United States Patent

White et al.

[15] **3,635,515**

[45] **Jan. 18, 1972**

[54] CAR TOP CABIN

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[22] Filed: **Feb. 11, 1970**

[21] Appl. No.: **10,476**

Related U.S. Application Data

[62] Division of Ser. No. 678,066, Oct. 25, 1967, abandoned.

[52] **U.S. Cl.** ..... **296/23 MC**

[51] **Int. Cl.** **B60p 3/32**

[58] **Field of Search** ..... 52/280, 281, 282, 582, 615, 52/618; 161/159, 160, 161, 133, 134, 135, 136, 137, 130; 296/23, 23 MC

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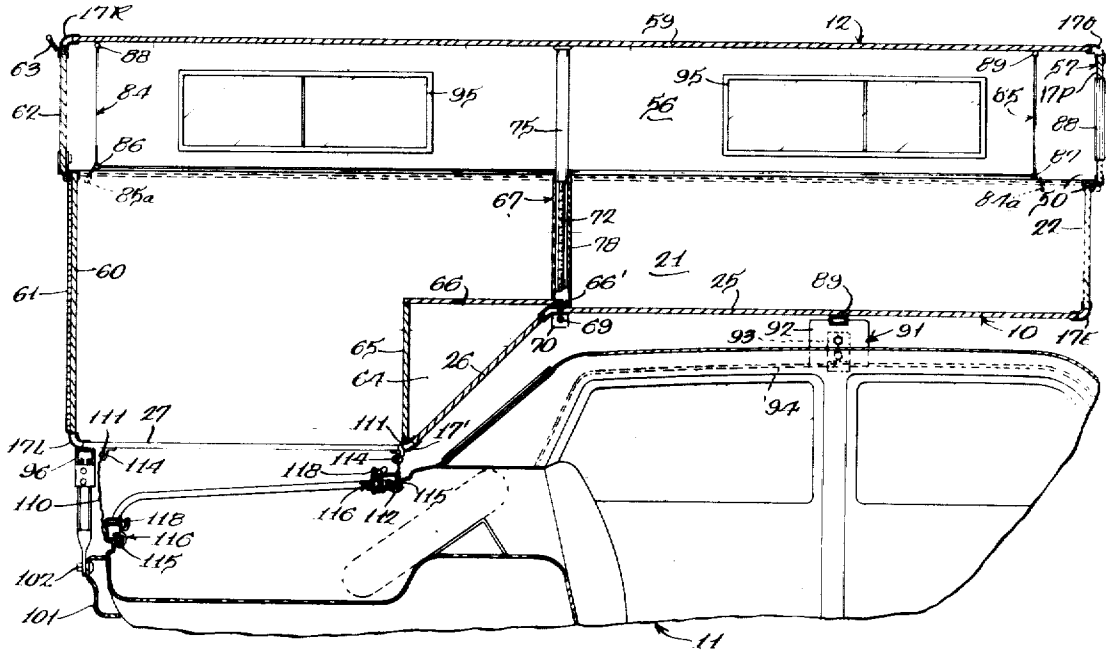
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Primary Examiner—John E. Murtagh
Attorney—Hofgren, Wegner, Allen, Stellman & McCord

[57] **ABSTRACT**

A traveler cabin adapted to be secured to the top of an automotive vehicle such as a passenger car, and including an upper housing mounted telescopically on a lower housing and movable between an upper position for use and a lower position for travel, the housings being constructed of self-reinforced panels and having means for guiding the movement of the upper housing.

