

Oct. 30, 1945.

R. C. STRAUSS

2,387,779

CARRIER UNIT

Filed April 12, 1941

7 Sheets-Sheet 1

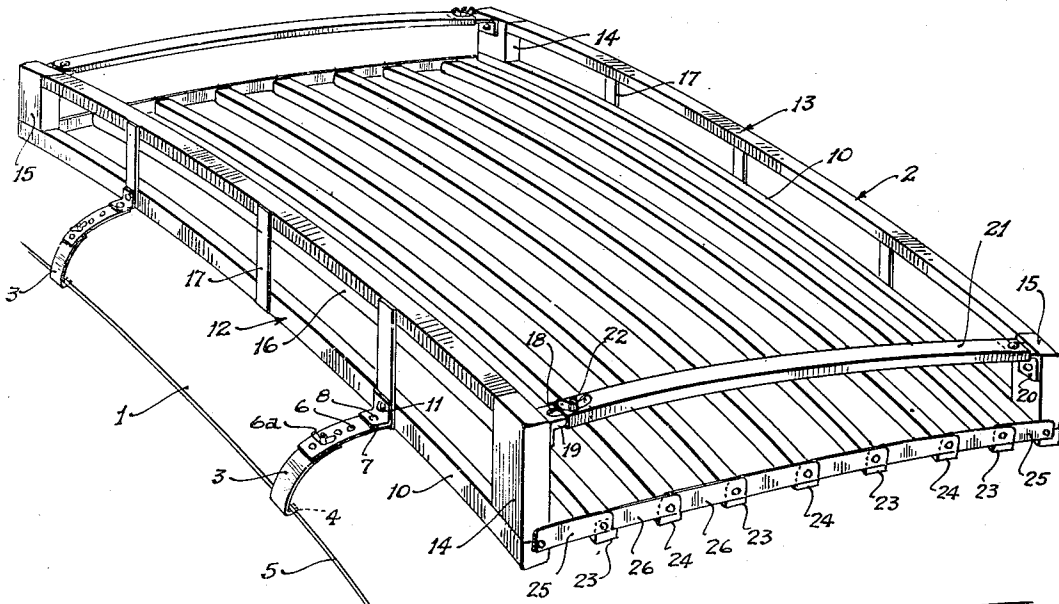


Fig. 1

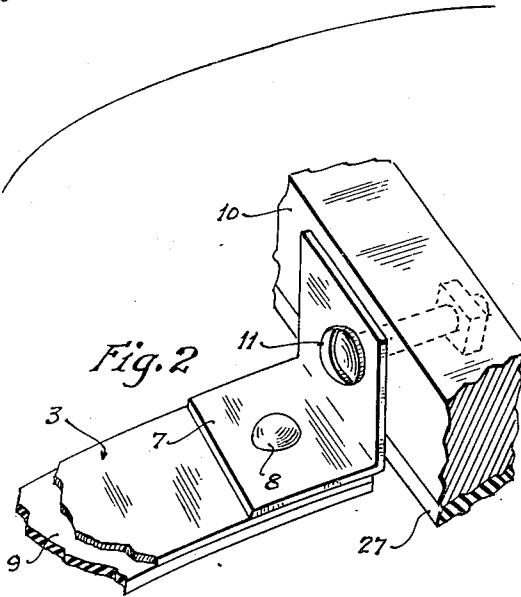


Fig. 2

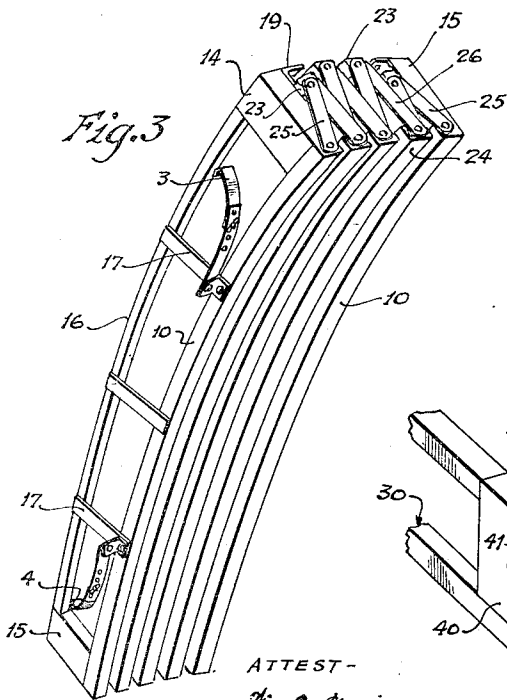


Fig. 3

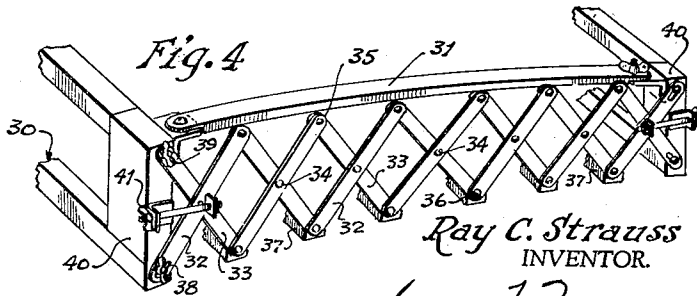


Fig. 4

ATTEST-
Jim C. Meiser

BY

Ray C. Strauss
INVENTOR.

George J. Mueller

ATTORNEY.

Oct. 30, 1945.

R. C. STRAUSS

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7 Sheets-Sheet 2

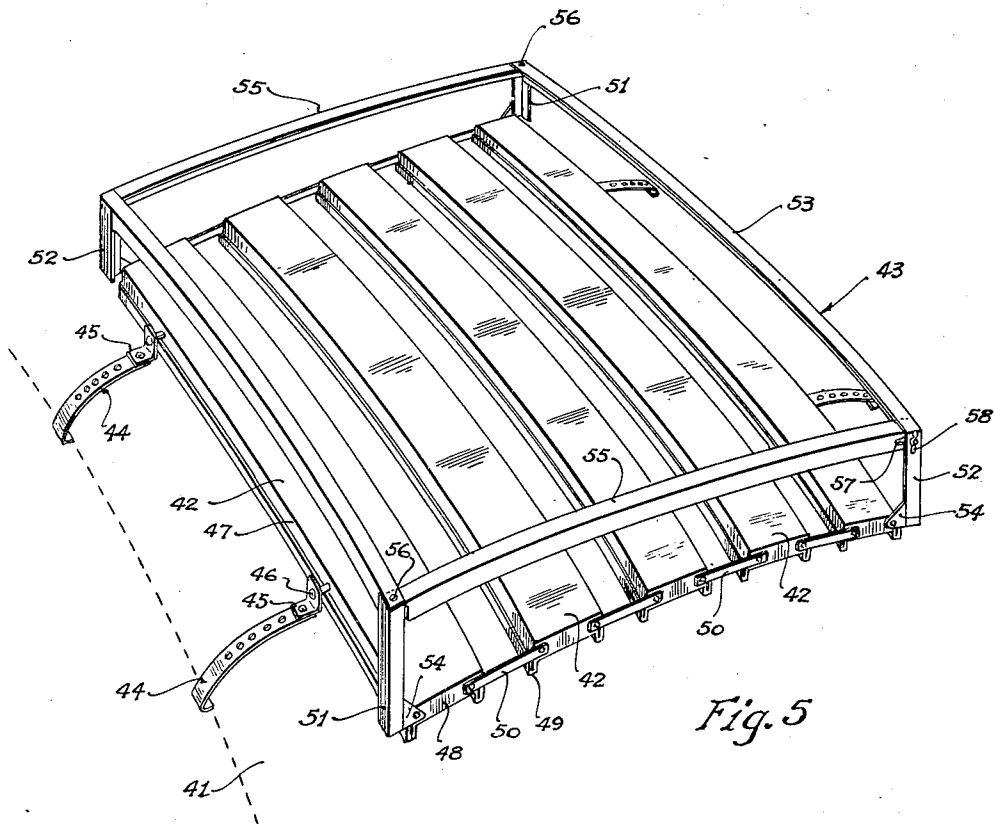


Fig. 5

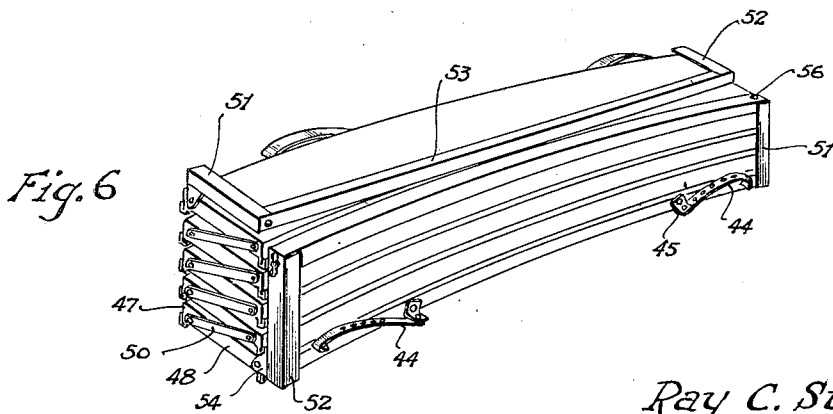


Fig. 6

ATTEST -

Wm. C. Meisen

BY

Ray C. Strauss

INVENTOR.

