Dec. 22, 1936. C. D. BONSALL 2,065,043

CAR ROOF

Filed March 14, 1936

Fig. 1.

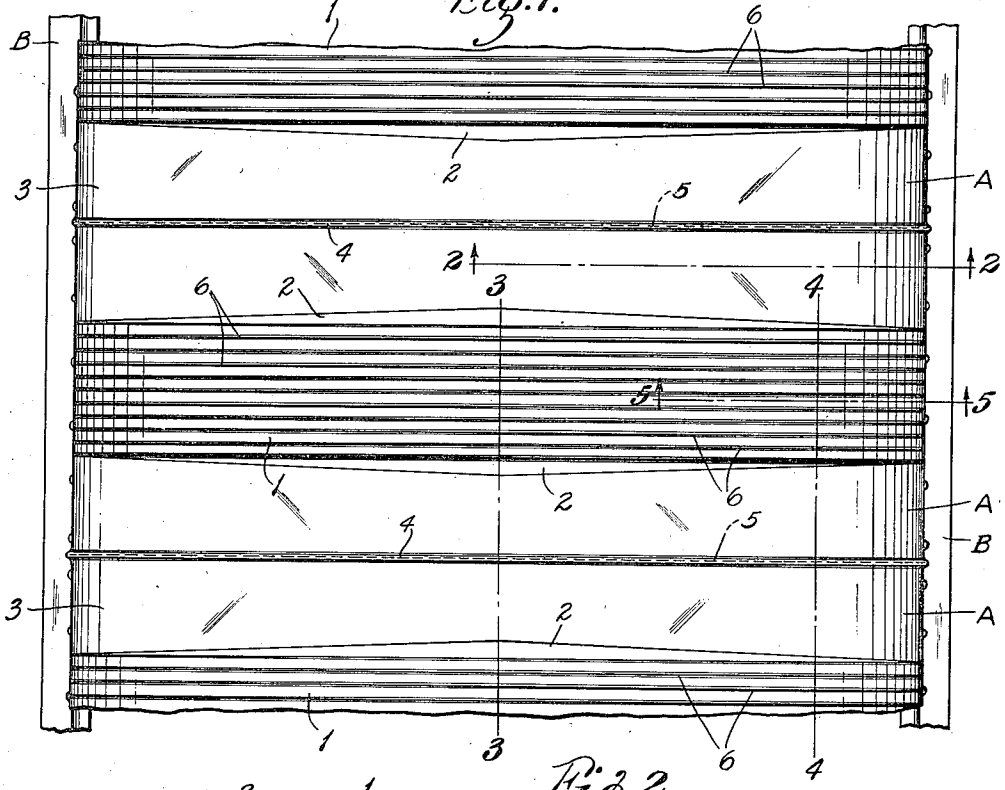


Fig. 2.

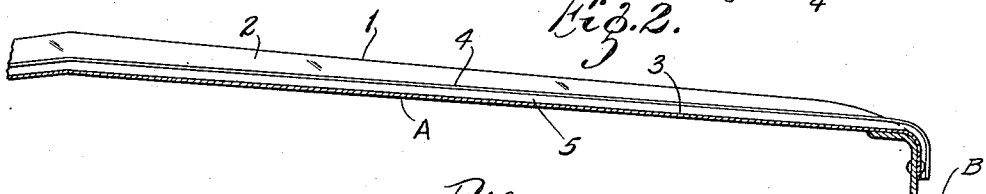


Fig. 3.

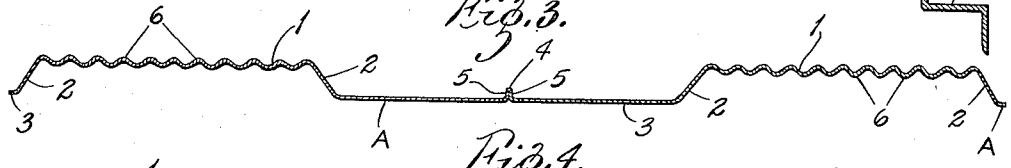


Fig. 4.

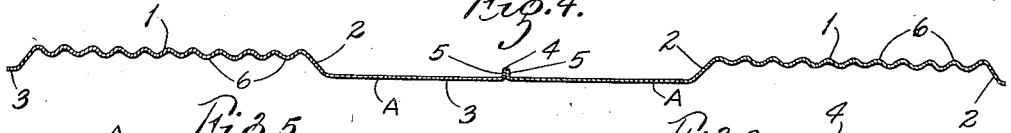


Fig. 5.

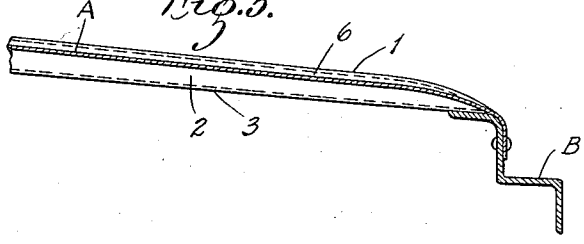
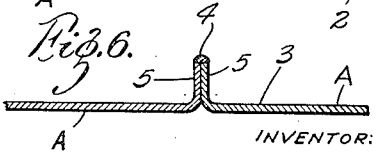


Fig. 6.



