Dec. 4, 1945. J. S. SWANN 2,390,472

WALL STRUCTURE

Filed July 17, 1944

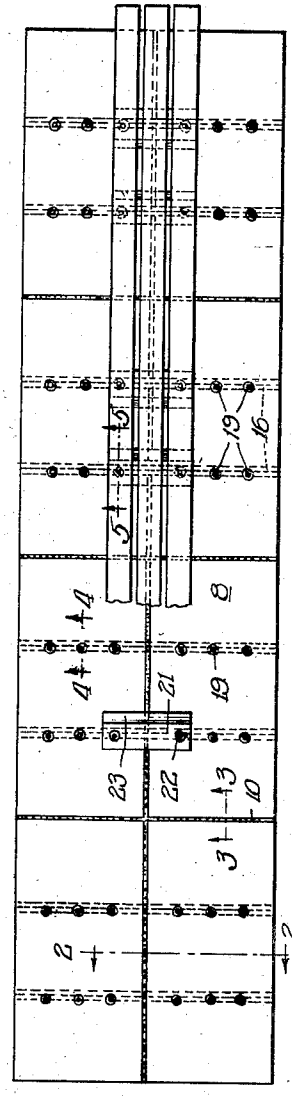


Fig. 1.

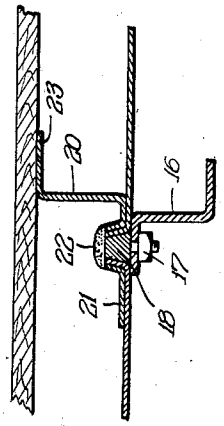


Fig. 5

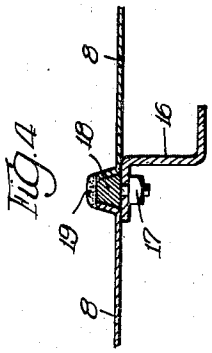


Fig. 4

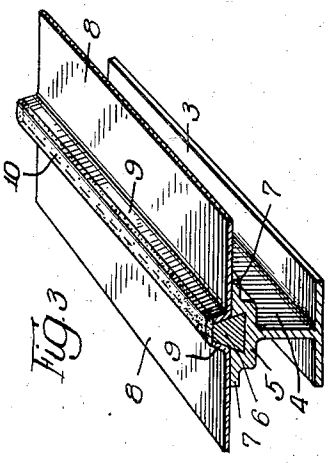


Fig. 3

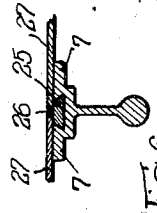


Fig. 6

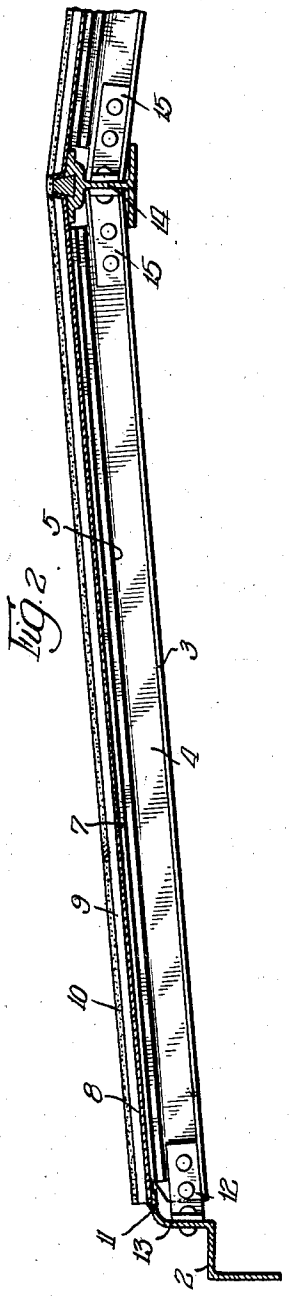


Fig. 2

INVENTOR.
James S. Swann,
BY
Antonio Fabisson.
Atty.

Patented Dec. 4, 1945 2,390,472

UNITED STATES PATENT OFFICE

2,390,472

WALL STRUCTURE

James S. Swann, Homewood, Ill., assignor to Standard Railway Equipment Manufacturing Company, Chicago, Ill., a corporation of Delaware

Application July 17, 1944, Serial No. 545,218

10 Claims. (Cl. 108—5.4)

This invention relates to railway car construction and particularly to welded car roofs of the types wherein the roof sheets extend from side plate to side plate of the car and are connected along their adjacent margins by upstanding seams having reinforcing members embodied therein and supported by a carline extending transversely of said car under said roof sheets. The invention may also be applicable to the walls or floors of railway cars or other structure.

The principal object of the invention is to provide means to secure treated steel plates to an aluminum post, carline or other stiffener.

A further object is to provide means to secure the edges of two adjacent plates together and to the aforesaid post, carline or other stiffener.

A still further object is to utilize such means to stiffen said aluminum post against deflection.

