To all whom it may concern:  

Be it known that I, Karl M. Hamilton, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Reenforced Car Ends, of which the following is a specification.

The invention relates to reenforced car ends, and the principal object of the same is to strengthen the ends of a car against horizontal and twisting strains, so as to preserve its proper shape in use. A further object is to apply the reenforcement in such manner that it will not obstruct any part of the interior of the car body. A further object is to provide a reenforcement which is of a unitary character and may be applied at the time of making repairs to car bodies already constructed. A further object of the invention is to connect the reenforcing frame with the exterior metal members of the car end so as to join said members with the side plates of the roof frame at points on said side plates which are at a considerable distance from the end of the car.

With such objects in view, as well as other advantages which may be incident to the use of the improvements, the invention consists in the parts and combinations thereof hereinafter set forth and claimed, with the understanding that the several necessary elements constituting the same may be varied in proportions and arrangement without departing from the nature and scope of the invention.

In order to make the invention more clearly understood there are shown in the accompanying drawings means for carrying the same into practical effect, without limiting the improvements, in their useful applications to the particular constructions which, for the purpose of explanation, have been made the subject of illustration. In the drawings:

45 Fig. 1 is an end elevation of a portion of a car having my reenforcement applied thereto, the latter being indicated by dotted lines.

50 Fig. 2 is a horizontal section of the same

55 on line II—II of Fig. 1.

Fig. 3 is a vertical section on line III—III of Fig. 2.

Referring to the drawings, 1 indicates the side plates and 2 the end plate of the car roof frame. 3 is the end sheathing (Fig. 1).

Exterior to the end sheathing are arranged vertical Z-bars 5 secured to the car body frame and to the end sheathing in a known manner by bolts 6.

The reenforcing end frame does or may comprise the following structural elements or their equivalents: 7, 7 indicate a pair of angle bars which are of L-shape in cross section. Each of said bars is bent at the point 8 to form a transverse end member 9 and a diagonal brace and tie member 10. The end members 9 are applied together one on top of the other, contacting on their plane faces so that the vertical flange of one member stands upward and the vertical flange of the other depends, said vertical flanges being fitted against the inner vertical face of the car end plate 2. The members 9 thus form a supplemental reenforcing end plate extending substantially from one side plate to the other. Said members 9 are secured together by bolts or rivets 11. At its outer end each of the supplemental end members 9 is securely connected with the side plate 1 by means of a gusset plate 12, said gusset plate being formed with a depending vertical flange 13 clamped by bolts 14 to the side plate, and formed with a horizontal flange 15 which extends for a distance along the horizontal flange of the member 19 and is secured thereto by bolts or rivets 16.

The rear or outer ends of the diagonal members 10 are connected with the side plates at a distance from the end of the car, as seen in Fig. 2, said diagonals being preferably arranged at an angle of about forty-five degrees with the end plate and with the side plates. This connection is formed by a bracket plate 17 having a vertical flange which is secured to the side plate by bolts 18 and a horizontal flange to which is riveted the horizontal part of said member 10.

The exterior vertical members or end posts are preferably in the form of Z-bars, which are secured at their upper and lower ends respectively to the roof and under frames of the car. The supplemental end plate 9, 9 is rigidly connected with said end posts by the 105 bolts 6 which pass through the vertical flanges of the members 9, the end plate 2 and the flanges of the posts 5.

The described reenforcing end frame as a whole is of very simple and economical con-
construction and may be applied to new cars or to those which are being repaired with the minimum of labor, and said frames may be constructed and sold as units for such purposes. All of the bars are or may be constructed as counterparts of each other according to a single pattern.

What is claimed is—

1. In a car end the combination of the end and side plates, and a reinforcement comprising a pair of metal bars each extending across the car and bent to form an end member and a diagonal member, said end and diagonal members being parallel with each other and with said car end plate and secured together so as to form a continuous supplemental end plate, means connecting said end members with the side plates, and means connecting the ends of said diagonal members with the side plates.

2. In a car end the combination of the end and side plates, and a reinforcement comprising a pair of metal bars each bent to form an end member and a diagonal member, said end members being parallel with each other and with said car end plate and secured together so as to form a continuous supplemental end plate extending from side plate to side plate, means connecting said end members with the side plates, and means connecting the ends of said diagonal members with the side plates.

3. In a car end the combination of the end and side plates, and a reinforcement comprising a pair of metal bars each bent to form an end member and a diagonal member, said end members being parallel with each other and with said car end plate and secured together so as to form a continuous supplemental end plate extending from side plate to side plate, means connecting said end members with the side plates, and means connecting the ends of said diagonal members with the side plates.

