No. 655,941. Patented Aug. 14, 1900.

D. C. ROSS.

CAR ROOF.

(Application filed May 21, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

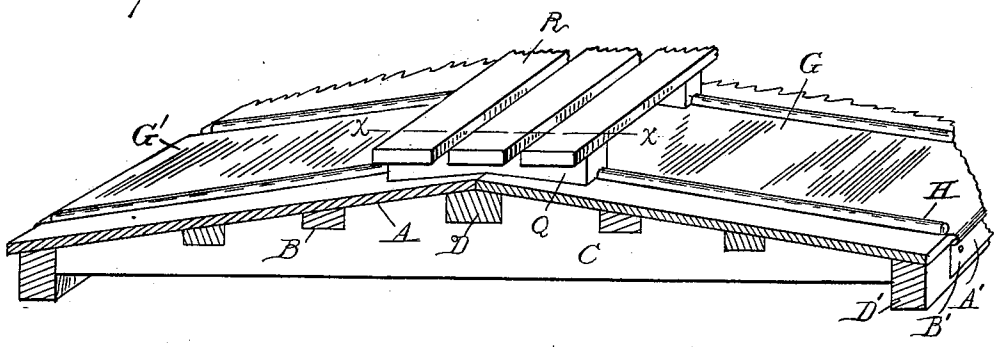


Fig. 2.

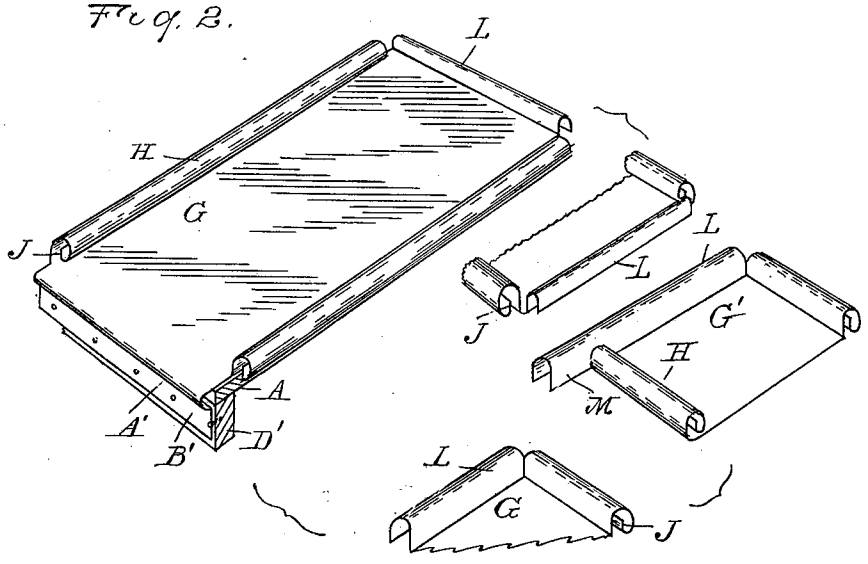
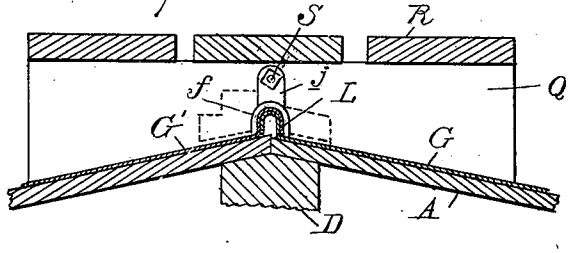


Fig. 3.



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Fig. 4.

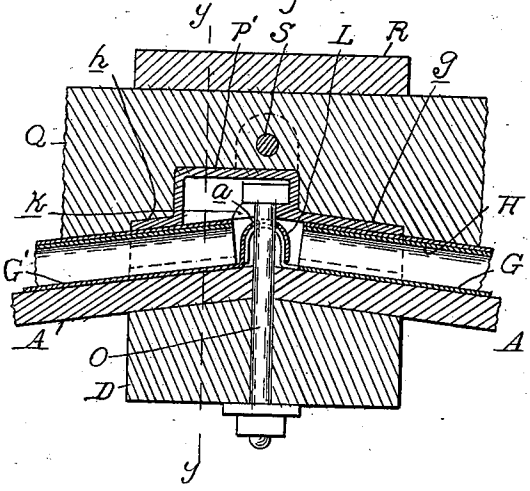


Fig. 5.

