July 12, 1932. C. D. BONSALL 1,866,539

CAR ROOF

Filed June 25, 1931 2 Sheets-Sheet 1

Fig. 1.

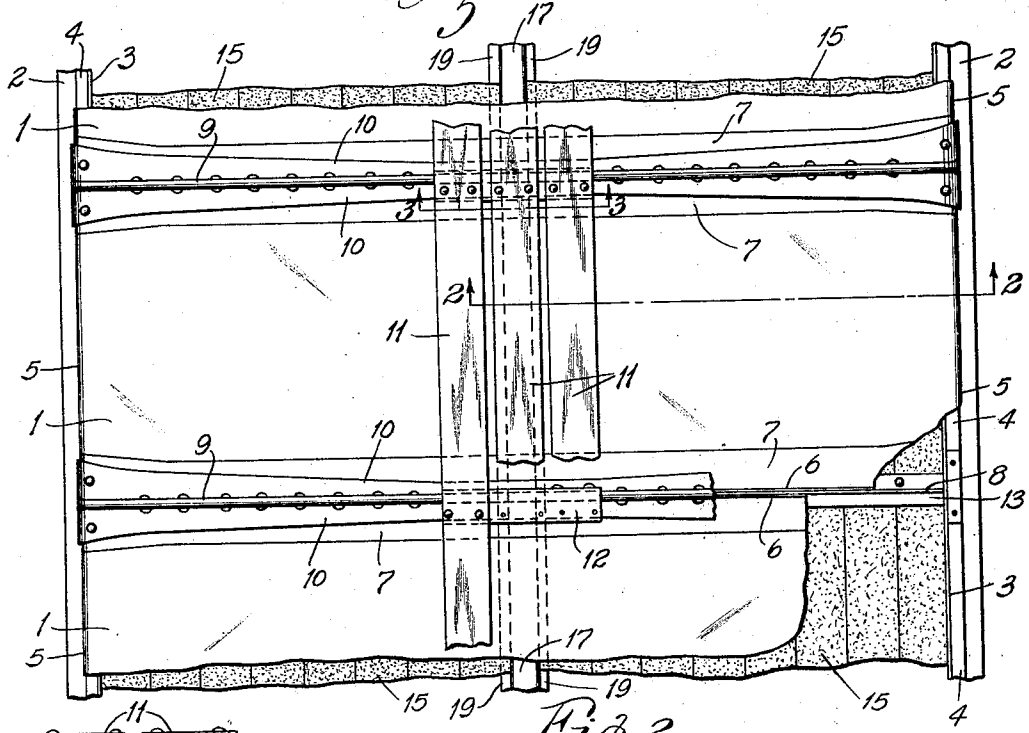


Fig. 2.

