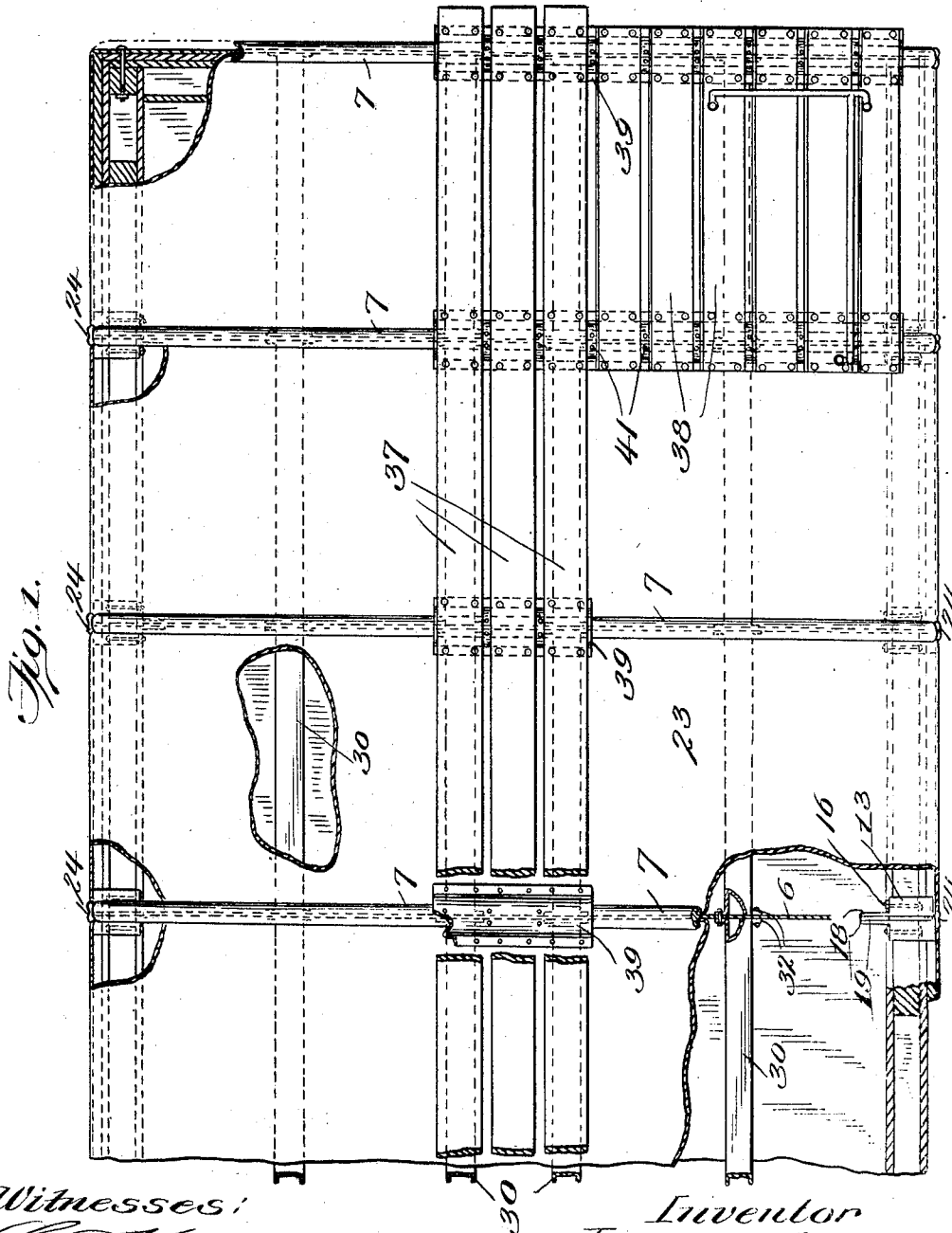


J. R. CARMER.
 ROOF STRUCTURE FOR RAILWAY CARS.
 APPLICATION FILED FEB. 2, 1912.

1,050,805.

