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PANEL WALL STRUCTURAL UNIT AND BUILDING CONSTRUCTION

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Fig. 1.

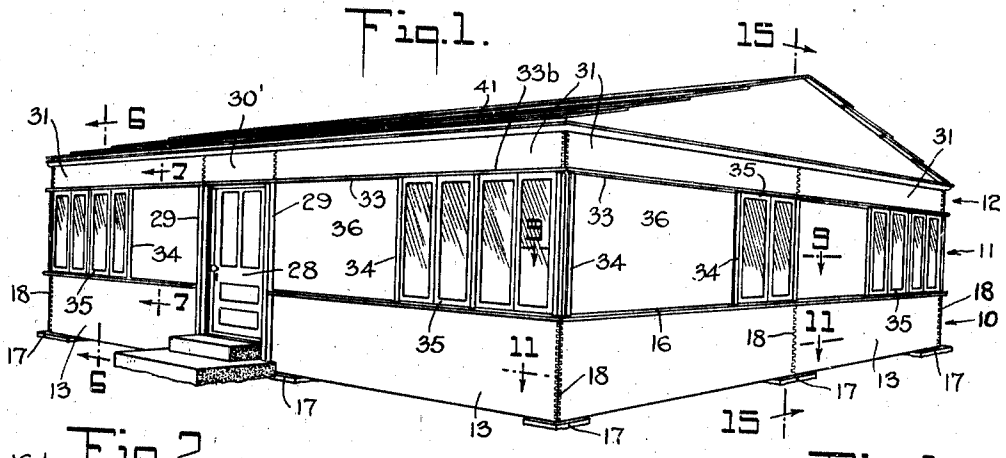


Fig. 2.

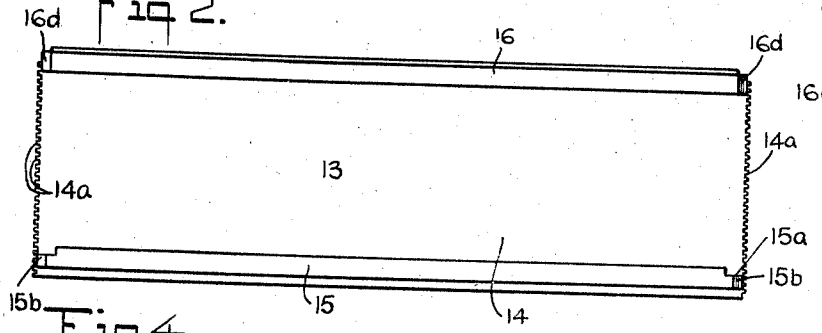


Fig. 3.

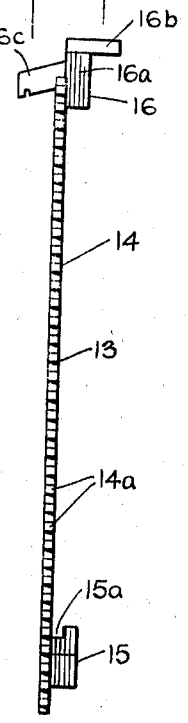


Fig. 4.

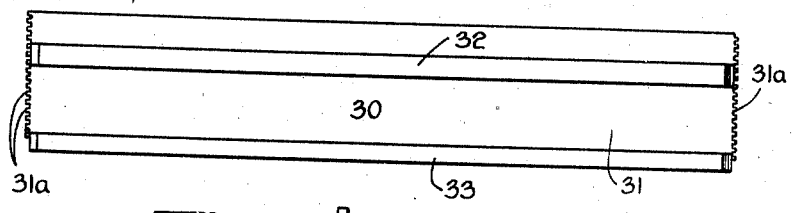
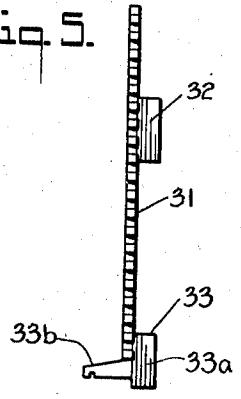


Fig. 5.



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PANEL WALL STRUCTURAL UNIT AND BUILDING CONSTRUCTION

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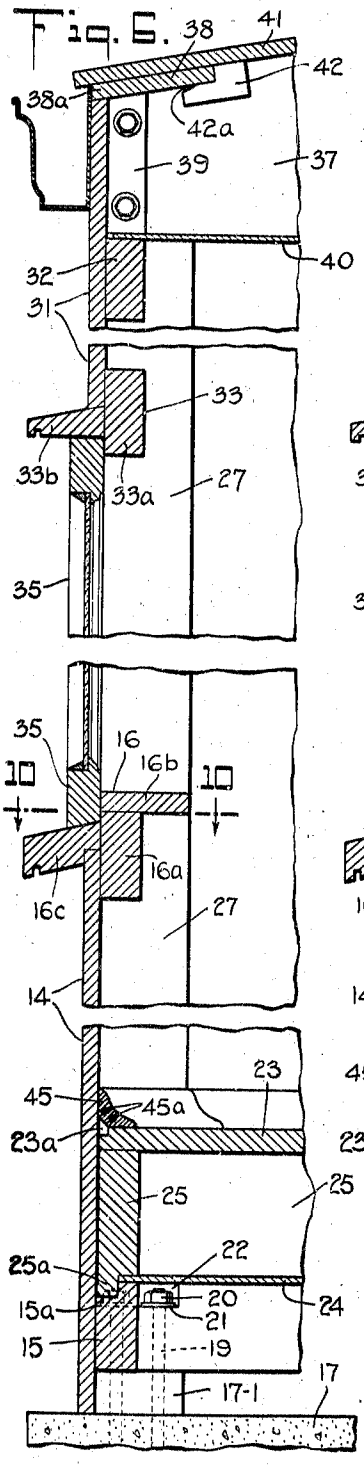
Fig. 6.



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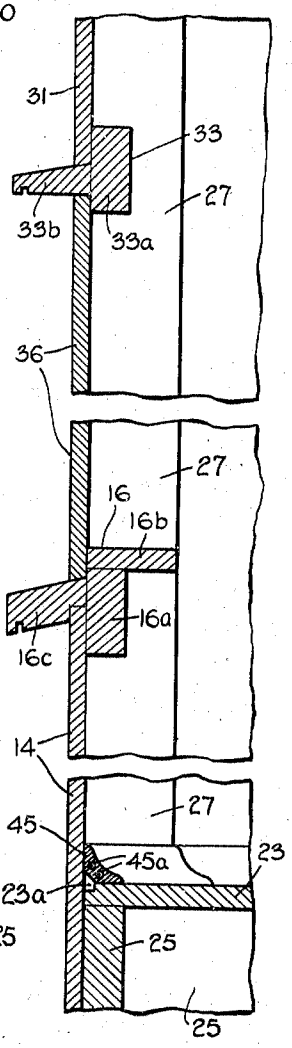
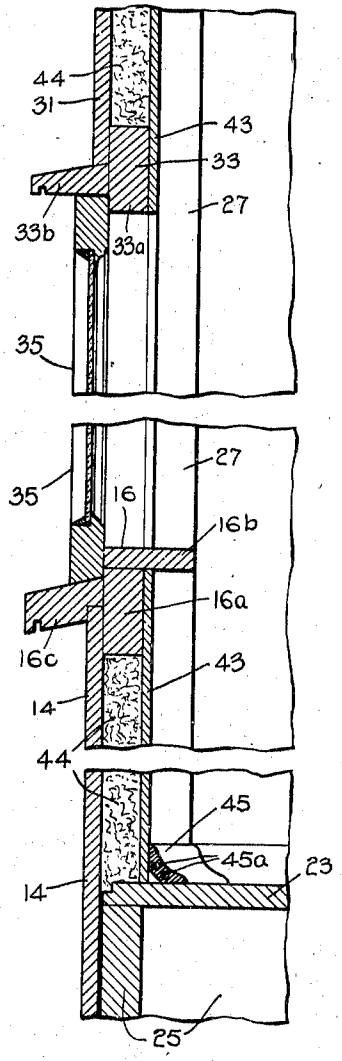


Fig. 8.



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PANEL WALL STRUCTURAL UNIT AND BUILDING CONSTRUCTION

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Fig. 9.

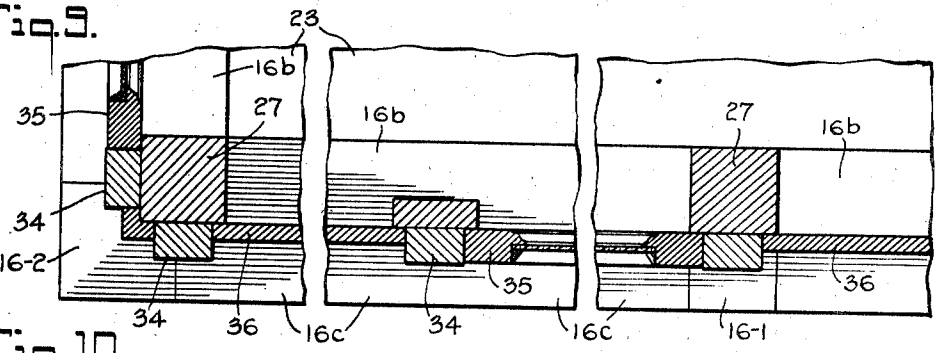


Fig. 10.

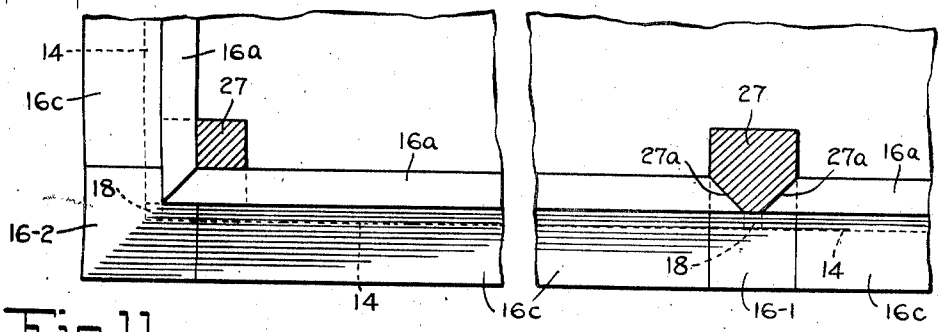


Fig. 11.

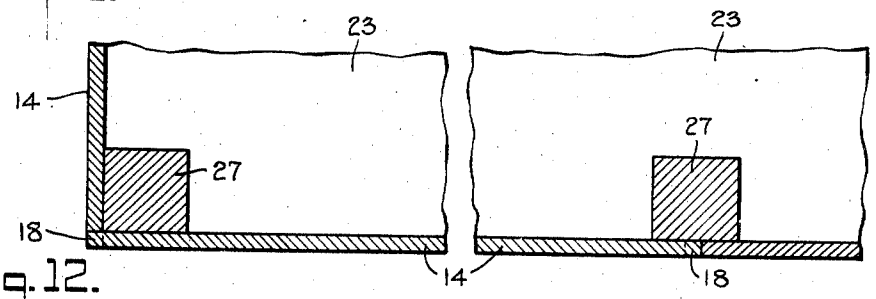


Fig. 12.