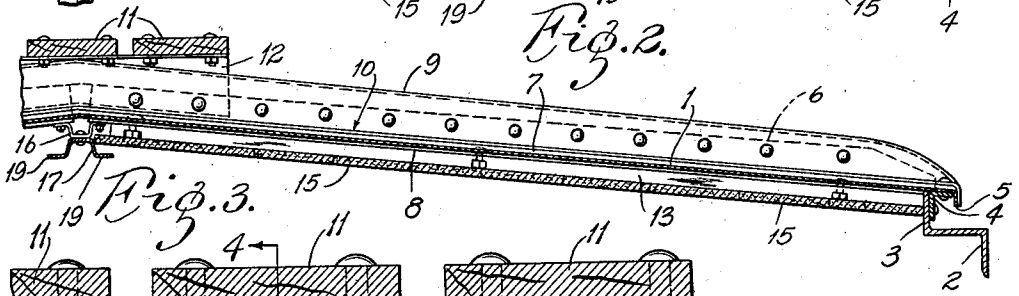
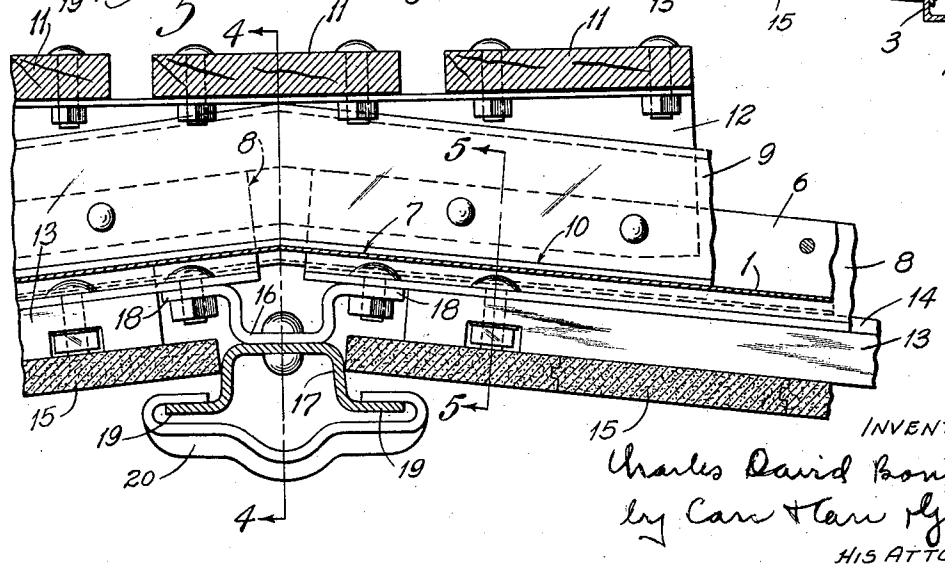


Fig. 3.



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Fig. 4.

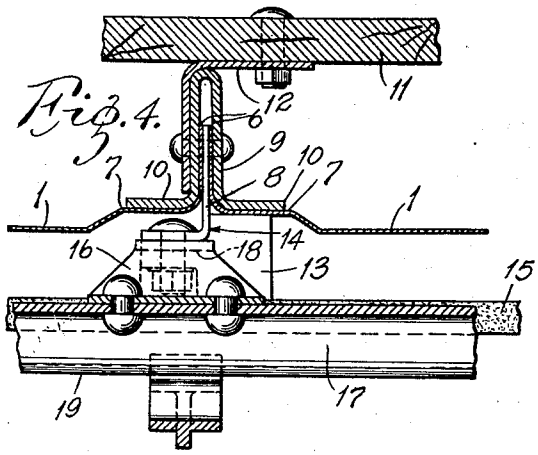


Fig. 5.

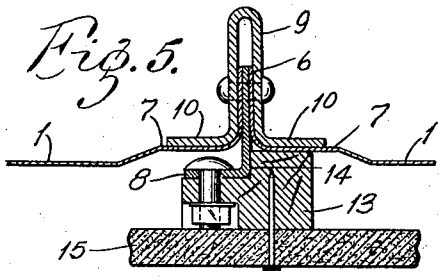


Fig. 6.

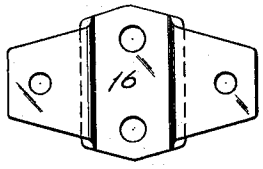


Fig. 7.

