

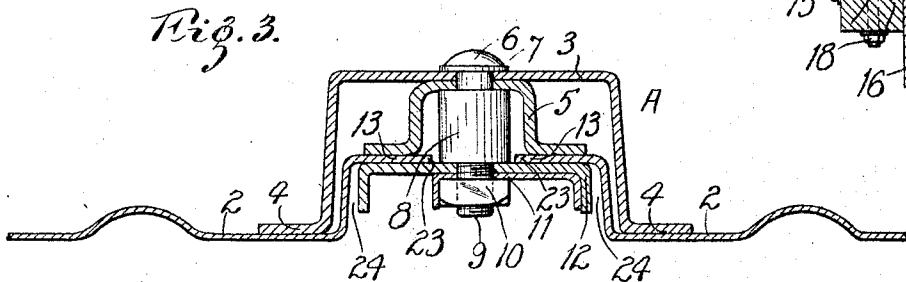
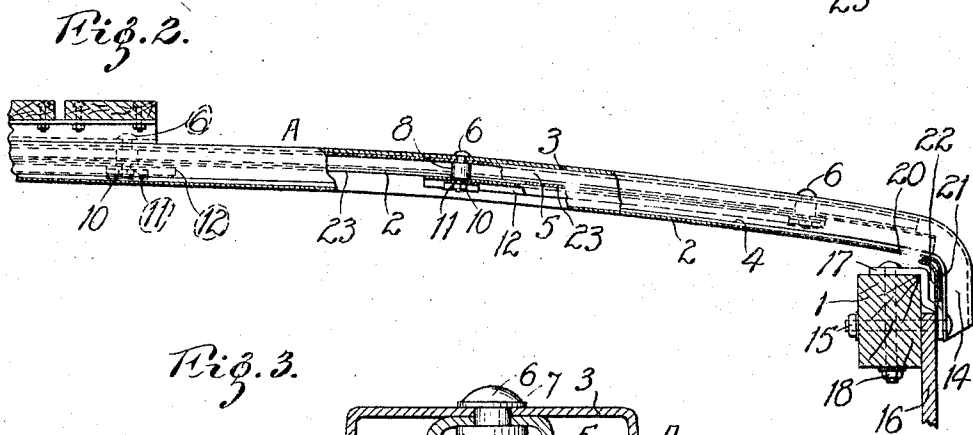
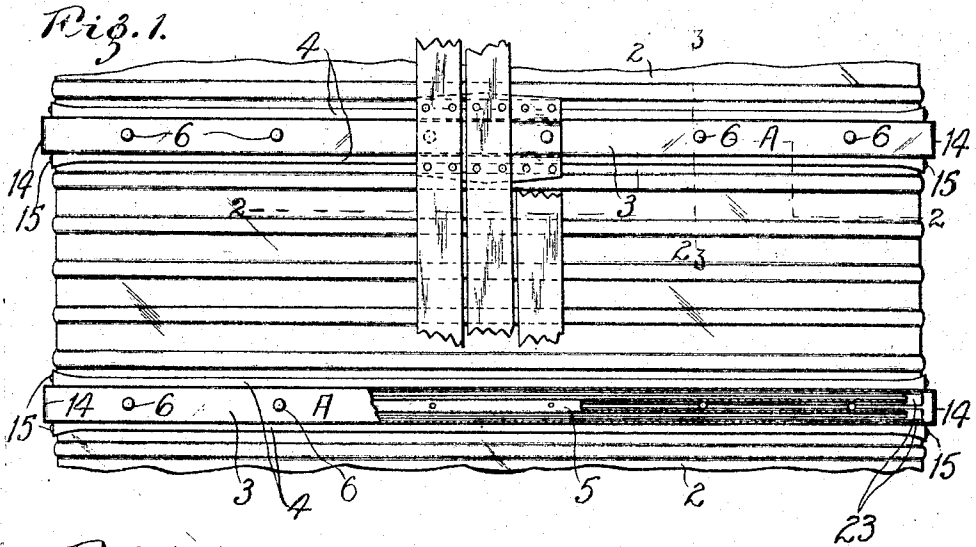
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C. D. BONSALE

FLEXIBLE CAR ROOF

Filed April 5, 1924



INVENTOR:
Charles D. Bonsall,
by *Constance*
HIS ATTORNEYS.

UNITED STATES PATENT OFFICE.

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

FLEXIBLE CAR ROOF.

Application filed April 5, 1924. Serial No. 704,393.

To all whom it may concern:

Be it known that I, CHARLES DAVID BONSALE, a citizen of the United States, and a resident of the city of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Flexible Car Roofs, of which the following is a specification.

My invention relates to car roofs and has for its principal objects to simplify and cheapen the construction and application thereof to the framework, and to enable the sheets to accommodate themselves to distortions of the framework. It consists in the parts and in the construction and arrangement of parts hereinafter described and claimed.

In the accompanying drawing, which forms 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 conforming to my invention.

Fig. 2 is a sectional view on the line 2—2 of Fig. 1 crosswise of the car.

Fig. 3 is a cross sectional view on the line 3—3 of Fig. 1 through a carline and adjacent portions of the roof sheets, and

Fig. 4 is a detail view of a shoulder bolt.

