Feb. 24, 1925. 1,527,398

A. CAMPBELL ET AL

END STRUCTURE FOR RAILWAY CARS

Filed June 7, 1923 3 Sheets-Sheet 1

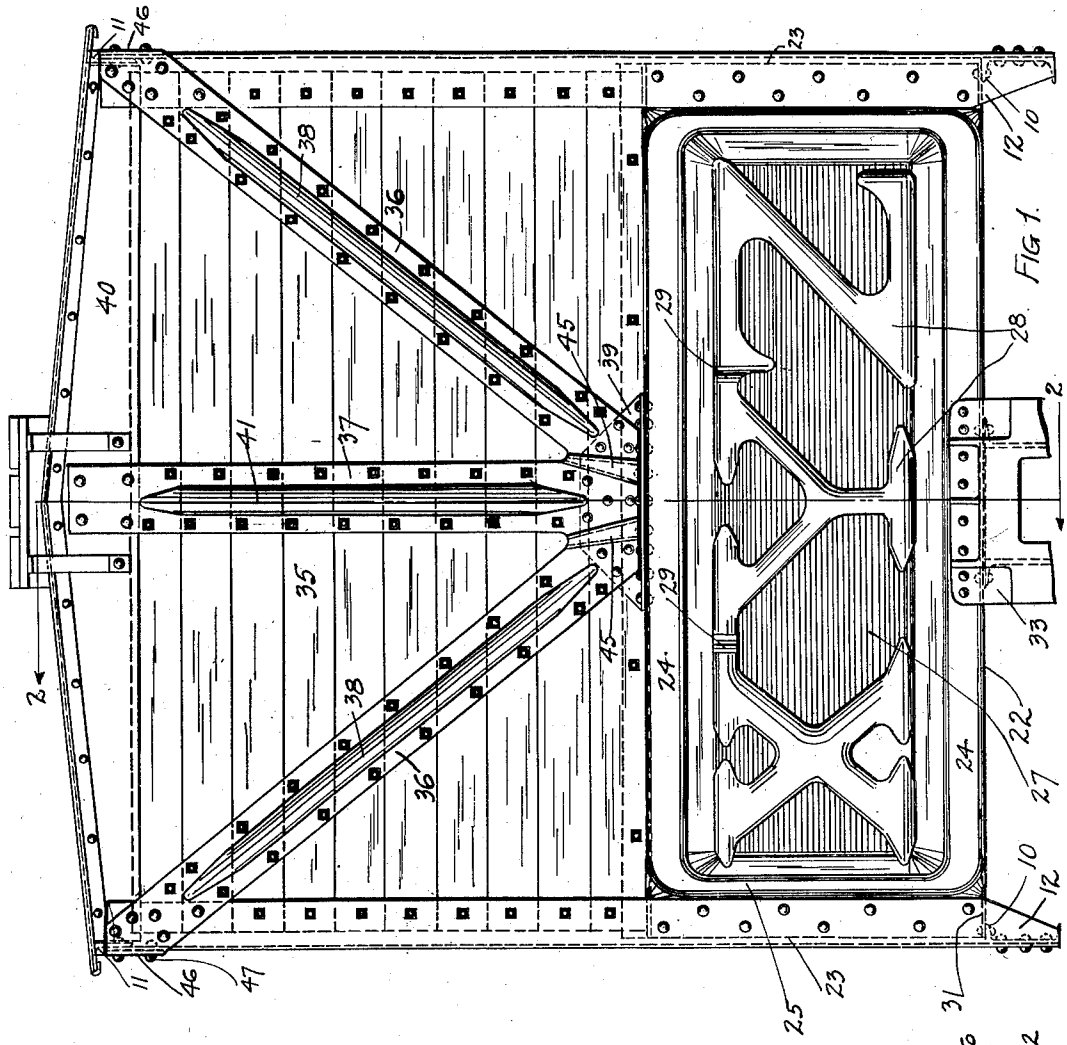


FIG 1.