Patented Jan. 21, 1913.

4 SHEETS—SHEET 1.



Witnesses:
C. A. Bateman
 C. A. Bateman

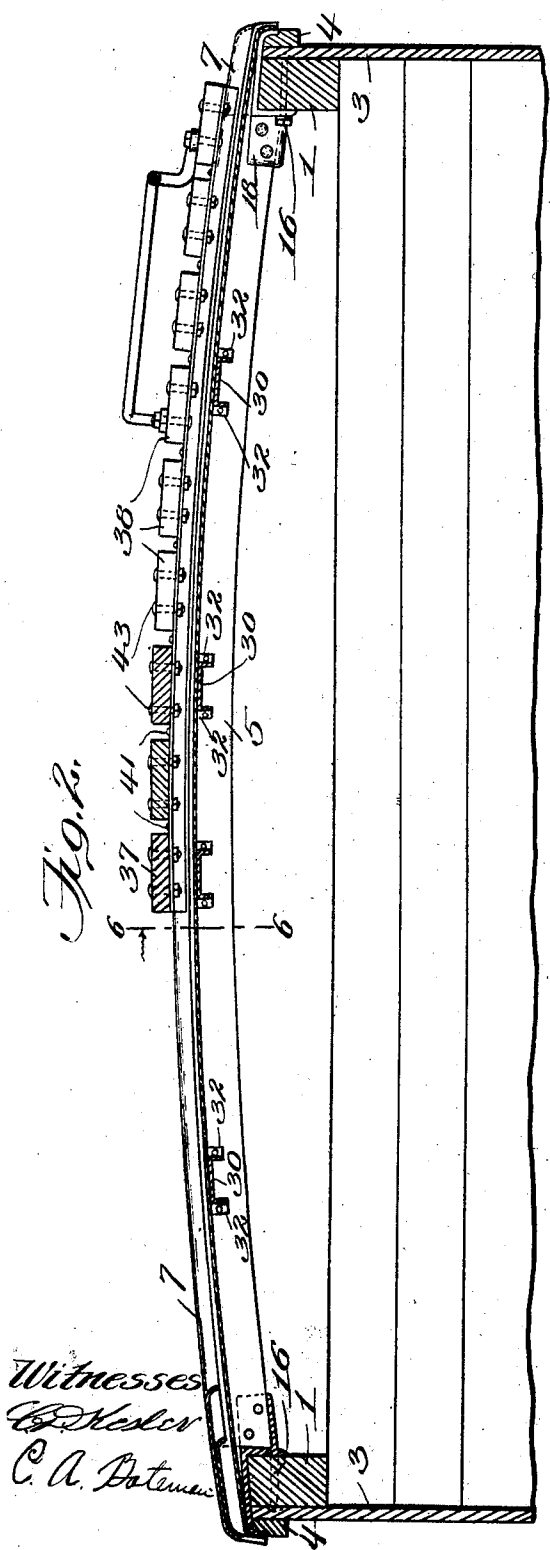
Inventor
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4 SHEETS—SHEET 2.