George F. Mueller

ATTORNEY.

Oct. 30, 1945.

R. C. STRAUSS

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7 Sheets-Sheet 3

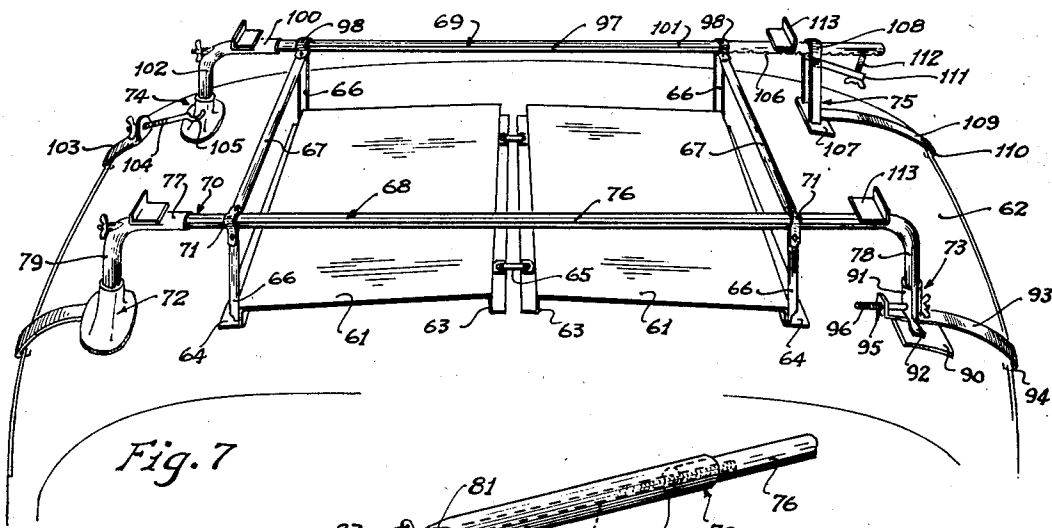


Fig. 7

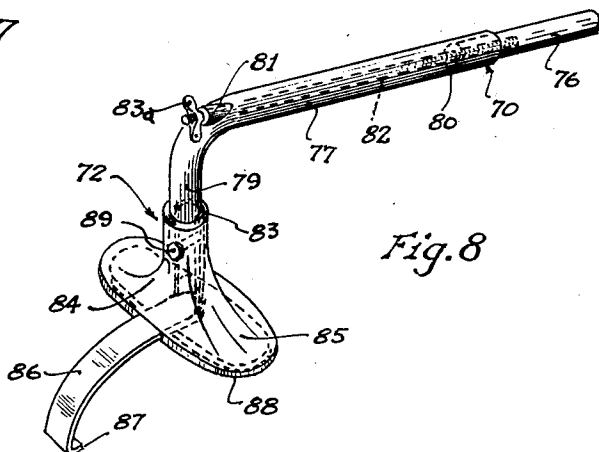


Fig. 8

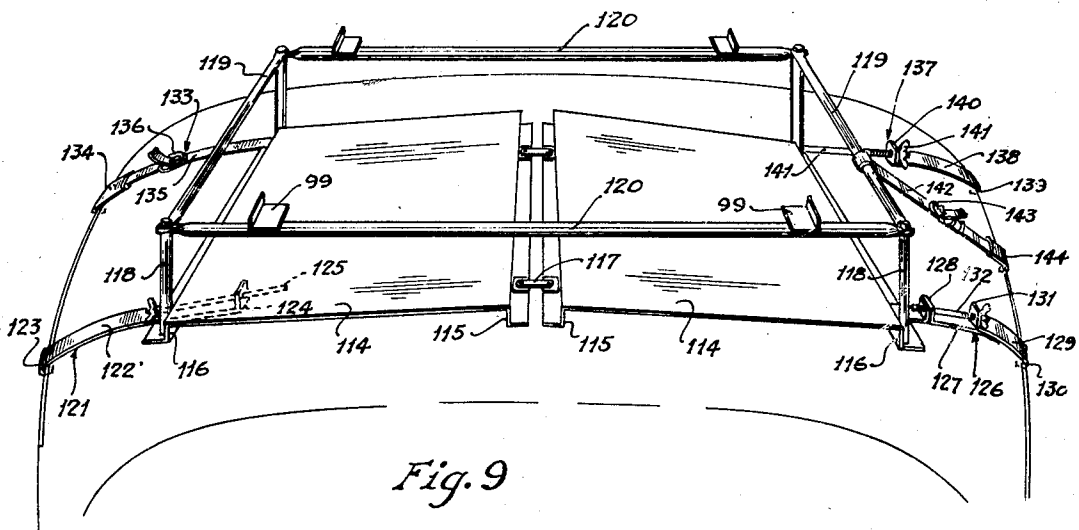


Fig. 9

Ray C. Strauss

INVENTOR.

ATTEST-

Am. C. Meiser

BY

George J. Mueller

ATTORNEY.

Oct. 30, 1945.