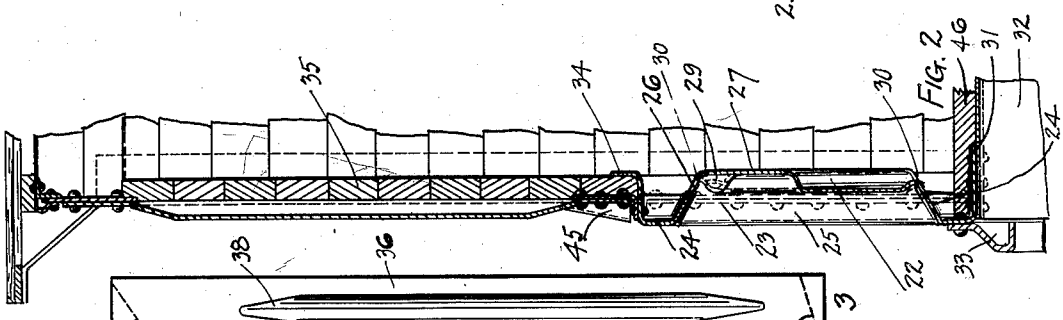


FIG. 2

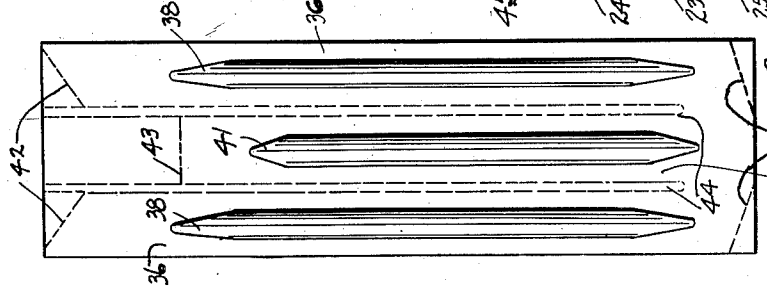


FIG 3

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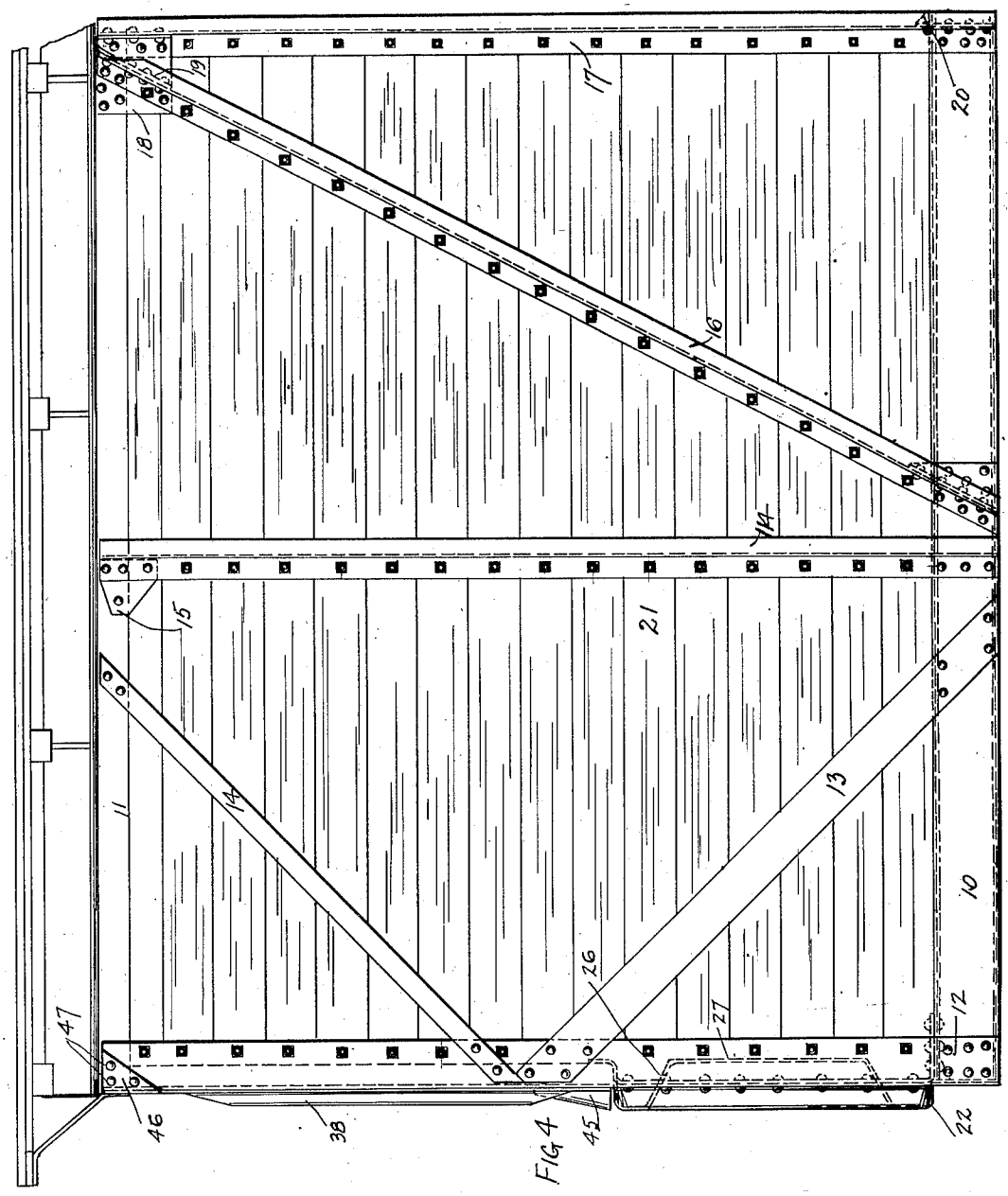