1 Claims, 11 Drawing Figures



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SHEET 1 OF 6

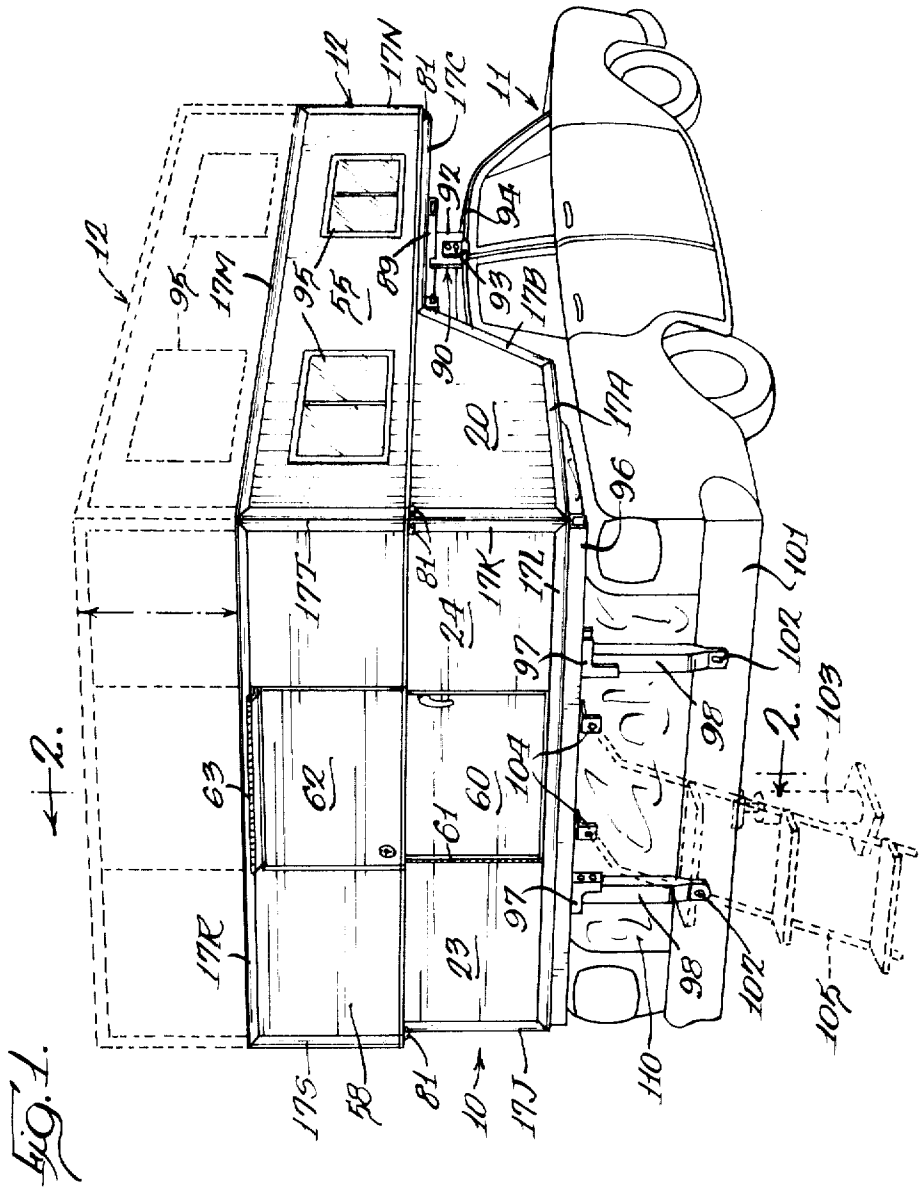


Fig. 1.

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Attys

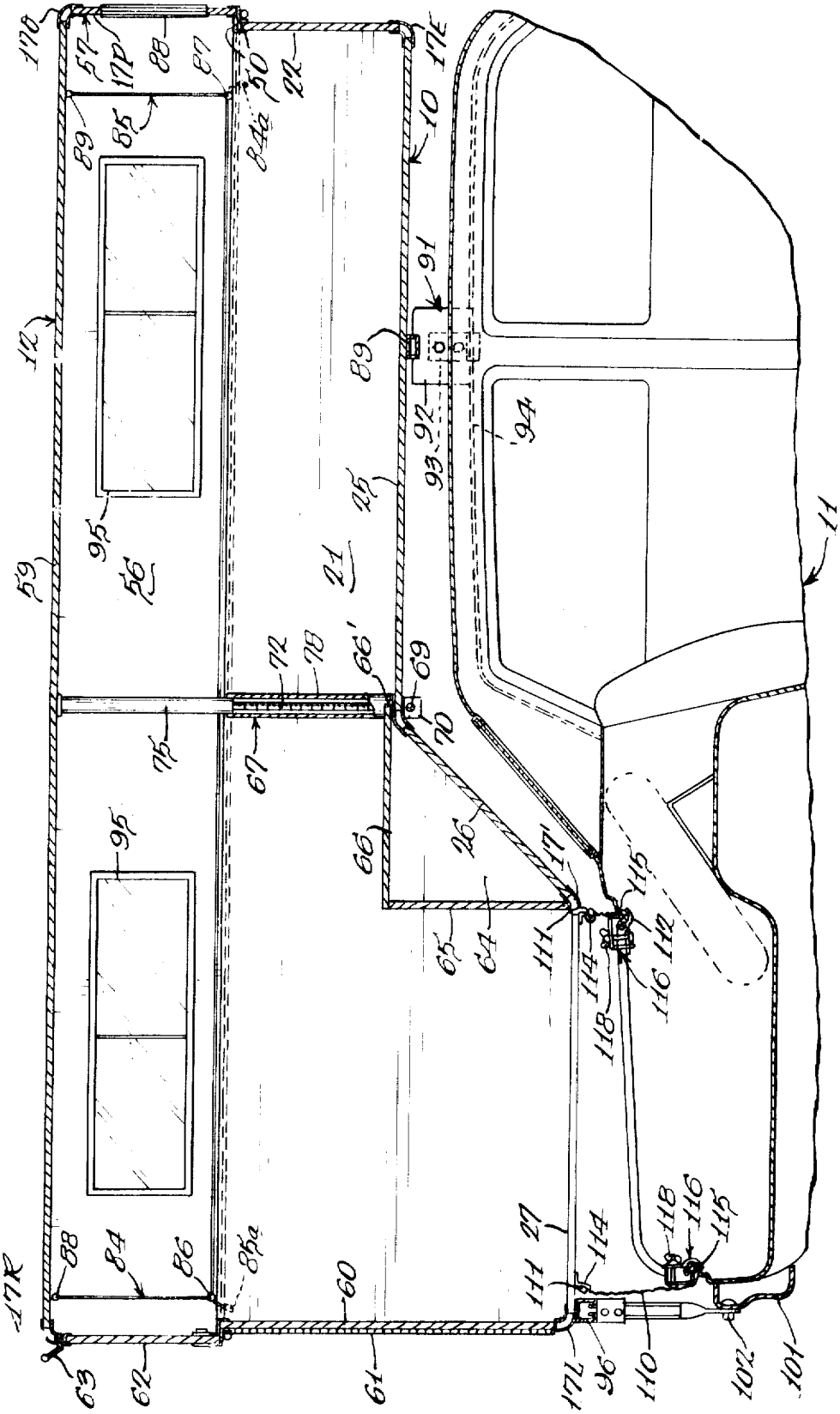


FIG. 2.

