W. K. LAVIS.

CAR ROOF.

APPLICATION FILED SEPT. 4, 1908.

954,194.

Patented Apr. 5, 1910.

4 SHEETS—SHEET 1.

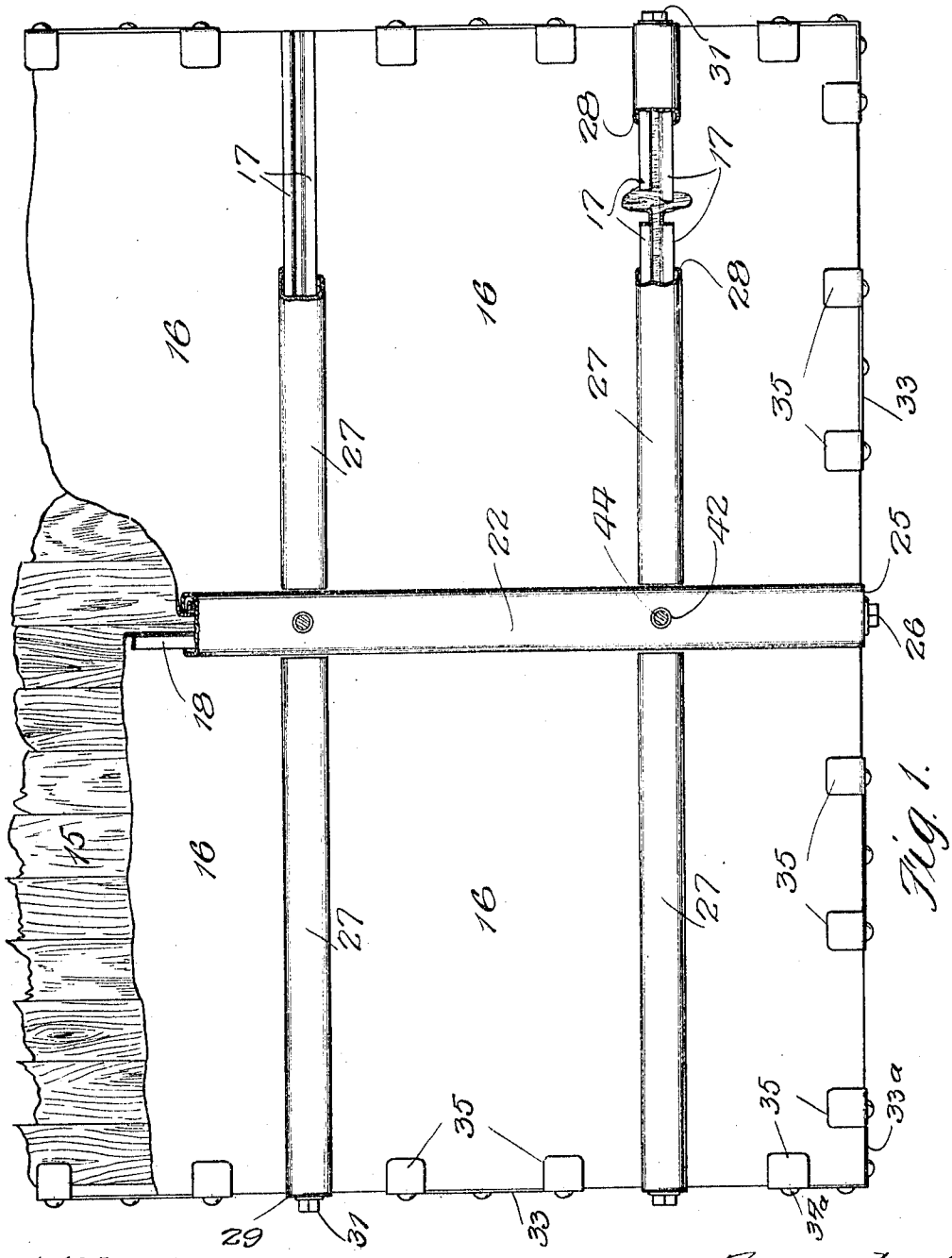

Fig. 1.