Witnesses
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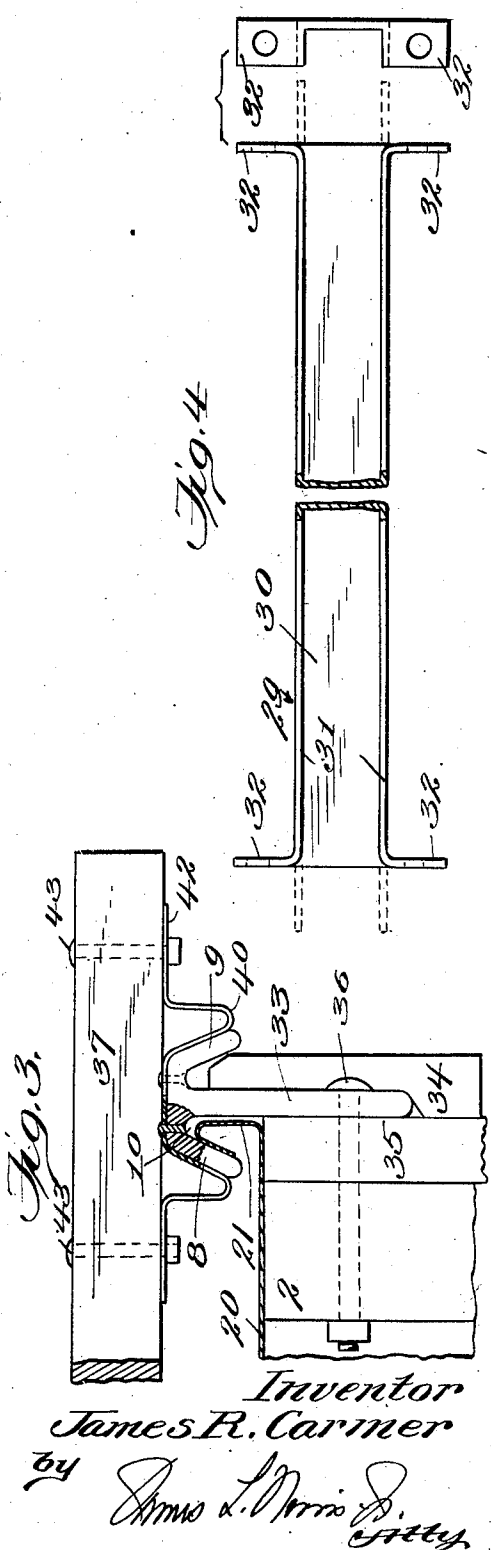


Fig. 3.

Fig. 4.

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4 SHEETS—SHEET 3

Fig. 7.

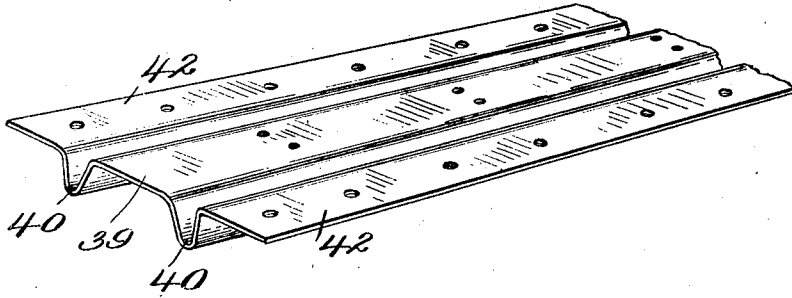


Fig. 5.

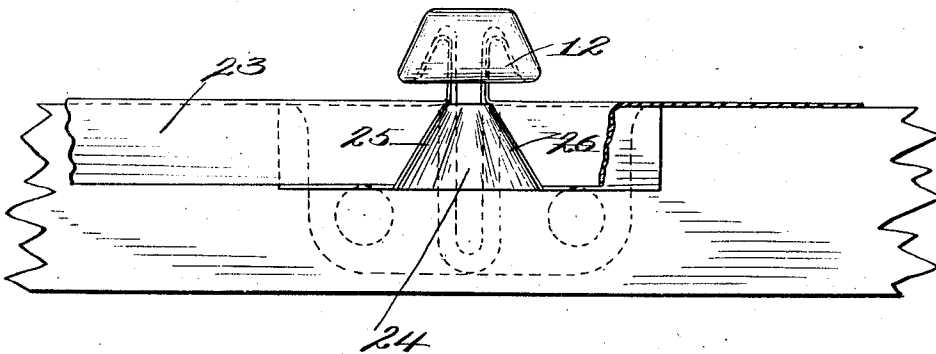
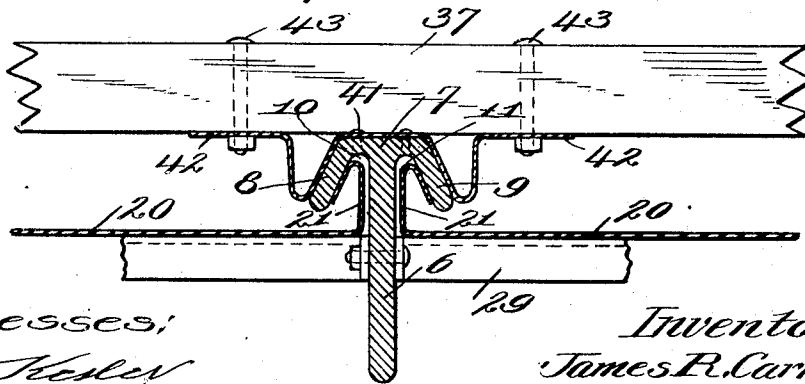