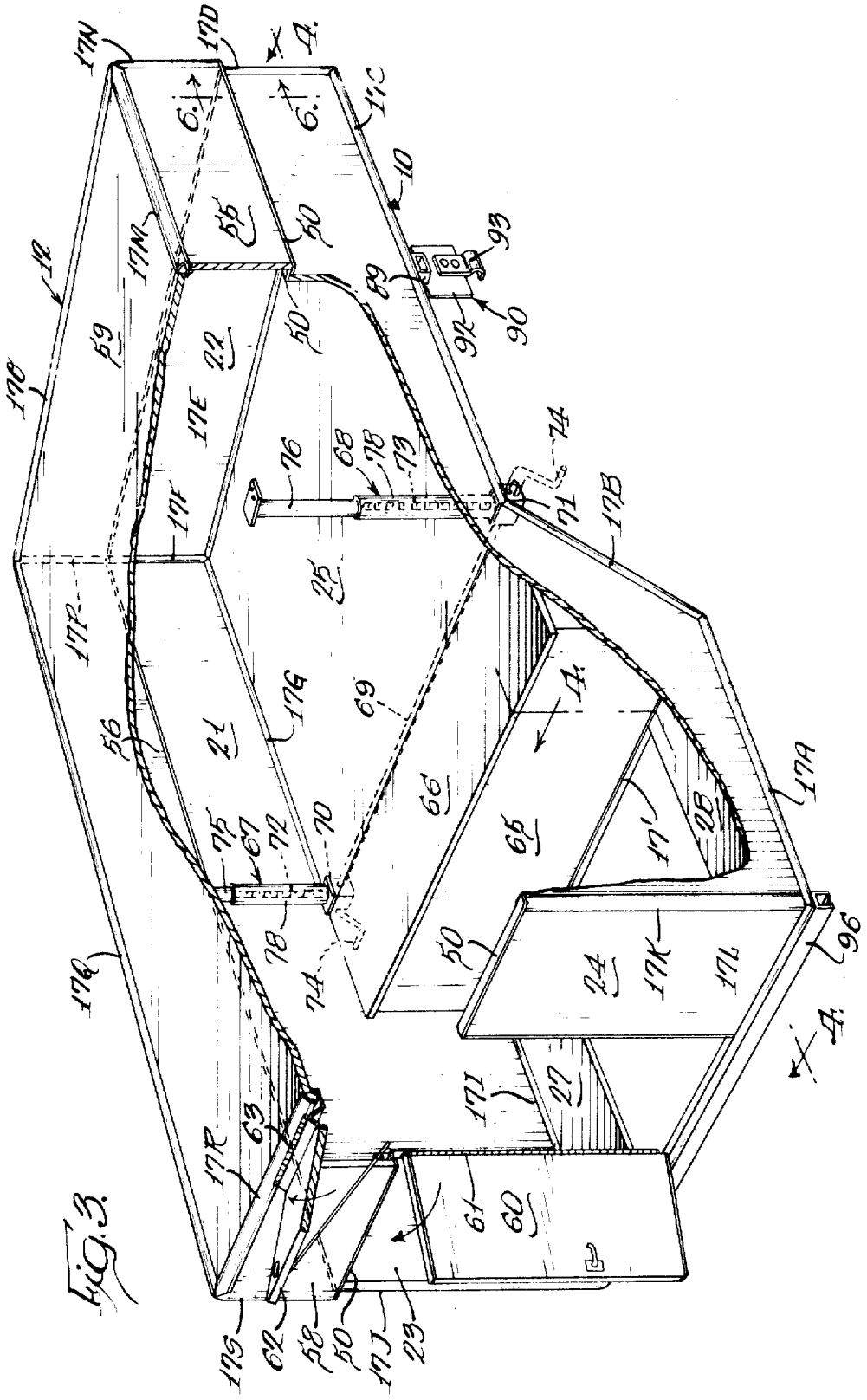


Fig. 3.

