March 22, 1932. M. H. MARTIN 1,850,283

CAR END STRUCTURE

Filed Dec. 29, 1928 2 Sheets-Sheet 1

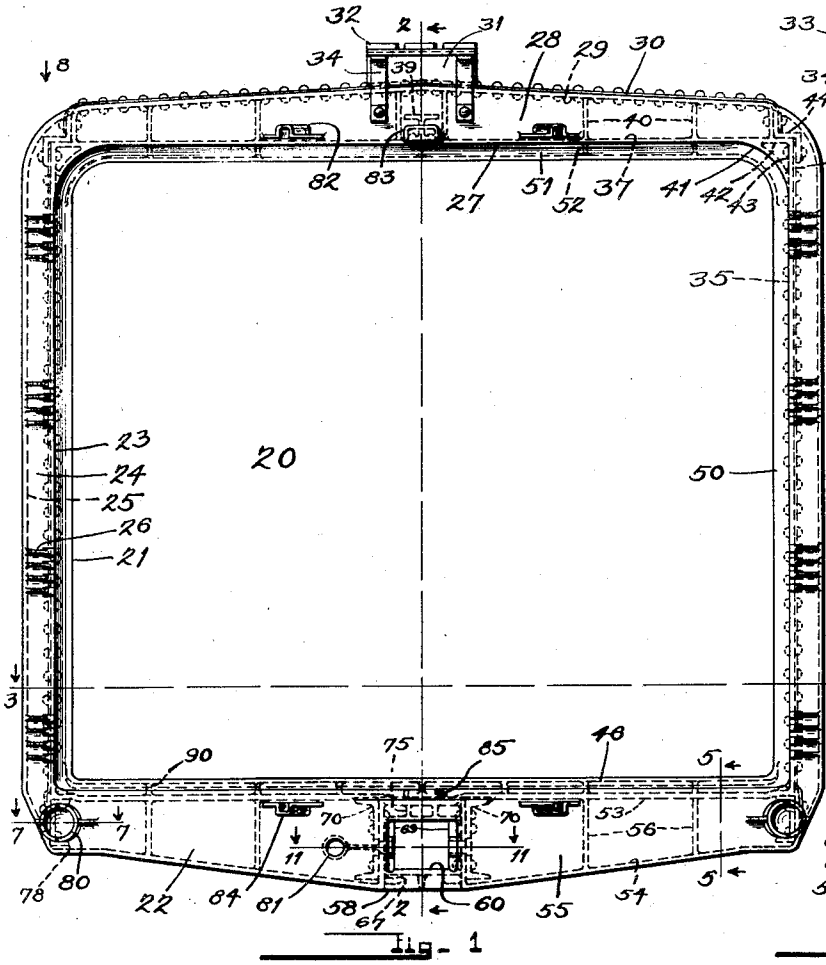


Fig. 1

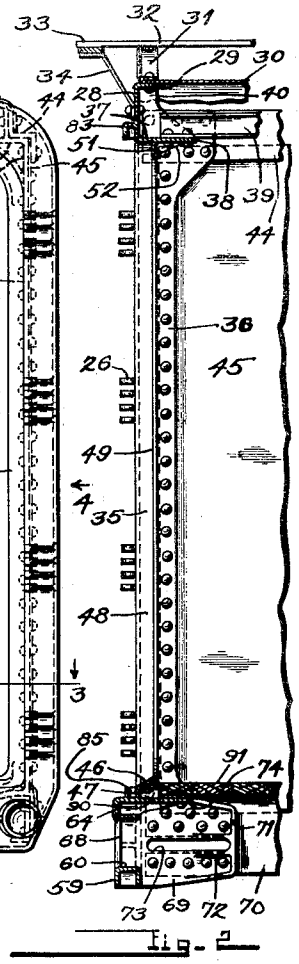


Fig. 2

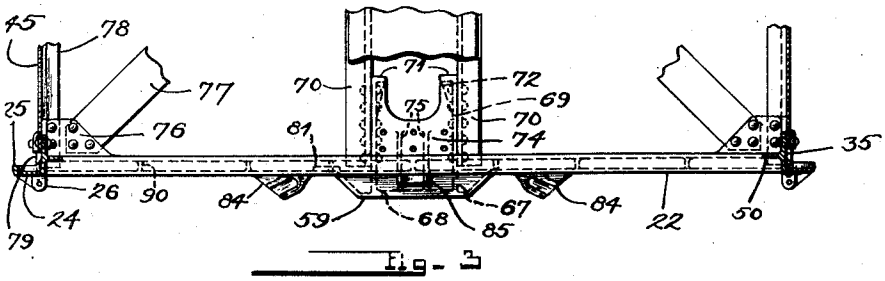


Fig. 3

Inventor
Mark H. Martin

By John W. Darley
Attorney

March 22, 1932. M. H. MARTIN 1,850,283

CAR END STRUCTURE

Filed Dec. 29, 1928 2 Sheets-Sheet 2

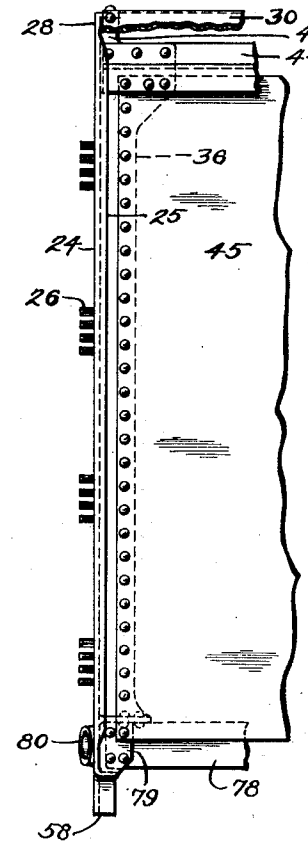


Fig. 4

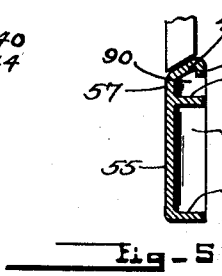


Fig. 5

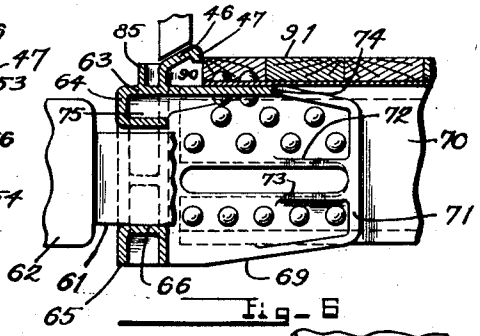


Fig. 6

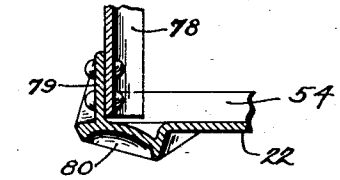


Fig. 7

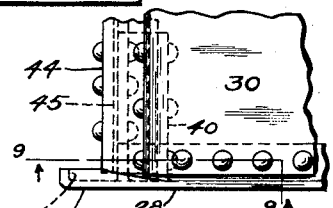


Fig. 8

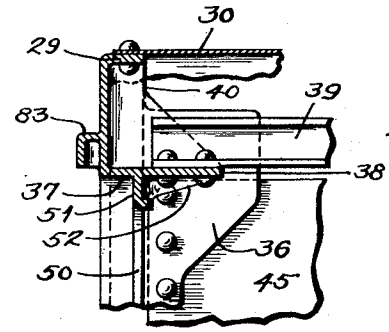


Fig. 10

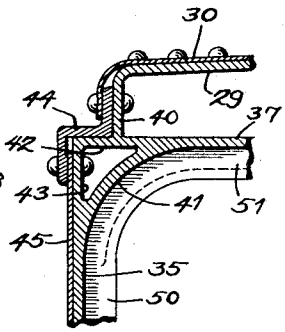


Fig. 9

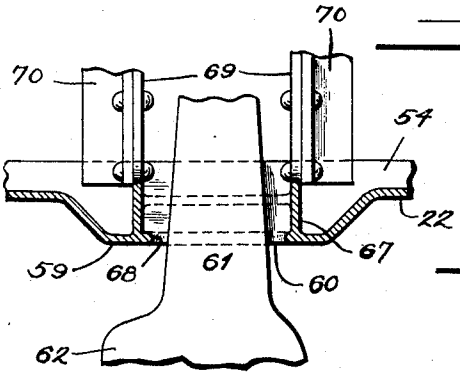


Fig. 11

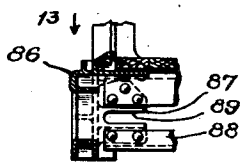


Fig. 12

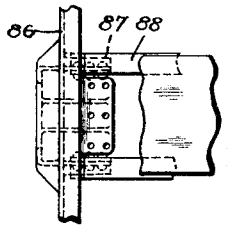


Fig. 13

Inventor
Mark H. Martin

By

John W. Darley
Attorney

Patented Mar. 22, 1932 1,850,283

UNITED STATES PATENT OFFICE

MARK H. MARTIN, OF READING, PENNSYLVANIA, ASSIGNOR TO BIRDSBORO STEEL FOUNDRY AND MACHINE COMPANY, OF BIRDSBORO, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA

CAR END STRUCTURE

Application filed December 29, 1928. Serial No. 329,100.

My invention relates to car end structure.

The principal object of my invention is to devise a car end structure for attachment to railway cars which shall materially strengthen this portion of the car construction, provide an effective and rigid tie for and between the ends of the upper and under framing and simplify the work of assembling, through a reduction in the number of necessary, separate parts.

