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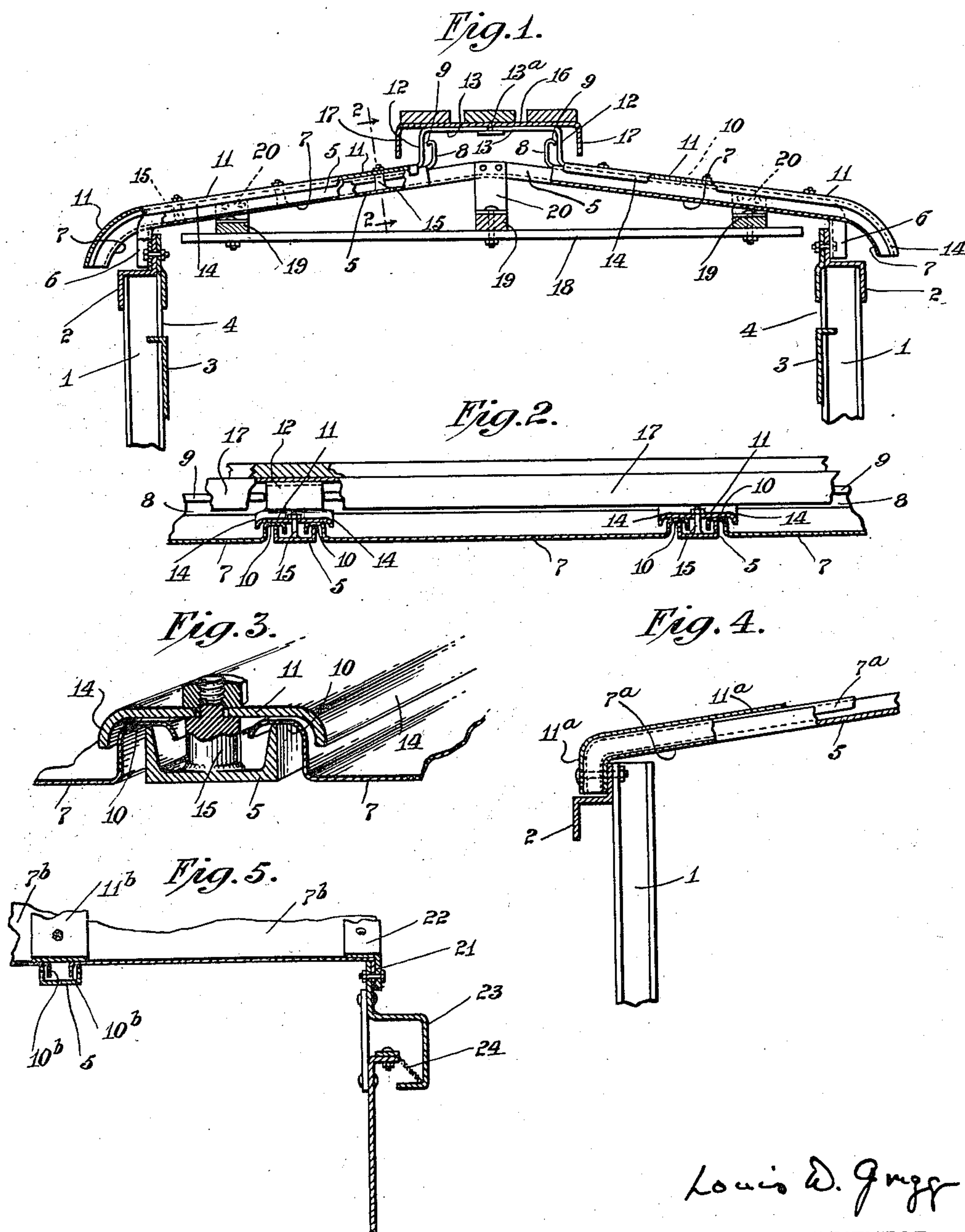
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CAR ROOF

