Sept. 15, 1959 C. E. VOLK 2,903,752

BUILDING CONSTRUCTION

Filed Nov. 26, 1954 3 Sheets-Sheet 1

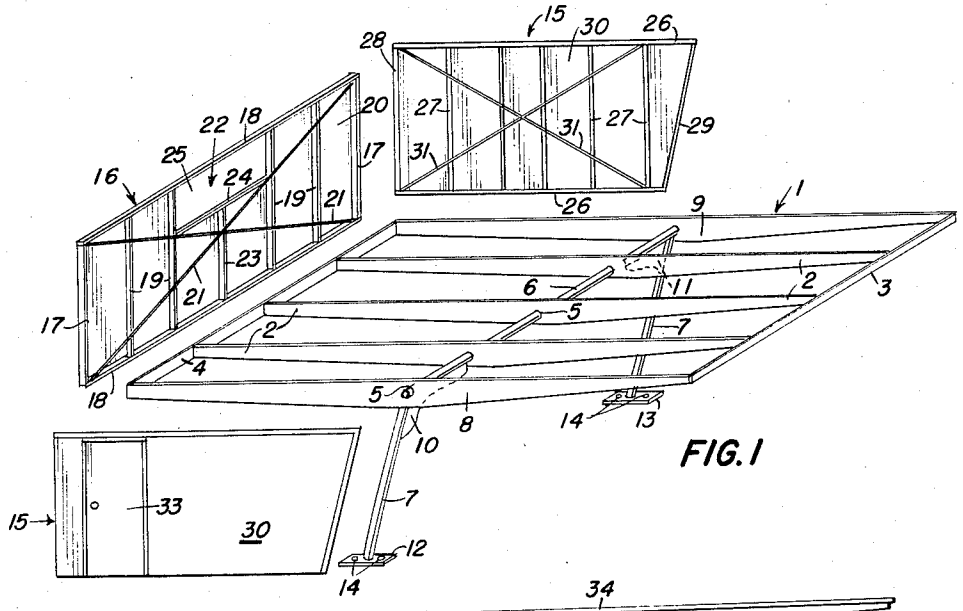


FIG. 1

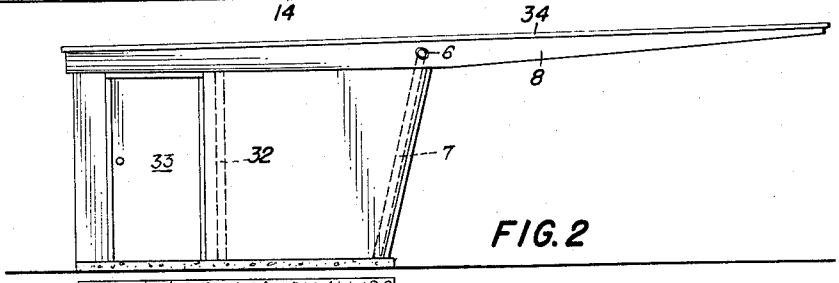


FIG. 2

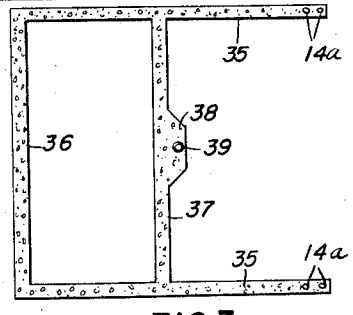