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4 SHEETS—SHEET 2.

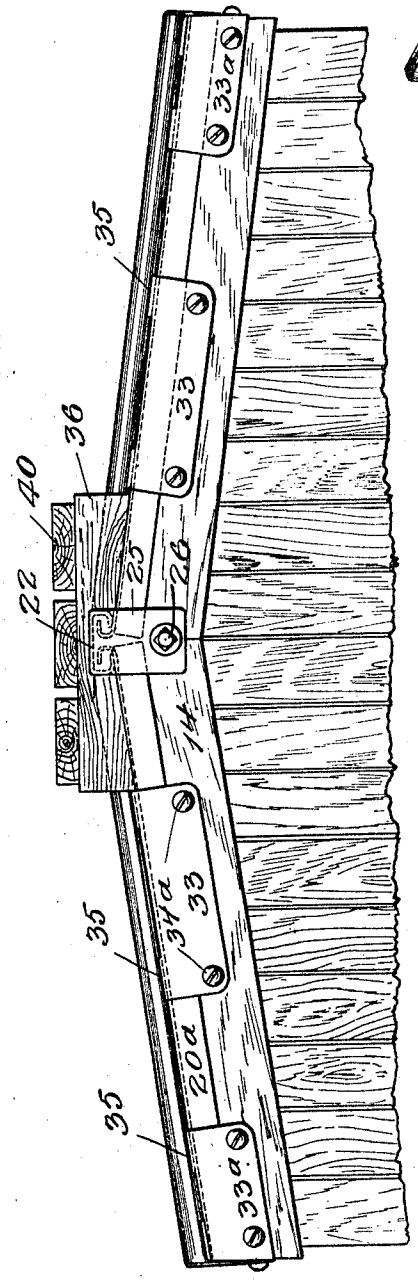

Fig. 2.

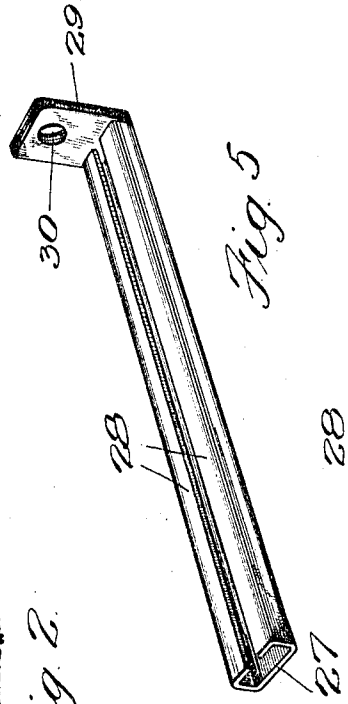

Fig. 5

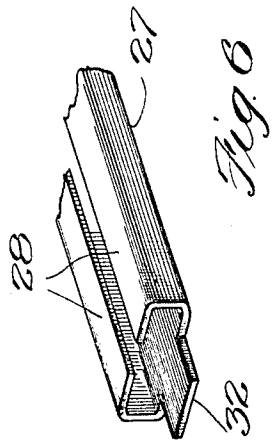

Fig. 6

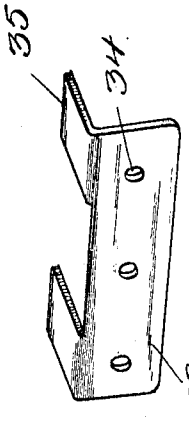

Fig. 3

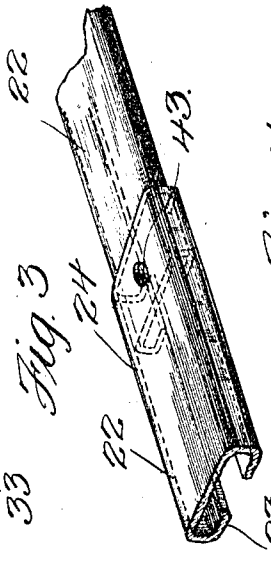

Fig. 4.

