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RAILWAY CAR CONSTRUCTION

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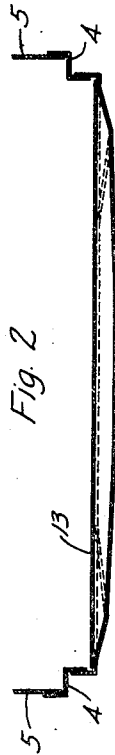


Fig. 2

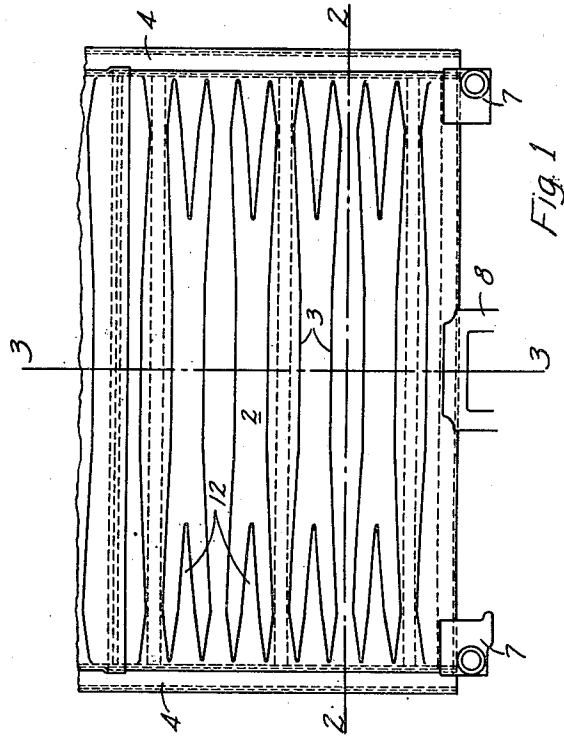


Fig. 1

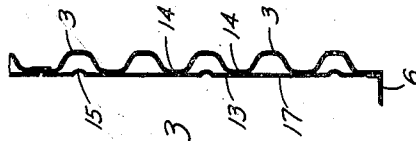


Fig. 3

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# UNITED STATES PATENT OFFICE

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## RAILWAY CAR CONSTRUCTION

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4 Claims. (Cl. 189—34)

The invention relates to railway cars, and more particularly to cars in which the walls comprise one or more corrugated metallic plates. This construction is commonly used for the end walls of railway freight cars but the invention also applies to cars in which this construction is used for side walls, roof and floor.

The object of the invention is to provide a smooth interior metallic surface in a car and also to provide a method of securing the sheet comprising said surface to the outer corrugated plate so as to prevent buckling of said sheet. When a thin sheet is secured to a relatively rigid body which is, in the case illustrated, the corrugated plate comprising the end wall of the car, said sheet has a tendency to buckle due to local heating caused by welding and, due to various local deformations caused by said welding process. It is an object of this invention to provide a plurality of corrugations in said thin sheet so that expansion and contraction of said corrugations will occur instead of buckling of said sheet.

The corrugated plates comprising the end wall of a car are usually designed to be very resilient in order to act as cushions which absorb the shocks, due to shifting of the lading when the car starts or stops suddenly. As the corrugated plate absorbs the shock of the shifting load it is deflected outwardly at the position struck in a way commonly called bowing out.

Another object of the invention is to prevent tearing of the smooth interior sheet when the end wall is thus bowed out.

In the drawing:

Fig. 1 shows a partial end elevation of a railway box car.

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

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

The drawing shows my invention applied to a railway box car in which the end wall comprises a metallic plate 2 provided with a plurality of substantially horizontal corrugations 3 extending between the corner posts 4. Other usual parts of a car are shown, such as side sheathing 5; end sill 6; corner casting 7 and striking casting 8. The corrugations 3 in the end plate 2 preferably divide into a larger number of preferably shallower corrugations 12 adjacent the corner posts 4, thus providing an end wall of great strength and resilience.

