Nov. 30, 1971 S. L. HOROWITZ 3,623,288

PREFABRICATED BUILDING CONSTRUCTION

Filed July 23, 1970 4 Sheets-Sheet 1

FIG. 1

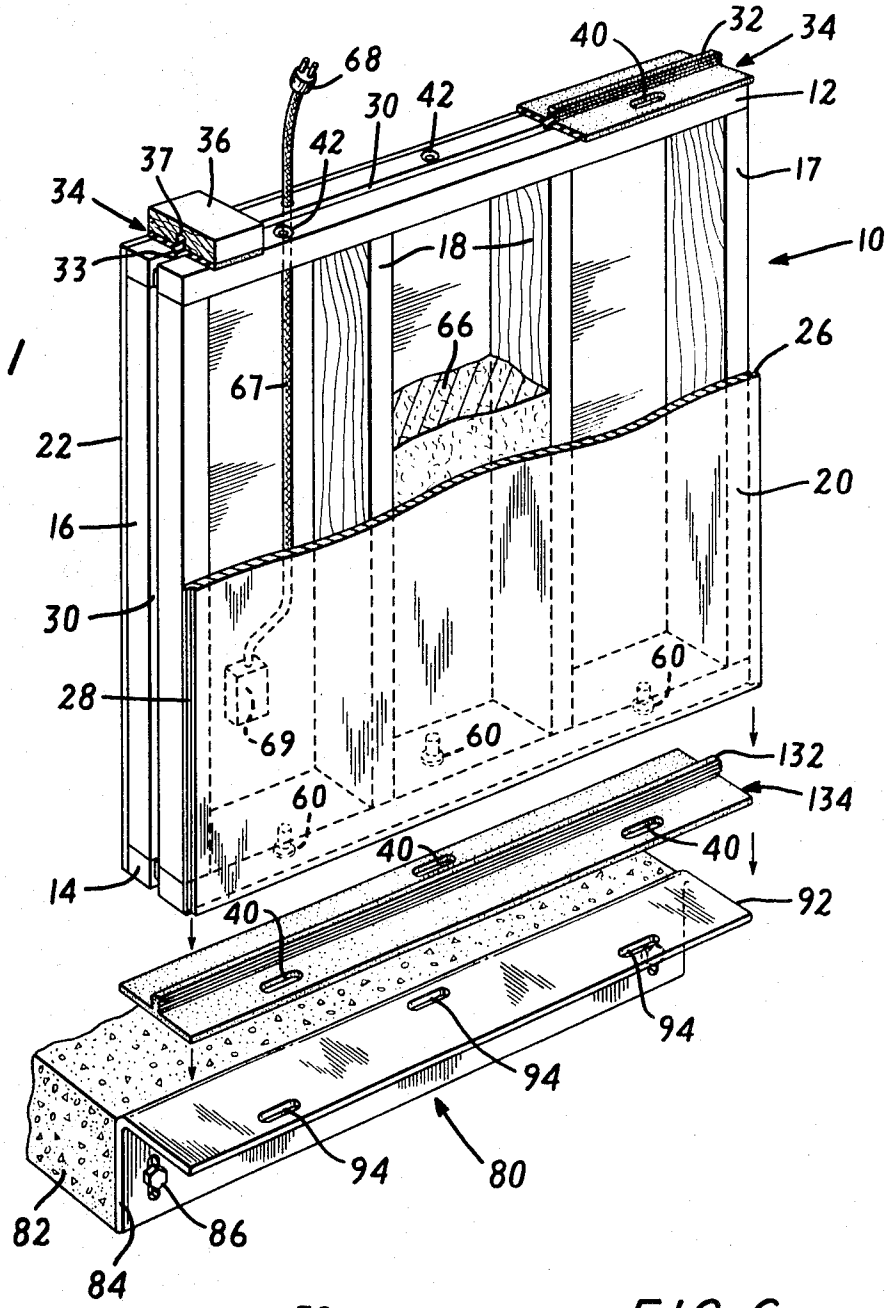
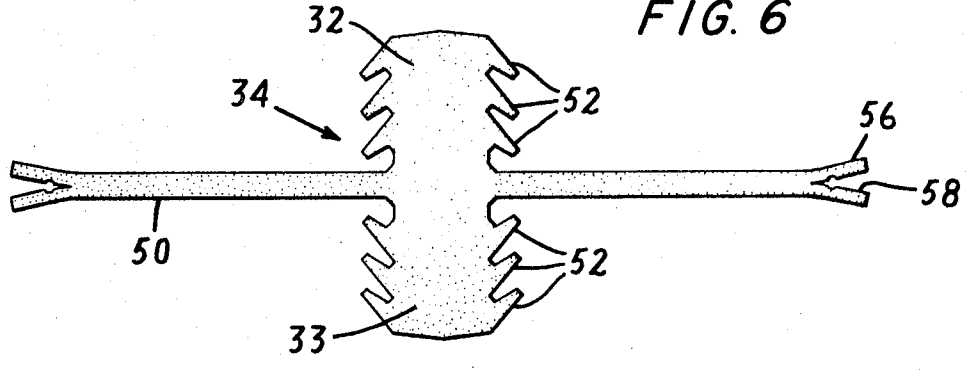