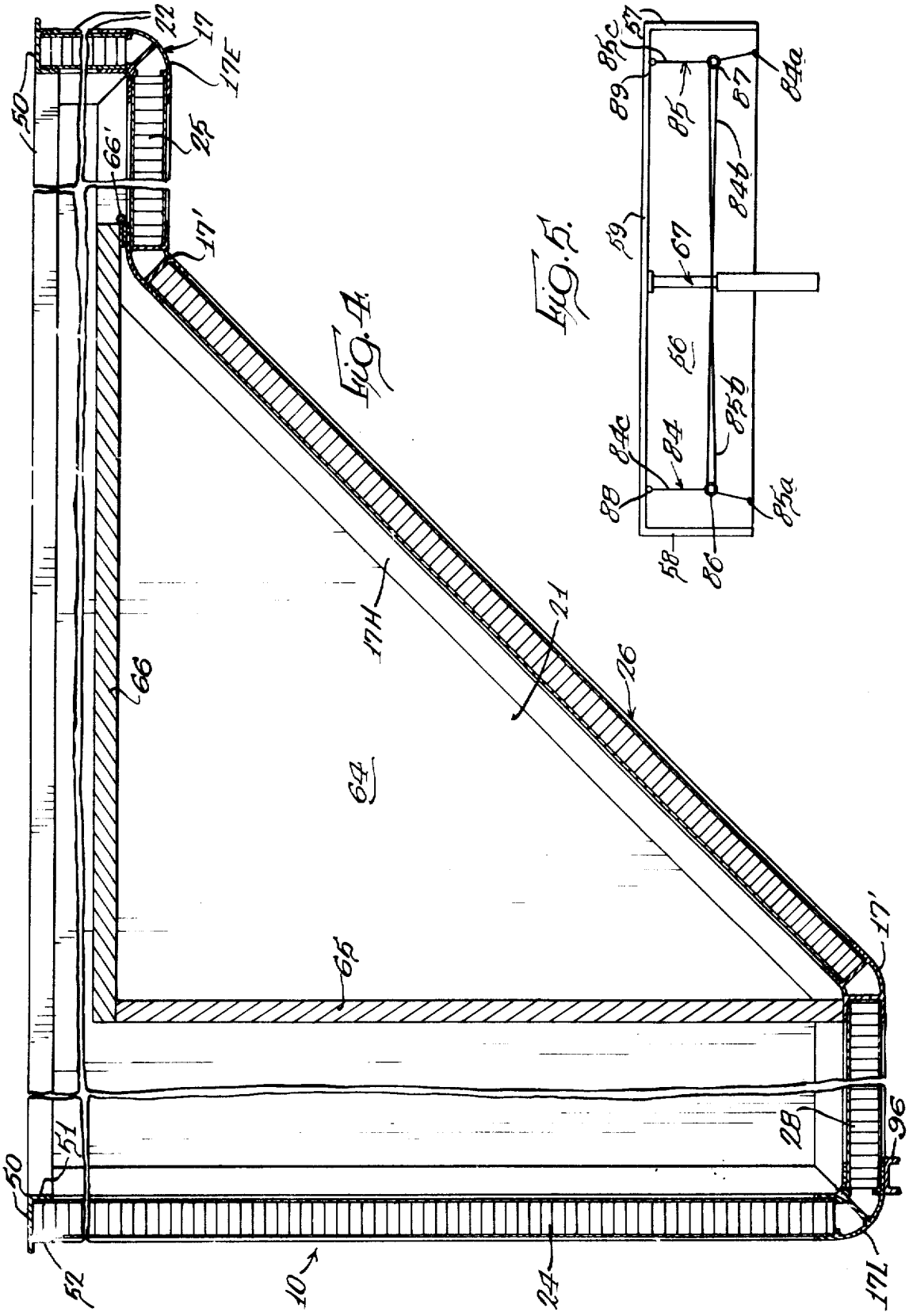

50
22
17
17E
66'
25
17'
66
17H
11
16
64
66
17'
51
50
28
96
52
10
24
17I

FIG. 4.

86c
67
89
85
87
84a
84b
59
67
56
85b
84c
84
88
85a
58
86

FIG. 5.

Fig. 6.

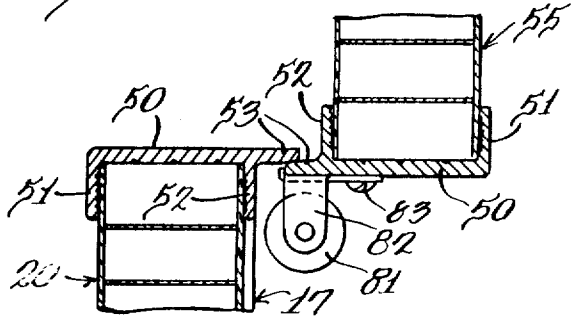


Fig. 8.

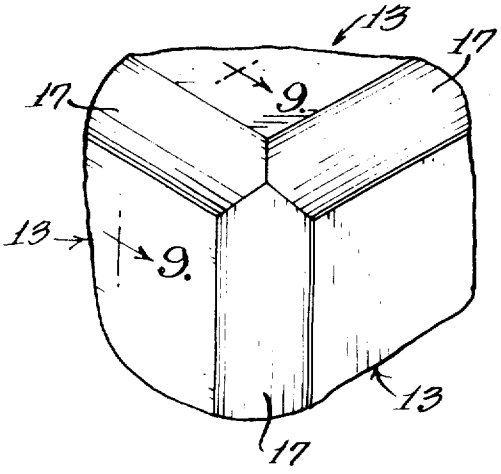


Fig. 7.

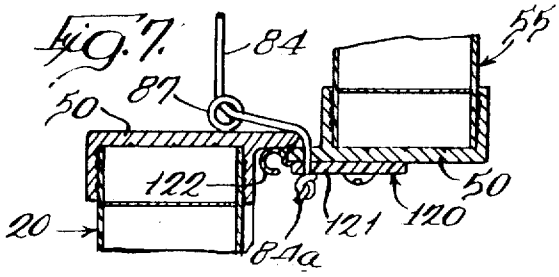


Fig. 9.

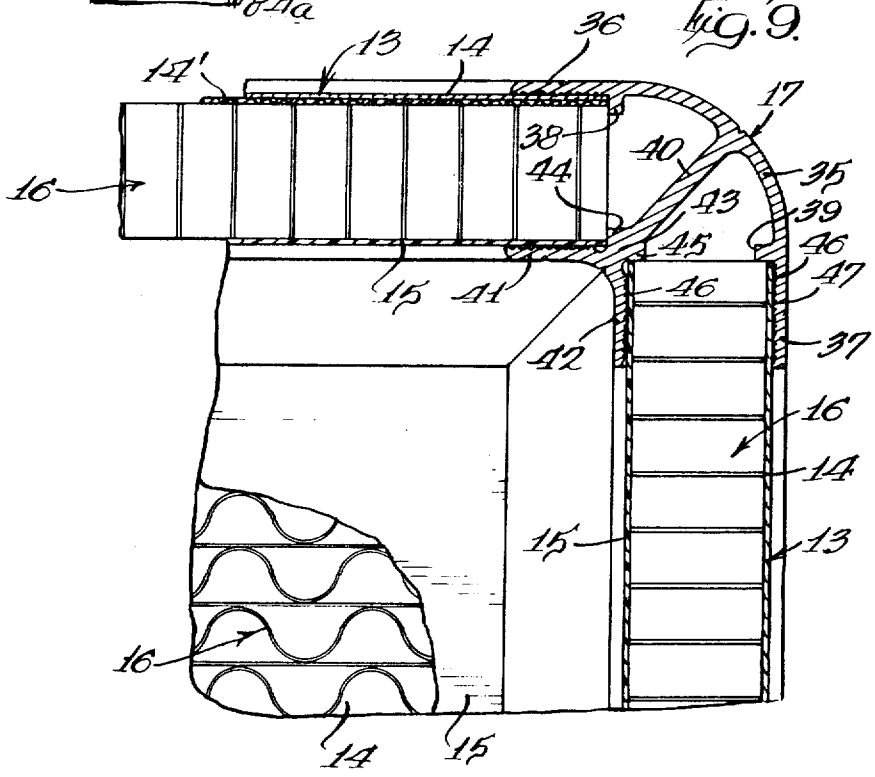


Fig. 11.

