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C. D. BONSALL

1,853,655

METAL CAR ROOF

Filed Sept. 17, 1930

Fig. 1.

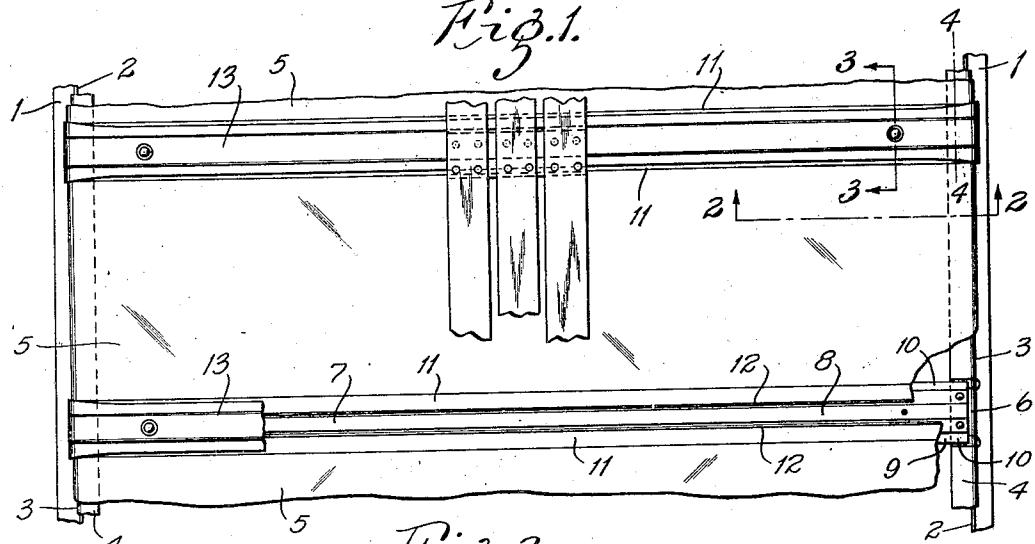


Fig. 2.

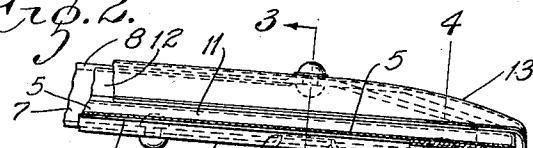


Fig. 3.

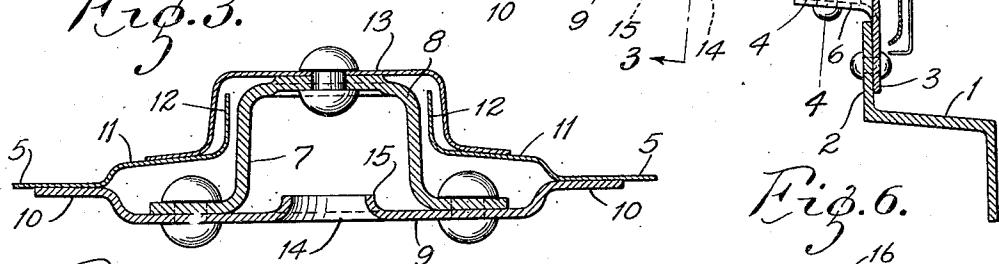


Fig. 4.

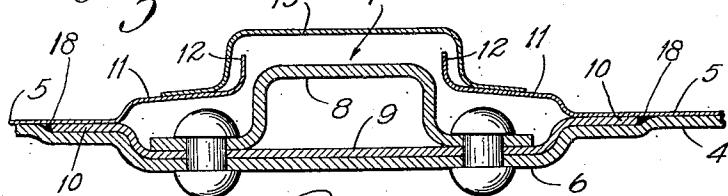


Fig. 6.

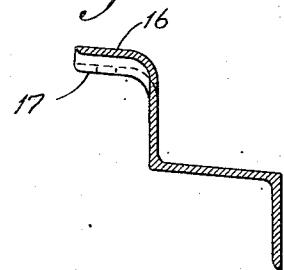
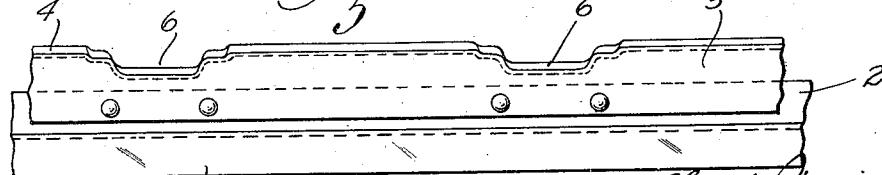


Fig. 5.



