April 16, 1929. C. D. BONSALL 1,709,603

CAR ROOF

Filed June 23, 1927 2 Sheets-Sheet 1

Fig. 1.

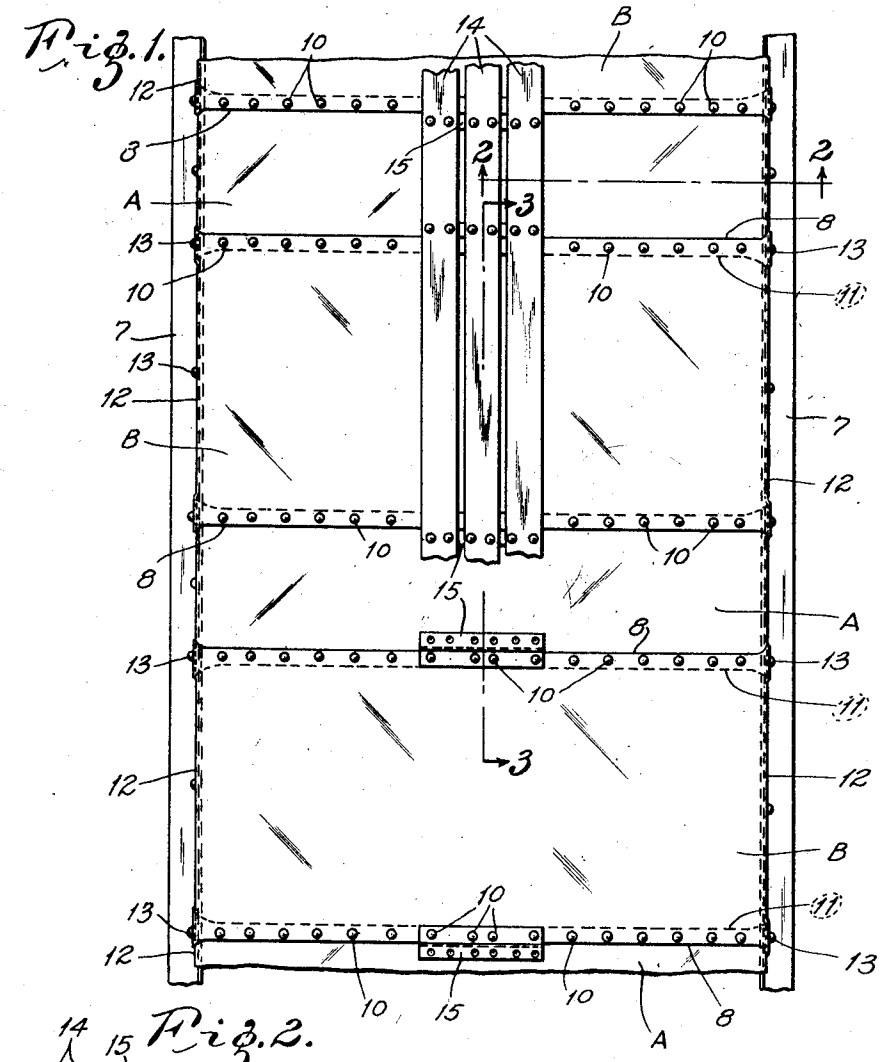
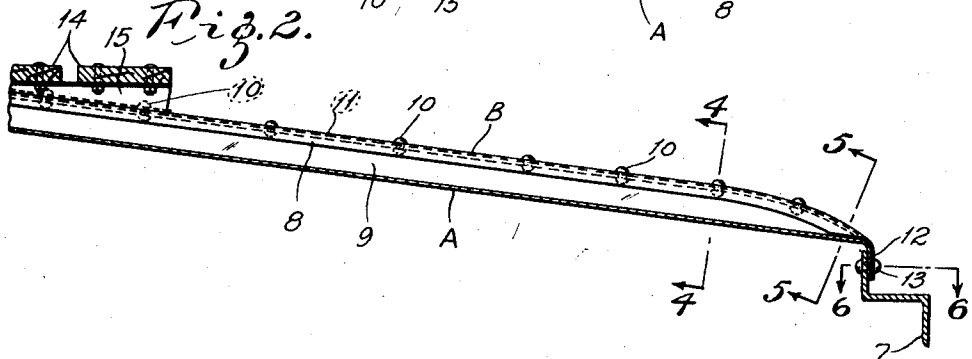


Fig. 2.



