May 3, 1927.

1,627,372

C. D. BONSALL

CAR ROOF

Filed June 21, 1926

Fig. 1.

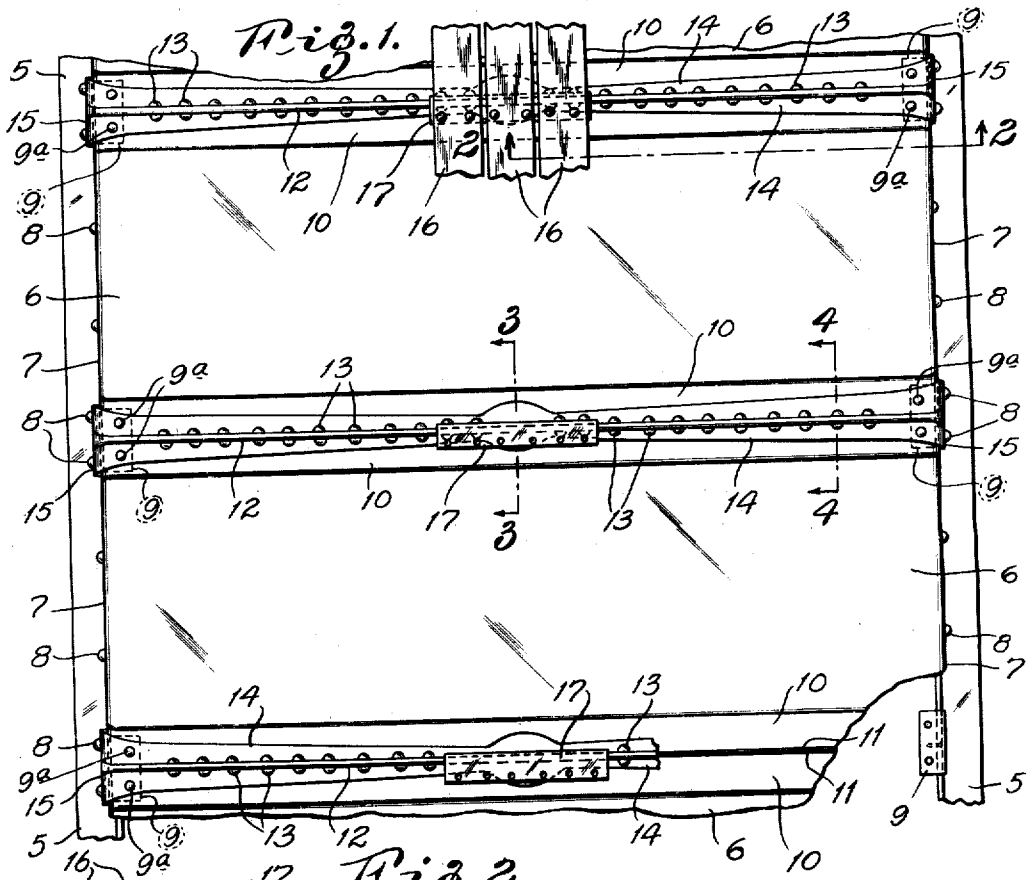


Fig. 2.

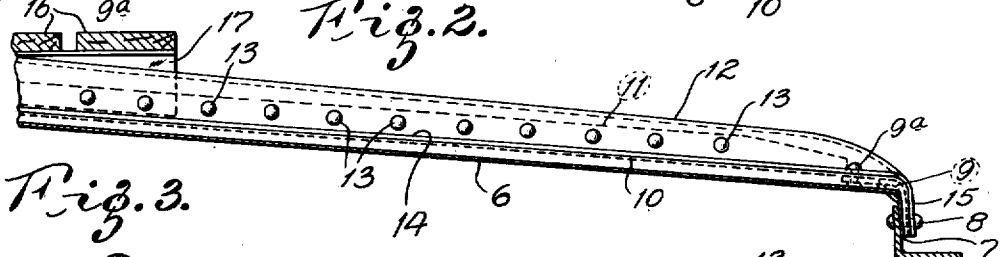


Fig. 3.