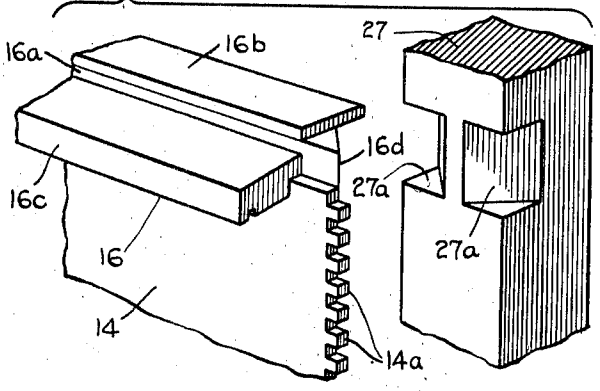


Fig. 13.

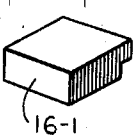
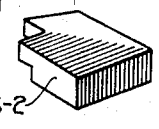


Fig. 14



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PANEL WALL STRUCTURAL UNIT AND BUILDING CONSTRUCTION

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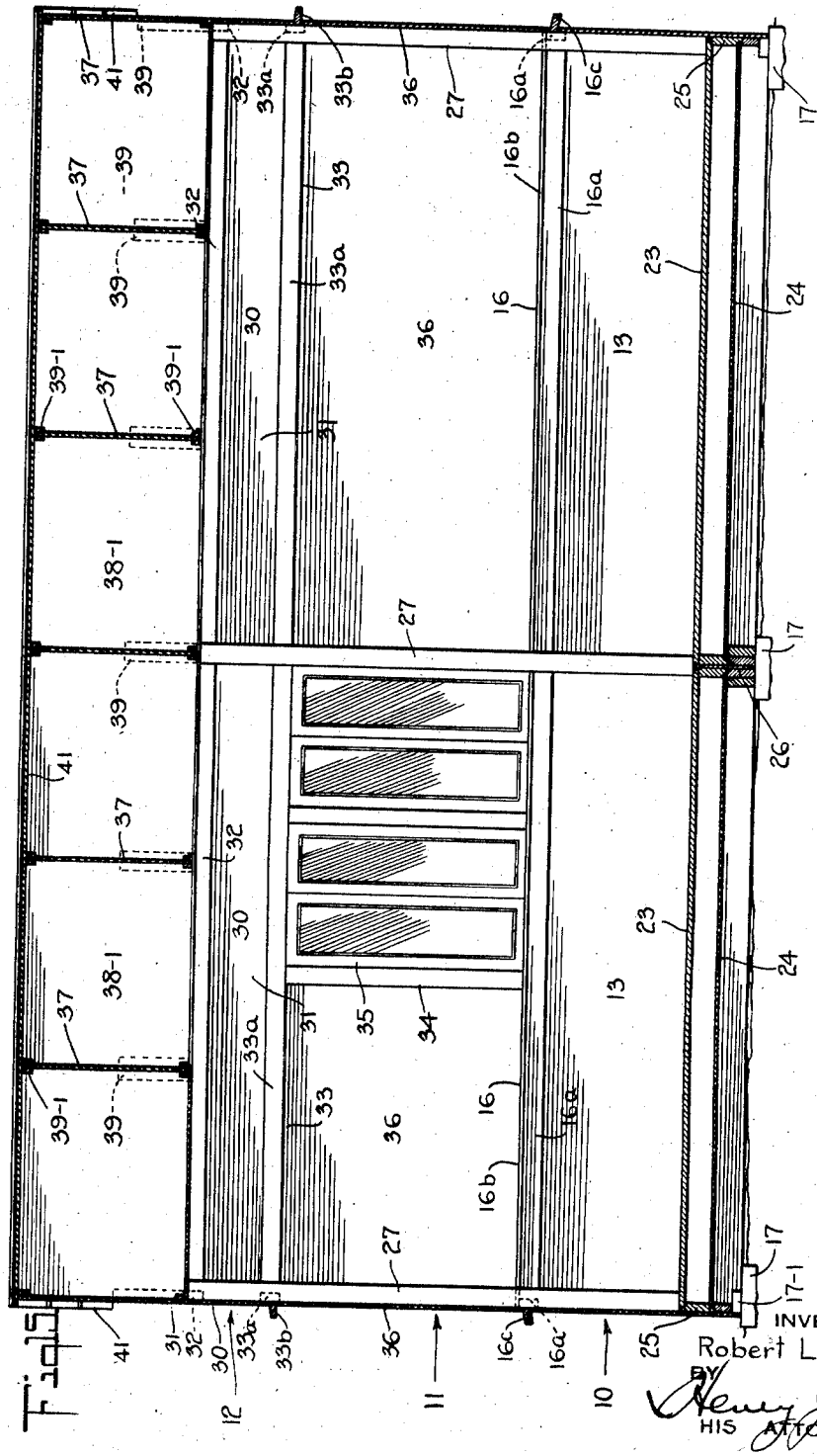

Fig. 15

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PANEL WALL STRUCTURAL UNIT AND BUILDING CONSTRUCTION

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Fig. 16.

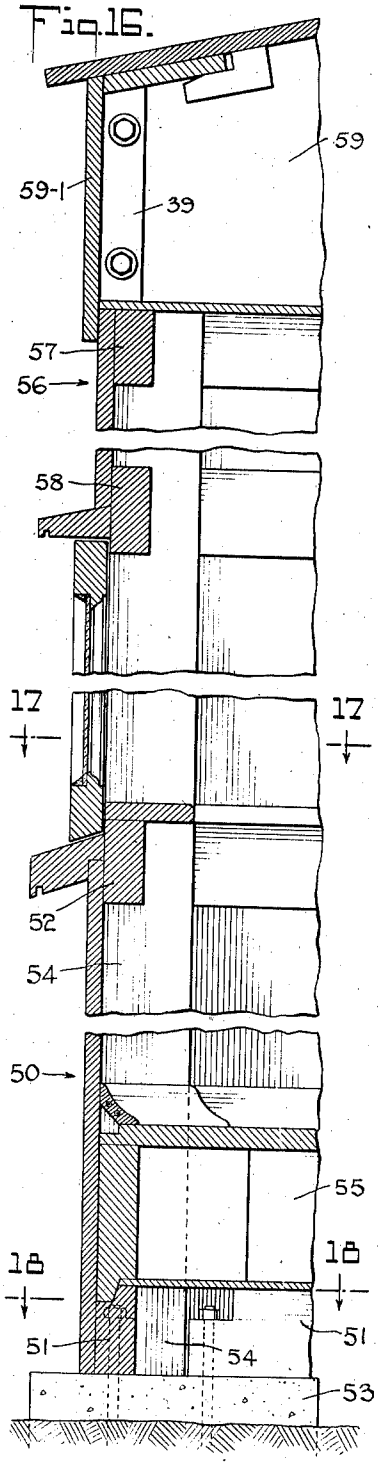


Fig. 23.

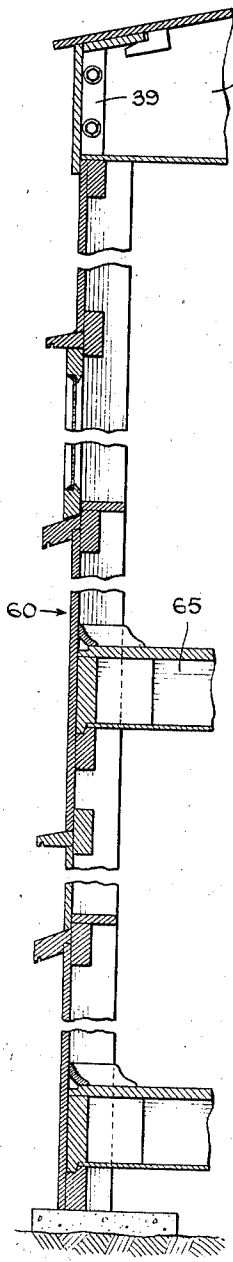


Fig. 18.

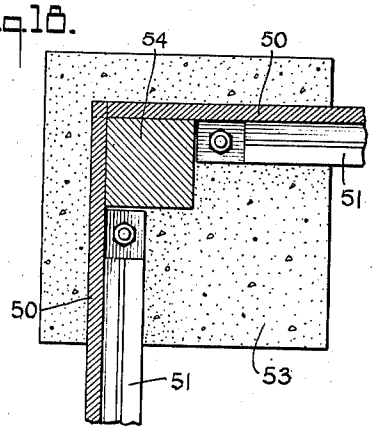
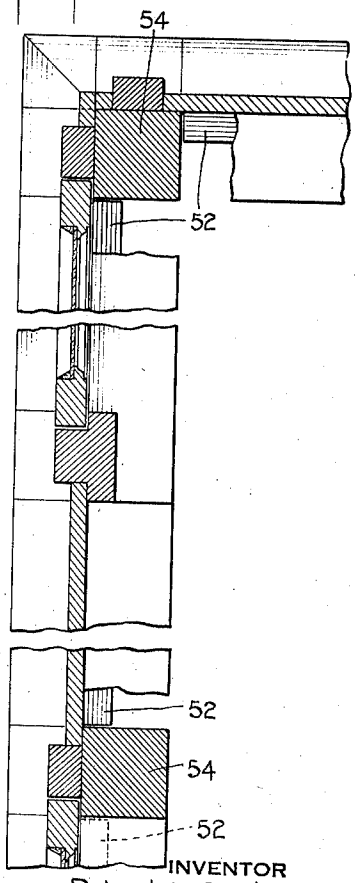


Fig. 17.



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PANEL WALL STRUCTURAL UNIT AND BUILDING CONSTRUCTION

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Fig. 21.

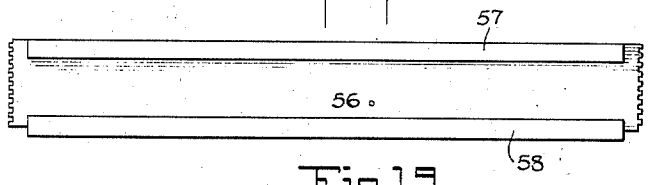
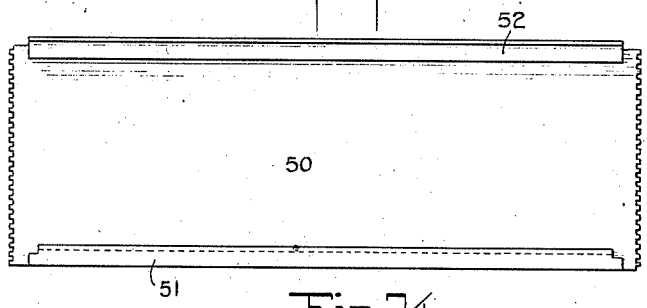


Fig. 19.



