June 12, 1923. 1,458,386

C. D. BONSALL

CAR ROOF

Filed Dec. 2, 1921

Fig. 1.

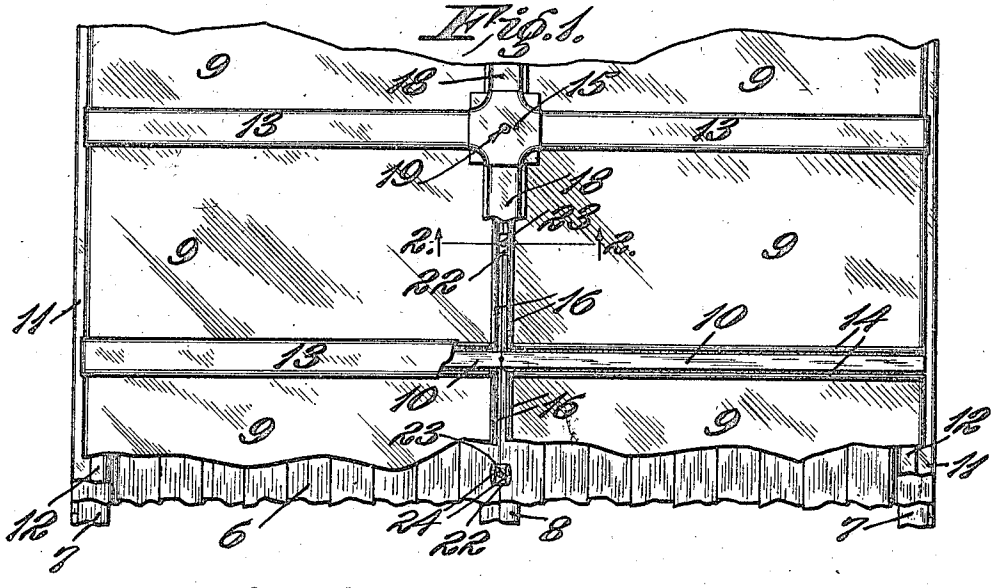


Fig. 2.

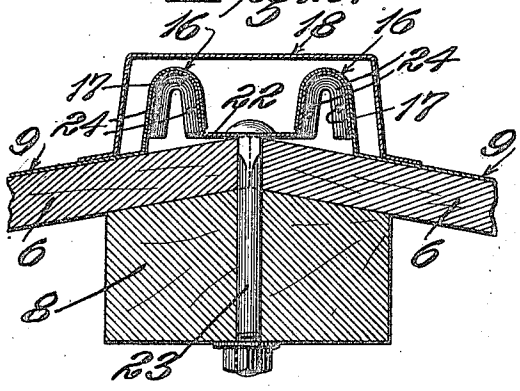


Fig. 4.

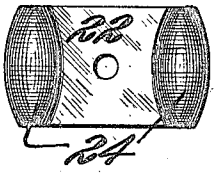


Fig. 5.

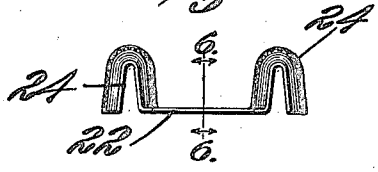


Fig. 3.

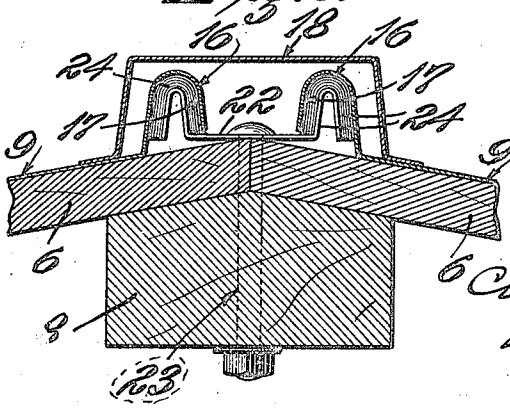
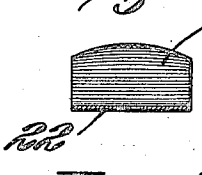


Fig. 6.



Inventor:
Charles D. Bonsall,
by Cameron & Cameron,
his Attorneys.

Patented June 12, 1923. 1,458,386

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 December 2, 1921. Serial No. 519,306.

To all whom it may concern:

Be it known that I, CHARLES DAVID BONSALL, 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 Car Roofs, of which the following is a specification.