Fig. 6.



Witnesses:
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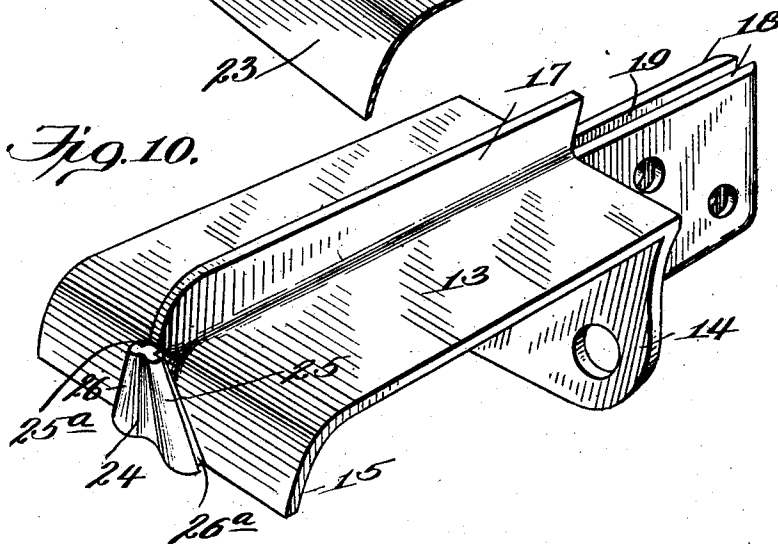
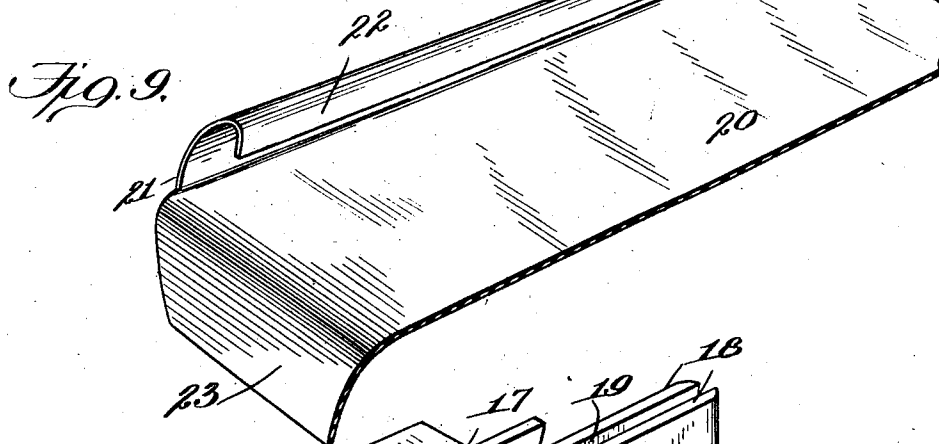
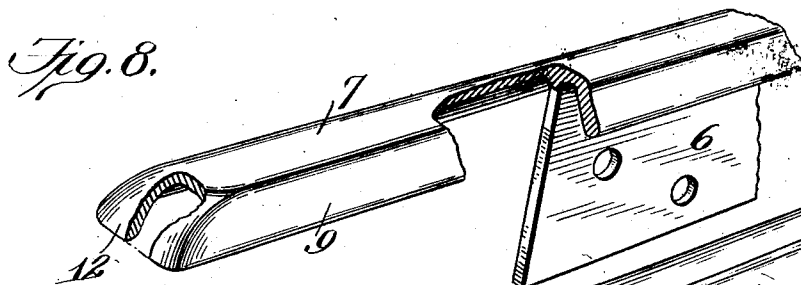
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4 SHEETS—SHEET 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES R. CARMER, OF WILMINGTON, DELAWARE.

