped section on the sides and top of the door casing with a substantially continuous inwardly extending flange, a door fitting within the L-shaped door casing and adapted to seat against the inwardly directed flange thereof, an outwardly directed flange carried
by the upper portion of said door casing, a channel member carried by said door adapted to overlap said flange when said door is in closed position forming a weathering protection and means for draining fluid collecting in said channel and permitting the escape of such collected fluid outside of said door.

16. House car end construction comprising a door casing forming a door-receiving opening, said door-receiving opening having vertical sides, a horizontal top portion and curved upper corners connecting the top portion and vertically secured to the sides of said door casing, vertical members carried by the doors terminating adjacent the curved upper corners thereof and adapted to come into sealing engagement with the vertical sides of said door casing when said door is in closed position and weathering means for the upper portions of the doors and the curved corners thereof comprising an outwardly directed flange carried by said door casing extending along the top portion thereof and around the curved corners and channel members carried by said doors adapted to overlap said flange when said doors are in closed position.

17. House car end construction comprising an end sill, corner posts and an end plate secured together forming a frame, said end plate forming curved corners at the connections with said corner posts, a pair of Z-bar members, vertical portions of which are secured to said corner posts, curved portions of which are attached to the curved portions of said end plate and horizontal portions of which overlap and are secured to horizontal portions of said end plate and said end plate including a horizontal depending flange forming a continuation of the inwardly extending flange of the Z-bar member defining the door-receiving opening.

18. House car end construction comprising a door receiving opening, a door fitting within said opening and means provided adjacent the top of said door for collecting fluid which leaks past the top edge of said door and directing said fluid outwardly of the door thereby preventing said fluid from reaching the interior of the car.

19. House car end construction comprising an end plate member defining the top of a door receiving opening, a door member fitting within said opening, a channel shaped member on one of said members adapted to overlap a flanged edge of the other of said members, said channel shaped member being adapted to collect fluid therein and means for discharging said collected fluid outwardly of the door.

20. House car end construction comprising an end plate defining the top of a door receiving opening, a door fitting within said opening, a channel shaped member on said door facing interiorly of said door and adapted to overlap a flanged edge of said end plate whereby said channel shaped member is adapted to collect fluid therein and means for discharging said collected fluid outwardly of said door.

21. House car end construction comprising an end plate member defining the top edge of a door receiving opening, a door member fitting within said opening, a channel shaped member secured to one of said members and facing interiorly of the car adapted to overlap a flanged edge of the other of said members and means for discharging fluid collected within said channel member outwardly of said door.

22. House car end construction comprising an end sill, corner posts and an end plate secured together forming a door receiving opening, a door hinged to one of said corner posts, a channel shaped member secured to the vertical hinged side of said door adapted to serve as a weathering protection, means adjacent the top of said door adapted to cooperate with said end plate for collecting fluid and means for discharging said collected fluid outwardly of said door.

23. House car end construction comprising a door casing, a door hinged to said door casing and channel means adjacent the top edge of said door and on the inner side thereof when said door is in closed position adapted to collect fluid which may leak past the top edge of said door and tending to direct said collected fluid outwardly of the door thereby preventing said fluid from reaching the interior of the car.

24. House car end construction comprising a door casing, a door hinged to said door casing and channel-shaped fluid collecting means adjacent the top edge of said door and on the inner side thereof when said door is in closed position, said means being adapted to collect fluid which may leak past the top edge of said door and said means being open at its ends adjacent the vertical edges of said door whereby said collected fluid is discharged from said means outwardly of the door thereby preventing said fluid from reaching the interior of the car.

25. House car end construction comprising a door casing, a door hinged to said door casing, a pair of cooperating weathering members respectively secured to the vertical hinged side of said door and to said door casing and adapted to form a seal when said door is in closed position and a channel shaped weathering member adjacent the top edge of said door on the inner side thereof when said door is in closed position, said member being adapted to collect fluid which may leak past the top edge of said door and to direct said collected fluid laterally to the exterior of the seal provided for the vertical hinged side of said door whereby said collected fluid
is prevented from reaching the interior of the car.
26. House car end construction comprising a door casing including an end plate at the upper portion thereof, a door hinged to said door casing, said end plate including a channel-shaped fluid collecting portion adapted to be overlapped by the top edge of said door when said door is in closed position, said channel-shaped portion being adapted to collect fluid which may leak past the upper edge of said door and to direct said collected fluid outwardly of said door thereby preventing said fluid from reaching the interior of the car.
Signed at Chicago, Illinois, this 8th day of April, 1929.
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