July 12, 1927. C. D. BONSALL 1,635,306

CAR ROOF

Filed Aug. 7, 1926 2 Sheets-Sheet 1

Fig. 1.

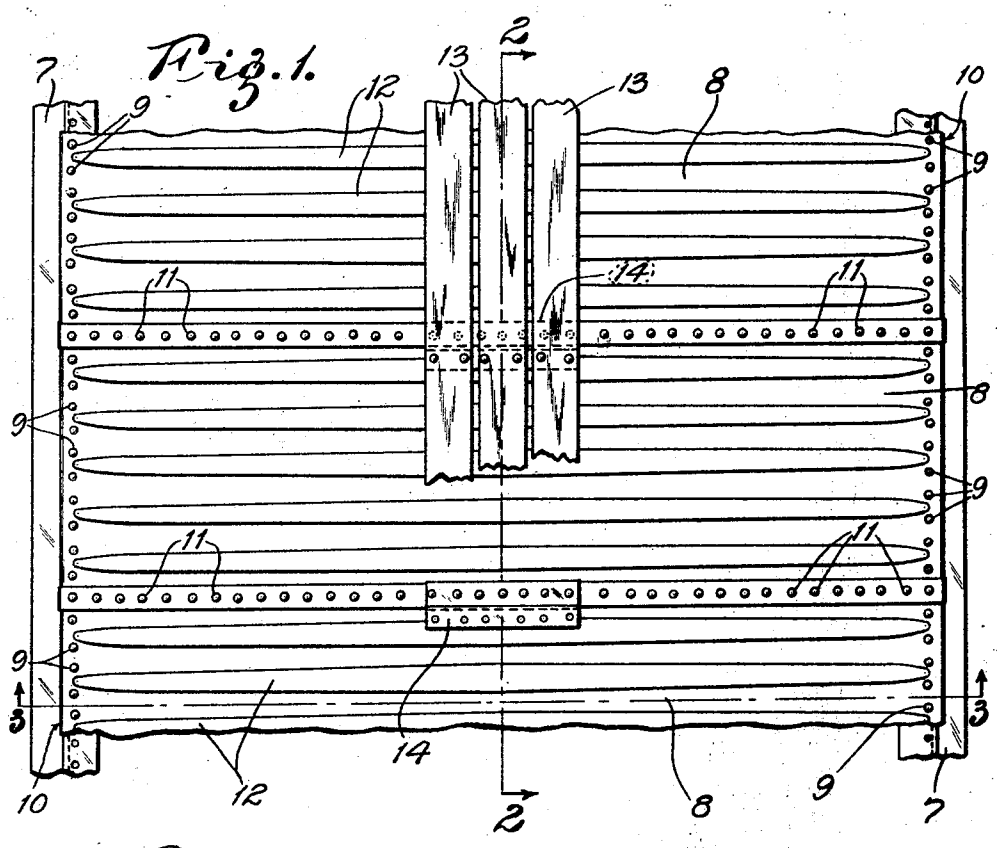


Fig. 2.

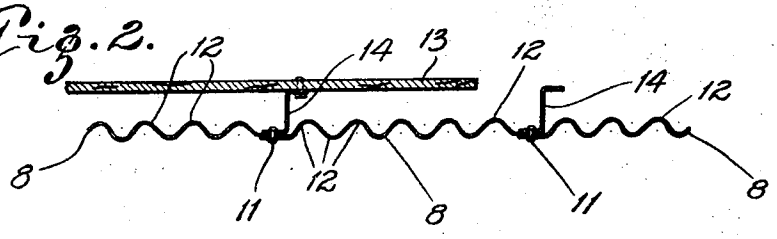
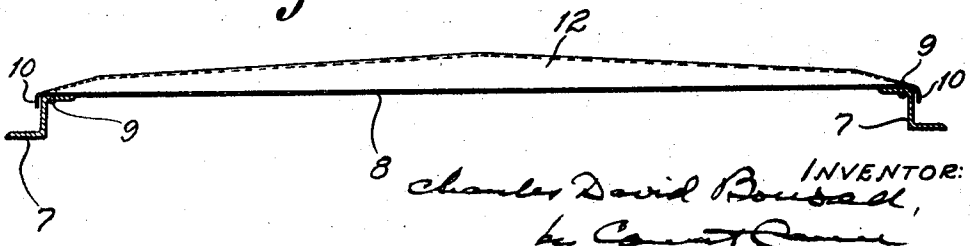


Fig. 3.



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CAR ROOF

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Fig. 4.

