

April 17, 1928.

1,666,115

C. D. BONSALE

CAR ROOF

Filed May 29, 1926

2 Sheets-Sheet 1

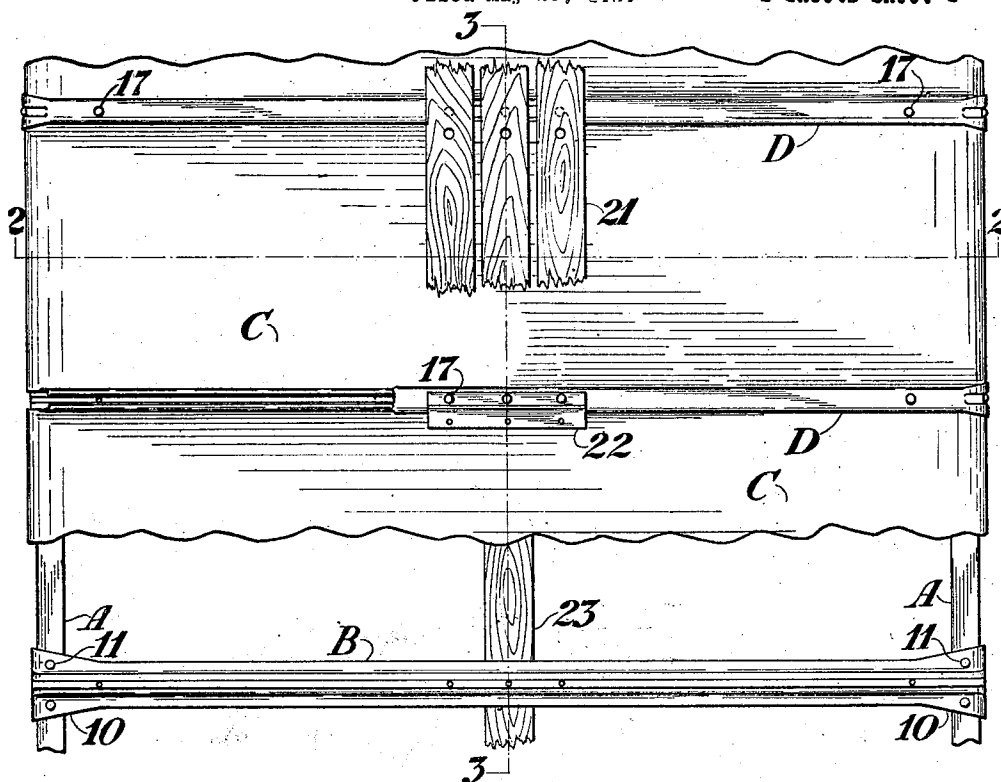


Fig. 1.

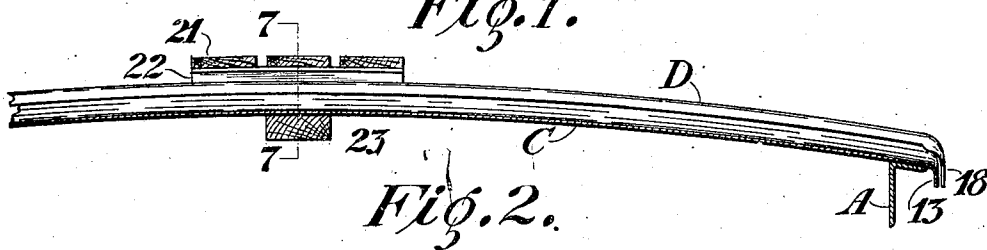


Fig. 2.

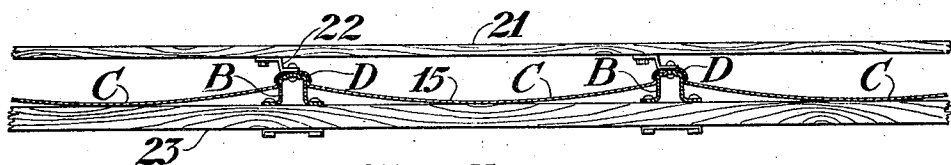


Fig. 3.