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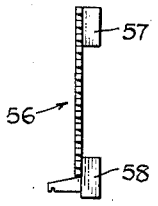
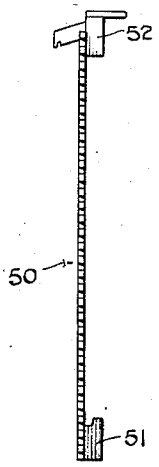


Fig. 20.



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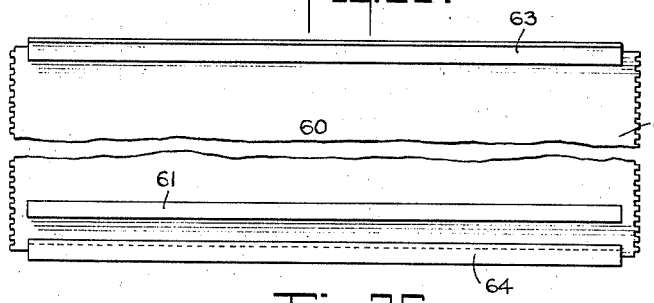

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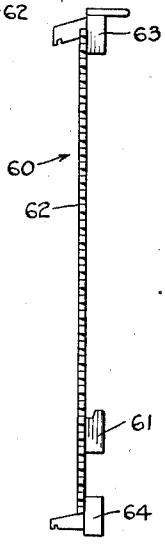

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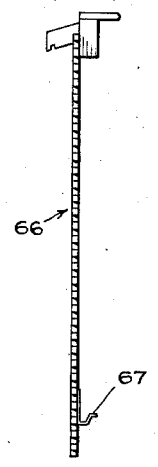

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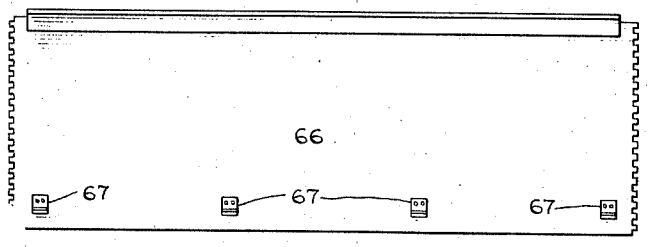

Fig. 28.

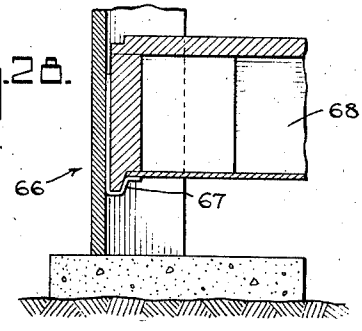

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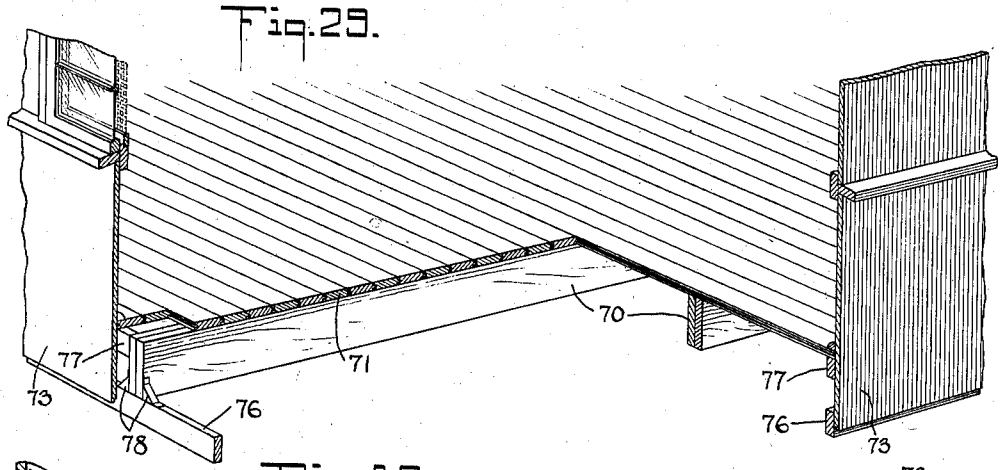
Fig. 29.



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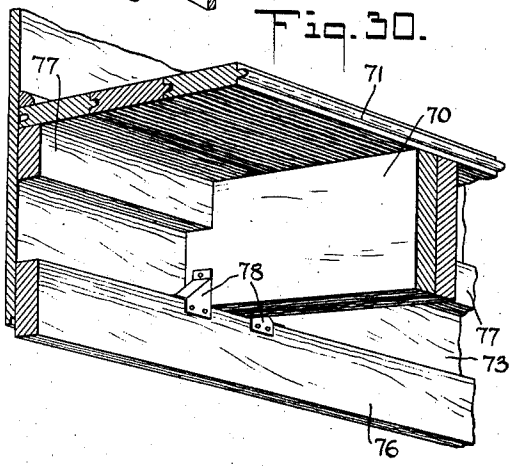


Fig. 31.

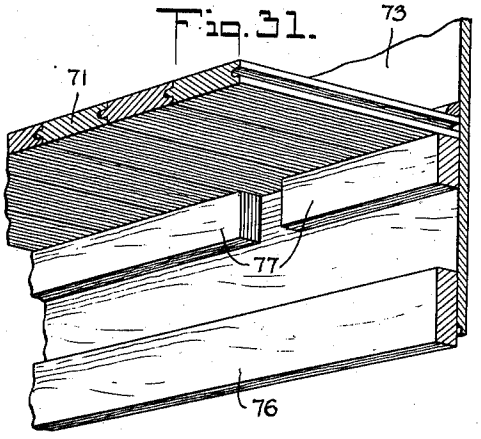


Fig. 32.

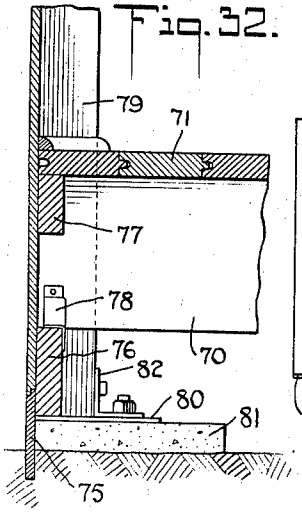
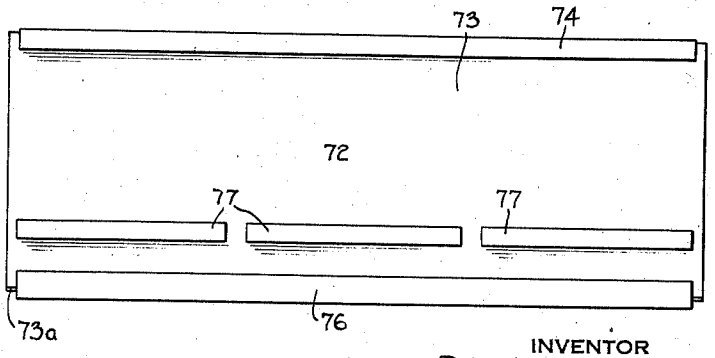


Fig. 33.



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PANEL WALL STRUCTURAL UNIT AND BUILDING CONSTRUCTION

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Fig. 34.

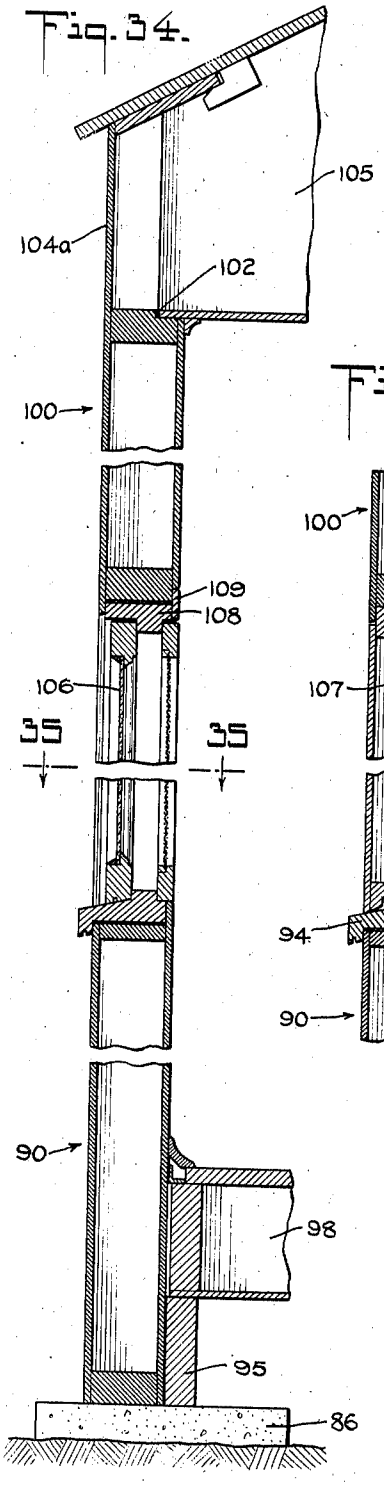


Fig. 37.

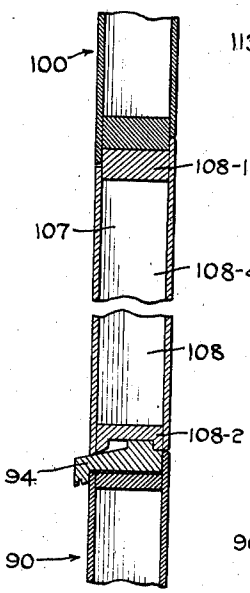


Fig. 44.

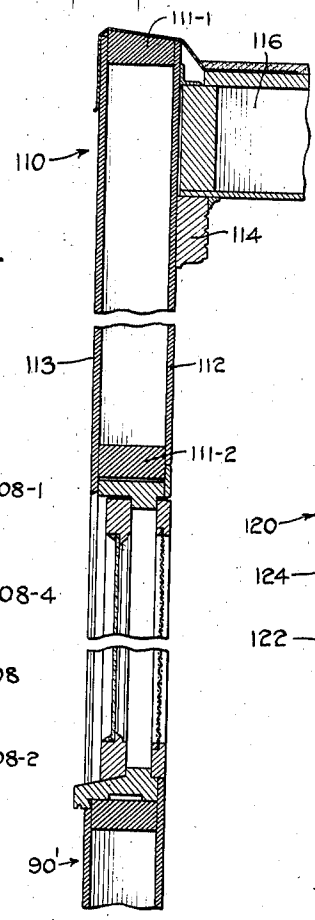


Fig. 46.

