

May 22, 1945.

D. G. B. HILL

2,376,695

BUILDING STRUCTURE

Filed Dec. 11, 1944

2 Sheets-Sheet 1

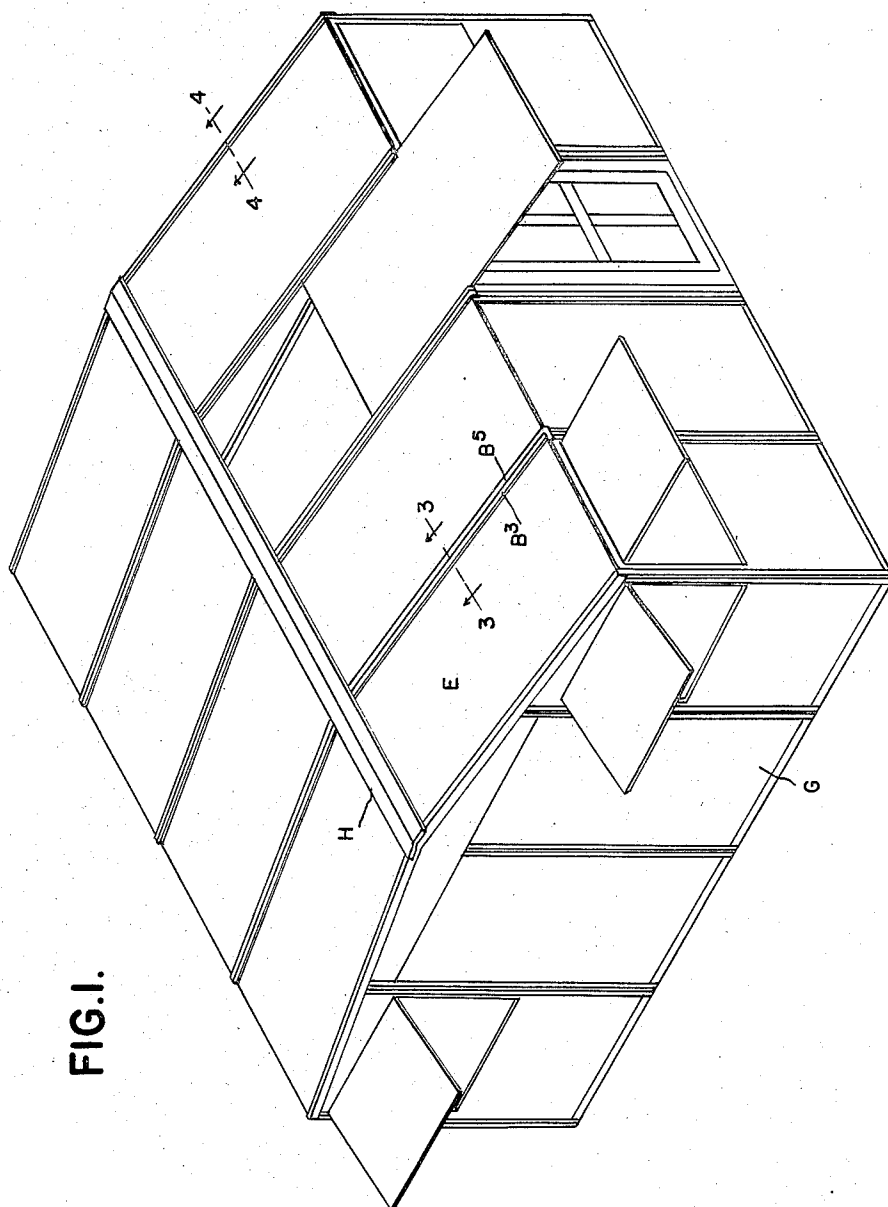


FIG. I.

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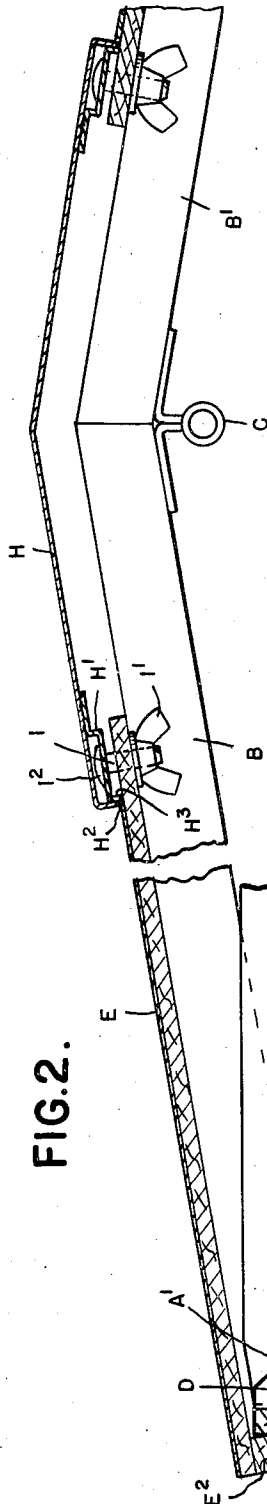


FIG. 2.

