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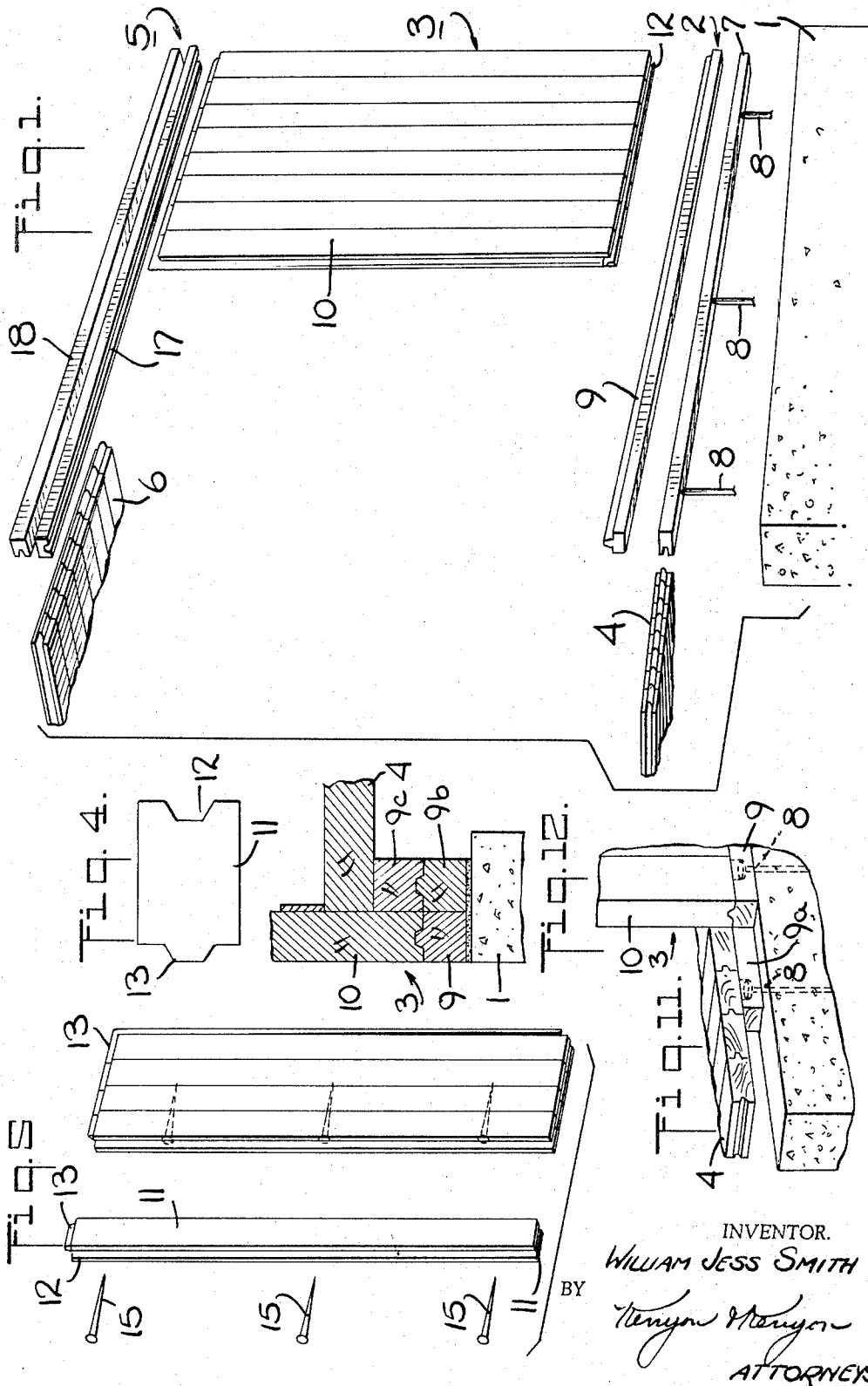
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3,369,335