ROOF STRUCTURE FOR RAILWAY-CARS.

1,050,805.

Specification of Letters Patent.

Patented Jan. 21, 1913.

Application filed February 2, 1912. Serial No. 675 007.

To all whom it may concern:

Be it known that I, JAMES R. CARMER, a citizen of the United States, residing at Wilmington, in the county of Newcastle and State of Delaware, have invented new and useful Improvements in Roof Structures for Railway-Cars, of which the following is a specification.

The present invention relates to improvements in railway car structures, and the primary object of the invention is to provide a roof structure therefor which enables a metal roof to be employed that will fulfil the conditions and requirements, the roofing sections, according to the present invention, being so held or locked in position that the entrance of water or moisture is effectively prevented although provision is made for such movements as may occur between the roofing sections and their supports and securing means due to the torsional or other strains to which the car is subject although the roofing sections are so held or locked in position that displacement is impossible, the structure provided by the present invention being relatively strong, inexpensive to manufacture, and capable of easy assembling, no bolts, screws or nails for securing the carlines, carline support castings, purlins, roofing sheets or running board supports passing through the exterior exposed portion of the roof to the interior of the car, thus preventing water or moisture following the bolts, screws or nails into the interior of the car which is a common evil on existing roofs. Moreover, the upturned flanges of the roofing sheets and the downturned flanges of the carlines, with the purlins as the under supports, lock the roofing sheets in position, avoiding puncturing of the sheets or the contact with the exposed surface of the sheet of a separate clamp or auxiliary joint cap, thereby permitting free expansion and contraction of the roofing sheets between the flanges and preventing friction and wear of the exterior portions of the sheets which would result from engagement of the sheets with separate joint caps or running board supports. These results are obtained by the use of a combined carline and joint cap, this construction greatly reducing the number of parts necessary. Moreover, the employment of a casting which is fastened to the side plate of the car and which supports the respective end of the carline provides a waterproof joint for

the roofing sheets at the eaves and drains away water or moisture which might enter the joint between the roofing sheets and thus reach the inside of the car.

Another object of this invention is to provide simple and improved means for mounting a running board on the roof of the car, the running board being so supported as to avoid damage to the roof or joints through which water or moisture might enter.

To these and other ends, the invention consists in certain improvements, and combinations and arrangements of parts, all as will be hereinafter more fully described, the novel features being pointed out particularly in the claims at the end of the specification.

In the accompanying drawing:—Figure 1 is a top plan view, partly in section, of a portion of an ordinary railway car provided with a roof structure constructed in accordance with one embodiment of my invention; Fig. 2 represents a transverse section through the upper portion of the car as shown in Fig. 1 and illustrating the roof structure; Fig. 3 is a fragmentary view of one end of the car roof showing a mode of attaching a carline thereto, locking the adjacent roof section thereby, and mounting the running board on the carline; Fig. 4 is a bottom plan view of one of the spacers which are preferably interposed between and connect the carlines; Fig. 5 is an end view of one of the carlines as viewed from one of the eaves of the roof; Fig. 6 represents a section on an enlarged scale and in the plane of the line 6—6 of Fig. 2; Fig. 7 is a perspective view of one of the saddles or supports for the running board; Fig. 8 is a perspective view, partly broken away, of one end of a carline constructed in accordance with the present invention; Fig. 9 is a perspective view of a portion of a metallic roofing section adapted to be used in connection with the present embodiment of the invention; Fig. 10 is a perspective view of a combined carline support and side plate cap adapted to be used in connection with a carline of the construction shown in Fig. 8.