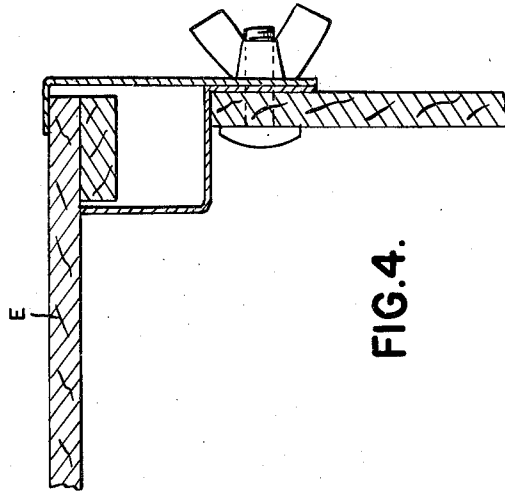


FIG. 3.

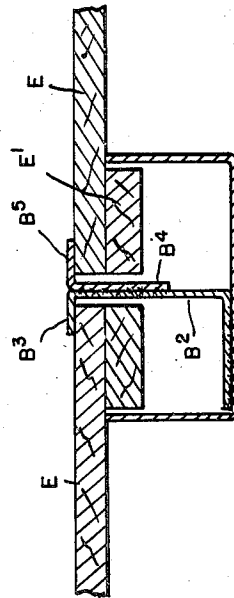


FIG. 4.

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BUILDING STRUCTURE

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Application December 11, 1944, Serial No. 567,654

8 Claims. (Cl. 108—1)

The invention relates to building structures and has for its object the obtaining of a knock-down or collapsible structure, which occupies comparatively small space in storage or during shipment and can be easily and quickly erected on the field. To this end the invention consists in the construction as hereinafter set forth.

In the drawings:

Fig. 1 is a perspective view of the erected building;

Fig. 2 is a transverse section therethrough;

Fig. 3 is a cross section on line 3—3, Fig. 1;

Fig. 4 is a cross section on line 4—4, Fig. 1.

In general construction my improved building structure comprises panels formed of plywood which are supported upon and secured to a collapsible metallic frame. The panels are all separable from the frame so that they may be stacked with each other for shipment, and the frame members are formed of separable units, each unit being formed of foldable sections.

More in detail, the frame members are preferably formed of metallic channel beams and include members A forming the vertically extending studs of the structure and members B and B' which form the roof rafters sloping oppositely from ridge to eaves. The rafter sections B and B' are connected together at the ridge by the hinge C and their abutting ends are at such an angle as to give the desired slope to the roof. Each section is formed of an upwardly opening channel beam having centrally thereof an upwardly extending web B² terminating in a laterally extending flange B³ which is in plane above the top edge of the channel sides. An angle bar B⁴ is attached to the web B² to have a flange B⁵ thereof extending oppositely from the web in the same plane as the flange B³. The stud channel beams A are slightly wider than the rafters B, B' so as to embrace the latter in the folded position of the frame. Each stud at its upper end has the web portion thereof cut away for the passage of the rafter leaving flanges A' for pivotal connection with the rafter by a pin or bolt D. Thus, when the frame is erected, the rafters are rigidly supported upon the studs but in collapsed position, the channel stud is folded to embrace the rafter, and the two sections B and B' of the rafter are folded on the hinge C to lie adjacent to each other.

As above stated, the panels which form both the roof and the sides of the building are of plywood and of a width to extend between adjacent frame members. Each of the roof panels E is of a length to extend from near the ridge to the

eaves which latter are outward beyond the studs A. On the underside of each panel E and at opposite side edges thereof are strips E' preferably formed of wood and which are of a width approximately the same as the dimension between the central web B² and the side flanges of the rafters B and B'. The thickness of each panel is also the same as the dimension between the upper edges of the sides of the rafter and the flanges B³ and B⁵ extending laterally from the web B². Thus, each panel E may be engaged with the rafters on opposite sides thereof by sliding it inward from eaves towards ridge, the bottom face resting on the side of the channel and the top face underlapping the flange B³ or B⁵. Also, the strips E' extend downward into the channel. At the eaves and, each panel E has a cross strip E² on its underside which strip fits against an inclined flange F secured to the side panels G of the structure. The panels G are secured to the studs A and extend upward to the underside of the roof panels E inside of the strips E². This will form a weatherproof joint between the roof panels and side panels at the eaves. At the ridge, there is provided a ridge cap H which overlaps the upper end portions of the panels E. This cap is secured to the roof panels by means of downwardly extending threaded studs I secured thereto and passing through apertures in the panels. Wing nuts I' engage these studs beneath the panels and clamp the cap H thereto. The studs I are secured to the cap H by having their head portions I² engaged with a strip H' welded or otherwise secured to the underside of the cap. The cap H is also provided with the down-turn flange H² with an adjacent down-turn flange H³ on the strip H'. Both of these flanges bear against the panels.