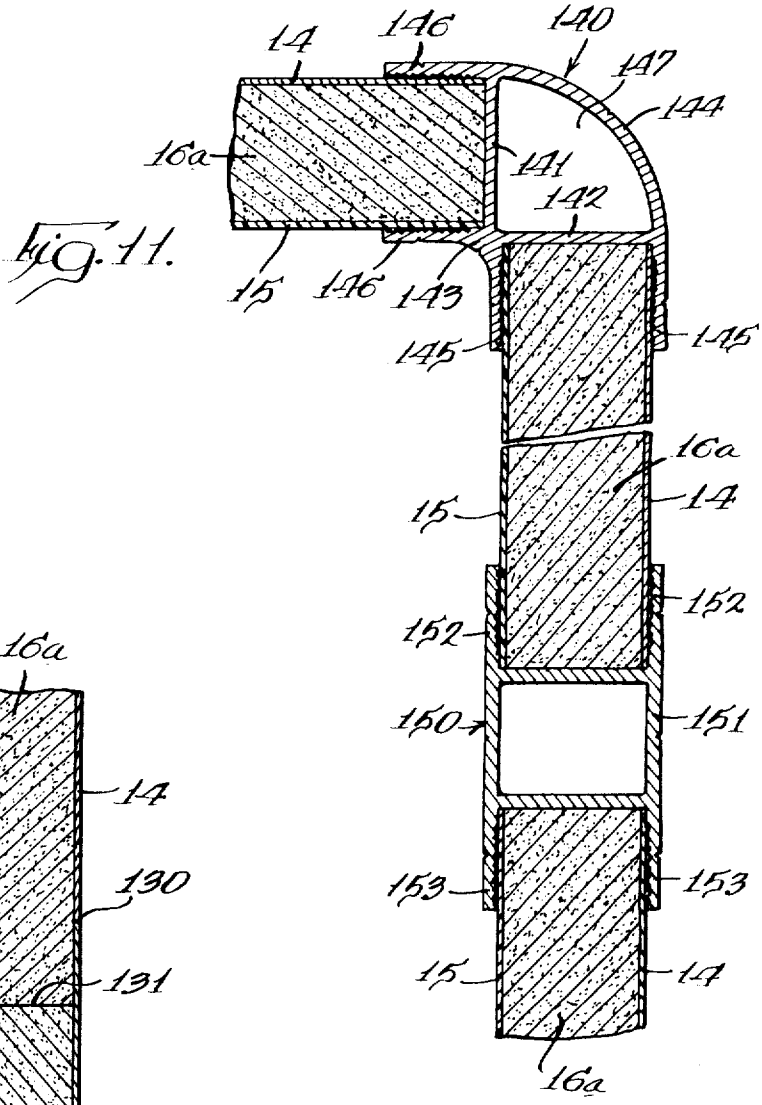
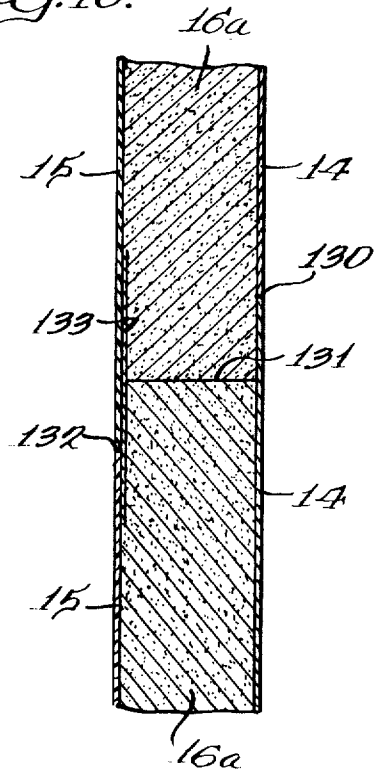

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16a
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142
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16a
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152
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151
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153
15
14
16a

Fig. 10.


16a
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130
133
131
132
14
15
16a

CAR TOP CABIN

This application is a division of our copending application Ser. No. 678,066 filed Oct. 25, 1967 now abandoned.

In general, the invention relates to car top devices often referred to as travelers or cabins adapted to be secured in place on top of an automobile such as a passenger sedan. In the past, it has been conventional to construct devices of the character described in the usual fashion involving the use of a skeletal reinforcing frame onto which covering or closing material is added. As a result of such construction, the weight of the device has been cumbersome, considering that the structure is to be carried by a car not necessarily originally designed for such purpose. The present invention contemplates the construction of such devices from self-reinforcing panels secured at adjoining edges in a manner to obviate the need for a separate frame, thereby substantially reducing the weight, the material involved, and the cost.

In a preferred form, the self-reinforcing panels are preferably of sandwich construction involving cellular cores with covering skins secured thereto in a manner to provide lightweight, high strength members which in themselves provide the structural rigidity of the device.

Preferably, a portion of the car top cabin extends over the top of the passenger compartment of the automobile. In order to provide a low silhouette while the vehicle is in motion and yet provide ample interior space during use, the cabin structure includes a lower housing and an upper housing telescopically mounted on the lower housing.

In the past, considerable difficulty has been experienced in conventional devices in providing appropriate means for elevating and lowering a telescopically mounted upper housing while at the same time maintaining it balanced or level in a fashion to facilitate free vertical movement. The present invention includes an improved adjusting and balancing mechanism of simple lightweight construction also reducing overall mass.