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2,065,043

CAR ROOF

Charles David Bonsall, Pittsburgh, Pa., assignor to P. H. Murphy Company, New Kensington, Pa., a corporation of Pennsylvania

Application March 14, 1936, Serial No. 68,940

6 Claims. (Cl. 108—5.4)

This invention relates to metal car roofs of the so-called neutral axis type wherein adjacent sheets are rigidly connected together and panels at one level are connected to panels at a lower level so that the roof as a whole acts as a beam supported on the side plates of the car.

The principal object of the present invention is to enable the upper panels of the roof to act more efficiently than heretofore in taking care of the compression stress. It consists principally in forming the upper panels with corrugations extending crosswise of the car. It also consists in the parts and combinations of parts hereinafter described and claimed.

In the accompanying drawing which forms part of this specification and wherein like numerals 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 an enlarged transverse section through one-half of the roof on the line 2—2 in Fig. 1,

Fig. 3 is a longitudinal section along the ridge of the roof on the line 3—3 in Fig. 1,

Fig. 4 is a section similar to Fig. 3 taken intermediate between the ridge and eaves of the roof on the line 4—4 in Fig. 1,

Fig. 5 is a transverse section through the roof in the region of the eaves, the section being taken through one of the corrugated roof ribs on the line 5—5 in Fig. 1; and

Fig. 6 is an enlarged vertical cross-section through one of the welded roof seam constructions.

In the construction illustrated in the drawing, the roof comprises roof sheets A whose ends are supported on and secured to the side plates B of the car. The longitudinal middle portion of each sheet is offset upwardly to form an upper panel 1, whose side edges are integrally connected by substantially vertical webs 2 with plane or uncorrugated side panels 3. The adjacent margins of adjacent sheets are suitably secured together to form watertight seams, preferably by welds 4. For this purpose, it is convenient to form low upstanding flanges 5 at the edges of the sheets, cause said flanges to abut flatwise and then secure them together by welds of added metal applied to the exposed edges of the flanges of the sheets.

The theory of the neutral axis roof contemplates that the upper panels will function as the compression members of the beam in which the lower panels function as the tension members and, therefore, that the compressive strength of the upper panel should be commensurate with the tensile strength of the lower panel. As a wide, thin upper panel is not well adapted to realize the full potential compressive strength of the metal, I form longitudinal corrugations 6 throughout the width of the compression panels for the purpose of increasing the efficiency of said panels in taking care of compression stresses. In this way, the metal in the upper panels operates more efficiently and it becomes practicable to use wider panels for a given thickness of sheet than would otherwise be feasible, and this, in turn, makes it feasible to use thinner sheets for the same strength.

It is noted that lower panels are in the region of tension where they need not be corrugated and, therefore, their whole area is effective in excluding the weather. It is also noted that the added weld metal is close to the plane of the lower panels and is, therefore, effective in increasing the tensile strength of the roof in beam action, and that their combined tensile strength should be substantially commensurate with the compressive strength of the corrugated upper panels.

What I claim is:

1. A metal car roof comprising roof sheets rigidly secured together at their side edges by welds, each sheet having its longitudinal middle portion corrugated throughout its width and located at a higher level than the side portions, the distance between said middle and lower portions being such that the roof will act as a beam and the compressive strength of the corrugated upper portion will be substantially commensurate with the tensile strength of the lower portions including the welds.

2. A metal car roof comprising upper panels, plane lower panels, webs connecting upper and lower panels together, and seams uniting adjacent lower panels together, the upper panels being corrugated longitudinally throughout their width to make their strength in resisting compression substantially commensurate with the strength of the lower panels and welds in resisting tension.

3. A metal car roof comprising side plates and roof sheets spanning from side plate to side plate and secured together and to the side plates, the longitudinal middle portion of each sheet constituting an upper panel that is corrugated lengthwise throughout its width and the side portions of said sheet constituting lower panels that are connected to the upper panel by webs, the strength of the upper panel for resisting longitudinal compression being substantially commensurate in beam action with the strength of

the lower panels and seams for resisting tension.

4. A metal car roof comprising side plates and roof sheets spanning from side plate to side plate and secured thereto and to each other, said sheets comprising upper panels, lower panels and connecting webs, and the upper panels being corrugated longitudinally so that the roof sheets together act as a beam with the compressive strength of the upper panels substantially commensurate with the tensile strength of the lower panels and connecting seams.

5. A metal car roof sheet comprising an upper panel extending longitudinally thereof, lower side panels and webs connecting the upper and lower panels, the upper panel being corrugated longitudinally throughout its width.

6. A metal car roof sheet comprising an upper panel extending longitudinally thereof, lower side panels and webs connecting the upper and lower panels, the upper panel being corrugated longitudinally throughout its width and the lower panels having plane surfaces with upstanding flanges at the edges thereof.

CHARLES DAVID BONSALL.