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4 SHEETS—SHEET 3.

Fig. 7.

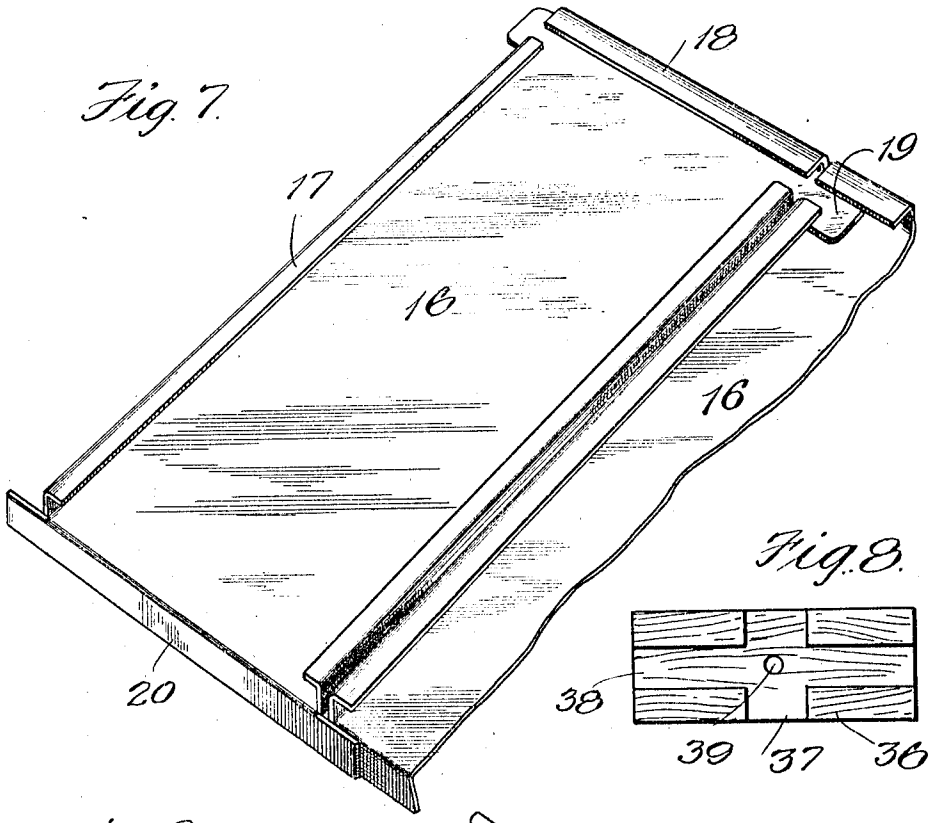
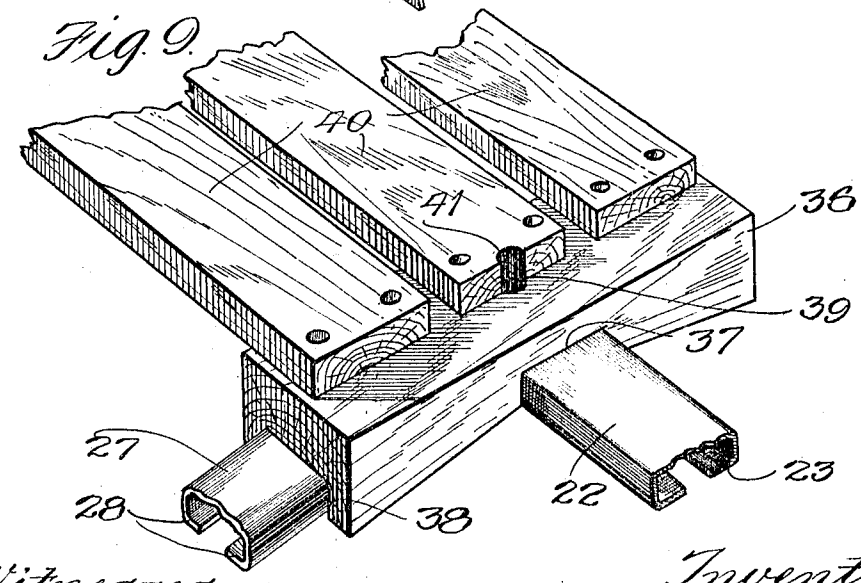


Fig. 8.