FIG. 6



Nov. 30, 1971 S. L. HOROWITZ 3,623,288

PREFABRICATED BUILDING CONSTRUCTION

Filed July 23, 1970 4 Sheets-Sheet 2

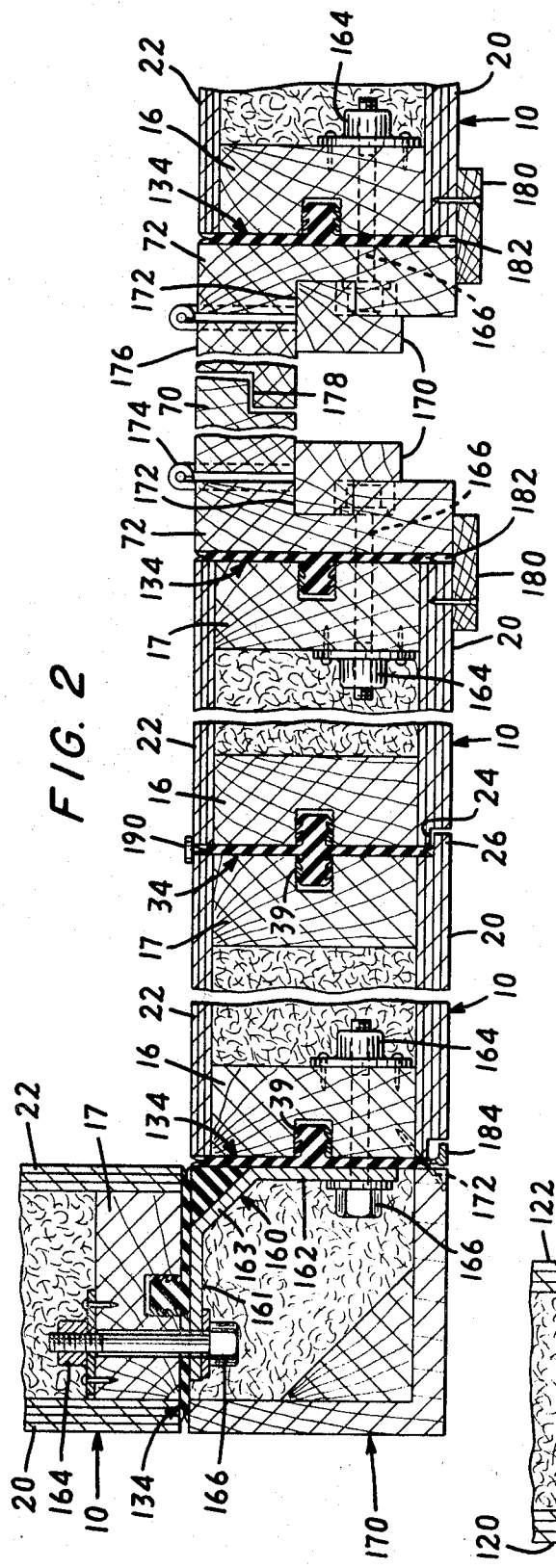


FIG. 2

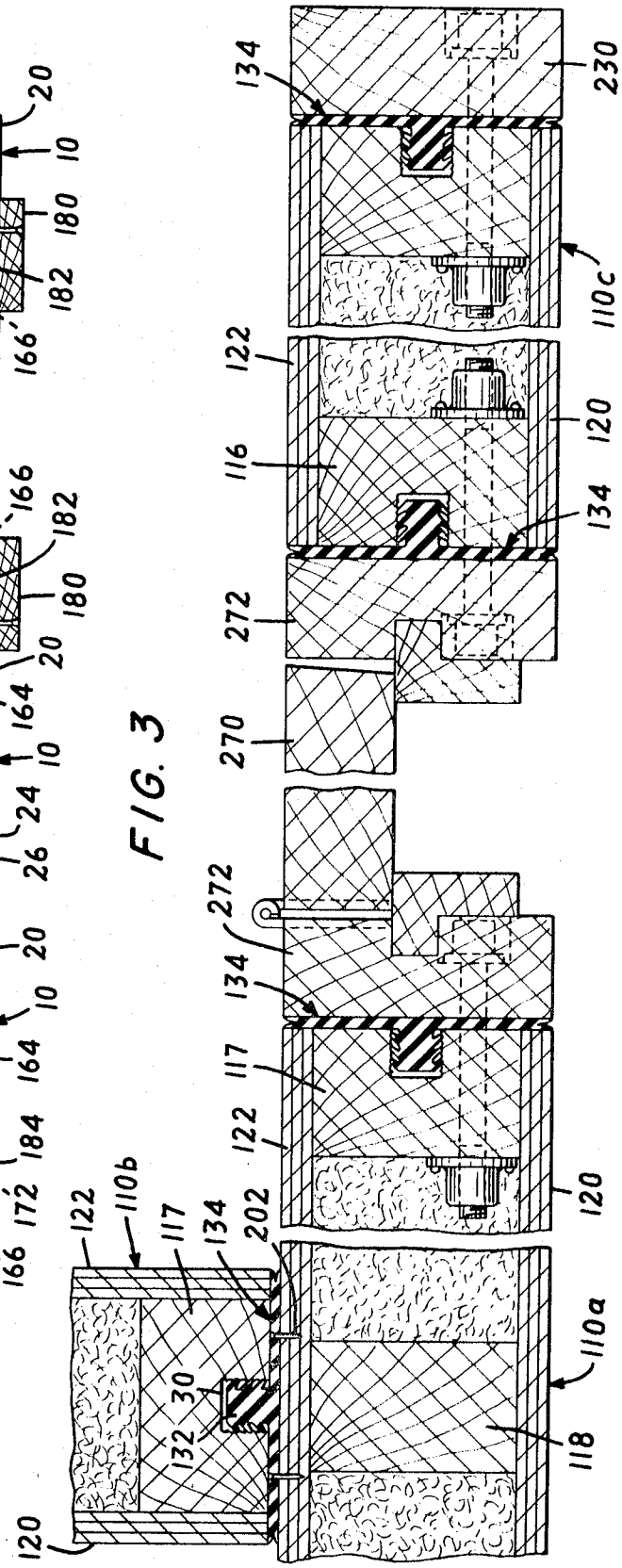


FIG. 3

PREFABRICATED BUILDING CONSTRUCTION

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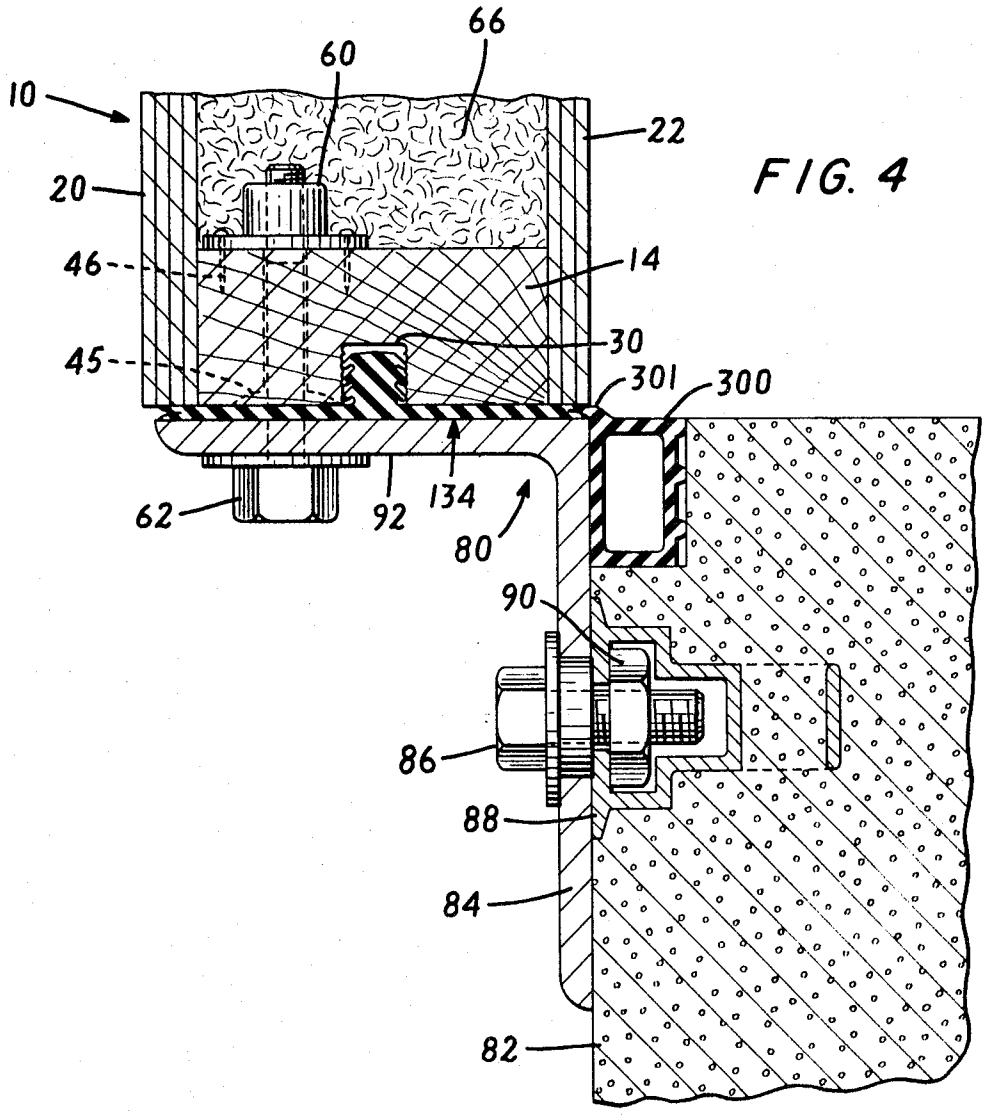
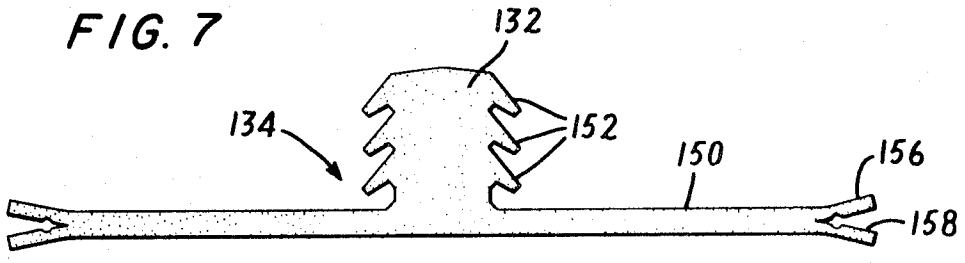