FIG. 3

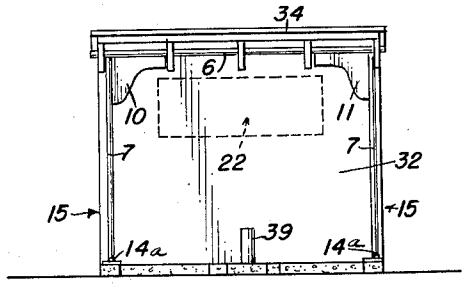


FIG. 4

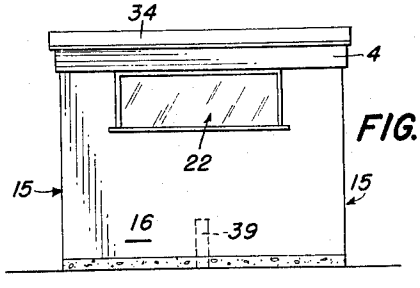


FIG. 5

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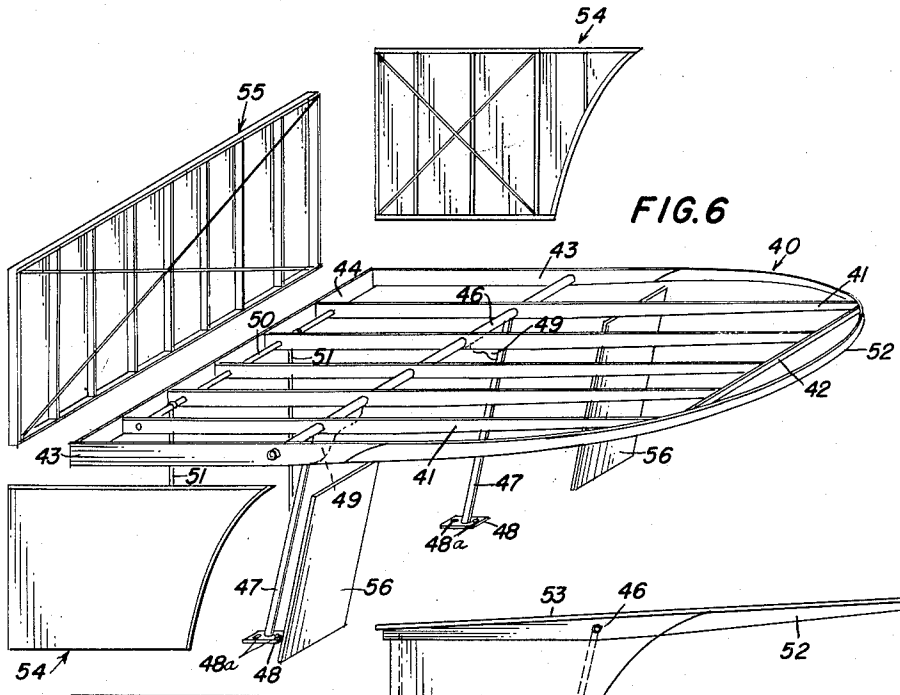


