

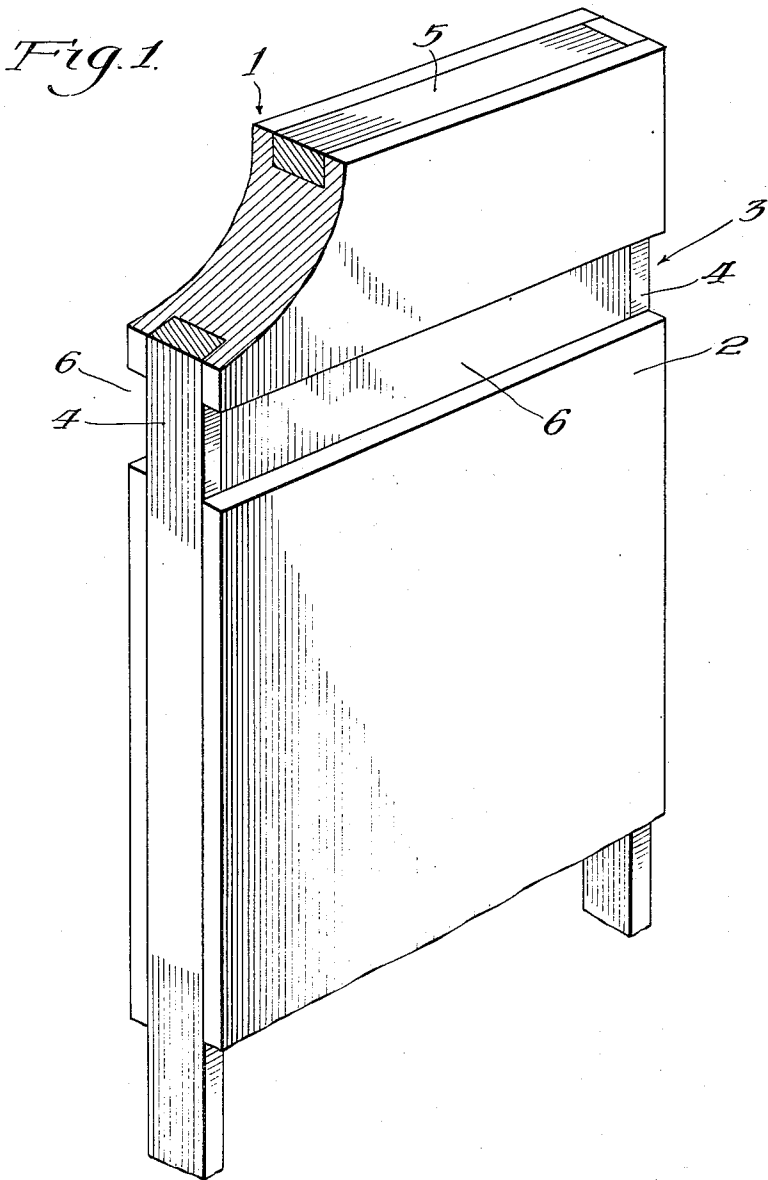
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J. C. MORRELL
WALL STRUCTURE

2,202,783

Filed Jan. 4, 1937

5 Sheets-Sheet 1



Inventor:
Jacque C. Morrell.
By: Lee J. Gary
Attorney.

May 28, 1940.