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UNITED STATES PATENT OFFICE

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METAL CAR ROOF

Application filed September 17, 1930. Serial No. 432,422.

This invention relates to metal car roofs and is particularly applicable to car roofs of the type wherein the roof sheets are movable with relation to the carlines. Its principal objects are to devise a construction wherein the height of the carline may be reduced without sacrifice of strength or headroom; and to better provide for the support of the sheets and for the positioning and securing 10 of the carlines. The invention consists principally in riveting to a main carline member of inverted channel shaped section a second member in the form of a plate with raised marginal portions that extend laterally beyond 15 the sides of the first member into position to support the side portions of the roof sheets. It also consists in providing the side plates with angle members that serve as supports for the end portions of the roof sheets 20 and have pockets located and arranged to receive the ends of the carlines which are riveted thereto. It also consists in the arrangements and combinations of parts hereinafter described and claimed.

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

Fig. 1 is a plan view of a portion of a roof embodying my invention, one of the seam caps being removed,

Fig. 2 is a vertical sectional view cross-wise of the roof on the line 2-2 of Fig. 1,

Fig. 3 is a vertical section through the seam construction on the line 3-3 of Figs. 1 and 2,

Fig. 4 is a vertical section on the line 4-4 of Figs. 1 and 2,

Fig. 5 is a side view of part of a side plate with the sheet and carline supports in place thereon but with the roof sheets and carlines removed; and

Fig. 6 is a cross sectional view of a modified form of side plate with the carline seat made integral therewith.

The present construction comprises side plates 1 of Z-section with the inner leg 2 upstanding and having riveted flatwise against the outer side of said leg an angle 50 shaped member 3 (or a series of angle shaped

members) whose upper leg 4 extends inwardly over the top of the side plate at an angle conforming to the pitch of the roof and at the proper elevation for the end portions of the roof sheets 5 to rest upon. At suitable intervals, such angle support 3 has depressions 6 in its top of proper shape to receive and form seats for the ends of the carlines 7, which are riveted thereto. Such seats are deep enough to bring the tops of the eaves portions of the carlines to the height desired.

The carlines are made of two members each. The upper member 8 is in the form of an inverted channel with outturned horizontal flanges at the bottoms of their sides, the channel feature and the horizontal flanges being maintained continuously from one end of the carline to the other end, but the channel being of maximum depth at the ridge of the car and decreasing continuously to its ends. The lower carline member 9 is in the form of a plate that extends the full length of the carline and is riveted to the bottom flanges of said inverted channel member. This bottom member is wider than the upper member of the carline and has its marginal portions struck up beyond the margins of the inverted channel shaped member into the form of raised horizontal flanges 10 that are of proper height for the side marginal portions of the roof sheets to rest upon.

The side marginal portions of the roof sheets beyond such supports are pressed up into raised panels 11 that incline upwardly and outwardly and terminate in vertical flanges 12 at their side edges. The adjacent side flanges of adjacent sheets lie on opposite sides of the upper or channel shaped member of the carline at a sufficient distance therefrom to afford adequate clearance to provide for the distortions of the substructure. Above the upper member of the carline and riveted thereto is a transverse seam cap 13 of inverted channel shape with laterally extending flanges at the bottoms thereof that are inclined conformably to the inclination of the inclined marginal portions of the roof sheets, such inclined portions of the sheets and of the seam cap being in contact and the verti-

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cal portions of the carline cap being spaced from the vertical flanges of the sheets far enough to afford proper clearance.

5 A hole 14 (or holes) is formed in the bottom member of the carline immediately below the point at which the carline cap is secured to the upper or channel member of the carline, such hole being provided to facilitate riveting. The edge 15 of such hole is flanged 10 or winged up to prevent any water that may reach the top of said bottom member from passing through said hole. Any water that gets under the roof sheet onto said bottom member of the carline will drain lengthwise 15 of the paneled bottom plate and be delivered over the carline to the outside of the car.