MULTI-SECTIONAL CONSTRUCTION

Filed Feb. 25, 1965

3 Sheets-Sheet 1



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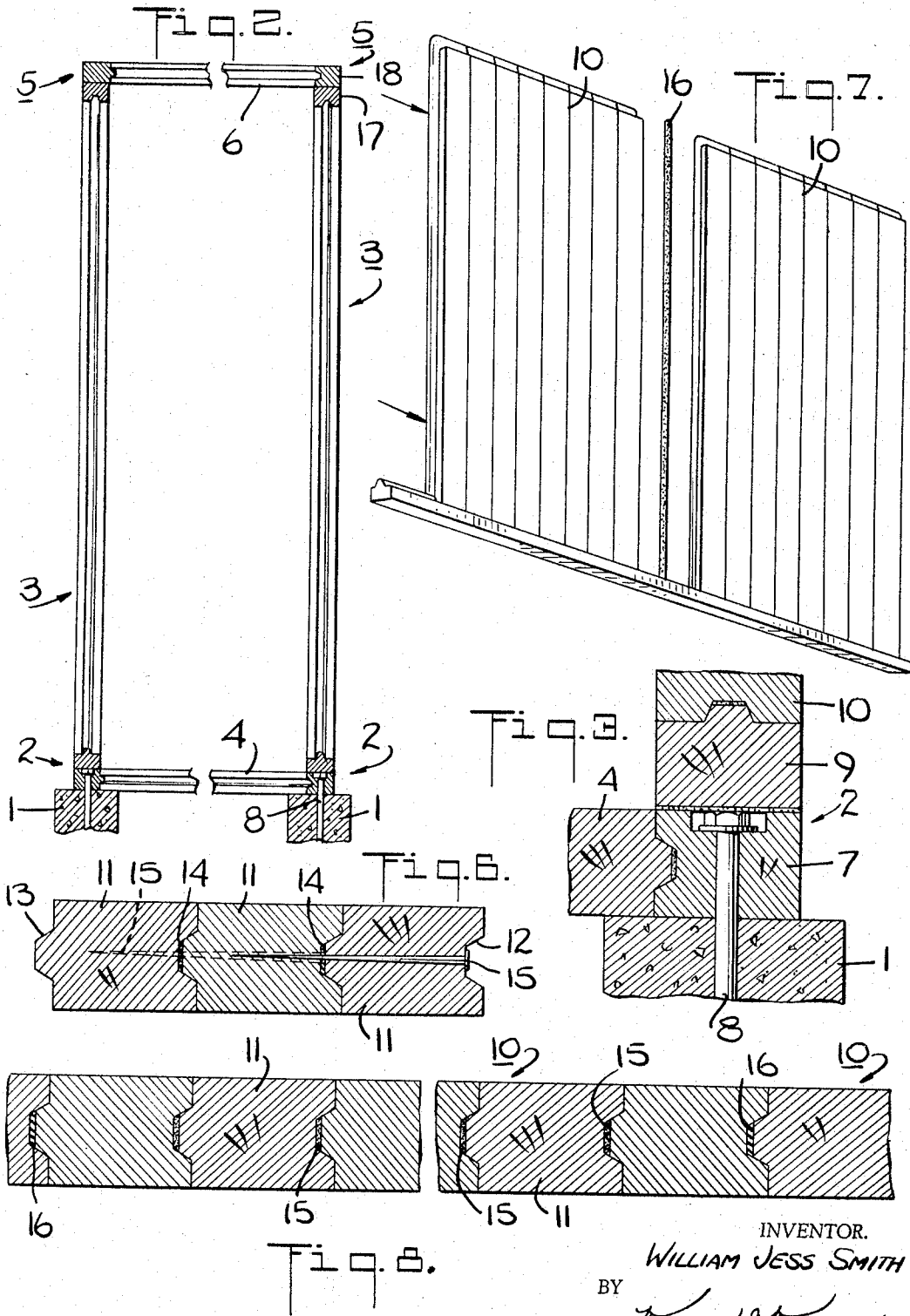
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MULTI-SECTIONAL CONSTRUCTION