FIG. 6

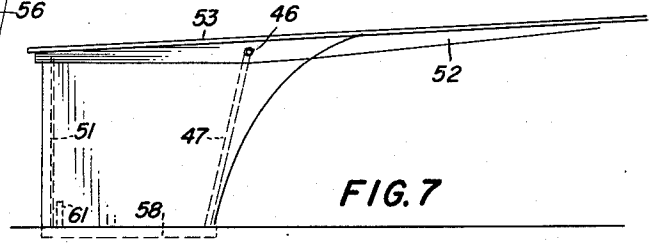


FIG. 7

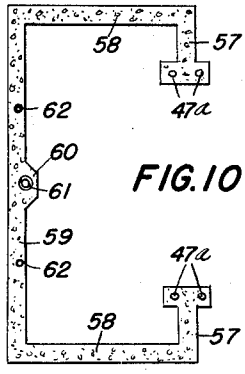


FIG. 10

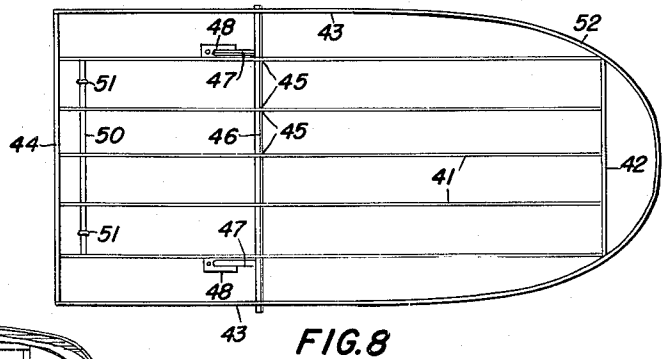
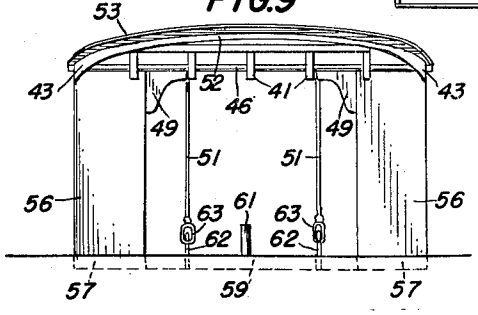


FIG. 8

FIG. 9



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BUILDING CONSTRUCTION

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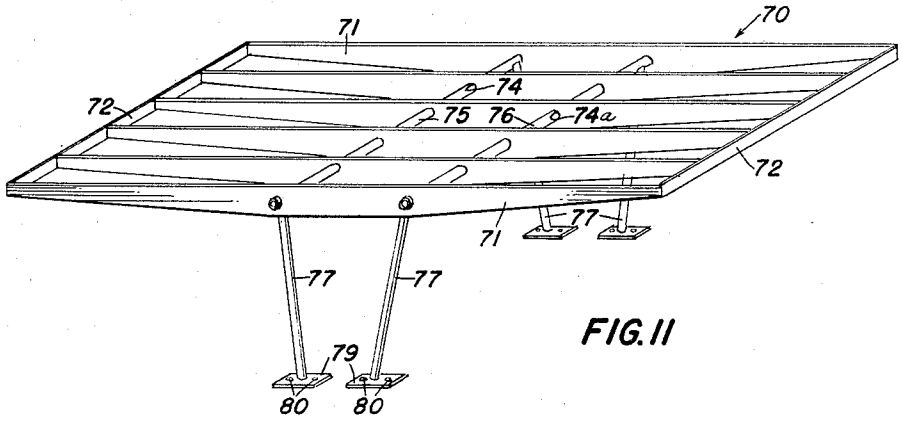


FIG. 11

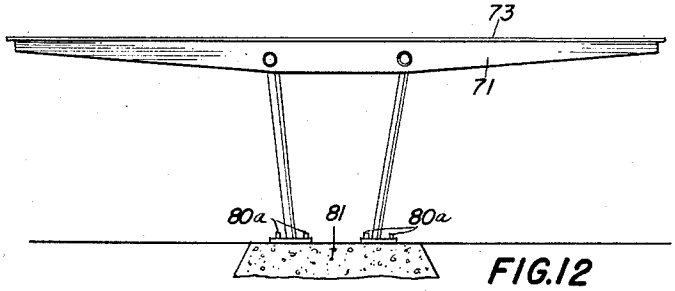


FIG. 12

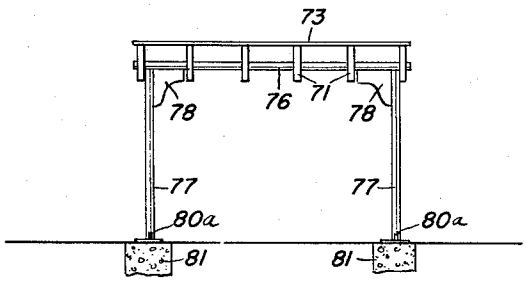


FIG. 13

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2,903,752

BUILDING CONSTRUCTION

Charles E. Volk, Great Falls, Mont.

Application November 26, 1954, Serial No. 471,308

5 Claims. (Cl. 20—1.13)

This invention relates to building constructions and more particularly to wooden structures capable of manufacture for shipment in compact, knock-down units for temporary or permanent erection by the purchaser, the erection of the structures requiring no special skills or equipment.