The carline construction hereinbefore described functions after the manner of a hollow box girder; and has important advantages in addition to its strength in carrying vertical load. One advantage is that, for equal strength, it requires less depth at the ridge than carlines now in use, in consequence of which the head room of the car may be increased, or the height of the roof may be decreased. Again, the carline construction has the merit of maintaining the box girder section from the ridge of the car to the supports on which the ends of the carlines rest, thus 30 greatly increasing the strength and stiffness of the carline in the region of the eaves in comparison with metal carlines now in use. Likewise, extending the carlines and sheet supporting members inwardly from the side 35 plates reduces the space that such carlines and sheets have to span, and such supporting members function as gussets for anchoring the carlines to the side plates. Another important advantage of thus supporting the 40 roof sheets is that it substantially excludes the sunlight which, in some designs of flexible roof, has entered at the ends of the carlines and done more or less damage to the lading. In the present design, the sunlight may 45 be more effectually excluded by chinking with heavy asphaltum or the like, the small spaces 18 at the side edges of the lower member of the carline and between the carline seat and roof sheets. Another advantage, as stated 50 above, is that any water that may leak past the roof sheets will be drained over the side of the car.

In the modification illustrated in Fig. 6, there are no separate supporting membrs but 55 the Z-shaped side plate has an extra inwardly extending flange 16 at its top and integral with it. The ends of the roof sheet rest on top of this extra flange 16 and the ends of the carlines rest in depressions or seats 17 provided therefor in the top of said extra flange and at proper intervals.

While I have illustrated my invention as applied to a roof with movably mounted sheets, it is obvious that some of its features 65 are applicable to roofs whose sheets are not

movable relatively to each other on the sub-structure. For instance, the hollow box design of carline and the manner of seating and supporting the carlines and sheets may be used with non-movable sheets.

70 The hereinbefore described carline is the subject matter of a divisional application Serial No. 558,191, filed August 20, 1931; and the hereinbefore described side plate is the subject matter of a divisional application Serial No. 589,607, filed January 29, 1932.

75 What I claim is:

1. A car roof construction comprising side plates, carlines supported by said side plates and roof sheets movably supported on said 80 side plates and carlines, a carline comprising an upper member of inverted channel shape and a bottom member secured thereto and comprising a channel of sufficient width to receive the upper member and raised marginal panels adapted to support the roof sheets.

2. A car roof construction comprising side plates having inwardly extending and depressed carline seats at the tops thereof, carlines supported in said seats and roof sheets movably supported on said side plates and carlines, a carline comprising an upper member of inverted channel shape and a bottom member secured thereto and comprising a 85 channel of sufficient width to receive the upper member and raised marginal panels adapted to support the roof sheets.

3. A car roof construction comprising 90 Z-shaped side plates arranged with their webs horizontal and the inner flange extending upwardly and having inwardly extending carline supports at the top thereof, said supports having depressed seats for the carlines, carlines secured in said depressed seats, 95 and movably mounted roof sheets, the carlines being of hollow box section throughout their length.

4. A car roof construction comprising 100 Z-shaped side plates arranged with their webs horizontal and the inner flange extending upwardly and having inwardly extending carline supports at the top thereof, said supports comprising angle shaped members 105 secured flatwise against the outside of the side plates and having legs that extend inwardly over the tops of the side plates and having depressed seats for the carlines, carlines secured in said depressed seats, and movably mounted roof sheets, the carlines being 110 of hollow box section throughout their length.

5. A car roof construction comprising side 115 plates, carlines of hollow box section supported by said side plates and having side 120 marginal extensions below the tops thereof constituting supports for the roof sheets, roof sheets movably supported on said carline 125 extensions and provided with upstanding flanges at their side edges spaced from the 130

sides of the carlines, and a seam cover of inverted channel shape secured to each carline with its sides enclosing and spaced from the side flanges of adjacent sheets.

6. A car roof construction comprising side plates, carlines of hollow box section supported by said side plates and having side marginal extensions below the tops thereof constituting supports for the roof sheets, roof sheets movably supported on said carline extensions and provided with upstanding flanges at their side edges spaced from the sides of the carlines and a seam cover of inverted channel shape riveted to the top of each carline with its sides enclosing and spaced from the side flanges of adjacent sheets, the lower member of the carline having a winged hole in vertical alinement with the seam cover rivet hole.

7. A car roof construction comprising side plates having inwardly extending and depressed carline seats at the tops thereof, carlines supported in said seats and roof sheets movably supported on said side plates and carlines, a carline comprising an upper member of inverted channel shape and a bottom member secured thereto and comprising a channel of sufficient width to receive the upper member and raised marginal panels adapted to support the roof sheets, the spaces at the side edges of the bottom carline members between their seats and the roof sheets being chinked with asphaltum or the like.

Signed at New Kensington, Pennsylvania,
this 8th day of September, 1930.

CHARLES DAVID BONSALL.

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