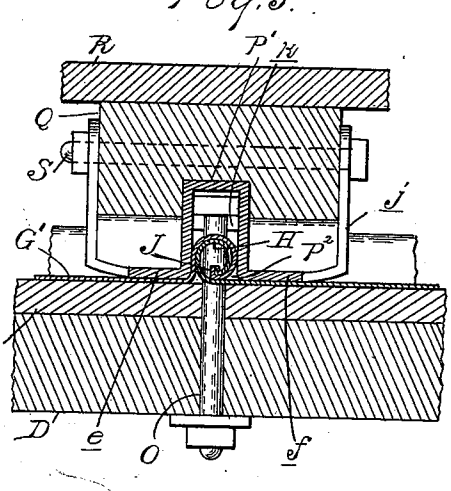


Fig. 6.

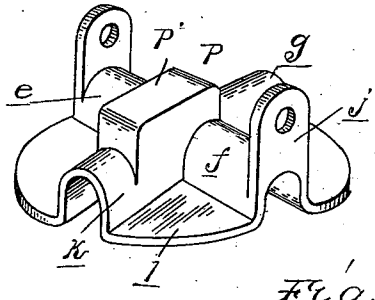


Fig. 7.

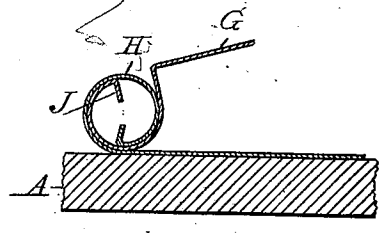
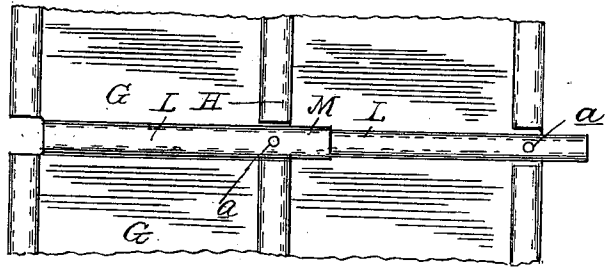


Fig. 8.



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UNITED STATES PATENT OFFICE.

DELMAR C. ROSS, OF DETROIT, MICHIGAN.

CAR-ROOF.

SPECIFICATION forming part of Letters Patent No. 655,941, dated August 14, 1900.

Application filed May 21, 1900. Serial No. 17,469. (No model.)

To all whom it may concern:

Be it known that I, DELMAR C. ROSS, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Car-Roofs, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to a car-roof composed of a multiple of plates or sections designed particularly as a metallic covering for the wooden roof-boards of an ordinary freight-car.

The invention consists in the peculiar construction of the sections and in their combination, whereby perfect flexibility is obtained by joints directly made between the sections themselves and the attachment to the car.

It further consists in the peculiar construction of a cap for the peak-joint, and, further, in the construction, arrangement, and combinations hereinafter described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a sectional perspective of the upper portion of a car, showing my improved metallic roof applied thereto. Fig. 2 is a perspective view of one of the sections complete and of the upper or peak end of complementary sections on opposite sides of the peak. Fig. 3 is a section taken on line *x x*, Fig. 1. Fig. 4 is a section taken through the cap and sleeper constituting the support for the running-boards. Fig. 5 is a section on line *y y*, Fig. 4. Fig. 6 is a perspective view of the cap and housing. Fig. 7 is a diagram view showing the manner in which the joint is formed between adjacent sections, and Fig. 8 is a plan view of the roof with the running-boards and caps removed.

A designates the board covering of an ordinary freight-car, supported upon the purlins B and carlines C.

D is the ridge-timber, and D′ the plates.