The invention primarily is intended to meet the need for an efficient and inexpensive shelter for motor vehicles. The need for such shelters has been increased greatly by the construction of apartment buildings and the development of housing projects in which no provision has been made for off-street, sheltered parking areas. Frequently, the space available for the erection of sheltered parking areas is insufficient to permit conventional garages to be built, and, in addition, the cost of the construction of conventional garages often is more than one cares to assume with the result that no shelter is provided for vehicles. Multiple unit dwelling constructions also frequency fail to provide storage spaces for equipment such as garden tools, lawn mowers, children's bicycles, and the like, and the lack of suitable storage space necessitates the construction of sheds or requires the equipment to be stored indoors or left outside to the ravages of weather.

An object of this invention is to provide an economical building construction capable of erection by the purchaser for providing a sheltered parking area for a motor vehicle.

Another object of the invention is to provide a building construction for sheltering a motor vehicle which occupies little more space than the vehicle itself.

Another object of the invention is to provide a building construction for sheltering a motor vehicle and also for furnishing covered storage space for articles other than and in addition to the vehicle.

Another object of the invention is to provide a knock-down building construction which may be assembled by persons having no special skill, the assembling of the structure being possible without special tools and equipment.

Other objects and advantages of the invention will be pointed out or will become apparent from the following description and claims when considered in conjunction with the accompanying drawings in which:

Figure 1 is an exploded view of one form of building showing the parts prior to assembly;

Figure 2 is an enlarged side elevational view of the assembled building parts shown in Figure 1;

Figure 3 is a top plan view of one form of foundation which may be used in the erection of the building parts shown in Figures 1 and 2;

Figure 4 is a reduced front elevational view of an assembled shelter, the view being taken from outside the shelter looking into and toward the rear of the shelter;

Figure 5 is a reduced rear elevational view of the shelter shown in Figure 2;

Figure 6 is an exploded view similar to Figure 1 of another form of shelter, the parts being shown prior to assembly;

Figure 7 is a reduced side elevational view of the assembled parts shown in Figure 6;

Figure 8 is a reduced top plan view of the roof or canopy structure, the top of the canopy being removed;

Figure 9 is a reduced front elevational view similar to Figure 4 but showing the interior of the completed shelter of Figure 7;

Figure 10 is a top plan view of one form of foundation which may be used in the erection of the shelter;

Figure 11 is a perspective view of another form of shelter, the roof panel of the canopy being removed;

Figure 12 is a side elevational view of the erected shelter; and

Figure 13 is an end elevational view of the shelter shown in Figure 12.

The building construction disclosed in Figures 1 through 5 comprises a roof or canopy structure 1 including a plurality of spaced parallel rafters 2, the rafters being held in spaced relation by means of end frame members 3 and 4. The rafters 2 are provided with aligned, transversely extending openings 5, and loosely received in the aligned openings 5 is a cylindrical or tubular rod purlin element 6 which extends transversely of and preferably spans the width of the canopy structure 1. Adjacent to each end of the rod element 6 is a supporting pillar or post 7 which is adapted to support the canopy structure above ground level, the pillars being secured to the rod by any suitable means such as welding. The connection of the pillars 7 with the rod element 6 preferably is inwardly of the outermost rafters 8 and 9 so that from the outside of the assembled building parts the junction of the rod element and pillars will be concealed from view. The joining of the rod element 6 and the pillars 7 in the described position also makes it possible for reinforcing means such as gussets 10 and 11 to be welded or otherwise secured to the rod and pillars in the positions where they will not be seen from outside of the assembled shelter. The lower extremities of the pillars 7 preferably are provided with bearing plates 12 and 13, each of which is provided with apertures as at 14 for a purpose to be explained subsequently.

The canopy structure 1, together with the transversely extending rod element 6 and supporting pillars 7, may be constructed and assembled at the factory. As has been pointed out, the rod element 6 is loosely received in the openings of the rafters and this makes it possible for the U-shaped unit comprising the rod element 6 and supporting pillars 7 to be rotated relatively to the canopy structure 1 so as to dispose the pillars 7 parallel to and in substantially the same plane as the rafters 2 for shipment as a substantially flat unit.