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CAR ROOF

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Fig. 3.

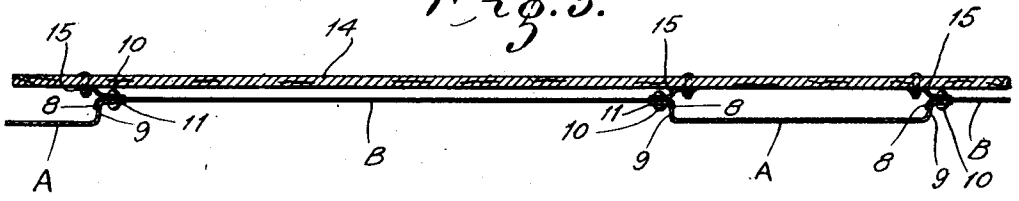


Fig. 4.

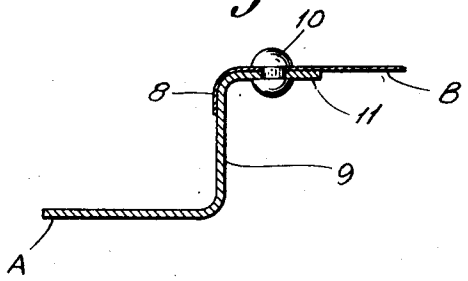


Fig. 5.

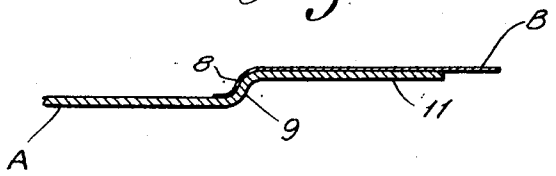
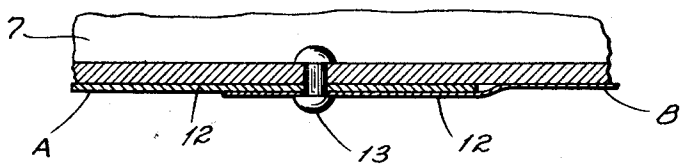


Fig. 6.



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Patented Apr. 16, 1929. 1,709,603

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 23, 1927. Serial No. 200,956.

This invention relates to single-course car roofs of the all-steel riveted-up type wherein heavy-gage self-supporting roof sheets extend from side plate to side plate and are rigidly secured thereto and to each other to form a rigid load sustaining structure.

The principal object of the present invention is to provide a strong, durable and rigid roof construction which will be as strong and as rigid as previous roofs of the same weight of metal but which can be produced more cheaply.

The present invention consists in a car roof comprising galvanized sheets and black iron sheets; it also consists in using galvanized sheets of relatively light gage and black iron sheets of relatively heavy gage; it also consists in arranging the two kinds of sheets alternately; it also consists in arranging the two kinds of sheets at two elevations; it also consists in making the light gage sheets enough wider than the heavy gage sheets to make the cross-sectional area of said light gage sheets the same as the cross-sectional area of said heavy gage sheets; and it also consists in the parts and arrangements and combinations 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 a portion of a car roof embodying my invention;

Fig. 2 is a transverse section through one-half the roof on the line 3—3 in Fig. 1;

Fig. 3 is a vertical longitudinal cross-section through the roof at the ridge on the line 2—2 in Fig. 1; and

Figs. 4, 5 and 6 are vertical cross-sections through the cooperating marginal portions of adjacent sheets on the lines 4—4, 5—5 and 6—6, respectively in Fig. 1.

Referring to accompanying drawing my invention is shown in connection with a single-course car roof of the all-steel riveted-up type which is shown applied to a steel box car whose roof substructure comprising Z-bar side plates 7, which are arranged with their webs horizontal with their inner flanges extending upwardly. Transversely arranged load sustaining roof sheets of two kinds or types A and B span the car from side plate to side plate with their eaves portions supported on the upstanding inner flanges thereof. The roof sheets of both types slope downwardly on opposite sides of the ridge to form a pitch or arcuate roof and are made in the form of channels. The roof sheets of the two kinds A and B are arranged alternately, the sheets A being arranged with the channel-opening upwardly, and the sheets B being arranged with the channel inverted or opening downwardly.