With the structure as thus far described, it will be understood that the panels E together with their edge strips E' form a tie connection between adjacent rafters. Also, that the roof will be weatherproof as any water which may pass between the flanges B³ or B⁵ and the panels, will drop down into the bottom of the rafter channel and will be conveyed to the eaves where it will escape outside of the side panels of the structure. The roof is also weatherproof at the eaves by the cross strips E² which tightly fit against the angle flanges F. Should any water pass inward between the strips E² and flanges F, it would be stopped by the portion of the panel G extending upward above the flange F. The specific construction of the sides of the structure does not form the subject matter of the instant applica-

tion and, therefore, will not be described further in detail.

What I claim as my invention is:

1. In a roof structure for buildings, a roof panel having a strip extending longitudinally on the underface adjacent to a side edge thereof, and an upwardly opening channel beam rafter for supporting said channel and telescopically receiving said strip, said rafter being provided with a laterally extending flange overlapping the side edge portion of said panel to retain the same.
2. In a roof structure for collapsible buildings, a series of roof panels, upwardly opening channel beam rafters between which said roof panels extend and on which they are supported, each rafter having a central web portion and laterally extending flanges on opposite sides thereof in a plane above the upper edges of the sides of the channel substantially equal to the thickness of one of said roof panels, and strips secured to the underface and adjacent to opposite side edges of said roof panels extending downward into the channels of the rafters, said panels being telescopically engageable with said rafters from the eaves ends thereof.
3. A roof structure comprising a series of spaced upwardly opening channel beam rafters, a series of roof panels extending between said rafters, each panel being provided with strips extending longitudinally on the underface adjacent to opposite side edges thereof and extending downward into said channels, and each of said rafters being provided with a central web portion having flanges projecting laterally on opposite sides thereof to overlap said panels, each panel being telescopically engageable with the rafters on opposite sides from the eaves ends thereof, a ridge cap for overlapping the upper end portions of said panels, and connecting means between said ridge cap and said panels.
4. A roof structure comprising a series of spaced upwardly opening channel beam rafters and a series of roof panels extending between said rafters, each panel being provided with strips extending longitudinally on the underface adjacent to opposite side edges thereof and extending downward into said channels, and each of said rafters being provided with a central web portion having flanges projecting laterally on opposite sides thereof to overlap and hold down said panels, said panels together with said strips forming a tie connection between adjacent rafters.
5. A roof structure comprising a series of spaced upwardly opening channel beam rafters, a series of roof panels extending between said rafters, each panel being provided with strips extending longitudinally on the underface adjacent to opposite side edges thereof and extending downward into said channels, and each of said rafters being provided with a central web portion having flanges projecting laterally on opposite sides thereof to overlap and hold down said panels, the latter forming tie connections between adjacent rafters, a ridge cap overlapping the upper end portions of said panels and connected thereto, a cross strip on the underside of the eaves end of each panel extending between adjacent rafters, side members extending upward beneath said panels on the inner side of said cross members, and an angle flange on each of said side members extending beneath each cross strip and forming therewith a weatherproof joint between each roof panel and each side member.
6. A roof structure comprising a series of spaced upwardly opening channel beam rafters, a series of roof panels extending between said rafters, each panel being provided with strips extending longitudinally on the underface adjacent to opposite side edges thereof and extending downward into said channels, and each of said rafters being provided with a central web portion having flanges projecting laterally on opposite sides thereof to overlap and hold down said panels, and channel studs for supporting said rafters pivotally secured thereto and embracing the same whereby said studs may be folded into alignment with said rafters to embrace the same for convenience in transportation.
7. A roof structure comprising a series of spaced upwardly opening channel beam rafters, a series of roof panels extending between said rafters, each panel being provided with strips extending longitudinally on the underface adjacent to opposite side edges thereof and extending downward into the said channels, and each of said rafters being provided with a central web portion having flanges projecting laterally on opposite sides thereof to overlap said panels, each panel being telescopically engageable with the rafters on opposite sides from the eaves ends thereof, and a ridge cap overlapping and detachably connected to the upper end portions of said panels.
8. A roof structure comprising a series of spaced upwardly opening rafters, a series of roof panels extending between said rafters, each panel being provided with strips extending longitudinally on the underface adjacent to opposite side edges thereof and extending downward into said channels, and each of said rafters being provided with a central web portion having flanges projecting laterally on opposite sides thereof to overlap and hold down said panels, a cross strip on the underside of the eaves end of each panel extending between adjacent rafters, side members extending upward beneath said panels on the inner side of said cross members, and means on each of said side members extending beneath each cross strip and forming therewith a weatherproof joint between each roof panel and each side member.

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