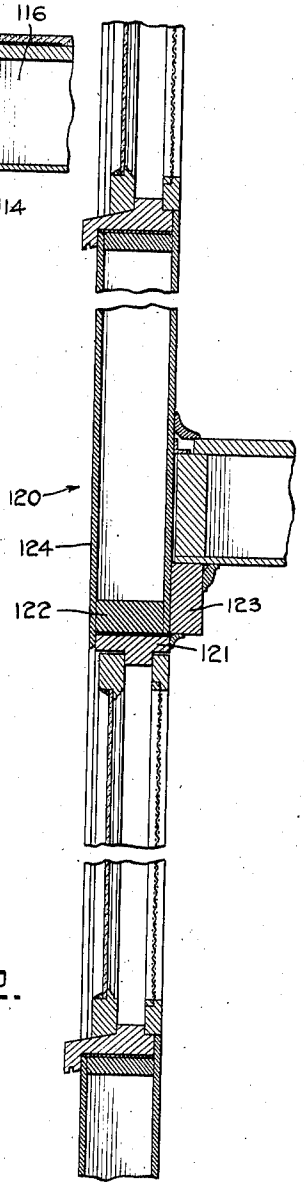
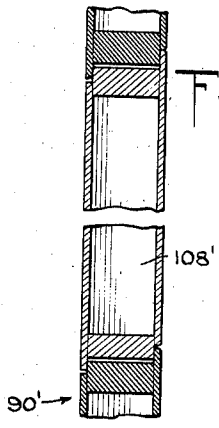


Fig. 42.



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PANEL WALL STRUCTURAL UNIT AND BUILDING CONSTRUCTION

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Fig. 35.

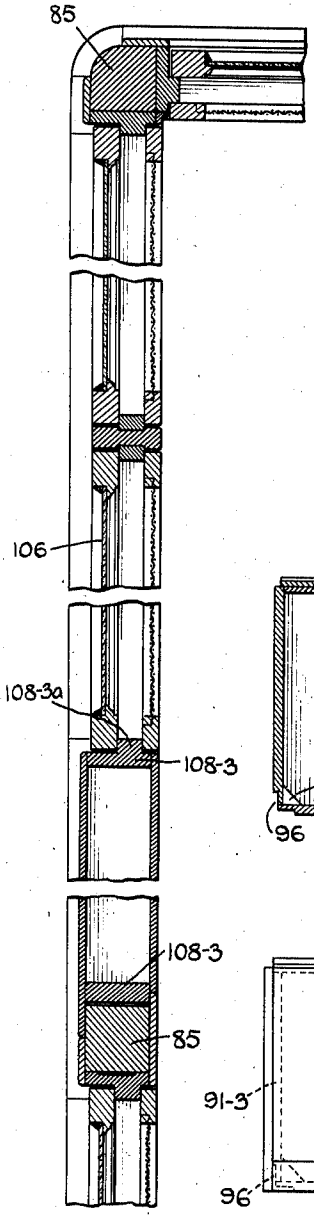

Fig. 39.

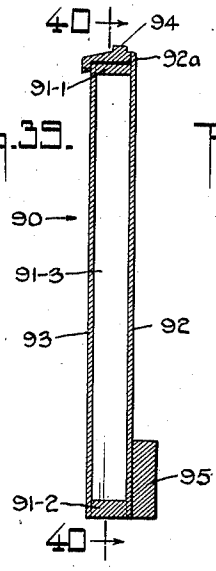

Fig. 43.

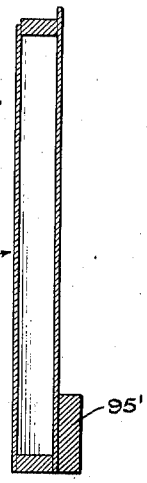

Fig. 40.

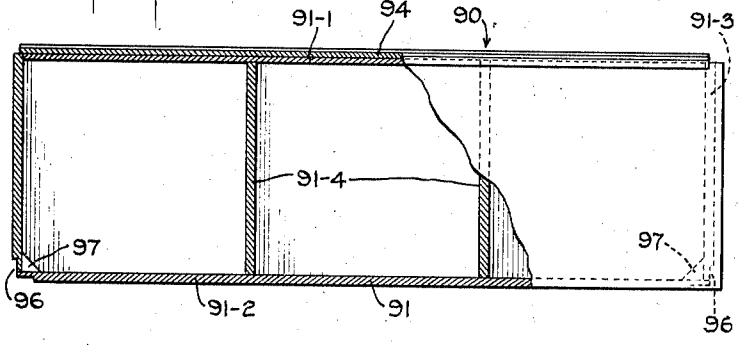

Fig. 38.

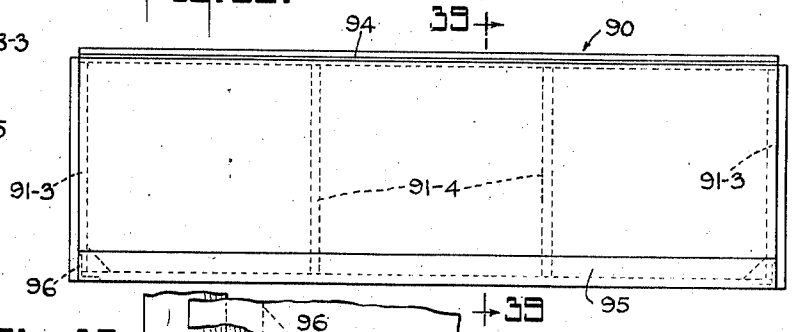

Fig. 36.

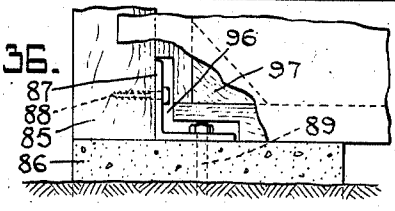

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Fig.4.

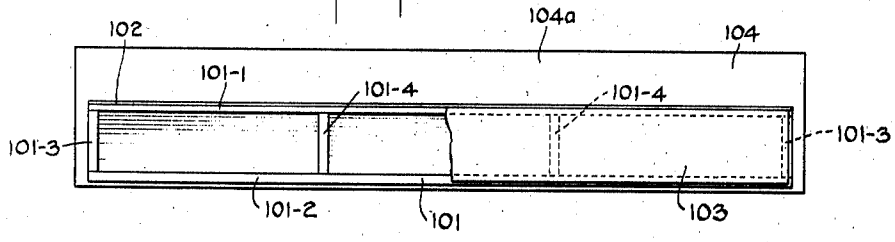
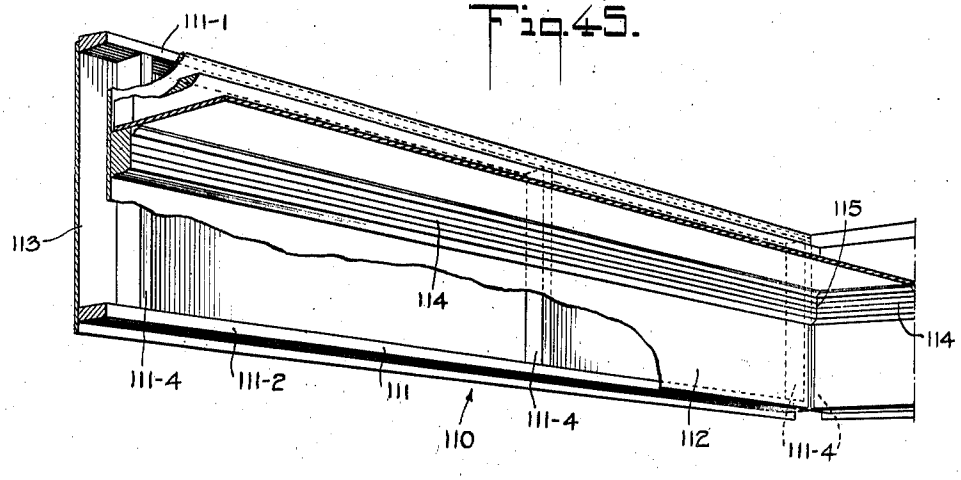


Fig.4a.



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Patented Mar. 25, 1941 2,235,811

UNITED STATES PATENT OFFICE

2,235,811

PANEL WALL STRUCTURAL UNIT AND BUILDING CONSTRUCTION

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Application July 12, 1939, Serial No. 283,961

21 Claims. (Cl. 20—1)

This invention relates to building construction and to structural units incorporated therein.

More particularly, the invention relates to building construction having at least the walls thereof assembled from prefabricated structural units, the wall-forming units being fabricated from panels of building material, together with appurtenant structural building elements, and, per se, comprising part of the invention.

Fundamental to building construction pursuant to the invention, is a novel association of novel prefabricated structural wall units. In many instances the floor and roof construction of the building may also be assembled from prefabricated structural units. Examples thereof are here disclosed, but do not constitute part of the present invention. The particular prefabricated roof structural units disclosed, and their structural association in roof construction, form the subject matter of my copending application for U. S. Patent Serial No. 178,670, filed December 8, 1937, now Patent #2,166,943, patented July 25, 1939. In fact, the roof and floor constructions play a part in the present invention only so far as they tie in and cooperate with the novel wall units and wall structure to form a completed building. Therefore, when the general term "panel unit" is hereinafter used, it refers to the panel structural wall unit novel with the invention.

Several basic concepts in the art of prefabricated building construction are novel with the invention, and make possible the fabrication and erection of buildings, particularly dwelling houses of moderate size, at comparatively low cost without the sacrifice of structural solidity and strength. Embodiments of the invention may be erected with facility by unskilled labor in a very short period of time.

Basic and unique with the invention is the utilization of panel type wall units to span respective lengths of the wall construction, the panel units functioning as deep beams in a primary load supporting and load transmitting capacity. Each panel unit comprises at least one solid panel composed of integral, homogeneous material, which serves to span a length of the wall construction and to transmit a received load in substantially the same manner as does a deep beam. Structural receiving means as, for instance, a stringer or a plurality of spaced and aligned hangers, is secured appurtenant a face of the panel structure and serves to receive floor or roof construction, thus distributing the load thereof along the length of the panel structure.

It is advantageous that window receiving means, as for instance, sill and drip sill elements, be secured adjacent one marginal edge of the panel structure. The window receiving means, in certain hereinafter disclosed forms of the panel unit, provides an effective strengthening addition thereto.

The panel units may be of two fundamental forms—single panel wall or double panel wall—both forms being adapted to function as deep beams, but the latter being more of the nature of a box girder. Essentially the same result is accomplished in both forms, that is, in both, the panel structure serves to receive and transmit the load. The double panel wall—or box girder type—structural unit is, because of its box framework, more sturdy. It is especially adapted for use where considerable solidity and strength is required to withstand internal and external environmental conditions, such as the support of heavy floor and roof loadings and the exposure to severe weather.

It is particularly advantageous that the panel units be rectangular in configuration and considerably longer than they are high, thereby enhancing the effectiveness of their structural function, and, in addition, contributing to the attainment of artistic and agreeable architectural design for the building as a whole.

The panel units are associated end to end about the peripheral contour of the building. The panel structure may per se, or with the aid of suitable finishing materials, provide the exterior and interior wall finish faces of the building. They are joined at mutually adjacent ends in any suitable weatherproof manner, and are preferably supported by suitably spaced foundation piers and/or columns. Floor and roof constructions are supported directly by the panel units, which, in turn, transmit the loads, preferably through column uprights, to any suitable type of foundation means.