FIG. 4

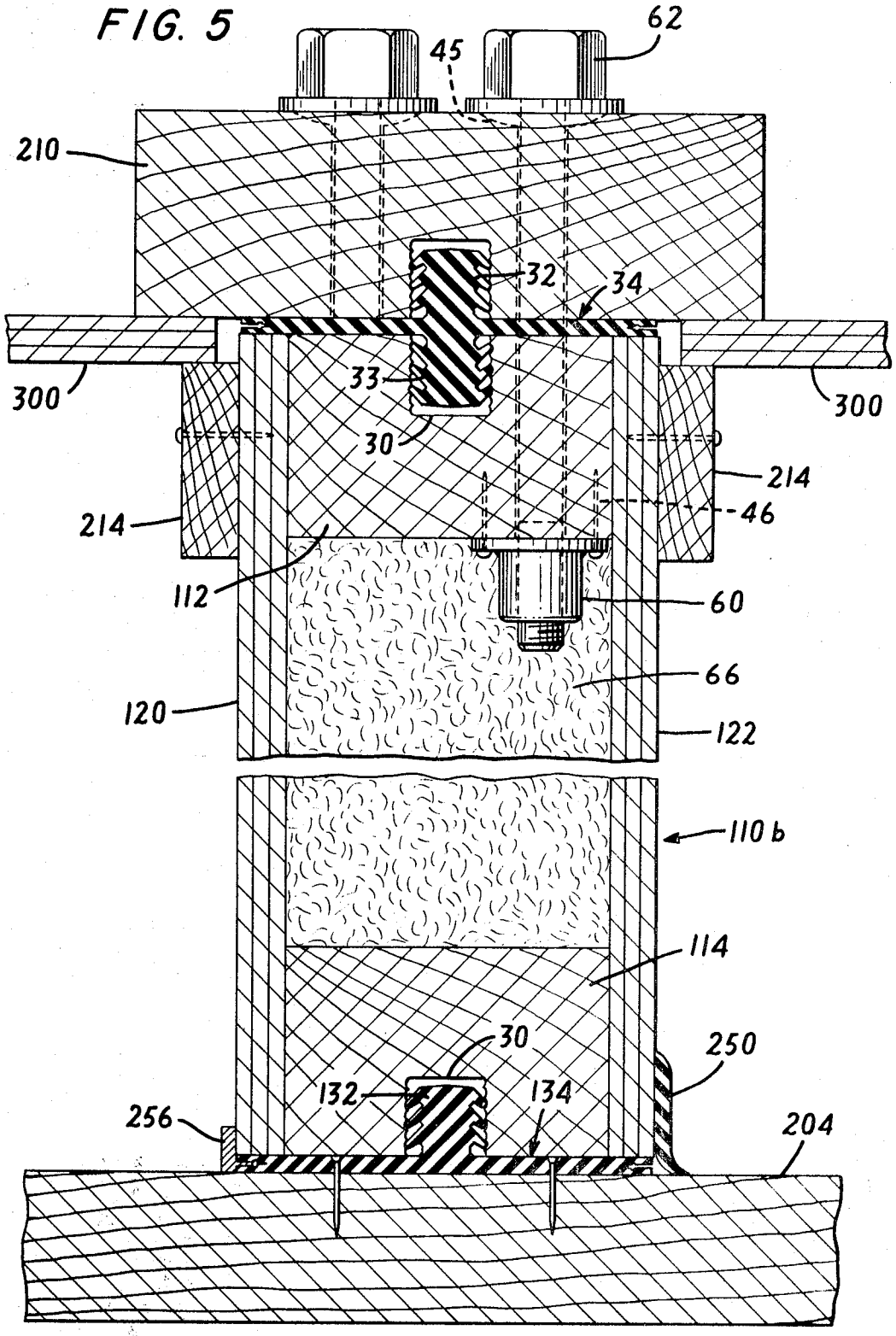
FIG. 7



PREFABRICATED BUILDING CONSTRUCTION

Filed July 23, 1970 4 Sheets-Sheet 4

FIG. 5



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PREFABRICATED BUILDING CONSTRUCTION

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Int. Cl. E02d 27/00
U.S. Cl. 52—293 23 Claims

ABSTRACT OF THE DISCLOSURE

A prefabricated building erected with prefabricated wall members constructed with a framework of horizontal and vertical members and panel skins disposed at opposite sides of the framework and fixedly secured thereto. The outer surfaces of the framework members are provided with grooves in which are received the tongue parts of resilient strip members, the resilient strip members providing seals at the joints along which the respective edges of the wall members are secured to the building structure and to other wall members. The resilient strip members also serve as connecting means at the vertical seam between two adjacent wall members for connecting the wall members together without recourse to use of fastener means which extend through the vertical side edges of the wall members.

BACKGROUND OF THE INVENTION

The present invention is concerned with prefabricated building construction characterized by the facility with which a building structure can be erected and if need be later dismantled for removal to a new building site. It is also concerned with special forms of structural components for use in such buildings designed so as to reduce the cost, labor and time required for erecting and dismantling prefabricated structures.

It is becoming more commonplace to use prefabricated building construction components and techniques in meeting the needs of housing construction, particularly to offset the very high labor costs attending erection of dwellings with conventional building materials and techniques. The advantages of providing prefabricated structures to meet building needs are well known, particularly with respect to the reduction of labor costs as well as the speed with which such structures can be erected and placed in service. Not only are consequential savings realized with respect to erection labor costs when using prefabricated construction, but the costs of fabricating the prefabricated structure components also can be reduced in that the major portion of fabrication is done in a factory on a mass production basis providing for the economic advantages attending large quantity material purchases, mass production fabrication techniques and more effective utilization of labor. Additionally, factory fabrication of structure components provides for optimum processing control thereby insuring production of uniform, high-quality components. Prefabricated structures, moreover, allow for substantial standardization of components and maximum utilization of unskilled labor in the erection of the structures at the job site.