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3 Sheets-Sheet 2



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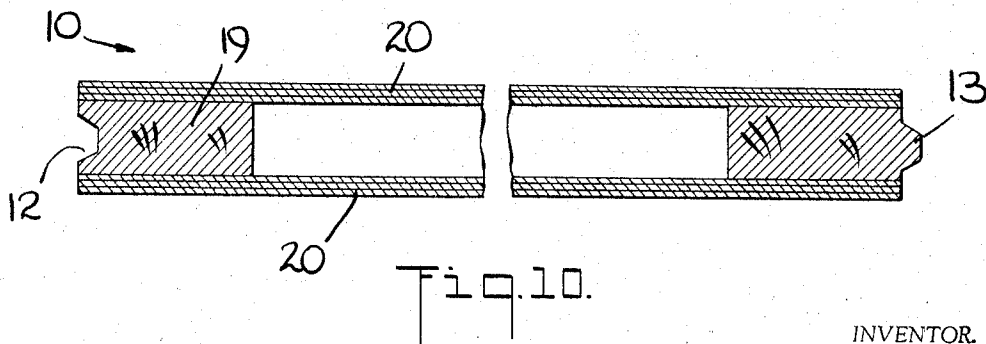
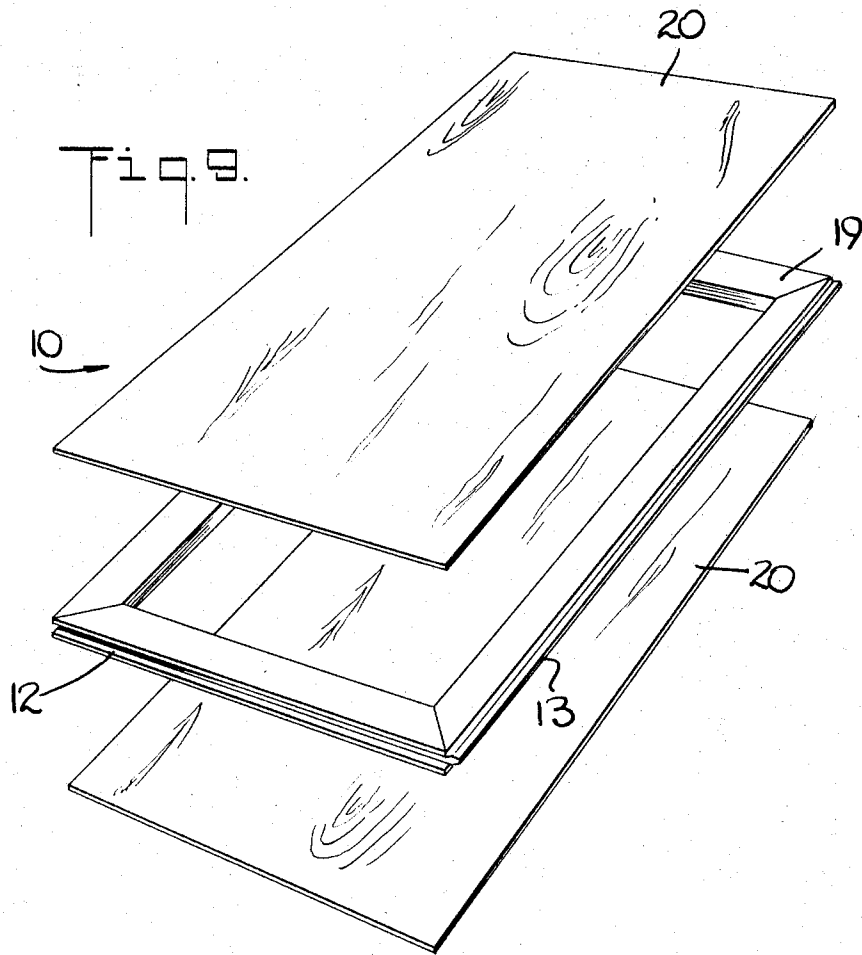
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MULTI-SECTIONAL CONSTRUCTION

Filed Feb. 25, 1965

3 Sheets-Sheet 3



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3,369,335

MULTI-SECTIONAL CONSTRUCTION

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This invention relates to multi-sectional wood construction. More particularly, this invention relates to multi-sectional wood construction for load-bearing walls, partition walls, flooring and roofing.