R. C. STRAUSS

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7 Sheets-Sheet 4

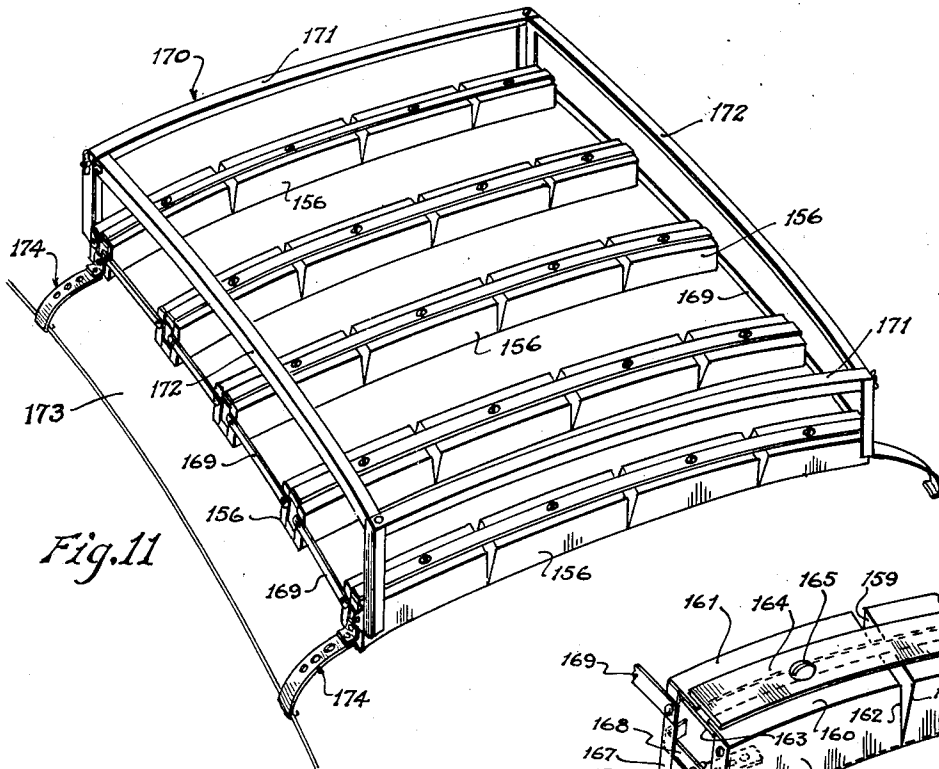


Fig. 11

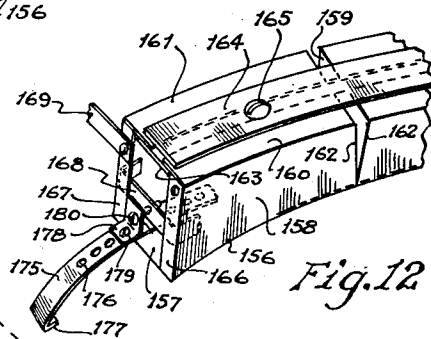


Fig. 12

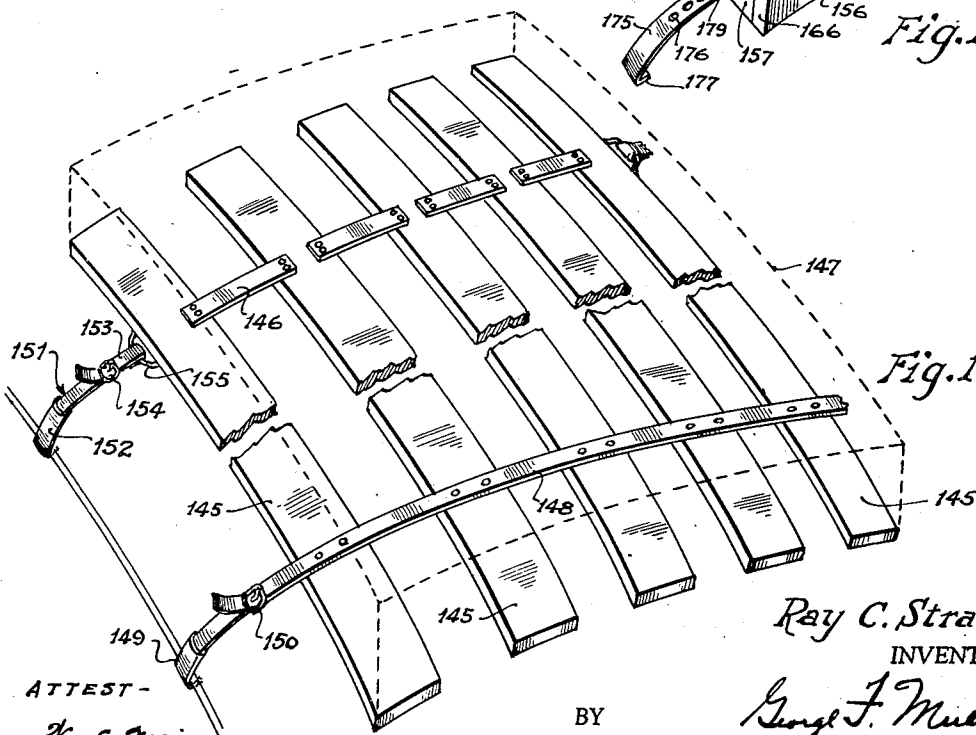


Fig. 10

ATTEST -
John C. Meisen

BY

Ray C. Strauss
INVENTOR.
George F. Mueller
ATTORNEY.

Oct. 30, 1945.

R. C. STRAUSS

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7 Sheets-Sheet 5

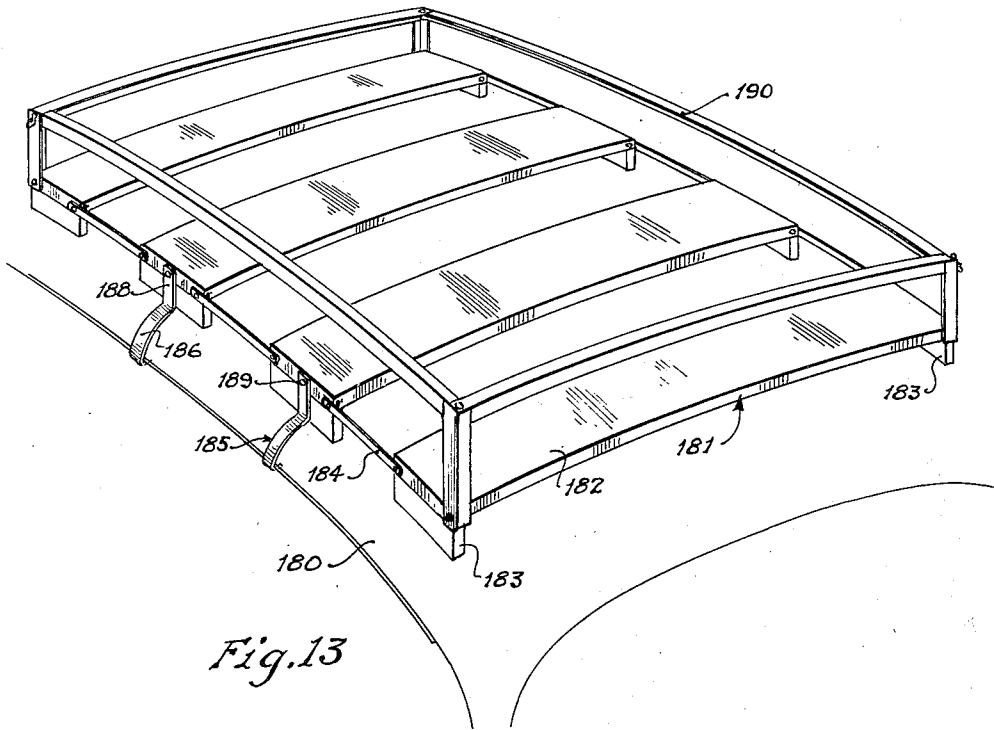


Fig. 13

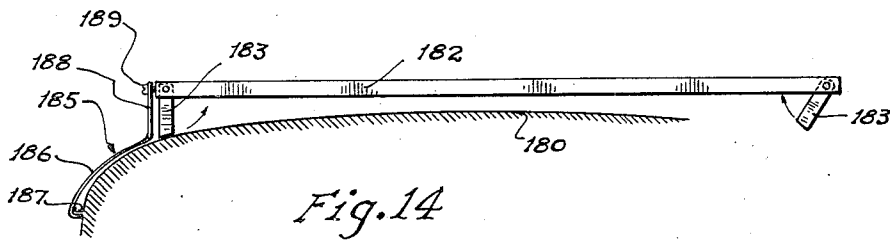


Fig. 14

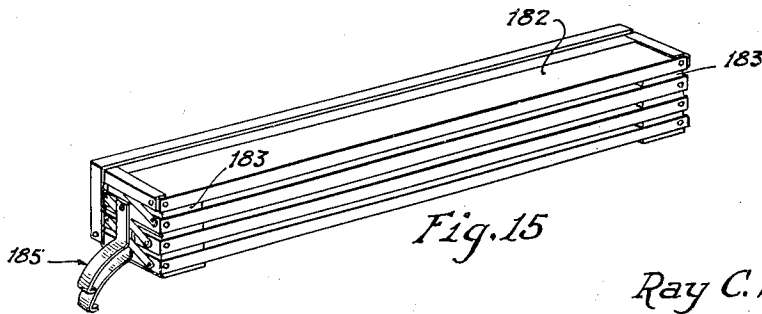


Fig. 15

ATTEST -

Th. C. Meiser

BY

Ray C. Strauss
INVENTOR.

George J. Mueller

ATTORNEY.

Oct. 30, 1945.

