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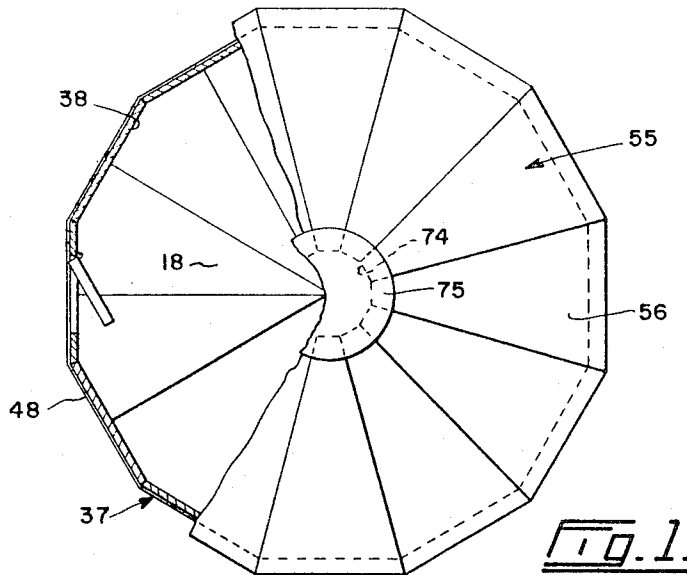
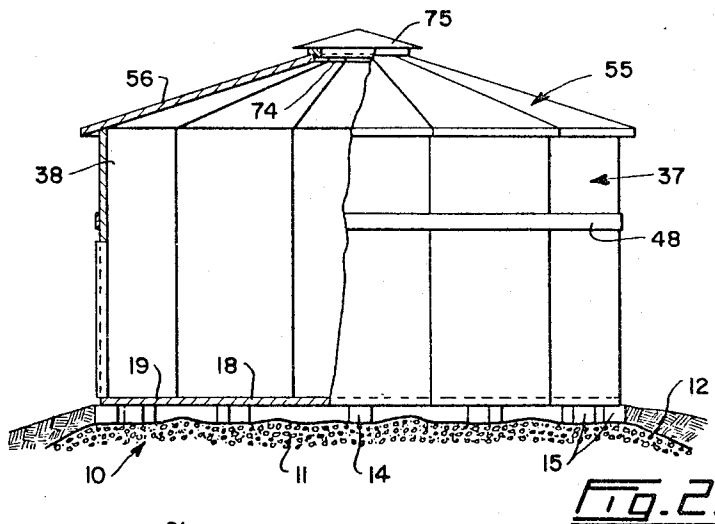
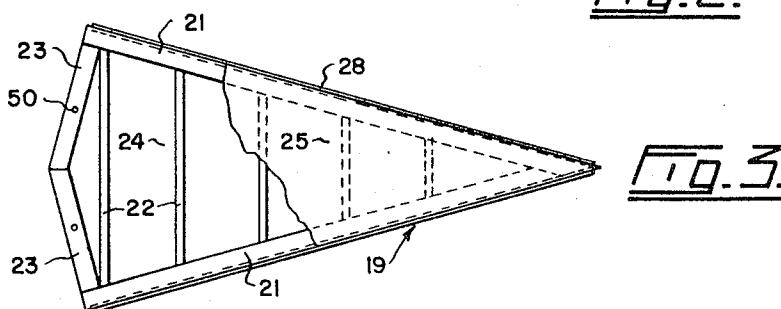
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3,277,620