Similar parts are designated by the same reference characters in the several views.

The present invention is applicable generally to railway cars of various types and it possesses important advantages over roof structures as commonly used, particularly in that it provides improved means whereby

metallic roofing may be employed, avoiding the common defects of corrosion of exposed surfaces resulting from wear at the running board saddles and joint caps, and also producing a weather-proof joint at the eaves besides eliminating bolts, screws and nails passing through the exterior exposed metal parts into the interior of the car, thus avoiding leakage of water and moisture into the car. The combining of the metal carline and roof sheet joint cap into one unitary structure and the employment of the combined carline support and side plate cap renders the above condition possible and greatly simplifies the roof construction.

In the accompanying drawing, the roof structure is supported by longitudinal frame members, commonly known as side plates 1, which may be either of wood or metal, and end frame members, commonly known as end plates 2, which may be either of wood or metal, these frame members being suitably supported by underframing either of wood or metal at the top and inner side of the siding 3, and the usual fascia boards 4 are shown secured to the upper edges of the siding and exteriorly thereof. The roof structure embodies a suitable number of longitudinally spaced carlines 5 which, according to the present invention, are of improved construction, they serve to seal and lock the roofing sections in position, and they are mounted on and secured to carline supports of improved construction which are attached to the longitudinal frame members 1. Each carline, according to the present invention, is composed of suitable metal and embodies a vertical or upright flange or web 6 which is preferably flat, as shown, and extends continuously between the carline supports, and a head or cap 7 formed on the upper edge of the flange or web extends continuously from end to end of the carline, this head or cap being formed with a pair of flanges 8 and 9 which serve to seal and lock the adjacent roofing sections. These flanges are arranged at opposite sides of the flange or web 6 and depend or extend downwardly from the head, such flanges in the preferred form of the invention extending at divergent angles and in directions downwardly and outwardly to form tapering channels 10 and 11 between them and the respective sides of the interposed web or flange 6. These flanges 8 and 9 are preferably connected at the end of the carline by a cap 12 which is preferably formed integrally with the flanges, as shown, and these caps serve to close the ends of the channels 10 and 11. A suitable number of supports are mounted on and secured to the longitudinal frame members 1 to receive the ends of the carlines. Each support in the present instance has a flat section 13 to seat upon the top of the re-

spective frame member and has inner and outer flanges 14 and 15 to engage the inner side of the frame member and the outer side of the fascia board 4, the upper outer corner of the latter being preferably rabbeted to accommodate the flange 15 as shown in Fig. 2, and each support may be secured in position by suitable bolts 16 which in the present instance extend through openings formed in the inner flange 14 for this purpose but these bolts do not extend through the fascia board or siding. The section 15 of the support is formed with an upstanding rib 17 which, when the carline is applied, enters the cavity which is formed by the head 7, and this rib forms in effect a continuation of the vertical flange or web 6 of the carline, this flange or web being preferably interrupted at a point where the ends of the flange or web 6 of the carline abut against the inner end of the rib 17. The inner side of the support is provided with a socket to receive the flange or web 6 of the carline, this socket in the present instance embodying a bracket which is formed integrally with and projects inwardly from the inner flange 14 of the support and is composed of opposed side members 18 which are connected at the bottom and form a slot or opening 19 between them into which the flange or web 6 of the carline may be introduced, and the carline may be fastened or secured in position by extending bolts or rivets through the socket and web, these parts being shown provided with apertures for this purpose. By securing the carline in this manner, spreading of the sides of the car is effectually prevented and collapsing of the sides of the car is also prevented, as the end of the flange or web 6 of the carline abuts against the inner side of the support.