The invention relates to flexible outside metal car roofs of the general type shown in C. C. Murphy Patent No. 1,133,493, dated March 20, 1915, wherein the roof sheets are pivoted near their ridge ends to the roof sheathing and are connected along their side and ridge margins by flexible seams; and it relates particularly to the ridge construction of roofs of this type. In roofs of this type, the roof sheets are arranged in pairs on opsite sides of the ridge and, heretofore, the two sheets of each pair have been pivoted to the roof substructure by means of ridge anchor saddles, which are pivotally secured to the ridge of the car and have raised pivot bosses that fit within similar raised pivot bosses formed in the roof sheets near their ridge ends. In such earlier constructions, the roof sheet bosses are held down on the anchor saddle bosses by means of extra running board saddles whose under sides are recessed to receive the roof sheet bosses, whereby said roof sheets are free to pivot or slue on the roof substructure, but are held from slipping off the eaves. The principal objects of the present invention are to pivotally secure the roof sheets in place without the use of the bossed ridge anchor saddles and the extra running board saddles and thereby save the cost thereof; to eliminate the bossing of the roof sheets and thereby save the cost of the bossing operation; and to locate the pivotal securing means entirely within the ridge covers.

The invention consists principally in an anchor member for preventing bodily movement of the sheets crosswise of the car, said member also functioning as a pivot for the roof sheets to turn on in accommodating themselves to the various distortions of the car substructure; and the invention further consists in the arrangements and combinations of parts hereinafter more fully described and claimed.

In the accompanying drawing, which forms part of this specification and wherein like reference numerals refer to like parts wherever they occur,

Fig. 1 is a plan view of a portion of a car roof provided with anchor members embodying my invention, parts being broken away to more clearly illustrate the invention;

Fig. 2 is an enlarged transverse cross-section through the ridge portion of the car roof, the section being taken through one of the anchor members on the line 2—2 in Fig. 1;

Fig. 3 is a transverse cross-section similar to Fig. 2, the anchor member being shown in end elevation; and

Figs. 4, 5 and 6 are a plan view, an end view and a side elevation, respectively, of a detached anchor member.

The roof illustrated in the accompanying drawing comprises roof sheathing boards 6, supported at the eaves by side plates 7, and at the ridge by a ridge pole 8. Metal roof sheets 9 are arranged in pairs on opposite sides of the ridge, the two sheets of each pair being disposed end to end crosswise of the car and spaced apart from each other on opposite sides of the ridge and from adjacent pairs along their side margins. Mullions or battens 10 are secured to the roof sheathing between the side margins of the sheets, and are of less width than the spaces therebetween. The eaves ends of the roof sheets are held down on the car at the eaves by means of flashing strips 11, which are secured to the side plates and have doubled-back portions 12 adapted to interlock with the doubled-under eaves portions of the roof sheets.

The side margins of adjacent roof sheets, together with the mullions located therebetween, are covered by channel-shaped transverse seam covers 13 whose side walls interlock with the side seam flanges 14 of the roof sheets. The transverse seam covers 13 extend from ridge to eaves and are held down at the eaves by turning their eaves ends under the doubled-back portions of the eaves strips 11, or in any other desirable manner. The transverse seam covers are secured in place at the ridge by means of four-way ridge corner caps 15.

The roof sheets are provided at their ridge ends with raised rebent flanges, which form hollow ribs 16. The spaced ridge ribs 16,

which form downwardly opening grooves 17 at the ridge ends of the roof sheets, are straddled by channel-shaped ridge seam covers 18, whose adjacent ends are covered by the ridge corner caps 15 and are held in proper alinement thereby. The corner caps 15 are secured to the substructure by means of bolts 19, which also secure the running board saddles (not shown) in position.

Sheet metal anchor members 22 are provided for spacing the sheets apart at the ridge and for preventing bodily movement of said sheets crosswise of the car. The anchor members 22 are located between the ridge ends of each pair of oppositely arranged roof sheets midway between the side margins thereof and are secured in place by bolts 23, which extend through the roof sheathing and ridge pole. Each anchor member comprises a flat body portion, whose side margins are formed with raised rebent flanges that form upstanding hollow ribs 24, which fit within the grooves 17 formed by the spaced ridge ribs 16 of the roof sheets.

The ribs 24 of each anchor member are lens-shaped; that is, the sides of said ribs are bowed outwardly from end to end thereof, thus forming convexo-convex or double-convex surfaces on opposite sides of said ribs. In consequence of this endwise convexity of the ribs 24 of the anchor members, the distance between the sides of said ribs and the sides of the roof sheet grooves 17 is a minimum midway of the length of the groove and increases gradually toward each end thereof. The width of the anchor member ribs midway of their length corresponds to the width of the roof sheet grooves, whereby said grooves snugly embrace said ribs midway of the ridge ends of the sheets and thus maintain a proper spacing of the ridge ends of the sheets and prevent bodily movement of said sheets crosswise of the car.

By reason of the double-convexity of the ribs of the anchor members, each side of a rib has a line contact with one side of a groove of a sheet midway of the ridge end thereof, with the result that each sheet has tangential pivotal contact with a rib of an anchor member, whereby the roof sheets are permitted to pivot or slue about the contacting portions of the double-convex surfaces of the anchor member ribs in response to the weaving of the car frame.

The principal advantages of the arrangement described is that it eliminates the extra running board saddles, the bossed anchor saddles and wholly eliminates the need for the expensive operation of bossing the roof sheets.

The invention is not restricted to the precise forms and arrangements shown and described.

