Oct. 12, 1926. 1,602,638

C. D. BONSALL

CAR ROOF

Filed Jan. 2, 1926

Fig. 1.

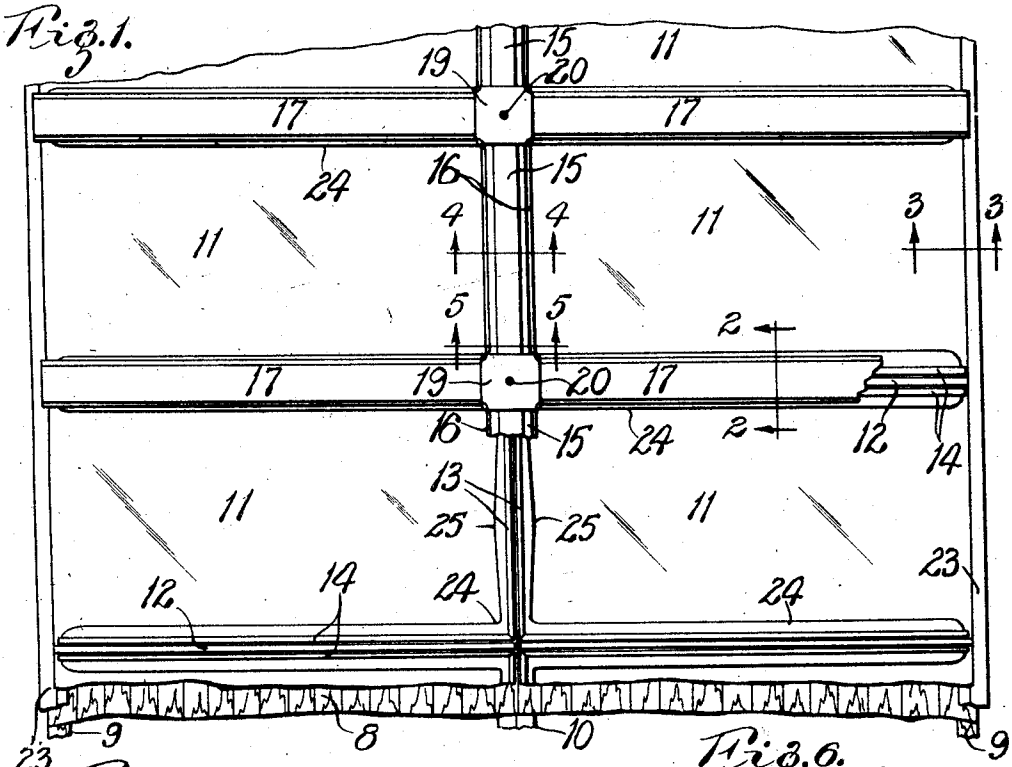


Fig. 2.

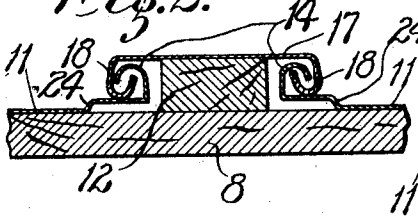


Fig. 4.

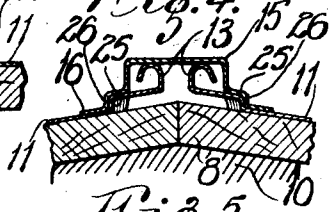


Fig. 5.

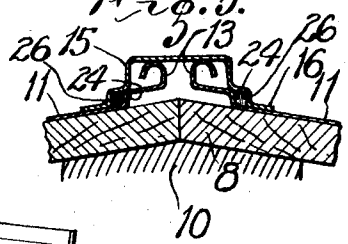


Fig. 3.

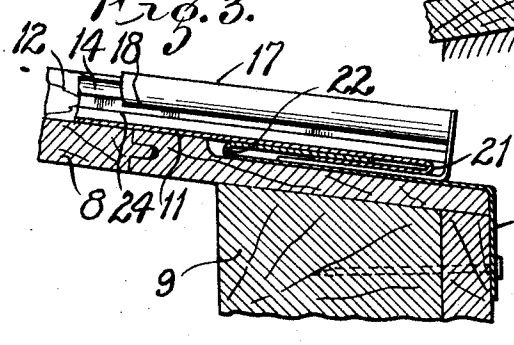
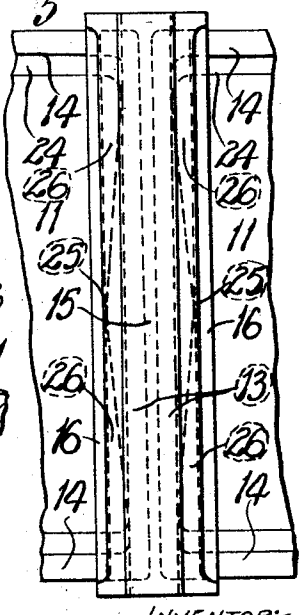


Fig. 6.