A very effective construction is had, both from the structural and architectural design standpoints, when the panel units are assembled in mutually spaced substantially parallel wall courses. A series of windows and/or filler panels may be inserted in the peripheral space between the spaced courses, thus affording considerable leeway for variation in window arrangement.

While the invention is especially well suited for the construction of single story buildings, its principles, as will be apparent hereinafter, may

be advantageously applied in the construction of multi-story buildings.

Panels of plywood have been found to be particularly well adapted for the fabrication of the panel units, though a variety of types of building material in panel form may be employed. The plywood, which consists of several laminations of wood veneer intimately bonded to one another, preferably by a moisture resistant bonding agent, is well adapted for the present use because of inherent strength and lightness. Special laminations having weather-resistant, insulating, ornamental and/or other suitable qualities may form component parts of the plywood. Structural elements, appurtenant to the panel structure, may be glued or otherwise intimately bonded to the appropriate face or faces of the plywood panel structure.

Additional objects and features of the invention will be apparent from the following detailed description of the several specific embodiments illustrated in the drawings.

In the drawings:

Fig. 1 represents a view, in perspective, of the front and side of a dwelling house embodying one form of the present invention.

Fig. 2 represents a detail view, in inside elevation, of one of the panel wall structural units which make up the lowermost wall section of the house illustrated in Fig. 1, the view being enlarged over that of Fig. 1.

Fig. 3 represents an enlarged end elevation of the panel wall structural unit illustrated in Fig. 2.

Fig. 4 represents a detail view, in inside elevation, of one of the panel wall structural units which make up the uppermost wall section of the house illustrated in Fig. 1, the view being enlarged over that of Fig. 1.

Fig. 5 represents an enlarged end elevation of the panel wall structural unit illustrated in Fig. 4.

Fig. 6 represents a condensed and greatly enlarged fragmentary view, in vertical section taken on line 6—6, Fig. 1.

Fig. 7 represents a condensed and greatly enlarged fragmentary view, in vertical section, taken on line 7—7, Fig. 1.

Fig. 8 represents a view, similar to Fig. 6, but illustrating another embodiment of the invention.

Fig. 9 represents a condensed and greatly enlarged fragmentary view, in horizontal section, taken on line 9—9, Fig. 1.

Fig. 10 represents a condensed fragmentary view, in horizontal section, taken on line 10—10, Fig. 6.

Fig. 11 represents a condensed and greatly enlarged fragmentary view, in horizontal section, taken on the line 11—11, Fig. 1.

Fig. 12 represents a fragmentary exploded view in perspective of certain details of the wall construction illustrated particularly in Fig. 11.

Fig. 13 represents a detail view in perspective, of a separable piece appearing in Fig. 10.

Fig. 14 represents a detail view, in perspective, of another separable piece appearing in Fig. 10.

Fig. 15 represents an enlarged vertical sectional view taken on line 15—15 of Fig. 1.

Fig. 16 represents a view corresponding to that of Fig. 6, but setting forth one of the possible deviations from the specific form of construction there illustrated.

Fig. 17 represents a horizontal section taken on the line 17—17, Fig. 16.

Fig. 18 represents a horizontal section taken on the line 18—18, Fig. 16.

Fig. 19 represents an inside elevation of a wall panel structural unit, per se, from the lower wall section of the construction illustrated in Fig. 16, the size scale being comparable to that of Fig. 2.

Fig. 20 represents an enlarged end elevation of the wall panel structural unit illustrated per se in Fig. 19.

Fig. 21 represents an inside elevation of a wall panel structural unit, per se, from the upper wall section of the construction illustrated in Fig. 16, the size scale being comparable to that of Fig. 4.

Fig. 22 represents an enlarged end elevation of the panel wall structural unit illustrated per se in Fig. 21.

Fig. 23 represents a condensed view, reduced in size as compared with Fig. 16, of a two story building of similar construction to that of the one story building illustrated in Fig. 16.

Fig. 24 represents an inside elevation of a wall panel structural unit, per se, which serves to make up the intermediate section of the two story building illustrated in Fig. 26, the size scale being comparable to that of Fig. 19.

Fig. 25 represents an enlarged end elevation of the wall panel structural unit illustrated, per se, in Fig. 24.

Fig. 26 represents an inside elevation of a wall panel structural unit corresponding to those illustrated in Figs. 2 and 19, but indicating another of the possible variations thereover.

Fig. 27 represents an enlarged end elevation of the wall panel structural unit illustrated, per se, in Fig. 26.

Fig. 28 represents a fragmentary vertical section corresponding to the lower part of Fig. 16, but illustrating the structure resulting from use of the wall panel structural unit of Figs. 26 and 27.

Fig. 29 represents a perspective view of a corner of a building embodying a somewhat different type of wall panel structural unit in the lower section which is adapted to accommodate and tie in with a customary type of built on the job floor construction. A portion of the corner is broken away to reveal details of the floor construction and of its joinder with the wall construction.

Fig. 30 represents an enlarged inside bottom perspective view of a fragment taken from the lefthand side of the corner structure of Fig. 29.

Fig. 31 represents an enlarged inside bottom perspective view of a fragment taken from the righthand side of the corner structure of Fig. 29.

Fig. 32 represents an enlarged fragmentary view somewhat similar to that of Fig. 28 but illustrating the construction of Fig. 29.

Fig. 33 represents an inside elevation, reduced in size, of the wall panel structural unit, per se, which forms a component part of the construction of Figs. 29 through 32.

Fig. 34 represents a view corresponding to those of Figs. 6 and 16, but setting forth a construction employing a double panel wall, i. e. box girder type, structural unit.

Fig. 35 represents a horizontal section taken on the line 35—35, Fig. 34.

Fig. 36 represents a fragmentary view in front elevation of a lowermost portion of the construction illustrated in Fig. 34.

Fig. 37 represents a fragmentary view corresponding to the mid portion of Fig. 34, but taken through the wall at a location of a filler panel rather than a window sash.

Fig. 38 represents a detail view, in inside elevation, of one of the double panel wall structural units which make up the lowermost wall section

of the construction illustrated in Fig. 34, the view being reduced in size as compared with that of Fig. 34.

Fig. 39 represents an enlarged vertical section taken on the line 39—39, Fig. 39.

Fig. 40 represents a partial vertical section taken on the line 40—40, Fig. 39, the remainder of the view being an inside elevation.

Fig. 41 represents a detail view, in inside elevation, of one of the double panel wall structural units which make up the uppermost wall section of the construction illustrated in Fig. 34, the view being reduced in size, as compared with that of Fig. 34.

Fig. 42 represents a view corresponding to that of Fig. 37, but illustrating a construction in which the window sill is a separate entity from the wall structural unit.

Fig. 43 represents a view, corresponding to that of Fig. 39, of a double panel wall structural unit taken from the lower wall section of the construction of Fig. 42.

Fig. 44 represents a fragmentary vertical section, corresponding to the mid-portion and upper portion of Fig. 34, of construction embodying a different type of roof construction and upper double panel wall structural unit.

Fig. 45 represents an inside perspective view, looking upward, of the construction illustrated in Fig. 44.

Fig. 46 represents a view corresponding to the mid-portion of that of Fig. 23, but illustrating a multi-story construction utilizing double panel wall structural units.

All of the illustrated and hereinafter described specific embodiments of the invention are based upon, and carry into practice, the fundamental generic concepts set forth hereinbefore.

In Figs. 1 through 33 are illustrated various embodiments of building construction which include single panel wall units. In Figs. 34 through 46 are illustrated various embodiments of building construction which include double panel wall units.

In Fig. 1 appears a one-story dwelling house presenting an architectural exterior made up of a plurality of relatively wide horizontal peripheral sections of the nature of courses. A lower section is indicated at 10, an intermediate window-receiving section at 11, and an upper section at 12.

Each of the wall sections of the type represented by 10 and 12 comprises an assembly of structural units prefabricated from suitable panel building material, together with appurtenant structural elements. The units in any one wall section are, as far as is practicable, of identical form and dimension affording interchangeability of units within such section. Further, each unit preferably has a horizontal length which greatly exceeds its vertical height and facilitates its function as a deep beam or girder as hereinafter explained.

The lower wall section 10, as shown in Fig. 1, may comprise wall structural units 13, illustrated per se in Figs. 2 and 3.

A rigid panel 14, preferably entirely solid and homogeneous throughout and formed of suitable building material, desirably plywood, provides the main body member of the unit and has secured thereto, preferably by gluing where the material used so allows, and otherwise in any suitable convenient manner, appurtenant structural elements having definite functions correlative to other structural portions of the building.

The appurtenant structural elements comprise a floor receiving stringer 15 and window frame means in the form of the window sill assembly 16. The floor receiving stringer 15 is disposed adjacent the lower marginal edges of the panel 14 and may be provided with a rabbet 15*a* for a purpose to be hereinafter explained. The stringer may, as illustrated, be secured to the body of the panel at a location spaced upwardly from the lower edge thereof and extending therealong. The lower margin of the panel is thus adapted to skirt the lower part of the construction.

The window sill assembly 16 is secured to the panel 14 adjacent the upper marginal edge thereof and may include a supporting under sill element 16*a*, a stool 16*b*, and a drip sill 16*c*.

The lateral ends of each unit are advantageously indentured, as at 14*a*, to provide for the formation of dove-tail joints between adjoining units, and, for a purpose later explained, the ends of appurtenant structural elements are advantageously beveled inwardly, as at 15*b* and 16*d*.

The foundation of the building is provided by a number of concrete piers 17, or the like, spaced according to the horizontal length of the units 13, around the periphery of the proposed exterior walls. If desired the foundation may be of the conventional continuous wall type. In that case, because of the nature of the panel wall units, it is not necessary to level off the top surface of the foundation. If the top surface is irregular, the wall units span the distance between the points of contact and function in their capacity of deep beams.

Column uprights are employed for tying the superimposed horizontal peripheral sections or courses to one another and to the lower section or course. The column uprights may rest directly upon the foundation or upon the floor construction. The latter is true in the present instance.

The units 13 are each positioned for spanning the distance between two adjacent piers 17. Opposite ends of the unit rest, respectively, on the respective piers, and the units extend in end to end horizontal alignment with each other, thereby placing the related appurtenant structural elements 15, and the related appurtenant structural elements 16, in end to end horizontal alignment. Interlocking of contiguous jointing indentures 14*a* produces dove-tail joints 18, see Fig. 1, which secure adjacent units together. Where the nature of the material permits, as in plywood or other composition-wood panel construction, further rigidity of jointing is had by gluing together the interlocking members of the joint.

Anchoring of the assembled panel wall units 13 to their respective piers 17 may be effected, as illustrated in Fig. 6, by bolts 19, having their threaded ends extending through supporting blocks 17—1 and through suitably provided holes in the stringers 15, such threaded ends being engaged by the nuts 20, which bear against washers 21, in cinching relation thereto, within the recesses 22.

