

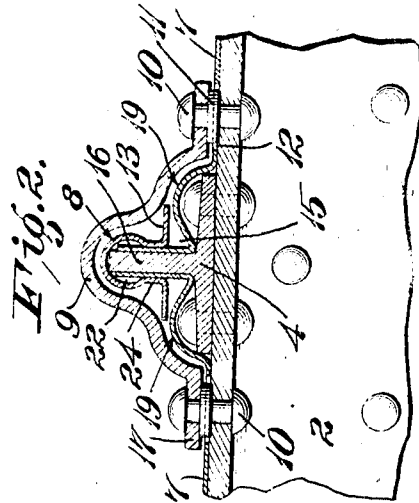
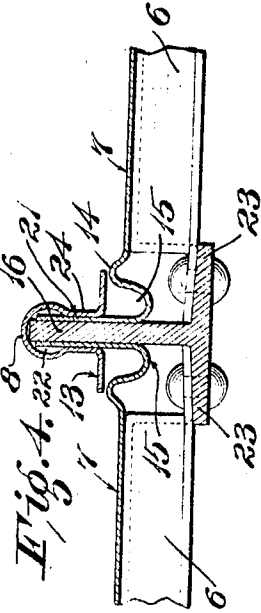
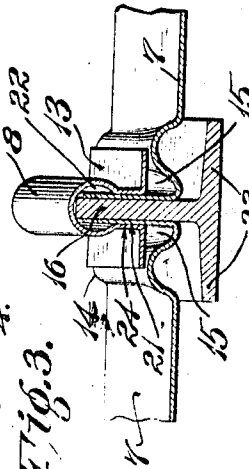
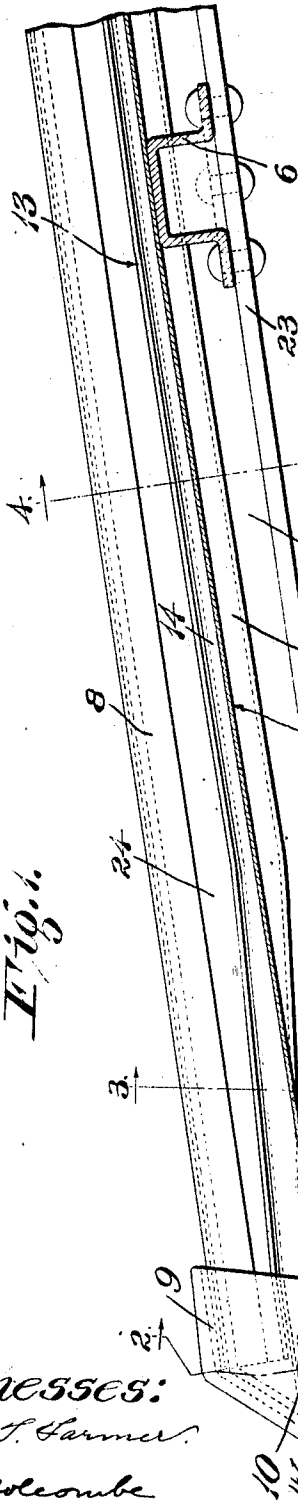
W. P. MURPHY.
METAL CAR ROOF.

APPLICATION FILED JAN. 23, 1911.

Patented Sept. 26, 1911.

2 SHEETS—SHEET 1.

1,004,063.