A further object is to devise an end structure for cars having end doors which shall include a door framing arranged to act as the structural basis for the end of the car, and to substantially immobilize the margin of the door opening, preventing the transmission of racking strains to the doors.

A further object is the devising of a structure of the character described in the form of a one piece casting which shall comprise integral features heretofore found as individual parts and particularly, the major elements known as the end framing and end sill.

A further object is the incorporation in a car end structure as above noted of integral facilities for performing the customary functions of the coupler striking plate, carry iron, and the front draft castings, and means for direct attachment to the framing of the car, including the roof and side sheets.

A further object is the production of a unitary car end structure of the character described which shall afford a strong, unyielding construction around the door opening and in localities which receive the buffing loads of the coupler, and which is susceptible of ready adaptation for use with the types of draft gears now employed.

My improved end structure is more particularly intended for application to railway cars utilized for the shipment of assembled automobiles, large machine units, and other bulky objects. The loading and unloading of objects of this kind is greatly facilitated by their handling through openings in the ends of the car, which are ordinarily closed by double doors. Owing to the size of the openings, which approximate the height and width of the car interior and the necessity for employing relatively heavy doors, it is important to provide a structure which shall maintain the integrity of the door opening against the hazards of service operation and which shall also serve as an adequate support for the doors, preventing sagging and insuring their serviceable fit at all times.

An arrangement of the foregoing character forms one phase of the subject matter of the present application, but in order to further strengthen and rigidify the end of the car, it is contemplated to associate with the door frame, in the form of a one piece casting, a portion for performing the same functions as the ordinary end sill and allied features thereof. There will thus be provided a unitary structure whose elements mutually assist each other in more effectively protecting the entire end of the car against the buffing and surging stresses encountered in train operation and other operating strains. Provision is made for direct attachment of the improved end structure to the car under framing, including the draft and side sills, and the diagonal bracing therebetween, and the upper framing of the car, including the side plates, roof and side sheets, thereby more securely tying together the basic structural elements of the car and accomplishing this result with a fewer number of parts than is now common practice.

Other features comprise a special form of construction for supporting the car flooring and protecting the same against damage and wear during loading and unloading. The sill portion of the casting is secured directly to the draft sills and includes integral front draft stops for receiving the tension load of the draft gear, and is also secured directly to the side sills through the medium of flanges formed on the ends of the end sill portion.