Side and rear ground engaging wall sections 15 and 16, respectively, are provided to enclose the rear part of the shelter. The rear wall section 16 comprises end frame members 17, top and bottom frame members 18, and vertical joists 19 extending between the top and bottom frame members 18. An outer panel 20 is secured to the frame members and joists by suitable means (not shown). Diagonally extending reinforcing straps 21 are secured to the end frame members 17 to provide rigidity to the rear wall section 16. If desired, a window 22 may be formed in the rear wall section in which event one joist will be shortened as at 23 and a horizontal window sill 24 and glass pane 25 provided.

Each side wall section 15 comprises top and bottom horizontal frame members 26, vertical joists 27, end frame members 28 and 29, and an outer panel 30 secured to the frame members and joists. Diagonally extending straps

31 are secured to the endmost vertical joist 27 and to the rear frame member 28 to provide rigidity for the side wall sections. In that form of the invention disclosed in Figures 1 to 5, the front frame member 29 and the edges of the side wall panels are inclined downwardly and towards the rear of the shelter for purposes to be explained. As shown in Figures 1 and 2, the outer panels 30 project beyond the forward vertical joints 27 a distance sufficient to overlie and conceal the supporting pillars 7 when the side panels are installed.

In some instances, a purchaser may desire to have a storage space provided which is separate and distinct from the space in which a vehicle is to be sheltered. In this event, an interior partition 32 may be included for installation within the interior of the shelter and be secured between the two side sections 15. To permit access to the storage compartment thus formed, a doorway and door 33 may be provided in one of the side sections, or, if preferred, the doorway may be formed in the rear section 16, or in the partition 32.

The parts forming the building construction as it is shipped from the factory are completed by a roof panel 34, cut to the size of the roof frame, and which may be secured to the roof frame members prior to shipment if desired.

Prior to assembling the parts in the erection of the building, it is preferred that a foundation be provided on which to anchor the parts. One form of foundation is illustrated in Figure 3 of the drawings and which comprises side and rear concrete footings 35 and 36, respectively, partially embedded in the ground. The foundation shown in Figure 3 also includes an intermediate transverse footing 37 which may be included if the finished building is to be equipped with the storage space forming partition 32. The intermediate footing 37 may include a central, forwardly extending portion 38 provided with a partially embedded post 39 which may serve as an abutment which a vehicle bumper may contact to prevent damage to the partition 32. The concrete for the foundations may be shipped along with the other parts in a dehydrated condition necessitating only the addition of water and mixing by the purchaser.

When pouring the concrete footings, suitable bolts may be partially embedded in the concrete at appropriate places for use in anchoring parts of the building to the foundation in a well known manner. Thus, bolts 14^a may be embedded in the concrete side sections 35 at positions corresponding to the spacing of the apertures 14 in the bearing plates 12 and other bolts (not shown) may be provided along the side and rear footings for cooperation with suitably spaced openings in the lower frame members of the side and rear panel sections to secure the latter to the foundation.

When erecting the building, the supporting pillars are swung away from the roof frame, the bolts 14^a are passed through the apertures 14 in the plates 12, and suitable nuts (not shown) are turned down against the upper surface of the plates 12 to anchor the supporting pillars 7 firmly to the foundation.

The position of the transversely extending element 6 is to one side of the center of gravity of the canopy structure and since the rod 6 is rotatably received in the bores 5 of the rafters 2, the canopy structure is free to rotate under the influence of gravity about the axis of the rod. In that form of the invention shown in Figures 1–5, the canopy has a tendency to rotate in a clockwise direction, as viewed in Figure 2. To overcome the tendency of the canopy to rotate, the lower frame member of the rear panel section 16 is secured to the foundation by bolts, as indicated previously, while the upper frame member 18 of the section 16 is secured to the canopy structure 1 adjacent to that end which is nearer to the rod 6, by any suitable means such as nails or bolts (not shown). With the canopy structure thus secured to the rear section 16, the rear section performs the dual function of enclosing the rear of the unit and serving as anchoring means, loaded in tension, for preventing relative rotational movement between the roof frame and the supporting pillars 7. The pillars 7, of course, are loaded in compression and serve to support the canopy structure above ground level, the free end of the canopy being cantilevered from the point of connection of the pillars 7 and the rod 6.