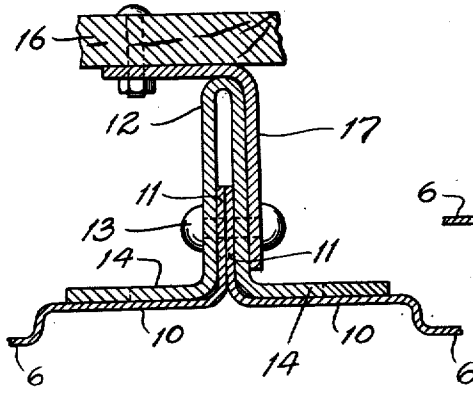
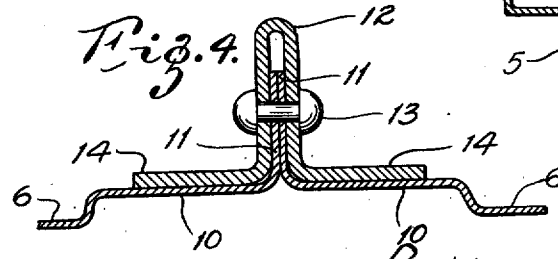


Fig. 4.



Inventor:
Charles David Bonsall,
by Cornell Cowen,
His Attorneys.

Patented May 3, 1927. 1,627,372

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 June 21, 1926. Serial No. 117,330.

This invention relates to car roofs of the all-steel riveted-up type wherein heavy gage roofing sheets extend from side plate to side plate of the car and are rigidly secured to each other by seam covers that function as outside carlines.

The principal object of the present invention is to increase the strength and rigidity of the roof by improving the sectional shape and arrangement of the cooperating side marginal portions of the roof sheets. Other objects are simplicity of construction and reduced cost of manufacture.

The invention consists principally in shaping and arranging the cooperating marginal portions of the roof sheets to form a roof that will be stiffer and stronger than previous roofs of the same weight of material. It also consists in the parts and in the combinations and arrangements of parts hereinafter described and claimed.

In the accompanying drawing which forms part of the specification and wherein like symbols refer to like parts wherever they occur.

Fig. 1 is a plan view of an all-steel riveted-up car roof embodying my invention;

Fig. 2 is an enlarged transverse section through one half of the roof between seams, the section being taken at a line 2—2 in Fig. 1; and

Figs. 3 and 4 are transverse cross sections through one of the roof seams at the joints on the lines 3—3 and 4—4, respectively, in Fig. 1.

Referring to the accompanying drawing, my invention is shown in conection with a car having Z-bar side plates 5 arranged with their webs horizontal and with its inner flanges extending upwardly. Metal roof sheets 6 extend transversely of the car from side plate to side plate thereof and slope downwardly on opposite sides of the ridge to form a pitch or arcuate roof. The roof sheets are provided with depending eaves flanges 7 that overhang the upstanding inner flanges of the side plates and are secured to the outer faces of said flanges by horizontal rivets 8.

The side marginal portions of the roof sheets are off-set upwardly, forming raised panels 10 at the sides thereof. The raised side panels of the sheets extend from end to end thereof and preferably are of substantially uniform width throughout their length. The free marginal edges of the upwardly offset side marginal portions 10 of the sheets are bent up to form upstanding seam flanges 11 at the side edges thereof. Throughout the greater portion of their length, the sheet flanges are preferably of substantially uniform depth; but the end portions of said flanges slope downwardly to the plane of the sheets adjacent to the eaves. The raised panels 10 and the upstanding seam flanges 11 at the outer edges thereof form substantially Z-shaped flanges at each side of the sheets.