Many forms of prefabricated structure designs and components for use therein are known in the art. However, such prefabricated structure designs and components do not completely fulfill present day requirements for cost reduction and speed of prefabrication and erection. For example, in prior art prefabricated structures, the wall sections thereof generally utilize connector means such as nuts and bolts, special clamps, weldments, splines, etc., at vertical seams for connecting each wall section to those wall sections adjacent therewith. Such connector means frequently are cumbersome to install. Also they are of

essentially permanent character, and therefore make it very difficult, if not impossible, to dismantle the structure if it is sought to alter the same or to remove it to another building site without effecting damage to the various building components and especially prefabricated wall members. Further, in making installation with prior art wall sections, whether for exterior or interior walls, skilled workmen, e.g., carpenters, are usually required to superintend the physical placement of each section to ensure that proper wall alignment is established and maintained during the course of the erection of the structure. Furthermore, in prefabricated structure types as are known, it is difficult to weatherproof, soundproof and control expansion and contraction in the structure except by the use of complicated and expensive joint and sealing devices. Thus, incorporation of complicated and special devices in a prefabricated structure as well as need to employ skilled labor in the erection thereof, constitute factors which make it difficult to reduce building construction cost especially wherein it is sought to erect an attractive, durable quality-type dwelling.

A further shortcoming of most known types of prefabricated structures is the lack of flexibility of the components and design thereof when it is proposed to modify a structure or depart from an existing layout. For example, if a number of pre-fabricated type one or two-family dwellings of standardized design are being erected in a building project, such structures generally have to be built with careful adherence to the basic design leaving little margin for modifying a selected design to suit a particular purchaser's preferences, of future needs, such as adding rooms, increasing overall floor space area, relocating specific rooms and the like. Unless the basic structure design and components thereof are both easily erected and dismantled, modification in or departure from the standard design is unlikely.

SUMMARY OF THE PRESENT INVENTION

The present invention is concerned with prefabricated building construction. It is concerned particularly with providing a novel prefabricated structure, prefabricated structure components, component connecting devices and erection techniques which make possible greatly reduced building costs by reducing the skilled labor required for erecting the structure, reducing the fabrication costs for building the various components in a factory on mass production scale wtih high degree of manufacturing quality, simplifying field erection of the structure with unskilled labor, and involving utilization of readily demountable components to provide flexibility for later structure alteration, repair or dismantling and removal to another building site without causing damage to the structure components.

In accordance with the present invention, a prefabricated building can be field erected with components made according to the present invention with but a minimum resort to use of known components such as hardware and the like. A major component provided by the present invention is a prefabricated wall member which functions with a number of like wall members to establish and define the building walls. Such wall member is designed to be suitably used as both an exterior and interior structural component, although the gauges and sizes of materials used in the wall member may differ to the extent that for exterior wall structure heavier, more durable, elements may be employed than those used for interior wall structure. The wall member is designed as a structurally, self-contained unit having load-bearing capabilities thus permitting its use in supporting roof and ceiling loads. Moreover, the wall member is designed to be compatible for use, if necessary, with the usual and known forms of building components such as

windows, door frames and the like. In one form of construction, the wall member can be comprised of a framework of generally rectangular configuration, such rectangular shape being provided by parallel spaced upper and lower horizontal frame members and vertical members extending between the ends of the horizontal members provided in the manner of wall studding in conventional construction. Secured to the framework at the opposite sides in covering position thereon are panel skins which can be provided in suitable sheet material form, e.g., plywood, plasterboard, fiberboard, asbestos board, sheet metal and the like. The panel skins can vary in thickness to a considerable degree and the two skins associated with each panel can differ from each other with respect to the building weather and interior side skins. However, the panel skins are each generally co-extensive with the framework. The framework horizontal and vertical members are provided at their outer surfaces, i.e., the sides of the members defining the perimeter of the framework, with slots or grooves along a course extending end-to-end of the respective framework members. The grooves are provided in the framework member in conjunction with the manner in which the wall members are joined or connected to adjacent wall members and other supporting structure such as overhead beams or plates, floors, doors and the like. For such purpose, the present invention employs as an important component, strips of resilient material, the strips being relatively thin elements provided at one or both sides thereof with projecting tongue parts. The resilient strips function as a means for effecting the connection of the wall members to the building supporting structure. The grooves in the wall member framework serve to receive a projecting tongue part of the resilient strips with the strips being interposed between the framework members and the building supporting structure. These resilient strips are used for placement intermediate adjacent wall members and such tongue parts are received in the grooves of the vertical framework members at the adjacent ends of such wall members. The other supporting surfaces of the building structure to which the wall members are connected such as beams, floors and the like also can be provided with slots or grooves for receiving a strip tongue part although this is not essential. In addition to serving as a sturdy connector means, the resilient strip serves, as will appear in more detail later, a number of other purposes. It functions to establish a weatherproof joint between the wall member and the associated supporting surfaces. Due to its resilient character, the strip provides a dampening means to absorb vibrations in the building structure thereby reducing noise; it functions as a locator means to insure proper wall alignment; and it also serves to compensate for expansion and contraction of the various building structure components. Other components provided by the invention include brackets for providing corner connection between walls, door and door-frame components, etc.

BRIEF DESCRIPTION OF THE DRAWINGS

The nature and objects of the present invention will appear more clearly from the following detailed description when taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of a prefabricated wall member or building panel made in accordance with the present invention, portions of the wall member panel skin nearest the viewer (weather side skin) being broken away for purposes of clarity, there being depicted in exploded view the resilient strip, saddle bracket and building structure floor slab on which the wall member is supported.

FIG. 2 is a horizontal sectional view illustrating the manner in which a building exterior wall section is erected using components made according to the present invention, there being illustrated also the manner in which the exterior wall sections are joined at building corners as well as the manner in which one form of door and door frame are installed.

FIG. 3 is a horizontal sectional view illustrating the manner in which building interior wall sections are arranged showing particularly the manner of connecting one wall member of a wall section to the side of another wall section for space subdivision as well as the manner of capping or blanking off the terminal end of an interior partition wall.

FIG. 4 is a fragmentary vertical sectional view illustrating the manner an exterior wall section wall member is supported on and connected to a saddle bracket connected to a building foundation or grade level slab.

FIG. 5 is a vertical sectional view illustrating the manner in which wall members are connected to the building floor and overhead structure, the depicted wall member being one forming part of an interior wall section and being connected to a wood floor at the bottom and an overhead or ceiling support at the top.

FIG. 6 is a sectional view of one form of resilient strip used for connecting the panel member to various building structures wherein the strip is provided with tongue parts on both sides thereof, the tongue parts being adapted to engage respectively in one of the wall member framework slots and a slotted course in the building supporting structure associated therewith and to which the wall member is connected.

FIG. 7 is a sectional view of a modified form of resilient strip provided at one side with a tongue part for reception in the wall member, the other side of the strip being a smooth surface for abutment reception against a smooth surface of the supporting surface to which the wall member is being connected, for example, an interior building floor surface.

Throughout the following detailed description, like reference numerals are used to denote like parts in the drawings.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention provides a novel prefabricated building structure as well as the components used for erecting such structure. The various components are characterized by the simplicity of their construction as well as the ease and facility with which they are assembled, thereby contributing to the rapid and relatively inexpensive erection of the building structure. The prefabricated building of the present invention is particularly suitable for erection on mass production scale of one and two-family dwellings, especially such dwellings as are intended to combine excellence of quality with reasonableness of purchase price. A most important feature of the present invention is that buildings made in accordance therewith can be dismantled at the site of original construction and removed to a new building site for erection thereon without recourse to damaging any components of the structure or rendering them unsatisfactory for reuse.