These and further objects of my invention will be set forth in the following specification, reference being had to the accompanying drawings, and the novel means by which said objects are effectuated will be definitely pointed out in the claims.

In the drawings:

Fig. 1 is an elevation of my improved end structure, showing the same in position on a

railway car, but with the doors, coupler and trucks omitted.

Figs. 2 and 3 are sections along the lines 2—2 and 3—3, respectively, in Fig. 1, looking in the direction of the arrows.

Fig. 4 is a side elevation of the structure, looking in the direction of the arrow 4 in Fig. 1.

Fig. 5 is a section along the line 5—5 in Fig. 1, looking in the direction of the arrows.

Fig. 6 is an enlarged view of the lower portion of Fig. 2, the coupler being included in this view.

Fig. 7 is a section through the push hole pocket along the line 7—7 in Fig. 1, looking in the direction of the arrows.

Fig. 8 is a plan view of the upper left hand portion of the structure, as view in the direction of the arrow 8 in Fig. 1.

Fig. 9 is a section along the line 9—9 in Fig. 8, looking in the direction of the arrows.

Fig. 10 is an enlarged view of the upper portion of Fig. 2, the running board and allied features being omitted.

Fig. 11 is an enlarged section along the line 11—11 in Fig. 1, looking in the direction of the arrows.

Fig. 12 is a view similar to Fig. 6 and the lower portion of Fig. 2, showing one form of a modification of my improved structure when used in connection with a draft gear employing a horizontal yoke.

Fig. 13 is a plan view of the modification shown in Fig. 12, looking in the direction of the arrow 13.

The numeral 20 represents my improved structure generally which comprises in a single casting an end frame 21 and an end sill 22. The frame 21 includes a pair of legs 23—23 which extend upwardly from the ends of the sill 22 and each leg comprises a marginal plate portion 24 which is flanged on its outer edge, as at 25, for stiffening and on which is formed the hinge lugs 26. The legs 23 are connected at the top by a cross member 27 which includes a marginal plate portion 28 and said portion is flanged inwardly as at 29 for attachment thereto of the roof sheets 30. Preferably, the upper edge of the portion 28 slopes downwardly according to an approved angle from the ridge line of the roof.

The flange 29 also provides a means for supporting and attaching a saddle 31 which supports one end of a running board 32, the extension 33 thereof being supported by one end of a bracket 34, the other end of which is riveted to the portion 28.

A continuous integral flange 35 extends inwardly from the inner edges of the portions 24 and 28, to form the vertical flanges 36—36 and the upper, horizontal flange 37. The flange 37 is increased in depth at the central portion thereof, as at 38, for the purpose of supporting one end of a loading rail 39, and a plurality of stiffening ribs 40 may be located in appropriate positions between the flanges 29 and 38.

The junctions of the upper ends of the flanges 36 with the flange 37 are preferably curved as at 41 to fit the customary type of doors employed, but an auxiliary extension 42 is provided on each end of the flange 37, which connects with a similar extension 43 forming a continuation of the upper ends of the flanges 36. There is thus formed a square corner at the upper ends of the legs 23 and one end of a side plate 44, which is a Z-bar in section, as shown clearly in Fig. 9, is secured thereto. The web portion of said bar rests on the extension 42 and the upper, vertical flange is secured to the outermost rib 40 and the end of the roof sheet 30 is bent down and over said flange and riveted thereto. The lower vertical flange of the plate 44 extends downwardly along the extension 43, but is spaced slightly therefrom to permit the securing therebetween of the upper corner of the side sheet 45. The vertical edge of said sheet is secured to the flange 36 along the length thereof, as shown in Figs. 2 and 4.

The lower portion of the continuous flange 35 projects from the end sill 22 to form a beveled portion 46 which slopes downwardly and outwardly from the interior of the car to constitute a threshold. The inner edge of the threshold is preferably disposed above the adjacent plank of the flooring 91 for protective purposes and may be flanged downwardly as at 47 for strength. As an additional factor to this end, a plurality of stiffening ribs 90 may be positioned between the under side of the threshold and the upper side of the end sill 22.

