Oct. 16, 1928. 1,688,133

C. D. BONSALL

CAR WALL STRUCTURE

Filed Sept. 26, 1925

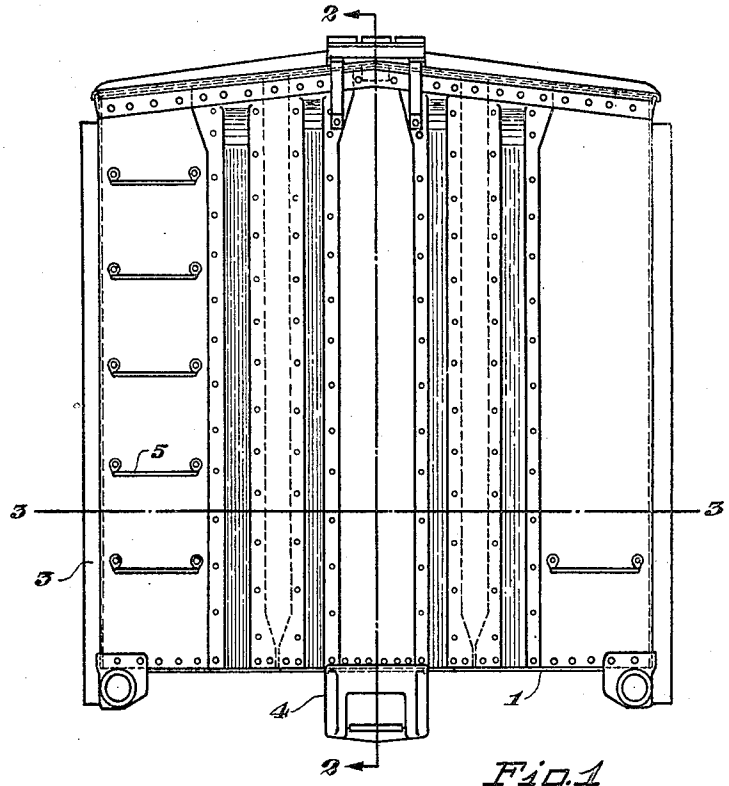


Fig. 1

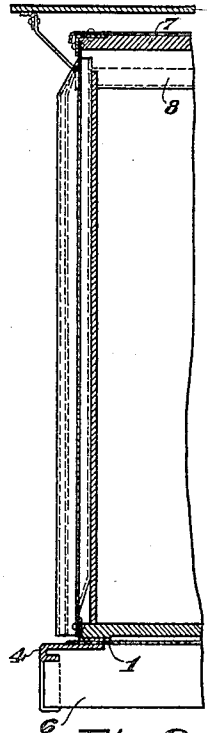


Fig. 2

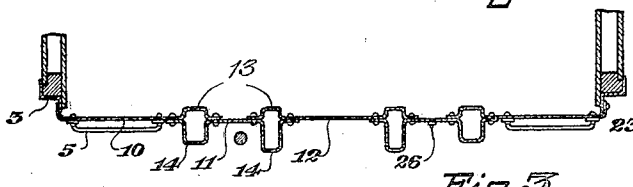


Fig. 3

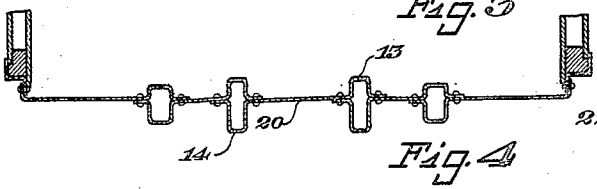


Fig. 4

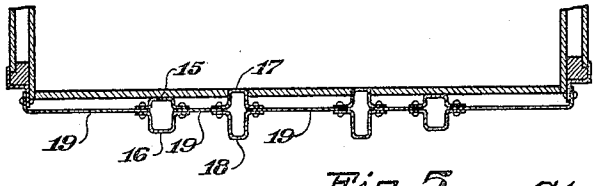


Fig. 5

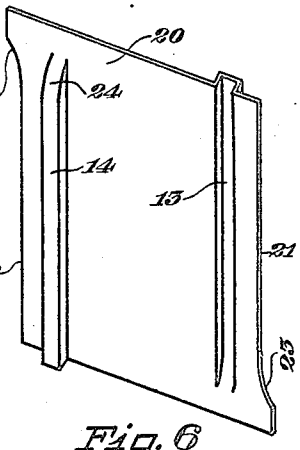


Fig. 6

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UNITED STATES PATENT OFFICE.

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CAR-WALL STRUCTURE.

Application filed September 26, 1925. Serial No. 58,845.