FIG 4

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END STRUCTURE FOR RAILWAY CARS

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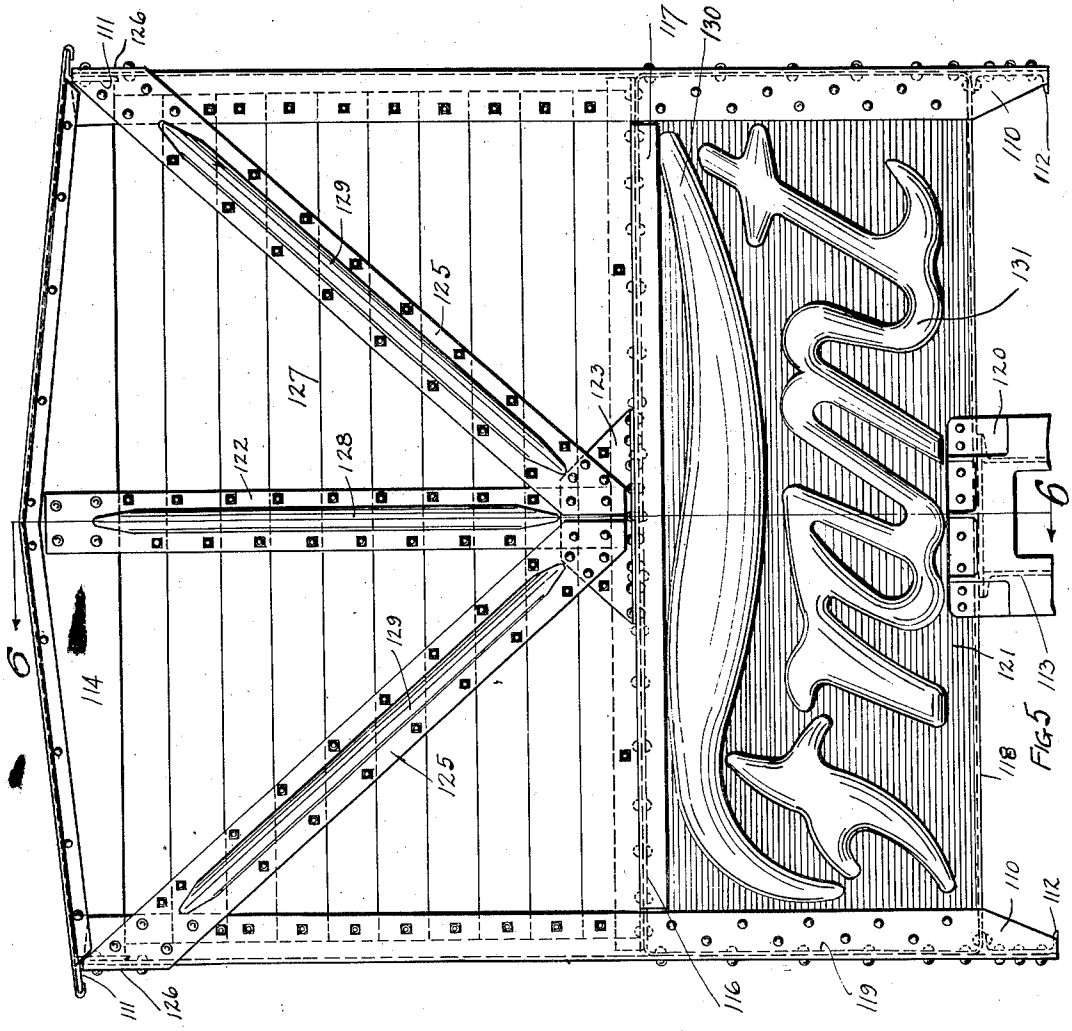


