June 22, 1926.

1,589,580

H. W. WILLIAMS

CAR CONSTRUCTION

Filed Dec. 7, 1922

Fig. 1

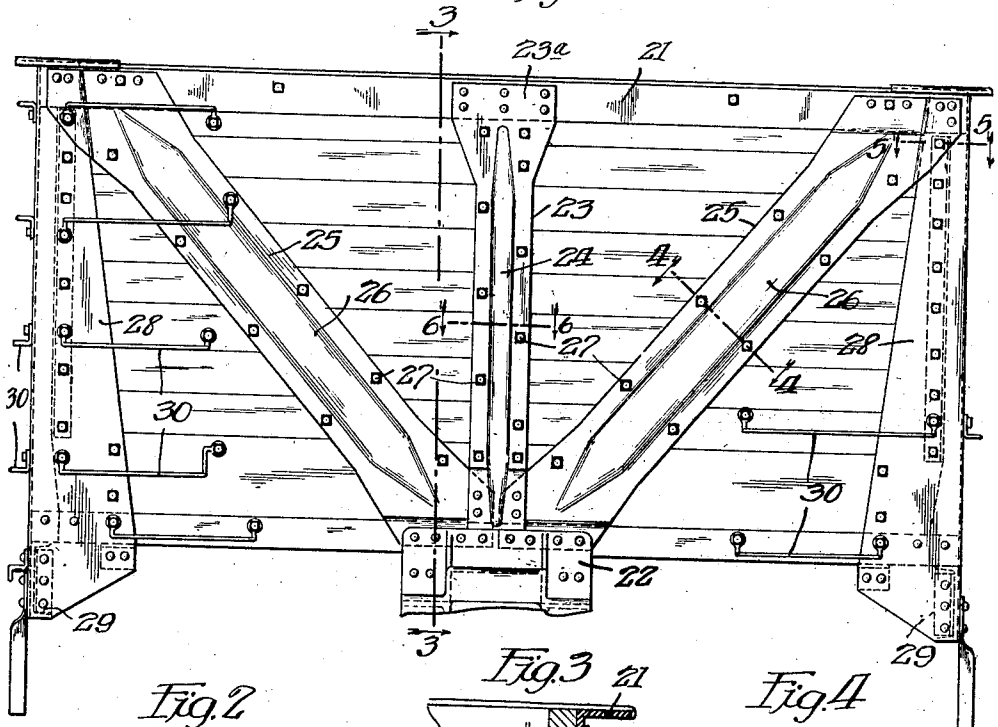



Fig. 2

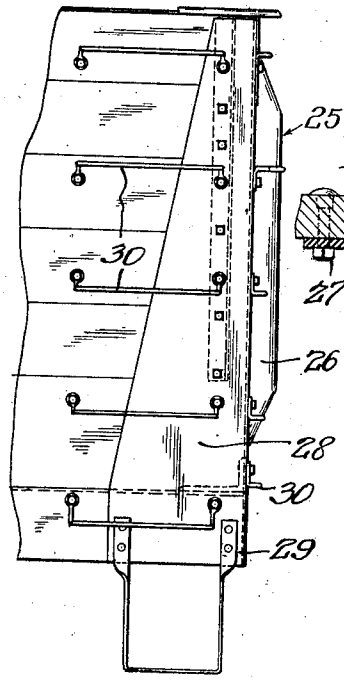



Fig. 3

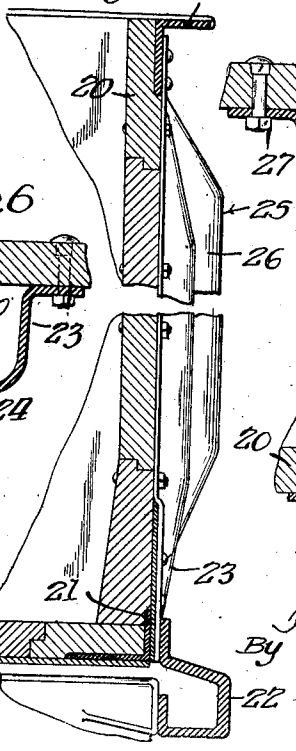



Fig. 4

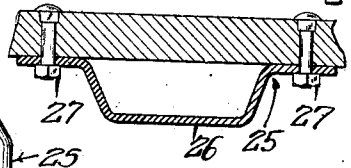



Fig. 6

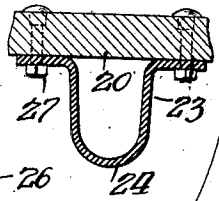
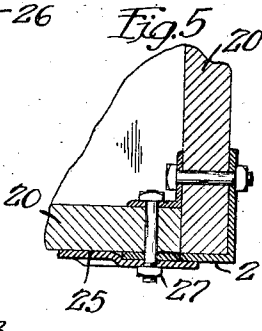



Fig. 5




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# UNITED STATES PATENT OFFICE.