Referring now to FIG. 1, there is illustrated a prefabricated wall member or panel **10** utilized for the purpose of erecting wall structure portions of the building and which member is one of the basic important forms of structure component provided by the present invention. The constructional features of the wall member whether such be embodied in a wall member for exterior wall service or interior wall service, are the same with the exception that the thickness and types of sheet material used for the after-described wall member panel skins may differ from those used on the interior wall member. Moreover, the wall member of the soon-to-be-given description is suitable for use on first, second or even third floor levels of a building structure. The depicted wall member **10** is representative of the various forms of such members which can be made according to the invention, the illustrated embodiment being a panel 8 feet high and

4 feet long. It will be understood that the wall member can be made in a wide range of dimensions to suit particular requirements. For example, wall members 7 feet high and 12 feet long could be utilized for special dwelling type structure applications and of course larger dimensioned wall members could be fabricated and used for commercial and/or industrial applications. The wall member **10** comprises a rugged framework of parallel-arranged, horizontally disposed upper and lower members **12, 14** respectively, and vertical members **16, 17** extending between the ends of the horizontal members **12, 14.** If the wall member is intended for prefabricated dwelling structure use, the framework is fabricated conveniently with conventional 2" x 3" or 2" x 4" wood lengths although as those skilled in the art will appreciate other structural forms inclusive of specially-shaped metal members could also be used. The framework also can include additional vertical members or studs **18** spaced intermediate and generally parallel with the vertical members **16, 17.** The vertical framework members **16, 17** as well as the studs **18** can be arranged in any selected pattern of spacing, as, for example, a centerline spacing of sixteen (16) inches such spacing being typical of that required by many governmental building codes. Of course, any other number of intermediate vertical members or studs **18** as desired or required could be used. The wall member framework is formed as a rigid structure, and for this purpose the horizontal members **12, 14** and vertical members **16, 17** and **18** are fixedly connected together in such manner as to provide with the after-described panel skins, a fully self-contained load-bearing structure capable of supporting roof, ceiling, wind and such other types of loading as can be expected to act on the structure when erected and in use. The above described framework members advantageously can be connected together in various ways. For example, a layer of an adhesive can be applied to the meeting surfaces of the various members in conjunction with the use of mechanical fastening devices such as nails, screws and the like to hold the members securely in permanent connection. The wall member **10** also includes as elements thereof and received on the framework in covering positions thereon at opposite sides, panel sheets or skins **20, 22** which are substantially coextensive with the expanse of the framework. The panel skins **20, 22** can be provided in the form of sheet material of various description, e.g., as sheets of plywood, plasterboard, Masonite, wood facing material, metal, composition materials and similar sheet type building material. As will be noted in FIG. 2, and with respect to wall members **10** designed to provide building exterior wall sections, the weatherside skin **20** can be somewhat thicker than the interior space skin **22.** The panel skins **20** and **22** depicted in FIG. 2 are 5/8 inch and 3/8 inch in thickness, respectively. Since building structure interior wall sections are not exposed to the degree of wear and tear and loading of exterior walls, the panel skins **120, 122** for wall members **110*a*–110*c*** embodied in interior wall sections such as shown in FIG. 3 can be of lighter gauge material than those used in the exterior wall section wall members **10.** In the case of the weatherside skins **20,** the vertical edges thereof can be so formed such as to provide a substantially watertight joint in conjunction with the outer skins **20** of the wall members adjacent thereto. Thus, each outer skin **20** is provided at one end edge with a projection or shoulder-like part **26,** and at the other end edge with a complemental grooved part **28.** Thus, when arranged in connected alignment with adjacent wall members, the projection **26** or groove **28** of one wall member **10** meets in overlapped interengagement with a projection or groove of an adjacent wall member. The vertical end edges of the inner panel skins **22** of wall members **10,** as will be noted in FIG. 2, can be made generally flush with the perimetrical surfaces of the vertical members **16, 17** of the wall member framework.

The outer or perimetrical surfaces of the framework members **12, 14, 16** and **17** are provided with grooves **30** along a course extending longitudinally of the respective members from end to end, such grooves being provided for the purpose of readily removably receiving tongue parts **32, 33** or **132** of resilient strip members **34** or **134** in the manner and for the purposes to be described shortly in greater detail. The grooves **30** may be rabbeted in the manner as shown at **39** (shown in greater detail in FIG. 2) so as to provide an enhancement of the degree of sealing engagement between the groove surfaces and the plurality of yieldably or deflectably formed wings **52** or **152** provided on the strip tongue parts **32, 33** or **132.**

As indicated before, a feature of the present invention is that the various wall members **10** and **110*a*–110*c*** except at the intersection of wall sections and at door and window frames, are joined together without recourse to connection at the vertical seam juncture of each wall member **10** or **110*a*–110*c*** with a member adjacent thereto with fastener means which extend through the wall members on which involve effecting such connection with a permanent fastener member such as nails, bolts, brackets, weldments and so on. The present invention provides that such joinder or connection of adjacent wall members can be achieved with means that are easily removably received in the wall members **10** and **110*a*–110*c***, yet such means provide a degree of wall members securement that precludes wall member deflection or loss of alignment under the heaviest loading to which the wall may be subjected.

Before continuing with the description of the wall members **10** and **110*a*–110*c***, consideration will be directed to the construction and function of an important component provided by the present invention for use in conjunction with said wall members, viz, the resilient strips **34, 134** employed in making connection of the wall members to other wall members and also to supporting structure in the building. The resilient strips can be made in various forms depending on the particular use and location of a strip in the structure. The strip **34** illustrated in FIG. 6 is intended for use at the vertical seams between adjacent wall members and for connection of top of the wall members with overhead supporting building structure such as a plate, beam and the like. The strip **34** is comprised of an elongated relatively thin body **50** of flexible or resilient material such as neoprene. The overall length of the resilient strips conveniently is determined by the length of the wall structure with which they are used and they can be provided in a single length coextensive with the vertical edges of each wall member, the full horizontal length of a wall section or in such number of individual sections as may be required to meet the particular installation requirement. For example, for use at vertical seams between adjacent wall members the strips can have an overall length of about 8 feet, whereas the horizontal runs below each wall member and at the top thereof, the strips may have a length from 4 feet upwards to the full wall section length. The strip **34** generally has a width substantially equal to the thickness or slightly less than the thickness of the wall member with which it is used. Formed integrally with the thin strip body **50,** and extending centrally therein and outwardly from the body at opposite sides thereof are relatively non-readily deformable, thick tongue parts **32** and **33.** Both tongue parts **32, 33** are of such dimension as to make them relatively rigid in contrast with the easily deflectable body part **50.** Thus, the tongue parts **32, 33** are provided with a certain strength to resist loading force applied to the wall members in the manner to be described more fully later on to maintain the wall members in proper alignment and positioning in the building structure. Each tongue part **32, 33** is provided at its sides with a plurality of yieldable or readily deformable wings **52.** The wings **52** which are formed integrally with the tongue