Following the installation of the rear panel section 16, the side panels 15 may be installed. As has been indicated, the side panels also may be anchored to the foundation and secured to the canopy section in which event they, too, will aid in preventing rotation of the canopy. If the roof panel was not secured to the roof frame previously it may be done at this point. The height of the rear section is somewhat less than the length of the supporting pillars and the dimensions of the side panels are proportioned so that the canopy structure, in its final position, slopes rearwardly to permit drainage of water off the roof panel.

It has been pointed out that the side panels terminate at substantially the points of connection of the pillars 7 with the rod 6. The purpose of this construction, aside from the design effect produced, is to permit the doors of a vehilce parked under the canopy to be opened without interference from the sides of the building. This construction enables the forward part of the vehicle to be completely protected from weather while the central and rear parts of the vehicle are shielded from above, and yet the transverse dimension of the shelter need be only slightly greater than the width of the vehicle.

Figures 6–10 disclose a modified form of the invention comprising a canopy structure 40 including a plurality of full length, spaced, parallel rafters 41 connected at one end by a frame member 42. On each side of the canopy frame there is a short rafter 43 having a length less than rafters 41. At the rear end of the canopy structure is a rear frame member 44 which connects all of the rafters. Each of the rafters 41, 43 is provided with a first bore 45 located at a point rearwardly offset from the center of gravity of the canopy and rotatably receiving a transversely extending purlin element or rod 46 which preferably spans the width of the canopy. Compression ground engaging, supporting pillars 47, provided with bearing plates 48 at one end, are welded or otherwise suitably secured adjacent to the ends of the rod 46 inwardly of the short rafters 43. Gussets 49 may be secured to the rod 46 and to the supporting pillars 47 to reinforce the construction. Each of the full length rafters 41 is provided with a transversely extending bore adjacent to the end nearer the bore 45 for reception of a rod 50 which supports a pair of ground engaging, tension rods or cables 51. Secured to the forward ends of the shorter rafters 43 is a curved band 52 of suitable bendable material which engages the front corners of the roof frame so that when the roof panel 53 is in place atop the rafters and frame members, the band 52 aids in the support of the roof panel 53 and presents a smooth, unbroken appearance from outside the unit.

Side and end ground engaging panel sections 54 and 55, respectively, are provided which are generally similar in construction to those described in connection with the embodiment of the invention shown in Figures 1–5. The only material difference between the two forms of side sections is that in the embodiment first described the forward edges of the sections slope rearwardly in a straight line whereas in the embodiment shown in Figures 6–9 the forward edges of the side sections 54 slope downwardly in a curved line which form a continuation of the curved ends of the short rafters 43. No window is shown in the rear section 55, but a window may be provided if desired. Associated with the side panel sections 54 are front panels 56 about which more will be said later.

In Figure 10 there is illustrated a preferred form of foundation adapted for use in conjunction with the build-

ing construction disclosed in Figures 6–9. The foundation comprises a poured concrete footing having T-shaped front sections 57, side sections 58, and a rear section 59. The T-shaped front sections are intended to provide support for the pillars 47, and bolts 47a may be embedded in the foundation for passage through apertures 48a in the bearing plates 48. The rear section 59 includes a forwardly projecting portion 60 in which a post 61 may be embedded to serve as an abutment against which the bumper of a vehicle may bear. On opposite sides of the portion 60 and embedded in the concrete footing section 59 are threaded anchor rods 62 the positions of which correspond to the spacing of the anchor cables 51. At the free end of each anchor cable 51 is a swivel turnbuckle 63 provided with a threaded opening adapted to receive the threaded ends of the associated anchor rod 62.

