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Patented Apr. 15, 1913.

2 SHEETS--SHEET 1.



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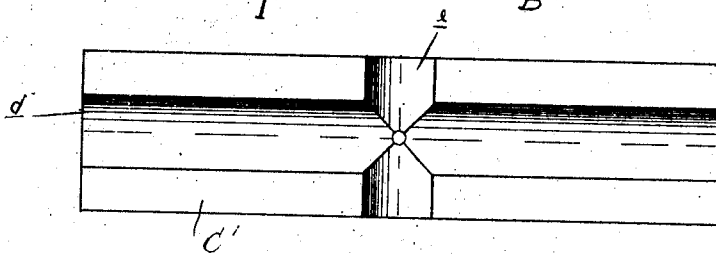
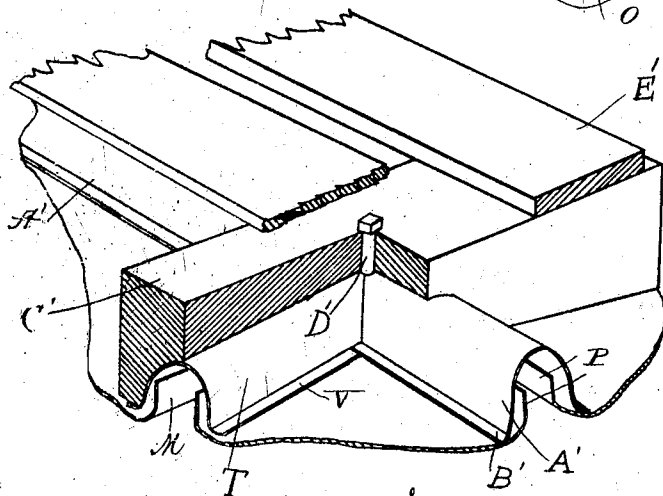
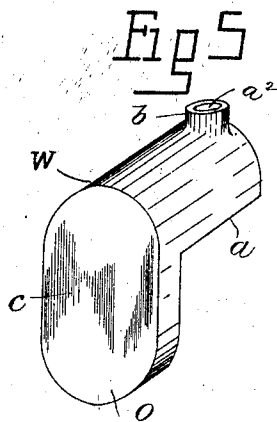
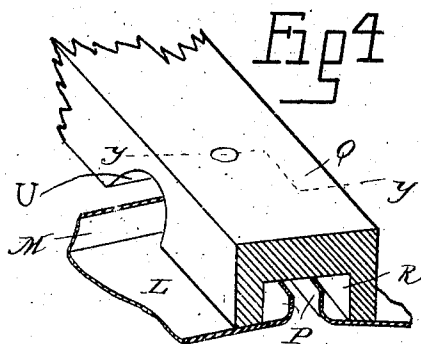
CAR ROOF.

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1,058,989.

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WITNESSES

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UNITED STATES PATENT OFFICE.

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CAR-ROOF.

1,058,989.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, CARLYLE E. LATTA and WILLIAM D. THOMPSON, both citizens of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Car-Roofs, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in car roofs and pertains more particularly to a car roof which as such is adapted to be manufactured and supplied to car builders. The invention may properly be classified and designated as a flexible plate-car-roof as distinguished more particularly from those roofs which are made with separate outside and inside sections or of a plurality of courses. In this particular, as a further distinguishing characteristic of the invention it may be stated that the same pertains to what may very properly be designated as a single course car-roof, as distinguished from a double course roof.

Generally speaking the invention relates to a metallic car roof which possesses adequate flexibility and required roofing rigidity. As components of the structure there are rigid or load supporting metallic plates constituting in the main the primary roofing elements, and associated with these plates are suitable means for forming weather-proofing joints between the plates, which means are so constructed and arranged that while the roof will be maintained weather-tight, it will still possess the requisite rigidity and flexibility to permit the weaving actions of the structure.

In the drawings illustrating an embodiment of the invention,—Figure 1 is a cross section through a roof embodying our invention; Fig. 2 is an enlarged sectional view transversely through the roof on line $y-y$; Fig. 3 is a section taken on line $x-x$ of Fig. 2, illustrating the peculiar construction of the covering means for the plate edges; Fig. 4 is a sectional perspective view, illustrating the holding-down means for the sheets at the

peak; Fig. 5 is a detached perspective view of the closure for the cap plates; Fig. 6 is a sectional perspective view, illustrating a modified form of holding-down means for the sheets at the ridge, and retaining means for the cap plates; and Fig. 7 is a bottom plan view of the saddle or sleeper, which supports the running-boards. Fig. 8 is a plan view of a portion of completed roof, some of the parts being removed.

In construction, the roof comprises a framework consisting of purlins A, ridge-pole B, and carlines C. D represents the usual side plates of the car, E the siding, and F the fascia. The carlines in this particular form of roof extend preferably uninterruptedly over the ridge from eave to eave, and consist of a body section G, including upstanding spaced flanges H, and a base section I extending laterally beyond the flanges, as indicated in Fig. 3.