My invention has for its object to provide in all metal car construction of novel character which is unusually strong for its weight and durable throughout, which may be conveniently and economically manufactured and transported, is weather proof and which possesses certain other desirable and advantageous features to be hereinafter described and claimed. My sheet metal wall structure is applicable to the end or side of box, automobile, gondola, stock or any other type of railway car equipment.

The ends of railway cars are subject to considerable stress due to the shifting of the lading. These blows are imparted to the end over the entire area thereof, or to local areas. Wheat is loaded to substantially the top of the car which causes all the blow to be imparted over the entire area of the end. Lumber is loaded to the top and upon impact the top boards shift causing a blow to be imparted at the top of the end. Sand, chats and other plastic loads and light pipe cause blows at the middle of the car, whereas rail, steel plates, castings and the like cause blows at the bottom of the car.

While, of course, efforts are made to block the lading in the car, the heavy locomotives, the emergency air brake and the classification hump break the lading away from its moorings and throw it against the end of the car.

A rigid end to a car, and particularly a large box car, materially strengthens the entire superstructure to resist the torsional and weaving movements which not only rack the car to pieces, but causes leaky roofs and inoperative and leaky doors with their consequent damage claims. As it costs as much to transport a ton of freight car as it does a ton of lading it is imperative that the weight of the car must be kept as low as possible, therefore, the end must be very light as well as strong. As freight cars are frequently damaged in wrecks and by other unfair usage, any end will be damaged in service, therefore, it must be capable of being easily repaired with such meagre facilities as the railroads are equipped with at their outlying repair points.

My wall is made of one or more metallic plates with their meeting sides overlapped and secured together, the overlapped portions being formed to provide members which act as columns to sustain the roof load, as beams to resist the thrust of the lading and as stiffeners to prevent buckling of the wall. These beam-columns are so formed as to provide ventilators or flues from the exterior to the interior of the car. Such ventilation is desirable because it prevents the condensation of moisture in the air within the car, which would injure some types of lading.

An object of the invention is to form the overlapped portions of the metallic plates of a railway car wall so as to provide a beam-column which also furnishes means of ventilation for the car.

The Interstate Commerce Commission has prescribed the minimum clearances between freight cars in their order of March 13, 1911, which reads as follows:

"No part of car above end-sills within thirty (30) inches from side of car, except buffer-block, brake-shaft, brake-wheel, brake-step, running-board or uncoupling lever shall extend to within twelve (12) inches of a vertical plane parallel with end of car and passing through the inside face of knuckle when closed with coupler-horn against the buffer-block or end-sill, and no other part of end of car or fixtures on same above end-sills, other than exceptions herein noted, shall extend beyond the outer face of buffer-block".

Any reinforcement in the wall not "within thirty (30) inches from the sides of the car" may extend to the face of the buffer block. An object of the invention is to take advantage of this condition and to make the beam-columns deeper near the middle of the car than "within thirty (30) inches from the side of the car".

The outer corrugated plate prevents rain, falling cinders or the like from entering the flues and the inner corrugated plate prevents sand, grain or similar lading from escaping from the car through the flue.

Another object of the invention is to arrange the lining boards so as to permit of a deeper beam-column near the middle of the car than elsewhere.

Another object of the invention is to provide primary reinforcements extending substantially from the underframe to the ridge pole or other roof framing, which members form excellent anchorage means and also to

provide other secondary reinforcements parallel to and spaced apart form the primary reinforcements. These reinforcements vary in depth and width according to conditions.

I have used the terms "plates" and "sheets" to simplify the claims, but there is no difference in their meaning as far as this invention is concerned.

These reinforcements or corrugations may be rectangular, as illustrated, or circular, or of any other desired contour.

In the drawings:

Fig. 1 shows the end of a railway car with my improved wall applied thereon.

Fig. 2 is a section on line 2—2 of Fig. 1

Fig. 3 is a section on line 3—3 of Fig. 1.

Fig. 4 shows a modified form.

Fig. 5 shows a modified form.

Fig. 6 is a perspective view of one of the plates.

For convenience, I have shown an end wall of a box car wherein 1 is the end sill; 2 the end plate; 3 the corner post; 4 the buffer block; 5 the end ladder; 6 the underframe; 7 the ridge pole and 8 the side plate.

The wall comprises a plurality of metallic plates 10, 11 and 12, some of which have one or more inwardly projecting corrugations 13 which terminate within the lower edge but extend to the upper edge of the plate and others of which have one or more outwardly projecting corrugations 14 which terminate within the upper edge but extend to the lower edge of the plate. These corrugations are positioned opposite each other and the plates are secured together on both sides of the corrugations so as to form a box girder. The corrugation 14 on the outside of the wall is open at the bottom and closed at the top, while the corrugation 13 on the inside of the wall is of reverse formation, i.e.; closed at the bottom and open at the top, thus forming a ventilating communication between the exterior and interior of the car.