Witnesses:
Edgar T. Farmer
Amos Combe

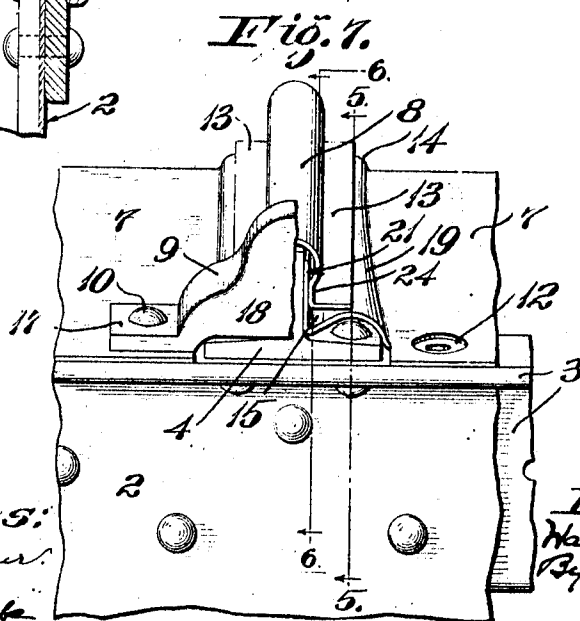
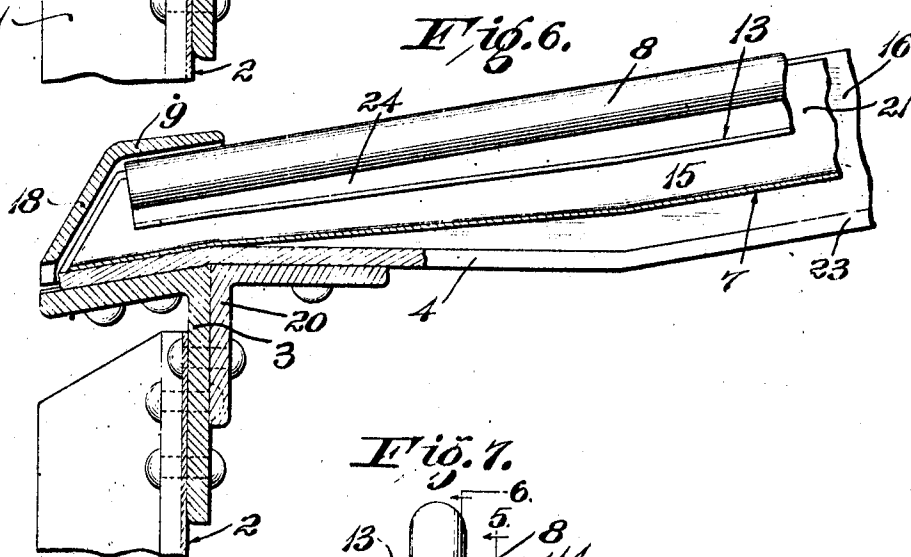
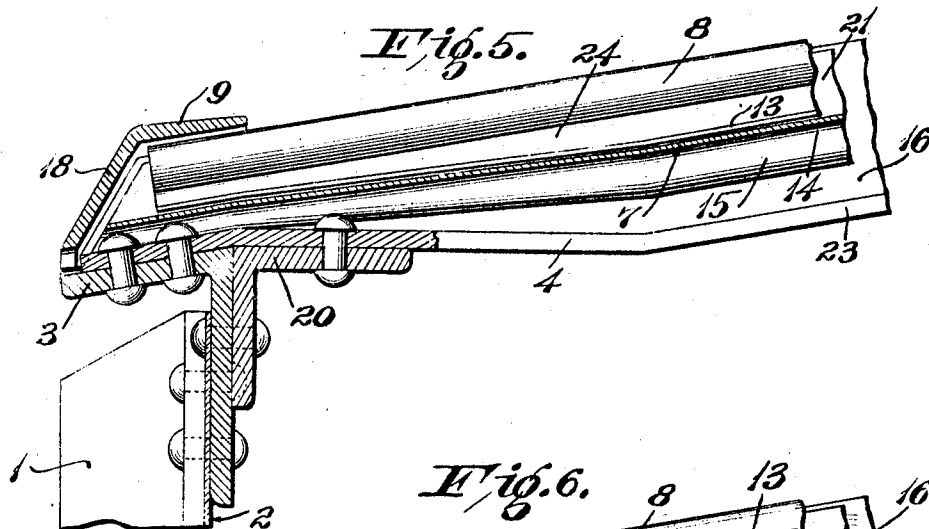
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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

WALTER P. MURPHY, OF CHICAGO, ILLINOIS.

METAL CAR-ROOF.

1,004,063.

Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed January 23, 1911. Serial No. 604,083.

To all whom it may concern:

Be it known that I, WALTER P. MURPHY, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Metal Car-Roofs, of which the following is a specification.

My invention relates to improvements in metal roofs for freight cars of the type in which sheet metal roof sheets are supported on the roof substructure, and connected by upstanding seams, and relates to the form of roof sheet and seam cap and arrangement of these parts with respect to each other for forming a water tight seam.

My invention further relates to the particular form of roof clip for covering the end of the seam between the roof sheets, and to the means for attaching it to the roof substructure, in such way as to permit of some slight movement of the roof sheets relative to the roof substructure.

Further objects of my invention will appear in and will be more fully described and set forth in connection with the accompanying drawing showing an embodiment thereof, in which drawings like numerals are used to designate like parts throughout the several figures, and what I believe is new and of my invention will be particularly pointed out in the claims forming a part of this specification.