Positioning of floor structure is next accomplished. Advantageously, but not necessarily, individual floor structural units, as illustrated fragmentarily in the assembled structure of Figs. 6, 7 and 8, and in vertical section in Fig. 15, are prefabricated to provide a section 23 of the finish flooring, and desirably, a section 24 of false-flooring which is spaced apart from the flooring

23 for insulation purposes, both the flooring 23 and false-flooring 24 being secured at their edges to beams 25. Conventional floor construction may be employed. The beams 25 include tongues 25a along their lower faces for close fitting reception in the rabbet 15a of the wall structural units 13. Floor supporting means, indicated generally at 26, Fig. 15, may be supplied centrally or otherwise of the structure, as found necessary.

On the floor structure thus assembled, and at the jointing locations between wall units, vertical uprights 27 of suitable material, such as wood posts, are erected to the proper story height to provide a skeleton framework of relatively widely spaced column uprights, as clearly illustrated in Fig. 15, conforming to the exterior wall outline of the building.

Sets of two adjacent uprights 27 may be spaced less widely and at distances commensurate with the width of any desired type of door, such as 28, and the horizontal continuity of the wall sections broken accordingly to allow for the positioning of the door. Door jambs 29, 29 may be secured to the uprights, or in some cases the uprights themselves may act as the jambs.

Each upright 27, exclusive of door uprights, fits snugly against the panels of interlocked units, at the location of jointing of same, and, to attain the snug fit, is mitered as indicated at 27a, 27a, Fig. 12, at a suitable location along its vertical height to effect miter jointing with the beveled ends 16d of under-sill elements 16a, which are appurtenant to the panels 14. Where the building material permits, as in plywood construction, the miter joints and contacting surfaces of uprights and panel are advantageously glued together.

Where wall units 13 intersect door uprights, only a single miter 27a is necessary, that being at the location of intersection of the element 16a, which is appurtenant to the adjoining panel 14.

The members 16b and 16c of the window sill assembly 16 of each wall unit 13 are preferably squared at their ends to abut at, or in line with, the lateral sides of the uprights 27, and the space thereby provided between ends of adjoining sill elements may be filled with the insert pieces 16—1 and 16—2, illustrated in detail in Figs. 13 and 14, respectively.

In the illustrated embodiment the wall units 13, in the section 10, are provided at their upper edges with the window sill assembly 16, and, accordingly, the next section upperly thereof, i. e. section 11, is reserved with a vertical dimension sufficient for the reception of the desired type of windows.

The upper wall section 12 is assembled from structural units 30, see Figs. 4 and 5, each prefabricated in the manner of fabricating the lower wall units 13, to include as the primary load supporting member, a panel 31 preferably having its lateral ends indentured as at 31a, 31a, to provide for dove-tail joints or equivalent interlocking between interconnected units. As illustrated, structural elements appurtenant to the unit 30 include the roof receiving stringer 32 disposed adjacent the upper edge of the panel, being spaced downwardly therefrom, as required by the hereinafter described prefabricated roof units, and window frame members in the form of a lintel assembly 33, which assembly 33 advantageously includes as component elements, the supporting lintel 33a and the drip member 33b, see Figs. 6, 7 and 8, and Figs. 1 and 15. The ends of the stringer 32 and the lintel 33a are beveled inwardly corresponding to the inward bevel of the ends of the elements 15 and 16 in the lower wall unit 13.

Assembly of these upper wall units 26, with their general similarity to the lower wall units 13, is accomplished in practically the same manner as has heretofore been explained in detail in connection with the assembly of the latter units, miter jointing being effected between the units and the uprights. Conveniently, an upper wall unit 30' of reduced length is utilized to span the reduced width between door uprights.

The window receiving section 11 may be filled in as desired with windows extending completely around the periphery—exclusive of doors—of the building, or with a combination of windows and filler panels, or with filler panels alone.

Advantageously, mullions 34, of the proper length, are positioned and secured in place by gluing, or other well known method to provide, in combination with the continuous lintel assembly 33 and the continuous sill assembly 16, a window frame for the reception of window sash 35 and/or filler panels 36.

The sill assemblies 16 of the lower wall units 13 function as the top compression members of the deep beams or girders, formed by the units 13 as structural entities, and thus afford increased rigidity for the panels 14 thereof.

Roof structural units may be prefabricated according to the disclosure of my co-pending application for U. S. Patent Serial No. 178,670, filed December 8, 1937, and entitled Roof construction. Such roof construction is illustrated in general in Figs. 1 and 15, and a fragment of same is illustrated in vertical section in Fig. 6.

The roof units, as sections of the roof construction just referred to, preferably comprise a plurality of rafter elements 37, in panel form, tied together by a marginal cross element 38 and a tie-panel 38—1, the rafter elements being secured to the tie-panel at spaced locations along its length; as illustrated in Fig. 15, the tie-panel 38—1 preferably forms the ridge of the roof construction. The eave-ends of the rafter elements 37 are desirably reinforced by side pieces 39, and the longitudinal edges of same may be reinforced by slats 39—1. The ceiling panel 40, see Fig. 6, may be applied as an interior finish.

The prefabricated roof framework rests upon the horizontally aligned roof receiving stringers 32 of the assembled panel wall units 20, the marginal edges 38a, see Fig. 6, of the cross-elements 38 fitting snugly against the upper edge of the wall section 12. A plurality of external roof panels 41, equipped with depending locking slats 42, and interlocked by slipping the receiving mouth 42a of each slat 42 over the free edge of the previously positioned panel—the marginal roof panel locking over the marginal cross-element 38—are provided to act as the external roof covering per se and to eliminate the necessity of any form of sheathing.

Fig. 8 illustrates what might be done to insulate the walls of the particular embodiment of the invention under the present consideration. Interior finish panels 43 are secured to the inner faces of the wall units 14 and 31, thus providing recesses for the retention of suitable insulating material 44.

Desirably, to carry out the general scheme of prefabrication followed in the construction, and as a practical method of wiring the building electrically, the molding 45, formed from insulating

material and incorporating the electrical conductors **45a**, **45a** and conveniently placed outlets (not shown), is employed. Such combined molding **45** and electrical wiring system forms the subject matter of my application for U. S. Patent Serial No. 682,757, filed July 29, 1933. Also, in this connection, the outer periphery of the flooring **23** of the floor units may be rabbeted as at **23a**, see Figs. 6 and 7, to provide additional channels for electrical wiring.

While the above described embodiment of the invention is in the form of a single story building, it is within the scope of the invention to provide two or more stories, see especially Fig. 23, hereinafter described. Also, the general construction is not limited to the particular type of floor and roof structure illustrated and described. A usual built-up-on-the-job floor might be used, see especially Fig. 29, hereinafter described, as might also a similarly constructed roof of desired type.

A slightly different type of single panel wall construction is set forth in Figs. 16, 17 and 18. The single panel wall structural units per se have their appurtenant structural elements somewhat differently arranged on their panel elements than is the case in the previous described constructions, and, as a result, the prefabricated roof construction is somewhat altered. The column uprights rest directly on the foundation piers rather than on the floor construction. Accordingly, the prefabricated floor construction is somewhat altered to accommodate the lower portions of the column uprights.

As illustrated in Figs. 16, 17, and 18, the single panel wall structural units—the units of the lower wall section being indicated **50** and the units of the upper wall section being indicated **56**—are assembled together with the floor and roof construction in substantially the same manner as are the panel wall units of the prior figures.

A panel wall unit, illustrated per se in Figs. 19 and 20, of the lower wall section is similar to the single panel wall structural unit **13** of the prior figures, the only differences being that the floor receiving stringer **51** is disposed at the bottom marginal edge of the panel with its bottom edge flush with the bottom edge of the panel, and that the ends thereof and of the under-sill element **52** are cut short rather than being beveled. Thus, the floor receiving stringer **51** rests, at opposite ends, directly on the spaced concrete foundation piers, see **53**, rather than upon supporting blocks, as is the case with the panel wall units **13** at **17—1**, Fig. 6, and the ends of the floor receiving stringer **51** and of the under-sill element **52** abut against, or proximate the lateral sides of adjacent columns, see **54**, Fig. 18, rather than fitting against each other or into miters provided in the column uprights as is the case with panel units **13**, see the lower portion of Fig. 6, and **27a**, **27a**, Fig. 12.

In spite of the structural differences of panel wall units **50** over panel wall units **13**, the former function, in substantially the same manner as the latter, as deep beams in a primary load supporting and load transmitting capacity. The ends of the panel member of each panel wall unit **50** may be secured in any suitable manner to the column uprights, as, for instance, by gluing.

The prefabricated floor construction, indicated generally at **55** is so fabricated as to fit around and snugly against the column uprights **54**, see Fig. 16.

A single panel wall structural unit **56**, illustrated per se, in Figs. 21 and 22, of the upper wall section is similar to the single panel wall structural unit **30** of the prior figures. Differences, however, reside in the fact that the roof receiving stringer **57** is disposed at the upper marginal edge of the panel member with its upper edge flush with the upper edge of the panel member, and the ends thereof and of lintel **58**, are cut short instead of being baffled.

The prefabricated roof construction, illustrated generally at **59**, differs from that illustrated in Fig. 6 in that an outer flashing **59—1**, which extends down over the upper margins of the panel wall units **56** when in place, is provided. The panel rafter units rest upon the top edge of the panel member and of the roof receiving stringer **57**, the load being transmitted, as is the case in the prior embodiment, through the panel members, which function in the capacity of deep beams.

As in the case of the panel wall units **50** of the lower section, the panel wall units **56** of the upper section are disposed with the ends of the roof receiving stringer **57** and of the lintel **58** abutting against, or proximate, the lateral sides of adjacent columns **54**, see particularly Fig. 17, and with the ends of the panel members secured to the column uprights in any suitable manner, as, for instance, by gluing.

In its application to a multi-story building, the construction of Figs. 16 through 22 utilizes single panel wall structural units **60** for the wall section or sections disposed intermediate the lower and upper wall sections, see Fig. 23.

A single panel wall structural unit **60** includes a floor receiving stringer **61** secured to the panel member **62** of the unit at a location intermediate of and parallel with the longitudinal edges thereof. A window sill assembly, indicated generally **63** and similar in construction and arrangement to that indicated **16** in the case of the panel wall unit **13**, is secured along the upper longitudinal marginal edge of the unit, and a window receiving assembly, indicated generally **64** and similar in construction and arrangement to that indicated **33** in the case of the panel wall unit **30**, is secured along the lower longitudinal marginal edge of the unit. Thus, the panel wall unit **60**, in effect, serves as a combination upper wall unit and lower wall unit for the wall section intermediate an upper and a lower story.

The floor construction or constructions above the first floor, see the floor construction indicated generally at **65**, Fig. 23, may be similar to that indicated **55**, Fig. 16.

In any of the aforedescribed embodiments of the invention, the single panel wall structural units may be fabricated in accordance with that illustrated per se in Figs. 26 and 27 and designated **66**. There, the floor receiving stringer is replaced by a series of spaced and aligned bracket elements, individually designated **67**. The bracket elements **67** collectively receive the floor structure, see floor structure **68**, Fig. 28, and transmit its weight to the panel member of the panel unit.