G and G′ represent metallic sheets adapted to be arranged upon opposite sides of the roof and extending from the peak to the lower edge thereof. These two sections are alike, except a slight addition to the section G′ at the peak, which will be more fully hereinafter described. I will first describe those parts which are alike in two sections G and G′. The sections themselves consist of flat plates which rest upon the roof A and, as before described, extend from the peak to the lower edge. At the lower edge these plates have an extension A′, formed in the shape of a curve or bend, of such size and length as to extend beyond the edge of the roof a sufficient distance to form what I call a "flexible" portion or section between the plate G proper and the vertical flange B′, which forms the securing-flange. This flange is formed by a continuation of the plate G beyond the curved bend or bead A′, as clearly shown in Fig. 2. The flange B′ extends down the side of the car and is secured thereto by nailing or otherwise, so as to form a tight joint. This construction is best illustrated in Fig. 2. The opposite sides of the plate G have locking-hooks H in the shape of an involute hook extending from the top edge thereof down to substantially the lower edge thereof—that is, down to the lower edge of that portion of the plate which rests upon the roof. These flanges terminate preferably in the vertical joint-flange J.

At the upper edge of the plates G G′ are formed the inverted hooks or trough-shaped flanges L. Upon the plate G these trough-shaped flanges extend across only the main body of the plate. Upon the plate G′ they are made to extend across the body of the plate and at one side have the extension M, which overlaps the joint between the adjoining sections, as clearly shown in Fig. 8.

In assembling the plate-sections to form the roof the sections G are arranged upon one side and the sections G′ upon the other side of the peak or ridge. The adjoining plates in each series are secured together by engaging the rolls or hooks H, as shown in Fig. 7, the plates being first placed end to end and at an angle to each other to permit of this engagement of the hooks, and the parts are then slid upon each other until they stand side by side, when they are turned down into parallelism, as shown in Fig. 1, resting flat upon the wooden roof A. In moving them down into parallelism or into a common plane the locking-flanges J are moved into contact and form a tight joint between the sections, as shown in Fig. 5. The hooks L of the plates G′ are overlapped upon the hooks L of the plates G, and thus serve to tie the two sec-

tions together at the peak. The extensions M cover the joint at the peak, as shown in Fig. 8, the lower ends being nailed through the securing-flange B'. The upper ends are secured by means of bolts O, which pass through apertures *a* in the flanges L, as clearly shown in Fig. 4. The sections thus being connected together form a continuous metal sheathing from one edge to the other of the roof. Between the lower edge of the plates G and the roof is a flexible section A', which permits the plates G to move lengthwise upon the wood covering. This is also permitted by the flexible connection formed by that portion of the hook L which extends between the plate G and the bolt, as shown in Fig. 4. The plate is therefore free to move either as a single plate or as connected plates to or from the line of the ridge, as the joints at the top and bottom are flexible enough to permit this movement, while the joints on the sides permit it by one hook H sliding in its adjoining or interlocking hook. The plates are also flexibly connected together at their sides by these interlocking hooks and may move to or from each other or be turned at an angle to each other without destroying the joint. This, it will be noticed, is accomplished without the addition of any additional cap plates, but by interlocking flanges on the edges of the plates themselves. It will be noticed that these plates are so securely fastened at top and bottom and are so securely fastened to each other at the edges by interlocking hooks forced tightly together (at the flanges J) that there is no possibility of rattling or shaking, and even if the parts should rust and wear to an appreciable extent the roof-sections thus constructed may be used with any desired form of cap for the corner-joints at the peak and any desired form of running-board may be placed thereon. The form of cap and running-board connection is shown particularly in Figs. 3, 4, 5, and 6, and is of the following construction:

In order that rain and snow may be effectually prevented from entering the car through the exposed portions of the joints—namely, at the meeting corners of adjacent sections—I provide caps or plates P, covering said corners of the plates, and a hood P', adapted to cover the bolt O and bolt-hole P^2 in the cap. In formation the cap referred to consists, essentially, of a four-way hood having intersecting radially-extending channels *e*, *f*, *g*, and *h* formed in its under side, the said channels terminating in the housing P' referred to, arranged centrally of the hood. The cap is likewise provided with oppositely-arranged and upwardly-extending perforated ears *j j*, the function of which will be hereinafter described.

k k designate lugs upon opposite sides of the interior of the housing. The semicircular base-sections *l l* are arranged at an angle to each other to permit of the cap lying flat upon the roof.

In placing the cap, with its housing, in position it is first arranged over the head of the bolt and then moved in a lateral direction to bring the lugs on the interior of the housing upon opposite sides of the bolt-shank beneath the head, as plainly shown in Figs. 4 and 5. Upon clamping the bolt by the turning of the nut *d* the cap is clamped upon the roof-sheathing.

