# United States Patent [19]

**Testaguzza et al.**

[11] **3,828,496**

[45] **Aug. 13, 1974**


[54] **PREFABRICATED BUILDING CONSTRUCTION**


[76] Inventors: **Gino S. Testaguzza**, Oxford; **Paul A. Perini**, Madison Heights, both of Mich.



[22] Filed: **Feb. 22, 1973**

[21] Appl. No.: **334,923**

**Related U.S. Application Data**

[63] Continuation of Ser. No. 115,179, Feb. 16, 1971, abandoned.

[52] **U.S. Cl.** ..... **52/91**, 52/259, 52/309, 52/615

[51] **Int. Cl.** ..... **E04b 1/54**

[58] **Field of Search** ..... 52/91, 615, 309, 250, 259, 52/439



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[57] **ABSTRACT**

A prefabricated building construction comprising a base, a plurality of wall units and a plurality of roof units. Each of the wall units comprises at least one panel with a hollow vertical opening therein. Each roof unit comprises at least one panel with a hollow portion therein. When the wall units and roof units are placed in position, the hollow portions of the wall units and the hollow portions of the roof units are in communication and concrete or other settable material is poured through the openings to provide a unitary structure. Reinforcing rods and the like can be positioned in the communicating hollow portions.


**4 Claims, 18 Drawing Figures**

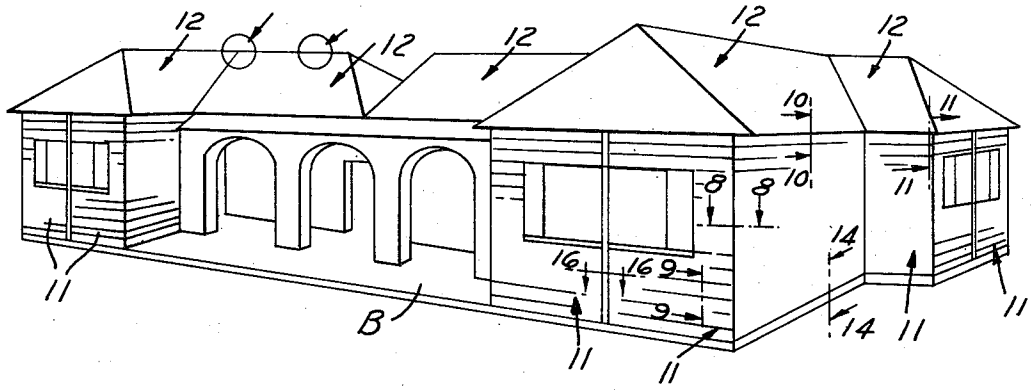

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FIG.1