The wall may be made of a pair of corrugated plates 15—16 or 17—18 each having a small flange on each side of the corrugation, which flanges are secured together to form a beam-column and flat plates 19 are inserted between the flanges and spans the distance between the respective beam-columns. Such a construction is shown in Fig. 5.

It may be desirable to form a corrugation near each side of a plate and position such corrugated plates with oppositely projecting corrugations in the overlapped portions of adjacent plates. Such a construction is shown in Fig. 3.

It may be desirable to form the plate (20) with an inwardly projecting corrugation 13 near one edge and an outwardly projecting corrugation 14 near the other edge and position such plates with oppositely projecting corrugations in the overlapped portions of adjacent sheets. Such a construction is shown in Fig. 4.

Fig. 6 shows one of the plates 20 of the construction illustrated in Fig. 4 wherein the corrugation 13 near the side 21 of the plate terminates within the lower edge but extends to the upper edge of the plate, and the corrugation 14 near the other side 22 of the plate terminates within the upper edge but extends to the lower edge of the plate.

The other corrugations may be made equal in strength to the middle corrugations by increasing their width.

The pressing of such corrugations or ribs in a metallic plate causes the plate to flare out (23) adjacent the termination 24 of the corrugation commensurate with the depth and length of the termination. I prefer not to shear off this flare but to utilize it to obtain greater riveting area, as shown in Fig. 1.

The filler blocks or nailing strips 27 are of the same depth as the inwardly projecting corrugations so that the lining boards 25 bear against and are supported by these corrugations. The nailing strips are held in place by bolts 26.

The accompanying drawings illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof within the scope of the claims will occur to persons skilled in the art.

I claim:

1. In a wall for a railway car, a metallic plate having an inwardly projecting corrugation formed therein which terminates within the lower edge but extends to the upper edge of the plate, and a metallic sheet having an outwardly projecting corrugation formed therein which terminates within the upper edge but extends to the lower edge of the sheet, said corrugations being positioned opposite to each other.

2. In a wall for a railway car, a metallic plate having an inwardly projecting corrugation formed therein which terminates within the lower edge but extends to the upper edge of the plate, and a metallic sheet having an outwardly projecting corrugation formed therein which terminates within the upper edge but extends to the lower edge of the sheet, said corrugations being positioned opposite to each other, one of said corrugations being deeper than the other.

3. In a wall for a railway car, a metallic plate having an inwardly projecting corrugation formed therein which terminates within the lower edge but extends to the upper edge of the plate, and a metallic sheet having an outwardly projecting corrugation formed therein which terminates with-

in the upper edge but extends to the lower edge of the sheet, said corrugations being positioned opposite to each other, said plate and sheet being secured together on both sides of the corrugations.

4. A wall for a railway car comprising a plurality of metallic plates formed with a corrugation near each opposite side thereof, some of the corrugations of the wall projecting inwardly and terminating within the lower edge of the plate but extending to the upper edge of the plate, other corrugations of the wall projecting outwardly and terminating within the upper edge of the plate but extending to the lower edge of the plate, said plates positioned with oppositely projecting corrugations in the overlapped portions of adjacent sheets.

5. A wall for a railway car comprising a plurality of metallic plates formed with a corrugation near each opposite side thereof, some of the corrugations of the wall projecting inwardly and terminating within the lower edge of the plate but extending to the upper edge of the plate, other corrugations of the wall projecting outwardly and terminating within the upper edge of the plate but extending to the lower edge of the plate, said plates positioned with oppositely projecting corrugations in the overlapped portions of adjacent sheets, some of said corrugations being deeper than others.

6. A wall for a railway car comprising a plurality of metallic plates formed with a corrugation near each opposite side thereof, some of the corrugations of the wall projecting inwardly and terminating within the lower edge of the plate but extending to the upper edge of the plate, other corrugations of the wall projecting outwardly and terminating within the upper edge of the plate but extending to the lower edge of the plate, said plates positioned with oppositely projecting corrugations in the overlapped portions of adjacent sheets, the outwardly projecting corrugations being deeper than the inwardly projecting corrugations.

7. A wall for a railway car comprising a plurality of metallic plates formed with a corrugation near each opposite side thereof, some of the corrugations of the wall projecting inwardly and terminating within the lower edge of the plate but extending to the upper edge of the plate, other corrugations of the wall projecting outwardly and terminating within the upper edge of the plate but extending to the lower edge of the plate, said plates positioned with oppositely projecting corrugations in the overlapped portions of adjacent sheets, the outwardly projecting corrugations near the middle of the wall being deeper than the other outwardly projecting corrugations.