In the present construction, there are carlines A that are supported by the side plates 1 and span the space between said side plates; and preferably said carlines and side plates constitute the sole supports of the roof sheets 2.

The carline comprises a main member 3 made of heavy sheet metal, which is preferably galvanized. This main member is of inverted channel shape and has horizontal side flanges 4 at the bottom thereof. Inside of this main carline member is an auxiliary member 5 of the same cross section but of considerably less width and depth than said main member. For the sake of economy, this auxiliary member is preferably made of a sheet of black iron, and it is secured flatwise against the undersurface of said main member by suitable rivets 6 (with washers 7 interposed, if desired), whereby said members are enabled to cooperate in taking care of the stresses to which the carline is subjected in practice.

Formed integrally with the rivets 6 on the underside thereof are a spacer or distance piece 8 and bolt portion 9 of reduced diam-

eter which is threaded to receive a nut 10. The rivet, spacer and threaded portion are hereinafter referred to collectively as a rivet bolt or shoulder bolt. Any suitable locknut 11 may be used to keep the nut tight. Interposed between the several nuts 10 and the lower offsets or shoulders of the respective shoulder bolts is a supporting strip or strips 12 of inverted channel section. The length of the spacer 8, that is, the distance from the upper shoulder of said shoulder bolt (being the shoulder that bears against the under surface of the auxiliary member of the carline), to the lower shoulder of said shoulder bolt (being the shoulder against the underside of which the supporting strip bears), is such that a space 13 approximately equal to the thickness of a roof sheet intervenes between the horizontal flanges of said auxiliary carline member and said sheet supporting strip 12.

The ends 14 of the main carline member are bent downwardly without great change of section and are secured to the sub-structure by horizontal bolts 15 that extend through the side flanges of said main carline member, the side plate 1 of the car and any other portions of the structure that may intervene between them. In the particular construction illustrated, said bolts 15 are shown passing through the side sheathing 16 of the car, which terminates short of the top of the side plate, and also through the downturned portion of an angular metal fitting 17, (whose horizontal portion rests on the top of the side plate and is secured by a vertical bolt 18 passing therethrough) and also through the vertical portion of an angular flashing strip 20 that is bent inwardly over the side plate.

The roof sheets are of heavy gage metal and extend lengthwise from side plate to side plate, being preferably corrugated lengthwise. The ends of these roof sheets have downturned flanges 21 which lie in the spaces 22 above the side sheathing that intervenes between the side plates and the downturned ends of the carline, where there is sufficient clearance to permit the sheets to accommodate themselves to distortions of the car frame. The side margins 23 of the sheets are offset upwardly, that is, they are bent upwardly and thence horizontally outwardly. The horizontal portions lie in the spaces 13 above-mentioned between the aux-

iliary carline member and the sheet supporting member; and the vertical portions lie between the side flanges of the supporting member and the vertical sides of the main carline member, where ample clearance spaces 24 are provided to permit the sheet to adapt itself to the distortions of the car frame.

By the foregoing arrangements of parts, the sheets are supported along their sides by the supporting plates secured to the carlines, but otherwise the sheets are free to move to such limited extent as may be necessary to accommodate themselves to any distortions of the car frame that are likely to occur in service. It is noted that there are no perforations in the sheets and that the downturned flanges at the ends of the sheets are counted on to prevent the sheets from slipping crosswise of the car to an excessive extent.

One of the principal advantages of the foregoing construction is the facility with which it may be applied. In applying this roof, the sheets are first placed in position, the carlines (without the supporting strips) are then located over the sheets and in proper relation thereto, and then the supporting strips are secured to the carlines. As the carlines are positioned with reference to the sheets and the clearances required at the sides thereof, inaccuracies or variations in the widths of the roof sheets do not entail the consequences that would be so serious if the carlines were all fixed in place first.

What I claim is:

1. A car roof construction comprising side plates, side sheathing terminating below the tops of said side plates, carlines of inverted channel section having sheet supporting strips secured inside thereof and having downturned ends secured to the side of the

car below the tops of said sheathing, and movably mounted roof sheets whose ends have downturned flanges in the spaces between the side plates and the downturned ends of the carlines, and whose side margins are offset upwardly and rest on said sheet supporting strips.

2. A car roof comprising side plates, carlines having downturned ends which are secured thereto but spaced horizontally from the top portions thereof, sheet supporting strips inside said carlines, and movably mounted roofing sheets, each carline comprising a main member of inverted channel section having horizontal flanges, an auxiliary member of substantially the same cross section rigidly secured flatwise against the under surface of the web of the main member by rivets that have threaded shoulder bolts integral therewith and extending downwardly therefrom and supporting said strips, and the roofing sheets having downturned end flanges in the spaces between the side plates and the downturned ends of the carlines and having side margins offset upwardly and resting on said sheet supporting strips below said auxiliary carline member.

3. A car roof comprising side plates, carlines connecting said side plates and rigidly secured thereto, each of said carlines comprising a main member of inverted-channel section and an auxiliary member of substantially the same cross-section rigidly secured flatwise against the inner surface of the main member, supporting strips secured to said carlines, and roof sheets extending from side plate to side plate and having their side marginal portions resting on said supporting strips.

Signed at New Kensington, Pa., this 31st day of March, 1924.

CHARLES DAVID BONSALE.