parts, constitute yieldable elements adapted for effecting close engagement with the grooves **30** formed in the framework of the wall members **10**, **110***a*–**110***c* to assure tight engagement between these elements. Further, the wings **52** facilitate the readily removable reception of the tongue parts in the grooves **30** of the wall member framework as well as in grooves formed in the associated supporting structure of the building to which the wall member is secured. For example, as may be noted in FIG. 1, a resilient strip **34** is received on top of the frame member **12** with its tongue part **33** received in the groove **30** of such frame member. On the other hand, the other tongue part **32** is intended for reception in the building overhead structure associated with and providing securement for the wall member and which by way of example is depicted in FIG. 1 as being a plate **36**, such plate being provided with a groove **37** similar to that in frame member **12**. The resilient strip **34** is so constructed that the connection made herewith, particularly at vertical seams of adjacent wall members, prohibits any relative movement between such wall members. This is in part due to the nature of the material of which the resilient strip is made as well as the relatively thick body of the tongue part. While the wings **52** are deflectable, the tongue parts **32**, **33** being relatively thick resist forces applied against the wall member whether the forces be a vertical loading or a loading applied against the face of the wall member, thereby insuring the positioning of the wall member and structural integrity of the building. The resilient strip **34** as indicated earlier generally has a main body **50** of overall width about the same dimension as or slightly less than the thickness of the wall member and a body thickness of about ⅛ inch. The overall height of the tongue parts **32**, **33** can vary depending on the size of the supporting structure and wall member frame with which they are used. However, for most applications the height of the tongue parts from base end, i.e., point of juncture with body **50**, to tip end will be about ⅝ to ¾ of an inch, and a main body thickness or lateral expanse excluding the wings, of about ⅜ to ½ inch. Depending on the rigidity of the basic material selected, these dimensions may, of course, vary. The resilient strips **34**, **134** as can be best noted in FIG. 1 are provided with a number of elongated openings **40** in the main body part **50** arranged alternately at opposite sides of the tongue parts, such elongated openings being provided to permit passage through the resilient strips of the nuts and bolts with which the upper part of the wall members and the lower part thereof are secured to the associated building supporting structure in the manner to be described later.

FIG. 7 depicts a modified form of resilient strip **132** which is in all respects the same as the strip just described, except it is provided with only one tongue part **132**, it being understood that the remaining portions of the strip designated by corresponding reference numerals one hundred numbers higher, are the same as those of the strip **34**. The resilient strip **134** is intended for use in connecting the bottom of the wall members to a supporting surface such as a floor, a special supporting saddle on a building foundation, and also for connecting the vertical edge of a wall member to another where the former is part of one wall section intersecting with the latter and the latter is part of another wall section. Thus it will be seen the strip **134** is employed where it is not convenient or possible to provide a groove or slot in a wall member face or in a floor or foundation saddle.

Both the resilient strip **34** and the resilient strip **134** may be provided with split side edges, such side edges being split into two branches as at **56**, **58** and **156**, **158** respectively, the branches providing for reception of building finish and trim components as will be described in greater detail later on.

Continuing now with further description of the wall members **10** and **110***a*–**110***c*, the present invention provides that fastening means which pass through the wall members are employed only at the tops and bottom of the wall members and at the intersections of wall sections wherein exterior wall members are concerned. Wall members used at the inside of a building may involve use of such fastening means only at the top thereof. Where such fastening means are employed, nuts **60** and bolts **62** are preferred. To accommodate the reception of such nut and bolt means, the top and bottom frame members **12** and **14** are provided with a number of bored openings **42**, such openings being provided at spaced-apart alternately off-center locations as shown in FIG. 1, and being adapted to register with the corresponding openings **40** formed in the resilient strips **34** and **134**, the arrangement of alternately offset openings and nut and bolt positioning being made for distributing the fastening load evenly throughout the framework structure and to avoid having to pass the bolts through the relatively thick tongue-parts of the resilient strips. To facilitate wall member installation, the bore openings **42** through which the bolts **62** are inserted can be countersunk as at **45** (see FIG. 4) to facilitate the workman's inserting the nut which frequently must be done blind. Also, the wall members **10** and **110***a*–**110***c* are fabricated with the nuts **60** associated with the top and bottom frame members **12** and **14** preinstalled and fixed at the inner sides of such members. Thus, as seen in FIG. 4, the nuts **60** are fixed to the frame member **14** with nails **46**. The nuts **60** being preinstalled enable rapid field assembly and eliminate recourse to complicated fastening devices permitting wall member connection to associated supporting structure in the most direct and inexpensive manner and giving the latitude for easily and simply dismantling the wall members should the need arise.

As can be seen in FIGS. 1–3, the wall members **10** and **110***a*–**110***c* also can include a filler therein sandwiched between the panel skins **20**, **22**, such filler being a mass of a thermally insulative material **65**, only a portion of the material being shown in FIG. 1 but it being understood that it may fill each bay of the wall member defined by the frame members **16**, **17** and **18**. Such material can be any one of the known insulators including glass fiber, asbestos, foamed plastic and the like. Furthermore, and in keeping with the feature of ready erection and dismantling of the wall members and structures prefabricated therefrom, the wall members can be provided with utility components depicted illustratively by the electrical wiring **67** shown in FIG. 1, such wiring being made operative in the building circuitry with suitable plug-type connectors **68**, the illustrated components including a wall-mounted electrical power outlet **69**. Provision for other utilities including heating, fresh-water, sanitary facilities, air-conditioning, etc. also can be provided in the wall members.

FIG. 2 illustrates the manner in which an exterior wall section and associated components including a door **70**, and door frame **72** are erected in a building with the prefabricated components of the present invention. While in FIG. 2, the full length wall section is not shown, it will be understood that as many wall members **10** as are required can be employed in the exterior wall section. However, the manner of connecting such intervening wall members is the same as that now to be described, continuing reference being made to FIGS. 1, 2 and 4. The respective wall members **10** used for exterior walls are designed to be supported directly on a floor slab, foundation, upper level plate or the like. In one representative form of structure erection, the exterior walls are received on support saddles **80** designed for connection to a building foundation **82**. The saddle **80** can include a vertical leg **84** which is secured to the foundation **82** by means of anchor bolts **86**, the foundation having female bolt receiving fitting **88** cast therein which fitting houses the nuts **90** used in conjunction with the anchor bolts **86**. The saddles **80** also include a horizontal leg **92** on which

physical placement of the resilient strips **134** and wall members **10** occur. As shown in FIG. 1, the horizontal leg **92** is provided with elongated slotted openings **94** for receiving the nuts **62** with which the wall member **10** is secured at its bottom to the supporting surface. The installation of the saddles **80** to the foundation **82** is effected in such manner as to present a level horizontal disposition to the leg **92** of the saddle thereby insuring proper level alignment of the wall structure. The respective exterior wall members are then received on the saddle with a resilient strip **134** intervening the lower horizontal frame member **14** of each wall member and the upper surface of the saddle leg **92**. As was indicated earlier, the tongue parts **132** of the resilient strips are received in the grooves **30** of the lower frame members **14** of the various wall members **10**. Fasteners such as bolts **62** are then passed through saddle leg **92**, resilient strip **134** and bottom frame member **14** of each wall member **10** from the underside of the saddle in the manner depicted in FIG. 4, the bolts being threaded into the pre-installed nuts **60** on the upper surface of the lower frame member **14** and secured thereto against rotation about its own axis with nails **46**. The remaining exterior wall members **10** are of course installed on the foundation **82** in the same manner. However, as a preliminary to mounting a new wall member **10** on the saddle **80** to one already installed, a resilient strip **34** is first inserted over the vertical end framework member **17** of the installed wall member with one tongue part **32** received in the associated groove **30** of the framework member of such installed wall member. The other tongue part **33** is then positioned to be received in the groove **30** of the vertical member **16** of the wall member **10** to be installed next. With the saddle **80** having been properly leveled, and with the first installed wall member properly lined up in the vertical, the resilient strips **34** thereafter serve to assure that all succeedingly installed wall members **10** are arranged in proper alignment.