DEMOUNTABLE BUILDING

Filed April 12, 1965

4 Sheets-Sheet 1



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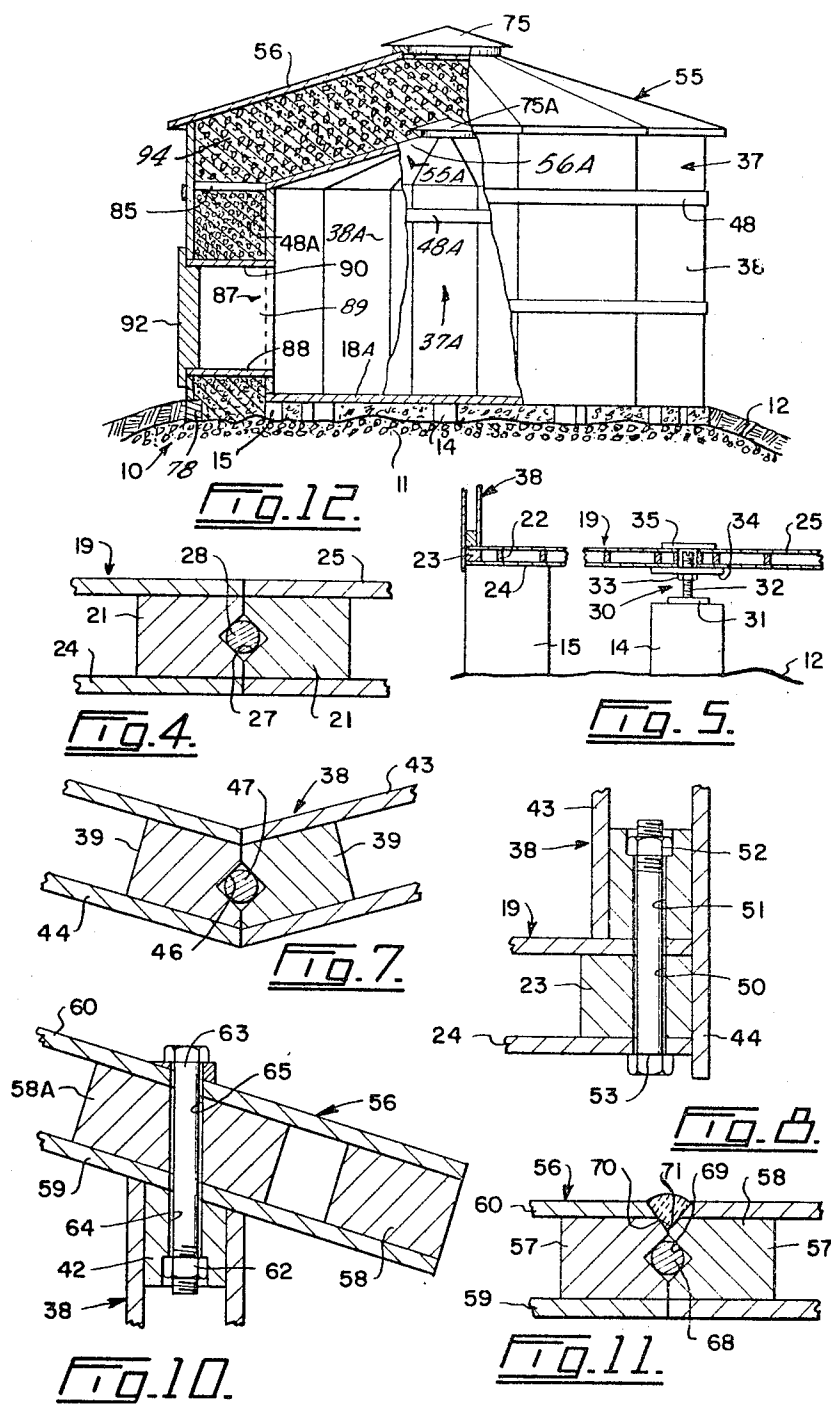
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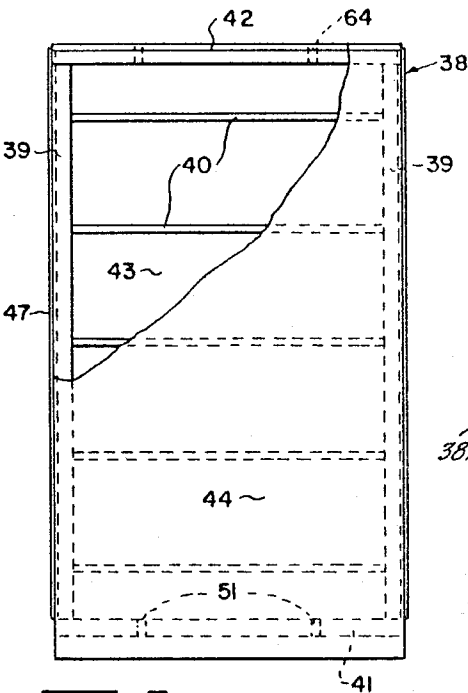