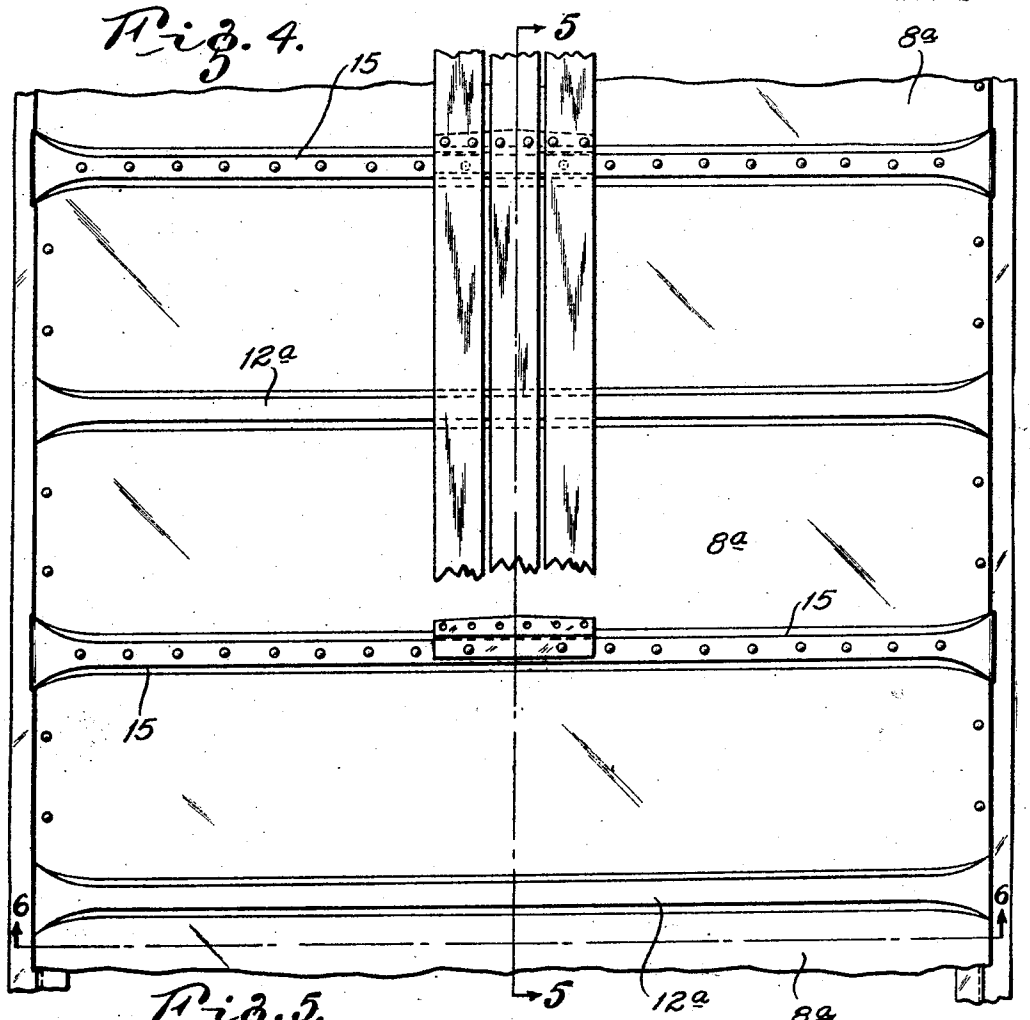


Fig. 5.

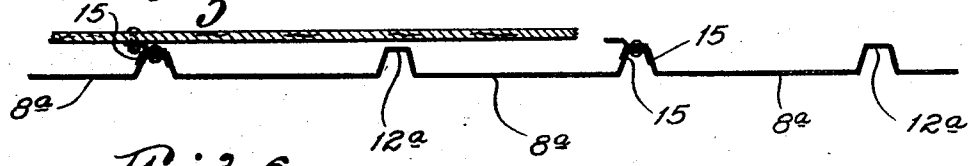
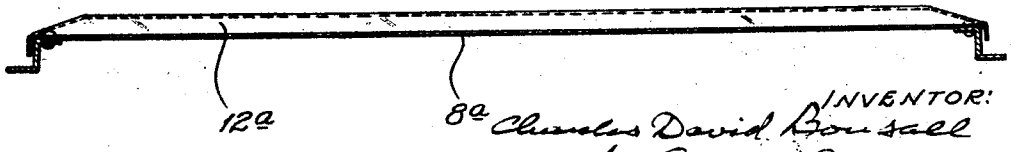


Fig. 6.



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Patented July 12, 1927. 1,635,306

UNITED STATES PATENT OFFICE.

CHARLES DAVID BONSALL, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO P. H. MURPHY COMPANY, OF NEW KENSINGTON, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

CAR ROOF.

Application filed August 7, 1926. Serial No. 127,782.

My invention relates to single-course metal car roofs of the type wherein self-supporting roof sheets span the car from side plate to side plate and are connected thereto and to each other.

It is well known that when a freight car is loaded with grain or the like, there is considerable pressure tending to bow out the side frames from end to end of the car; and car roofs have long been designed with reference to this tendency of the side frames to bow out. Heretofore, such tendency has been resisted by tie rods or by carlines or by deforming some portion of the sheet to function after the manner of a tie rod or a carline; but in all cases, the roof has been higher at the middle of the car than at the eaves, and this fact excluded the body portion of the sheet from functioning as a tie member. The principal object of the present invention is to devise a construction wherein the body of the roof sheet will function as a tie member for preventing the spreading of the side plates. Other objects are to reduce the weight of the roof, to simplify the construction thereof and to cheapen the cost of manufacture.