FIG 5

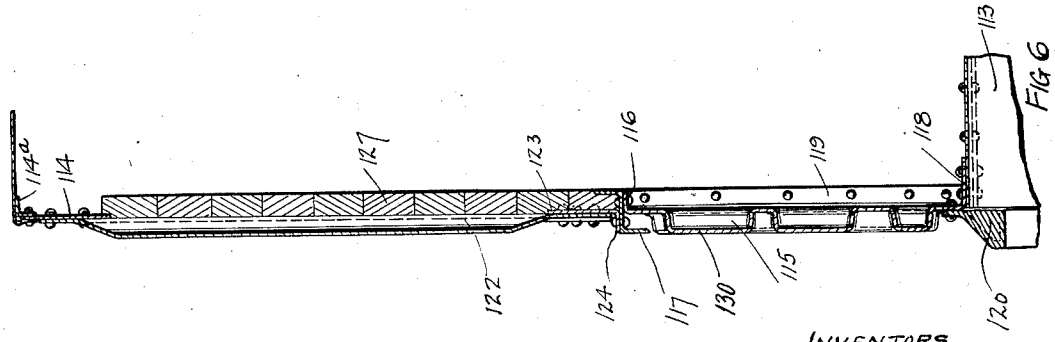


FIG 6

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Patented Feb. 24, 1925. 1,527,398

UNITED STATES PATENT OFFICE.

ARGYLE CAMPBELL AND GEORGE B. DOREY, OF CHICAGO, ILLINOIS, ASSIGNORS TO ENTERPRISE RAILWAY EQUIPMENT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

END STRUCTURE FOR RAILWAY CARS.

Application filed July 7, 1923. Serial No. 644,030.

To all whom it may concern:

Be it known that we, ARGYLE CAMPBELL, a citizen of the United States, and GEORGE B. DOREY, a citizen of Canada, both residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in End Structures for Railway Cars, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings forming a part of this specification.

Our invention relates to an improved end structure for railway cars, particularly for cars of the box type having ends which are comparatively high as compared to the width thereof, though not necessarily restricted to cars of that type, and has for its object the production of an end wall which will be capable of withstanding the heavy strains and pressure occurring in service. In cars of the identified type, it has been customary to brace the ends of the car against outward bulging by utilizing long vertical beams or a large number of horizontally extending corrugations forming a series of beams extending between the corner posts and it is an object of this invention to devise a simplified construction using a fewer number of beams disposed in such a manner as to reduce the length of span between their supports.