Fig. 6.

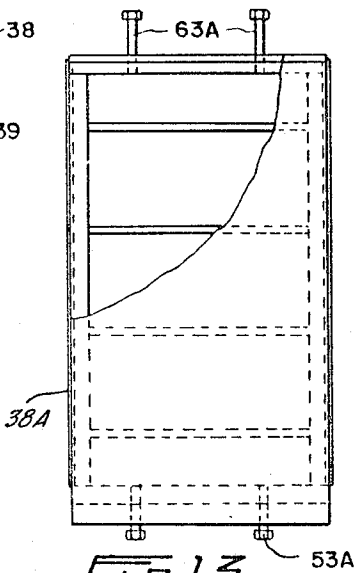


Fig. 13.

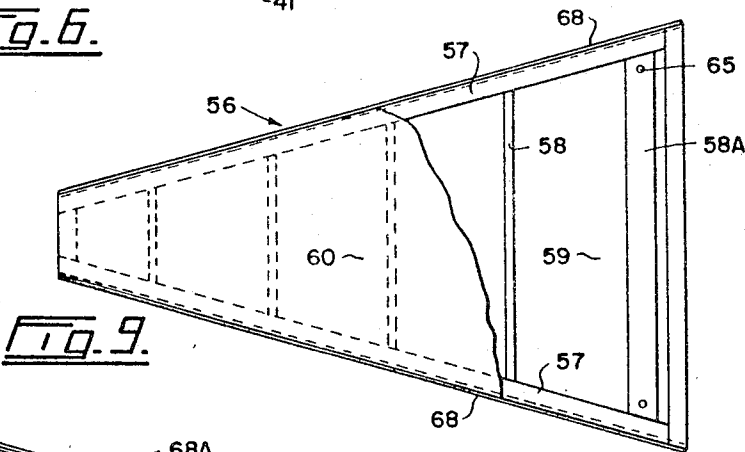


Fig. 9.

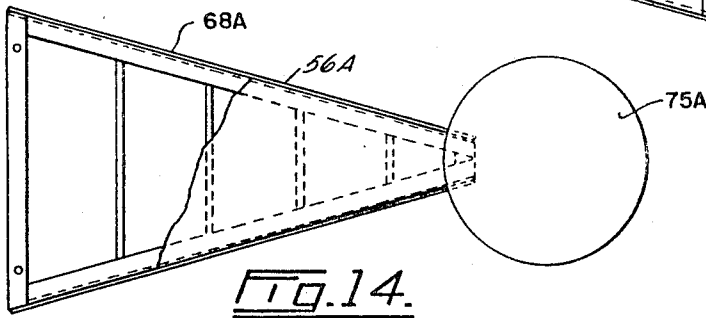


Fig. 14.