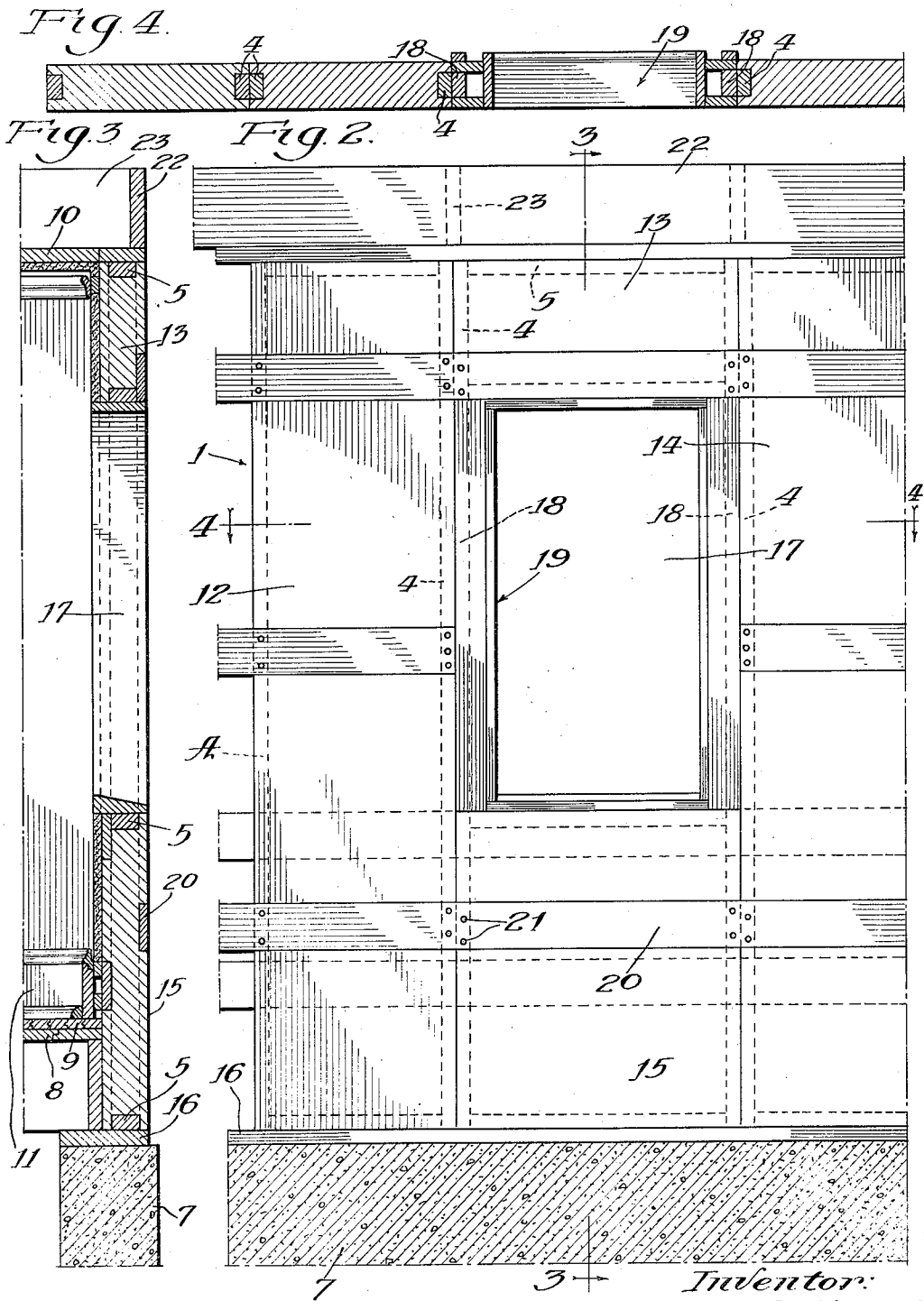
J. C. MORRELL

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WALL STRUCTURE

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5 Sheets-Sheet 2



Inventor:
Jacque C. Morrell,
By: Lee J. Garg
Attorney.

May 28, 1940.

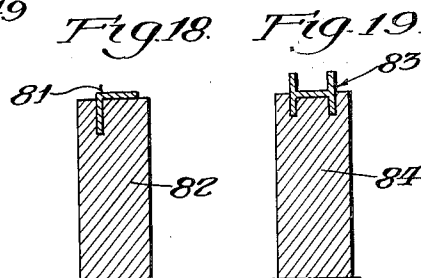
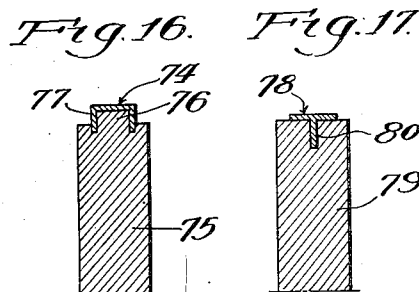
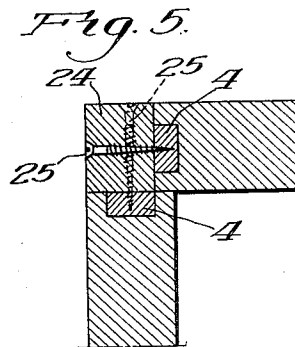
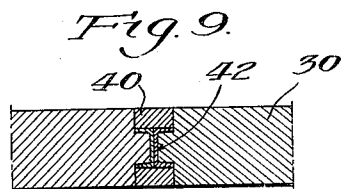
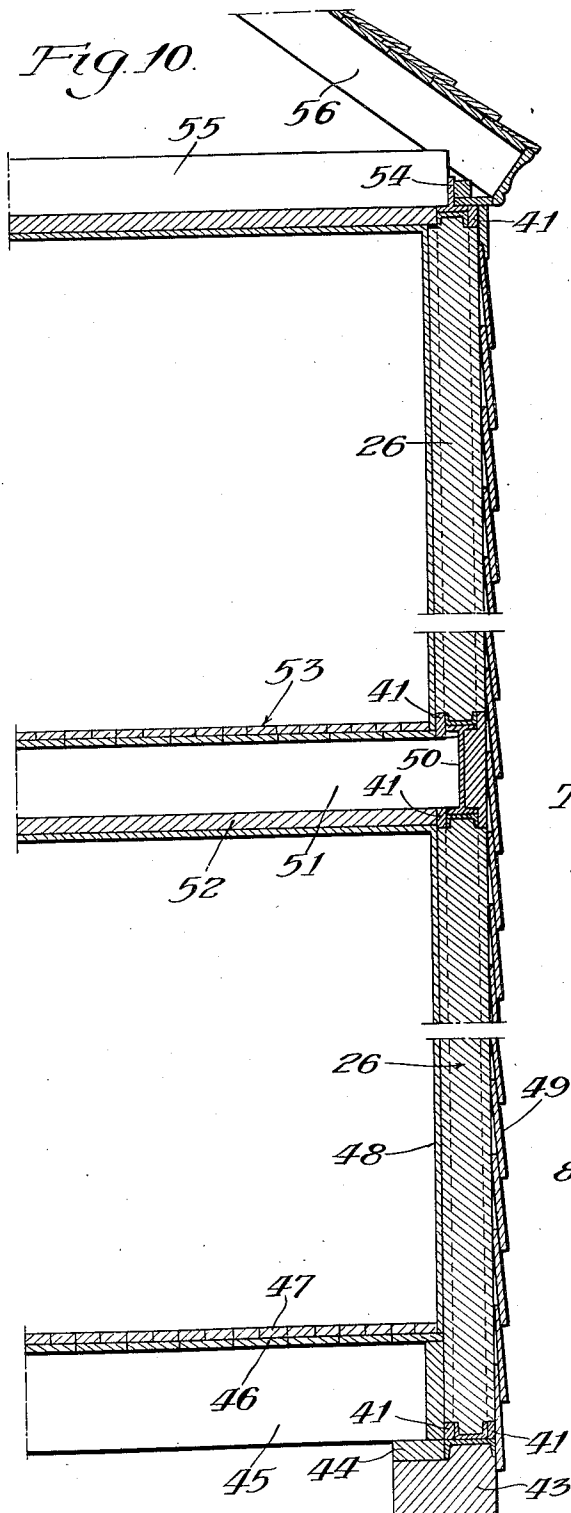
J. C. MORRELL

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WALL STRUCTURE

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5 Sheets-Sheet 3



Inventor:
Jacque C. Morrell,
By: Lee J. Gary
Attorney

May 28, 1940.