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UNITED STATES PATENT OFFICE.

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CAR ROOF.

Application filed January 2, 1926. Serial No. 78,811.

This invention relates to car roofs of the flexible outside metal type wherein metal roof sheets extend from eaves to ridge of the car and are loosely secured to the car at the ridge by means of seam covers upon which the roof sheets rock or roll in accommodating themselves to the distortions of the car frame.

The principal object of the present invention is to increase the strength and rigidity of the cooperating portions of the roof sheets and ridge seam covers whereby said portions are better adapted, under service conditions, to resist stresses that tend to bend or distort them and thus prevent the sheets from sluing or oscillating upon the car in response to the weaving of the car frame. Other objects are simplicity of construction and cheapness and compactness of design.

The invention consists principally in means hereinafter set forth for securing a pivotal or oscillatory movement of the roof sheets around the region near the middle of their ridge ends; and it also consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawing, which forms 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 a flexible outside metal car roof embodying my invention;

Fig. 2 is a vertical cross-section through one of the transverse seams on the line 2—2 in Fig. 1;

Fig. 3 is a vertical cross-section through the eaves portion of the roof on the line 3—3 in Fig. 1;

Fig. 4 is a vertical cross-section through the ridge portion of the roof, the section being taken midway of the transverse seams on the line 4—4 in Fig. 1;

Fig. 5 is a similar cross-section taken through the ridge seam on the line 5—5 in Fig. 1; and

Fig. 6 is a plan view of one of the ridge seam caps, showing the ridge and portions of the roof sheets cooperating therewith.

The roof substructure of the car may be of any suitable construction. Preferably it comprises roof sheathing boards 8 that extend transversely of the car from eaves to ridge thereof with their eaves ends supported on the side plate 9 of the car and with their ridge ends supported on the ridge pole 10 thereof.

Metal roof sheets 11 are arranged on the roof sheathing in two rows, one on each side of the ridge, the sheets on opposite sides of the ridge being spaced apart and the sheets on the same side of the ridge being spaced apart. The sheets on opposite sides of the ridge are arranged in alinement crosswise of the car; and mullions or battens 12 are secured to the roof sheathing in the spaces between the adjacent side margins of the sheets, thereby permitting a limited angular adjustment of the roof sheets between mullions.

The roof sheets have their side and ridge margins turned upwardly and thence curved inwardly and downwardly over the body portions of the sheets to form upstanding inwardly and downwardly hooked ridge and side seam flanges 13 and 14, respectively. Pressed metal ridge seam covers 15 of substantially inverted channel-shaped section straddle the spaced ridge seam flanges 13 of adjacent sheets between the side seam flanges 14 thereof and have outstanding base flanges 16 resting on the body portions of said sheets. The adjacent side seam flanges 14 of the sheets, together with the mullions 12 located therebetween, are covered by inverted channel-shaped transverse or side seam covers 17 that extend from eaves to ridge and rest on said battens. The side walls of the side seam covers 17 have inwardly and upwardly extending flanges 18 at the bottoms of their side walls that interlock with the side seam flanges of the sheets 14. The adjacent ends of the respective ridge and transverse seam covers 15 and 17 are secured in position at the ridge by means of the usual four-way corner caps 19 that are secured to the car by means of vertical bolts 20 which serve also to secure the running board saddles (not shown) in position.

The eaves ends of the body portions of the roof sheets have doubled-under flanges 21 that are hooked beneath the double-back flanges 22 of eaves flashing strips 23 secured to the car at the eaves, whereby the eaves

ends of the sheets are free to move in their own plane to a limited extent but are held against vertical movement. The eaves ends of the transverse seam covers 17 are also held down at the eaves by hooking the doubled-under extensions 23 thereof beneath the ends of the mullions and the doubled-back flanges 22 of the eaves flashing strips 23.

The flanged side and ridge marginal portions of the roof sheets are offset upwardly or slightly raised to a higher plane than the body portion thereof to form a raised border 24 that is disposed substantially parallel to said body portion and extends continuously from points located a short distance inwardly from the eaves ends of the sheets along the sides and the ridge ends thereof. The upwardly offsetting of the body portions of the sheet along their side and ridge margins raises said margins above the general water level of the sheets and eliminates any tendency for water to creep beneath the seam covers by capillarity.