R. C. STRAUSS

2,387,779

CARRIER UNIT

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7 Sheets--Sheet 6

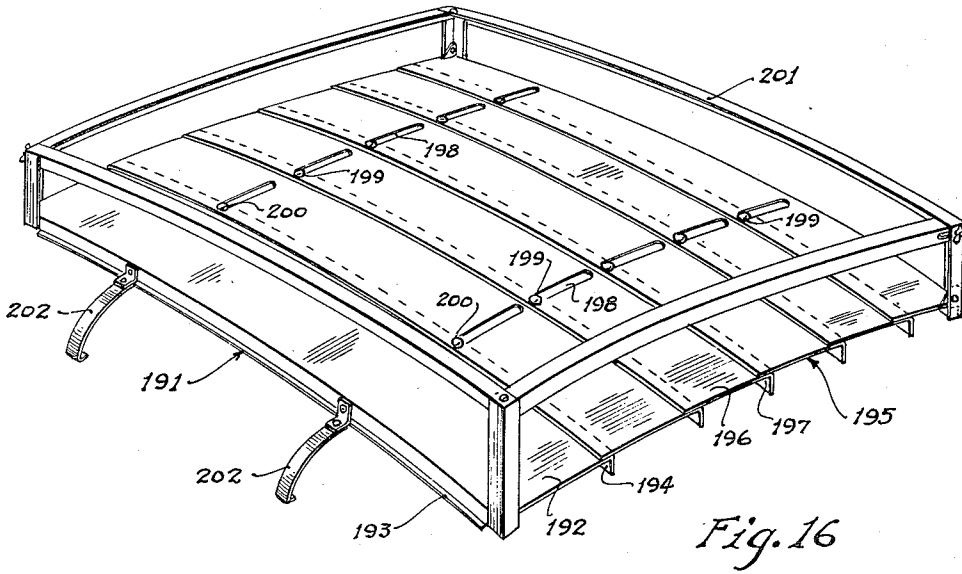


Fig. 16

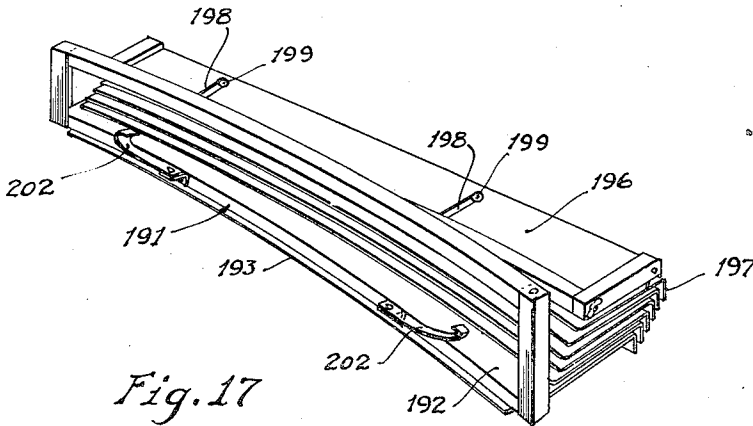


Fig. 17

ATTEST-

John C. Meiser

BY

Ray C. Strauss
INVENTOR.
George F. Mueller
ATTORNEY.

Oct. 30, 1945.

R. C. STRAUSS

2,387,779

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7 Sheets-Sheet 7

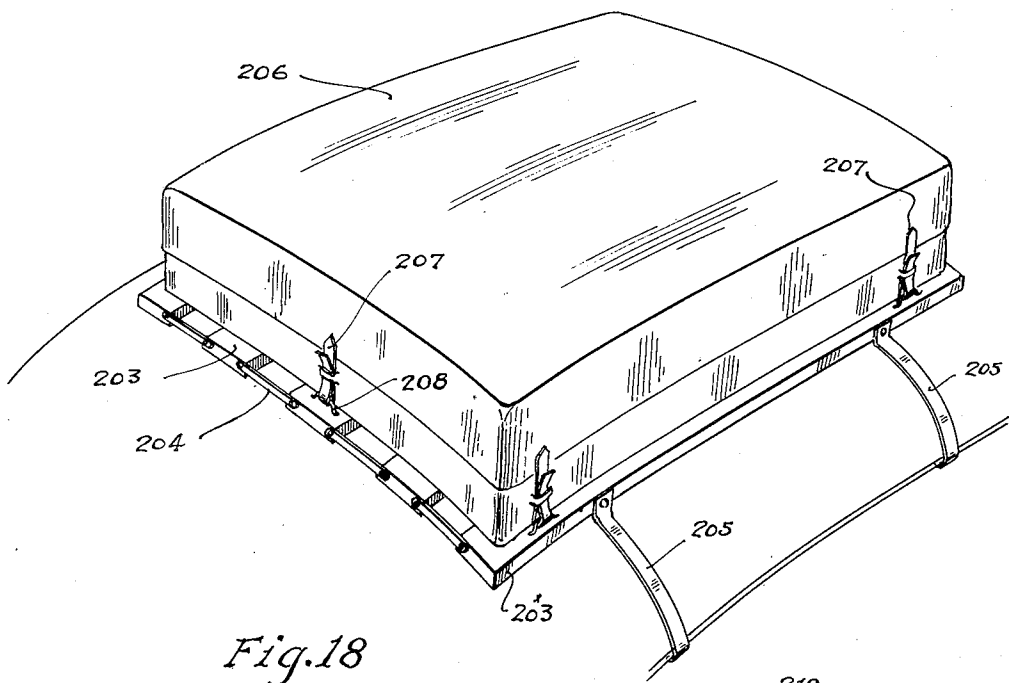


Fig. 18

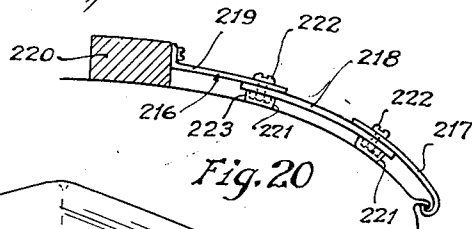


Fig. 20

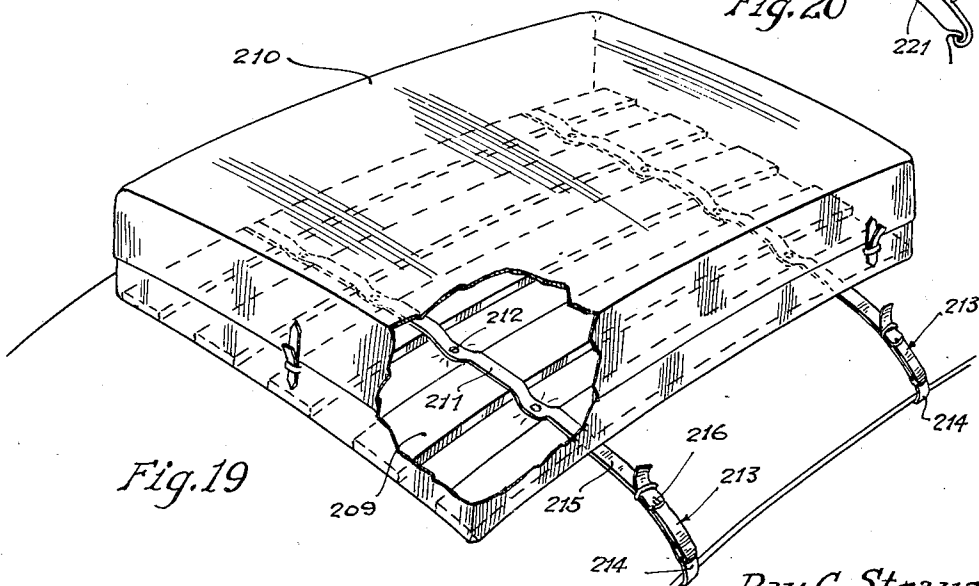


Fig. 19

ATTEST-

Sam C. Meiser

BY

Ray C. Strauss
INVENTOR.

George F. Mueller

ATTORNEY.

UNITED STATES PATENT OFFICE

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CARRIER UNIT

Ray C. Strauss, Madison, Wis.

Application April 12, 1941, Serial No. 388,293

2 Claims. (Cl. 224—29)

This invention relates to luggage or parcel carriers adapted to be removably mounted on the roof of vehicles, such as automobiles and the like.

With the use of the all-steel roof construction in present day motor vehicles, I have found that it is feasible to removably mount a luggage carrier on the roof of such vehicles. The carrier may be rigid, but preferably is collapsible and may present a continuous or a discontinuous load bearing surface. The collapsible carrier may be removed from the vehicle roof and folded or collapsed into a relatively small space and stowed in a small space in the vehicle when not in use.

One of the objects of this invention is to provide a carrier unit which may be removably mounted or secured on a vehicle roof and which distributes the weight of the luggage or other articles over a relatively large area of the vehicle roof.