Filed March 22, 1933

2 Sheets-Sheet 1



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INVENTOR

BY *W. B. Whitney*

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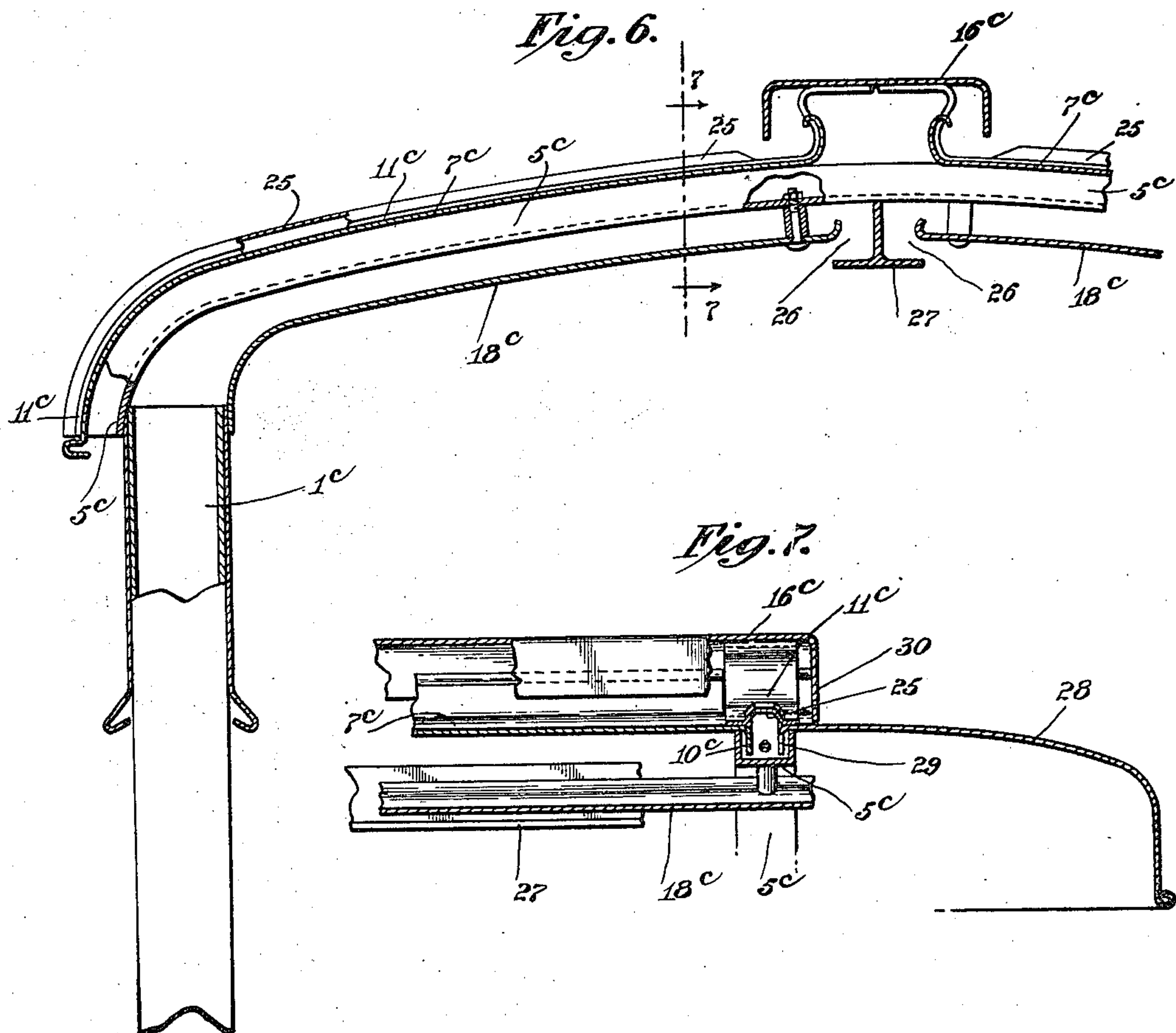
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2,011,628

CAR ROOF

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3 Claims. (Cl. 108—5.4)

This invention relates to car roofs, and particularly to the roofs of cars designed especially for service, in the transportation of fruit, for example, and passengers, in tropic and semi-tropic countries where the tracks of the narrow and standard gauge roads are usually uneven and derailment of the cars will be frequent unless the roof is sufficiently flexible to allow the superstructure and underframe to so yield and conform to the irregularities of the track as to maintain fairly uniform the wheel loads thereon; and the object thereof is to provide a light metallic roof, for railway and possibly other cars, which is both extremely flexible and substantially waterproof and, whenever desired, can be so constructed as to afford ventilation for the interior of the car.

To this end, my new car roof consists, essentially, of a series of transverse channels, with flanges upturned, which also serving as car-lines extend across the car at spaced intervals, sloping downwardly from the ridge to the eaves on each side thereof, a series of transverse roof plates, intermediate the channels, the sides of which overlap the adjacent sides of two adjoining channels and terminate in flanges downturned within the channels, and a series of relatively narrow transverse cover plates which cover the channels and the adjacent sides of the roof plates and are so mounted as to provide sufficient clearance for the free lateral movement of the overlapping sides of the roof plates over the flanges of the channels. Preferably, the roof plates do not extend across the ridge of the roof but are in two series one on each of the opposite sides thereof and at their upper ends, adjacent the ridge, are provided with upturned flanges, the transverse cover plates, which may be broken at the ridge for convenience of manufacture, are upset on each side thereof and immediately outside the flanges at the upper ends of the opposed roof plates to provide shoulder abutments for their flanges, and a single longitudinal cover plate with downturned flanges along its sides is mounted over the upset central ridge sections of the transverse cover plates and, overlapping the flanges on the upper ends of the roof plates, covers the opening between them. A feature of the roof is that it is, or can be, constructed without bolt holes, in the roof plates, to become enlarged with wear and leak, in the bottom of the channels inside the eaves of the car, which holes also may leak.