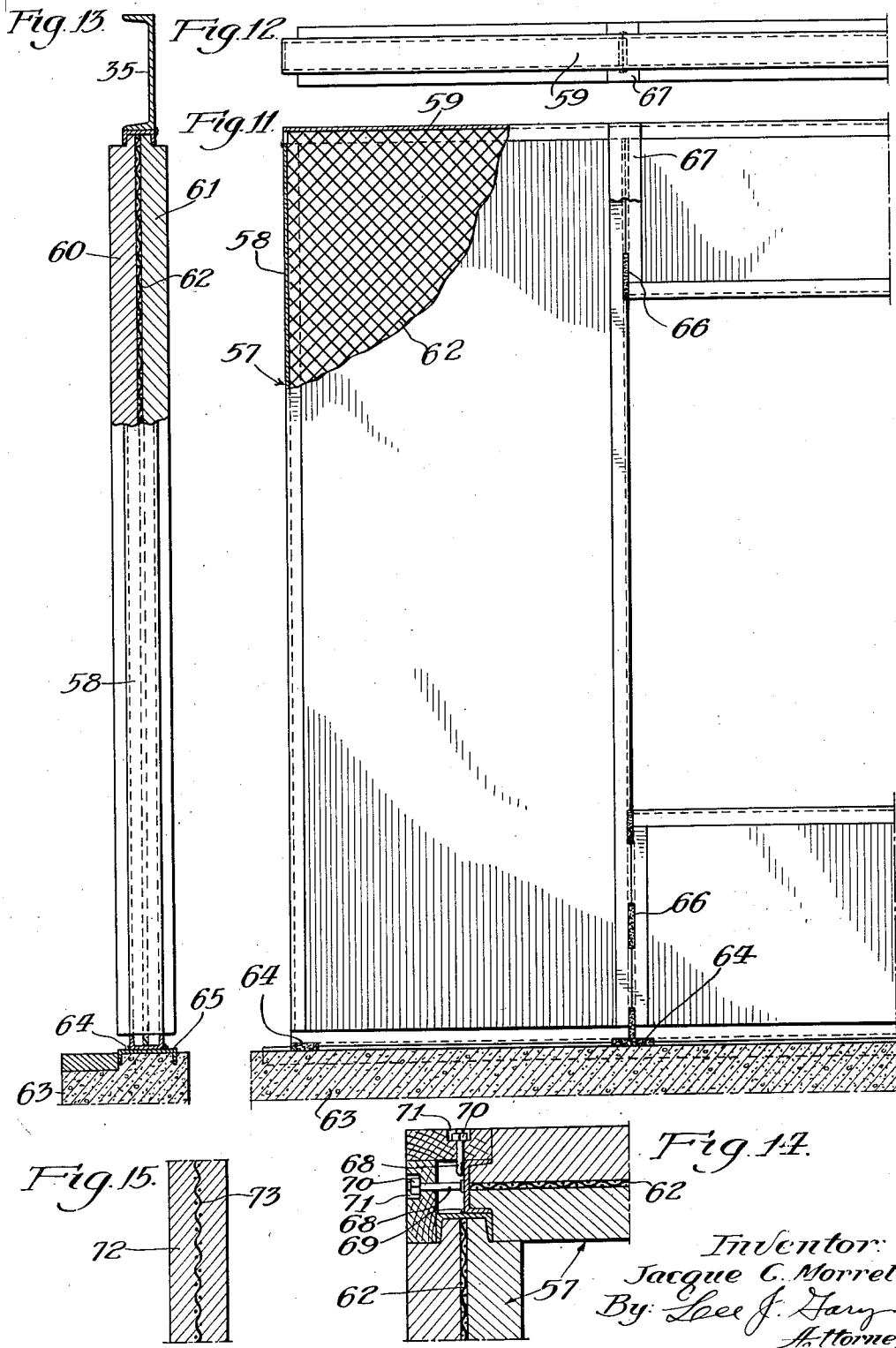
J. C. MORRELL

2,202,783

WALL STRUCTURE

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5 Sheets-Sheet 5



Inventor:
Jacque C. Morrell,
By Lee J. Gary
Attorney.

UNITED STATES PATENT OFFICE

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WALL STRUCTURE

Jacque C. Morrell, Oak Park, Ill.

Application January 4, 1937, Serial No. 118,965

16 Claims. (Cl. 20-4)

This invention relates to improvements in a method and means for constructing buildings, and refers specifically to the provision of prefabricated units or wall sections which are factory built and may be assembled in situ to simultaneously form both frame and walls of the building.

One item of expense which above most others is conducive to raising the construction cost of buildings, particularly residences and small buildings, is attributable to the present method or mode of building construction. With the exception of a few portions of the building, the entire structure must be constructed in situ of essentially raw materials. In this regard, the building industry stands almost alone as one which has not heretofore taken advantage of the theory of specialization which in other industries has manifested itself in quantity or line production of standardized or semi-standardized units.