The roofing sections which are preferably of metal are applied in the form of plates which extend transversely across the roof and each plate occupies the space between adjacent carlines. In the present instance, each roofing section 20 has its edge bent vertically at 21 adjacent to the side of the vertical web or flange 6 of the respective carline, and this upturned edge is doubled to form a lip 22 which, when the carline is in position, lies closely against the inner side of the depending flange 8 or 9 as the case may be. By doubling the edge of the roofing section in this manner, the edge of the lip 22 possesses a certain degree of yield or resilience which enables it to bear closely and uniformly against the inner side of the respective depending flange, thereby producing a liquid and moisture-proof seal at this point and at the same time providing for expansion and contraction of the roofing sheet. The edges of each roofing section at the eaves of the roof may be down-

turned to form lips 23 which overlap the edges of the fascia boards and enter the slots 25^a and 26^a on the combined carline support and side plate cap, thus preventing the entrance of water or moisture at these points and securing the sheets in position. The application of each carline to its respective supports causes the depending flanges thereon to descend upon the doubled edges of the two adjacent roofing sections, thereby forming joints which not only lock the roofing sections from displacement but also form sealed joints of a character which will prevent the entrance of water or moisture even though the water be driven against the joint with considerable force due to a rapid movement of the car. To prevent water or moisture from entering at the outer edge of the rib 17, it is also preferable to provide a guard 24 which in the present instance is formed as a part of and projects outwardly from the flange 15 of the support and has divergent forward and rear edges 25 and 26 which are provided with the slots 25^a and 26^a and secure the correspondingly flanged ends on the adjacent roofing sections, the inclination of the guard insuring proper drainage of water and preventing the water from entering the car.

In order to maintain the various carlines in proper spaced relation and also to provide supports beneath the roof to sustain a weight imposed thereon, the carlines are preferably connected by rigid spacers or purlins 29, each spacer in the present instance being composed of a section of channel iron 30 having the web portion arranged uppermost and the flanges 31 in depending relation, the web portion being cut away for a suitable distance from each end of the channel iron and the flanges thereof are bent in opposite directions and at right angles to the length of the channel iron to form attaching lugs 32 which may be riveted or bolted to the vertical webs or flanges of the adjacent carlines. At each end of the car, the roofing may be secured by a carline 33 wherein the vertical web or flange thereof will be secured to the siding 35 and the end frame member 2 by a suitable number of bolts 36, the depending flange at the inner side of this carline cooperating with the doubled locking and sealing edge on the end roofing section as shown in Fig. 3, the end fascia board 34 being rabbeted to accommodate the vertical web of the carline and secured to the siding beneath the carline.

The present invention also provides simple and effective means for supporting and securing the running board on the roof of the car, the running board in the present instance embodying a longitudinal section 37 and a transverse section 38 which leads thereto from the ladder at one side of the

car. This running board is supported by and secured to the projecting heads of the carlines, a suitable number of saddles 39 being employed each of which is preferably composed of a plate of metal which is grooved longitudinally to form a pair of depending ribs or flanges 40, the middle portion of the plate resting on the center of the head of the respective carline and the ribs 40 straddling and engaging the opposite sides of the divergent flanges 8 and 9, the saddle being thereby centered on the carline and rivets 41 serve to secure the saddle firmly to the carline. The opposite edges 42 of the saddle preferably project in opposite directions and provide means for securing the running board thereto, bolts 43 being employed for this purpose in the present instance. The laterally extending section 38 of the running board may be supported on the two end carlines and in this instance the saddles will be elongated to the proper extent.

I claim as my invention:—

1. A roof structure for railway cars embodying a carline having a roof joint cap rigid therewith, and a roofing section having an upstanding portion formed with a lip directed downwardly and outwardly from the carline and engaging the under side of the joint cap thereof.

2. A roof structure for railway cars embodying a member having a flanged head rigid therewith, and a roofing section having a portion extended upwardly beneath said head and having its adjacent edge directed downwardly and outwardly to form a yieldable lip, the under side of the flanged head of the member engaging the outer side of said yieldable lip.