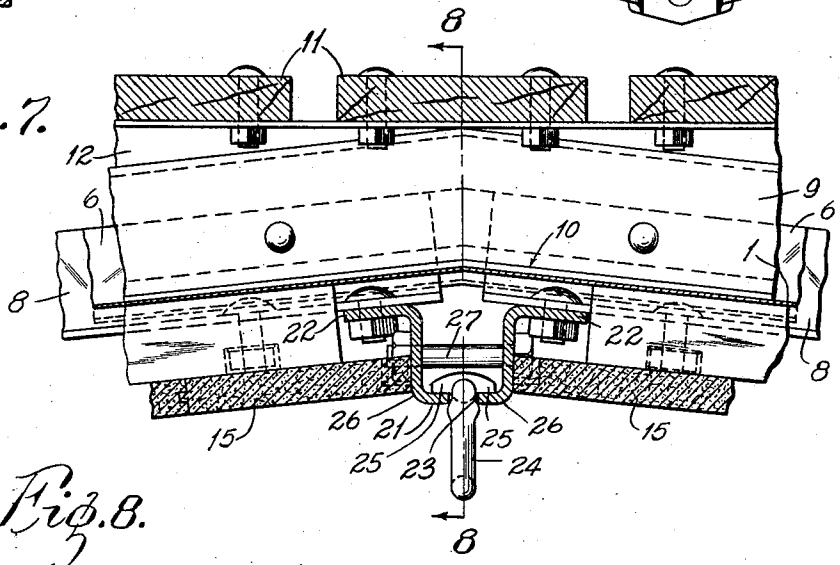
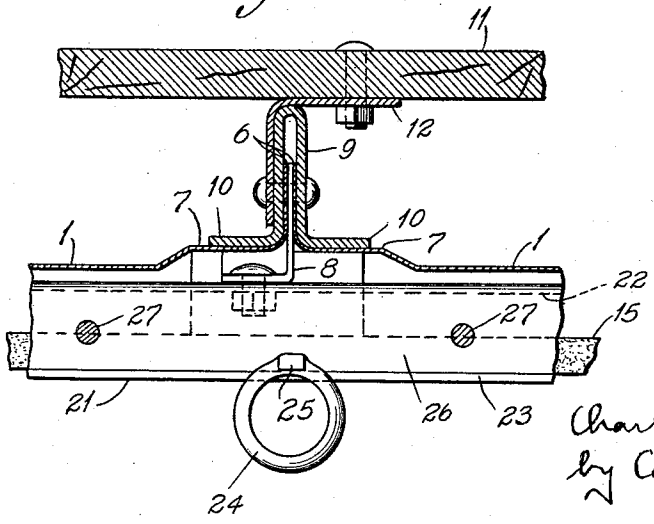


Fig. 8.



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Patented July 12, 1932 1,866,539

UNITED STATES PATENT OFFICE

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CAR ROOF

Application filed June 25, 1931. Serial No. 546,770.

This invention relates to car roofs, particularly insulated car roofs of the type shown in my Patent No. 1,643,975, dated August 4, 1927, wherein self-supporting roof sheets extend from side to side of the car and are rigidly connected along their adjacent margins by upstanding seams that function as outside carlines and have members secured therein for stiffening said seams and for suspending the insulating lining beneath said roof sheets.

The principal object of the present invention is to provide a simple and efficient arrangement for attaching a load-lifting beam to roofs of the above type. Other objects are ease of assembly, compactness of design, fewness of parts and cheapness of manufacture.

The invention consists principally in the parts and in the construction, combinations and arrangements of parts hereinafter described and claimed.

In the accompanying drawings which form 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 an insulated car roof provided with a lifting beam construction embodying my invention.

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

Fig. 3 is an enlarged fragmentary vertical transverse section through the ridge portion of the roof on the line 3—3 in Fig. 1.

Fig. 4 is a vertical longitudinal section through the roof in the region of one of the seams, the section being taken at the ridge on the line 4—4 in Fig. 3.

Fig. 5 is a similar section taken intermediate between the ridge and the eaves on the line 5—5 in Fig. 3.

Fig. 6 is a plan view of one of the hanger brackets which connect the ridge ends of the combined seams stiffeners and lining supports and which also support the lifting beam.

Fig. 7 is a fragmentary section similar to Fig. 3 showing a lifting beam of modified construction; and

Fig. 8 is a vertical section on line 8—8 in Fig. 7.

Referring to the accompanying drawings, my invention is shown in connection with an all-steel riveted-up car roof comprising metal roof sheets 1, which extend from side plate 2 to side plate 2 alongside of each other and slope downwardly on opposite sides of the ridge to form a pitch or arcuate roof. As shown in the drawings, the side plates 2 are preferably of Z-shaped cross-section and are positioned with their webs horizontal and with their inner flanges 3 extending upwardly. The roof sheets 1 are supported on and riveted to the outstanding top flanges of eaves angle strips 4, which extend longitudinally of the car with their other flanges projecting downwardly and riveted flatwise to the outer faces of the upstanding inner flanges 3 of the side plates 2.