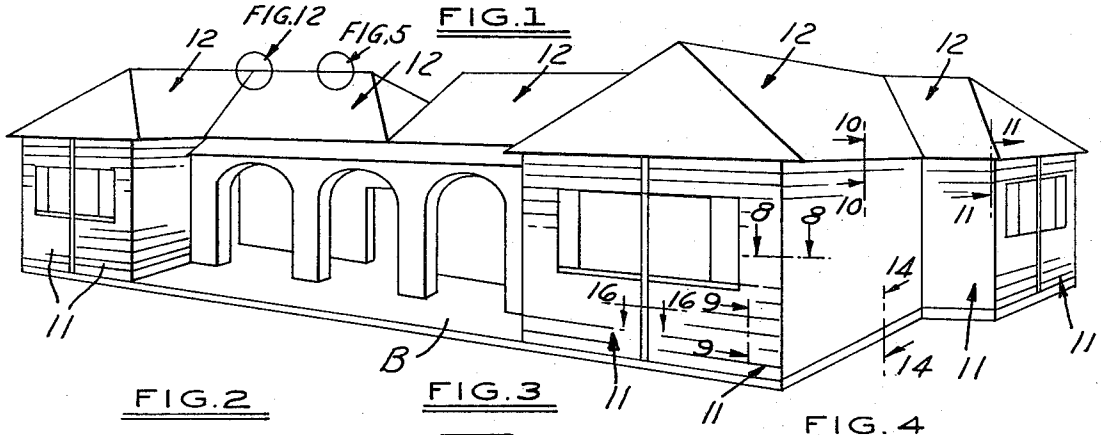


FIG.2

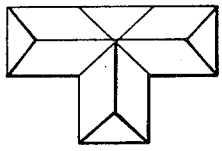

FIG.3

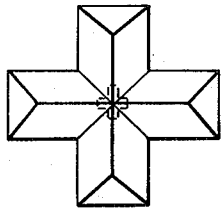

FIG.4

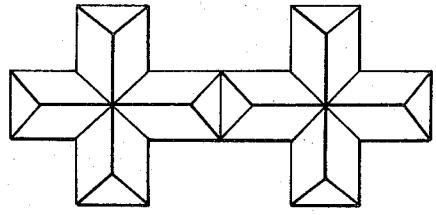

FIG.5

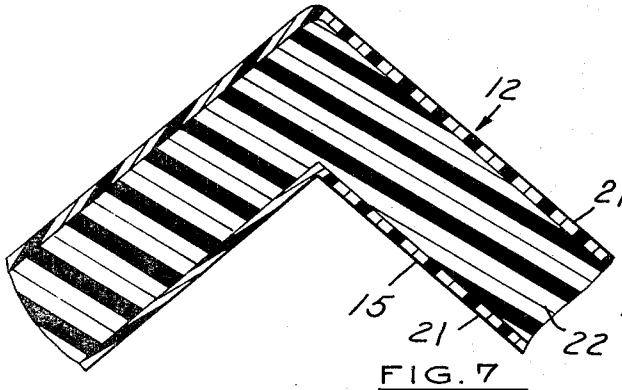


FIG.6

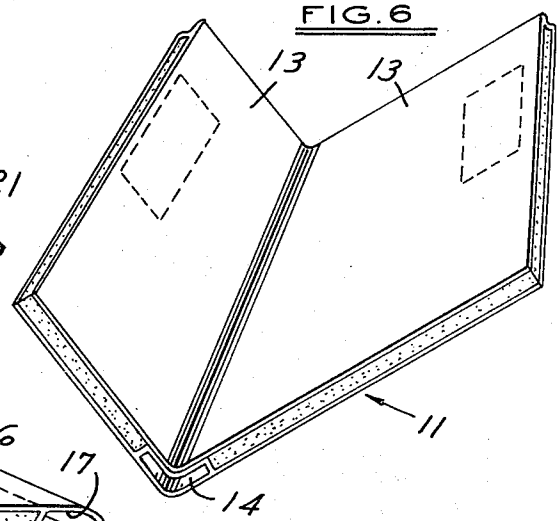


FIG.7

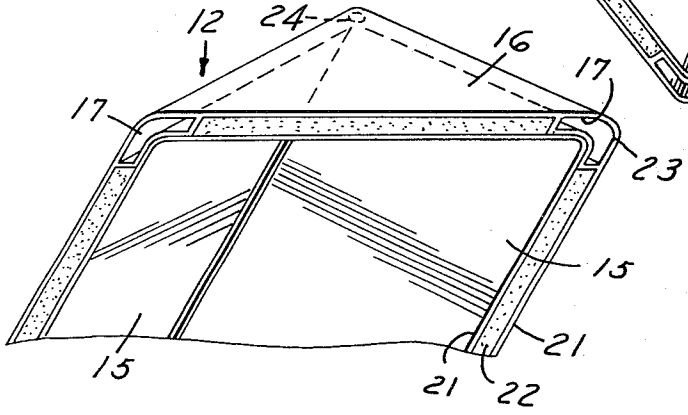


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FIG. 8

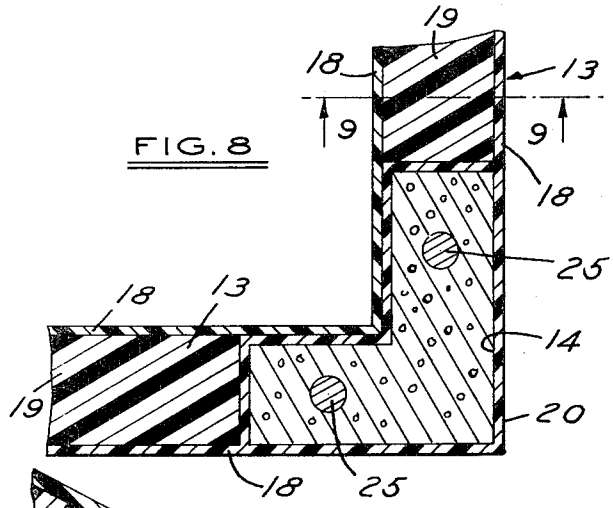


FIG. 9

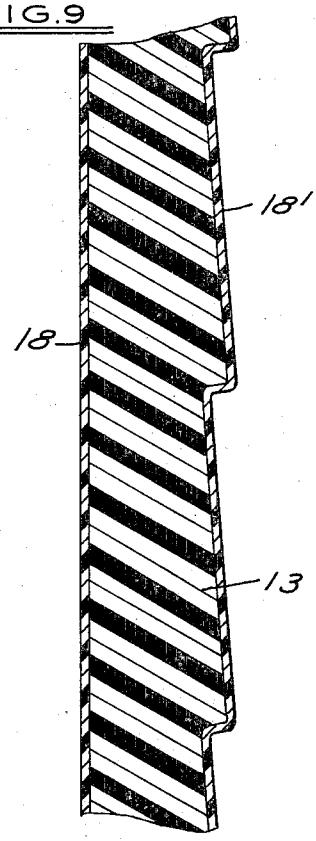


FIG. 10

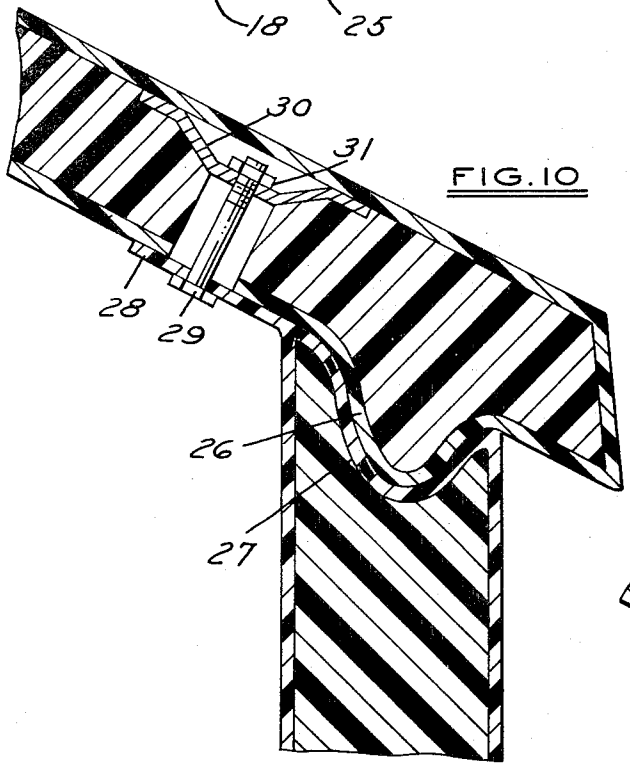


FIG. 11

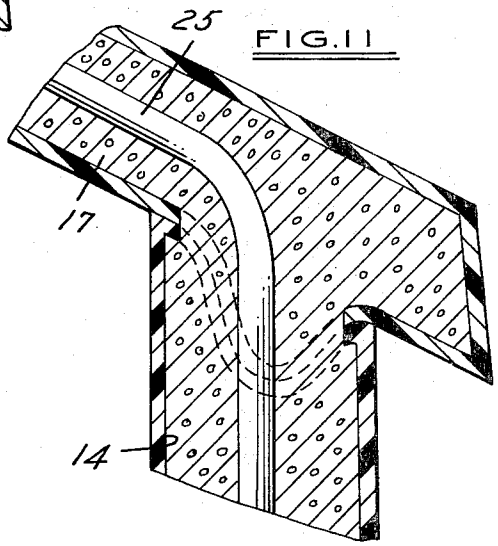


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FIG. 12

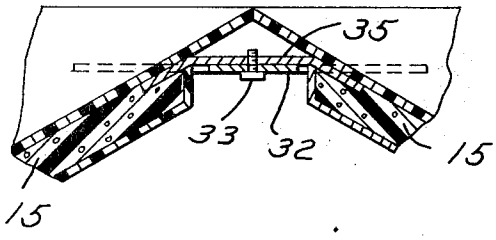



FIG. 13