One of the objects of the invention is to provide a composite metal and wood structure wherein portions formed of metallic plate are reinforced by means of designated markings.

Another object of the invention is to provide a metallic car panel which is formed to present a plurality of embossments spaced from each other and constituting horizontally extending beams and to further rigidify the space intermediate said horizontal embossments by means of embossments designating indicia, symbols or legends identified with the operation or maintenace of the car.

A further object of the invention is to provide a car end having a beam extending substantially horizontally between the sides of the car, a metallic panel below the beam and composite construction above the said beam.

A still further object of the invention is to provide a horizontal beam of great strength extending between the sides of the car and other beams secured to the said horizontal beam intermediate the supports thereof and also to the sides of the car.

For a full comprehension of this invention, references may be had to the accompanying drawings wherein Figure 1 is an elevational view of a car end showing our improved construction. Figure 2 is a vertical sectional view through the end of the car and taken on a line corresponding substantially to line 2—2 of Fig. 1. Fig. 3 is a view of the plate forming the bracing of the end upper panel and illustrating a stage in the operation of forming this bracing, as will be fully explained hereinafter. Fig. 4 is a side elevational side view of a portion of the car shown in Fig. 1. Fig. 5 is an end elevational view of a car end showing a modified form of construction. Fig. 6 is a vertical sectional view through the end of the car and taken on a line corresponding substantially to a line 6—6 of Fig. 5.

Referring first to Figs. 1 to 4 inclusive which illustrate our preferred form of construction, wherein 10 indicates the bottom member of the side framing, 11 the top member of the side framing, and 12—12 the corner posts of the car which are each secured to both of the corresponding aforesaid members. Each corner post 12 is braced to the side bottom member 11 by means of a diagonal brace 13 and to the side top member by means of a diagonal member 14, both of said diagonal members being extended to locations on the side framing near the body bolster of the car, where the side frame is usually reinforced by a vertical post 114 as shown in Fig. 4. At the upper end thereof the post 114 is secured by means of gusset 15 to the side top member 11 and the construction of the side frame, as indicated, is the usual one consisting of diagonal brace 16 and intermediate vertical post 17 secured to the longitudinal members by means of gusset 18 and brackets 19 and 20. The side wall boards 21 in this case are secured to the side frame and corner post 12.

The end of the car is preferably of composite construction, the lower panel 22 thereof being formed of a metallic plate having flanges 23—23 secured to the respective cor-

ner posts 12—12, said plate having portions of the same embossed outwardly providing horizontal corrugations 24 near the respective upper and lower margins of the panel and vertical corrugations 25—25 adjacent the corner posts. The said corrugations 24 and 25 are preferably formed to present a continuous corrugation in order to minimize the danger of tearing the plate. The portion of the plate defined by the aforesaid horizontal and vertical corrugations is dished inwardly thereby forming a pan-like portion 26 of truncate shape presenting a flat surface 27 which is rigidified by means of characters 28. In the present instance, the characters 28 designated by the letters X Y Z are typical characters usually employed by owner carriers for ready identification of their own equipment. Such characters are preferably disposed to form a continuous embossment wherever possible in order to preserve a beam effect and to further facilitate the embossment of the characters without tearing of the metal plate, and in order to more sharply define the characters, a shallow indentation may be made between the characters, as shown at 29—29 where the same are joined together. It has been found desirable to have the margins of the characters, as at 30, merge into the sloping wall of the truncate shape portion 26 rather than into the wall 27 from which the characters are embossed. The wall 31 forming the outer flange of the lower corrugation 24 is of extended width and secured to the center sill 32 and also to the side bottom members 10—10, thereby forming a beam of great strength well adapted to form a backing for the striking plate 33 which is secured to the outer vertical wall of the lower corrugation 24 of the panel and which is formed with a flat surface against which the striking plate abuts. The plate, adjacent the upper margin of the panel, is bent upwardly as shown at 34 forming the inner flange of a Z-shaped horizontal beam resisting buckling of the margin of the plate and forming a weather guard to prevent the entry of rain and moisture at the joint between the metal panel and wooden sheathing 35 which forms the wall of the upper portion of the end of the car.