Fig. 9.



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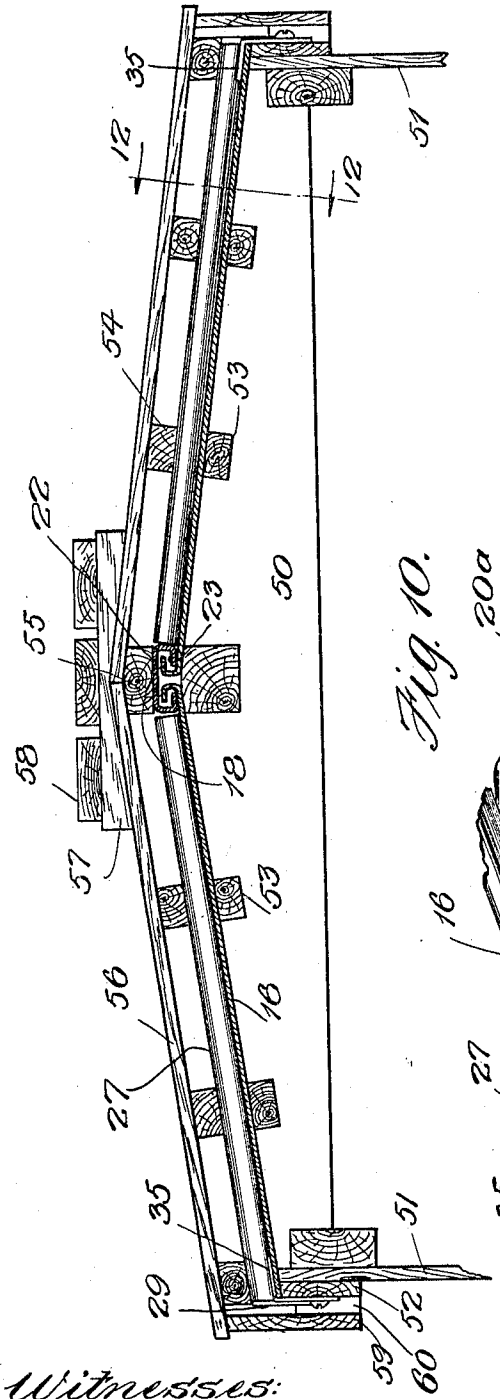

Fig. 10.

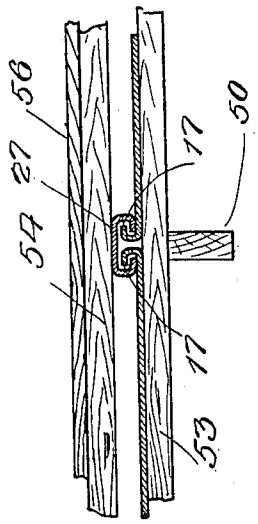

Fig. 12.

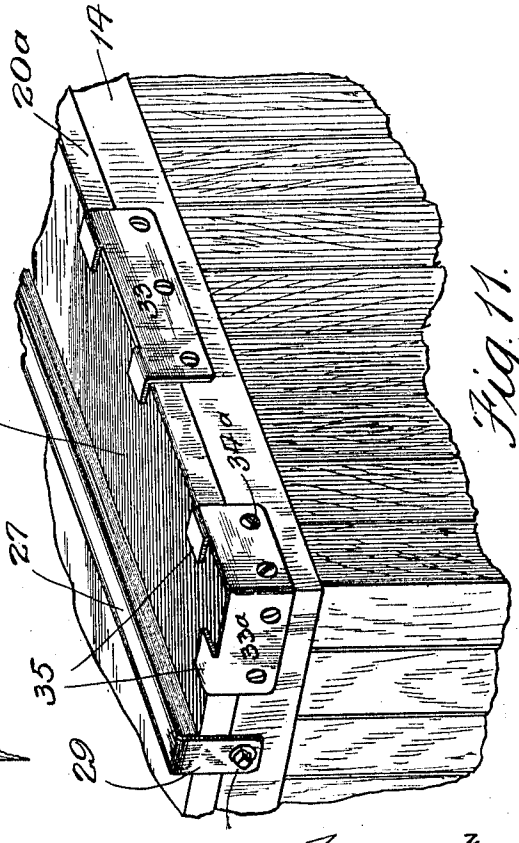

Fig. 11.