The roof sheets are arranged on the car side by side with the upstanding seam flanges 11 of adjacent sheets in contact with each other flatwise; and said adjacent flanges of said sheets are covered by weatherproofing members preferably in the form of inverted U-shaped seam covers or carline caps 12, which extend from eaves to eaves of the car and are rigidly secured to said sheet flanges by rows of rivets 13. The seam covers 12 are preferably of greater depth at the ridge than at the eaves, each one decreasing in depth uniformly from the ridge to points adjacent to the eaves where they are curved downwardly over the beveled eaves end of the upstanding sheet flanges and merge into the plane of the base flanges of the seam cover at the ends thereof. The seam covers are provided with lateral base flanges 14 that extend longitudinally of said seam covers from end to end thereof and rest on the raised panels 10 of the roof sheets. The eaves ends of seam covers are secured to the eaves angles 6 by the securing rivets 8 for the eaves ends of the roof sheets and are provided with depending end flanges 15 that overhang the end portions of the depending eaves flanges of adjacent sheets. As shown in the drawing, the surplus metal resulting from the downwardly curved end portions of the seam covers is preferably utilized to gradually widen the eaves end portions of the lateral base flanges 12 of the seam covers and the depending eaves flanges 15 thereof.

As shown in the drawing, a knee-brace 9 is located beneath the eaves ends of the sheets at each joint. The vertical flanges of each knee-brace is positioned between the upstanding flanges of the side plate and the

depending eaves flanges of the roof sheets end is secured in position by the rivets 7. The other flange of each knee brace extends inwardly beneath the hollow rib formed by the round margins 10 of adjacent sheets and is secured flatwise thereto and to the base flanges of the seam cover by nuts 9ª.

Running boards 16 extend longitudinally of the car at the ridge and are secured to the lateral top flanges of Z-shape running board saddles 17, whose lateral extending base flanges are secured flatwise to the sides of the seam covers by the rivets 13 that secure said seam covers to the sheet flanges covered thereby.

By the arrangement hereinbefore described, the raised panels of adjacent sheets conjointly function after the manner of hollow ribs at the base of the roof joints, which ribs, together with or including the upstanding sheet flanges cooperate with the seam covers to increase the load carrying capacity of the roof. The panelling of the sheets at the base of each joint also strengthens the roof against horizontal stresses caused by the racking and weaving of the car structure in service.

Another advantage of the roof construction hereinbefore described is that it locates the lower edges of the seam or carline caps above the general drainage level of the sheets and thus overcomes the tendency of water to enter the roof joints and produce rust.

The invention is adapted for use with cars having various forms of side plate construction, and I do not wish to be limited to the precise construction shown and described.

What I claim is:

1. A car roof comprising side plates and self supporting roof sheets extending from side plate to side plate and rigidly secured thereto, said roof sheets being provided along their adjacent margins with raised panels having upstanding flanges at their edges that are rigidly secured together in direct contact with each other.

2. A car roof comprising side plates and self supporting roof sheets extending from side plate to side plate and rigidly secured thereto, said roof sheets being provided along their adjacent margins with raised panels having upstanding flanges at their edges that are rigidly secured together in direct contact with each other, and means for weatherproofing the joints between said flanges.

3. A car roof comprising side plates and self supporting roof sheets extending from side plate to side plate and rigidly secured thereto, said roof sheets being provided along their adjacent margins with raised panels having upstanding flanges at their edges that are rigidly secured together flatwise in direct contact with each other, and carline caps covering said flanges and rigidly secured thereto.

4. A car roof comprising side plates and self supporting roof sheets extending from side plate to side plate and rigidly secured thereto, said roof sheets being provided along their adjacent margins with raised panels having upstanding flanges at their edges that are rigidly secured together flatwise in direct contact with each other, and carline caps covering said flanges and rigidly secured thereto. said carline caps having against the upper surfaces of the raised oustanding base flanges bearing flatwise panels of adjacent sheets.