The upper portion of the end frame of the car consists, broadly, of a plurality of diagonal braces 36—36 and a vertical brace 37 which all act as beams resisting outward buckling of the car end wall and which are also preferably so disposed as to prevent weaving of the car end.

The diagonal members 36, each of which has a reinforcing embossment 38 formed therein, are secured at their outer ends to the corner posts 12 and at their lower or inner ends to the upper beam portion of the metallic panel as constituted by the upper corrugation 24, either directly or by means of a bracket member 39 in the manner shown. The vertical brace 37, which is disposed intermediate said diagonal members 36 has its lower end secured to the bracket member 39 and its upper end secured to the end plate 40 of the car, the end plate 40 extending between and being secured to the corner posts. In order to brace the vertical member against outward buckling, it is also provided with a verticallly extending corrugation 41 therein.

While the diagonal and vertical members may be made of separate parts, a preferred construction consists in forming the same from a single plate as shown in Fig. 3, forming the respective corrugations 38—38 and 41 at the same operation and thereafter shearing the plate as indicated at 42 42′ and 43 and slotting the same as shown at 44. The diagonal brace portions are then separated and the connecting metal to either side of the vertical member 37 pressed as shown at 45 in the form of a corrugation. Such a construction saves considerable weight and provides great rigidity.

While the diagonal beams are shown as anchored centrally of the horizontal beam member it will be evident that the said diagonal beams may be anchored to the horizontal member at a location intermediate the center of car and the corner posts thereby lessening the bending strain on the said horizontal beam. Each diagonal member 36 is preferably bent around a corner post 12 as indicated at 46 and directly secured to the side top member 11 by means of rivets 47, thereby distributing outward stresses on the car end wall directly to the side framing of the car. An important feature of the invention is the provision of the transverse beam member, spaced an appreciable distance from the floor 46 of the car, and resisting outward buckling of the end of the car, the said beam illustrated in this particular embodiment being the corrugation extending along the upper margin of the lower panel, and which acts as a support for the ends of other beams which are preferably formed with a shorter span between their supports than the said horizontal member.

In Figs. 5 and 6 a modified form of the invention is illustrated. In said figures, 110 indicates the corner posts, 111 the side top member, 112 the side bottom member, 113 the center sills, 114 transverse upper end member extending between and connecting the corner posts and reinforced by a flanged member 114ª, 115 a metallic panel forming the lower portion of the end of the car, said panel having the horizontal margins thereof flanged, preferably at right angles to the main body of the plate as indicated at the upper margin 116 where the flange is secured to a horizontally extending Z-

shaped beam 117, and at the lower margin 118 where the same is secured to the center sills 113 and to the side bottom members 112—112, and at the vertical margins 119—119 whereby the panel is secured to the corner posts. The lower margin or flange 118 is formed of extended width in order to provide a rigid backing for the striking casting 120 which is secured to the center sills and to the main body of the panel. A vertical beam member 122 is secured to beam 117 through the medium of a bracket 123 which is flanged at 124 and thereby secured to the web of beam member 117. Diagonal members 125 are disposed to either side of the vertical beam member 122 and each of said members is secured thereto and to the bracket member 123 and extends upwardly and outwardly and is secured to the corner post 110 and bent around the same as indicated at 126 and a connection effected with the corner post 110 and the longitudinal top member 111, as well as the transverse upper member 114. The upper portion of the car end wall is formed of wooden sheathing 127 which is bolted to the corner posts and to the vertical and diagonal beams. The vertical and diagonal beams are suitably corrugated as indicated at 128 and 129, respectively, to effectively stiffen the same against outward buckling.

The lower panel 115 in this instance is particularly adapted to box cars specifically engaged in the automobile carrying trade and the particular symbol "Frant" shown as a rigidifying embossment might be illustrative of a particular make of automobile which it is desired to advertise extensively. In this particular instance, the upper portion 130 of the letter "F" is extended transversely past the other letters thereby constituting in itself a transverse beam. The remaining letters "rant", indicated at 131, form a continuous embossment and rigidify the main body of the plate 121 in all directions and constitute an effective preventative against buckling of the same. In this embodiment of our invention the members constituting the horizontal beams preventing outward buckling of the car end consist of the rolled beam 117 assisted by the aforesaid embossment 130.