The roof sheets 1 are provided at their eaves ends with depending drip flanges 5 that overhang the outer edges of the eaves angles 4. The roof sheets are provided along their adjacent side margins with upstanding seam flanges 6; and the body portions of said sheets are preferably offset upwardly adjacent to said flanges to form raised panels 7. The side marginal seam flanges 6 of the roof sheets are coped off at the eaves ends of the sheets and merge into the plane of the side marginal panels 7 thereof.

Metal strips or plates 8 of substantially angular cross-section have one flange interposed between the adjacent side seam flanges 6 of adjacent roof sheets, the other flange extending beneath the raised side marginal panel 7 of one roof sheet and being spaced vertically therefrom. Metal seam caps 9 of substantially inverted U-shaped cross-section are placed astride adjacent side marginal seam flanges 6 and the vertical flange of the strip 8 interposed therebetween and are riveted or otherwise rigidly secured to said flanges to form an upstanding seam construction that functions after the manner of an exterior carline for the roof. Each seam is provided with two of the angle-shaped plates or strips 8 that extend from the side plates to

points short of the ridge. The seam caps 9 extend from eaves to eaves of the car and are provided with outstanding base flanges 10 that rest on the raised side marginal panels 7 of adjacent roof sheets and are turned down at the eaves over the depending drip flanges 5 of said sheets. The seam caps 9 are preferably curved downwardly over the beveled eaves ends of the upstanding side seam flanges 6 of the roof sheets.

Running boards 11 extend longitudinally of the car at the ridge and are supported on and rigidly secured to the lateral top flanges of angle-shaped running board saddles 12 that are secured to the sides of the seam caps by the securing rivets therefor.

Bolted or otherwise rigidly secured to the underside of the lateral base flanges of the angle-shaped plates 8 embodied in each seam are wooden strips 13 that extend longitudinally of said plates from the side plates to points short of the ridge ends of said plates. Each wooden strip 13 is rabbeted, as at 14, along one of its upper corners to accommodate the base flange of the seam plate 8 to which it is secured; and the portion of said strip located on the side opposite from said base flange is preferably in contact with the raised side marginal roof sheet panel 7 located thereabove. Located below the wooden supporting strips 13 is an insulating lining 15 of wood or other insulating material, which is nailed or otherwise rigidly secured to the undersides of said strips. The wooden strips 13 serve as nailing strips for the insulating lining 15, and they also serve to space the said lining below the roof sheets and thus provide dead air insulating spaces between the roof sheets and said linings.

As shown in Figs. 1 to 6, the spaced ridge ends of the two angle-shaped plates 8 and stiffener in each seam or carline construction are connected together by means of a splice member 16 that serves as a hanger for a load-lifting beam 17 which extends longitudinally of the roof at the ridge, preferably from end to end of the car. Each of these combined splice members and beam hangers 16 comprises a channel-shaped body portion with outstanding top flanges 18 that are bolted or otherwise rigidly secured to the bottoms of the ridge end portions of the base flanges of the two combined hanger and stiffening plates 8 for each seam. The channel-shaped beam hanger 16 is located between the spaced ridge ends of the wooden nailing strips 13 that are bolted to the hanger plates 8 embodied in the seam; and the load-lifting beam 17 is shown in the form of a metal member of inverted channel-shaped cross-section with outstanding base flanges 19. The web or top portion of the inverted channel-shaped load-lifting beam 17 is riveted or otherwise secured flatwise to the bottom of the web of the channel-shaped beam hanger 16, with the upper portion of the inverted channel of said beam located between the spaced ridge ends of the insulating lining 15 and with the lateral base flanges 19 of said beam spaced far enough below said insulating lining to accommodate the inwardly hooked flanges of a clip 20 which is slidably supported on said flanges and serves to support a suitable lifting tackle (not shown).