The sheets of the two kinds A and B are assembled on the car by lapping the depending side marginal flanges 8 of the inverted channel-shaped sheets B over the upstanding side walls 9 of the channel-shaped sheets A and by securing the body or web portions of sheets B by rivets 10 to underlying outstanding flanges 11 located at the upper edges of the side walls of the sheets A. By this arrangement, the marginal portions of inverted channel-shaped sheets B are supported by and are rigidly secured to the outstanding top flanges 11 of the channel-shaped sheets A. Said sheets, when assembled, form a single-course roof whose longitudinal cross-section comprises alternating flat topped ribs and flat bottom channels extending crosswise of the car.

As shown in drawing, the sheets of both kinds are provided with depending eaves flanges 12 that overhang upstanding inner flanges of the side plates and are secured to the outer faces of said flanges by horizontal rivets 13; and the inverted channel-shaped sheets B, together with the flanged side margins of the channel-shaped sheets A, are curved downwardly at their eaves ends.

Running boards 14 rest on the lateral top flanges of Z-shaped running board saddles 15, whose lateral base flanges rest on the inverted channel-shaped sheets A immediately above the underlying top flanges 11 of the channel-shaped sheets B and are secured in position by securing rivets 10 therefor.

It is noted that the upper inverted channel-shaped sheets B are made of relatively light gage galvanized metal; that the channel-shaped sheets A are pressed from plain black iron sheets of relatively heavy gage; and that the heavy gage sheets are preferably made twice as thick as the light gage sheets. It is also noted that the light gage galvanized sheets B are made enough wider

than the heavy gage black iron sheets A to make the cross-sectional area of said light gage sheets substantially the same as the cross-sectional area of said heavy gage sheets, thereby securing an even distribution of metal above and below the neutral axis of the roof and enabling the maximum strength of the metal to be utilized.

It is also noted that the heavy gage black iron sheets of the present roof are of slightly heavier gage than the galvanized roof sheets used in previous roofs and that the light gage galvanized sheets of the present roof are of slightly lighter gage than the sheets of said previous roofs. This arrangement produces a roof having the same weight and strength as previous roofs, and at the same time reduces the cost of the present roof, because every other one of the sheets thereof is a black iron sheet which can be purchased at considerably less cost than the galvanized sheets.

As shown in the drawing, the narrow heavy-gage sheets are preferably located in the lower plane where they are better adapted to resist lateral stresses which tend to throw the car frame out of square and are thick enough to last as long as the thin sheets which are protected by the galvanized coating. It is also noted that the heavy-gage sheets, by reason of their increased thickness, will wear as long as the thinner galvanized sheets. If desired, corrosion of the black iron sheets may be prevented by applying a preservative coating of mineral paint thereto.

Obviously, my invention admits of considerable modification in the design of the roof and in the arrangement of the two kinds of sheets and I do not wish to be limited to the specific design illustrated.

What I claim is:

1. A metal car roof comprising galvanized roof sheets alternating with black iron sheets.

2. A car roof comprising metal roof sheets, some of said sheets being galvanized and the others being made of plain black iron.

3. A metal car roof comprising relatively wide light gage sheets alternating with relatively narrow heavy gage sheets, the cross sectional area of the two kinds of sheets being substantially the same.

4. A metal car roof comprising relatively light gage galvanized sheets alternating with relatively heavy gage black iron sheets.

5. A metal car roof comprising relatively wide galvanized roof sheets alternating with relatively narrow black iron sheets.

6. A metal car roof comprising relatively wide galvanized roof sheets alternating with relatively narrow black iron shets, the cross sectional area of the two kinds of sheets being substantially the same.

7. A metal car roof comprising relatively wide light gage galvanized sheets alternating with relatively narrow heavy gage black iron shetse.

8. A metal car roof comprising relatively wide light gage galvanized sheets alternating with relatively narrow heavy gage black iron sheets, the cross sectional area of the two kinds of sheets being substantially the same.

9. A metal car roof comprising roof sheets of substantially channel-shaped section and arranged in two series with the sheets of one series having their channels opening downwardly and alternating with the sheets of the other series whose channels open upwardly, the sheets of one series being relatively wide galvanized sheets of relatively thin gage and the sheets of the other series being relatively narrow black iron sheets of relatively heavy gage, the cross-sectional area of the wide thin gage galvanized sheets being substantially the same as the cross-sectional area of the narrow heavy gage black iron sheets.

Signed at New Kensington, Pennsylvania, this 20th day of June, 1927.

CHARLES DAVID BONSALL.