While we have shown and described what we now consider the preferred manner of carrying out our invention, the same is merely illustrative and we contemplate all changes and modifications that come within the scope of the claims appended hereto.

We claim:

1. In a railway car, a composite end having the lower portion thereof formed of a metallic panel and the upper portion thereof including wooden sheathing; said lower panel having rigidifying, intelligible, indicatory characters incorporated therein.

2. In a railway car, a composite end having the lower portion thereof formed of a metallic panel and the upper portion thereof including wooden sheathing; said lower panel having the upper margin thereof reinforced by means of a horizontally extending corrugation and the body of the plate below said corrugation reinforced by intelligible, indicatory characters incorporated therein.

3. In a railway car, a composite end having the lower portion thereof formed of a metallic panel and the upper portion thereof including wooden sheathing; said lower panel having the lower margin thereof reinforced by means of a horizontally extending corrugation and the body of the panel above said corrugation being reinforced by having intelligible indicatory characters incorporated therein.

4. In a railway car, a composite end having the lower portion thereof formed of a metallic panel and the upper portion thereof including wooden sheathing; said lower panel having horizontally extending corrugations therein and the space intermediate said corrugations reinforced by intelligible, indicatory characters incorporated therein.

5. In an end wall structure for railway cars, the combination with the side frames of the car; of a metallic panel extending between the said frames and secured thereto, the said panel having vertical and horizontal rigidifying corrugations therein and the space intermediate said corrugations being reinforced by intelligible indicatory characters pressed therein.

6. In an end wall structure for railway cars, the combination with the side frames of the car; of a metallic panel extending between the said frames and secured thereto, the said panel having continuous vertical and horizontal rigidifying corrugations therein, the space within the continuous corrugation being rigidified by embossed intelligible indicatory characters.

7. In an end wall structure for railway cars, the combination with the side frames of the car; of a metallic panel forming the lower part of the end wall and secured to said frames; of a horizontally disposed stiffening beam disposed adjacent the upper margin of the aforesaid lower panel and constituting a beam resisting outward bulging of the end and adapted to carry stresses on the panel to the side frames; and beams angularly disposed relatively to the aforesaid horizontal beam, each having one end secured to said horizontal beam and the other end secured to the corresponding side frame of the car, said angularly disposed beams being substantially parallel to the end wall of the car.

8. In an end wall structure for railway

cars, the combination with the side frames including corner posts; of an upper member extending crosswise of the car between the corner posts of the car and secured thereto; a lower metallic panel; wooden sheathing constituting the wall of the car between the aforesaid upper member and lower panel; and a beam extending crosswise of the car and adapted to reinforce the upper margin of the lower panel against outward bending and other beams having one end thereof anchored to the said beam intermediate the corner posts and adapted to brace the wooden sheathing against outward bending.

9. In a railway car end structure, in combination with the side framing of the car including corner posts; a framed structure including upper and lower metallic members spaced apart and extending between and secured to the said posts; wooden sheathing disposed in the space intervening between said upper and lower members; a beam member reinforcing the upper margin of said lower member; and a vertical beam member secured to the aforesaid beam member and to said upper member intermediate the corner posts and adapted to brace the wooden sheathing against outward bending.

10. In a railway car end structure, the combination with the side framing of the car including corner posts; of a framed structure including upper and lower metallic members spaced apart and extending between and secured to the said posts; wooden sheathing disposed in the space intervening between said upper and lower members; a beam member reinforcing the upper margin of said lower member; and diagonal and vertical members secured to the aforesaid beam member and to portions of the framing.