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UNITED STATES PATENT OFFICE.

WILLIAM K. LAVIS, OF LA GRANGE, ILLINOIS.

CAR-ROOF.

954,194. Specification of Letters Patent. Patented Apr. 5, 1910.

Application filed September 4, 1908. Serial No. 451,637.

To all whom it may concern:

Be it known that I, WILLIAM K. LAVIS, a citizen of the United States, residing at La Grange, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Roofs, of which the following is a specification.

The object of my invention is to provide a new and improved sheet metal roof for freight cars.

A further object is to make such a roof of metal sheets laid over a supporting framework, but loosely secured thereto, so as to permit more or less straining of the supporting framework without thereby bending or otherwise distorting the metal roof sheets.

These objects and others will be made apparent in the following specification and claims when taken in connection with the accompanying drawings, in which—

Figure 1 is a top plan view of the roof, certain parts being broken away in order to show the structure more clearly. Fig. 2 is an end elevation. Figs. 3, 4, 5 and 6 are detail perspective views. Fig. 7 is a perspective view of one of the roof sheets. Fig. 8 is a bottom plan view of the saddle which supports the running board. Fig. 9 is a perspective view of the running board and its support. Fig. 10 is a cross section of a car roof showing a modified form of my invention. Fig. 11 is a perspective view of one corner of the roof illustrated in Fig. 1. Fig. 12 is a cross section, taken on the line 12 of Fig. 10.

In the particular embodiment of the invention which I have illustrated in Figs. 1 and 2 and certain detail views, I have shown a wooden roof having boards 15 extending longitudinally of the car. On the end and sides of the car adjacent to the edges of the roof are the fascia boards 14. The sheet metal roof comprises rectangular roof sheets 16, arranged as shown in Fig. 1. Fig. 7 shows a detached roof sheet. At its upper edge each roof sheet 16 has a backwardly and upwardly turned lip 18, and along the lateral edges are upwardly and inwardly turned lips 17. These sheets are stamped to the desired shape, as shown in Fig. 7, and in the process of stamping them the lateral projections 19 are left in the same plane as the main part of the roof sheet 16. At the lower corners other lateral projections 21 are left, and these, together with the entire lower edge 20, are turned down at right angles.

It will be observed that in assembling the roof sheets 16 on the car roof, the lateral projections 19 of adjacent sheets overlap, and similarly the projections 21 at the lower corners overlap.

The roof sheet 16 having been laid on the car roof, as shown in Fig. 1, the securing pieces or sheaths 22 are next added. These have the shape shown in Fig. 4, each one consisting of a long narrow strip of sheet metal with the edges 23 bent downwardly and together, so as to leave a slot between them. The ridge sheath 22 is put in place by sliding it in a longitudinal direction, so that its in-turned edges 23 shall hook under the upper edges 18 of the roof sheets 16. It will at once be obvious that the ridge sheath 22 retains the roof sheets 16 from sliding off transversely from the car. One end of each ridge sheath 22 is slightly enlarged, so that the adjoining ends of the consecutive members can be telescoped, as indicated by the reference numeral 24 in Fig. 4. The end 25 of the ridge sheath 22, which comes at the end of the car, is formed by folding over three thicknesses of sheet metal and then doubling the end down at right angles. This down-turned end 25 is then fastened to the end fascia board by means of the bolt 26, which has its head on the outside and the nut therefor on the inside.