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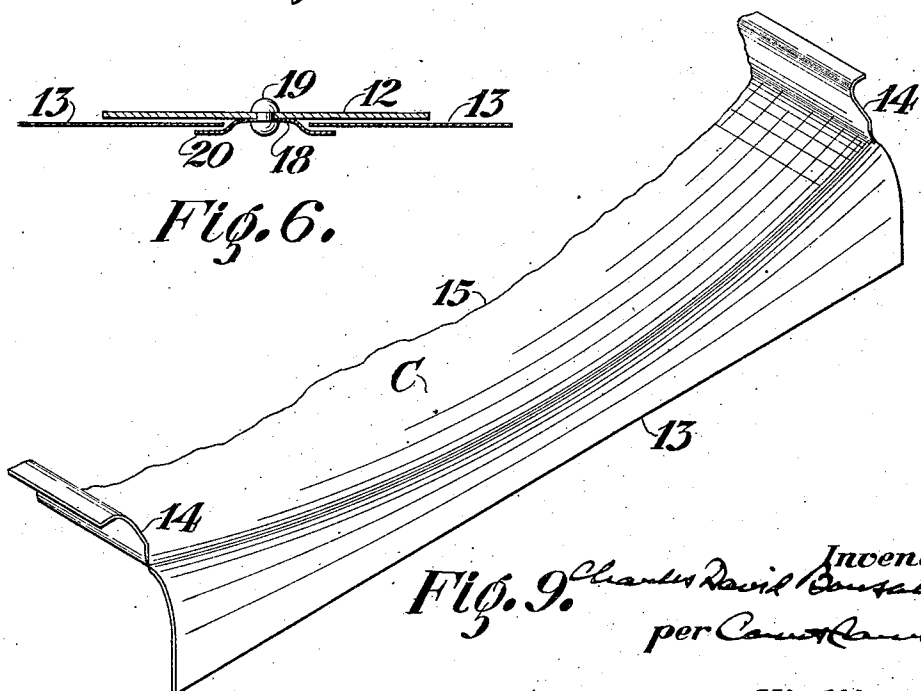
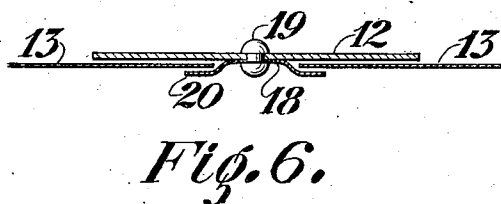
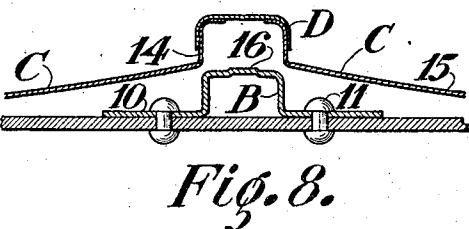
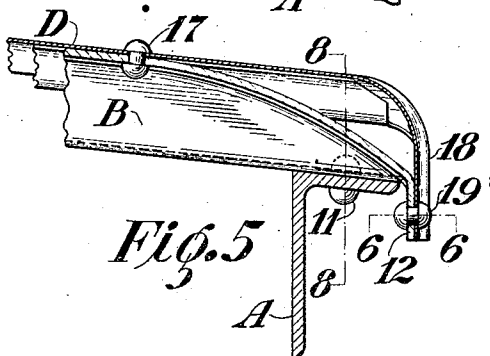
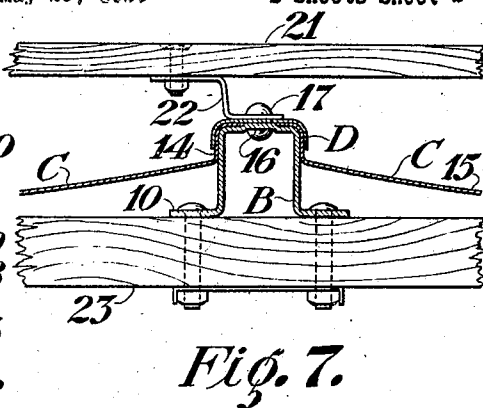
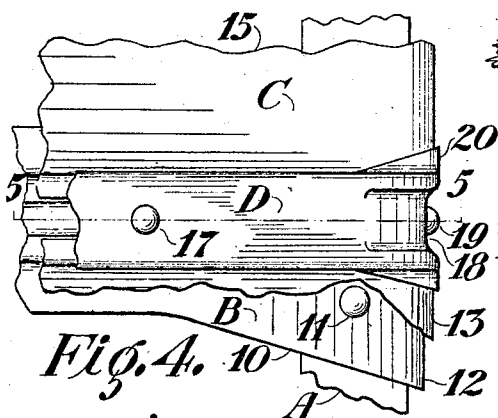
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Filed May 29, 1926

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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

CAR ROOF.

Application filed May 29, 1926. Serial No. 112,509.