5. A car roof comprising side plates, self supporting roof sheets extending from side plate to side plate, said side plates constituting the sole supports for said sheets said roof sheets being formed along their adjacent margins with raised panels that terminate in upstanding flanges, and inverted U-shaped seam covers flanges straddling the upstanding covers of adjacent sheets and having lateral extending base flanges resting on the raised panels thereof.

6. A car roof comprising side plates and self-supporting roof sheets spanning from side plate to side plate and rigidly secured thereto, said roof sheets being directly connected along their adjacent margins by upstanding seams constituting load carrying members and being provided on opposite sides of said seams with raised panels that cooperate with said seam to increase the load carrying capacity thereof.

7. A car roof comprising side plates and self-supporting roof sheets spanning from side plate to side plate and rigidly secured thereto, said roof sheets being provided along their adjacent margins and upstanding seam flanges, and seam covers straddling adjacent seam flanges, said seam covers being rigidly secured to adjacent seam flanges with the seam flanges bearing flatwise directly against each other and against the sides of the seam covers from end to end, whereby they constitute load carrying members, said sheets being provided adjacent to said seams with raised panels which cooperate with said seam covers and the flanges covered thereby to increase the load carrying capacity of the roof.

8. A car roof comprising side plates and self-supporting roof sheets spanning from side plate to side plate and rigidly secured thereto, said roof sheets being provided along their adjacent margins with upstanding seam flanges, said seam covers being rigidly secured to adjacent seam flanges with the seam flanges bearing flatwise directly against each other and against the sides of the seam covers from end to end, whereby they constitute load carrying members, said

sheets being provided adjacent to said seams with raised panels which cooperate with said seam covers and the flanges covered thereby to increase the load carrying capacity of the roof, said seam covers being provided with laterally extending base flanges that bear flatwise on the raised panels of adjacent sheets.

9. A car roof comprising side plates, roof sheets and carlines, said roof sheets and said carlines extending from side plate to side plate and rigidly secured thereto and to each other, the portions of the roof sheets located at the carlines being offset from the main body portions of the roof sheets and the carlines lying wholly to one side of the plane defined by said offset portions.

Signed at New Kensington, Pa., this 16th day of June, 1926.

CHARLES DAVID BONSALL.

sheets being provided adjacent to said seams with raised panels which cooperate with said seam covers and the flanges covered thereby to increase the load carrying capacity of the roof, said seam covers being provided with laterally extending base flanges that bear flatwise on the raised panels of adjacent sheets.

9. A car roof comprising side plates, roof sheets and carlines, said roof sheets and said carlines extending from side plate to side plate and rigidly secured thereto and to each other, the portions of the roof sheets located at the carlines being offset from the main body portions of the roof sheets and the carlines lying wholly to one side of the plane defined by said offset portions.

Signed at New Kensington, Pa., this 16th day of June, 1926.

CHARLES DAVID BONSALL.

CERTIFICATE OF CORRECTION.

Patent No. 1,627,372. **Granted May 3, 1927, to**

CHARLES DAVID BONSALL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, claim 4, transpose lines 79 and 80, so that line 80 will precede line 79; same page, line 89, claim 5, strike out the word "flanges", and line 90, for the word "covers" read "flanges"; line 125, claim 8, after the word "flanges" insert the words "and seam covers straddling adjacent seam flanges"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 24th day of May, A. D. 1927.

M. J. Moore,
Acting Commissioner of Patents.

Seal.

CERTIFICATE OF CORRECTION.

Patent No. 1,627,372. Granted May 3, 1927, to

CHARLES DAVID BONSALL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, claim 4, transpose lines 79 and 80, so that line 80 will precede line 79; same page, line 89, claim 5, strike out the word "flanges", and line 90, for the word "covers" read "flanges"; line 125, claim 8, after the word "flanges" insert the words "and seam covers straddling adjacent seam flanges"; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 24th day of May, A. D. 1927.

Seal.

M. J. Moore,
Acting Commissioner of Patents.