The raised side marginal portions of each sheet are preferably of uniform width throughout. The raised ridge marginal portions of each sheet is of a maximum width midway of the ridge ends of the sheet and gradually decrease in width towards the sides thereof. As shown in the drawing, this widening of the raised ridge marginal portion of the sheet is produced by providing the inner edge of said raised marginal portion with converging faces that meet at the middle of the sheets to form an inwardly extending point or projection 25 that extends inwardly from the ridge ends of the sheets. If desired, the inner edge of the raised ridge marginal portion may be curved or bowed inwardly to present a convex shoulder rib or abutment in the ridge end portion of the body of the sheet.

As shown in the drawing, the ridge seam covers 15 straddle the ridge seam flanges 13 of the sheets and have base flanges 16 that rest on the body portion of the sheets inside of the pointed or tapered raised ridge marginal portions thereof. The lower portions of the side walls of said ridge seam covers are offset outwardly between the raised side marginal portions of the sheets to form longitudinal recesses 26, within which are accommodated the pointed inner edge portions 25 of the raised ridge margins of the roof sheets. These pointed edge portions bear against the straight vertical walls of the wide down portions of the ridge seam covers at their middle portions only, whereby said sheets are adapted to rock or roll upon the contacting portions of the ridge seam caps in adjusting themselves to the distortions of the car frame.

A very important advantage of the roof construction hereinbefore described is that it provides a strong rigid abutment that will not become damaged in service and thus interfere with or prevent the desired sluing movement of the sheets. At the same time, the roof is adapted for economical manufacture because it permits the use of ridge seam covers having parallel sides and also because it permits the use of roof sheets having straight ridge seam flanges.

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

What I claim is:

1. A flexible car roof comprising movably mounted roof sheets having upstanding seam flanges along their adjacent margins, and a seam cover secured to the car and straddling the seam flanges of adjacent sheets, said roof sheets having upwardly offset portions in their bodies that are shaped and arranged to contact with the sides of said seam cover for a portion of its length only.

2. A flexible car roof comprising roof sheets spaced apart along their adjacent margins and having upstanding seam flanges extending along said margins, and a seam cover secured to the car and straddling adjacent seam flanges, said roof sheets having shouldered body portions, said shoulders being shaped to engage the sides of said seam cover substantially midway of its length only.

3. A flexible car roof comprising movably mounted roof sheets having upstanding seam flanges along their adjacent margins, and a seam cover secured to the car and straddling adjacent seam flanges, the adjacent marginal portions of said sheets being raised above the general level of the main body portions thereof, and the inner edges of said raised marginal portions being shaped to contact with the sides of said seam covers for a portion of their length only.

4. A flexible car roof comprising roof sheets spaced apart along their adjacent edges and having upstanding seam flanges extending along said edges, and a seam cover secured to the car and straddling the adjacent seam flanges of said sheets, said roof having their adjacent marginal portions raised above the general level of the body portion of the sheets, said raised marginal portions of said sheets being wider at their middle than at their ends, whereby they are adapted for contact with the sides of said seam covers midway of their length only.

5. A flexible car roof comprising roof sheets spaced apart along their adjacent margins and having upstanding seam flanges extending along said margins, and a seam cover secured to the car and straddling the adjacent seam flanges of said sheets, said roof sheets having their adjacent marginal portions offset upwardly beneath said seam cover to form shoulders that are adapted to

bear against the middle portion of the sides of said seam cover and are normally spaced therefrom at the ends thereof.

6. A flexible car roof comprising roof sheets spaced apart along their adjacent margins and having upstanding seam flanges extending along said margins, and a seam cover secured to the car and straddling said flanges and normally spaced therefrom, the body portions of the sheets being offset upwardly to form raised abutments that engage the sides of said seam covers substantially midway of their length only.

7. A flexible car roof comprising metal roof sheets spaced apart along their adjacent margins and having upstanding seam flanges extending along said margins, and a seam cover secured to the car and straddling said flanges, the adjacent marginal portions of said sheets being raised above the general level of the body portions thereof, said raised marginal portions of said sheets being located inside of said seam cover and contacting with the sides thereof at its middle portion only.

8. A flexible car roof comprising metal roof sheets spaced apart along their adjacent margins and having upstanding seam flanges extending along said margins, the marginal portions of said sheets adjacent to said seam flanges being offset above the general plane of the body portions thereof to form shoulders that are spaced farther from the edge of the sheets at the middle of said raised margins than at the ends thereof, and a seam cover straddling said seam flanges and the raised marginal portions of said sheets and having base flanges resting on the body portions thereof.

9. A flexible outside metal car roof comprising metal roof sheets spaced apart along their adjacent edges and having seam flanges extending along said edges, and a seam cover secured to the car and straddling the adjacent seam flanges of said sheets, the body portions of said sheets being formed with shoulder portions that cooperate with said seam cover and are shaped to secure an independent sluing of the sheets around the middle of their adjacent side marginal portions in response to the distortion of the car frame in service.

Signed at New Kensington, Pa., this 29th day of December, 1925.

CHARLES DAVID BONSALL.