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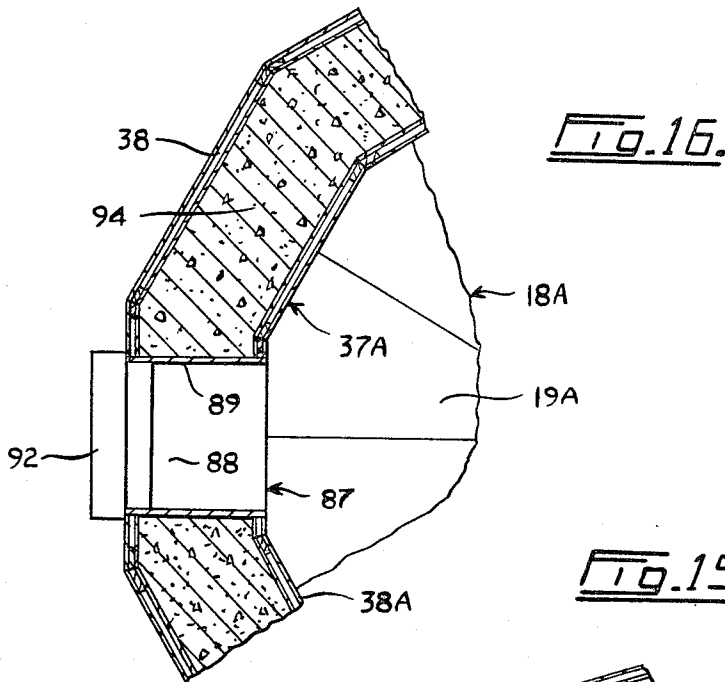
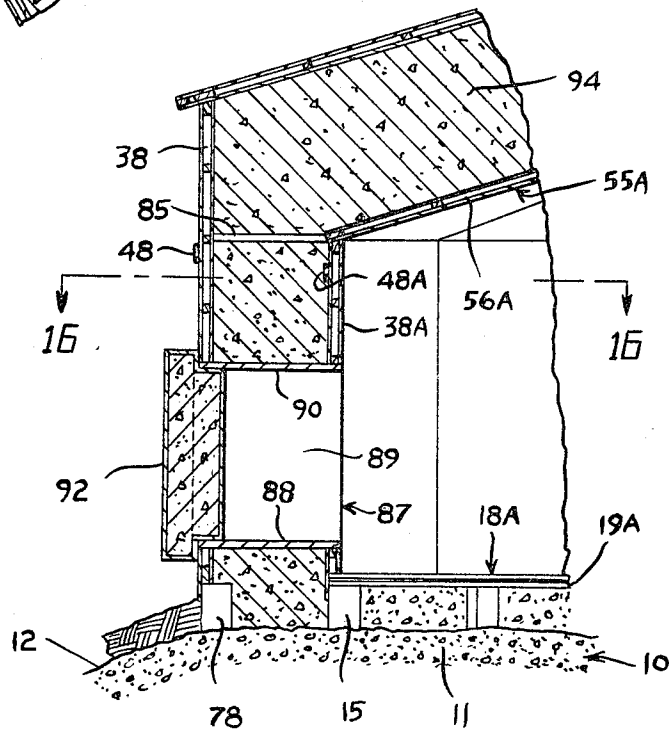
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DEMOUNTABLE BUILDING

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4 Claims. (Cl. 52-82)

This application is a continuation-in-part of my copending application Serial No. 267,087 filed March 22, 1963, and now abandoned.

The present invention relates to a structure having a number of prefabricated parts designed to be packaged and shipped as a unit for assembly at a building site, which parts are so adapted as to be rapidly disassembled, if so required, to be readily moved to another site for re-erection, and are known as demountable buildings.

Suitably modified, these structures are well adapted to provide radiation protection such as might be required in radiation observation posts, fallout shelters, and the like. Such embodiment essentially is a demountable building having as an inner shell a second, smaller, demountable building inside the larger building, the intervening space filled with sand, gravel, or other suitable material, and closable tunnel entrance means to the interior.

In previous embodiments of my building I have had to deal with maximum roof (snow) loads of, say, 55 pounds per square foot. In the novel embodiment above, the roof strength of the inner building becomes particularly important since the inner roof may be subject to loads of 200 pounds per square foot, and more.