As applied to the roof, the body sections of the carlines extend to the outer face of the fascia, as shown in Fig. 2, while the base sections I extend downwardly and within suitable recesses, such as J, formed within the plates D, as plainly shown in Fig. 2. They are secured at their lower edges by bolts K.

L represents the roofing-plates arranged in two series, one on each side of the ridge or peak. Each plate of the series has its marginal side edges turned upwardly, forming upstanding flanges as M and these flanges are adapted to abut or extend in proximity to the upstanding flanges upon the carlines, as shown in Fig. 3. At their lower edges the plates are bent downwardly, and the depending portions O are conveniently nailed to the fascia.

At the ridge or peak each plate terminates in an upstanding flange, as P, and the two series of flanges are arranged in proximity to one another, but spaced sufficiently to permit under the torsional and twisting movement of the roof relative transverse movement of the series, thus providing at the peak the desired flexibility transversely of the roof.

In Fig. 4 we have shown a holding-down

means for the ends of the plates at the ridge in the form of a super-ridge-pole Q, the under face of which is cut away or grooved, forming a continuous longitudinal opening R, within which the upstanding flanges P on the sheets extend, the opening being of sufficient width to permit transverse play of the plates for the purposes previously set forth. The ridge-pole in turn is held in place by bolts S, as indicated in Fig. 2.

The marginal portions of the plates are covered in this instance by inverted trough-shaped cap plates T, each extending from the eave to the ridge, and the upper portion of the cap projecting within a suitable transverse groove or opening U formed in the ridge-pole, as shown in Fig. 4. Each cap extends entirely over the body portion of its carline and the adjoining sheet flanges, and contacts with the plate bodies at a distance from the upturned edges. A space or clearance, as α' , is formed between the cap and each marginal plate flange, which allows relative longitudinal play of the plates under the twisting movements of the roof structure. The caps are provided preferably with marginal flanges V adapted to rest upon the roofing plate bodies, thus forming a tight joint, preventing the driving in of the rain and consequent leakage.

The lower ends of the cap plates are covered by suitable closures, as W, the closures in turn being held upon the cap plates, and the latter upon the roof plates by lag-screws X which extend vertically through the closure, cap plate and carline.

The preferred form of closure is illustrated, consisting of a trough-shaped section a embracing the lower portion of the cap plate, and formed with a vertical aperture a^2 and a bolt-seat b ; and a flat depending plate section c extending over the open end of the cap plate and at a distance below the same, the cap being held in place by the lag-screw X. As thus constructed, the rigid plates being preferably attached at their lower ends at the eaves, provision is made for relative transverse movement and longitudinal play of the plates, and the desired flexibility of the metallic roofing is obtained.

In Fig. 6 we have shown a modified form of holding-down means for the plates at their upper ends consisting of channel-shaped cap plates A', preferably marginally flanged, as at B', and arranged over the peak flanges of the plates and intermediate of the transverse cap plates T. The meeting ends of the longitudinal and transverse caps, as shown in Fig. 6, are preferably covered by a sleeper or saddle C', the under face being channeled out longitudinally and transversely, as indicated by the reference-letters d and e , to engage over the cap plates.

The sleeper is held in place by a suitable bolt D', and is adapted to receive the usual running-boards E'.

The sleeper described, as will be obvious, not only covers the joints between the cap plates, thus preventing leakage, but also performs the further function of holding the several cap plates down upon the roof structure, thus dispensing with the necessity of specially prepared devices for this purpose.

It is to be understood that the invention herein described is not limited to the structure so described and as shown. Many widely different forms of structure can be made and substituted without departing from the nature and principle of the invention.

Some of the more important advantages of the invention may be stated to be as follows: First, the structure is simplified by entirely dispensing with the board covering generally used in roofs of the prior art, and so in a satisfactory manner; second, there is a material reduction in the weight of the roof as compared with such former structures, which means decrease in the dead load of the car as a whole and increase in freight-load carrying capacity; third, the thickness or depth of the entire roof structure is greatly decreased, thereby providing additional space within the car for the freight; fourth, there is increased strength both in the roof itself and in the car structure; fifth, the roof is not damaged by the ordinary stresses of service and the cost of repairs is therefore reduced to a minimum; and sixth, the roof is thoroughly weather-proof not only when first installed but during a long period of service.

What we claim as our invention is,—

1. A flexible plate-car-roof comprising a skeleton frame, load sustaining rigid metallic roofing plates spanning open spaces of said frame, and independently freely movably supported thereon and secured thereto, and weather proofing means between adjacent plates permitting said free independent movement.

2. A flexible plate-car-roof comprising carlines, load sustaining rigid metallic roofing plates spanning the open spaces between said carlines and independently freely movable therebetween, and weather proofing means between adjacent plates supported thereby independent of the carlines and permitting the independent movement of the plates.