What I claim is:

1. A flexible car roof comprising roof sheets spaced apart along their adjacent margins which are formed with raised hollow ribs that extend lengthwise thereof, and an anchor member secured to the car between the spaced margins of adjacent sheets, said anchor member having raised ribs extending lengthwise thereof that are adapted to fit within the raised marginal ribs of adjacent sheets, the sides of the anchor member ribs having tangential contact with the sides of the roof sheet ribs, thereby preventing bodily movement of the sheets towards and away from each other and permitting said sheets to slue about the contacting portions of said anchor member ribs.

2. A flexible car roof comprising roof sheets spaced apart along their adjacent margins which are formed with downwardly opening grooves that extend lengthwise thereof, a seam cover straddling the spaced margins of adjacent sheets, and an anchor member located within said seam cover and secured to the car between the spaced margins of adjacent sheets, said anchor member having ribs extending lengthwise thereof that are adapted to fit within the marginal grooves of adjacent sheets, said ribs having reverse convex surfaces extending lengthwise thereof, the convexity of each rib being a maximum midway of the length of the roof sheet grooves, thereby permitting a limited angular adjustment of said sheets with respect to the said ribs.

3. A flexible car roof comprising roof sheets spaced apart along their adjacent margins which are formed with grooves that extend lengthwise thereof, a seam cover straddling the spaced margins of adjacent sheets, and an anchor member secured to the car between the spaced margins of adjacent roof sheets, said anchor member having ribs extending lengthwise thereof that are adapted to fit within the marginal grooves of adjacent sheets, the sides of said ribs having tangential contact with the sides of said grooves, thereby preventing bodily movement of said sheets towards and away from each other and permitting sluing of the sheets about the contacting portions of said ribs.

4. A flexible car roof comprising roof sheets spaced apart on opposite sides of the ridge and having raised rebent flanges at their ridge ends, a seam cover straddling the ridge flanges of oppositely arranged sheets, and an anchor member secured to the car between the ridge margins of oppositely arranged sheets, said anchor member having raised rebent flanges adapted to fit within the ridge flanges of oppositely arranged roof sheets, the side walls of the anchor member flanges being reversely curved from end to end thereof, thereby forming convex surfaces that engage the side walls of the roof sheet flanges and permit sluing of the sheets

about the contacting portions of said convex surfaces.

5. A flexible car roof comprising roof sheets oppositely arranged on each side of the ridge and having raised hollow ribs extending lengthwise of their ridge ends, and an anchor member secured to the car between the ridge ends of oppositely arranged sheets, said anchor member having raised ribs extending lengthwise thereof that are adapted to fit within the hollow ribs of oppositely arranged sheets, the sides of said anchor member ribs having tangential contact with the sides of said roof sheet ribs midway of their length.

6. A flexible car roof comprising roof sheets oppositely arranged on each side of the ridge and having downwardly opening grooves extending lengthwise of their ridge ends, a seam cover straddling the spaced ridge ends of oppositely arranged sheets, and an anchor member located within said seam cover and secured to the car between the spaced ridge ends of oppositely arranged sheets, said anchor member having ribs extending lengthwise thereof that are adapted to fit within the roof sheet grooves, said ribs having convex surfaces extending lengthwise thereof whose convexities are a maximum opposite the middle of the ridge end of the sheets.

7. A flexible car roof comprising roof sheets oppositely arranged on each side of the ridge and having grooves extending lengthwise of their ridge margins, a seam cover straddling the spaced ridge ends of oppositely arranged sheets, and an anchor member located beneath said seam cover and secured to the car between the spaced ridge ends of oppositely arranged sheets, said anchor member having ribs extending lengthwise thereof that are adapted to fit within the grooves of oppositely arranged sheets, the sides of said ribs having tangential contact with said grooves.

8. A flexible car roof comprising roof sheets oppositely arranged on each side of the ridge and having raised rebent flanges at their ridge ends, a seam cover straddling the spaced ridge ends of oppositely arranged sheets, and an anchor member located beneath said seam cover and secured to the car between the spaced ridge ends of oppositely arranged sheets, said anchor member having raised rebent flanges at its side margins adapted to fit within the raised rebent ridge flanges of oppositely arranged roof sheets, the side walls of the anchor member flanges being reversely curved from end to end thereof to form convex surfaces that have tangential contact with the side walls of the roof sheet flanges.

9. As an article of manufacture, an anchor member for car roof sheets, said member having ribs extending lengthwise of its opposite margins, a rib being of greater width at its middle than at its end.

10. As an article of manufacture, an anchor member for car roof sheets, said member having ribs extending lengthwise of each of its side margins whose sides are reversely curved from end to end thereof to form convex surfaces, the convexities being a maximum midway of the length of said ribs.

11. As an article of manufacture, a sheet metal anchor member for car roof sheets, said anchor member having raised rebent flanges extending lengthwise of its side margins, the side walls of said flanges being reversely curved from end to end forming convex surfaces, the convexities being a maximum midway of the length of said flanges.

Signed at Parnassus, Pa., this 28th day of November, 1921.

CHARLES DAVID BONSALL.