HOMER W. WILLIAMS, OF CHICAGO, ILLINOIS.

## CAR CONSTRUCTION.

Application filed December 7, 1922. Serial No. 605,488.

My invention relates more particularly to the method of constructing or reenforcing the ends of railway cars, such as gondola or box cars and comprises means whereby the end structure is reenforced, resistance to load thrusts provided and the shocks or thrusts transferred to the structural members of the car; that is to say the invention contemplates bracing or reenforcing means which may be readily applied to the ends of a gondola car or box car to come within the general requirements as to clearance, etc.; my improved structure or reenforcing means being somewhat of cantilever construction whereby the sides of the car will not only be prevented from spreading but at the same time prevented from drooping from the body bolster toward the ends of the car.

My invention contemplates means so disposed as to act as a cantilever which rests on and is secured to the under-frame of the car and adapted to transmit the strains or shocks to the heavy timbers or members of the underframe; the bracing in reality constituting an integral part of the car structure, with the result that the usual weakness in the end framing of freight cars, especially of the gondola or box car type, is thereby eliminated and a concentration of strength provided at points where the strains, due to shifting loads, are usually concentrated or encountered.

The objects and advantages of my invention will be more readily comprehended and understood from the detailed description of the accompanying drawings, wherein:—

Figure 1 is an end elevation of a gondola type of car with the running gear omitted.

Figure 2 is a fragmentary view in elevation of the side of the car at one end.

Figure 3 is a sectional view taken on the line 3—3 of Figure 1 looking in the direction of the arrows.

Figure 4 is a detail sectional view taken on the line 4—4 of Figure 1.

Figure 5 is a detail sectional view taken on the line 5—5 of Figure 1 looking in the direction of the arrows.

Figure 6 is a detail sectional view, taken on the line 6—6 of Figure 1.

As my invention is applicable to the well known type of composite wood and steel construction of gondola car or box car at present in use, a specific description of the general car construction need not be entered into.

In the exemplification of the invention, as disclosed in Figure 1, where one end of a gondola car has been shown composed of the usual plank or timber construction, as shown at 20 in Figure 3, reenforced at the top and bottom by suitable angle irons or members as at 21; with the longitudinal center provided with the usual striking casting at 22 disposed coincident with the usual draft rigging under the floor of the car.

My improved reenforcing means comprises a structural member 23 adapted to extend from top to bottom at the end of the car and of suitable sheet metal preferably formed with a longitudinal rib as at 24 disposed substantially throughout the length of the reenforcing member 23. In the particular exemplification of the invention as disclosed in Figure 1, the reenforcing rib 24 is shown produced by providing the longitudinal center of the member 23 with a corrugation having a rounded exterior surface, somewhat U-shape in cross section, as disclosed in Figure 6; with the ends of the corrugation or outwardly dished portion of the member 23 preferably tapering off into the flat end portions which are shown preferably flared or enlarged. In Figure 1, the upper end of the member 23, where it is flared or enlarged as shown at $23^a$, is suitably secured to the reenforcing angle iron 21 disposed about the upper outer side of the car; while the lower end is intended to be disposed rearward of and secured to the striking casting or plate 22 and therefore to the underframe or structural portion of the car.

Diverging upwardly from opposite sides of the lower end of the reenforcing member 23, I provide the brace members 25, 25, also composed of suitable sheet metal with a longitudinally disposed rib or corrugation as at 26, preferably somewhat of enlarged channel formation as shown in cross section in Figure 4. The ends of the brace members 25 are also preferably enlarged to provide suitable attaching points whereby the upper ends may have lapping relation with and be secured or riveted to the reenforcing angle member 21, while the lower ends of both brace members 25 are brought into close relation with each other and preferably rearward of the member 23 so as to permit the same securing means or rivets whereby the lower end of member 23 is secured in place to also constitute fastening means or

rivets for a portion of the lower ends of the brace members 25; while the immediate lower ends of both brace members 25, which are also arranged rearward of the striking casting or plate 22, are secured to the underframe by the same rivets or fastening means whereby the striking plate and the lower end of the member 23 are secured in place.

The intermediate portions of the members 23 and 25, at suitable intervals, are secured to the body or end of the car by suitable bolts and nuts as at 27 thereby securing the end planks 20 in flush relation with the reenforcing members.