As was indicated earlier, at the corners of the building structure, i.e., the intersection of two exterior wall sections, fastener means are utilized which extend through the ends of the wall members **10** forming the corner joint. Such joint is provided as shown in FIG. 2 by employing a bracket **160** having at least two legs **161**, **162** joined with a central part **163** and to which are connected the vertical edges of the respective intersecting wall members **10**. The bracket is provided as an element having a vertical height corresponding with that of the wall members **10** and the respective legs **161**, **162** thereof are connected to the vertical frame members **17**, **16** of the two wall members with nuts **164** and bolts **166** in the same manner as described earlier in connection with the nuts **62** and bolts **60** with which securement of the wall members **10** is made to the foundation saddles **80**, the nuts **164** and bolts **166** being alternately offset from the vertical centerline of the frame members **17**, **16** and the nuts **164** being preinstalled on the frame members in the same manner as the nuts **62**. Thus, it will be noted that the inner vertical surfaces of frame members **17**, **16** are provided with nuts **164** fixed thereto at vertically spaced intervals and the bolts **166** received therein pass through the resilient strips **134** at such intervals. The break at the corner joint is finished to present a flush surface with the outer surface of the wall members **10** with facing strips **170**, the latter being toe-nailed into the panel skins in the manner illustrated as at **172**.

A feature of the present invention is that the wall members **10**, **110***a*–**110***c* are easily adapted for embodiment of doors and windows in a structure made therewith. Standard manufactured windows and doors could be used or these components can be especially designed for incorporation in the structure of the wall members.

FIG. 2 illustrates one manner in which a door can be installed in an exterior wall section. For this purpose two door frame elements or battens **72** can be installed at the opposed ends of two wall members **10** defining a space in the wall section. Such space could, for example, be a 4-foot space produced by omitting a wall member in the wall section. Such frame members **72**, it will be noted, are intervened in their connection to the wall members **10** by means of resilient strips **134** in the same manner as previously described in connection with the corner joint. The frame members **72** are connected to the wall members **10** with nuts **164** and bolts **166** at a number of vertical-spaced locations in the same manner as described for the corner joint, and door stop strips **170** are received in slots **172** provided in the frame members **72**. The door **70** is hinged as at **174** to one frame member **72** and a dead bolt leaf or false door **176** which also provides the door stop **178** can be secured to the other frame member **72**. In this manner a regular sized door opening is provided for entry from the exterior to the building interior and if necessary, the false door **176** can be removed to provide an opening of almost 4 feet for maximum access when moving furniture, etc.

As was indicated earlier the external or weather wall surfaces are made water tight by means of the projection and groove arrangement as depicted at **26** and **28**, the overlapping joint being such as to provide with the resilient strip **34** a substantially water-tight seam. On the other hand the manner of closing off entry to a vertical seam at the weather side adjacent the door is effected by means of a decorative trim strip **180**, which has a projecting finger **182** which is received in the vertical seam between the end parts **56**, **58** of the resilient strip **34**. Similarly, a trim piece **184** can be snapped into the branches of the resilient strip **134** at the corner joint. Wall joints at the inside of the wall section can be finished with trim pieces **190** received in end parts **56**, **58** of the resilient strip **134**, with removable tape or any other manner satisfactory to the purpose.

FIGS. 3 and 5 illustrate the manner of installation of interior wall members **110***a*–**110***c*. The interior wall members can be installed easily and quickly in several ways involving minimum use of fasteners such as nuts and bolts except at the tops of the wall members or at the ends of a partition section. For example, an interior wall section subdividing a space and intersecting another wall section can be easily installed by first fixing a resilient strip **134** (FIG. 3) to the skin **122** of one wall member **110***a*, the strip **134** being secured on skin **122** with nails **202**, adhesive or other fastening means, the strip installation being effected such that the longitudinal direction of the tongue part **132** extends perpendicular to the floor surface. A second resilient strip **134** is then laid on the floor **204** (FIG. 5) in the precise location where the wall is desired and aligned so that its tongue part **132** is at a right angle with the vertically disposed tongue part of the first installed strip, i.e., that fixed to the wall member. The floor laid resilient strip is then fixed in place on the floor, as for example, by nailing. In this manner, the wall member mounted and floor mounted resilient strips provide locator means to insure that the interior wall member **110***b* can be installed with proper alignment to wall member **110***a* without leveling, measuring, etc. The wall member **110***b* is then set in place with the groove **30** in frame member **117** receiving the tongue part **132** of the wall mounted strip **134** (FIG. 3) and the groove **30** in frame member **114** receiving the tongue part **132** in the floor mounted strip **134** (FIG. 5).

FIG. 5 shows the manner in which the upper or top parts of interior wall sections are secured to associated building supporting surfaces. As a preliminary it will be noted that with respect to interior wall section wall members, the panel skins may each be of the same thickness and composition since not being exposed to the elements such panel skins can be of a lighter gauge. As was indicated above, the bottom part of the interior wall member **110***b* is secured to the floor slab or other floor structure **204** by being supported solely through the agency of the resilient strip **134**. At the top, suitable connection

can be provided by bolting through the upper horizontal frame member **112** of the wall member **110***b* to an overhead structure such as a cross beam connected to the bottom chord of a truss. Such beam **210** also provides a surface for securing ceiling pieces **300**, and the ceiling wall corner sections of the room spaces can be finished off with molding strips **214** nailed directly to the panel skins.

Referring again to FIG. 3, interior wall structure can be provided at certain locations with a door **270** in the same manner as that described with respect to the exterior wall structure depicted in FIG. 2 and be supported on frames or battens **272** connected with the ends of the wall members **10**. Since not all interior wall structure will terminate at another wall, it may be advantageous in connection with partition segments such as the wall member **110***b* to finish off the end of the partition with a suitable capping piece or batten **230** which can be bolted to the terminal edge of interior wall member **110***c* in the manner shown.

It will be evident from reading the foregoing description that the present invention provides an important improvement in prefabricated structures. Aside from the ease of erection and dismantling of structures provided herewith, it includes many features which enhance the overall integrity of the structure. For example, as illustrated in FIG. 4, a combination vapor barrier seal and thermal break element **300** can be provided around the edge of the foundation or slab **82** of the structure. Such seal **300** has an upper tip end portion **301** which can be placed so that it interfits with the branch ends of the resilient strip **134** underlying the exterior wall section wall member **10**, thereby establishing an impenetrable barrier to vapor. Also, as will be noted in FIG. 5, the wall members provide for simple yet effective means for decoratively finishing the building spaces. For example, a moulding strip **256** can be snapped into place at the floor-wall member joint, being received in the branches of the resilient strip **134**. Alternatively, conventional moulding **250** can be adhesively tacked or otherwise secured to the wall member skin as shown. As was mentioned earlier herein, the present invention provides that a prefabricated structure provided thereby possesses excellent characteristics of soundproofing. This results from the use of the resilient strip **134**. Alternately, conventional moulding **250** wall member so that vibration can neither enter nor leave the wall member structure itself. At each joint in the structure, such resilient strip members function to dampen any vibration coming from supporting structure such as floor or overhead beams to prevent transmission of sound vibrations to the wall members. Similarly, if such vibration should be created directly in a particular wall member by any agency, the vibrations cannot leave the particular wall member and enter others or the various support structures in the structure. Moreover, such vibrations are for the most part absorbed in the wall member per se by the thermally insulative layer **66**.