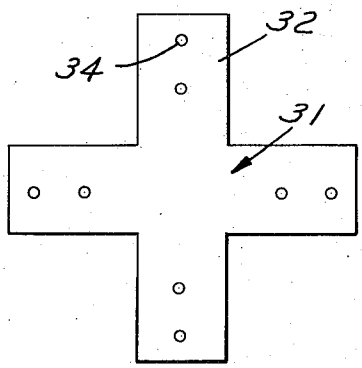



FIG. 14

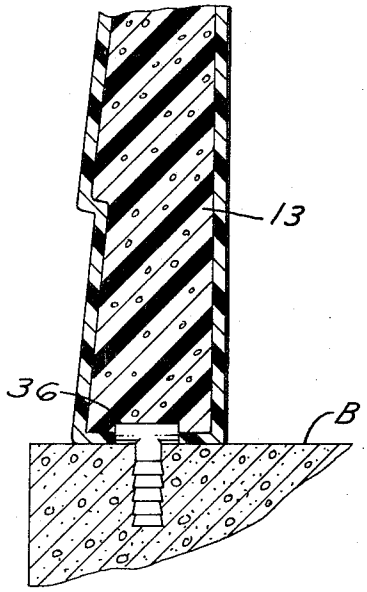



FIG. 15

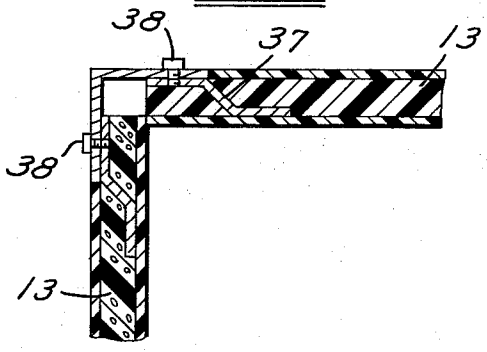



FIG. 16

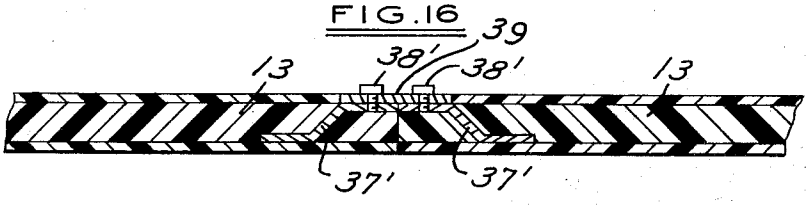



FIG. 17

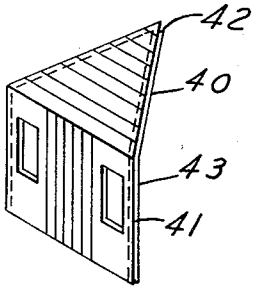
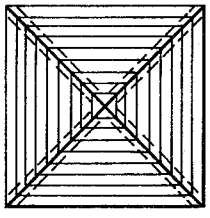



FIG. 18



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# PREFABRICATED BUILDING CONSTRUCTION

This application is a continuation of application Ser. No. 115,179, filed Feb. 16, 1971, now abandoned.

This invention relates to prefabricated building construction.

## BACKGROUND OF THE INVENTION

It is becoming increasingly evident that low cost, durable construction for buildings is desirable and essential to meet the needs.