3. A flexible plate-car-roof comprising carlines, load-supporting roofing plates spanning the spaces between the carlines, flanges on the sides of the plates arranged at an angle to the body thereof, and metallic caps for the joints between the said flanges

and carlines, spaced from the carlines and plate flanges to permit a relative movement between the same and the flanges whereby a flexible joint is formed between the carline, carline cap and plates.

4. A flexible plate-car-roof comprising carlines, load supporting rigid metallic roofing plates, spanning the spaces between the carlines and independently freely movable therebetween, flanges on the sides of the plates arranged at an angle to the body thereof, metallic caps over the carlines and flanges, and lateral flanges on the caps parallel with the body of the plates and resting thereon.

5. A flexible plate-car-roof comprising carlines, load supporting roofing plates spanning spaces between the carlines, flanges on the sides of the plate arranged at an angle to the body, means for securing one end of said plates to the car, metallic caps over the carlines and flanges, spaced from the carlines and plate flanges to form flexible weather proof cover for the joint.

6. A flexible plate-car-roof comprising side plates, metallic carlines connecting the side plates, purlins connecting the carlines, of a covering composed of load-supporting metal roofing plates between the carlines, secured at one end, marginal flanges on said roofing plates adjacent to but separated from the carlines, and caps over the carlines and plate flanges, said caps being spaced from the plate flanges.

7. A flexible plate-car-roof comprising side plates, metallic carlines connecting the side plates, purlins connecting the carlines, a covering composed of exposed rigid load supporting metal roofing plates between the carlines, marginal flanges on said roofing plates adjacent to but spaced from the carlines, caps over the carlines and plate flanges, said caps being spaced from the plate flanges, and lateral foot flanges on the bottom of the caps resting on the plate.

8. A flexible plate-car-roof consisting of purlins, carlines, flanged roofing plates spanning spaces between said carlines and independent of each other, caps supported by said roofing plates covering the carlines and the flanges of said plates and independent thereof.

9. A single course metal car roof comprising purlins, side plates, ridge members and carlines spaced apart, exposed rigid load supporting roof sheets loosely positioned between the carlines and spanning substantially the space therebetween, means for weather-proofing the joint between the carlines and plates permitting free relative movement between the same, and means for securing the plates in position.

10. A flexible plate-car-roof comprising carlines formed of metallic structural beams

extending from eave to eave, load sustaining metallic roofing plates spanning open spaces between said carlines, means for forming a flexible weather proof connection between said carlines and plates, and purlins extending longitudinally of said carlines and directly supporting said plates.

11. In a flexible plate-car-roof, the combination with carlines, of load sustaining metallic roofing plates having upstanding flanges and arranged in a plane within the vertical space limits of the carlines, said plates being independently movable, and means for forming a weather proof flexible joint between said carlines and plates.

12. An outside car roof covering comprising the longitudinally extending ridge pole, purlins and side plates, metallic carlines extending uninterruptedly from eave to eave comprising an upstanding flange and a base plate extending upon opposite sides of said flange, said base plate being in engagement with the side plates and ridge pole and being set into the purlins, its upper face being flush with the upper surface of the purlins, metallic covering plates extending from eave to ridge having upturned flanges at their side edges and the ridge and resting at their edges on the lateral extension of the carlines, the intermediate portion of the plates having a bearing upon the carlines, a cap plate covering the flanges at the ridge engaging the plate body at a distance from the flanges, a bolt passing through said cap and ridge pole for securing the former in place, a closure for the lower ends of the cap plates, and a bolt passing through said closing cap plates, and carlines and engaging the side plates.

13. In a flexible plate-car-roof, an open frame comprising carlines, exposed rigid load supporting metal roofing plates between the carlines having marginal edge flanges adjacent the carlines and caps over the carlines having side parts spaced from the carlines and plate flanges and having their lower edges arranged adjacent the plates to form a weathering joint therebetween.

14. In a flexible plate-car-roof, an open frame member comprising carlines, exposed rigid load supporting metal roofing plates between the carlines having marginal flanges at their side edges adjacent the carlines, caps spanning the carlines and spaced from the said plate flanges, their lower edges resting on the plates and serving to hold the plates in position but permitting lateral movement thereof.

15. A flexible plate-car-roof comprising purlins, side members, ridge members, and carlines spaced apart, exposed rigid load supporting roof plates loosely positioned between the carlines, and means for weather-proofing the joint between the carlines and

plates comprising projections on the plates
and spanning members spaced from the car-
lines and having contact with the plates,
said contact permitting a relative move-
5 ment between the plates and carlines.

16. A flexible car-roof comprising a series
of independently movable load supporting
roofing plates spanning spaces between the
sides of the car, and means for weather-
10 proofing the joint at the edge of the adjacent

plates permitting said independent move-
ment.

In testimony whereof we affix our sig-
natures in presence of two witnesses.

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WILLIAM D. THOMPSON.

Witnesses:

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NELLIE KINSELLA.