The corners of the car, namely the junctures between the sides and ends of the car, are each provided with a reenforcing member or angular metallic plate 28, formed to lie flat with the sides and ends of the car as shown in Figures 1, 2 and 5; the lower ends of the reenforcing members or plate 28 being preferably flared or enlarged to provide greater attaching and reenforcing surfaces at the side and end sills of the car underframe. The members 28 are adapted to extend from a point adjacent to the top of the car to a point preferably beneath the floor level and therefore in lapping relation with the side sills as shown at 29 in Figures 1 and 2; the lower ends being rigidly secured to the side and end sills while the upper ends are adapted to be secured to the reenforcing member 21; and that portion of the reenforcing members 28 disposed about the end of the car adjacent the top is preferably disposed beneath and in partial lapping relation with the upper ends of the brace members 25, 25, so that the rivets or other securing means at the upper ends of the brace members 25 will also constitute the securing means for the upper portions of the members 28 at the ends of the car. The corner members 28, like the members 25, 25 and 23, at suitable points throughout the lengths thereof, are also preferably perforated to receive bolts for securing the end and side planks 20 thereto. The corner reenforcing members 28, as well as the reenforcing members 25, or at least one of the latter, at proper points are adapted to receive bolts for securing the hand-holds and steps indicated at 30 arranged along the ends of the car as well as on the sides adjacent to the ends.

My improved tripartite car end reenforcement or inverted tripodal bracing provides a cantilever construction from body bolster out to the end of the car with compression strains being transmitted to the center beam of the car underframe, whereby both side sills and the side plates are held and supported; while the corner plates 28 in reality act as suspension members or links to hold up the corners of the car; the bracing offering proper resistance to the load thrusts, transferring the shocks to the structural members of the car underframe; that is to say, my improved bracing serves a threefold purpose, namely providing a very strong end construction;—providing a diagonal bracing which prevents the sides of the car from spreading;—and acting as a cantilever whereby the sides of the car are prevented from drooping down from the bolster toward the ends of the car, as the tripartite bracing or cantilever rests on or is secured to the car underframe.

I have shown and described what I believe to be simple adaptations of my invention, which has been described in terms employed merely as terms of description and not as terms of limitation, as structural modifications may be made without, however, departing from the spirit of my invention.

What I claim is:—

1. In a composite wood and steel car construction, provided with a striking casting, an inverted tripod brace whereby the compression strains are transmitted to the longitudinal center sill of the car underframe, said brace consisting of a metal plate disposed vertically at the center of the car end wall, and a pair of metal plates disposed diagonally upward from the lower end of the first mentioned plate, the lower ends of the three plates being arranged in lapping relation intermediate of the car end sill and the striking casting at the longitudinal center line of the car, with said lower ends and the striking casting being secured to the car underframe, while the upper ends of the three plates are secured to the top reenforcing member of the car, and suspension members disposed about the corners of the car body in lapping relation with the upper ends of the diagonally arranged plates, while the lower ends are secured to the side and end sills of the car.

2. In a composite wood and steel car construction, the combination of a striking casting, with a tripartite brace composed of a metal plate arranged rearward of the striking casting at the center of the car end wall while the upper end is secured to the top reenforcing member of the car, a pair of diagonally arranged plates extending upwardly from the lower end of the first mentioned plate to the upper corners of the car end, all of said plates being provided with outwardly disposed rigidifying surfaces arranged lengthwise of said plates intermediate of the longitudinal edges of the plates, the lower ends of the three plates being in lapping relation rearward of the striking casting and riveted to the car underframe by the rivets which secure the striking casting in place whereby said rivets are placed in double shear, and metallic corner posts disposed about the corners of the car, with the upper ends in lapping relation with the di-

agonal plates and secured to the top reenforcing member of the car while the lower ends of the corner posts are secured to the sides and end sills of the car underframe to constitute suspension members.

3. In combination with the top reenforcing member about the upper end of a car body and the striking block or casting at the longitudinal center line of the car, a metallic car-end bracing comprising a vertically disposed member secured at top to said reenforcing member while the lower end is arranged rearward of the striking block or casting, and a pair of upwardly diverging members extending from said striking casting toward said top reenforcing member adjacent to the sides of the car body, the lower ends of the upwardly diverging members being arranged in lapping relation with the first member rearward of the striking casting, the lower ends of the three members and the striking casting being riveted to the car end sill and to the longitudinal center sill of the car underframe.

4. In the end construction of a composite car provided with a top reenforcing member and a striking casting at the longitudinal center line of the car, a tripartite brace composed of vertically and upwardly diverging members, each provided with a longitudinal rib along the longitudinal center of the member and tapering at the ends so as to provide flat ends for said members, the lower ends of all of said members being arranged in lapping relation and secured to the car underframe rearward of the striking casting while the upper ends are secured to the top reenforcing member.

HOMER W. WILLIAMS.