Adjacent roof sheets 16 on either side of the car are adapted to be loosely held together by means of the securing members or sheaths 27. One of these is shown in inverted position in Fig. 5. The edges 28 of the strip of metal 27 are bent around so as to nearly meet, and these downwardly and inwardly turned edges 28, respectively engage the upwardly and outwardly turned lateral edges 17 of the adjacent roof sheets 16. The transverse sheaths 27 are assembled by sliding them in place transversely from the side edges of the car roof toward the center. At the outer ends the sheet metal is folded over in three thicknesses, and then bent down at a right angle, as indicated by the reference numeral 29. A bolt 31 passes through the hole 30 in the down-turned end 29, and through a corresponding hole in the side fascia board of the car. This bolt has its nut on the inside of the car.

As a slight modification of the form of transverse sheath shown in Fig. 5 a projecting lip 32 may be formed at the upper or inner end thereof, as illustrated in Fig. 6.

In this case the transverse sheaths 27 are applied before the ridge member 22, and after each sheath 27 is in place, the lip 32 is bent down, so as to hook over the upper ends of the laterally up-turned edges 17 of the roof sheets 16. After the lips 32 have been bent down in this way, the ridge sheaths 22 can be applied.

On the ends of the car I simply bend the edges down over the end fascia board 14, as indicated by the reference numeral 20^a in Fig. 2. It is thus apparent that I can construct the roof sheets 16 of uniform standard width, measured in the direction of the length of the car, and then trim off the last sheet at the end of the car, so that an edge 20^a of the proper width will be left.

On the side edges and at the ends of the roof I apply clips, of the form shown in Fig. 3. Each of these comprises a main body portion 33, adapted to be secured by means of screws 34^a passing through the holes 34 into the fascia boards of the car. Each member 33 has two projections 35, which reach up over the edge of the roof. At the corner of the roof I bend one of the clips 33 at a right angle, as will be seen most clearly in Fig. 11, and thus the two prongs of the clip, respectively, engage the side and end edges of the roof sheet.

To support the running board 40, and also to assist in securing the metal roof in place, I provide the saddle blocks 36, shown in Figs. 8 and 9. The under surface of each block 36 has a longitudinal channel 37 and a transverse channel 38 adapted to respectively engage the sheaths 22 and 27. At the center is a hole 39, which registers with a hole 42 in the sheath 22 and with a hole 41 in the running board. A bolt 44, shown in section in Fig. 1, extends through these holes, having its head on the outside and its nut on the inside of the car. The consecutive lengths of ridge sheaths 22 telescope at 24, and through the overlapping ends a hole 43 is made. The dimensions are such that this hole comes opposite the securing members 27, and is therefore in position to be engaged by the bolt 44 in the same manner as the hole 42 already described.

The securing members or sheaths 27 and 22 have the same cross section and the ends that lap over the fascia are the same at both the ends and sides of the car. Thus it is obvious that only one set of dies is needed for these parts.

Referring now to the modification illustrated in Fig. 10, this has the sheet metal roof under the board roof. The carlines are represented by the reference numerals 50, the side walls of the car by 51, and the fascia boards by 52. The carlines 50 support the purlines 53, their upper surface being flush with the upper surface of the carlines. On this framework, comprising the members 50, 52 and 53, the sheet metal roof is applied in a manner exactly similar to that shown in Fig. 1. The structures of the roof and of the individual members thereof are exactly similar to that which has already been described. Next the longitudinal frame members 54 and the ridge member 55—all of wood—are laid over the sheet metal roof, resting upon and being supported by the sheaths 27 and 22. On these supporting wooden strips 54 and 55 the board roof 56 is applied, the boards extending transversely. Ordinary saddle blocks 57 and running boards 58 are then added. At its lateral edges the board roof 56 extends a little beyond the fascia 52. Filler blocks 60 are applied to the fascia 52, and then secondary fascia boards 59 are attached to these filler blocks 60, their upper edges fitting closely under the lateral edge of the board roof 56.