What is claimed:

1. In a building, a wall member adapted for installation between pairs of opposed parallel horizontal and vertical supporting surfaces, said wall member comprising

a framework having upper and lower horizontal members, and vertical members extending between said horizontal members at the ends of the latter,

panel skins disposed at opposite sides of said framework and fixedly secured thereto, said panel skins being substantially coextensive with said framework,

the outer surfaces of said upper and lower horizontal members and said vertical members being provided with grooves extending along a course extending longitudinally of said members, and

resilient strip members received on said outer surfaces of said horizontal and vertical members, said strip members having a relatively thin strip-like body and an enlarged tongue portion extending outwardly at least at one side of said body, said tongue portion being tightly but readily removably engagedly received in the groove formed in the outer surface of the member associated therewith, the other sides of said strips being in abutment with said supporting surfaces.

2. A building wall member in accordance with claim **1** wherein said resilient strip is provided with another enlarged tongue portion at its other side, said other tongue portion being readily removably engagedly received in a like groove formed in the supporting surface associated therewith.

3. A building wall member in accordance with claim **1** further comprising additional vertical frame members extending between said horizontal frame members at locations spaced intermediate the ends of said horizontal frame members.

4. A building wall member in accordance with claim **1** further comprising a mass of thermally insulative material filling the spaces within said wall member bounded by said framework horizontal and vertical members and said panel skins.

5. A building wall member in accordance with claim **1** wherein the grooves formed in the outer surfaces of said horizontal and vertical frame members are rabbeted, the tongue portions of said strip members being provided with laterally extending wing-like elements, said wing-like elements being yieldably deformable for tightly engaging the rabbeted surfaces of said grooves when said tongue parts are received therein.

6. A building wall member in accordance with claim **1** further comprising fastener means for connecting said upper and lower horizontal frame members with their respective associated supporting surfaces, said fastener means extending through said upper and lower horizontal frame members.

7. A building wall member in accordance with claim **6** wherein said fastener means comprises nuts and bolts, the upper and lower horizontal frame members and the strip members associated therewith being provided with passages extending therethrough for receiving said bolts.

8. A building wall member in accordance with claim **7** wherein the nuts are preinstalled and permanently fixed at least to the inner surface of said horizontal upper and lower frame members.

9. A building wall member in accordance with claim **7** wherein the passages extending through said frame members and strip members are spaced longitudinally therealong at locations offset from the longitudinal centerline of said frame members and strip members and alternately at opposite sides of said centerline.

10. A building wall member in accordance with claim **1** wherein said panel skin members are fixedly secured to said framework with an adhesive.

11. A building wall member in accordance with claim **10** wherein said panel skin members are fixedly secured to said framework with an adhesive and mechanical fasteners.

12. A building wall member in accordance with claim **1** wherein said panel skin members are made of plywood.

13. A building wall member in accordance with claim **1** wherein said panel skins have parallel vertical edges at opposite ends thereof, the vertical edges of at least one of said panel skins being provided respectively with a shoulder-like projection and a groove, said shoulder-like projection and said groove being complementally overlappingly engageable with like projections and grooves of wall members installed adjacent thereto.

14. For a building, a wall member adapted for installation on supporting surfaces in the building and connection therewith by connection means engaged with said supporting surfaces and including tongue-like portions extending outwardly of said supporting surfaces, said wall member comprising

a framework of frame members connected in an en-

circling course defining substantially the peripheral expanse of said wall member, and

panel skins disposed at opposite sides of said framework and fixedly secured thereto, said panel skins being substantially coextensive with said framework,

the outer surfaces of said framework members being provided with grooves extending along a course extending longitudinally of said members,

said tongue-like portions being tightly but readily removably engagedly received in the grooves formed in the framework members.

15. A building wall member in accordance with claim **14** wherein said framework is a substantially rectangular structure comprised of upper and lower horizontal frame members and vertical frame members extending between said horizontal frame members at the ends thereof.

16. In a building wall section comprised of two or more aligned wall members, joint connector means for connecting the vertical edge part of one wall member with a vertical edge part of a wall member adjacent thereto, the vertical edges of said wall members having grooves formed therein, said connector means comprising,

a resilient strip member interposed between the vertical edge part of the one wall member and the vertical edge part of the adjacent wall member, said resilient strip having a relatively thin main body part extending substantially the full thickness of said wall members, said strip member further having

relatively thick tongue-parts extending outwardly from said main body part at opposite sides of the latter, said tongue-parts being readily removably engagedly received in the grooves of said wall members vertical edge parts but under sufficient condition of constraint therein to resist relative movement between said vertical edge parts.

17. Building joint connector means in accordance with claim **16** wherein said tongue-parts are each provided with a plurality of deformable wings extending laterally therefrom, the grooves in the vertical edge parts of said wall members having rabbeted surfaces, said deformable wings tightly engaging said rabbeted surfaces.

18. Building joint connector means in accordance with claim **16** wherein the side edges of said main body part are split into two branches.

19. Building joint connector means in accordance with claim **18** further comprising a joint trim piece received against the wall members and bridging the joint therebetween, said trim piece having a projecting finger received removably intermediate the two branches at one side edge of said main body.

20. In a building, a prefabricated wall section therefor, said building including bottom and overhead supporting surfaces, said wall section comprising

a plurality of prefabricated wall members each including an encircling framework of horizontal upper and lower members and vertical members etxending between the ends of said horizontal members,

panel skins secured at opposite sides of said framework and being generally coextensive therewith,

said wall members being arranged upright in adjacent edge-to-edge alignment, the outer surfaces of the framework of each wall member being provided with grooves extending longitudinally thereof,

resilient strip members interposed between the adjacent vertical edges of succeeding ones of wall members, and also interposed between the top edges of said wall members and said overhead supporting surfaces and between the bottom edges of said wall members and said bottom supporting surfaces, said strip members having at least one tongue-like part received in the grooves formed in the framework of said wall members,

mechanical fastener means extending through the framework of each wall member and through the resilient strips at the tops and bottoms of said wall members, and said mechanical fastener means being connected with said framework and with the overhead and bottom supporting surfaces of said building.

21. A building prefabricated wall section in accordance with claim **20** wherein the resilient strip members interposed between the adjacent vertical edges of succeeding ones of said wall members are provided with tongue-like parts at opposite sides thereof, said tongue-like parts being received in the grooved formed in said adjacent vertical edges and providing the sole means of connection therebetween.

22. A building prefabricated wall section in accordance with claim **20** wherein the bottom supporting surface comprise saddles received on a building foundation.

23. A building prefabricated wall section in accordance with claim **22** wherein a vapor barrier and thermal break element is received in said foundation adjacent said saddle, said vapor barrier and thermal break element having a part nestably received in the resilient strip interposed between said saddle and said wall member, said part providing a vapor-tight and thermal barrier along the bottom of the wall members.

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