It will be realized that this large inner roof load will impose much greater foundation loads than heretofore. Further, such buildings may require to be erected in winter conditions upon frozen ground, or hastily erected upon a site having poor bearing qualities. Thus subsidence is likely, and accordingly suitable provision against subsidence effects is provided.

I have been able to overcome these and other difficulties with the improvements of the present invention, which improvements result also in stronger and cheaper construction and erection when applied to demountable buildings of the previous general type.

The present invention consists essentially of three major elements; floor panels, wall panels and roof panels. The invention also includes an external band or bands together with miscellaneous parts.

The improved structure does not use a sill under the wall panels, does not require flashing at the junction of wall and floor, provides means to level the floor after subsidence of the peripheral foundation, avoids the use of external capping and flashing members on the radial roof joints, or of separate rafter-like members, and has further advantages which will be apparent as the disclosure proceeds.

An object of the invention is to provide a demountable building having three major elements; floor panels, wall panels and roof panels; and means to join these elements to one another.

A further object is to provide vertical adjusting means central of the floor assembly to compensate for peripheral foundation subsidence.

A still further object is to provide a wall panel having, external of the bottom member thereof, an outer skin extending below the lower edge of the floor panel thus to provide integral flashing means to protect the junction of wall and floor.

The foregoing comprising a demountable building, a still further object is to provide an exterior wall and roof in spaced relationship to the wall and roof first above mentioned and of generally similar construction thereto, the space between the walls and roofs adapted to be filled

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with radiation shielding material, tunnel means to provide access to the interior, and shielded closure means for the tunnel.

These and other objects, and further advantages, will become apparent as the disclosure proceeds.

Referring to the drawings:

FIGURE 1 is a plan of the invention, part in section.

FIGURE 2 is an elevation also part in section.

FIGURE 3 is a plan of a substantially triangular floor panel.

FIGURE 4 is an enlarged vertical section of the side edges of the floor panels.

FIGURE 5 is a fragmentary vertical section showing a floor levelling device.

FIGURE 6 is an elevation of a wall panel.

FIGURE 7 is an enlarged sectional plan of the side edges of the wall panels.

FIGURE 8 is an enlarged vertical section showing the floor and wall panel securing means.

FIGURE 9 is a plan of a roof panel.

FIGURE 10 is a detail section showing the wall and roof panel connecting means.

FIGURE 11 is a detail section of the side edges of the roof panels.

FIGURE 12 is an elevation, part in section, of a modified form of the invention.

FIGURE 13 is an elevation of an inner wall panel.

FIGURE 14 is a plan of an inner roof panel.

FIGURE 15 is a fragmentary detail sectional view of the modification of the invention.

FIGURE 16 is a section taken on the line 16-16 of FIG. 15.

As shown best in FIGURES 2 and 12 the building is adapted to be erected upon a foundation 10 which may be a substantially circular mound of gravel 11. A plastic sheet 12 may be laid upon the gravel and supported on this base is a centrally disposed concrete block 14 and circumferentially spaced blocks 15.

The building consists of a floor 18 which is formed by a number of substantially triangular panels 19, see FIGURE 3. Each floor panel consists of a frame made up of converging joists 21 which are connected by transverse members 22. At the butt end of the panel, each joist is fitted with a bearer 23 which is disposed at right angles thereto and the two bearers are joined together at the centre of the frame. The frame is enclosed by lower and upper sheets of plywood 24 and 25 respectively. A V-shaped groove 27, see FIGURE 4, is formed in the outer side edge of each joist, and seated in the complementary grooves of adjoining panels are cylindrical dowel splines 28, preferably of wood.

In FIGURE 5 it will be seen that a levelling device 30 is mounted on the block 14 and this device suitably may consist of a plate 31 on which a vertical bolt 32 is rotatably mounted. The bolt is fitted with a nut 33 having a wide horizontal flange 34. The spaced apart tips of the floor panels rest upon the flange 34 and the slotted upper end of the bolt 32 projects between said tips. A removable cover 35 is secured to the panel tips above the bolt. The device 30 serves to bring the centre of the floor into the horizontal plane of the periphery thereof during erection. When settling occurs during the life of the structure, the periphery of the floor will become lower than the centre, the device then serves to take out the central hump.