It is a general object to provide a new and improved car top traveler cabin having an upper housing telescopically mounted on a lower housing.

Another object is to provide a car top cabin constructed of walls made of stiff, flat, self-reinforcing cellular panels having metal or plastic exterior surfaces and secured rigidly together at their adjacent edges by cornerpieces which serve as reinforcing frame elements.

A further object is to provide such a car top cabin in which metal corner extrusions, or similar members of other materials, have corner portions and pairs of parallel flanges extending at right angles therefrom to receive the adjacent edges of relatively stiff, flat wall panels therebetween to be secured thereto.

An additional object is to provide a new and improved car top cabin structure of the type described including means for guiding the movement of an upper housing telescopically on a lower housing.

It is also an object to provide a new and improved structure of the character mentioned including means for preventing tipping of the upper housing on the lower housing during adjustment.

Other objects will become apparent from the following detailed description, taken in connection with the drawings in which:

FIG. 1 is a perspective view from the rear of a four door automobile with the trunk lid removed and a preferred form of the invention installed thereon, the upper housing being shown in its lowered position in full lines and in its raised position in dotted lines.

FIG. 2 is a longitudinal vertical section through the car top cabin and a portion of the automobile approximately along the line 2—2 of FIG. 1, with the upper housing in its raised position.

FIG. 3 is a perspective view of the car top cabin, partly broken away, and with the upper housing in its raised position.

FIG. 4 is an enlarged vertical fragmentary longitudinal section through the lower housing at about the line 4—4—4 of FIG. 3.

FIG. 5 is a view like FIG. 2 at a reduced scale to illustrate the mechanism for balancing the upper housing on the lower housing with the upper housing positioned between the upper and lower limits.

FIG. 6 is an enlarged vertical fragmentary section along the line 6—6 of FIG. 3.

FIG. 7 is a fragmentary sectional view like FIG. 6, displaced longitudinally therefrom, illustrating a flexible seal acting between the upper and lower housings.

FIG. 8 is a fragmentary perspective view of an upper corner of the upper housing.

FIG. 9 is a fragmentary section along the line 9—9 of FIG. 8.

FIG. 10 is a sectional view illustrating a panel construction with a foamed core and illustrating the manner in which joints occur in the panel components.

FIG. 11 is a view similar to FIG. 9 illustrating a modified corner extrusion and also an extrusion for joining panels in a common plane.

As shown in the drawings, the invention is in the form of a car top cabin or mobile enclosure comprising a lower housing 10 adapted to be mounted on a passenger car such as a sedan 11, and an upper housing 12 which is telescopically supported on the lower housing 10. As illustrated, the trunk lid has been removed from the sedan but such removal is not necessary to use of the invention. The housings are constructed of relatively stiff, flat, lightweight, self-reinforcing panels. In a preferred form, the panels are a sandwich type (FIG. 9) having an aluminum sheet 14 forming the outer face thereof and a plastic sheet 15 forming the inner face thereof, with a honeycomb structure 16 of paper or other material therebetween. A sheet 14' of material such as cheesecloth may be inserted between the honeycomb and sheet 14 to cooperate with a plastic bonding material to secure the parts together.

Such panels, as described more fully hereinafter, are inherently strong and rigid, being in effect self-reinforced. They are made or cut to the desired shapes and are joined directly at their adjacent edges, such as the corners of the housings, by means, such as cornerpieces preferably in the form of extrusions 17, which may be of metal, such as aluminum or other material, such as plastic. As shown best in FIGS. 4, 8 and 9, the extrusions have rounded corner portions and pairs of parallel edge portions or flanges extending at right angles to each other to overlap and be secured to the adjacent edges of the panels.

The sandwich type panels with corner extrusions secured thereto combine to form rigid, solid housings without the addition of columns, braces, etc., and contribute to a lightweight construction.

More particularly, with reference to FIGS. 1 to 4, the lower housing 10 comprises side panels 20 and 21, a front panel 22, rear panels 23 and 24, a bottom panel 25 under the forward portion thereof, an intermediate inclined bottom panel 26, and a pair of spaced rear bottom panels 27 and 28. The panels of the lower housing are secured together in a solid, self-reinforced structure by corner extrusions 17A to 17L as shown in the drawings, the form of which is shown also in FIGS. 9 and 10. To secure the inclined panel 26 in position, modified corner extrusions 17' are used, these extrusions having pairs of parallel flanges at about 45° to each other. At the lower edge of the panel the extrusion 17' is secured to the adjacent panels 27 and 28. At the upper edge of the panel the extrusion 17' is secured to the adjacent panels 25.

As illustrated in FIG. 9, a corner extrusion 17 consists of an outer corner portion 35, which is shown as curved but may be shaped right angularly, with flat flanges 36 and 37 extending at right angles therefrom and provided with locating ribs 38 and 39 respectively. An integral diagonal wall 40 extends inwardly from the corner portion 35 and has flat flanges 41 and 42 extending at right angles from the inner edge 43 thereof. Preferably the wall 40 is also provided with locating ribs 44 and 45 for the adjacent edges of the panels 13. Thus, the outer and inner flanges 36 and 41 form a pair of flanges at right angles to the pair of flanges 37 and 42 and each pair of flanges is

adapted to receive and be secured to the adjacent edges of honeycomb panels 13. The flanges are shown serrated at 46 on their panel-engaging surfaces and are fastened securely to the panels as by means of a suitable bonding material 47, such as an epoxy type.