Another object of this invention is to provide a carrier which may be easily and quickly mounted or removed from the vehicle roof.

Another object of this invention is to provide a carrier which may be removably mounted on the vehicle roof without marring the roof, or without permanent fastening means on the roof or vehicle body, or without permanently fastening the unit to the roof or other portions of the vehicle.

A further object of this invention is to provide means whereby the carrier may be secured to the roofs of vehicles of various widths and curvatures.

Other objects and advantages of this invention will become apparent from the detailed description and the claims which follow which are to be considered in conjunction with the accompanying drawings, wherein:

Fig. 1 is a perspective view of a carrier made in accordance with my invention mounted removably on a vehicle roof.

Fig. 2 is a perspective view, at an enlarged scale, of the draw-up means for securing the carrier to the vehicle roof.

Fig. 3 is a perspective view of the carrier of Fig. 1, illustrating the unit in collapsed position.

Fig. 4 is a perspective view of one end of a carrier unit illustrating a modified form of connecting means between the pontoons forming the carrier.

Fig. 5 is a perspective view of another modification of a carrier made in accordance with my invention.

Fig. 6 is a perspective view of the carrier unit

of Fig. 5 illustrating the unit in collapsed position.

Fig. 7 is a perspective view of a further form of carrier unit made in accordance with the present invention.

Fig. 8 is a perspective view, at an enlarged scale, of one form of bracket adapted to secure the carrier to the vehicle roof.

Figs. 9 and 10 are perspective views of further forms of carriers or grid racks made in accordance with this invention.

Fig. 11 is a perspective view of a carrier unit in which the pontoons extend transversely of the vehicle roof.

Fig. 12 is a perspective view, at an enlarged scale, of one end of a pontoon of the carrier unit illustrated in Fig. 11.

Fig. 13 is a perspective view of another modification of the carrier unit in which the pontoons extend transversely of the vehicle roof.

Fig. 14 is an end view of one of the pontoons of the carrier unit of Fig. 13.

Fig. 15 is a perspective view of the carrier unit of Fig. 13 illustrating the unit in collapsed position.

Fig. 16 is a perspective view of a further embodiment of the carrier unit of this invention wherein a continuous load bearing surface is illustrated.

Fig. 17 is a perspective view of the carrier unit of Fig. 16 illustrating the unit in collapsed position.

Figs. 18 and 19 are perspective views of further forms of carrier units made in accordance with my invention.

It is well known that it is not possible to place parcels or luggage of substantial weight directly upon the vehicle roof. If such attempt is made, the weight of the luggage, unless it is extremely light in weight, will depress the roof, and may permanently dent the roof. Although the weight may not be sufficient to dent the roof, the article may be of such nature and construction that it would permanently mar the surface. I have discovered that if the weight is distributed over a substantial area of the vehicle roof, articles of considerable weight may be placed on the roof without denting or permanently injuring the surface. The weight may be conveniently distributed by means of a plurality of load bearing pontoons, each of which is supported upon the roof over a substantial area. The pontoons may be in the form of slats or ribs or may consist of a load bearing surface supported in spaced relation to the roof, and supported by the roof. The ribs

or other load bearing surfaces or members are preferably connected together to form a collapsible unit or may be more or less permanently joined, as will be described more fully hereinafter. It is apparent that the unit may be provided with a closure or cover member so as to afford protection to the luggage or other articles in inclement weather, and to protect the articles from the elements, if desired. The unit is provided with brackets which are adapted to grip the eaves or sills or edge portions of the vehicle roof whereby the unit is securely mounted removably on the roof. The brackets may be provided with means for adjustment to accommodate roofs of various widths, within certain limits.

The construction illustrated in Figs. 1, 2 and 3 comprises a collapsible carrier unit or grid rack which may be folded into a relatively small space, as clearly illustrated in Fig. 3. In Fig. 1, the carrier unit is shown mounted removably upon the roof 1 of a motor vehicle. The carrier comprises a collapsible unit 2' and a plurality of brackets 3. The brackets 3 may be constructed of band or strip steel, or web or other more or less flexible straps, and are more or less flexible. The brackets are preferably arcuate as illustrated more clearly in Fig. 3. The brackets terminate in hook-like extremities 4 which are adapted to grip the sill 5 of roof 1. The tie member or intermediate portion of the bracket may be formed in two sections, as illustrated, the adjacent or overlapping portions being provided with cooperating apertures 6 which permit rough adjustment of the unit for various widths of roofs. The two sections are connected by bolts 6a which may, if desired be provided with wing nuts. The opposite extremity of the bracket is pivotally secured to an angle member 7 by satisfactory means such as a rivet 8 or bolt. In order to prevent marring of the surface of the roof, a satisfactory resilient or elastic material 9, such as rubber or cork, may be secured to the lower surface of the bracket. The angle member 7 is in turn secured to the longitudinal terminal pontoon 10 by means of a bolt 11. The bolt permits the carrier to be drawn tightly across the roof, thereby retaining the carrier on the roof. The brackets serve to tensionally secure the connected pontoons between the sills of the roof.

The collapsible unit or grid rack 2 comprises longitudinal end sections 12 and 13 which may be identical in construction. The end section 12 comprises a longitudinal pontoon 10 in the form of a slat having corner blocks 14 and 15 rigidly secured to the slat adjacent its ends. A bar 16 is rigidly secured to the upper ends of corner blocks 14 and 15. A plurality of struts 17 are secured to slat 10 and bar 16 to rigidify the end section. A tongue 18 having a slot 18 is secured to corner block 14 and projects transversely from the block. An angle member 20 is rigidly secured to corner block 15 and projects transversely therefrom. A transverse bar 21 is mounted pivotally on angle member 20 and is adapted to be pivoted into a position substantially parallel to longitudinal bar 16 when the carrier is removed from the vehicle roof and collapsed. The free end of transverse bar 21 is provided with a thumb screw 22 which is adapted to cooperate with the slotted tongue 18 of the laterally opposite corner block to securely fasten the free end of bar 21 to the tongue.

A plurality of spaced pontoons in the form of slats 23 and 24 are connected by pivotally mounted links 25 and 26 and span the space between

end slats 10. The links 25 are pivotally secured to end pontoons 10 at one end and to pontoons 23 at the other end. Links 26 are secured pivotally to pontoons 23 at one end and to pontoons 24 at the other end. The lower surface of pontoons 10, 23 and 24 is preferably provided with elastic or resilient material 27, such as felt, cork or rubber to prevent marring of the surface of the roof. Pontoons 10, 23 and 24 are preferably curved so as to conform to the longitudinal contour of the roof. Transverse bars 21 may be curved so as to conform approximately to the transverse contour of the roof.

In mounting the carrier unit on the roof, the collapsible unit is extended or opened and placed upon the roof. The hook-like extremities 4 of the brackets 3 are placed over the sills or eaves 5 of the roof and the bolts 11 of the brackets are drawn tight. The carrier is thereby secured to the vehicle roof and will support considerable weight without denting or marring the surface of the roof.

In removing the carrier or rack from the roof, the bolts 11 of the brackets are loosened and the hook-like extremities 4 are removed from the sills or eaves of the roof. Upon loosening the bolts 11, angle members 7 may be pivoted, and the brackets may be swung into a position substantially parallel to the pontoons, as illustrated in Fig. 3. The carrier unit is then removed from the roof and transverse bars 21 are pivoted into a position substantially parallel to longitudinal bars 16. The unit may then be collapsed or folded. As illustrated in Fig. 3, the pontoons 23 are folded into positions adjacent longitudinal bar 16, while pontoons 24 remain adjacent to and in the plane of the end pontoon or slat 10. As is apparent from Fig. 3, the two links adjacent the end sections may be shorter than the intermediate links to permit the pontoons or slats adjacent the end sections to be collapsed under the longitudinal bars and transverse bars. In the collapsed condition, the carrier may be stored in a small space.

It is to be understood that the end sections and pontoons may be constructed of wood or metal, as desired. In the embodiment illustrated, the pontoons are supported on the roof by a continuous surface contact with the roof along the length of the pontoons. The transverse bars and links are preferably formed of metal.