My invention relates principally to single-course all-steel 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 the distortions of the framework incident to service conditions. The invention consists in the parts and in the combinations and arrangements 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 an enlarged transverse section through one-half of the roof on the line 2—2 in Fig. 1;

Fig. 3 is a vertical longitudinal section through the roof at the ridge on the line 3—3 in Fig. 1;

Fig. 4 is a fragmentary plan view of the eaves portion of the roof in the region of one of the seams;

Fig. 5 is a vertical section on the line 5—5 in Fig. 4;

Fig. 6 is a horizontal section through the depending eaves flanges of a carline, seam cover and roof sheets on the line 6—6 in Fig. 5;

Fig. 7 is a vertical cross-section through one of the seams at the ridge, the section being taken on the line 7—7 in Fig. 2;

Fig. 8 is a similar section taken at the side plate on the line 8—8 in Fig. 5; and

Fig. 9 is a perspective view of the eaves end portion of one of the roof sheets.

The present roof comprises side plates A connected by carlines B; it also comprises metal roof sheets C which span the spaces between the side plates and carlines; and it also comprises seam covers D that cover the carlines and the adjacent side margins of the roof sheets from side plate to side plate. The roof sheets, carlines and seam covers slope downwardly on opposite sides of the ridge to form a pitch or arcuate roof.

As shown in the drawings, the side plates A are of angular cross-section and are preferably arranged with one flange down and the other flange up and facing outwardly. Each of the carlines B is of substantially inverted channel-shaped section with out-

standing horizontal flanges 10 along the lower edges of its side walls. The end portions of the carlines rest on and are rigidly secured to the side plates A by rivets 11 that extend through the outstanding top flanges of said side plates and the lateral base flanges 10 of said carlines. At the end portions of the carlines, their tops are preferably curved downwardly and merge into the plane of the lateral base flanges 10 of said carlines at the ends thereof, where they are provided with depending end flanges 12 that overhang the outer edges of the side plates.

The roof sheets C are provided with depending eaves flanges 13 that are spaced away from the outer edges of the side plates A and the depending end flanges 12 of the carlines B without being fastened thereto. The side marginal portions of the roof sheets C are offset upwardly to form upstanding side marginal flanges 14 that terminate short of the depending eaves flanges 13 of said sheets. Each of said side seam flanges 14 is of substantially inverted L-shaped section; that is, each seam flange 14 preferably comprises an upstanding web portion having an outstanding lateral flange at its top. The body portions 15 of said sheets are made concave in directions transverse of their length; that is, said body portions 15 slope downwardly from the side marginal flanges 14 of the sheets to the middle thereof, whereby said sheets are substantially trough-shaped in transverse section. The trough-shaped body portions 15 of the sheets extend from end to end thereof where they are curved downwardly and merge into the flat surfaces of the depending eaves flanges of said sheets. The lower edges of the depending eaves flanges 13 of the sheets are preferably made straight, whereby said eaves flanges are deeper at the sides of the sheets than at the middle.

The angular side seam flanges 14 of the roof sheets have a snug fit over the upper side edges or corners of the carlines; and the tops of the carlines, between the adjacent marginal edges of adjacent seam flanges have raised or upwardly offset middle portions 16, whose surfaces are substantially flush with the upper surfaces of said flanges. In consequence of this arrangement, the seam covers, which straddle the carlines and the seam flanges, have a full bearing against the

carlines and seam flanges and thus firmly clamp the seam flanges to the carlines.

As shown in the drawings, the seam covers D are positively secured to the carlines at the ridge and adjacent to the eaves, preferably by rivets 17 that pass through said covers and the raised middle portions 16 of the carlines. The seam covers are turned down at the eaves to cover the ends of adjacent sheet flanges and have depending end flanges 18 that overhang the depending end flanges 12 of the carlines and are rigidly secured thereto by horizontal rivets 19. As shown in Fig. 6, the side marginal portions of the depending end flanges 18 of the seam covers are offset outwardly, as at 20, to accommodate the adjacent end portions of the depending eaves flanges 13 of the sheets, and are spaced far enough from said eaves flanges to permit limited angular adjustment thereof during the racking and weaving of the car frame in service.

The running-boards 21 extend longitudinally of the car at the ridge and are preferably supported on and secured to the lateral top flanges of Z-shaped running-board saddles 22 whose lateral base flanges rest on the seam covers and are secured in position by means of the rivets that secure the ridge portions of said seam covers to the carlines. If desired, the roof frame may be further strengthened by securing a ridge pole or purlin 23 to the undersides of the lateral base flanges of the carlines.