With further reference to FIGS. 4 and 6, a metal extrusion 50 is applied to each lower edge of the side and end panels in the upper housing 12 and each upper edge of the side and end panels of the lower housing 10. The extrusions 50 have parallel flanges 51 and 52 extending at right angles therefrom to receive the adjacent edge of a panel 13 therebetween, and have lateral flanges 53 which overlap and serve to limit the extent the upper housing can be raised and to seal the adjacent edges of the upper and lower housings when the upper housing is in its raised position. The inner surfaces of the flanges 51 and 52 are also preferably serrated so as to provide a more effective bond when the panels are joined thereto.

The upper housing 12, as shown best in FIGS. 1 to 3, has corner extrusions 17M to 17T connecting side panels 55 and 56 and end panels 57 and 58 to a top panel 59. If desired, the upper housing may have a top opening door in the top panel 59.

A door 60 is provided for closing the space between the end panels 23 and 24 of the lower housing 10 and has a hinge 61 along one edge securing it swingably to the adjacent edge of the rear panel 23. A second closure member 62 is provided with a hinge 63, securing it to the adjacent portion of the top panel 59.

Preferably, use is made of the inclined bottom panel 26 (FIGS. 2–4) to provide a storage compartment 64, utilizing a vertical wall panel 65 appropriately secured in position and a top door panel 66 hingedly mounted at its forward edge, as shown at 66'. Alternately, the panel 66 may be permanently secured in place or apertured for purposes of mounting plumbing, appliances, or the like.

To raise and lower the upper housing 12 on the lower housing 10, screw and nut devices 67 and 68 are provided near the middle of the housings, together with actuating means comprising a cross-shaft 69, bevel gear drive devices 70 and 71 between the cross-shaft and screw members 72 and 73 of the screw and nut devices, and a detachable handle 74 which may be used on either end of the cross-shaft. The nut members are secured in the lower ends of tubes 75 and 76 secured to the top panel 59 of the upper housing 12, the screw members and gear drive devices being mounted on the bottom panel 25 of the lower housing 10. If desired, the screws 72 and 73 may each be housed in a tube as at 78 stationary on the lower housing and large enough to receive tube 75 or 76 when the upper housing is lowered.

In order to facilitate movement of the upper housing on the lower housing relatively freely without the upper housing tipping and binding, provision is made to guide the upper housing and balance the same to maintain it substantially level at all times relative to the lower housing.

In particular, relatively frictionless relative movement between the housings is facilitated by guide rollers, as at 81 (FIG. 6), each rotatably mounted on an inverted U-shaped bracket 82 secured, as at 83, to the bottom surface of the extrusion 52 along the bottom edge of the upper housing. As illustrated, the bracket 82 is secured to the extrusion 52 adjacent the inner edge of the extrusion in the vicinity of the lateral flange 53 with the roller 81 positioned to engage the lower housing in the event the upper housing deviates laterally. At least one roller is provided at each of the four sides of the upper housing, and preferably there are two rollers at each side, one adjacent each corner, so that the roller 81 engages the corner extrusion 17.

In order to prevent tipping, as best illustrated in FIGS. 2 and 5, there are a pair of cables 84 and 85 each having opposite ends secured to the upper housing so that the opposite ends of each cable are vertically spaced and longitudinally spaced at opposite sides of the jack mechanisms 67 and 68. A pair of eyelets 86 and 87 are provided on the lower housing adjacent the top thereof and longitudinally spaced on opposite sides of the jack mechanisms, that is, near the front and rear ends of the car top cabin. Each cable passes through a pair of eyelets and the eyelets confine the cable to extend upwardly from a lower cable end at 84*a* and 85*a* to an eyelet as at 87 and 86, longitudinally as at 84*b* and 85*b* to the other eyelet as at 86 and 87 and thence upwardly to an upper cable end as at 84*c* and 85*c*.

In operation, it will be understood that the jack mechanisms 67 and 68 are preferably located longitudinally in a front to rear direction at a place approximately coincident with the center of gravity so that the forward and rearward portions of the cabin are approximately balanced. However, in any event, it will be understood that if there is any tendency of the upper housing to tip, the cables 84 and 85 prevent tipping. In particular, referring to FIG. 5, if the upper housing 12 tends to tip in a clockwise direction about the jacks, the upper end 84*c* tends to move upwardly and the lower end 84*a* tends to move downwardly, but such movement is prevented by the eyelets 86 and 87 in the absence of elongation of the cable, which is not intended to yield. Conversely, if the upper housing ends to tip in a counterclockwise direction, cable end 85*c* tends to move upwardly and cable end 85*a* tends to move downwardly, but such movement is prevented by the eyelets. As illustrated, both cables 84 and 85 are located at one side of the housing and pass through common eyelets 86 and 87, but they may be located separately at opposite sides of the cabin.

In the preferred construction, the upper ends of the cables are tied in eyelets 88 and 89 secured in the upper corner extrusion 17Q. Each lower cable end is passed through a series of three apertures in flange 53 of the extrusion 50 at the bottom edge of the upper housing and then knotted, as best illustrated in FIG. 7. The eyelets 86 and 87 are secured to the upper surface of the flange 53 on the extrusion 50 at the upper edge of the lower housing also as illustrated in FIG. 7.

Windows may be provided in the upper housing 12 as at 95 and at other locations if desired.

When assembled in the form shown in full lines in FIG. 1, the housings are rigid structures formed by the honeycomb panels and corner extrusions, and the device may readily be installed on a passenger car. To facilitate such installation, the lower housing is provided with means for attachment to the car.

Thus, as shown in FIGS. 1 to 3, a pair of clamp devices 90 are secured to opposite ends of a transverse support bar 91 attached to the lower housing 10 beneath the bottom panel 25. The clamp devices each are of a form having a roof-engaging bracket 92 rigidly attached to bar 89 and resting in the rain gutter 94 on the roof of the car and clamp member 93 for engaging the exterior of the rain gutter.