A substantially flat metallic sheet 13 of preferably thinner material than the corrugated plate 2 is positioned against and secured to the tops of the inwardly projecting corrugations 14 in the end plate 2. The sheet 13 may be secured to the

corrugated plate 2 by any means, but preferably by spot welds at intervals along the horizontal line of major corrugations 14. A plurality of horizontal minor corrugations 15 extending between the opposite edges of said thin sheet 13 are pressed therein. It is intended that the minor corrugations 15 be relatively small so that the sheet 13 is substantially flat, thus providing a smooth interior surface for the wall. Each minor corrugation 15 is positioned opposite a major corrugation 3 in the end wall plate preferably and projects within said major corrugation 3. The drawing illustrates each minor corrugation 15 opposite a major corrugation 3, but it is not intended that the invention comply strictly with this arrangement. It may be necessary to employ only half the number of minor corrugations 15 shown or even fewer. It is the purpose of the invention to provide as many of said minor corrugations 15 as are required to prevent buckling of said thin sheet 13.

When the end 2 is bowed out the position assumed by the plate 13 requires that it be of somewhat greater length than when in the original flat position. This increase in length would likely tear the thin sheet 13 if said sheet were not provided with the corrugations 15 to relieve the stress caused by said bowing out.

It is particularly important that the sheet 13 not be secured to the corner posts 4. When the end is bowed out that portion of the end wall corrugated plate 2 adjacent the corner posts 4 functions as a vertical rib which expands and contracts as the deflection of the end varies. If the sheet 13 were secured to said corner posts 4 it would tend to restrict the above mentioned relative movement between end plate 2 and corner posts 4, but since the sheet 13 is of thin material it does not have sufficient strength to restrict said movement and would be torn. It is for this reason that the sheet 13 is not secured to the corner posts 4.

It is intended that the smooth sheet 13 be of such thickness that it does not materially increase the strength of the corrugated plate 2 nor decrease its resilience. Its function is primarily that of a smooth metal lining.

The accompanying drawing illustrates 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. A wall structure for a railway car comprising a metallic plate extending between and secured to spaced apart frame members, said plate being  
 5 formed with major corrugations which function as beams between said frame members and a relatively thin substantially flat metallic sheet  
 10 formed with a plurality of minor corrugations substantially parallel to the major corrugations, said sheet being attached to said plate on the  
 15 inside thereof and unattached to said frame members, whereby said sheet provides a smooth interior surface for said wall and does not materially reduce the resiliency of the corrugated wall plate under beam action.

2. A wall structure for a railway car comprising a metallic plate extending between and secured to spaced apart frame members, said plate being  
 20 formed with major corrugations which function as beams between said frame members and a relatively thin substantially flat metallic sheet  
 25 formed with a plurality of minor corrugations extending to the opposite edges of the sheet and positioned substantially parallel to the major  
 30 corrugations, said sheet being attached to said plate on the inside thereof and unattached to said frame members, whereby said sheet provides a smooth interior surface for said wall and does not materially reduce the resiliency of the corrugated wall plate under beam action.

3. A wall structure for a railway car comprising a metallic plate extending between and secured to spaced apart frame members, said plate being

formed with major corrugations which function as beams between said frame members and a relatively thin substantially flat metallic sheet formed with a plurality of minor corrugations extending to the opposite edges of the sheet and  
 5 positioned substantially parallel to the major corrugations, each of said minor corrugations being opposite one of said major corrugations, said sheet being attached to said plate on the inside  
 10 thereof and unattached to said frame members, whereby said sheet provides a smooth interior surface for said wall and does not materially reduce the resiliency of the corrugated wall plate under beam action.

4. A wall structure for a railway car comprising a metallic plate extending between and secured to spaced apart frame members, said plate being  
 15 formed with major corrugations which function as beams between said frame members and a relatively thin substantially flat metallic sheet  
 20 formed with a plurality of minor corrugations extending to the opposite edges of the sheet and positioned substantially parallel to the major corrugations, each of said minor corrugations projecting into one of said major corrugations, said  
 25 sheet being attached to said plate on the inside thereof and unattached to said frame members, whereby said sheet provides a smooth interior surface for said wall and does not materially reduce the resiliency of the corrugated wall plate  
 30 under beam action.

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