In Fig. 4, I have illustrated a modified form of collapsible carrier unit. The longitudinal end sections 30 and transverse bars 31 may be identical to the corresponding elements illustrated in Figs. 1, 2 and 3. This modification differs in the connecting or linkage system connecting the end sections and the intermediate spaced pontoons. The linkage system comprises cross links or a pantograph linkage consisting of links 32 and 33 joined pivotally at their centers 34 and at their upper ends 35 and at their lower ends 36 and to the pontoons 37. The free ends of the cross links are provided with slots 38 and 39 and are secured pivotally to the corner blocks 40. Thumb screw 41 may be provided between corner block 40 and the cross linkage to permit adjustment or limitation of the action of the linkage.

In Figs. 5 and 6, I have illustrated a modification of the carrier unit or grid rack which is particularly adapted to steel or metal fabrication. The unit may be collapsed readily into a relatively small space for storage purposes. The load bearing surface is supported upon the roof by means of depending edges, the edges distributing

the weight of the luggage over a substantial portion of the roof area.

In Fig. 5, the carrier unit is shown mounted removably upon the roof 41 of a motor vehicle. The carrier unit comprises a series of spaced, connected pontoons 42 provided with an upwardly extending railing 43 and means comprising brackets 44 for removably mounting the pontoons on the vehicle roof and tensionally securing the pontoons between the sills of the roof. The brackets 44 are similar in construction to brackets 3 described hereinbefore. The brackets 44 are secured pivotally to an angle member 45 which is in turn secured to pontoon 42 by means of bolts 46. The bolts permit the pontoons to be drawn tightly across the roof and thereby retain the unit on the roof. The brackets are preferably covered with rubber, felt, cork or other material to prevent marring the surface of the roof.

The pontoons 42 comprise pans having depending longitudinally extending skirts 47 and depending transversely extending skirts or ends 48. The pans may be formed in any desired manner, and it is apparent that this construction is adaptable to a drawing operation. The curvature of the longitudinal skirts may be formed by any desired manner, corrugation of the skirts has been found convenient and practical. The pontoons may be formed with an over-arc or a greater curvature than the curvature of the vehicle roof. Upon mounting the unit on the vehicle roof and placing a load on the pontoons, the pontoons will be pressed into conformity with the curvature of the roof and the depending longitudinal skirts will contact the roof along their lengths. For illustrative purposes, the longitudinal skirts are shown deeper than the lateral skirts 48, however, the lateral skirts or ends may be of the same depth as the longitudinal skirts. Rubber channels 49 or channels of felt, cork or like materials are secured to the longitudinal skirts, and, if desired, to the lateral skirts, to prevent marring of the surface of the roof. The adjacent pontoons are joined by links 50 which are secured pivotally to the transverse skirts or ends 48 as by means of rivets or bolts.

The railing comprises corner posts 51 and 52 and a longitudinal bar 53 which is rigidly secured to the corner posts, as by welding. A hinge plate 54 is secured to the lower end of each of the corner posts, as by welding. The hinge plates 54 are secured pivotally to transverse skirts or ends 48 of the outer or terminal pontoons 42. A transverse bar 55 is secured pivotally to the upper end of corner posts 51, as by means of rivet 56. The free end of transverse bar 55 is provided with a longitudinally extending slot 57. A thumb bolt 58 is provided in posts 52 which are adapted to cooperate with slots 57 and secure the free ends of the transverse bars 55 to posts 52. In the collapsed condition, the transverse bars 55 may be pivoted so as to lie adjacent longitudinal bars 53. The railing may be conveniently formed from angle iron, as illustrated. The depending sides of the bars may be curved slightly, if desired, to render the bar arcuate to conform more or less to the contour of the roof.

In mounting the carrier unit on the vehicle roof, the unit is opened or extended. Transverse bars 55 are pivoted from their longitudinal positions into transverse positions. Thumb bolts 58 are drawn tight to secure the free ends of transverse bars 55 to corner posts 52. The unit is then placed on the vehicle roof. The hook-like extremities of brackets 44 are placed over the sills

of the roof. The bolts 46 are drawn tight to secure the carrier on the roof. The carrier unit will support considerable weight without denting or marring the surface of the roof.

In removing the unit from the roof, bolts 46 are loosened and the hook-like extremities of the brackets removed from the sills of the roof. The brackets may be pivoted into a position substantially parallel to skirt 47 of pontoon 42, and the angle members 45 may be pivoted to bring the brackets into the position illustrated in Fig. 6. The unit may then be removed from the roof. Thumb bolts 58 are loosened and transverse bars 55 may be pivoted under the longitudinal bars 53. In collapsing the unit, the pontoons may be stacked one upon the other, and one side rail pivoted so that it will rest upon the top pontoon, as clearly illustrated in Fig. 6. In the collapsed position, the unit occupies a relatively small space.

In Fig. 7, I have illustrated a further modification of the carrier unit. In this modification, the pontoons comprise load bearing surfaces or platforms 61 which are spaced from the surface of the roof 62 by depending longitudinal angle members 63 and 64 which may be integral with the load bearing surface or may be secured thereto, as by welding. The lower surface of the angle members may be provided with a covering of rubber, cork, or the like material to prevent marring of the surface of the roof. The pontoons are connected by means of links 65 to provide some flexibility between the pontoons so that the unit may be adapted for use on roofs having various contours. The unit is provided with upstanding corner members or posts 66 which may be formed from angle iron and may be secured to the pontoons as by means of welding. The upper ends of longitudinally adjacent corner members 66 are connected by a longitudinal bar 67 secured to the members by rivets, bolts or welding.

The carrier unit is secured removably to the vehicle roof 62 by means of supporting members 68 and 69. The supporting members illustrate various bracket constructions which may be employed to secure the carrier to the roof. The supporting members may be mounted removably on the vehicle roof by means of brackets 72, 73, 74 and 75.

Supporting member 68 comprises a tubular transverse bar 70 secured to corner posts 66 by means of bands 71. The tubular bar comprises telescoping tubular members 76 and 77, each of which has its end portion turned downwardly at substantially right angles, as illustrated at 78 and 79, respectively. The opposite end of tubular member 76 is fitted with a threaded plug 80. Tubular member 77 is provided with an outwardly projecting sleeve 81. A threaded stem 82 having a thumb screw head 83a passes through sleeve 81 and is threaded into plug 80.

Bracket 72 comprises a hollow head 84 adapted to receive the depending end 79 of tubular member 77. The head 84 is reinforced by an arcuate plate or tubular element 83 which may be secured to longitudinal bearing plate 85 and tie member 86. Bearing plate 85 serves to distribute any weight which may be placed on the supporting member. Tie member 86 may be more or less flexible and is arcuate to permit the tie member to conform to the contour of the shoulder of the roof. Tie member 86 terminates in a hook-like element or member 87 which is adapted to grip the sill or eave of the roof. To further strengthen the bracket and prevent marring of the surface of the roof, the arcuate plate 84, bearing

plate 85 and the base of the tie member 86 are molded in rubber 88. The intermediate portion of tie member 86 may be provided with a covering of rubber or cork, if desired. The depending end 79 of tubular member 77 may be secured to the bracket by means of a bolt 89.

A similar bracket may be secured to the depending end 78 of tubular member 76. The supporting member is secured to the vehicle roof by placing the hook-like members 87 of the brackets under the sills or eaves of the roof and drawing up threaded stem 82 until the hook-like members of both brackets grip the opposite sills.

Bracket 73 comprises a longitudinal bearing plate 90 and an upwardly projecting yoke. The yoke consists of a split tubular element 91 and a bifurcated portion 92, the leg portions being secured to bearing plate 90 as by welding. A tie member 93 passes through the bifurcated portion of the yoke, the outer end of the tie member terminating in a hook-like member 94, while the inner end terminates in an upwardly projecting lug 95 having a threaded opening therein. A threaded stem 96 is threaded in the opening in lug 95 and passes through an opening in yoke 91. Tie member 93 is preferably more or less flexible so that on drawing up the stem 96 or the stem 82, the tie member will conform more or less to the contour of the shoulder of the roof. Bearing plate 90 and tie member 93 may be provided with a covering of rubber or the like to prevent marring of the surface of the roof.