Another object of the invention is to provide a light weight relatively strong roof or wall adaptable for use in light weight cars capable of moving at high speeds.

Another object of the invention is to provide a carline or purlin of extruded aluminum reinforced by a steel member to furnish the additional rigidity required of a carline or purlin, said steel member having all surfaces save the upper surface thereof, aluminized, or treated with corrosion resisting material.

Other objects and advantages of the invention will appear in the following description thereof.

Referring now to the accompanying drawing wherein like reference characters indicate like parts;

Fig. 1 is a plan view of a portion of a car roof embodying my invention.

Fig. 2 is a enlarged transverse section through substantially one-half of the roof on line 2—2 of Fig. 1.

Fig. 3 is a section on line 3—3 of Fig. 1, and partial perspective view.

Fig. 4 is a section on line 4—4 of Fig. 1.

Fig. 5 is a longitudinal section on line 5—5 of Fig. 1 showing the manner of attaching the running board thereto.

Fig. 6 is a section through a carline or purlin showing the invention adapted to provide a flush exterior surface.

My invention contemplates a carline of extruded aluminum extending from side plate 2 to side plate 2 of the car. The carline is of substantially I-shape, with base flanges 3 extending laterally from the lower edge of the web 4, and a transverse portion 5 in the upper surface of which head portion is formed a longitudinally extending dove-tailed or interlocking channel in which is snugly fitted a correspondingly shaped steel insert member 6 which is aluminized on all surfaces save the top surface thereof for reasons which will hereinafter appear. Lateral flange-like portions 7 extend outwardly from said channel to support the edges of the roof sheets 8 which extend thereover and are bent upwardly forming the flanges 9 which bear against the tapered sides of the member 6. The roof sheets 8 are also aluminized excepting along the edges of the flanges 9. Welding material 10 is run along the top of the reinforcing member 6 and adjacent edges of the flanges 9 thereby securing the sheets to the member 6, which in turn is dovetailed to the carline mamber, thereby providing a positive securing of the parts together with no surfaces not aluminum, or at least aluminized, exposed to the weather. The upper surface of the member 6 and edges of the flanges 9 are not aluminized or otherwise treated in order to leave a surface better adaptable for welding. The side plates 2 are of substantially W-section, as indicated in Fig. 2, and the ends of the roof sheets 8 are secured by welding to the upper slightly upwardly inclined flange 11 of said side plate, said welding being preferably continuous to form a seal. The steel insert 6 is also preferably secured to the flange 11 of said side plate. Angle brackets 12 are secured as by riveting to the ends of the web portion 4 of the carline and to the vertical portion 13 of the side plate to form a rigid support for the carline and roof sheets.

A similarly constructed purlin 14 forming the ridge of the car roof is provided, and angle brackets 15 are secured as by riveting to the inner ends of the webs 4 of the carline and to the webs of the purlin to thereby rigidly support said inner ends of said carlines. The purlin, of course, extends centrally from end to end of the car.

To reinforce the roof sheets I have provided a plurality of Z-bars 16 of aluminum or aluminized steel positioned transversely of the car and intermediate each pair of carlines. The upper horizontal flange of each Z-bar 16 is provided with a plurality of spaced holes into each of which an aluminized metal bolt 17 is placed, said bolts 17 having truncated conically shaped heads 18, the upper surface of which is preferably not aluminized. Correspondingly spaced boss punched holes are formed in the roof sheets 8, the flanges about the edges of which holes fit over the conical head of said bolts, and the top of said

head and edge of said flange are welded together, as at 19.

To support a running board longitudinally of the center of the car I have provided Z-shaped brackets 20, one horizontal flange 21 of which is boss punched to fit over the boss punching of the roof sheet and bolt head, and welded thereto, as shown at 22, Fig. 5. The running board is secured to the upper horizontal flange 23 of the bracket 20.

A roof of such construction has several advantages. It is exceptionally light in weight; the bending moment or moment of elasticity of the aluminum carline is reinforced or strengthened by the steel reinforcing member and when completely assembled and welded together provides a strong, rigid, light-weight roof, capable of withstanding the shocks and strains of increased speeds of trains to which it may be subjected. Furthermore, all corrosive surfaces of the reinforcing member or bolt are completely covered from the elements.

In constructing a car with my invention the four walls, purlins and carlines (with insert) are erected. The roof sheets are then applied and welded as heretofore described. Conversely, the roof sheets may be removed by simply removing the welding around the individual sheet to be removed, which is a material advantage in case of repair.

In Fig. 6, the structure of the carline or purlin is substantially identical to that shown in Fig. 3, excepting that the upper surface of the steel insert 25 is flush with the upper surfaces of the lateral roof sheet supporting flanges 7 so that the welding material 26 secures the edges of the roof sheets 27—27 together and to the steel insert 25, thus providing a smooth exterior surface for the structure. Such smooth exterior surface may be preferable when the invention is used as a car roof or as a floor or wall.

