

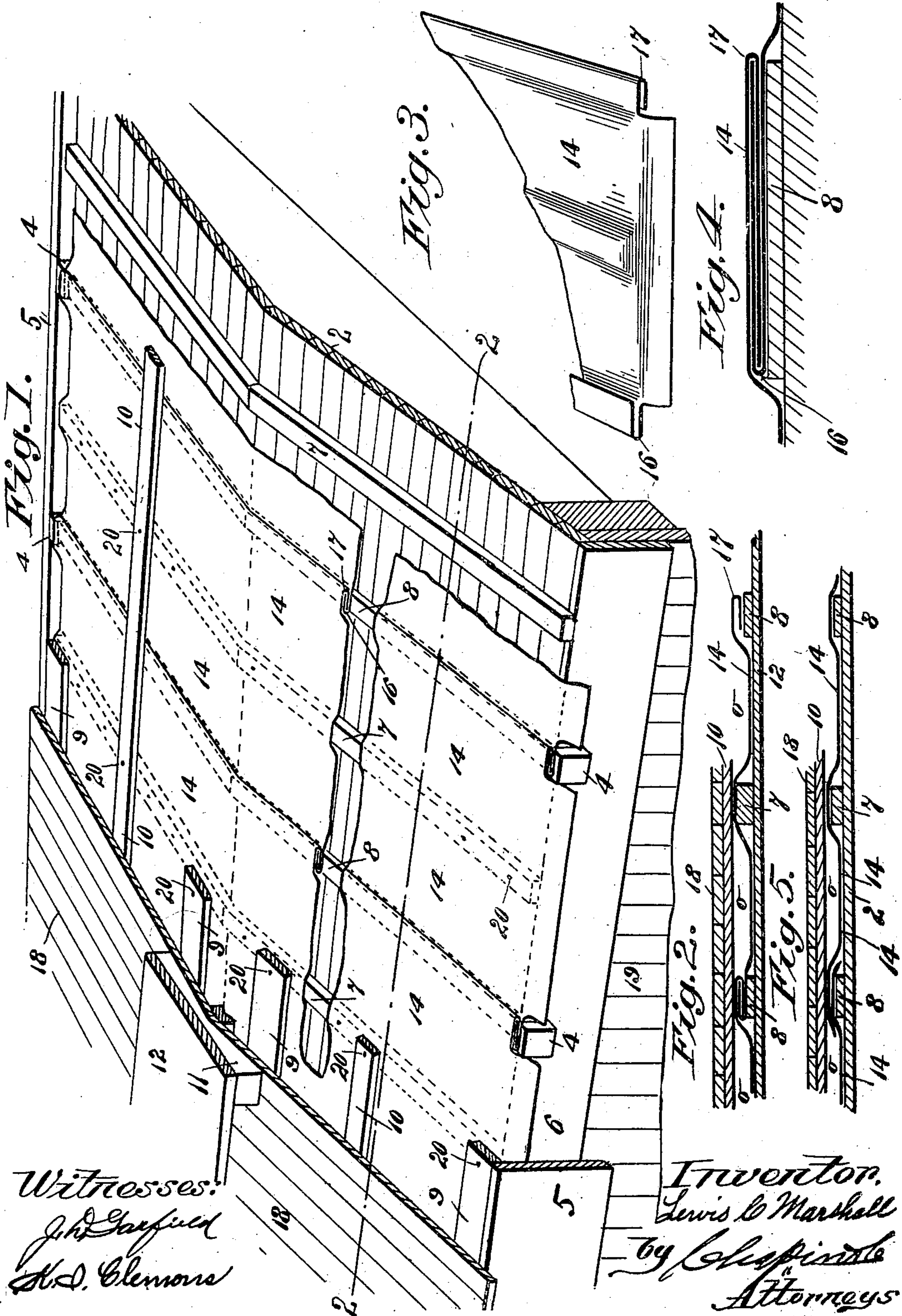
No. 673,646.

Patented May 7, 1901.

L. C. MARSHALL.  
CAR ROOF CONSTRUCTION.

(Application filed Oct. 4, 1900.)

(No Model.)



Witnesses:  
J. H. Garfield  
H. D. Clemens

Inventor.  
Lewis C. Marshall  
by *Chapin & Co.*  
Attorneys



# UNITED STATES PATENT OFFICE.

LEWIS C. MARSHALL, OF EAST WALPOLE, MASSACHUSETTS.

## CAR-ROOF CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 673,646, dated May 7, 1901.

Application filed October 4, 1900. Serial No. 31,950. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS C. MARSHALL, a subject of the Queen of Great Britain, residing at East Walpole, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Car-Roof Constructions, of which the following is a specification.