It will be apparent that other types of supporting elements may be spaced and aligned on the panel members of the panel wall units similarly to the bracket **67** as substitutes for floor receiving stringers. Also, spaced and aligned brackets or other types of supporting elements may be

employed in place of the roof receiving stringers of the panel wall units of an upper section. In other words, the floor receiving stringers and the roof receiving stringers need not be continuous in their longitudinal span of the panel wall units. Discontinuous supporting means are satisfactory for receiving and supporting floor and roof loads and for transmitting such loads to the panel members of the panel wall units.

In instances where "cut on the job" floor constructions are employed in place of the prefabricated floor constructions aforedescribed, it is advantageous that the panel wall structural units of the lower or intermediate sections be so constructed and arranged as to effectively accommodate the component parts of the floor construction. Figs. 29 through 32 illustrate a "cut on the job" floor construction tying in with a special type of single panel wall structural unit, which, per se, is illustrated in Fig. 33.

The "cut on the job" floor construction may comprise conventional joists **70** serving to support conventional tongue and groove flooring **71**.

The single panel wall structural units designated **72**, see especially Fig. 33, may comprise a panel member **73**, which corresponds in general to the panel members of the panel wall units heretofore described, and appurtenant structural elements. The appurtenant structural elements comprise a window receiving assembly, designated generally **74**, extending along the top marginal edge of the panel member **73**, and constructed and arranged as found suitable in the particular instance.

The bottom longitudinal edge of the panel member **73** is grooved in the present case, as at **73***a*, for the reception of a suitably tongued base board **75** which serves to conceal the foundation means. A joist receiving stringer **76** is secured at the lower marginal edge of the panel member **73**, and extends longitudinally therealong. It conveniently extends below the bottom edge of the panel member **73** to facilitate placement of the base board **75**.

Spaced upwardly from the joist receiving stringer **76** such that their top edges are disposed above the top edge of the joist receiving stringer **76** by distances equal to the heights of the joist **70**, is a series of flooring supports, individually designated **77**. The individual supports are advantageously aligned horizontally and are spaced apart from one another by distances substantially equal to the widths of the joists **70**.

In assembling the building, the joists are cut to proper length and their ends are set upon the stringer **76** at locations immediately below the spaces between the flooring supports **77**. Thus, the upper portions of the joists are accommodated by such spaces. Metal gusset pieces, see the pieces **78, 78**, Figs. 29, 30 and 32, may be employed to secure the ends of the joists **70** to the recciving stringer **76**.

The flooring may be laid over the joists **70** in conventional manner. It should be noted that the lateral margins of the flooring **71** rest upon and are supported by the flooring supports **77**.

As is indicated in Figs. 32, the column uprights, see **79**, advantageously rest on plates **80** which lie, respectively, upon the upper surfaces of the foundation piers **81**. They may be securely fastened to the foundation piers by means of angle plates **82**, suitably bolted to the column uprights and to the foundation piers. The panel members **73** may be dovetailed, as is the case with the panel members of the prior figures, but, as is illustrated, may also be merely squared off for close fitting abutment against one another when the panel wall units are assembled.

As is the case in the prior embodiments, the panel member of each panel wall structural unit **73** functions as a deep beam in a primary load supporting and load transmitting capacity, the weight of the floor construction being transmitted to the panel members through the joist receiving stringers **76** and flooring supports **77**.

The principles of the invention may be carried out, and the desired results effected, by the use of double panel wall structural units of box beam or girder type, those being preferable to the aforedescribed single panel wall structural units where considerable solidity and strength is required. In Figs. 34 through 45 is illustrated double panel wall structural unit construction.

The building construction illustrated in Figs 34 through 37 is somewhat similar to those illustrated in Figs. 6 and 16 and, as is the case of the construction in Fig. 16, the column uprights of the instant construction rest directly upon the foundation piers.

The column uprights **85** are erected on the foundation piers, see **86**, Fig. 36, and may be secured thereto by angle plates **87**. The latter are secured to the columns **85**, as by means of screws **88**, and to the foundation piers **86**, as by means of bolts **89**, the heads of the bolts being embedded in the concrete of the piers.

The double panel wall structural units of the lower wall section, see the units **90**, are placed between the column uprights **85** with their ends abutting thereagainst and resting upon adjacent piers **86**. Thus, as is the case in the prior embodiments, the panel units span distances between any two adjacent foundation piers and any two adjacent column uprights.

Illustrated per se in Figs. 38 through 40, the double panel wall structural units **90** are preferably constructed to resemble a box beam or girder. A box framework **91** is formed by upper and lower header elements **91—1** and **91—2**, respectively, by end elements **91—3, 91—3**, respectively, and by intermediate elements **91—4, 91—4**, respectively. Inside and outside panel members **92**, and **93**, respectively, secured in any suitable manner, as, for instance, by gluing, to the opposite broad faces of the box frame **91**, provide web-plates.

Window receiving means, such as that indicated **94**, is preferably made a component part of the double panel wall unit, and for this purpose is secured to the upper header element **91—1**. The inside panel member **92** may extend upwardly, as at **92***a*, to conceal the joinder between the window receiving means **94** and the header element **91—1**.

A floor receiving stringer **95** is secured in any suitable manner, as, for instance, by gluing, to the outer face of inside panel member **92**, preferably at the lower margin of the panel wall unit. If found advantageous, the floor receiving stringer **95** may be screwed, or otherwise attached through the panel member **92**, to any or several of the component elements of the box frame **91**.

For accommodating the angle plates **87**, which secure the column uprights **85** to the foundation piers **86**, the lower corners of the box frame **91** may be indentured as at **96, 96**. For reinforcing the corners thus indentured, triangular blocks **97, 97**, may be glued, or otherwise secured, within the box frame **91**.

The floor construction, indicated generally at **98**, rests upon the floor receiving stringer **95**, and

the panel wall unit **90**, as an entirety, supports the floor load in the manner of a deep beam.

As is the case in the single panel wall structural unit construction, the floor receiving stringer **95** may be spaced upwardly from the lower longitudinal edge of the panel member **92**, or a series of brackets or other supporting elements, as in Fig. 26, may be substituted for it. Also, where a "cut on the job" floor construction is employed, a joist receiving stringer and a series of flooring supports, similar to those illustrated in Figs. 29 through 33, may replace the single stringer **95**.

The upper wall section of the building illustrated in Figs 34 through 37 is assembled from double panel wall structural units designated **100**, and illustrated per se in Fig. 41. Each double panel wall unit **100** includes a box frame **101** somewhat similar to box frame **91** of the double panel wall unit **90** of the lower wall section, the box frame comprising upper and lower headers **101—1** and **101—2**, respectively, end elements **101—3**, **101—3**, and intermediate elements **101—4**, **101—4**. The upper header **101—1** is advantageously rabbeted along its upper inside longitudinal margin, as at **102**, for accommodating roof construction.

Inner and outer panel members **103** and **104**, respectively, are secured, as, for instance, by gluing, to opposite broad faces of the box frame **101**. The inner panel member **103** fits flush with the bed of rabbet **102** and is preferably indented from the remaining peripheral margins of the box frame for accommodating projecting portions of other units and/or panel insert pieces. The outer panel **104** extends upwardly from the box frame, as at **104***a*, to tie-in with the prefabricated roof construction, indicated generally **105**, such roof construction being essentially similar to that disclosed in prior figures. The remaining margins of the panel member extend slightly beyond box frame **101** to effect joinder with, or snug abutment against, corresponding ends of like panel units at column locations.

Between the vertically spaced lower and upper sections of the building, either window sashes, as indicated at **106**, Figs. 34 and 35, or filler panel units, indicated at **107**, Fig. 37, may be installed. In the former case, window receiving means may be made a component part of the double panel wall unit **100**, or may be positioned in association therewith if and when desired. The window receiving means may take the form of a lintel **108**, Fig. 34. A panel insert **109** may face the joinder, or the inner panel member **103** may extend downwardly for that purpose. In the latter case, the window receiving means, e. g. the lintel **108**, may be eliminated, see Fig. 37.

The filler panel unit **107** is preferably similar in construction to the double panel wall structural units **90** and **100**. It includes a box frame **108** which is constructed with upper and lower headers **108—1** and **108—2**, respectively, end elements **108—3**, **108—3** and intermediate elements **108—4**, **108—4**. The respective headers and elements are configurated as necessitated by the particular joinder they must make with other structure. As shown in Fig. 37, the lower header **108—2** is grooved to fit over the window receiving means **94** of lower double panel wall unit **90**, and, as shown in Fig. 35, one of the end elements **108—3** is rabbeted along both marginal edges to provide a mullion member **108—3***a* for the window framing.

The double panel wall structural units **90** of the lower wall section need not include window-receiving means as component parts thereof, see the unit **90'**, Figs. 42 and 43. Such panel wall units may be employed in the same building with panel wall units **90**, being placed at those locations where filler panel units are employed instead of window sash.

The units **90'** are identical with units **90**, except for the fact that the upper portion thereof is arranged to receive a lower coordinating portion of a filler panel unit, see the filler panel unit **108'**, Fig. 42.

A type of roof construction requiring support along the inside panel face of the double panel wall structural unit may, in certain instances, be desirable. Then, see Figs. 44 and 45, the upper panel wall units are constructed with a roof receiving stringer applied to the outer face of the inside panel, see the panel wall unit **110**, Figs. 44 and 45.

The box frame **111** comprises upper and lower headers **111—1** and **111—2**, respectively, and elements **111—3**, **111—3** and intermediate elements **111—4**, **111—4**. Inner and outer panel members **112** and **113** are secured to opposite broad faces of the box frame **111**, as, for instance, by gluing. The roof receiving stringer **114** is secured in any suitable manner to the outer face of inside panel **112** intermediate its long edges and extending parallel thereto and along the lengths thereof. The stringers **114** may be beveled at their ends to provide a corner joinder as indicated at **115**, Fig. 45.

The roof construction may be flat, as indicated generally at **116**, Fig. 44, and, for cooperation therewith, the upper header **111—1** of the box frame **111** may be beveled inwardly. The roof construction **116** rests squarely on the stringer **114**, and the latter transmits the load to the remainder of the double panel wall structural unit. It should be noted that both panels in the unit share in supporting the load.

The double panel wall structural units may be employed in multi-story buildings as readily as may be the single panel wall structural units. As illustrated in Fig. 46, double panel wall units, designated **120**, of a type similar to the double panel wall unit **90**, Fig. 39, may be employed intermediate the upper and lower sections.

The double panel wall unit **120** is preferably identical with the double panel wall unit **90** except for the provision of window receiving means in the form of a lintel **121** along the bottom surface of the lower header **122**. The window receiving means may form a component part of the prefabricated panel wall unit, or, as in previously described instances, may be an independent entity. In the latter case, the lower portion of the unit is formed for the reception of the window receiving means. The floor receiving stringer, here designated **123**, may be disposed with its bottom edge flush with the bottom edge of the lower header **122**, as illustrated, or may be disposed at any convenient location intermediate the upper and lower edges of the panel wall unit. The vertical dimension of the unit may be determined by the individual instance of use.