The invention consists principally in a car roof comprising a series of roof sheets whose body portions extend substantially straight from side to side of the car. The invention also consists in the parts and arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawings, which form part of this specification and wherein like symbols refer to like parts wherever they occur,

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

Fig. 2 is a section through the roof along the longitudinal center line thereof, said section being taken on the line 2—2 in Fig. 1;

Fig. 3 is a transverse cross section through the roof on the line 3—3 in Fig. 1;

Fig. 4 is a plan view of a modified roof construction;

Fig. 5 is a cross section taken along the longitudinal center line of the roof on the line 5—5 in Fig. 4; and

Fig. 6 is a transverse section on the line 6—6 in Fig. 4.

Referring to Figs. 1 to 3, inclusive, of the accompanying drawings, my invention is shown applied to a car comprising side plates 7 of substantially Z-shaped cross section which are preferably arranged with their webs vertical and with their top flanges extending inwardly and their bottom flanges extending outwardly. Metal roof sheets 8 extend in a substantially straight line from side plate to side plate of the car and are supported on and rigidly secured, preferably by rivets 9, to the inwardly extending top flanges of the Z-bar side plates. The eaves ends of the sheets are provided with depending eaves flanges 10 that overhang the vertical webs of the side plates; and the side marginal portions of adjacent sheets are lapped and rigidly secured together by rivets 11. The portions of the sheets between their lapped side margins are preferably provided with upstanding corrugations or hollow stiffening ribs 12 that extend transversely of the car from end to end of the sheets where they merge into the plane of the main body portions thereof. As shown in the drawing, the stiffening ribs are made deeper and wider at the longitudinal center line of the car than at the side plates, thereby increasing the load carrying capacity of the ribs along the longitudinal center line of the roof. Running boards 13 extend longitudinally of the car midway between the side plates and rest on and are rigidly secured to the lateral top flanges of Z-shaped running board saddles 14, whose lateral base flanges rest on and are rigidly secured to the roof sheets at their over-lapped side margins.

As shown in Fig. 2 of the accompanying drawing, the main body portions of the sheets are disposed in a substantially horizontal plane; that is, said body portions of said sheets extend substantially straight from side plate to side plate of the car. The principal advantage of such sheets is that their flat base or body portions act as straight tie members to prevent spreading of the side plates, while their upstanding stiffening ribs act as struts to prevent movement of the side plates toward each other and as beams to increase the vertical load carrying capacity of the roof. Other advantages of the ribbed flat sheet over the pitched sheets of previous roof constructions are that such ribbed flat sheet is better adapted for die pressing; it requires less metal; it can be pressed with cheaper dies;

it is better adapted for stacking or piling; it requires less space in shipping; it is easy to handle and can be readily assembled on the car.

In the modified roof construction shown in Figs. 4 to 6, inclusive, the roof sheets 8^a have flat body portions that extend in a straight line from side plate to side plate and are provided along their adjacent side margins with hollow upstanding seam flanges or ribs 15 that are lapped and riveted together to form hollow upstanding seams. The sheets are also provided midway of their side seam flanges with upstanding stiffening ribs 12^a. In this construction, the ribs 12^a and 15 are of substantially uniform depth and width throughout and are provided with flat tops that extend in a straight line parallel to the plane of the flat body portions of the sheets, except at the eaves where they slope downwardly and merge into the plane of the flat body portions of the sheets at the eaves ends thereof.

Obviously my invention admits of considerable modification in the design of the seams and stiffening ribs and I do not wish to be limited to the specific designs illustrated.

What I claim is:

1. A car roof comprising a series of roof sheets whose body portions extend substantially straight from side to side of the car.

2. A car roof comprising a series of roof sheets secured to each other and to the car frame, said sheets having flat body portions that extend substantially straight from side to side of the car.

3. A car roof comprising a series of roof sheets connected together and to the car frame, the body portions of said sheets being flat and extending substantially straight from side to side of the car, said sheets being provided with stiffening ribs.

4. A car roof comprising a series of self-supporting roof sheets rigidly secured to each other and to the car frame, the body portions of said sheets being flat and extending substantially straight from side to side of the car, whereby said sheets are adapted to serve as tie members for preventing spreading of the car frame.

5. A car roof comprising a series of roof sheets secured to each other and to the car frame, the body portions of said sheets being flat and extending substantially straight from side to side of the car, said sheets being provided with stiffening ribs whose tops slope downwardly from the longitudinal center line of the car to the eaves thereof.

6. A car roof comprising a series of roof sheets rigidly secured to each other and to the car frame, the body portions of said sheets being flat and extending substantially straight from side to side of the car, said sheets being provided with stiffening ribs that extend transversely of the car and are deeper at the longitudinal center line thereof than at the eaves thereof.

7. A car roof comprising a series of roof sheets rigidly secured to each other and to the car frame, the body portions of said sheets being flat and extending substantially straight from side to side of the car, said sheets being provided with stiffening ribs that extend transversely of the car and are deeper and wider at the longitudinal center line of the car than at the eaves thereof.

Signed at New Kensington, Pennsylvania, this 31st day of July, 1926.

CHARLES DAVID BONSALL.