In the drawings accompanying this application, Figure 1 is a partial section through the eaves of a metal car roof; Fig. 2 is a partial section on the line 2-2 in Fig. 1; Fig. 3 is a partial section on the line 3-3 in Fig. 1; Fig. 4 is a partial section on the line 4-4 in Fig. 1; Fig. 5 is a partial section on the line 5-5 in Fig. 7, showing the seam cap in side elevation; Fig. 6 is a partial section on the line 6-6 in Fig. 7 showing the seam cap in side elevation; and Fig. 7 is a partial view in side elevation of the eaves of the roof at a seam showing the hood clip partly broken away.

In the several figures of the drawings, 1 denotes a side post of a car and 2 the side plating; 3 is the side plate securely riveted to the side posts and serving as a support for the ends of the carlines 4 which are securely riveted to the side plates on both sides of the car and also attached thereto by means of brackets 20. The carlines 4 are of

T section having lateral flanges 23 and vertical flanges 16, arranged with the vertical flanges uppermost, and are laterally braced by purlins 6 extending between adjacent carlines and securely riveted to the flanges 23 thereof. The body portion of the purlins is of an inverted channel shape, but the end portions thereof are flattened so as to rest flatwise against the horizontal flanges of the carline. By this arrangement a space intervenes between the vertical portion of the carline and the end of the raised portion of the purlin supported thereby, which space is utilized to accommodate the trough or drain hereinafter mentioned. The roof sheets 7 are arranged on the purlins between the vertical flanges 16 of the carlines and have upturned side flanges 21 adjacent thereto.

Between each side flange 21 and the substantially flat portion of the roof sheet are a deep corrugation 15 next the side flange and a smaller corrugation 14 projecting slightly above the flat part of the roof sheet, as shown in Fig. 4. The deep corrugation 15 preferably extends below the plane of the body of the sheet and is accommodated by the space intervening between the vertical portion of the carline and the raised portions of the purlins. Over the upstanding flanges 21 and the vertical flange of the carline is placed a seam cap 8 for the purpose of providing additional protection from the weather. This seam cap has an enlarged portion embracing the upper edges of the side flanges of the sheets and carline with a space between the inner walls of the seam cap and the upper parts of the flanges. The seam cap has extensions 24 contacting with the middle portions of the side flanges 21 of the roof sheets and terminating in lateral wings 13 extending at right angles to the main body of the seam cap. These lateral wings bridge the space over the deep corrugations 15 and terminate adjacent the upper extremities of the raised corrugations 14. The object of this arrangement of flanged corrugated sheets and seam cap is to prevent water driven by the force of a storm or the motion of the air passing a swiftly moving car from entering the car over the tops of the flanges 21. The corrugations 14 deflect a sheet of water passing over the roof sheets and direct it upward over the seam cap 8, thus lessening the

amount of water which would otherwise be driven under the flanges 13.

The trough formed by the corrugation 15 provides ample space for the passage of water which does enter under the flange 13 down and off the eaves of the car before it can collect with sufficient pressure under the wing 13 to force its way between the parts 24 of the seam cap and the flange 21. In case some water under pressure does follow up the inside of the cap between the parts 24 and the flange 21, upon emerging into the space 22 within the seam cap near the top of the flange 21 it will lose its pressure and so will not be driven up to the top of the flange 21 and thus into the car. If it were not for the spaces at 15 and 22 a film of water under pressure entering beneath the wing 13 would be driven up under the seam cap and over the flange 21 into the car, but these enlargements relieve the pressure forcing this film of water under the seam cap and thus serve to prevent its entrance into the car.

At the eaves of the roof where the carlines are riveted to the side plates the corrugations 14 are enlarged sufficiently so that the roof sheets avoid the rivets in the flanges of the carlines as shown at 19 in Figs. 2 and 7. The seam caps and roof sheets are secured from becoming detached from the roof substructure by hood clips 9 having front faces 18 covering the open ends of the corrugations and seam caps. The hood clips are secured to the side plate by rivets 10 passing through holes in the roof sheets. These rivets have enlarged portions 11 above the side plate which provide shoulders against which the flanges 17 of the hood clips bear, these enlargements being of such thickness that the flanges 17 are spaced slightly above the roof sheets 7. The holes 12 in the roof sheets are made somewhat larger than the enlargements 11 so that the roof sheets can have some slight movement with respect to the roof substructure. This capability of movement is necessary in order that the roof sheets shall not be torn by stresses arising from the racking or weaving of the car body, as would be the case were the sheets rigidly attached to the substructure.