The character of the framework and walls of the usual building is such, that it would readily lend itself to quantity or line production, since the major portion of the framework and walls of substantially all buildings resemble each other so closely that sections of said framework or walls can be almost considered as standard, or they can be made up of smaller units to render them so.

Therefore, one of the features of my invention resides in the provision of combination framework and wall units or panels which may be factory constructed, and which can be assembled in situ to simultaneously provide the framework and walls, either interior or exterior, of the building.

Briefly described, my invention comprises the provision of suitable frames, constructed of wood or metal, which are fabricated in the factory and take shapes, rectangular, square, polygonal, circular or any combination of such geometric forms which would be most commonly encountered in practice. In one specific aspect, these forms comprise the framework of the building. For instance, when assembled in situ, or "on the job" the frame members constitute the studs or other vertical supports of the building walls and to some extent they constitute horizontal supporting members. However, to take full advantage of the economy of this type of production, the curtain portion of the wall is constructed as a unitary portion of the frames as a part of the factory fabrication of the units. Accordingly, during assembly in situ, not only the framework of the building is formed, merely as an assembly operation, but the curtain portion of the wall or

wall panels are simultaneously provided, leaving substantially nothing but finishing operations to be performed to complete the building wall structure.

The objects and advantages of my invention will be more apparent from the accompanying drawings and following detailed description.

In the drawings:

Fig. 1 is a detailed prospective view of a fragmentary portion of a typical structural unit embodying my invention, parts being broken away and parts being shown in section.

Fig. 2 is a fragmentary face view of a portion of a wall built of my prefabricated structural units.

Fig. 3 is a vertical sectional view taken on line 3-3 of Fig. 2.

Fig. 4 is a horizontal sectional view taken on line 4-4 of Fig. 2.

Fig. 5 is a detailed horizontal sectional view of a corner juncture of the structural units shown in Figs. 1 to 4 inclusive.

Fig. 6 is a face view, parts being broken away, of a portion of a wall constructed of structural units of slightly modified form.

Fig. 7 is a top plan view of the portion of the wall shown in Fig. 6.

Fig. 8 is a side elevational view of the portion of the wall shown in Fig. 6.

Fig. 9 is a horizontal sectional view taken on line 9-9 of Fig. 6.

Fig. 10 is a vertical sectional view of a portion of a building having a wall structure such as that shown in Figs. 6, 7 and 8.

Fig. 11 is a view similar to that shown in Fig. 6 illustrating another modified unit.

Fig. 12 is a top plan view of the wall shown in Fig. 11.

Fig. 13 is a side elevational view of the wall illustrated in Fig. 11.

Fig. 14 is a horizontal sectional view of a corner juncture of the units shown in Figs. 11, 12 and 13.

Fig. 15 is a detailed sectional view of a slightly modified panel structure.

Fig. 16 is a fragmentary view of an edge of a section illustrating a modified frame-panel association.

Figs. 17, 18 and 19 are views similar to Fig. 16 showing other modifications.

Referring in detail to the drawings, particularly Fig. 1 thereof, 1 indicates a structural unit embodying the concepts of my invention. The unit 1 comprises a panel 2 constructed of a rigid type of wall panel material, preferably a heat

insulating material such as gypsum blocks, fibrous insulating materials of vegetable, animal or mineral origin or other types of insulating slabs or blocks customarily used for wall structure. The panel illustrated at 2 in Fig. 1 shows the use of a fibrous type of wall board or panel.

In this form of my invention the panel 2 is supported and defined by a frame 3 which comprises upright members 4 and cross members 5. In the embodiment illustrated, the frame 3 is rectangular in form and the members 4 and 5 are embedded in the thickness of the panel adjacent the end and side surfaces of the panel. The upright members 4 and the cross members 5 are joined at the corners of the rectangle so formed by means of nails, screws or other conventional means of securement. In the embodiment illustrated, transverse recesses 6 are provided upon each face of the panel 2, the depth of the recesses extending to the side portions of the upright members 4. The purpose of the recesses 6 will be hereinafter more fully described wherein it will be recognized that said recesses may be provided on both or only one face of the panel.

Although a rectangular unit is illustrated in Fig. 1, it is to be understood, of course, that the units comprising my invention may take any suitable shape and in practice said units would be constructed in shapes which are found to be most flexible and conform most easily with the windows, doors, or other openings in the walls of the conventional house or building.

Referring particularly to Figs. 2, 3 and 4, the application of the units 1 to a conventional building is illustrated. The building, of course, will be provided with the usual concrete foundation 7 which, of course, is co-extensive with the outer walls of the building. The building may also be provided with the conventional sub floor 8, finish floor 9 and ceiling 10, together with conventional interior finishing strips or boards such as mop boards 11 and the like.

The wall of the building is built up of a plurality of units 1, those illustrated in the portion of the building shown being designated, for convenience, by the numerals 12, 13, 14 and 15. In practice, the units 1 when adapted to constitute an outer wall will be disposed upon a stringer 16 positioned over the foundation 7. The upright members 4 constituting a portion of the frame 3 are vertically mounted upon the stringer 16 and may extend from the stringer 16 to the ceiling 10 at the solid portions of the wall. If a window 17 is to be provided in the wall, units 1 of smaller dimensions such as those indicated at 13 and 15 may define the upper and lower sides of the window. If the window is to be of ornamental shape such as a Gothic window or a window of semi-circular top, the upper unit 1 may be prefabricated to provide the desired definition of the upper side of the window.