This invention relates to roof constructions for freight-cars especially, the object being to provide an improved construction for such roofs in respect to improved structural means therein for preserving the roof in a water-tight condition, notwithstanding the warping or twisting movements to which a car-body is subjected when running on the road, whereby leaking seams are opened in the roof and especially when heavily loaded; and the invention consists in the peculiar construction and arrangement of the roof parts of a car, and particularly those parts intermediate of certain outer and inner roof parts, all as hereinafter fully described, and more particularly pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a perspective view of a section of a car-roof constructed according to my invention, said figure showing also a part of one side of a car. Fig. 2 is a sectional view on line 2 2, Fig. 1. Fig. 3 illustrates one end of a strip of the roofing material shown in Fig. 1 and shows the interlocking folds of the longitudinal borders thereof. Fig. 4 is a cross-sectional view of one of the purlins of the roof and illustrates the method herein employed of interlocking the adjoining borders of two strips of roof-covering material. Fig. 5 shows a longitudinal section of a part of the sub-roof, showing the rafters thereon in cross-section, a slightly-different arrangement of the meeting ends of the roofing paper or material thereon, a longitudinal section of an overlying purlin, and a cross-section of the outer roof.

Referring to the drawings, 19 indicates a part of one side wall of a car adjoining one border of the roof thereof. The subroof 2 of the car is constructed and supported on said side walls in any well-known manner, and against each lower border of said subroof is fixed an inner fascial board 6, whose upper border is in the plane of the outer face of said

subroof 2, and an outer fascial board 5. The outer fascial boards 5 are firmly secured to the outer edges of the border purlins 9 and to the outer faces the blocks 4, beyond the plane of the inner fascial boards 6, thereby providing suitable space between said two fascial boards for a normally free air-movement between said boards and the lower ends of the sheets of roofing material 14, which ends terminate in a direction downwardly and partly across said space, so that any water that may find its way onto the roofing-sheets 14 may freely run off therefrom and drop clear of said two fascial boards. Furthermore, said open-air communication from side to side of the car between the roofs thereof serves to keep the car cooler in hot seasons and conduces to the durability of the roof parts.

The preferred class of flexible roofing material herein referred to is an impermeable paper fabric. This is preferable to metal, for the reason that it cannot deteriorate by rust or corrosion and that it more freely yields to the car movements, thereby preventing such cracking thereof as would impair its waterproof quality, and, furthermore, a paper of the class described is much better adapted to contribute to the formation of a folded water-tight uniting-joint between the roofing-strips than sheets of metal would be, for the folds of such paper are easily compressible to a degree that prevents the passage of water and at the same time permits free play of the roofing-strips under a certain degree of torsional movement of the car. The sheets of said roofing material 14 directly back of said blocks extend somewhat upwardly and more or less over the tops and the opposite sides thereof, substantially in the manner shown in Fig. 1, in order to prevent, as far as possible, any water from passing between the interengaging faces of said blocks and outer fascial board.

In assembling the overlying parts of the roof herein described and shown upon the subroof 2 of a car, whereby an open space is maintained between the latter and the outer roof, the subrafters 7 and 8 are applied and suitably secured to said subroof in the alternate relations of variable thicknesses shown in Fig. 1, said thinner rafters being provided



at such points on the roof as corresponds with the positions of folded interlocking borders of the strips of roofing material and the thick rafters intermediate of the thinner ones, to the end that such support for the peculiarly folded and joined borders of said roofing material shall be provided as will permit more or less of free play of the roofing-strips, but keeping the folded borders thereof in place without binding them. Said thicker subrafters serve as supports for the purlins, which run longitudinally thereover. The said interlocking fold, which unites the borders of the roofing-strips 14, is clearly illustrated in Figs. 1 to 4, inclusive, and comprises a fold of each border of each strip, whereby a longitudinal section of the border is folded over toward a longitudinal center line of the strip, thereby bringing said folded-over section opposite the adjoining surface portion of said strip, but not against it, and therefore a fold is produced on the opposite borders of each strip which is adapted to receive therein the edge section of another strip, hooking them together, as it were, with the border of one strip within the fold of the other, whereby the borders of two or more strips are interengaged or united to form a continuous roof-covering, all as clearly shown in the drawings. Said border folds may be made so that the free edges of the strip will be as shown in Fig. 3 or both on the under side, the latter being preferable for excluding water. Said folds are indicated in said Fig. 3 by 16 and 17, respectively. The interlocked borders of said strips when the latter are placed on the roof, as in Fig. 1, between the rafters 8 and the superposed purlins, become thereby so held in engagement that any water that may penetrate through the outer roof 18 will freely run off the roofing 14 and will not pass through said folded parts to the subroof 2 thereunder. Air-passages, as indicated by *o* in Figs. 2 and 5, are formed between the roofing 14 and the under side of the roof 18, connecting with the openings between the said fascial boards for the purpose specified.