8. A wall for a railway car comprising a plurality of metallic plates formed with a corrugation near each opposite side thereof, some of the corrugations of the wall projecting inwardly and terminating within the lower edge of the plate but extending to the upper edge of the plate, other corrugations of the wall projecting outwardly and terminating within the upper edge of the plate but extending to the lower edge of the plate, said plates positioned with oppositely projecting corrugations in the overlapped portions of adjacent sheets and secured together on both sides of the corrugations.

9. A wall for a railway car comprising a plurality of metallic plates formed with a corrugation near each opposite side thereof, some of the corrugations of the wall projecting inwardly and terminating within the lower edge of the plate but extending to the upper edge of the plate, other corrugations of the wall projecting outwardly and terminating within the upper edge of the plate but extending to the lower edge of the plate, said plates positioned with oppositely projecting corrugations in the overlapped portions of adjacent sheets and secured together on both sides of the corrugations, some of said corrugations being deeper than others.

10. A wall for a railway car comprising a plurality of plates, each plate having an inwardly projecting corrugation formed therein near one vertical edge which terminates near the bottom edge but extends to the top edge of the plate, and an outwardly projecting corrugation formed therein near the opposite vertical edge which terminates near the top edge but extends to the bottom edge of the plate, said plates positioned with oppositely projecting corrugations in the overlapped portions of adjacent plates.

11. A wall for a railway car comprising a plurality of plates, each plate having an inwardly projecting corrugation formed therein near one vertical edge which terminates near the bottom edge but extends to the top edge of the plate, and an outwardly projecting corrugation formed therein near the opposite vertical edge which terminates near the top edge but extends to the bottom edge of the plate, said plates positioned with oppositely projecting corrugations in the overlapped portions of adjacent plates, some of said corrugations being deeper than others.

12. A wall for a railway car comprising a plurality of plates, each plate having an inwardly projecting corrugation formed therein near one vertical edge which terminates near the bottom edge but extends to the top edge of the plate, and an outwardly projecting corrugation formed therein near the opposite vertical edge which terminates near the top edge but extends to the bottom edge of the plate, said plates positioned with oppositely projecting corrugations in the overlapped portions of adjacent plates, the

outwardly projecting corrugations being deeper than the inwardly projecting corrugations.

13. A wall for a railway car comprising a plurality of plates, each plate having an inwardly projecting corrugation formed therein near one vertical edge which terminates near the bottom edge but extends to the top edge of the plate, and an outwardly projecting corrugation formed therein near the opposite vertical edge which terminates near the top edge but extends to the bottom edge of the plate, said plates positioned with oppositely projecting corrugations in the overlapped portions of adjacent plates, the outwardly projecting corrugations near the middle of the wall being deeper than the other outwardly projecting corrugations.

14. A wall for a railway car comprising a plurality of plates, each plate having an inwardly projecting corrugation formed therein near one vertical edge which terminates near the bottom edge but extends to the top edge of the plate, and an outwardly projecting corrugation formed therein near the opposite vertical edge which terminates near the top edge but extends to the bottom edge of the plate, said plates positioned with oppositely projecting corrugations in the overlapped portions of adjacent plates and secured together on both side of the corrugations.

15. A wall for a railway car comprising a plurality of plates, each plate having an inwardly projecting corrugation formed therein near one vertical edge which terminates near the bottom edge but extends to the top edge of the plate, and an outwardly projecting corrugation formed therein near the opposite vertical edge which terminates near the top edge but extends to the bottom edge of the plate, said plates positioned with oppositely projecting corrugations in the overlapped portions of adjacent plates and secured together on both sides of the corrugations, some of said corrugations being deeper than others.

16. A metallic plate for a railway car wall having a corrugation formed therein adjacent one side thereof which terminates near one end but extends to the opposite end of the plate, and an oppositely projecting corrugat on formed adjacent the opposite side of the plate which terminates near one end but extends to the opposite end of the plate, the first mentioned corrugation terminating near the opposite end of the plate to that of the last mentioned corrugation.

17. A metallic plate for a railway car wall having a corrugation formed therein adjacent one side thereof which terminates near one end but extends to the opposite end of the plate, and an oppositely projecting corrugation formed adjacent the opposite side of the plate which terminates near one end but extends to the opposite end of the plate, the first mentioned corrugation terminating near the opposite end of the plate to that of the last mentioned corrugation, one of said corrugations being deeper than the other.

CHARLES DAVID BONSALL.