Practical embodiments of the invention are shown, by way of illustration and not of limita-

tion, in the accompanying drawings, in which—

Figure 1 is a view showing, in transverse section, the preferred form of my improved car roof as applied to a freight car; Fig. 2 is a view of a broken portion of the same, partly in side elevation and partly in longitudinal section on the line 2—2 of Fig. 1; Fig. 3 is a detail, partly in perspective and partly in section also on the line 2—2 of Fig. 1; Fig. 4 is a detail showing, in transverse section, a modification of the roof at the eaves of a car; Fig. 5 is a detail showing, in longitudinal section, a further modification of the roof and one form of attachment of an end roof plate to the end wall of the car; Fig. 6 is a view showing, in partial transverse section, a further modification of the roof as adapted to a passenger car; and Fig. 7 is a detail showing partly in side elevation and partly in longitudinal section on the line 7—7 of Fig. 6, an end channel, an end roof plate, and an inverted dish plate extending over and providing a roof for the end platform of the car.

Referring first to Figs. 1 to 3 of the drawings, the reference numeral 1 indicates two of the usual side stakes with which the superstructure of a car is framed, 2 indicates the longitudinal Z-shaped eaves-members which are mounted upon the side stakes on the opposite sides of the car, and 3 indicates the side sheathings with which the car frame is closed and are here shown as provided with ventilating openings 4 on each side and immediately below the eaves-members.

The transverse channels 5, which may be regarded both as frame and roof members, are placed at spaced intervals and, sloping downwardly from the ridge on either side, are here shown as bent vertically downward at each end 6 and bolted or otherwise suitably secured thereto at the upper flange of an eaves-member. The roof plates 7 as shown extend, in two series one on each side of the car, from near the ridge to and out over the eaves-member, and each roofs the space between and at its sides overlaps the sides of two adjoining channels. At its upper end each roof plate is bent upwardly to provide an upturned flange 8 the edge of which is preferably curled over to form an outwardly and downwardly projecting lip 9, and along each side is bent upwardly outside of and at a short distance from the adjacent flange of a channel, and then over and downwardly within the channel, thus forming a relatively wide lateral inverted trough 10 which extends and is normally centered over the flange of the channel. The transverse cover plates 11 extend from side to side of the

car, being bent upwardly on each side of the ridge immediately outside, and providing shoulder abutments 12 for, the flanged ends of the opposed roof plates and having between these upward bends a horizontal section 13 which, broken at 13^a if desired for convenience of manufacture, spans the opening between the opposed roof plates. Each of these cover plates, shown as provided with downturned flanges 14 along its sides, is of a width to cover the channel and overlap the upset adjacent sides of the roof plates; and each is secured at suitable intervals to a channel by nuts on the threaded ends of posts 15 which are welded to the bottom or web of the channel and are of a length to support the cover plate slightly above, and so provide a clearance allowing the free lateral movement of, the upset sides of the roof plates over the flanges of the channel. The single longitudinal cover plate 16, extending the entire length of the car, is as shown supported upon and secured in any suitable manner to the central ridge section 13 of the transverse cover plates. Its sides overlap the upper ends of the opposed roof plates and are provided with downturned flanges 17 which preferably extend downwardly somewhat below the upper lipped edges of the flanges of the roof plates. Its upper surface may be roughened and serve as a running board, or if desired, the usual wooden running board slats may be mounted thereon. A ceiling 18, an optional feature, is here shown as secured by bolts to longitudinal stringers 19 in turn secured by the same bolts to straps 20 riveted to a flange of the channels.

It is to be noted that, constructed as described, the free lateral movement of the inverted trough-shaped sides of the roof plates between the flanges of the channels and the transverse cover plates gives extreme flexibility to the roof. The roof, moreover, is practically waterproof, since there are no holes in the roof plates, which are held against outward and downward movement by the engagement of the flanges at their upper ends with the shoulder abutments 12 provided by the transverse cover plates; the downturned lips on the flanged upper ends of these plates prevent rain from being swept up over them, and the channels, which serve as troughs to carry off any water which may work over the sides of the roof plates, are also without holes in their webs between the eaves of the car. And ample ventilation is provided, both from the outside through and along the channels and from within around the sides of the ceiling, through the opening along the ridge of the roof.

The modified structure illustrated in Fig. 4 differs from that already described in the single respect that the outer ends of the roof plates 7^a and transverse cover plates 11^a, instead of extending out over the eaves, are bent downwardly in conformity with the bend of the ends of the channels and abut the horizontal element of the eaves-members, thereby preventing the entry of outside air through and along the sides of the channels.