The continuous flange 35, which includes the vertical flanges 36, the upper horizontal flange 37 and the beveled threshold 46, defines a door opening 48 and in order to provide a seat for the doors, which in the arrangement shown will be of the double variety, a flange 49 is further formed on the frame. This flange includes the vertical flanges 50 which project from the flanges 36 substantially normal thereto and a predetermined distance inwardly from the front of the end frame, and an upper, horizontal flange 51 which projects downwardly from the flange 37 and in alignment with the flanges 50. Stiffening ribs 52 may be provided on the rear side of the flange 51.

As already indicated, the lower portion of my improved car end structure constitutes an end sill 22 which, in the preferred form shown, is intended for use with draft gears employing vertical yokes. The sill is formed as an integral casting with the end frame 21 and includes upper and lower flanges 53 and 54, respectively, which are joined by a connecting web 55. Strengthening ribs 56 may be disposed at appropriate intervals between said flanges and an extension 57 projects up-

wardly as a continuation of the web 55 to merge into the threshold 46, as shown in Fig. 5.

The depth of the web 55 is increased at the mid-portion of the sill as at 58 and extends forward from the vertical plane thereof to form a projection 59. A passage 60 extends through said projection for the reception of the drawbar 61 of the coupler 62. Above the opening 60, the projection 59 is generally channel-shaped in section, as shown in Fig. 6, with the upper limb 63 thereof being a continuation of the upper flange 53 and the vertical web 64 being flush with the upper, front side of said projection and serving as a striking plate for the horns of the coupler 62. Below the opening 60, the projection 59 is also generally channel-shaped in section with the front limb 65 thereof being substantially flush with the lower portion of said projection and the horizontal web 66 thereof serving as a carrier for the drawbar 61.

Extending inwardly from the web 55 on each vertical side of the passage 60 are flanges 67 and at their junction with said web, projections 68 extend toward each other along the vertical sides of said passage, as shown in Fig. 11, to limit the swinging movement of the coupler when the car is rounding curves and to strengthen this portion of the structure against the impact of the drawbar during such movement. The flanges 67 form cheek plates 69 which are secured to the draft sills 70 in any approved manner and are further flanged on the inner ends thereof as at 71, to form the front stops for the draft gear, which stops may be strengthened by ribs 72 extending inwardly along said plates. Accordingly, a tension pull on the coupler is transmitted directly through these stops to the draft sills without the necessity for employing other parts. A slot 73 is formed in each cheek plate 69 for the reception of the usual draft key and the depth of the upper flange 53 is increased as at 74 extending back and connecting with the flanges 71 to bridge the space between said cheek plates and to thereby further strengthen the structure in locations which receive the buffing load of the coupler. As an additional mode of strengthening this portion of the casting, ribs 75 may be appropriately disposed on the undersides of the portion 74 and limb 63 of the projection 59.

The flange 53 is further increased in depth at each end of the casting, as at 76, to facilitate attachment thereto of the diagonal braces 77 and also of the side sills 78. As a further means of securing the casting to the side sills, flanges 79 are provided at each end of the web 55 and appropriately attached to said sills. The flanges 79 also furnish a means of securing the lower corners of the side sheets 45.

Push pole pockets 80 are cast integral with the structure at each end of the sill 22 and a passage 81 is provided in the web 55 for the train pipe. Preferably, the usual upper keepers 82 and 83, and lower keepers 84 and 85, for cooperation with the standard forms of door locks are also cast integral with the frame, the precise shape thereof being determined by the character of door lock employed in any given instance. Accordingly, the keepers shown are to be construed as generic representatives of this type of accessories.

In the modification illustrated in Figs. 12 and 13, which shows only the sill portion of the structure, the latter, represented generally by the numeral 86 is designed for use with draft gears employing horizontal yokes. This modified form differs from that heretofore described only in the provision of a changed form of cheek plate 87 for attachment to the draft sills 88, an open ended slot 89 being provided in each plate to receive the front draft key. It is contemplated that other forms of cheek plates may be cast integral with the end sill for cooperation with other types of horizontal yoke attachments and the plates may even be eliminated without affecting the central thought involved.