A similar bracket may be secured to the depending end 79 of tubular member 77. The supporting member is secured to the vehicle roof by placing the hook-like members 94 of the brackets under the sills or eaves of the roof and drawing up threaded stem 96 until the hook-like members of both brackets grip the opposite sills or eaves.

Supporting member 69 comprises a tubular transverse bar 97 secured to the rear corner posts 66 by means of bands 98. The tubular bar comprises telescoping members 100 and 101 which may be of a construction similar to the telescoping members of bar 70. The end portion of member 100 is turned downwardly at substantially right angles, as at 102.

Bracket 74 is similar to bracket 72, having a longitudinal bearing plate and an arcuate up-standing plate or tubular member which are preferably molded in rubber. The tie member comprises a hook-like member 103 adapted to grip the sill or eave of the roof and a threaded bar 104 having one end bent at substantially right angles, as at 105. The bracket is provided with an aperture adapted to receive the bent end 105 of the threaded bar 104.

As is apparent, a similar bracket may be secured to the opposite end of the tubular bar. The supporting member is secured to the vehicle roof by placing the hook-like member 103 of the brackets under the eaves or sills of the roof and drawing up the threaded bars 104 until the hook-like members of both brackets grip the opposite eaves or sills.

The end portion of telescoping member 101 is provided with a series of indents or cut-out sections 106 which cooperate with bracket 75. Bracket 75 comprises a longitudinal bearing plate 107, an upwardly extending stirrup 108 and a tie member 109, the tie member terminating in a hook-like member 110. The upper end of the stirrup 108 passes over tubular member 101. A dog 111 is mounted pivotally in the stirrup and is provided with a threaded bolt 112 which is

adapted to cooperate with the indents 106 in the tubular member 101 to secure the tubular member to the stirrup and bracket.

Plates or angle members 113 may be secured to supporting members 68 and 69. The plates may be spaced to provide means for supporting a boat, a canoe, or other articles. With this construction, the unit serves efficiently as a combination luggage carrier and boat carrier.

It is apparent that the supporting members 68 and 69 may be used to support relatively long articles such as skis, ladders, and the like. If desired for such purposes, the pontoons may be dispensed with. The ladder or other relatively long articles is lashed to the supporting members.

The carrier unit of Fig. 9 is provided with two pontoons comprising load bearing surfaces or platforms 114 provided with depending longitudinal angle members 115 and 116, which may be provided with rubber, cork or like material on their under surface to prevent marring of the surface of the roof. The pontoons are connected or joined by links 117 to provide some flexibility between the pontoons so that the unit may be adapted for mounting and use on roofs having various contours. The unit is provided with a railing comprising corner posts 118 which may be secured to the corners of the pontoons by suitable means such as welding. Longitudinal bars 119 and transverse bars 120 are secured to the upper ends of corner posts 118, as by means of bolts which are threaded into the corner posts. The bars may be formed from tubular metal, if desired.

The pontoons may be secured to the vehicle roof by brackets of various constructions, as clearly illustrated in the drawings. The bracket 121 comprises a tie member 122 having a hook-like extremity 123 adapted to grip the sill of the roof. The opposite end of the tie member 122 is turned upwardly to form a lug 124. The upwardly extending lug 124 is provided with a threaded aperture adapted to receive thumb screw 125. The tie member extends through a slot in angle member 116. The thumb screw is journaled in an aperture in angle member 116. A similar bracket may be secured to the opposite side of the unit. The unit is mounted upon the vehicle roof by placing the hook-like members 123 under the sills of the roof and drawing up thumb screws 125 until the hook-like members grip the opposite sills of the roof.

The bracket 126 comprises a tongue 127 having a fold 128, a tie member 129 terminating at one end in a hook member 130 and at the other end in an upwardly turned lug 131, and a threaded stem 132. Tongue 127 may be rigidly secured to angle member 116 of pontoon 114, as by welding, riveting or other suitable means. The fold 128 is provided with threaded apertures adapted to receive the threaded stem 132. The threaded stem passes through an aperture in lug 131.

A similar bracket may be secured to the opposite side of the unit. The unit is secured to the vehicle roof by placing the hook-like members 130 under the sills or eaves of the roof and drawing up the threaded stems until the hook-like members grip the opposite sills or eaves of the roof.

The bracket 133 comprises a hook-like member 134 and a strap 135 provided with a buckle 136. The strap may be secured to angle member 116 and passes through a suitable slot in the hook-like member 134. The unit is secured

to the vehicle roof by drawing up the strap 135 and locking the strap in the buckle 136.

The bracket 137 comprises a tie member 138 terminating at one end in a hook-like member 139 and at the other end in an upwardly turned lug 140. A threaded stem 141 is secured to angle member 116 and extends through an aperture in lug 140, the opposite end of the stem being provided with a thumb or wing nut 141. The unit is secured to the vehicle roof by drawing up thumb nut 141 until the hook-like members grip the opposite sills of the roof.

If desired, a strap 142 provided with a buckle 143 and hook member 144 may be secured to the opposite sides of the railing, only one being shown in the drawings. Hook member 144 is adapted to grip the sill or eave of the roof. After the carrier unit is mounted and secured to the vehicle roof, the hook members 144 are placed over the opposite sills or eaves and the straps drawn tight and locked in the buckles to stabilize the railing. Plates or angle members 99 may be secured to bars 120 to provide means for supporting a boat or other articles. The carrier unit thereby serves as a combination luggage carrier and boat carrier.

In Fig. 10, there is illustrated a relatively inexpensive carrier unit made in accordance with my invention. The load bearing surface consists of a plurality of pontoons 145 in the form of wood slats which are connected by flexible links or straps 146. The pontoons or slats are in contact with the vehicle roof along their entire lengths. A railing 147 of any desired construction may be secured to the pontoons, the railing being illustrated in the drawings by broken lines. The unit is secured to the vehicle roof by suitable brackets.

In one form of means of securing the unit to the roof, a strap 148 is secured to the pontoons 145. A hook element 149 is attached to the strap adjacent each end and the free ends of the strap are secured to buckles 150, only one being shown in the drawings. The unit is secured to the vehicle roof by placing the hook elements 149 under the sills or eaves of the roof and drawing tight the free ends of the strap.

In an alternative means of securing the unit to the vehicle, a bracket member 151 comprising a hook element 152, strap 153 and buckle 154 is employed. The strap 153 is secured to the terminal pontoon by means of staples 155 which are secured to the pontoons. It is obvious that a plurality of such brackets are employed. In securing the unit to the roof, the hook members 152 are placed under the sills of the roof and the straps 153 drawn tight.

In the modification illustrated in Figs. 11 and 12, the unit comprises a plurality of connected, spaced pontoons 156 which extend transversely of the vehicle roof. The pontoons 156 comprise open-end box-like supporting members comprising a base 157, upwardly turned sides 158 and 159, which may be at substantially right angles to the base, and inwardly turned top sections or flanges 160 and 161. The sides and flanges are preferably cut along a plurality of lines, as at 162, to permit the units to be bent or curved to conform to the contour of the vehicle roof. The flanges 160 and 161 are clamped between plates 163 and 164. In adjusting the units for a particular roof, the bolts 165 are loosened and the box-like unit placed upon the roof. After the sections are bent to the desired contour, the flanges are securely clamped between plates 163 and 164 by drawing tight bolts 165.

The sides 158 and 159 are preferably provided with tongues 166 and 167, respectively, which are turned inwardly. If desired, to strengthen the end structure, the tongues may be welded to the base 157 and the respective flanges. A cross bar 168 spans the open ends of the box-like units and is secured to the sides 158 and 159 and tongues 166 and 167, as by welding. The box-like supporting units or pontoons are connected by links 169 which are secured pivotally to the tongues of adjacent supporting units or pontoons. A railing 170, similar in construction to the railing illustrated in Figs. 5 and 6, is secured to the corners of the terminal pontoons. The railing differs in that the transverse bars 171 are fixedly secured to the end or corner posts, and the longitudinal bars 172 are mounted pivotally to a corner post and secured to the opposite corner post by a thumb screw or bolt.

The carrier unit or grid rack is secured to the roof 173 by means of brackets 174 which comprise a tie member 175 provided with a plurality of spaced apertures 176 and which terminates in a hook-like extremity 177. The bracket is secured to an angle member 178 by means of screw 179. The angle member is secured to cross bar 168 of the supporting members or pontoons 156 by means of bolt 180. Although each of the supporting members may be provided with brackets, it is, in general, entirely satisfactory to provide only the terminal members with the brackets.