In the modification illustrated in Fig. 5, the overlap at each side of the roof plates 7^b extends straight out over the flange of a channel and is provided with a single flange 10^b downturned within and normally spaced away from the flange of the channel, and the cover plates 11^b, which are flat in cross section, are mounted, as hereinabove described, on posts which do not pierce the web of the channel and will support them slightly above the roof plates. The outer side of

and end roof plate is here shown as flanged downwardly, at 21, over the end wall of the car and secured thereto by an angle-iron 22. There is also shown, near the top of the end wall, a ventilating opening which is provided with a hood 23 having a screen 24 set across its open lower side.

In the adaptation of the roof to a passenger car, shown in Figs. 6 and 7, the channels 5^c of the arched roof are attached at their downturned ends to the square box posts 1^c which frame the sides of the car, outside of the outer side sheathings. The roof plates 7^c and transverse cover plates 11^c are curved downwardly at their ends in conformity with the downward curve of the channel ends and at the extremity of these ends are provided with an ornamental beading. The overlap at the sides of the roof plates, as in the modification illustrated in Fig. 5, extends straight over the flange of a channel and terminates in a flange 10^c downturned within the channel; and the sides of the cover plates, also as shown in Fig. 5, extend straight out over the flanges of the channels and the adjacent sides of the roof plates, but these plates are here shown as upset to provide a central longitudinal rib 25 on each side of their raised central ridge sections. The ceiling plate 18^c, attached at its sides to the inner side sheathings of the car, is divided centrally to form a central longitudinal ventilating opening 26, with upturned sides, immediately beneath the opening along the ridge between the upper ends of the roof plates. An inverted T-bar 27, which may serve to carry wires and for the mounting of electric lamps, is suspended in any suitable manner (not shown) from the channels, its vertical web extending centrally of the ventilating opening in the ceiling while its horizontal flanges practically conceal such opening. At each end of the car a single shaped plate 28, extending from side to side thereof and with a flange 29 downturned along its inner side within the end channel, serves as a hood to roof the car platform; and an extension 30 at the end of the longitudinal cover plate 16^c is bent down against this special roof plate.

While I have illustrated and hereinabove described my improved car roof in what I consider to be the best forms for the practical application thereof, it will of course be understood that it may be further modified in its several details or certain of these details omitted entirely, within the scope of the appended claims, without departing from the principle or sacrificing the substantial advantages of the invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. A car roof of the type described comprising transverse channels with flanges upturned, roof plates arranged in series on the opposite sides of the ridge with upturned flanges at their upper ends adjacent the ridge and sides overlapping the flanges of the two adjoining channels and terminating in flanges downturned within the channels, transverse cover plates mounted over and covering the channels and the adjacent sides of the roof plates with sufficient clearance to allow the free lateral movement of the overlapping sides of the roof plates over the flanges of the channels and at each side of the ridge bent up to provide a shoulder abutment against which the flanged upper end of a roof plate freely bears and thereby is held against outward and downward movement, and a longitudinal cover plate supported upon the ridge sections of the transverse cover plates intermediate their bent-up

shoulder abutments and covering the opening between the adjoining upper ends of the roof plates.

2. A car roof of the type described comprising 5 transverse channels with flanges upturned, roof plates arranged in series on the opposite sides of the ridge with upturned flanges at their upper ends adjacent the ridge and sides overlapping each the side of one of two adjoining channels 10 and shaped to provide an inverted trough extending over the flange of the channel, transverse cover plates mounted over and covering the channels and the adjacent sides of the roof plates with sufficient clearance to allow the free 15 lateral movement of the roof plates over the flanges of the channels and bent up on each side at the ridge to provide a shoulder abutment against which the flanged upper end of a roof plate may bear and be held against outward and 20 downward movement, and a longitudinal cover plate with downturned flanges along its sides supported upon the raised central ridge sections of the transverse cover plates and covering the

opening between the upper ends of the opposed roof plates.

3. A car roof of the type described comprising transverse channels with flanges upturned, roof plates arranged in series on the opposite 5 sides of the ridge with upturned flanges at their upper ends adjacent the ridge and sides overlapping each the side of an adjacent channel and shaped to form a relatively wide inverted trough normally centered over the flange of the 10 channel, transverse cover plates with downturned flanges along their sides mounted on posts fixed to but not piercing the webs of the channels and with a clearance to allow the free 15 lateral movement of the overlapping sides of the roof plates over the flanges of the channels and bent up at the ridge to pass over and provide shoulder abutments for the flanged upper ends of the opposed roof plates, and a longitudinal cover plate with downturned flanges along its 20 sides supported upon the raised central ridge sections of the transverse cover plates.

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