To erect the building construction disclosed in Figures 6–10, the supporting pillars 47 are swung away from the canopy structure 40 and positioned on the T-shaped foundation sections 57 with the apertures 48a of the bearing plates 48 receiving the embedded bolts 47a. Suitable nuts (not shown) are threaded onto the bolts to anchor the bearing plates and pillars firmly to the foundation. As is the case with the first-described embodiment of the invention, the canopy structure 40 has a tendency to rotate about the axis of the rod 46 under the influence of gravity. To overcome the tendency of the canopy to rotate, the turnbuckles 63 at the ends of the cables 51 are threaded onto the ends of the anchor rods 62. The length of the cables 51 and turnbuckles 63 is such that the canopy, in its anchored position, has a rearward slope to permit drainage from the roof 53.

After the canopy structure has been erected and anchored in the proper position above ground level, the end and side panels, 55 and 54, respectively, may be secured to the foundation and to the canopy structure in any suitable known manner. These panels will oppose any tendency of the canopy structure to rotate about the axis of the rod 46 in a counterclockwise direction, as viewed in Figure 7. Then the front panels 56 are positioned inwardly of the curved forward edges of the side panels 54 and are secured to the side panels and to the canopy structure, and, if desired, to the foundation in any suitable manner. The inclusion of the short rafters 43 and the front panels 56 provides sheltered storage spaces at each side of the enclosed portions of the building without interfering with the accommodation of the vehicle.

In Figures 11–13, there is disclosed another embodiment of the invention which comprises a canopy structure 70 including a plurality of spaced, parallel rafters 71 connected one to another at each end by frame members 72 and also including a roof panel 73 secured to the rafters and frame members. Each of the rafters is provided with two transversely extending bores 74 and 74a which respectively rotatably receive transversely extending purlin elements or rods 75 and 76 which preferably span the width of the canopy frame. Secured adjacent to each end of the rods 75 and 76, but inwardly of the outermost rafter, is a ground engaging, compression supporting pillar 77. The pillars 77 may be secured to their respective rods by any convenient means such as by welding, and reinforcing gussets 78 may be welded or otherwise suitably secured to the rods 75, 76 and to the pillars 77. The rods and pillars thus are capable of rotation relative to the canopy structure 70. When the building unit disclosed in Figures 11–13 is prepared for shipment, the pairs of pillars 77 may be swung toward opposite ends of the canopy so as to lie between adjacent rafters 71 to make a flat package.

The position of each of the rods 75 and 76 is offset with respect to the center of gravity of the canopy so that the canopy, if supported by only one pair of pillars, would have a tendency to rotate about the axis of the rod 75 or 76 under the influence of gravity. When both pairs of pillars are in supporting position, however, the tendency of the canopy to rotate is overcome and the canopy is anchored in elevated position.

Each supporting pillar 77 carries at its free end a bearing plate 79 provided with a pair of apertures 80 for reception of anchoring bolts 80a which conveniently may be embedded in the concrete foundation as previously described. The foundation satisfactorily may comprise a concrete block 81 embedded in the ground at each side of the building.

In the embodiment of the invention shown in Figures 11 to 13, both ends of the canopy are cantilevered from the points where the rods 75 and 76 pass through the rafters 71 and both pairs of pillars 77 are loaded in compression when supporting the canopy. Also, the plane of the roof line preferably is horizontal rather than being sloped.

When the building construction shown in Figures 11–13 has been erected, a vehicle may be driven under the canopy structure and be wholly contained under the canopy. Because the pillars 77 are disposed toward the central portion of the building, a vehicle need not be perfectly aligned with the canopy prior to entering the sheltered area. That is, a portion of a turn may be completed upon entering the area beneath the canopy without danger of crashing into a supporting pillar which would be likely to happen if the pillars were positioned at the ends of the canopy structure. The supporting pillars need not interfere with the opening of the doors of a vehicle since the doors may open between the adjacent pairs of pillars or the vehicle may be driven to a point toward one end of the building where its doors clear the pillars.