Accordingly, among the objects of the present invention are to provide a prefabricated building construction wherein the major components of the building are formed off the job site and delivered to the job site; wherein the components when assembled provide a durable structure that requires minimum maintenance and can be used under various climatic conditions.

## SUMMARY OF THE INVENTION

A prefabricated building construction comprising a base, a plurality of wall units and a plurality of roof units. Each of the wall units comprises at least one panel with a hollow vertical opening therein. Each roof unit comprises at least one panel with a hollow portion therein. When the wall units and roof units are placed in position, the hollow portions of the wall units and the hollow portions of the roof units are in communication and concrete or other settable material is poured through the openings to provide a unitary structure. Reinforcing rods and the like can be positioned in the communicating hollow portions.

## DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a building embodying the invention.

FIGS. 2–4 are diagrammatic plan views showing various building constructions embodying the invention.

FIG. 5 is a fragmentary sectional view on an enlarged scale taken at the encircled area designated FIG. 5 in FIG. 1.

FIG. 6 is a fragmentary perspective view of a wall unit embodying the invention.

FIG. 7 is a fragmentary perspective view of a portion of the roof unit embodying the invention.

FIG. 8 is a fragmentary horizontal sectional view on an enlarged scale taken along the line 8—8 in FIG. 1.

FIG. 9 is a fragmentary vertical sectional view taken along the line 9—9 in FIG. 8.

FIG. 10 is a fragmentary sectional view taken along the line 10—10 in FIG. 1.

FIG. 11 is a fragmentary sectional view taken along the line 11—11 in FIG. 1.

FIG. 12 is a fragmentary sectional view on an enlarged scale taken at the encircled area designated FIG. 12 in FIG. 1.

FIG. 13 is a plan view of a portion of the structure shown in FIG. 12.

FIG. 14 is a fragmentary vertical sectional view taken along the line 14—14 in FIG. 1.

FIG. 15 is a horizontal sectional view through a modified form of the invention.

FIG. 16 is a sectional view taken along the line 16—16 in FIG. 1.

FIG. 17 is a perspective view of a modified form of wall element.



FIG. 18 is a plan view of a modified form of the invention.

## DESCRIPTION

Referring to FIGS. 1–4, the buildings embodying the invention basically utilize prefabricated components including wall units 11 and roof units 12. Each wall unit 11 comprises two panels 13 connected by a vertical hollow portion 14. Each roof unit comprises angularly related panels 15 and transverse angularly related panel 16 defining a gable with hollow portions 17 spacing the edges of the panels 15, 16. As shown in FIGS. 1–4 the units can be assembled to form buildings of various sizes and floor plans.

Referring more specifically to the wall units 11, each panel 13 comprises outer layers 18 such as fiber reinforced plastic filled with a foam plastic material 19 such as urethane. The hollow portion 14 between panels 13 is defined by a prefabricated box 20 of similar reinforced fibrous glass material.

In manufacturing the wall unit, the layers 18 are placed along the walls of a mold, the box 20 is placed in position and the plastic material 19 is foamed in place. Instead of using a prefabricated box, the layers can be formed in situ by using an insert to define the hollow portion 14 and the plastic material may be then foamed in place. As shown in FIG. 9, the outer layer 18′ of the plastic material may have a configuration for decorative purposes.

The roof unit 12, such as shown in FIG. 7, is similarly formed of outer layers 21 filled with a foam plastic material 22 and boxes 23 defining the hollow portions 17.

The wall units 11 are assembled on a base B (FIG. 1) to form the walls of the building and then one or more roof units 12 are positioned over the wall units with the openings or hollow portions 17 in communication with the hollow portions 14. Concrete or similar fill material is poured through an opening 24 in each roof unit 12 to form a unitary structure. If desired, reinforcing rods 25 can be provided in the openings 14, 17 (FIG. 11).

The roof units 12 and wall units 11 are provided with interengaging projections 26 and recesses 27 at some portions thereof to provide for interfitting of the components (FIG. 11).