3. A roof structure for railway cars embodying a carline having a roof joint cap rigid therewith, a roofing section having an upstanding portion adjacent but unattached to the carline and formed with a downwardly and outwardly directed lip, the latter engaging the roof joint cap, and means arranged beneath and supporting the roofing section in cooperative relation with the joint cap of the carline.

4. In a roof structure for railway cars, the combination of roofing sections having upturned edges provided with yieldable downwardly and outwardly directed lips, and a carline having flanges bearing laterally against the yieldable lips of the roofing sections to hold the latter in position and form moisture-proof joints therewith.

5. In a roof structure for railway cars, the combination of roofing sections having upturned doubled edges to form downwardly and outwardly inclined lips, and a carline having a head bearing laterally against said downwardly and outwardly inclined lips to hold the respective sections in

position and to form moisture-proof joints therewith.

6. In a roof structure for railway cars, the combination of roofing sections having upturned doubled edges, formed with outwardly and downwardly inclined lips, and a carline having a head provided with divergent downturned flanges cooperative with said lips of the roofing sections to hold the latter in position and form water-tight joints therewith.

7. In roof structures for railway cars, the combination of roofing sections, the adjacent edges of which are upturned and doubled in reverse relation forming divergent downwardly and outwardly inclined lips, and a carline having a web portion spaced freely between the adjacent roofing sections and provided with divergent flanges engaging the upper outer sides of the lips of the respective roofing sections.

8. In roof structures for railway cars, the combination of combined carline supports and side plate caps provided at their inner sides with vertical sockets and having upstanding ribs on their upper sides, and a carline spanning said supports and having a vertical web seated in and secured to the respective sockets and forming a continuation of said rib.

9. In roof structures for railway cars, the combination of a pair of supports mounted and secured at opposite sides of the car, each support having an upstanding rib, a carline connecting said supports and having a channeled head thereon portions of which overlie the ribs of the supports, and roofing sections the adjacent edges of which are locked in position by said head of the carline.

10. In roof structures for railway cars, the combination of a pair of supports mounted and secured at opposite sides of the car, each support having an upstanding rib and also a socket at the inner side thereof, a carline having a vertical web portion seated and secured in the sockets of the supports and forming a continuation of the ribs thereon, the carline also having a laterally projecting channeled head, and roofing sections having retaining sections held by said head.

11. In roof structures for railway cars, the combination of a pair of supports mounted and secured at opposite sides of the car, each support having an upstanding rib and also a socket at the inner side thereof, a carline having a vertical web portion

seated and secured in the sockets of the supports and forming a continuation of the ribs thereon, the carline also having a head which projects laterally from opposite sides of the web and is channeled longitudinally, the channels being closed at the ends of the carlines and each support being provided at its outer face and below the rib thereon with a tapered guard, and roofing sections abutting against the web of the carline and the ribs of the supports and having upturned doubled edges engaged in the channels of said head.

12. In roof structures of the class described, the combination of a plurality of laterally spaced carlines having roof joint caps rigid therewith, roofing sections interposed between the carlines and having upstanding portions engaging the under sides of the respective joint caps, and purlines extending between and connecting the carlines and supporting the roofing sections in cooperative relation with the joint caps.

13. A roof structure for railway cars comprising, in combination, roofing sections having their adjacent edges upturned and then inclined outwardly and downwardly, and a unitary carline and joint cap having a web arranged freely between the upturned edges of the roofing sections and divergent downturned flanges covering and engaging the upper sides of the outwardly and downwardly inclined edges of the roofing sections.

14. A roof structure for railway cars comprising, in combination, a carline having a vertical web and a joint cap rigid therewith and formed with flanges which are inclined downwardly and outwardly, roofing sections having upstanding portions adjacent to but spaced from the respective sides of the web of the carline, said upstanding portions having downwardly and outwardly yieldable lips bearing against the under sides of the respective flanges of the carline, and supports attached to the web portion of the carline and bearing against the under sides of the roofing sections to maintain the latter in operative position.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES R. CARMER.

Witnesses:

CHAS. S. HYER,

JAMES L. NORRIS, Jr.