In the construction shown in Figs. 7 and 8, the roof is shown provided with a sectional or built-up load-lifting beam 21 of channel-shaped section with lateral top flanges 22 that are bolted or otherwise rigidly secured directly to the bottoms of the ridge end portions of the base flanges of the plates 8 for each seam; and the bottom or web of the channel is provided with a longitudinal slot 23 adapted to slidably receive a ring 24 for supporting a lifting tackle (not shown). The ring 24 is slidably supported in the slot 23 by means of laterally extending portions 25 at the top of said ring. The load-lifting beam 21 preferably comprises two side members or sections 26 of substantially Z-shaped cross-section that are so arranged that their webs form the sides of the channel, their upper flanges form the top flanges 22 of said channel and their bottom flanges form the slotted bottom of said channel. The two side sections 26 of the beam 21 are prevented from spreading apart by means of horizontal bolts 27 that extend through alined openings provided therefor in the vertical webs of said sections.

The hereinbefore described arrangement provides simple and efficient means for securing a load-lifting beam to a car roof, especially insulated car roofs of the type hereinbefore described. It serves to connect together the ridge ends of the two plates embodied in each seam, thereby increasing the strength and rigidity of the seam; it permits the insulating lining to be removed and replaced without disturbing the lifting beam; and the lifting beam is so compactly arranged between the spaced ridge ends of the insulating lining and the wooden supporting strips therefor that it does not materially decrease the headroom inside of the car.

Obviously, the hereinbefore described construction admits of considerable modification without departing from the invention. Therefore, I do not wish to be restricted to the precise arrangements of parts shown in the drawings.

What I claim is:

1. In a car roof, a series of plates embodied therein and extending substantially from ridge to eaves thereof, a load-lifting beam located beneath said roof, and hangers for securing said beam to said roof, each of said hangers being secured to the top of said beam and to the adjacent ridge ends of said plates.

2. In a car roof, a series of plates embodied

therein and extending substantially from ridge to eaves thereof, a load-lifting beam located beneath said roof, and hangers for suspending said beam from said plates, each of said hangers comprising a channel-shaped member secured to the top of said beam and having side flanges rigidly secured to the adjacent ridge ends of said plates.

3. In a car roof, a series of plates embodied therein and extending substantially from ridge to eaves thereof in pairs, and a channel-shaped member for each pair of plates located beneath the ridge end portions of said plates and rigidly secured thereto.

4. In a car roof, a series of plates embodied therein and extending substantially from ridge to eaves thereof in pairs, an insulating lining supported by said plates and terminating short of the ridge to provide a space, and a channel-shaped member for each pair of plates located in said space beneath the ridge ends of said plates and rigidly secured thereto.

5. In a car roof, a series of plates embodied therein and extending transversely thereof, an insulating lining supported by said plates and terminating short of the ridge to provide an opening in said lining, hangers located in said opening below said plates and secured to the adjacent ridge ends of the latter, and a load-lifting beam secured to said hangers.

6. A car roof comprising roof sheets connected by upstanding seams, plates embodied in said seams, a load-lifting beam extending longitudinally of the car beneath said plates, and hangers for said beam, each of said hangers comprising a member interposed between and rigidly secured to the seam plates and to said beam.

7. A car roof comprising roof sheets connected by seams, plates embodied in said seams, a load-lifting beam located beneath said roof sheets, and a hanger for securing said beam to the plates of each of said seams, said hanger comprising a channel-shaped member secured to the top of said beam and having outstanding top flanges that are secured to the adjacent ends of the plates embodied in said seam.

8. A car roof comprising roof sheets connected by upstanding seams, plates embodied in said seams and extending substantially from eaves to ridge of the roof, a load-lifting beam extending longitudinally of the car beneath the roof, and hangers for said beam, each of said hangers comprising a channel-shaped member secured to the top of the lifting beam and having outstanding top flanges that are secured to the undersides of the adjacent ridge end portions of the plates of each seam.

9. In a car roof, plates embodied in said roof and extending transversely thereof substantially from eaves to ridge in pairs, and a load-lifting beam extending longitudinally of the roof and rigidly connected to the ridge end portions of the plates of the several pairs.