The reference-letter Q designates the usual sleeper which constitutes the support for the running-boards R, and this sleeper I arrange between the perforated ears *j j*, before referred to. The sleeper is hollowed out in such manner as to lie flat upon the roof, and a bolt S, Fig. 5, extends through the ears and said sleeper, securely holding the latter in its proper position. The running-boards R are arranged upon and secured to the sleepers in the usual manner.

While I have shown and described a particular type of cap, the latter being in the form of a hood, with grooves or channels formed in its lower face, I do not care to limit myself to this construction, as the cap may consist simply of a flat plate having a bolt-hole formed therein, with the housing arranged over the bolt-opening.

What I claim as my invention is—

1. A metallic roof-section comprising a plate, locking-hooks upon opposite sides of the latter, an inverted trough at one end of the plate, the edges of said trough being in the plane of the plate extending transversely and at some distance beyond the plate at one side of the latter, and a securing-flange upon the opposite plate end.

2. A metallic roof-section comprising a plate, locking-hooks upon opposite sides of the plate, a securing-flange depending from one of the plate ends, and an inverted trough carried by and having its inner edge integral with the opposite plate end, the trough projecting laterally beyond the edge of one side of the plate and having its outer free edge in the plane of the plate, substantially as and for the purpose described.

3. In a metallic roof composed of roof-sections, a cap for covering a section-joint, comprising a hood having radially-extending channels formed in its under face and an opening formed therein, through which the securing-bolt is adapted to extend, and a housing, constructed to receive the bolt-head, covering the bolt-hole formed in the cap.

4. In a car-roof, the combination with a roof-sheathing, a multiple of connected metallic roof-sections thereon, a series of caps arranged over the meeting corners of the adjacent sections, each cap having a bolt-hole formed therein, a bolt extending through each cap, and a housing, constructed to receive and support the bolt-head, covering the bolt-hole formed in the cap.

5. In a car-roof, the combination with a roof-sheathing, a multiple of connected metallic roof-sections thereon, a series of caps arranged

over the meeting corners of the adjacent sections, each cap having a bolt-hole formed therein, a bolt extending through each cap, a housing, constructed to receive and support the bolt-head, covering the bolt-hole formed in the cap, oppositely-arranged upwardly-extending perforated ears upon each cap, a sleeper intermediate each pair of ears, a bolt extending through said sleeper and ears and the running-boards supported upon the sleepers.

6. In a car-roof, the combination with the roof-sheathing, of a multiple of connected metallic roof-sections thereon, a series of caps arranged over the meeting corners of adjacent sections, each cap having a bolt-hole formed therein, a housing for each cap covering the bolt-hole, oppositely-arranged lugs upon the interior of the housing, a bolt for each cap, a bolt-head engaging the lugs within the housing, and a bolt-shank extending through the cap and sections, and a nut for each bolt, substantially as described.

7. In a metallic roof, the combination of two adjoining section-plates, and a joint connecting the adjacent portions of said plates, comprising two involute hooks one upon the meeting side of each plate, the said hooks being bent in the same direction and adapted to be engaged one within the other, and abutting flanges upon the free ends of the hooks, the relative arrangement and proportion of the parts being such that when the section-plates are turned into a common plane on the engaging hooks the flanges will abut.

8. In a metallic roof, the combination of two adjoining section-plates and a joint connecting the adjacent portions of said plates, comprising two involute hooks, one upon the meeting side of each plate, the said hooks being bent in the same direction and adapted to be engaged one within the other, and abutting flanges upon the hooks formed by bending upwardly at substantially right angles to the plane of the plate the free end of each hook, the relative arrangement and proportion of the parts being such that when the section-plates are turned into a common plane on the engaging hooks the flanges will abut.

9. A car-roof comprising a roof-frame and covering, of a metallic covering consisting of a multiple of plates extending from the peak to the lower edge of the sheathing, sliding joints connecting the edges of adjoining plates and a flexible connection between the main section of each sheet and the car at the lower edge of each sheet, and a yielding connection at the peak, whereby each sheet may move longitudinally in relation to the adjoining sheets, without bending or buckling.

10. A metallic car-roof consisting of a series of plates extending from the peak to the lower edge of the sheathing, a connection with the car at the lower end, a flexible section between that car connection and the plate, sliding flexible joints connecting the adjoining plates, and a flexible joint at the upper end of the plate, for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

DELMAR C. ROSS.

Witnesses:
H. C. SMITH,
M. B. O'DOGHERTY.