The sheets are assembled on the car preferably by springing or forcing their concave body portions into place between adjacent carlines, in which position the side seam flanges of the sheets have a snug fit over the upper edges of the carlines. The seam covers or carline caps are then placed over the carlines and the seam flanges supported thereon and are rigidly secured to the carlines, thereby firmly clamping the roof sheet flanges thereto.

It is noted that by the foregoing arrangement of parts, the roof sheets are supported along their sides by the carlines to which they are firmly clamped in position to exclude the weather; but that in case of the distortion of the car frame, the sheets move with the carlines independently of the remainder of the roof frame and are adapted to accommodate themselves to such distortion by the flexing or bending of their concavely curved body portions. It is also noted that the concave body portions of the sheets operate to convey moisture on the seams to the middle of the sheets, thereby greatly simplifying the problem of making a water-tight seam between adjacent sheets.

It is noted that the concavely curving or bowing of the body portions of the sheets enables said body portions to be supported directly on the purlins and side plates in the

plane of the bottoms of the carlines without the use of filler strips or purlins that are offset upwardly between carlines, thereby permitting the use with relatively deep carlines of relatively shallow seam covers and roof sheets having relatively shallow seam flanges.

Other advantages of the above roof are its great simplicity and cheapness of construction, the facility with which it may be applied, and the elimination of perforations in the sheets.

Obviously, the hereinbefore described construction admits of considerable modification without departing from the invention; therefore, I do not wish to be limited to the precise arrangement shown and described.

What I claim is:

1. A car roof comprising side plates, carlines extending from side plate to side plate, roof sheets extending from side plate to side plate between carlines, said roof sheets having upwardly offset marginal portions resting on the tops of said carlines, and seam covers positively secured to said carlines and straddling said carlines and the upwardly offset marginal portions of the sheets, said seam covers snugly embracing the upwardly offset marginal portions of the sheets engaged therewith, thereby firmly clamping said portions to said carlines.

2. A car roof comprising side plates, carlines extending from side plate to side plate, roof sheets extending from side plate to side plate between carlines, and having upwardly offset side marginal portions adapted to bear against the top and sides of said carlines, and seam covers rigidly secured to said carlines and snugly embracing the upwardly offset margins of said sheets whereby said upwardly offset marginal portions of said sheets are firmly clamped to said carlines against movement transversely thereof.

3. A car roof comprising side plates, carlines extending from side plate to side plate, roof sheets extending from side plate to side plate between carlines, said roof sheets comprising bowed body portions adapted to be sprung into place between adjacent carlines and upwardly offset marginal portions overlapping the tops of said carlines, and seam covers straddling said carlines and snugly embracing the upwardly offset portions of said sheets to firmly clamp said portions to said carlines against movement transversely thereof.

4. A car roof comprising side plate, carlines extending from side plate to side plate, roof sheets extending from side plate to side plate between carlines, said roof sheets having concave body portions adapted to be sprung into place between adjacent carlines and upwardly and outwardly directed side marginal flanges bearing against the sides and top surfaces of said carlines, and seam

covers secured rigidly to said carlines and snugly embracing the side marginal flanges of said sheets to firmly clamp said flanges to said carlines.

5 5. A car roof comprising side plates, carlines extending from side plate to side plate, roof sheets extending from side plate to side plate between carlines, said roof sheets comprising body portions that are concave
10 in directions transverse to the length of said carlines and side marginal flanges of substantially inverted L-shaped section that fit over the upper side edges of said carlines, and seam covers secured to said carlines for
15 firmly clamping the inverted L-shaped sheet flanges thereto.

20 6. A car roof comprising side plates, relatively deep carlines extending from side plate to side plate, roof sheets extending from side plate to side plate, said roof sheets comprising bowed body portions resting on the side plates between carlines and rela-

tively shallow upstanding side marginal flanges resting on the tops of said carlines, and relatively shallow seam caps secured to
25 the carlines and snugly embracing the marginal flanges of said sheets thereby firmly clamping the side marginal flanges of said sheets to said carlines.

7. A car roof sheet comprising trans- 30 versely bowed body portions having at the sides thereof, outwardly bent upstanding flanges and at the ends thereof depending flanges.

8. A car roof sheet comprising a trans- 35 versely concave body portion having at the sides thereof flanges of substantially L-shaped section and at the ends thereof depending flanges that are deeper at the sides
40 of the sheet than at the middle thereof.

Signed at New Kensington, Pa., this 24th day of May, 1926.

CHARLES DAVID BONSTALL.