It will be obvious from the foregoing description that my improved car end structure combines in a single casting features which have heretofore existed as separate units with the consequent necessity for their fitting and assemblage together in the building of a railway car. According to my arrangement, the required number of separate parts is not only lessened, but the unitary construction results in a more adequate tying up of the end structure of the car and a more effective resistance to the shocks applied thereto during operation. The casting is particularly strengthened in the region which is subjected to the buffing stresses of the coupler and provision is also made for an adequate seating and support of the doors in closed position, and for protecting the flooring at the door opening by a special form of threshold.

The end frame 21, which is shaped as a door frame, is by reason of its rigid, unitary structure completely free from warping or any tendency to a change of shape and effectually resists the transmission of racking strains to the doors. The door opening accordingly retains its correct contour and therefore permits a free swinging of the doors as originally fitted over a longer period of time than now obtains in the art. The casting of the hinge lugs and door lock keepers with the structure permits the fitting and securing of the doors and locks to the structure before application of the latter to the car, thereby considerably simplifying this phase of the assemblage and facilitating the handling of these doors which are relatively heavy.

While I have shown one set of elements and combinations thereof for effectuating my improved car end structure, it will be understood that the same are illustrated for purpose of disclosure only and in nowise to restrict the arrangement to the exact forms and shapes set forth, for it will be obvious that other variations in the latter may be adopted without departing from the spirit of my invention.

I claim:

1. A car end structure comprising an integral end frame having a marginal portion defining a door opening and attaching flanges for securement to the main structure of the car, including flanges attachable to the webs of the draft sills.

2. A car end structure comprising an integral end frame having a marginal portion defining a door opening, attaching flanges for securement to the main structure of the car, including flanges attachable to the webs of the draft sills, and integral hinge lugs for the carriage of the doors.

3. A car end structure comprising an integral end frame having a marginal portion defining a door opening and attaching flanges for securement to the main structure of the car and for directly receiving the roof sheets.

4. A car end structure comprising an integral end frame having a marginal portion defining a door opening and flat, attaching flanges projecting substantially lengthwise of the car for securement to the main structure of the car and for directly receiving the side sheets.

5. A car end structure comprising an integral end frame having a marginal portion defining a door opening and attaching flanges for securement to the main structure of the car and for directly receiving the roof and side sheets.

6. A car end structure comprising an integral end frame having a marginal portion defining a door opening, a continuous integral flange projecting inwardly from the inner edges of said opening, and a second, integral flange projecting from said first named flange to form therewith a seat for receiving a door.

7. A car end structure comprising an integral end frame having a marginal portion defining a door opening, a continuous integral flange projecting inwardly from the inner edges of said opening, and a second, integral flange projecting from said first named flange to form therewith a seat for receiving a door, and strengthening ribs on the rear side of said second named flange connecting with said first named flange.

8. A car end structure comprising an integral end frame having a marginal portion defining a door opening, a continuous integral flange projecting inwardly from the inner edges of said opening and including a threshold portion, and a second integral flange projecting from said first named flange to form therewith a seat for receiving a door, said threshold portion being inclined outwardly and downwardly.

9. A car end structure comprising an integral end frame having a marginal portion defining a door opening, a continuous integral flange projecting inwardly from the inner edges of said opening and including a threshold portion, and a second, integral flange projecting from said first named flange to form therewith a seat for receiving a door, the inner edge of said threshold portion being disposed above the adjacent plank of the flooring.

10. A car end structure comprising an integral end frame having a marginal portion defining a door opening, an upper attaching flange for receiving the roof sheets, and a flange disposed below said attaching flange for receiving a loading rail.

11. A car end structure comprising an integral end frame having a marginal portion defining a door opening, an upper attaching flange for receiving the roof sheets, a flange disposed below said attaching flange for receiving a loading rail, and strengthening ribs positioned between said flanges.

12. A car end structure comprising a one piece casting including an end frame, an end sill, and attaching flanges for securement to the upper and under framing of the car, including the draft sills.