In mounting the carrier on a vehicle roof, the opposite tie members 175 are adjusted roughly to grip the eaves or sills of the roof by securing the tie members to the angle members 178 by the proper aperture 176. The screw 180 is then drawn tight to secure the unit to the vehicle roof between the eaves or sills.

It is apparent that the supporting member or pontoon 156 may be used in pairs to support relatively long loads, such as skis, ladders, and the like. In such use, two individual pontoons are mounted on the vehicle roof, one adjacent the forward end of the roof and the other adjacent the rearward portion of the roof. The ladder or other article is placed on the pontoons and may be secured to the pontoons by means of straps.

In Figs. 13, 14 and 15, I have illustrated a further modification of the carrier unit in which the pontoons 181 are collapsible and extend transversely of the vehicle roof. The pontoons comprise pans 182 which are maintained in spaced relation with respect to roof 180 by means of stanchions 183 which are preferably hinged to the depending sides of the stanchions 183. In the collapsed position of the carrier unit, the stanchions 183 may be pivoted into a position substantially parallel to the pans, as illustrated in Fig. 15. The pontoons are connected by links 184 which are secured pivotally to the depending ends of the pans. A railing 190, similar to the railing described in Figs. 5 and 6, may be secured to the pontoons.

The carrier unit is secured to the roof 180 by means of brackets 185. The brackets comprise a tie member 186 which terminates at one end in a hook-like member 187. The tie member 186 is preferably more or less flexible so as to be adapted to conform to the contour of the shoulder of the roof. The hook-like member 187 is adapted to grip the sill or eave of the roof. The opposite end of the tie member is bent upwardly to form a head member 188. The brackets are adjustably secured to the pontoons by means of bolts 189.

In mounting the unit on the vehicle roof, the stanchions are pivoted into positions substantially at right angles to the pans. The railing is extended and the unit placed on the vehicle roof. The brackets are placed over the eaves of the roof and the bolts 189 drawn tight. In removing the unit from the roof, the steps are reversed. After the stanchions are pivoted into positions substantially parallel to the pans, the pans are stacked upon each other and one side of the railing pivoted into a position substantially parallel to the top pan, as illustrated in Fig. 15.

Although the load bearing surfaces described and illustrated hereinbefore are discontinuous, it is entirely feasible to provide a substantially continuous load bearing surface, as illustrated in Figs. 16 and 17. In this modification, one of the terminal pontoons 191 comprises a load bearing surface 192 having depending longitudinal skirts 193 and 194. The remaining pontoons 195 comprise a load bearing surface 196 having a single depending longitudinal skirt 197. The skirts are preferably provided with a rubber or other covering to prevent marring of the surface of the roof.

The load bearing surfaces 196 of pontoons 195 are each provided with lateral slots 198. Rivets 199 are secured to load bearing surfaces 196 of the pontoons adjacent the skirts 197, and project upwardly through the lateral slots 198 of the adjacent overlapping pontoon. Load bearing surface 192 is provided with rivets 200 adjacent skirt 194 and which rivets project upwardly through lateral slots 198 of the adjacent overlapping pontoon 195. The load bearing surfaces 196 of the adjacent pontoons may be moved laterally of each other to collapse the unit, as illustrated in Fig. 17, the slots 198 sliding along the rivets.

A railing 201, similar in construction to that described hereinbefore, may be secured to the terminal pontoons. Brackets 202 are secured to skirt 192 and similar brackets are secured to skirt 197 of the opposite terminal pontoon, and are adapted to tensionally secure the pontoons to the vehicle roof. The brackets 202 are preferably in line with slots 198 and rivets 199. On drawing tight the brackets, the pontoons are in effect pulled down into contact with the vehicle roof and tensionally secured between the eaves or sills of the roof.

The carrier units illustrated in Figs. 18 and 19 are provided with a container or duffel bag. In the carrier unit illustrated in Fig. 18, a plurality of pontoons 203, in the form of wood or metal slats, are connected by links 204 which may be of metal or fabric or other suitable construction. Brackets 205 are secured to the terminal pontoons and serve as means for removably mounting the carrier unit to the vehicle roof. A duffel bag 206 is mounted on the pontoons by means of straps 207 secured to staples 208. If desired, the bag may be permanently fixed to the pontoons, as by grommets.

In the unit illustrated in Fig. 19, the pontoons 209, in the form of wood or metal slats, are positioned within the duffel bag 210. The slats may be merely placed in the bag, but I prefer to provide means for preventing the slats from shifting in position during use of the unit. Such means may comprise a band or strap 211 which is secured to the bag at spaced intervals by means of grommets 212 or by other suitable means, as by stitching or sewing the strap to the bottom of the bag at spaced intervals. The slats are posi-

tioned under the band or strap between the points at which the band is secured to the bottom of the bag. The unit is secured to the vehicle roof by means of brackets 213 which comprise hook-like elements 214, straps or tie members 215 and buckles 216. If desired, the inner band or strap 211 may be integral with the strap 215 of the brackets. This construction provides satisfactory connection between the pontoons and also permits the carrier unit to be folded into a relatively small space for storage purposes when not in use. By placing the slats or pontoons within the bag, it is not necessary to secure an elastic or resilient material to the under surfaces of the pontoons or slats to prevent marring of the surface of the vehicle roof by the pontoons. This type of construction provides a satisfactory unit for supporting loads upon the vehicle roof and also provides a covering for the load.

In Fig. 20, I have illustrated an alternative means for providing adjustment of the brackets. The bracket 216 includes a hook-like member or element 217 which is adapted to grip the sill or eave of the roof, an adjusting plate 218 and a tie member 219 which is secured to the pontoon 220. The hook-like element and tie member are provided with spaced apertures, as illustrated in Figs. 1 and 3. A pair of spaced threaded nuts 221 are secured to plate 218 registering with spaced apertures in the plate. To prevent marring of the surface of the roof, the nuts are preferably covered with rubber, as indicated at 223. The bracket is adjusted by placing a desired aperture in tie member 219 and hook member 217 over the appropriate apertures in plate 218 and threading screws 222 into the nuts 221.

It is to be understood that the foregoing description is merely illustrative of my invention and that various modifications will suggest themselves to those skilled in the art, and may be made without departing from the spirit and scope of my invention. For example, the pontoons may be formed with a nonyielding arc or curvature to conform to the contour of the roof, or with an under-arc or lesser curvature than the curvature of the roof, or with an over-arc or greater curvature than the curvature of the roof, in the latter cases, the loading of the unit and the mounting of the unit causing the curvature of the pontoons to conform to that of the roof. The pontoons might also be rigidly joined to form a non-collapsible unit, if desired. It is also possible that for certain purposes, it may be desirable to omit the railing, or modifications of the railing may be desired. The surfaces or edges which contact the surface of the roof may be provided with molded rubber shoes or channels which are permanently secured to such surfaces or edges.

I claim:

1. A carrier unit adapted to be removably mounted on the roof of a vehicle comprising a plurality of longitudinally extending pontoons each comprising a load bearing surface having depending skirts adapted to bear upon the roof, links pivotally secured to lateral depending skirts of adjacent pontoons, an upwardly extending railing secured to the outer corners of the terminal pontoons, and a pair of brackets secured to each of the terminal pontoons and adapted to secure the pontoons on the roof, each of the brackets comprising a hook-like member adapted to grip a sill of the roof and a tie member secured at one end to the hook-like member and at the other end to the outer depending skirt of a terminal pontoon.

2. A carrier unit adapted to be removably mounted on the roof of a vehicle comprising a plurality of longitudinally extending pontoons each comprising a load bearing surface having depending skirts adapted to bear upon the roof, links pivotally secured to the lateral depending skirts of adjacent pontoons, an upwardly extending railing secured to the outer corners of the terminal pontoons, and a pair of brackets secured to the terminal pontoons and adapted to secure the pontoons on the roof, each of the brackets comprising an angle member secured to the outer longitudinal depending skirt of a terminal pontoon and a tie member terminating in a hook-like extremity secured to the angle member.

RAY C. STRAUSS.