It will be noted that in disposing the units to form the wall in the manner hereinbefore described, the upright members 4 will be positioned in the places heretofore occupied by the conventional studs and said upright members will function in the same capacity as studs have heretofore functioned. In both Figs. 2 and 4 it will be manifest that the upright members are disposed adjacent each other at the vertical line of juncture between adjacent units, whereby studs of substantially double the cross section of the upright members are provided at appropriately spaced intervals throughout the length of the wall. Adjacent the vertical edges of the window,

members 18 similar to the upright members 4 may be positioned to form a continuous line of support between the upright members of the unit 13 and the upright members of the unit 15. A conventional window frame or sash 19 is then positioned in the aperture provided between defining sides of the units bordering the window.

To join adjacent units to form a unitary wall construction, horizontal members 20 are positioned in the recesses 6 and are secured to the vertical members 4 by means of nails or screws 21 or other fastening means. It is preferred that the members 20 may be of such thickness as to be disposed flush with the remaining surface of the panel 2. However, instead of recessing the face or faces of the panel 2 for the reception of the member 20, only a relatively small area of said panel may be recessed immediately in front of the sides of the upright 4 which will expose a relatively small area of said upright. Metal plates 20 may be positioned in said recesses and may serve to connect adjacent uprights together. This latter structure is not shown in the drawings but would be obvious to any one skilled in the art. Further, other fastening means will undoubtedly be suggested to those skilled in the art.

A beam 22 surmounts the units comprising the wall and is primarily supported by the stud-like members comprising the uprights 4. If a floor is to be built above the room defined by the wall described, joists 23 are secured in position above the supporting stud-like members and units 1 are disposed in appropriate positions above the first floor to form the frame and curtain walls of the floor above.

In the embodiment of my invention hereinbefore described the members constituting the frame 3 are constructed of wood and may comprise conventional 2 by 4 (inch) members, or members of other suitable dimensions which when joined to corresponding members of adjacent units provide studs of suitable cross-section.

When two of the units abut along their vertical edges to form a corner, a column 24 of rectangular cross-section is positioned with its sides in alignment with the outer faces of the units. The sectional dimensions of the column 24 may be such that one unit will overlap the end of the angularly disposed unit a distance sufficient to bring the end of said overlapping unit in alignment with the edge of the frame member of the angularly disposed unit. Screws 25 or other fastening means may be employed to secure the upright member 4 of the corner abutting units to the column 24.

Of course, if desired, the panels instead of being constructed of fibrous insulating material or the like, may comprise cast or moulded materials containing ingredients having inherent insulating properties or a high percentage of relatively small voids or pockets containing dead air or inert gas. The panel 2 may include such materials as ceramic substances, tile, brick, etc., moulded concrete or pre-formed cement blocks and the like, depending upon the conditions and particular uses to which they will be applied.

Referring to Figs. 6, 7, 8, 9 and 10, a slight modification of my invention is shown. In this embodiment of my invention, 26 indicates one of the basic structural units employed and comprises frame members 27 and 28 joined at their ends to form, in this instance, a rectangular frame. The members 27 constitute the vertical or upright members and the members 28 constitute the horizontal members. The members 27 and 28 may 75

be constructed of steel or other suitable metal and may be of channel section or other shapes such as I, H, T, L and the like. The members 27 and 28 are so disposed as to have the flanges 29 extend inwardly.

The rectangular frame comprised of the members 27 and 28 is adapted to support a panel 30 which constitutes a portion of the curtain wall of a building when the units 26 are assembled. The panel 30 is of greater width than the width of the web of the channels comprising the members 27 and 28 and a restricted section 31 of the panels is adapted to be embraced between the flanges 29 of the members 27 and 28, the restricted portion 31 in effect constituting an up-raised ridge which is co-extensive with the perimeter of the panel 30. To join the members 27 and 28 in position the ends thereof may be welded or joined in any other suitable manner. The panel 30 preferably comprises an insulating material but may be constructed of any of the materials heretofore described as being suitable for the construction of the panel 2.

As can be readily seen, the units 26 comprising the members 27 and 28 and the panel 30 may be pre-fabricated and may be delivered to the site of the building to be assembled to form the building wall and frame as will be hereinafter described.

To assemble the units 26 to form an outer wall, the same may be mounted upon channel irons 32 whose flanges may extend downwardly into the usual concrete foundation 33. The lower members 28 are preferably welded as indicated at 34 in Fig. 6 to the supporting channels 32 and if desired the units may be constructed of such dimensions that the upright members 26 may extend from the foundation to the ceiling of the first floor, a beam 35 may be mounted upon the upper portion of the unit and serves as a support for the next floor above or the attic floor and roof as the case may be. Similar to the embodiment illustrated in Figs. 1 to 5 inclusive, the units 26, are disposed in vertical edge abutting relationship and the adjacent abutting upright members 27 are welded together.

When a window space 35 is to be provided the same may be defined by a portion of an upright member 27 and the horizontal members 28 of units 36 and 37, constituting units similar to 26, but of smaller dimensions. As can readily be seen by referring to Fig. 6, the upright members 27 of the units 36 and 37 vertically abut the upright member 27 of the next adjacent unit 26 and the same are permanently joined by means of welding 38 or if desired, the adjacent abutting vertical members 27 may be secured together by bolts or the like (not shown). Of course, the same procedure is followed to provide a door or other opening in the wall.

In view of the fact that elongated recesses 39 are provided in the face of the wall adjacent the vertical line of juncture of the units, blocks or strips 40 constructed of wood, plaster or constructed of the same material constituting the panel 30, are positioned in said recesses and preferably have their outer surfaces flush with the plane of the wall. Such blocks or strips may be positioned in the recesses 39 at each face of the wall, that is, the inner and outer faces. In addition, as illustrated at 41 in Fig. 10, blocks or strips similar to the blocks 40 may be positioned in the recesses formed adjacent the horizontal members 28 whereby a continuous wall of flat surface is provided. These recesses may also be

filled with plaster, cement or other similar material preferably having insulating value. They may also be employed for the insertion of wood nailing strips to provide means of attachment of interior and exterior surfaces.