4. In a car end the combination of the end and side plates, and a reinforcement comprising a pair of metal bars each bent to form an end member and a diagonal member, said end members being parallel with each other and with said car end plate and superposed and secured together so as to form a continuous supplemental end plate extending from side plate to side plate, means connecting said end members with the side plates, and means connecting the ends of said diagonal members with the side plates.

5. In a car end the combination of the end and side plates, and a reinforcement comprising a pair of metal bars each bent to form an end member and a diagonal member and each extending from one side plate to the other side plate, said end members being parallel with each other and with said car end plate and secured together so as to form a continuous supplemental end plate extending from side plate to side plate, means connecting said end members with the side plates, and means connecting the ends of said diagonal members with the side plates.

6. In a car end the combination of the end and side plates, and a reinforcement comprising a pair of L-bars each bent to form an end member and a diagonal member, said end members being parallel with each other and with said car end plate and secured together so as to form a continuous supplemental end plate extending from side plate to side plate, mean connecting said end members with the side plates, and means connecting the ends of said diagonal members with the side plates.

7. In a car end the combination of the end and side plates, and a reinforcement comprising a pair of metal bars each bent to form an end member and a diagonal member, said end members being parallel with each other and with said car end plate and secured together so as to form a continuous supplemental end plate, means connecting said end members with the side plates, and means connecting the ends of said diagonal members with the side plates, external end posts, and means connecting said supplemental end plate with said posts.

8. A reinforcing supplemental car end frame, comprising a pair of flanged metal bars each bent to form an end member and a diagonal brace and tie member, said end members being superposed and secured together in parallel arrangement so as to form a continuous supplemental end plate extending from side to side of the car and adapted to be attached to the end plate, and means connecting the ends of said diagonal members extending outwardly away from the end members and adapted to be attached to the side plate at points distant from the end plate.

9. A reinforcing metal frame for car ends, comprising, in combination, a flanged reinforcement extending diagonally from a side plate to the end plate and thence along the end plate towards the opposite side plate, a second flanged reinforcement extending diagonally from said opposite side plate to the end plate and thence extending parallel with the first reinforcement and with the end plate towards the mentioned side plate, and means securing rigidly together the transverse and parallel portions of said reinforcements to form a double reinforcement along the median portion of the end plate, the end portions of said parts forming single reinforcements for the outer portions of the end plate.

10. A reinforcing metal frame for car ends, comprising, in combination, a pair of bracing members each extending continuously from the end of a car side plate along the car end plate and thence diagonally to
the other car side plate at a point distant from its end, said members being secured one to the other to form a supplemental end plate extending from side plate to side plate, and means whereby each end of each of said members is attached to a side plate.

11. In combination with the wooden end wall of a railway box car, of a metal reinforcement for the same comprising substantially upright members on the outside of the end wall and a transverse brace on the inside of the car composed of two members with their inner ends overlapped to a distance corresponding to the distance between the upright members, the upper end of each upright member being secured to both members of said transverse brace.

12. In combination with the wooden end wall of a railway box car, of a metal reinforcement for the same comprising substantially upright members on the outside of the end wall, a transverse brace on the inside of the car composed of two members with their inner ends overlapped to a distance corresponding to the distance between the upright members, the upper end of each upright member being secured to both members of said transverse brace, and means for securing the ends of said transverse brace to the side walls of the car.

13. In combination with the wooden end wall of a railway box car, of a metal reinforcement for the same comprising substantially upright members on the outside of the end wall, a transverse brace on the inside of the car composed of two members with their inner ends overlapped to a distance corresponding to the distance between the upright members and their outer ends provided with means extending diagonally across the corners of the car and attached to the side walls thereof, the upper ends of said upright members being secured, in each case, to both the members of said transverse brace.

14. In combination with the wooden end wall of a railway box car, of a metal reinforcement for the same comprising substantially upright members on the outside of the end wall, a transverse brace on the inside of the car composed of two members with their inner ends overlapped to a distance corresponding to the distance between the upright members, the upper end of each upright member being secured to both members of said transverse brace, and means providing diagonally arranged reinforcing elements for connecting said transverse brace to the side walls of the car.

15. In combination with the wooden end wall of a railway box car, of a pair of substantially upright reinforcing members on the outside of the end wall; a transverse reinforcement on the inside of the car comprising two members overlapped for a distance corresponding substantially to the distance between the upright members, the members of the transverse reinforcement having inwardly projecting, horizontal flanges which are secured together at said overlap, respectively upwardly and downwardly projecting flanges which lie flatwise upon and are secured to the end wall of the car, the upper ends of said upright members being anchored each to both of the members of said transverse reinforcing structure, and means for connecting said transverse reinforcement to the side walls of the car.

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