10. In a car roof, hanger plates embodied in said roof and extending transversely thereof substantially from eaves to ridge in pairs, a load-lifting beam extending longitudinally of the roof and rigidly connected to the ridge end portions of the plates of the several pairs, and an insulating lining for said roof, said insulating lining being secured to said hanger plates and extending from opposite sides of said beam at the level thereof substantially to the eaves of the roof.

11. In a car roof, hanger plates embodied in said roof and extending transversely thereof substantially from eaves to ridge, a load-lifting beam extending longitudinally of the roof and connecting the adjacent ridge end portions of said plates, said load-lifting beam comprising sections arranged to form a channel, and means for securing said sections to the ridge ends of the hanger plates.

12. In a car roof, hanger plates embodied in said roof and extending transversely thereof substantially from eaves to ridge, a load-lifting beam extending longitudinally of the roof and connecting the adjacent ridge end portions of said plates, said load-lifting beam comprising Z-shaped sections arranged to form a channel with outstanding top flanges, means for securing said sections to the ridge ends of the hanger plates, and means for securing said sections together.

13. A car roof comprising roof sheets connected by seams, hanger plates embodied in said seams extending substantially from ridge to eaves, nailing strips secured to said hanger plates and terminating short of the ridge, an insulating lining secured to said nailing strips and also terminating short of the ridge, and a load-lifting beam construction located between the spaced ridge ends of said nailing strips and said lining and connecting the ridge ends of said plates.

14. A car roof comprising roof sheets connected by seams, hanger plates embodied in said seams extending substantially from ridge to eaves, nailing strips secured to said hanger plates and terminating short of the ridge, an insulating lining secured to said nailing strips and also terminating short of the ridge, a load-lifting beam construction located between the spaced ridge ends of said nailing strips and said lining and connecting the ridge ends of said hanger plates, said load-lifting beam construction comprising hangers secured to the ridge ends of said plates, and a beam secured to said hangers.

15. A car roof comprising roof sheets connected by seams, hanger plates embodied in said seams extending substantially from ridge to eaves, nailing strips secured to said hanger plates and terminating short of the ridge, an insulating lining secured to said nailing strips

and also terminating short of the ridge, and a load-lifting beam construction located between the spaced ridge ends of said nailing strips and said lining and connecting the ridge ends of said plates, said load-lifting beam construction comprising a channel-shaped member having outstanding flanges at the top of its side walls that are rigidly secured to the adjacent ridge ends of said plates.

16. A car roof comprising roof sheets connected by seams, hanger plates embodied in said seams extending substantially from ridge to eaves, nailing strips secured to said hanger plates and terminating short of the ridge, an insulating lining secured to said nailing strips and also terminating short of the ridge, a load-lifting beam construction located between the spaced ridge ends of said nailing strips and said lining and connecting the ridge ends of said hanger plates, said load-lifting beam construction comprising two members of substantially Z-shaped cross-section that are disposed with their webs vertical, with their top flanges extending outwardly away from each other and rigidly secured to adjacent ridge ends of said hanger plates and with their bottom flanges extending inwardly towards each other and spaced apart to provide a slot.

17. A car roof comprising roof sheets connected by seams, hanger plates embodied in said seams extending substantially from ridge to eaves, nailing strips secured to said hanger plates and terminating short of the ridge, an insulating lining secured to said nailing strips and also terminating short of the ridge, a load-lifting beam construction located between the spaced ridge ends of said nailing strips and said lining and connecting the ridge ends of said hanger plates, said load-lifting beam construction comprising two members of substantially Z-shaped cross-section that are disposed with their webs vertical, with their top flanges extending outwardly away from each other and rigidly secured to adjacent ridge ends of said hanger plates and with their bottom flanges extending inwardly towards each other and spaced apart to provide a slot, and means for securing together the vertical webs of said members.

Signed at New Kensington, Pennsylvania, this 22nd day of June, 1931.

CHARLES DAVID BONSALL.