The building has a polygonal wall 37 formed of rectangular panels 38. In FIGURE 6 it will be seen that each wall panel consists of a frame made up of side studs 39 which are connected by horizontal members 40 and bottom and top rails 41 and 42 respectively. A sheet of plywood 43 covers the interior face of the frame and the exterior is similarly covered by a sheet 44. As best seen

in FIGURE 8, the sheet 44 extends downwards beyond the under side of the floor panel, whereby it becomes unnecessary to provide separate flashing at this point.

The side edges of the studs are bevelled as shown in FIGURE 7 so that the wall panels may be angularly disposed to one another and said side edges are also provided with V-shaped grooves 46 in which dowels 47 are lodged. Additionally to secure the wall panels against horizontal displacement, one or more bands 48 encircle the wall 37 and the ends of these bands are connected together by turnbuckles, not shown.

FIGURE 8 shows the preferred means of securing the wall panels to the floor panels. The bearers 23 are provided with a centrally disposed openings 50 which are aligned with openings 51 drilled in the bottom rail 41 near the studs. Suitably, the openings 50 and 51 are jig drilled to ensure accurate fit in assembly.

The openings 51 are countersunk to receive nuts 52 and these members are engaged by bolts 53 which extend upwardly through the aligned openings. It will be noted that each wall panel is centered above the joists, viz. it extends across two adjoining floor panels with the groove faces of the studs being disposed above the joint between the bearers, see particularly FIGURE 1.

The building is provided with a pyramidal roof 55 formed of triangular panels 56. As shown in FIGURE 9 the roof panel has a frame formed of converging rafters 57 which are connected by cross members 58. Plywood sheets 59 and 60 cover the inner and outer faces of the roof panel frame.

Each roof panel rests upon a single wall panel with the upper edge of the top rail 42 being suitably bevelled as shown in FIGURE 10. The wall and roof panels are secured together by nuts 62 and bolts 63 with the bolts extending through openings 64 and 65 formed in the rails 42 and members 58A respectively. The roof panels are also secured together by dowels 68 seated in complementary V-shaped grooves 69 formed in the panel members 57. Above the dowel receiving grooves the edges of the members 57 and the edges of the sheets 60 are bevelled so as to define a channel 70, see FIGURE 11. This channel is adapted to be filled with a suitable water-proofing compound 71 so as to provide an effective seal between the roof panels.

This construction eliminates the capping, flashing and similar members found in previous constructions.

The narrow ends of the roof panels define a polygonal opening 74, and this opening is closed by suitable cap 75, which is sealed against the entrance of moisture.

The above described construction provides adequate protection from the weather but if shelter from atomic fallout is required I propose to build the structure as shown particularly in FIGS. 12 to 16. This shelter is adapted to be erected on a similar foundation 10 on which a central block 14 and suitably spaced outer edge blocks 15 are mounted as before. The floor 18A of the fallout shelter is made up of triangular panels 19A, the tips of which are supported by the levelling device 30.

Mounted on the floor panels 19A is an inner wall 37A formed of panels 38A. The rectangular inner wall panels support an inner roof 55A made up of triangular panels 56A. A cap 75A forms a closure for the opening defined by the tips of the roof panels 56A.

The floor, wall, roof panels and roof cap of the fallout shelter are of the same construction as in the previously described embodiment of the invention but obviously are of proportionately smaller size. Bolts 53A secure the wall panels to the floor panels as before and other bolts 63A similarly lock the wall and roof panels together. One or more turnbuckle-fitted bands 48A encircle the inner wall 37A to apply clamping pressure to the several panels making up the inner structure.