It will be observed that my improved sheet metal car roof comprises only four kinds of members, which can be made up of any standard size for any given width of car. These four varieties are as follows: the roof sheets 16, the ridge members 22, the lateral securing members 27, and the edge clips 33. Thus, a great saving of care and material will be attained by not having to make dies adapted to particular car lengths. Each roof sheet 16 is nowhere directly attached to the framework underneath. At its lower edge it is snugly held in place by the clip 33, but the sheaths 22 and 27 are purposely so made that they shall go in place with a sufficient clearance. Thus, it follows that any straining of the car roof—whether it be due to sagging at the center, or to diagonal wrenches, or to any other cause—will not distort the roof sheets 16. Nevertheless, they will be held down securely to the car roof, for the ridge-securing sheath 22 overlaps the upper edges of all the roof sheets and it is securely bolted through to the ridge beam of the car framework.

I desire to call attention to the provisions that are made to prevent water from beating through the sheet metal roof. An inspection of the sections shown in Fig. 1 shows that any rain water which might tend to drive under the sheaths 22 and 27 would be deflected back by the respective edges 18 and 17 of the roof sheets 16. At the upper inner ends of the roof sheets, where the transverse sheaths 27 abut against the ridge member 22, the projections 19 from the roof sheet 16 lap over each other, and thus prevent leakage at these points. Similarly the projections 21 overlap at the lower or outer corners of the roof sheets 16. Thus, it will be apparent that even though the adjacent roof sheets 16 slide a little relatively to one another, there will be no opening afforded for rain water to drive through. The sheaths 22 and 27, and

the clips 33, are made of heavier sheet metal than the roof sheets 16.

By my device of securing the edges of the roof sheets in a manner to permit relative adjustment with respect to the supporting framework beneath, I have succeeded in obtaining an absolutely torsion-proof roof, and at the same time I have made adequate provision to prevent leakage of rain water through the joints in the roof. The roof can be very quickly applied or removed, inasmuch as it is secured to the framework beneath only by means of the bolts 42 through the ridge sheaths 22, bolts 31 and 26, and the screws 34 along the fascia.

I claim:—

1. A car roof comprising a supporting framework, rectangular metal sheets laid thereon side by side, adjacent sheets being slightly spaced from one another along the longitudinal center line of the roof and along lines transverse thereto, clamps binding the outer edges of the sheets to the said framework, the sheets being free from the framework at all other points, the spaced edges of the sheets being turned upwardly, a series of telescoping sheaths extending from end to end of the car engaging the spaced upturned edges of adjacent sheets along the center line of the roof, and transverse sheaths engaging the spaced upturned transverse meeting edges of the roof sheets, said last named sheaths being fastened at their outer ends to the framework.

2. A car roof comprising rectangular metal sheets meeting along the longitudinal center line of the roof and in lines transverse thereto, sheaths engaging adjacent edges, saddle blocks channeled to engage said sheaths, a running board supported by said saddle blocks, and bolts through the running board, the saddle blocks, the longitudinal sheaths and the under supporting framework.

3. A car roof comprising a supporting framework, rectangular metal sheets laid thereon side by side, adjacent sheets being slightly spaced from one another along the longitudinal center line of the roof and along lines transverse thereto, clamps binding the outer edges of the sheets to the said framework, the sheets being free from the framework at all other points, the spaced edges of the sheets being turned upwardly but leaving lateral projections in the plane of the body of the sheets at the upper inner corners thereof, said projections of adjacent sheets overlapping, and sheaths loosely engaging the spaced upturned edges of adjacent sheets.

4. A car roof comprising a supporting framework, rectangular metal sheets laid thereon side by side, adjacent sheets being slightly spaced from one another along the longitudinal center line of the roof and along lines transverse thereto, clamps binding the outer edges of the sheets to the said framework, the sheets being free from the framework at all other points, the spaced edges of the sheets being turned upwardly but with overlapping lateral projections in the plane of the sheets at their inner corners and the outer edges of the sheets being turned downwardly over the edge of the framework and overlapping at the corners, and sheaths loosely engaging the spaced upturned edges of the adjacent sheets.

In testimony whereof, I have subscribed my name.

WILLIAM K. LAVIS.

Witnesses:
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