The rear of the lower housing 10 is supported by a depending structure including a rectangular steel tube 96 secured along the bottom of the adjacent corner extrusion 17L. The tube 96 is slotted along the bottom to facilitate receipt of brackets as at 97 which may be adjusted along the tube and then secured in position to support upright tubular posts as at 98 suitably secured to the brackets 97 and to the car bumper 101 as at 102.

If desired, a jack 103 may be provided under the bumper to support the rear end of the car when the device is in use. Also, the tube 96 will accept mounting brackets 104 to facilitate attachment of a ladder 105 providing access to the cabin structure.

In order to seal any gap between the bottom end of the lower housing and the perimeter of the trunk opening of the automobile, there may be a boot 110 (FIG. 2) of flexible material such as rubberized nylon fabric, in the form of a large tube of relatively short irregular length. At opposite ends, the tube includes a peripheral elastic cord or bead as at 111 and 112, each disposed in a hemmed over portion of the boot. At the upper end, the boot and the cord 111 are secured in spaced retaining clips as at 114 suitably attached to the bottom of the lower housing. At the lower end, the boot and the

cord 112 are secured to the rain trough 115 around the trunk opening by suitably spaced clamps as at 116, of the type including two relatively movable parts adapted to be drawn together by a bolt and wingnut 118 with the cord 112 and rain trough therebetween so that the cord and clamp are secured to the rain trough.

In order to provide a seal between the upper and lower housings around the entire periphery thereof when the upper housing is elevated for use, there may be a longitudinal seal member as at 120 (FIG. 7) secured to the undersurface of the extrusion 50 at the bottom of the upper housing. The seal strip includes a relatively wide mounting portion 121 and a relatively flexible rolled sealing edge 122 overlapping the adjacent flange 53 on the lower housing. An effective seal is thus provided. In the event of a draft tending to enter the cabin, there is a tendency to unroll the edge 120 to 122, sealing it tightly. If desired, there may be a similar inner seal carried on the top of the lower housing and cooperating with the upper housing.

In constructing the self-reinforcing panels, the cellular cores may be of honeycomb form as illustrated in FIG. 9, utilizing resin impregnated paper or other materials, or in lieu of honeycomb, the core may be of foamed material, such as plastics including urethanes and styrenes, and such as metal including aluminum. Foamed material is illustrated in the core material at 16*a* in FIGS. 10 and 11. The outer skins may be metal, such as aluminum, or they may be any of many, many different plastic materials either reinforced as with fiberglass or not reinforced. In the construction illustrated herein, the bottom panels as at 25, 27 and 28 contain inner skins of fiberglass reinforced plastic material, while the remaining inner skins are unreinforced plastic of suitable decorative appeal. The skins or plates attached to the core material may even be of other materials such as mineral sheets, like asbestos, gypsum and mica, or they may be vegetable materials, such as wood veneer or paper.

The skins are secured to the core material by suitable bonding agents such as relatively slow curing resin adhesives, epoxy for example, which allow some time for adjustment of the components relative to each other after contact, or relatively fast adhesives like synthetic rubbers, called contact adhesives, which allow little or no adjusting time after contact of the components. The first-mentioned adhesives are preferably used in securing the panels in the corner extrusions.

Where a panel is desired larger than readily available component sheets such as the core, the aluminum or the plastic, the panels may be formed with joints in the components, but the joints are preferably not aligned. As illustrated in FIG. 10, the aluminum skin 14 includes abutted edges at 130, the core members are abutted at an offset joint 131 and the plastic members are abutted at a further offset joint 132 and the latter is preferably bridged by a sheet, as at 133, of aluminum or the like.

In FIG. 11, a modified corner extrusion 140 is illustrated in which there are right angular bracing webs 141 and 142 connecting parallel inner and outer curved corner portions 143 and 144 terminating in parallel flanges as at 145 at right angles to parallel flanges as at 146. Such construction provides a central passage 147 which may be utilized for various purposes, such as conduits, in contrast to the extrusion shown in FIG. 9 where the web 40 is centrally located, though the latter is more economical. As shown in FIG. 4, the modified cornerpieces 17' are constructed with angularly disposed webs like those shown at 141 and 142.

In the event it is desired to join panels in a common plane, use is made of an H-shaped extrusion 150 illustrated in FIG. 11 including a center box-shaped portion 151 from which parallel flanges 152 extend at one side and parallel flanges 153 extend at the other side. The panels are secured in the extrusions illustrated in FIG. 11 in the same manner as previously described.

While the foregoing description relates to application of the invention to a sedan, it will be understood that the principles are also applicable to other vehicles, such as for example, a pickup truck, or a coupe.

We claim:

1. A car top traveler cabin for use on a passenger vehicle having a forward passenger compartment and an open rear baggage compartment, comprising a lower housing having a rectangular four wall portion fitting along the top of the passenger compartment from the vicinity of the windshield to a position above the rear bumper and an integral part extending downwardly at the sides of the baggage compartment and the rear thereof, a bottom having an opening in register with the opening in the baggage compartment and a top closure, the housing sides consisting of self-reinforcing cellular panels having smooth inner and outer surfaces, a vertical cornerpiece at each corner provided with a turned corner portion and with pairs of parallel flanges extending at right angles from the corner portion and overlapping the adjacent edges of the panels forming the housing sides, means securing the top closure and the bottom to the housing means securing the parallel flanges of the cornerpieces to the panels to form a rigid structure, means for securing a forward portion of the cabin to the top of the passenger compartment, means for securing a rear portion of the cabin to the car rear bumper with the cabin walls in spaced relation above the baggage compartment and a flexible tubular boot secured to the lower ends of the cabin walls and to the perimeter of the baggage compartment to connect the registered openings.

* * * * *