13. A car end structure comprising a one piece marginal casting including an end frame and an end sill, the inner edges of said frame and sill defining a door opening.

14. A car end structure comprising a one piece casting including an end frame, end sill, and flanges on said sill for attachment to the side sills and the webs of the draft sills.

15. A car end structure comprising a one piece casting including an end frame, end sill, and flanges on said frame for attachment directly to the side plates, and flanges on said end sill for attachment to the draft and side sills.

16. A car end structure comprising a one piece casting including an end frame, end sill, flanges on said frame for attachment directly to the roof and side sheets, and flanges on said sill for attachment directly to said side sheets.

17. A car end structure comprising a one piece casting including an end frame, an end sill, and an opening lying wholly within the marginal edges of said sill for the passage of the drawbar, the lower side of said opening acting as a carrier for said bar.

18. A car end structure comprising a one piece casting including an end frame, an end sill, the inner edges of said frame defining a door opening, and integral door lock keeper

on said frame and sill positioned adjacent the upper and lower edges of said opening.

19. A car end structure comprising an integral end frame having a marginal portion defining a door opening, and a flange formed on said frame to provide a threshold portion for the door opening.

20. A car end structure comprising an integral end frame having a marginal portion defining a door opening, a continuous integral flange projecting inwardly from the edges of said opening and including a threshold portion, and a second integral flange projecting from said first named flange to form therewith a seat for receiving a door.

21. A car end structure comprising an integral end frame having a marginal portion defining a door opening, and a flange formed on said frame to provide a threshold portion for the door opening, the inner edge of said portion being disposed above the adjacent plank of the flooring.

22. A car end structure comprising an integral end frame having a marginal portion defining a door opening, and a flange formed on said frame to provide a threshold portion for the door opening, and a flange on said threshold for strengthening the same.

23. A car end structure comprising an integral end frame having a marginal portion defining a door opening, a flange formed on said frame to provide a threshold portion for said door opening, the inner edge of said threshold being disposed above the adjacent plank of the flooring, and a depending flange on said threshold for strengthening the same.

24. A car end structure comprising an integral end frame having a marginal portion defining a door opening, and a flange formed on said frame for receiving a loading rail.

25. A car end structure comprising a one piece casting including an end frame and an end sill, the inner edges of said frame defining a door opening, a continuous integral flange projecting inwardly from the inner edges of said opening, and a second integral flange projecting from said first named flange to form therewith a seat for receiving a door.

26. A car end structure comprising an integral end frame having a marginal portion defining a door opening, and flanges at the junction of the sides and top thereof forming seat portions for the attachment of side plates.

27. A car end structure comprising an integral end frame having a marginal portion defining a door opening, and flanges at the junction of the sides and top thereof forming substantially square corners for the attachment of side plates.

28. A car end structure comprising an integral end frame having a marginal portion defining a door opening, an upper attaching flange for receiving the roof sheets, and a flange below said attaching flange defining the upper edge of the door opening.

29. A car end structure comprising an integral end frame having a marginal portion defining a door opening, an upper attaching flange for receiving the roof sheets, a flange below said attaching flange defining the upper edge of the door opening, and strengthening ribs disposed between said flanges.

30. A car end structure formed of a one-piece casting comprising an end frame and an end sill provided with integral end flanges for attachment to the side sills, integral cheek plates for attachment to the draft sills, and a flange on the inner end of each of said cheek plates adapted to act as front stops for the draft gear.

31. A car end structure formed of a one-piece casting comprising an end frame and an end sill provided with integral end flanges for attachment to the side sills, integral cheek plates for attachment to the draft sills, said cheek plates including slots for the reception of the draft key, and means on said cheek plates adapted to act as a front stop for the draft gear.

32. A car end structure formed of a one-piece casting comprising an end frame and an end sill provided with integral end flanges for attachment to the side sills, integral cheek plates for attachment to the draft sills, said cheek plates including slots for the reception of a draft key and a flange formed on the inner end of each of said cheek plates adapted to act as front stops for the draft gear.