As shown particularly in Fig. 9, where the adjacent units abut, the vertical members 27 are so disposed as to bring the flanges of the members 27 into abutting relationship and, as a consequence, a metal stud is provided of substantially I or H section. Similar to the members 4 described in conjunction with Figs. 1 to 5 inclusive, the composite or joined upright members designated 42 in Fig. 9 serve as studs comprising the frame of the wall and also comprising supports for the various beams and rafters which are normally supported by the studs in the usual building construction.

Referring particularly to Fig. 10, a fragmentary portion of a building is illustrated in a more or less diagrammatic manner to show the application of my invention when units 26 are employed. The building may have the usual foundation 43 upon which a stringer 44 is mounted. Suitably spaced rafters 45 may be carried at their ends upon the opposite stringers 44 and may be supported intermediate their length by suitable piers or columns (not shown). A sub-floor 46 may be positioned upon the rafters or beams 45 and the usual finished floor 47 may be secured to the sub-floor 46. The wall of the building may constitute units 26 which may be carried upon the foundation 43. The interior surface of the wall may be plastered as indicated at 48 or may carry wall boarding, wood veneer or other decorative wall surfacing. The outer surface may be covered by siding or clapboards 49 or, if desired, may be covered by brick or stone veneer, stucco or any of the conventional outer wall surfacing materials. If desired, suitable nailing strips (not shown) may be mounted upon the interior or exterior surface of the wall to facilitate the mounting of the interior or exterior wall finish.

In Fig. 10 the upper portion of the lower units 26 may carry I beam 50 which, in turn, may support the ceiling rafters 51. A ceiling sheathing 52 may be carried at the lower portion of the rafters 51 and the ceiling proper may comprise appropriate surfacing material conforming with the surfacing material of the interior of the walls. Suitable floors may be carried upon the upper portion of the rafters 51 as indicated generally at 53. Units 26 also constitute the walls of the upper compartment and are mounted upon the I beams 50 in the same manner as the lower units are mounted upon the foundation 43, and in like manner, the interior surface of the walls comprising the units 26 may be finished in the same manner as the compartments below. Of course, outer siding, brick veneer or the like also covers the outer surface of the upper units 26. A beam 54 of suitable section may surmount and be carried by the upper portion of the units 26 and may carry attic rafters 55 and roof 56.

It can readily be seen that the units comprising my invention are susceptible of being used with the conventional building constructions, that is, floor constructions, ceiling constructions, roof constructions, sidings and interior finishes usually employed in the erection of a building. The advantages, however, of my invention, will be readily apparent when the fact is taken into consideration that the studs and curtain walls

of the building are erected simultaneously and comprise essentially the vertical frame work of the building.

Referring particularly to Figs. 11, 12, 13 and 14, another modification of my invention is illustrated and comprises the utilization of structural units 57. The structural units 57 follow in most respects the form of the units 26 and are provided with vertical frame members 58 and horizontal frame members 59 so joined as to define a rectangular section. Of course, said members may be arranged to form any other desired shape depending on the intended position of the unit in the wall. Wall material may be carried by the frame comprised of the members 58 and 59. However, in this embodiment of my invention the wall material may be constructed in sections as indicated at 60 and 61. The sections 60 and 61 in effect comprise halves of the wall material 30 but are separated from each other by reticulated, reinforcing means 62 which is co-extensive in area with the wall material.

It is obvious that by the provision of the reinforcing means 62 the wall is prevented from buckling or being otherwise distorted and is particularly adaptable when fibrous insulating board or the like constitutes the panels 60 and 61. By this arrangement the desirable properties of the fibrous material in regard to insulation are obtained and in addition by the provision of the reinforcing means 62 a relatively rigid and strong structure is secured. Similar to the assembly of the units 26 the structural units 57 may be mounted upon a suitable foundation 63 and the panels comprising the horizontal members 59 may be welded as at 64 to supporting channels 65 carried upon the foundation. The vertically abutting junctures of adjacent units may be welded as indicated at 66 and suitable blocks or strips 67 may be utilized to fill in the channels or recesses provided between adjacent units. Similar to the structural units 26 the vertical members 58 are joined web to web to form studs of substantially I or H sections which serve as the supporting frame work for not only the curtain walls of the building but for the beams and rafters.

Referring particularly to Fig. 14 a corner junction of two units 57 is shown. To join the units in order to form a corner, the vertical members 58 are so disposed with respect to each other that the plane of the web of one member is positioned substantially along the center of the web of the angularly disposed unit. Threaded bolts 68 are welded or otherwise secured to the web of the first mentioned member, one series of bolts extending at right angles to the plane of the web and another series of bolts extending substantially parallel to said web. The web of the first mentioned member is secured to the web of the second member by welding 69 at suitably spaced intervals along the length of the members. Boards, preferably of wood, are then secured by means of the bolts to said members to form the exterior corner, the outer plane of the boards being flush with the outer surfaces of the walls 57. To secure the boards in place, the bolts 68 may extend therethrough and are engaged by nuts 70 which may be positioned in countersinks or recesses 71.

Of course, since units 26 are similar to units 57 with respect to the frames thereof, units 26 may be joined to form corners in a manner similar to that described in conjunction with units 57.