Fig. 5 illustrates a modified arrangement of the borders of the roofing-strips 14, which are there shown as overlying or interengaging one another across the thinner rafter 8 and under the purlin 10, and the weight of the latter and the roof 18 bearing thereupon serve to hold the said two overlying borders so folded one against the other that there is little danger of water passing between them.

The running-board 12 is applied to the apex of the roof 18, supported on the requisite number of saddles 11, and the part of the roof underlying said saddles is chiefly supported on the two wide purlins 9 thereunder, which are nailed, as shown at 20, Fig. 1, to the subrafters 7, as also are those at the borders of the roof and the intermediate narrow ones 10.

Having thus described my invention, what

I claim, and desire to secure by Letters Patent of the United States, is—

1. In a car-roof construction comprising a subroof and an outer roof arranged in separated relations thereby forming a normally open air-space therebetween; fascial boards beneath the eaves of said roofs, between which are normally open air-spaces communicating with said air-space between said roofs, subrafters of variable thicknesses secured on said subroof, and strips of flexible roofing material extending over said subroof having interlocked borders extending longitudinally over the thinner of said rafters, and suitable purlins applied between said flexible roofing material and said outer roof, substantially as described.

2. In a car-roof construction comprising a subroof and an outer roof arranged in separated relations, whereby a normally open air-space is formed between said two roofs, separated fascial boards extending longitudinally beneath the eaves of said roofs having normally open air-spaces therebetween communicating with the said air-space between said two roofs, subrafters of variable thickness secured on said subroof, strips of flexible impermeable roofing material extending over said subroof having interlocked borders extending longitudinally over the thinner of said rafters, and purlins extending longitudinally of the roof between said two roofs over said roofing material, on which said outer roof lies, secured against the surface of said roofing material, whereby the same is retained in position relative to said subrafters, substantially as described.

3. In a car-roof construction comprising a subroof and an outer roof arranged in separated relations, a series of alternate high and low subrafters between said roofs, means intermediate of said two roofs for rendering the subroof water-tight, consisting of a series of strips of flexible waterproof roofing material united at a point over said low subrafters by inserting the border of one strip within the folds of the opposite one, and means for securing said united roofing-strips to said high subrafters and for holding said folded borders in freely-engaged relations, substantially as described.

4. In a car-roof construction comprising a subroof and an outer roof arranged in separated relations; a series of alternate high and low subrafters, fascial boards beneath the eaves of said roofs between which are normally open air-spaces communicating with the space between said roofs, a flexible roofing material applied to said subroof, the edges of which extend into said air-spaces beneath the eaves of the roof free of contact with the car, and means for securing said material to said high subrafters, substantially as described.

5. In a car-roof construction comprising a subroof and an outer roof arranged in separated relations; alternate high and low subrafters between said roofs, fascial boards be-



neath the eaves of said roofs between which are normally open air-spaces communicating with the space between said roofs, a series of blocks interposed between said fascial boards whereby their separation is rigidly maintained, a flexible roofing material applied to said subroof, portions of the borders of which extend between said blocks into said air-spaces therebetween, and other portions of which borders extend above the tops thereof, substantially as described.

6. In a car-roof construction comprising a subroof and an outer roof arranged in separated relations; a series of rafters 7 and 8, of unequal thickness, extending over said subroof between the eaves thereof, the rafters 7 being the thicker ones, and the thinner rafters 8 being intermediate of said rafters 7, a roofing material consisting of a series of flexible strips of impermeable paper, the borders of which strips are united by folds which receive the border of one strip within the fold of the other, which roofing material is laid

upon said rafters with the folded and united borders thereof lying upon said thinner rafters, whereby said folded parts are held in the plane of the roofing each side thereof, and a series of purlins extending over said roofing material and secured to said rafters, substantially as described.

7. In a car-roof construction comprising a subroof and an outer roof arranged in separated relations; fascial boards beneath the eaves of said roofs between which are normally open air-spaces communicating with the space between said roofs; alternate high and low subrafters applied to said subroof, a flexible roofing material applied over said subrafters, the borders of which interengage, and the ends of which extend into said air-space beneath the eaves of the roof, free from contact with the car, substantially as described.

LEWIS C. MARSHALL.

Witnesses:

GEORGE M. GRAVES,  
F. W. FILLMORE.