33. A car end structure formed of a one-piece casting consisting of an end frame and an end sill comprising upper and lower horizontal flanges and a connecting web, integral cheek plates extending inwardly from said web for attachment to the draft sills, and a flange on the inner end of each of said cheek plates adapted to act as front stops for the draft gear.

34. A car end structure formed of a one-piece casting consisting of an end frame and an end sill comprising upper and lower horizontal flanges and a connecting web, flanges on the ends of said web for attachment to the side sills and integral cheek plates extending inwardly from said web for attachment to the draft sills, the depth of said upper flange being increased over said cheek flanges and at the ends of said casting.

35. A car end structure formed of a one-piece casting comprising an end frame and an end sill provided with integral end flanges for attachment to the side sills, integral cheek plates for attachment to the draft sills, and a flange on each of said cheek plates adapted to act as front stops for the draft gear.

36. A car end structure formed of a one-piece casting consisting of an end frame and

an end sill comprising upper and lower horizontal flanges and a connecting web, integral cheek plates extending inwardly from said web for attachment to the draft sills, and a flange on each of said cheek plates adapted to act as front stops for the draft gear.

37. A car end structure formed of a one-piece casting comprising an end frame and an end sill provided with integral end flanges for attachment to the side sills, integral cheek plates for attachment to the draft sills, said cheek plates including slots for the reception of a draft key, and a flange on each of said cheek plates adapted to act as front stops for the draft gear.

38. A car end structure formed of a one-piece casting consisting of an end frame and an end sill comprising upper and lower horizontal flanges and a connecting web, flanges on the ends of said web for attachment to the side sills and integral cheek plates extending inwardly from said web for attachment to the draft sills, the depth of said upper flange being increased over said cheek flanges.

39. A car end structure formed of a one-piece casting consisting of an end frame and an end sill comprising upper and lower horizontal flanges and a connecting web, flanges on the ends of said web for attachment to the side sills and integral cheek plates extending inwardly from said web for attachment to the draft sills, the depth of said upper flange being increased at the ends of said casting.

40. A car end structure comprising a one-piece casting including an end frame and an end sill, the inner edges of said frame and sill defining a door opening, a continuous integral flange projecting inwardly from the inner edges of said opening, a portion of said flange along said sill forming a threshold portion, and a second integral flange projecting from the frame portion of said continuous flange to form therewith a seat for receiving a door.

41. A car end structure comprising a one-piece casting including an end frame and an end sill, the inner edges of said frame and sill defining a door opening, a continuous integral flange projecting inwardly from the inner edges of said opening, the portion of said flange along said sill being inclined outwardly and downwardly to form a threshold portion, and a second integral flange projecting from the frame portion of said continuous flange to form therewith a seat for receiving a door.

42. A car end structure comprising a one-piece casting including an end frame and an end sill, the inner edges of said frame and sill defining a door opening, a continuous integral flange projecting inwardly from the inner edges of said opening, the portion of said flange along said sill forming a threshold portion having its inner edge disposed above the adjacent plank of the flooring, and a second integral flange projecting from the frame portion of said continuous flange to form therewith a seat for receiving a door.

43. A car end structure comprising a one-piece casting including an end frame and an end sill, the inner edges of said frame and sill defining a door opening, a continuous integral flange projecting inwardly from the inner edges of said opening, the portion of said flange along said sill forming a threshold portion having its inner edge disposed above the adjacent plank of the flooring, a depending flange on said threshold for strengthening the same, and a second integral flange projecting from the frame portion of said continuous flange to form therewith a seat for receiving a door.

44. A car end structure comprising a one-piece casting including an end frame and an end sill, the inner edges of said frame and sill defining a door opening, a continuous integral flange projecting inwardly from the inner edges of said opening, the portion of said flange along said sill forming a threshold portion inclined outwardly and downwardly, and a second integral flange projecting from the frame portion of said continuous flange to form therewith and with said threshold portion a seat for receiving a door.

In testimony whereof I affix my signature.

MARK H. MARTIN.