It will be noted too that in this modification plain flat sheets are used.

In railway car construction a function of the roof is to resist the stresses caused by the service movements of the car which tend to distort the car body. Such stresses may cause the side plates to come together or spread, or cause one side plate to move longitudinally ahead of the other. When the invention is used as a car roof I prefer to use the construction shown in Fig. 3 so that the flanges 9 of the roof sheets transmit the aforesaid stresses to the insert 6 and thence to the carline (or purlin) independently of the welding 10. Where the invention is used as a light wall or partition I prefer to use the construction shown in Fig. 6.

Wherever the term or terms "aluminum," "aluminized," or "corrosion resisting material" is used in the specification or claims, it is intended to include any corrosion resisting material, either solid, as of copper, aluminum or the like, or surface treated material, such as cadmium coated, copper clad, bonderized, etc.

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 comprising an aluminum member having a channel formed in the upper surface thereof, a corrosive metallic insert shaped to be interlockingly held within said channel to thereby reinforce said member and projecting above said upper surface, aluminized roof sheets provided with side flanges abutting the sides of the projecting portion of said insert, and welds uniting the upper surface of said insert and adjacent edges of the flanges of said roof sheets together, whereby said insert is entirely surrounded by said member and said roof sheets and welds and thereby protected against corrosion.

2. A wall comprising an aluminum member having a dovetailed channel formed in the upper surface thereof, a correspondingly dovetailed corrosive steel insert within said channel to thereby reinforce said member and having a portion projecting above said upper surface, aluminized roof sheets provided with side flanges abutting the sides of the projecting portion of said insert, and welds uniting the upper surface of said insert and adjacent edges of the flanges of said roof sheets together, whereby said insert is entirely surrounded by said member and said roof sheets and welds and thereby protected against corrosion.

3. A wall comprising an aluminum member having a channel formed in the upper surface thereof, and a corrosive steel insert shaped to be interlockingly held within said channel to thereby reinforce said member and adapted for welding to adjacent edges of roof sheets, aluminized roof sheets overlapping said insert, and welds uniting the upper surface of said insert and adjacent roof sheets together, whereby said insert is entirely surrounded and thereby protected against the corrosive action of the elements.

4. A wall comprising a member formed of aluminum material having an upper surface adapted to support roof sheets, corrosive steel means having tapered sides secured to said upper surface to reinforce said member and extending upwardly therefrom for securing roof sheets to said member, roof sheets provided with upwardly inclined flanges abutting the inclined sides of said means, said means having all surfaces thereof save the upper surface treated with corrosion resisting material, and welds securing said upper surface of said means and edges of said flanges of said roof sheets together, whereby said welds protect said upper surface from corrosion.

5. A wall comprising a member formed of aluminum material having an upper surface adapted to support roof sheets, corrosive steel means having tapered sides secured to said upper surface to reinforce said member and extending upwardly therefrom for securing roof sheets to said member, roof sheets treated with corrosion resisting material provided with upwardly inclined flanges having untreated edges to facilitate welding, said flanges abutting the inclined sides of said means, said means having all surfaces thereof save the upper surface treated with corrosion resisting material, and welds securing said upper surface of said means and edges of said flanges of said roof sheets together, whereby said welds protect said upper surface and the unprotected edges of said flanges from corrosion.

6. A member formed of extruded aluminum having a dovetailed channel formed in the upper surface thereof, and a correspondingly dovetailed steel insert interlockingly held within said channel to reinforce said member and adapted for welding to adjacent edges of roof sheets.

7. A member formed of aluminum material having an upper surface adapted to support roof sheets, steel means secured to said upper surface to reinforce said member and extending upwardly

therefrom for securing roof sheets to said member, said means having all surfaces thereof save the upper surface treated with corrosion resisting material, said untreated surface facilitating welding of roof sheets thereto.

8. A member formed of aluminum material having an upper surface adapted to support roof sheets, steel means secured to said upper surface to reinforce same and for securing roof sheets to said member, said means having all surfaces thereof save the upper surface treated with corrosion resisting material, said untreated surfaces facilitating welding of roof sheets thereto.

9. A wall comprising a member formed of extruded aluminum having an upper surface having a longitudinal channel formed therein, a corrosive metallic insert interlockingly secured in said channel to thereby reinforce said member, roof sheets treated with corrosion resisting material having their side edges abutting a surface of said insert, said insert having all surfaces thereof save the upper surface treated with corrosion resisting material, and welds securing said upper surface of said insert and edges of said roof sheets together, whereby said insert is entirely surrounded by said member and said roof sheets and welds and thereby protected against corrosion.

10. A wall comprising a member formed of aluminum material, steel means secured to a surface thereof to reinforce said member, wall sheets overlapping said surface of said member, and welds securing said wall sheets and steel means together, said member, wall sheets and welds being associated and arranged so as to entirely surround said steel means and thereby protect same against corrosion.

JAMES S. SWANN.