Enclosing the inner structure is an outer building having a wall made up of the panels 38. A circular row of blocks 78 are mounted on the foundation 10 and these

blocks serve to support the abutting edges of the outer wall panels 38. The remainder of the outer shell of the building is constructed substantially as previously described, however, it will be noticed that no flooring is laid between the inner and outer walls of the shelter. Preferably the wall panels 38 and 38A are connected together by suitably located stays 85.

Extending between the inner and outer walls is a walk-in entrance 87 consisting of a floor 88, sides 89 and a roof 90. The floor 88 preferably is a short step up from the floor 18A of the shelter. A door 92 is mounted on the outer end of the tunnel 87 and desirably this door is a hollow structure filled with a suitable radiation shielding material.

The space between the inner and outer wall and roof panels is entirely filled with a material 94 such as sand and gravel. The fill 94 which is contained by the inner and outer walls of the shelter rests on the foundation 10 and occupies the space between the blocks 15 and 78 around the entire polygonal shelter as well as beneath the floor 88 of the entrance. Thus, the slightly elevated floor 18A is completely sealed from weather and radiation and the weight of the fill, except that which occupies the space above the inner roof, is supported by the foundation. The building then is firmly anchored to the ground and the load the structure is required to support is reduced to a point where no additional reinforcing members are required.

A building of this construction having such load supporting requirements is subjected to a certain amount of settling over a period of time. The levelling device 30 therefore is extremely important, particularly since it is not feasible to provide access to the space beneath the floor from the exterior of the shelter. As settling occurs the owner can periodically level the floor simply by raising the cover 35 and adjusting the bolt 32 to raise or lower the tips of the floor panels.

I have pointed out that, in a fallout shelter as herein described, the roof of the inner building may be subject to very large loads, and accordingly the inner building of a fallout shelter embodiment of my invention is as above described. In certain circumstances it may be desirable that the outer building be of the same construction. In other circumstances, a main purpose of the outer construction may be to retain the protective material, in which circumstances I may utilize any suitable means to attain this end, for instance an outer building of a previous demountable construction.

What I claim is:

1. A demountable building comprising a floor formed of substantially triangular panels supported upon a foundation, inner and outer peripheral walls each formed of rectangular panels, said inner wall panels being supported on the outer edges of the floor panels, inner and outer pyramidal roofs each formed of substantially triangular panels, all the aforesaid panels being secured together in edge to edge relation by removable members seated in complementary panel side edge grooves, fastening members securing the inner wall panels to adjoining floor and inner roof panels and the outer wall panels to the outer roof panels, said inner and outer peripheral walls each being encircled by a constricting band, said inner and outer pyramidal roofs each having their apexes covered by a cap, a tunnel extending between the inner peripheral wall and the outer peripheral wall to provide access to the interior of the building, a closure for the outer end of the tunnel, a filling of radiation shielding material between the inner and outer peripheral walls and the inner and outer pyramidal roofs, said filling extending below the lower edges of the inner and outer wall panels to rest upon the foundation.

2. A demountable building as claimed in claim 1, and vertically adjustable means accessible from the interior of the building supporting the apexes of the floor panels.

3. A demountable building as claimed in claim 2,

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wherein the foundation includes an outer circle of blocks and the abutting side edges of the outer wall panels bear directly upon said blocks.

4. A demountable building as claimed in claim 3, wherein the inner and outer peripheral walls are inter-connected by stays.

References Cited by the Examiner

UNITED STATES PATENTS

2,363,765	11/1944	Fleming-Williams	-----	190—1
3,068,534	12/1962	Hu	-----	52—237 X
3,152,366	10/1964	McCrorry et al.	-----	52—237 X

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FOREIGN PATENTS

1962	Canada.
1951	France.
1956	France.
1962	France.
1946	Great Britain.

OTHER REFERENCES

“Steel Shelters for Fallout Protection,” prepared by American Iron and Steel Institute, December 1961, page 5.

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