Referring particularly to Fig. 15 a fragmentary

sectional view of a modified wall panel is shown. This type of wall panel resembles the panel comprised of sections 60, 61 and reinforcement 62, but comprises a unitary section 72 having reinforcing means 73 embedded therein. This type of construction is particularly suitable when fibrous insulating material is used for the wall panelling, in which case the panelling proper and reinforcing means comprises an integral structure.

Of course, it is to be understood that, the reinforcing means 62 and/or 72 can be used in the panelling 2 described in conjunction with the form of my invention shown in Figs. 1 to 5 inclusive. Further, it is to be understood that other types of panel reinforcing may be used in place of the reticulated screens 62 and 73, for instance, reinforcing rods, bars, tubes or the like (not shown) may be embedded in the panels 2 and 72 or disposed between the sections 60 and 61, preferably during fabrication of the same.

Referring particularly to Figs. 16, 17, 18 and 19 modifications of the basic form of my invention illustrated in Figs. 6 to 9 inclusive as shown. In Fig. 16, channels 74 are used as the horizontal and vertical members of the unit. In this case the panelling material 75 is associated in a slightly different manner with the frame. The panelling material is provided with a peripheral ridge 76 which is embraced by the channel 74. However, the ridge does not extend outwardly as far as the ridge 31 and as a consequence the flanges of the channel are embedded in the thickness of the panel.

In Fig. 17, T-sectioned frame members 78 comprise the horizontal and vertical members and carry the panelling material 79. The flange 80 of the T-sectioned members is embedded in the thickness of the panel. The studs formed by the welding of adjacent frame members, of course, will be of X-section.

In Fig. 18, L-sectioned frame members 81 comprise the horizontal and vertical members and carry the panelling material 82. One flange of the L-sectioned members is embedded in the thickness of the panel. The studs formed by the welding of adjacent frame members, in this case, will be of T-section.

In Fig. 19, H-sectioned frame members 83 comprise the horizontal and vertical members of the unit and carry the panelling material 84. In this case the portions of the flanges on one side of the web and the web itself is embedded in the thickness of the panel and the studs formed by the welding of adjacent frame members will be of double H-section.

Of course, other type sections may be used without departing from the spirit of my invention since my invention broadly contemplates a structural unit which constitutes the frame and panels of a wall, the frame being adapted to take the place of structural members such as studs, cross supporting members and the like.

As has been hereinbefore described the external portion of the building constructed of the units comprising my invention may include the usual wood siding, brick or stone veneer, stucco, metal or the like. These, if desired, may be constructed as integral portions of the units themselves (not shown) and may be prefabricated with the unit. Similarly, sheets of interior finishes, such as plaster, plaster board, wall board, etc., may be prefabricated with the unit and be carried as an integral portion of the unit.

In its broadest aspects the invention includes

both the prefabricated frames as well as the frames and the wall material or panels. The latter may not necessarily be limited to good insulating materials but may be made up of moulded or precast slabs of hydraulic cement, concrete, resins, particularly synthetic, ceramic materials and the like, although it is to be pointed out that the latter materials are not to be considered as strictly equivalent to the insulating materials.

Although my invention is shown and described in conjunction with the construction of exterior walls, the units comprising my invention have equal applicability as interior walls or partitions. In this case the vertical frame members function as studs or vertical supports and the horizontal frame members function as cross-supports or horizontal stress-bearing members.

It will, of course, be understood that various combinations of the features of the invention, other than the combinations illustrated and described, will be obvious to those skilled in the art and are, therefore, entirely within the scope of the invention, as defined by the appended claims. The same applies to various modifications and minor departures from the specific forms of frames and wall slabs as well as the method and means of constructing the frames with and without the wall material, and joining them as herein illustrated and described.

I claim as my invention:

1. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having vertical building frame members joined in spaced relationship by transverse members and a panel of solid construction formed of non-load bearing material carried by and extending between said vertical frame members, said panel units being positioned in said wall and fastened together externally of said panel units with the vertical frame members of adjacent panels in abutting relationship so that abutting vertical frame members of adjacent panels form a load bearing stud in the plane of said wall and means for covering the abutting vertical frame members.

2. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having vertical building frame members joined in spaced relationship by transverse members which form the ends of said units and a panel of solid construction formed of heat insulating non-load bearing material carried by and extending between said vertical and transverse frame members, said panel units being positioned in said wall and fastened together externally of said panel units with the vertical frame members of adjacent panels in abutting relationship so that abutting vertical frame members of adjacent panels form a load bearing stud in the plane of said wall, and means for covering the abutting joints of the said frame members comprising a heat insulating material.

3. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having vertical building frame members joined in spaced relationship by transverse members which form the ends of said units and a panel of solid construction formed of fibrous heat insulating non-load bearing material carried by and extending between said vertical and transverse frame members and at least partly covering said frame members, said panel units being positioned in said wall and fastened together externally of said

panel units with the vertical frame members of adjacent panels in abutting relationship so that abutting vertical frame members of adjacent panels form a load bearing stud for said wall, and means for covering the abutting joints of the said vertical frame members.

4. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having vertical metal building frame members joined in spaced relationship by transverse building frame members which form the ends of said units and a panel of solid construction formed of non-load bearing material carried by and extending between said vertical and transverse frame members, said panel units being positioned in said wall with the vertical frame members of adjacent panels in abutting relationship and welded together along their edges to form load bearing studs in the plane of said wall, and means for covering the abutting vertical frame members and the welded edges of the same.

5. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having vertical metal building frame members joined in spaced relationship by transverse building frame members which form the ends of said units and a panel of solid construction formed of non-load bearing heat insulating material carried by and extending between said vertical and transverse frame members and at least partly covering said frame members, said panel units being positioned in said wall with the vertical frame members of adjacent panels in abutting relationship and welded together along their edges to form load bearing studs for said wall, and means for covering the welded edges of the said vertical frame members.

6. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having vertical building frame members joined in spaced relationship by transverse building frame members which form the ends of said units and a panel of solid construction formed of non-load bearing material carried by and extending between said vertical and transverse frame members and at least partly covering said frame members, said panel units being positioned in said wall with the vertical frame members of adjacent panels in abutting relationship so that abutting vertical frame members of adjacent panels form a load bearing stud for said wall, said panel units having aligned recesses in their outer surfaces and connecting members positioned in said recesses and extending between said panel units to secure the same together.

7. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having wooden vertical building frame members joined in spaced relationship by transverse building frame members which form the ends of said units and a panel of solid construction formed of non-load bearing material carried by and extending between said vertical and transverse frame members and at least partly covering said frame members, said panel units being positioned in said wall with the vertical frame members of adjacent panels in abutting relationship so that abutting vertical frame members of adjacent panels form a load bearing stud for said wall, said panel units having aligned recesses in their outer surfaces and connecting members posi-

tioned in said recesses and extending between said panel units to secure the same together.

8. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having vertical building frame members joined in spaced relationship by transverse building frame members which form the ends of said units and a panel of solid construction of greater thickness than the frame members formed of non-load bearing material carried by and extending between said vertical and transverse frame members and at least partly covering said frame members, said panel units being positioned in said wall and fastened together externally of said panel units with the vertical frame members of adjacent panels in abutting relationship so that abutting vertical frame members of adjacent panels form a load bearing stud for said wall, and means for covering the abutting joints of the said vertical frame members.

9. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having vertical metal building frame members joined in spaced relationship by transverse building frame members which form the ends of said units and a panel of solid construction of greater thickness than the frame members formed of non-load bearing material carried by and extending between said vertical and transverse frame members and at least partly covering said frame members, said panel units being positioned in said wall with the vertical frame members of adjacent panels in abutting relationship and welded together along their edges to form load bearing studs for said wall, and means for covering the welded edges of the said vertical frame members.

10. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having wooden vertical building frame members joined in spaced relationship by transverse building frame members which form the ends of said units and a panel of solid construction formed of non-load bearing material carried by and extending between said vertical and transverse frame members and covering the lateral edges of said frame members, said panel units being positioned in said wall with the vertical frame members of adjacent panels in abutting relationship so that abutting vertical frame members of adjacent panels form a load bearing stud for said wall, said panel units having aligned recesses in their outer surfaces and connecting members positioned in said recesses and extending between said panel units to secure the same together.

11. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having vertical metal building frame members joined in spaced relationship by transverse building frame members which form the ends of said units and a panel of solid construction formed of non-load bearing material carried by and extending between said vertical and transverse frame members and at least partly covering said frame members, said panel units being positioned in said wall with the vertical metal frame members of adjacent panels in abutting relationship so that abutting vertical metal frame members of adjacent panels form a load bearing stud for said wall, said panel units having aligned recesses in

their outer surfaces and connecting members positioned in said recesses and extending between said panel units to secure the same together.

12. A building structure comprising a plurality of prefabricated load-bearing panel units forming a bearing wall of a building, said units having vertical building frame members joined in spaced relationship by transverse members and a panel of solid construction formed of heat insulating non-load-bearing material carried by and extending between said vertical frame members, said panel units being positioned in said wall and fastened together externally of said panel units with the vertical frame members of adjacent panels in abutting relationship so that abutting vertical frame members of adjacent panels form a load-bearing stud in the plane of said wall and means for covering the abutting joints of the said vertical frame members comprising a heat insulating material.

13. A building structure comprising a plurality of prefabricated load-bearing panel units forming a bearing wall of a building, said units having vertical building frame members joined in spaced relationship by transverse members and a panel of solid construction formed of fibrous heat insulating non-load-bearing material carried by and extending between said vertical frame members, said panel units being positioned in said wall and fastened together externally of said panel units with the vertical frame members of adjacent panels in abutting relationship so that abutting vertical frame members of adjacent panels form a load-bearing stud in the plane of said wall and means for covering the abutting joints of the said vertical frame members.

14. A building structure comprising a plurality of prefabricated load-bearing panel units forming a bearing wall of a building, said units having metal vertical building frame members joined in spaced relationship by transverse members and a panel of solid construction formed of heat insulating non-load-bearing material carried by and extending between said metal vertical frame members, said panel units being positioned in said wall and fastened together externally of said panel units with the metal vertical frame members of adjacent panels in abutting relationship and welded together along their edges to form load-bearing studs in the plane of said wall and means for covering the abutting metal vertical frame members and the welded edges of the same.

15. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having vertical steel building frame members joined in spaced relationship by transverse members and a panel of solid construction formed of non-load bearing material carried by and extending between said vertical steel frame members, said panel units being positioned in said wall and fastened together externally of said panel units with the vertical steel frame members of adjacent panels in abutting relationship so that abutting vertical steel frame members of adjacent panels form a load bearing stud in the plane of said wall, and means for covering the abutting vertical steel frame members.

16. A building structure comprising a plurality of prefabricated load bearing panel units forming a bearing wall of a building, said units having vertical wooden building frame members joined in spaced relationship by transverse members and a panel of solid construction formed of

non-load bearing material carried by and extending between said vertical wooden frame members, said panel units being positioned in said wall and fastened together externally of said panel units with the vertical wooden frame members of adjacent panels in abutting relationship so that abutting vertical wooden frame members of adjacent panels form a load bearing stud in the plane of said wall, said panel of non-load bearing material substantially covering the abutting vertical wooden frame members.

JACQUE C. MORRELL.