In all of the illustrative embodiments of the invention, the building parts may be disassembled quickly and easily and be moved from one location to another. Moreover, the parts can be stored conveniently in a small area if storage is desired.

The embodiments of the invention herein disclosed have been described with reference primarily to building constructions adapted for use as a shelter for a motor vehicle. The invention is equally suitable for adaptation as boat houses, beach or pool dressing rooms and cabanas, children's play shelters, cabins, or other outdoor buildings where low cost and convenience of erection are important and where portability and compact storage are desired characteristics. Also, the structures disclosed herein may be erected in single units, as shown, or may be erected as twin or triple or even more units as desired. This disclosure, therefore, is intended to be illustrative rather than limitative of the invention, the invention being defined in the appended claims.

I claim:

1. A building construction comprising a canopy structure including a plurality of spaced, parallel rafters; an element disposed transversely of said rafters and rotatably received in aligned openings formed in said rafters intermediate the ends of said rafters and offset from the center of gravity of said canopy structure; compression supporting means secured to said element for supporting said canopy structure above ground level, the end of sand canopy structure between which and said supporting means the center of gravity of said canopy structure is located being cantilevered from the connection of said supporting means and said element; and tension anchoring means connected to said canopy structure towards the end of said canopy structure which is opposite to said cantilevered end of said canopy structure and cooperable with said compression supporting means for maintaining said canopy structure above ground level.

2. A building construction comprising a canopy structure including a plurality of spaced, parallel rafters; an element disposed transversely of said rafters and rotatably received in aligned openings formed in said raft-

ers intermediate the ends of said rafters and offset from the center of gravity of said canopy structure; compression supporting means secured to said element for supporting said canopy structure above ground level, the end of said canopy structure between which and said supporting means the center of gravity of said canopy structure is located being cantilevered from the connection of said supporting means and said element; a second element disposed transversely of said rafters and extending through aligned openings formed in said rafters towards that end of said canopy structure which is opposite to said cantilevered end of said canopy structure; and tension means connected to said second element and cooperable with said compression supporting means for maintaining said canopy structure above ground level.

3. A building construction comprising a canopy structure including a plurality of spaced, parallel rafters, each of said rafters having a pair of spaced openings formed therein; a first rod rotatably received in one of the openings of each pair in each of said rafters and extending transversely of said canopy structure; a second rod received in the others of said openings in each of said rafters and extending substantially parallel to said first rod; a pair of supporting pillars secured one adjacent to each end of said first rod for supporting said canopy structure above ground level, the length of said pillars being less than the distance from said first rod to the end of said canopy sturcture nearest said first rod; and means secured to said second rod for maintaining said canopy structure in supported position above ground level and against rotation relative to said first rod.

4. A building construction comprising a roof frame including a plurality of spaced, parallel rafters each having a bore extending transversely therethrough along a line offset from the center of gravity of said frame; an element rotatably received in the bores of said rafters; a foundation; supporting pillars anchored to said foundation for supporting said frame above ground level; means connecting said pillars to said element whereby said pillars are loaded in compression and said frame tends to

rotate relatively to said pillars about the axis of said element under the influence of gravity; and means loaded in tension interposed between said frame and said foundation for preventing relative rotation of said frame and said pillars.

5. A building construction comprising a canopy structure including spaced, parallel rafters; an element disposed transversely of said rafters and rotatably extending through openings formed in said rafters intermediate the ends thereof; supporting means for supporting said canopy structure above ground level; and means connecting said supporting means to said element, said supporting means being capable of rotation relative to said canopy structure about the axis of said element whereby said supporting means may be rotated to and from a position substantially parallel to and in the same plane as said rafters, said supporting means having a length no greater than the distance from the connection thereof with said canopy structure to the nearest end of said canopy structure so that when said supporting means is in said position, said supporting means is wholly within the confines of said canopy structure.

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