The corrugations in the roof sheets adjacent the side flanges 22 introduce an element of flexibility between the roof sheets at the seams, and thus not only assist in preventing entrance of water at the seams but also serve to protect the roof sheets from tearing adjacent the seams, which would result were the sheets rigidly attached to each other or to the carlines at the seams. The wings 13 of the seam caps are positioned above the corrugations 14 in the roof sheets in order that the roof sheets may have some movement on the roof at right angles

to the carlines without danger of the seam caps and roof sheets coming in contact and wearing or cutting through.

The hood clips 9 are spaced away from the ends of the seam caps 8 and corrugations 15 in the sheets, and the front faces 18 of the clips are cut away at their lower edges in order to provide a space for the running off of storm water and an outlet for dirt which may have lodged under the seam caps 8 or in the corrugations 15, thus enabling these places to be kept clear.

It is evident that my improvements are applicable to all outside metal roofs having roof sheets connected by upstanding seams, and I do not wish to be understood as limiting my invention to the precise arrangement shown.

Having described a particular embodiment of my invention, what I desire to claim and secure by Letters Patent is as follows:

1. In a car roof, the combination of carlines, purlins supported thereby below the tops thereof, metal roof sheets resting on said purlins and having side flanges turned up alongside of said carlines, said sheets being provided with an upwardly extending corrugation parallel with and adjacent to its side flanges, and seam caps covering a carline and the adjacent up-turned flanges of adjacent sheets and having lateral extensions terminating immediately above said corrugations.
2. In a car roof, the combination of carlines, purlins supported thereby below the tops thereof, metal roof sheets resting on said purlins, and seam caps covering the adjacent marginal portions of the sheets, the marginal portion of a sheet comprising a corrugation extending upwardly above the plane of the sheet, a second corrugation extending downwardly below the plane of the sheet and an up-turned portion alongside of the carline, and a seam cap having a lateral portion extending over the downwardly extending corrugation and terminating immediately above said up-turned corrugation.
3. In a car roof, the combination of metal carlines having laterally extending flanges at the lower portion thereof, metal purlins with flattened end portions supported flatwise on said flanges and with raised body portions, metal roof sheets resting on said purlins having up-turned margins arranged alongside of said carlines, and metal seam caps, the portion of the roof sheet next to its up-turned margin having a corrugation extending below the plane of the sheet, and the portion of the sheet adjacent to said downwardly extending corrugation having a corrugation extending above the plane of the sheet, and the seam caps having laterally extending portions which terminate immediately above the upwardly extending corrugations of adjacent sheets.

4. In a car roof, the combination of metal carlines having laterally extending flanges at the lower portion thereof, metal purlins with flattened end portions supported flatwise on said flanges and with raised body portions, metal roof sheets resting on said purlins having up-turned margins arranged alongside of said carlines, and metal seam caps, the portion of the roof sheet next to its up-turned margin having a corrugation extending below the plane of the sheet, and the portion of the sheet adjacent to said downwardly extending corrugation having a corrugation extending above the plane of the sheet, and the seam caps having laterally extending portions which terminate immediately above the upwardly extending corrugations of adjacent sheets, and said seam caps being enlarged at the tops to provide a space between the interior walls thereof and the sides of the up-turned margins of the sheets at their extremities.

5. In a car roof, the combination of carlines, purlins supported thereby below the tops thereof, metal roof sheets resting on said purlins, and seam caps covering the adjacent marginal portions of the sheets, the marginal portion of a sheet comprising a corrugation extending upwardly above the plane of the sheet, a second corrugation extending downwardly below the plane of the sheet and an up-turned portion alongside of the carlines, and a seam cap having a lateral portion extending over the downwardly extending corrugation and terminating im-

mediately above said up-turned corrugation, and means for movably holding said sheets upon the roof sub-structure, said means comprising clips overlying the sheets, fastened to the roof sub-structure by means of rivets passing through holes in the roof sheets, said holes being larger than the body portions of the rivets.

6. In a car roof, the combination of carlines, purlins supported thereby below the tops thereof, metal roof sheets resting on said purlins, and seam caps covering the adjacent marginal portions of the sheets, the marginal portion of a sheet comprising a corrugation extending upwardly above the plane of the sheet, a second corrugation extending downwardly below the plane of the sheet and an up-turned portion alongside of the carline, and a seam cap having a lateral portion extending over the downwardly extending corrugation and terminating immediately above said up-turned corrugation, and means for movably holding said sheets upon the roof sub-structure, said means comprising clips secured to the sub-structure and having the hood portions overlapping the end portions of the respective seam caps, the hood portion being perforated in register with the trough formed by the downwardly extending corrugations of the roof sheets.

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Witnesses:

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