11. In a railway car end structure, the height of which is greater than the width thereof, the combination with corner posts; of a horizontal beam member extending across the car between the corner posts and secured thereto, the said beam member being spaced an appreciable distance from the floor of the car; an upper member extending across the car between the corner posts and spaced from the aforesaid member an appreciable distance; wooden sheathing forming the wall intermediate the said upper and lower members; and a vertical beam member located between the corner posts and having the terminal portions thereof anchored respectively to the upper member and to the lower member, said vertical beam having the distance between supports less than the distance between corner posts and adapted to resist outward bulging of the wooden sheathing.

12. In a railway car end structure, the combination with the side framing including longitudinal members and corner posts; of a horizontally disposed lower beam member spaced an appreciable distance from the floor of the car and extending between and secured to the corner posts of the car; of an upper member extending between the corner posts of the car near the top thereof and secured to the corner posts; wooden sheathing disposed intermediate the upper and lower members; bracing means between the upper and lower members comprising members having one terminal anchored to the corner posts near the top of the car and having the other terminal anchored to the beam member intermediate the corner post, the said diagonal members also constituting beam members resisting outward bending of the wooden sheathing.

13. In a railway car end structure, the combination with side frames; of wooden sheathing forming the upper portion of the end wall of the car; a metallic panel forming the lower part of the end wall of the car, the aforesaid metallic panel being formed with a rigidifying corrugation extending outwardly beyond the plane of the outer face of the sheathing and having an upturned flange overlapping the inner face of the sheathing thereby presenting a substantially Z-shaped horizontally extending beam adapted to transmit stresses on the end of the car to the side frames thereof.

14. In a railway car end structure, the combination with side frames; of wooden sheathing forming the upper portion of the end wall of the car; a metallic panel forming the upper portion of the end wall of the car; a metallic panel forming the lower part of the end wall of the car, the said metallic panel having the main body thereof embossed outwardly beyond the plane presented by the outer face of the sheathing and having the central portion of such embossed portion dished inwardly to form a central panel bounded by a continuous corrugation, the said central panel being rigidified by intelligible indicatory characters embossed therein.

15. In a railway car end structure, a member adapted to brace the car end against weaving and outward bulging and comprising a vertical member and diagonal members diverging therefrom and having free ends adapted to be anchored to separate parts of the car structure, said vertical and diagonal members being integrally connected at their other ends.

16. As an article of manufacture adapted for car end structures, comprising: a member having a plurality of spaced independent, corrugated beams adapted to be pressed therein in unison; the separate beams being connected at one end by integral portions of metal, said metal connections having a corrugation between said beams.

17. In a railway car, a sheet metal ele-

ment having a pressed, truncated shaped portion presenting a flat face reinforced by embossments representing intelligible indicatory characters.

18. In a railway car end structure, a metallic panel having a truncated shaped portion pressed therein, said pressed portion presenting an extended flat plane reinforced by embossments representing intelligible indicatory characters; and a continuous corrugation around the aforesaid truncated portion.

19. In a railway car, a sheet metal element having a pressed portion presenting a substantially flat face and margins angularly disposed thereto, said flat face being reinforced by embossments representing intelligible indicatory characters and merging into the aforesaid angularly disposed margins.

20. In a reinforcing box car end having corner posts, the combination with reinforced sheet metal sheathing and wood sheathing attached to said post, said sheet metal sheathing being disposed at the bottom and wood sheathing above, said composite wall including, a horizontally extending beam along the line where the sheet metal and wood sheathings are united, said beam being disposed at such a height as to leave the vertical height of the wood sheathing less than the horizontal dimension of the wood sheathing; of means on the exterior of the wood sheathing, rigidly connected to said beam, for reinforcing the wood sheathing against bulging.

21. In an end for a railway car, the combination with an upper panel; of a lower panel, one of said panels being formed of metal, and the other including wooden sheathing, said metal panel having rigidifying intelligible indicatory characters incorporated therein.

In witness that we claim the foregoing, we have hereunto subscribed our names this 2nd day of June, 1923.

ARGYLE CAMPBELL.
GEORGE B. DOREY.

Witnesses:
FRANCES SAVAGE,
HARRIETTE M. DEAMER.