The roof units and wall units are preferably interconnected by a structure such as shown in FIG. 10 which includes an integral projection 28 that extends upwardly from the interior surface of the wall unit into underlying relationship with the undersurface of the roof unit and a bolt 29 that is positioned and extends through the wall portion 28 into and through a plate 30 embedded in the roof unit. A nut 31 welded to the plate provides a means for threading the bolt 29 to mechanically lock the roof unit and wall unit. At the intersection of four roof units for example as shown in broken lines in FIG. 3, a mechanical joint may be provided by the structure shown in FIGS. 12 and 13 which includes a cross-shaped metal piece 31 that has arms 32 that project into the area of the open end of the roof panels 15. One or more screws 33 extend through openings 34 of the member 31 into embedded plates 35 at the open end of the juncture of apex formed by the panels 15. The wall units are fastened to the base by various structures such as an embedded metal member 36 which is embedded both in the panel 13 and the base B.

Where two panels are brought together at an angle, a joint such as shown in FIG. **15** may be used comprising bent plate members **37** embedded in each panel **13** into which screws **38** can be threaded.

A similar joint may be provided between adjacent panels for example where the panels **13** lie in the same plane utilizing members **37, 37'** but utilizing a bridging plate **39.**

In the form of the invention shown in FIGS. **17** and **18,** the units comprise integral roof panels **40** that are generally triangular in shape and wall panels **41** that are generally rectangular in shape, the roof and wall panels being interconnected. Each roof and wall panel has communicating openings or cavities **42, 43** which cooperate with the openings **42, 43** of the adjacent panel to provide closed openings through which material may be poured to assemble the building. As shown in FIG. **18,** units comprising a roof panel and a wall panel can be assembled in various configurations to form a building.

We claim:

**1.** In a prefabricated building construction, the combination comprising

a base structure,

a plurality of prefabricated substantially identical wall units mounted on said base structure to provide generally vertical walls,

each said wall unit comprising continuous outer layers of fiber reinforced plastic providing a space between said layers,

the major portion of the space between said layers being filled with a foam plastic material,

each said wall unit having intergral angularly related wall panel portions defined by said outer layers and said foam plastic filler,

each said wall unit being formed in situ during manufacture of the units to provide a hollow space at the area of juncture of the wall panel portions extending the entire length of the wall panel portions,

at least one roof unit mounted on said wall units,

said roof unit including continuous spaced layers of fiber reinforced plastic material providing a space between said layers,

the major portion of the space between said layers being substantially filled with said foam plastic material,

each said roof unit including intergral two angularly related roof panel portions and an end panel portion extending transversely of the roof panel portions,

said roof panel and end panel portions being defined by said layers of said roof unit,

said roof unit being formed in situ during manufacture of the unit to provide a hollow space at the area of intersection of the roof panel and end panel portions,

said wall units being positioned in side-by-side relationship,

said roof unit being positioned on said wall units with the hollow spaces of the roof unit communicating with the hollow spaces of the wall units,

and a material cast in situ after the wall units and roof units have been superimposed filling said hollow spaces of the roof unit and wall units and thereby forming an integral structure.

**2.** The combination set forth in claim **1** including reinforcing elements extending through said hollow spaces.

**3.** For use in a prefabricated building construction, a pair of wall units comprising

continuous outer layers of fiber reinforced plastic providing a space between said layers,

the major portion of the space between said layers being filled with a foam plastic material,

each said wall unit being formed in situ during manufacture of the units to provide a hollow space at the area of juncture of the wall panel portions extending the entire length of the wall panel portions,

a roof unit adapted to be mounted on said wall units,

said roof unit including continuous spaced layers of fiber reinforced plastic material providing a space between said layers,

said wall units and said roof unit having intergral angularly related panel portions defined by said outer layers and said foam plastic filler,

said roof unit being formed in situ during manufacture of the units to provide a hollow space at the area of intersection of the roof panel and end panel portions,

said wall units being adapted to be positioned in side-by-side relationship and said roof unit being adapted to be positioned within said wall units with the hollow spaces of the said roof unit communicating with the hollow spaces of said wall units.

**4.** The combination set forth in claim **3** including reinforcing elements extending through said hollow spaces.

* * * * *