In all the preferred embodiments of the invention, a panel member defines substantially the entire broad face dimensions of the panel wall structural unit. The panel member is homogeneous in character, that is, is formed of rigid sheet material which is substantially homogeneous throughout. Plywood is an excellent example of the type of material referred to. To one broad face of the panel member is secured means for receiving and supporting component construc-

tion of the building which extends horizontally, e. g. floor and roof construction. Such means extends substantially rectilinearly along the long dimension of the panel member, and is substantially parallel with the lengthwise edges thereof.

In the box girder type of panel wall structural unit, a box frame is secured to the broad face of the panel member which is opposite that broad face to which the said means for receiving and supporting horizontally extending construction is secured.

Whereas this invention has been illustrated and described with respect to several of the preferred embodiments thereof, many changes may be made without departing from the generic scope and spirit of the invention as set forth herein and in the claims that follow.

I claim:

1. A prefabricated wall structural unit for building construction comprising a rigid, substantially rectangular, solid panel member of integral homogeneous material; and supporting means projecting from a broad face of said panel member and extending substantially rectilinearly along the long dimension thereof and substantially parallel with the lengthwise edges thereof, said supporting means being adapted to receive and support horizontally extending component construction when the unit is incorporated in building construction, and being intimately united with said integral homogeneous material in such manner as to transfer thereto received loads.

2. A prefabricated structural unit, as recited in claim 1, wherein the stated supporting means is a continuous stringer.

3. A prefabricated structural unit as recited in claim 1, wherein the stated supporting means is a plurality of individual supporting elements spaced apart in substantially rectilinear alignment along the long dimension of the unit.

4. A prefabricated structural unit as recited in claim 1 wherein a surface of the stated supporting means is substantially flush with a longitudinal edge surface of the stated panel member.

5. A prefabricated structural unit as recited in claim 1 wherein the stated supporting means is disposed intermediate the lengthwise edges of the stated panel member.

6. A prefabricated structural unit as recited in claim 1 wherein the stated supporting means is a combination of a continuous stringer and a substantially rectilinear series of individual supporting elements disposed a predetermined distance above, and extending substantially parallel with, the said continuous stringer, said individual supporting elements being spaced apart from one another by predetermined distances.

7. A prefabricated structural unit as recited in claim 1 wherein a box frame is secured to the broad face of the stated panel member which is opposite that broad face thereof to which the stated means is secured.

8. A prefabricated structural unit for building construction comprising a rigid substantially rectangular solid panel member of integral, homogeneous character defining substantially the entire broad face dimensions of the unit; supporting means projecting from a broad face of said panel member and extending substantially rectilinearly along the long dimension thereof and substantially parallel with the lengthwise edges thereof, for receiving and supporting horizontally extending component construction of said building construction, said supporting means being intimately united with the integral homogeneous material of the panel member in such manner as to transfer thereto received loads; a peripheral frame secured to the broad face of the said panel member which is opposite the broad face thereof to which the said supporting means is secured; intermediate elements spaced apart within the confines of said peripheral frame, being secured to the long frame members thereof and being disposed substantially parallel to the short frame members thereof; and a panel member secured to the said peripheral frame and to said intermediate elements at the sides thereof which are opposite the sides to which the first mentioned panel member is secured.

9. A prefabricated building construction comprising foundation means; a lower exterior wall section assembled from prefabricated structural units extending end to end horizontally substantially peripherally of the building and resting upon said foundation means, said units each comprising a rigid panel of building material having floor supporting means secured thereto at a location spaced upwardly from its lower edge, and window receiving means secured appurtenant its upper margin; a floor structure received and supported by the floor supporting means of said lower wall section; spaced columns resting on said floor structure proximate to and tying in with said lower wall section at locations of joinder between said wall units, to define the general exterior wall contour of the building; an upper exterior wall section assembled from prefabricated structural units extending end to end substantially coextensive horizontally with said lower exterior wall section and spaced apart vertically therefrom to afford a peripheral wall opening for the reception of windows and/or filler panels, said structural units of the upper exterior wall section each comprising a rigid panel of building material having roof supporting means secured thereto at a location spaced downwardly from its upper edge, and window receiving means secured appurtenant its lower margin, the said units, further, meeting at column locations and being secured thereat to the columns; and a roof structure received and supported by the roof supporting means of said upper wall section.

10. For use in building construction, a prefabricated structural unit comprising a rigid substantially rectangular panel; window receiving means proximate and extending along one of the long edge portions of the panel, being rigidly secured to said panel and extending from at least one face thereof; and a load receiving stringer rigidly secured to the body of the panel at a location spaced apart from, and extending along, the other long edge thereof, said load-receiving stringer projecting from the said one face of the panel.

11. A prefabricated structural unit as recited in claim 10 wherein the panel is of plywood and the window receiving means and the load-receiving stringer are of wood glued to the plywood panel.

12. A prefabricated structural unit as recited in claim 10 wherein the panel is of plywood and the window receiving means and the load-receiving stringer are of wood glued to the plywood panel, the ends of the plywood panel being indentured for dovetail interlocking with complementarily indentured ends of like structural units.

13. A wall structure comprising a series of

spaced columns; prefabricated structural units, as set forth in claim 10, each spanning the distance between two columns, the window receiving means and the load-receiving stringers of said structural units tying in at their ends with the columns, and the ends of the panels of said structural units interlocking with contiguous ends of adjacent panels.

14. A building comprising foundation piers spaced apart around the periphery thereof, a plurality of prefabricated wall structural units as recited in claim 10 extending end to end around substantially the wall periphery of the building to form a lower course of the walls, each of said wall structural units spanning the distance between two of said piers with its window receiving means uppermost and its panel and load-supporting stringer supported by said piers; floor structure tying in with and supported by the load-supporting stringers of the so assembled units; columns resting on the floor structure at locations directly above the said piers, the window receiving means of said units tying in with said columns; a plurality of prefabricated wall structural units as recited in claim 10, extending end to end around substantially the wall periphery of the building, being spaced apart upwardly from the said lower course of the walls to form an upper course of the walls, each of the wall structural units of the said upper course of the walls spanning the distance between two of said columns with its load-supporting stringer uppermost and its window receiving means lowermost, both the load-supporting stringer and the window receiving means tying in at their ends with their respective columns; and roof structure tying in with, and supported by, the load-supporting stringers of the so assembled units of the said upper course of the walls.

15. A building comprising foundation piers spaced apart around the periphery thereof, a plurality of prefabricated wall structural units, as recited in claim 10, extending end to end around substantially the wall periphery of the building to form a lower course of the walls, each of said wall structural units spanning the distance between two of said piers with its window receiving means uppermost and its panel and load-supporting stringer directly supported by said piers; floor structure tying in with and supported by the load-supporting stringers of the so assembled units; columns resting on the floor structure at locations directly above the said piers, the window receiving means of said units tying in with said columns; a plurality of prefabricated wall structural units as recited in claim 10 extending end to end around substantially the wall periphery of the building, being spaced apart upwardly from the said lower course of the walls to form an upper course of the walls, each of the wall structural units of the said upper course of the walls spanning the distance between two of said columns with its load-supporting stringer uppermost and its window receiving means lowermost, both the load-supporting stringer and the sill member tying in at their ends with their respective columns; roof structure tying in with and supported by the load-supporting stringers of the so assembled units of the said upper course of the walls; and windows and/or filler panels disposed in the spacing between the said lower course of the walls and the said upper course of the walls between said sill members.

16. A building comprising foundation piers spaced apart around the periphery thereof, a plurality of prefabricated wall structural units as recited in claim 10 extending end to end around substantially the wall periphery of the building to form a lower course of the walls, each of said wall structural units spanning the distance between two of said piers with its window sill member uppermost and its panel and load-supporting stringer directly supported by said piers; floor structure tying in with and supported by the load-supporting stringers of the so assembled units; columns resting on the floor structure at locations directly above the said piers, the window receiving means of said units tying in with said columns; a plurality of prefabricated wall structural units as recited in claim 10 extending end to end around substantially the wall periphery of the building, being spaced apart upwardly from the said lower course of the walls to form an upper course of the walls, each of the wall structural units of the said upper course of the walls spanning the distance between two of said columns with its load-supporting stringer uppermost and its window receiving means lowermost, both the load-supporting stringer and the window receiving means tying in at their ends with their respective columns; roof structure tying in with and supported by the load-supporting stringers of the so assembled units of the said upper course of the walls; and interior panels secured to the inner extremities of the columns forming insulating chambers between themselves and the exterior panels of the said structural units.

17. In a building construction, a wall structure including a prefabricated structural unit comprising a panel of rigid sheet material which has a horizontal length greatly exceeding its vertical height and appurtenant load receiving elements extending longitudinally along substantially the length of the panel, said appurtenant load receiving elements comprising window receiving means secured along substantially the length thereof adjacent one longitudinal edge of the panel and load receiving stringer means secured along substantially the length thereof adjacent the other longitudinal edge of the panel, said panel and said appurtenant load receiving elements being supported solely at their ends, and functioning together as a deep beam in a primary load supporting and load distributing capacity.

18. A building construction comprising exterior walls assembled from prefabricated structural units, each of said structural units comprising a plywood panel which has a horizontal length greatly exceeding its vertical height and appurtenant load receiving elements extending horizontally along substantially the length of the panel, said appurtenant load receiving elements comprising window receiving means secured along substantially the length thereof adjacent one longitudinal edge of the panel and load receiving stringer means secured along substantially the length thereof adjacent the other longitudinal edge of the panel, said panel and said appurtenant load-receiving elements being supported solely at their ends and functioning together as a deep beam in a primary load supporting and load distributing capacity, the said panels, and, therewith, the respective appurtenant load-receiving elements, extending end to end horizontally to form substantially peripheral exterior-wall sections of the building, the said panels being securely jointed and weather sealed to one another at the ends thereof.

19. A prefabricated wall structural unit com-

prising a rigid, substantially rectangular, solid panel of integral homogeneous material, a window receiving element extending along one longitudinal margin of one of the broad faces of said panel and projecting outwardly therefrom, and supporting means extending along the other longitudinal margin of said broad face of the panel and projecting outwardly therefrom for receiving and supporting horizontally extending structure when the unit is incorporated in building construction, said window receiving element and said supporting means being intimately united with said integral homogeneous material of the panel in such manner as to transfer thereto received loads.

20. A prefabricated wall structural unit as recited in claim 19 wherein the stated supporting means comprises a continuous stringer and a substantially rectilinear series of individual supporting elements disposed a predetermined distance above, and extended substantially parallel with, the said continuous stringer, said individual supporting elements being spaced apart from one another by predetermined distances.

21. In building construction, spaced uprights, a substantially rectangular, solid panel wall unit extending between said spaced uprights and secured thereto adjacent its ends, said panel wall unit comprising integral homogeneous panel material, and being supported solely by said uprights for function as a deep beam, and horizontally extending structure of said building construction intimately engaging the integral homogeneous material of said panel wall unit between said uprights in such manner as to be supported thereby.

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