In the past walls were made of a conventional beam, studding and gypsum board. However, such necessitated construction at the job site. In order to overcome this, a paneled plywood wall construction has been used which consists of a pair of plywood panel boards secured in back-to-back fashion to studs. Such a construction does not provide sufficient strength for use as a load-bearing wall. Further, the paneled wall construction had to be made with a great degree of care in order to obtain a neatly finished wall.

Generally, this invention contemplates the formation of a wood panel of convenient dimensions from a plurality of timber units possessing particular tongue and groove configurations. Each timber unit is formed from a block of wood approximately of the dimensions 4 inches by 6 inches by 8 feet. The edge surfaces of each timber are formed with suitable tongue and groove means by a milling machine which operates under very close tolerances.

The tongues of each timber are dimensioned to be one-eighth inch shorter in projection than the grooves of the timbers into which they will project. The gap which thus results when two timbers are mated can be filled with a suitable bonding glue, for example, an epoxy-resin glue, so that an integral unit can be formed of the mated timbers.

After bonding of two like timbers, a plurality of spikes, preferably three, can be driven on equal spacings into the main body portions of the mated timbers along the longitudinal line thereof in order to further insure securement of the timbers together.

The timbers are successively secured together in the above manner so as to form panels which measure approximately 4 inches by 40 inches by 8 feet. In order to form a suitable joint seal between adjacent panels in situ the tongue ends of each formed panel are provided with gaskets which are sufficiently expandable to afford an airtight seal in the event of wood shrinkage. Such gaskets may be neoprene or other plastic.

An alternate construction of such wood panels is comprised of a frame having the peripheral dimensions of the desired panel dimensions and having a section, such as a plywood section, secured to each face thereof. In this alternative panel construction the outer edges of the frame are milled to form tongue and groove configurations so that these panels may be successively secured together in the same manner as the panels formed from a plurality of abutting timbers described herein.

In order to further reduce the possibility of shrinkage and warpage of the wood, each wooden member is kiln-dried to a moisture content in the range of from 4% to 15%. Also, where necessary to insure against shrinkage and warpage, each member can be drilled out to form a one inch core along the center lineal axis. After forming the panels may be sealed through vat dipping in a fire, termite and/or mildew retardant as may be required by a particular building code.

The panels formed according to this invention are capable of use for the floors, walls and roofing of a building. For example, as a well, a first floor plate is properly secured to the foundation as by bolts and a second floor

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plate having an upstanding tongue portion is bonded to the top of the first floor plate; a wall panel which is suitably grooved on its bottom edge surface to receive the tongue of the second floor plate is positioned on the floor plate and bonded thereto. The top edge surface of the wall panel which has the tongue portion is received in and bonded to a ceiling or roof plate in a similar manner as above. Successive wall panels are positioned between the floor and ceiling plates adjacent each other to form a completed wall. Such a solid wall, however, does not preclude the use of stone, brick, wood or stucco veneer on the exterior.

The floors, roofing, and partition walls are constructed in a similar manner as the wall above with slight design variations in the proper connecting members.

Accordingly, it is an object of this invention to provide a multi-sectional wood panel construction of solid timbers.

It is another object of this invention to provide a multi-sectional wood panel construction of solid timbers having mating tongue and groove portions.

It is another object of this invention to provide a panel construction of a frame covered with sections, such panels having peripheral mating tongue and groove portions.

It is another object of this invention to provide a multi-sectional wood panel construction for use as a load bearing wall, a partition wall, flooring and roofing.

It is another object of this invention to provide a multi-sectional wood panel construction which can be easily and quickly erected in place with consequent substantial savings in labor costs.

It is another object of this invention to provide a building unit constructed of multi-sectional wood panels.

These and other objects of this invention, as well as its nature and substance, will be more clearly perceived and fully understood by referring to the following detailed description and appended claims taken in conjunction with the accompanying drawings in which:

FIG. 1 represents an exploded perspective view of a floor, wall and ceiling made in accordance with this invention;

FIG. 2 represents a cross-sectional view of a floor, wall and ceiling unit made in accordance with this invention;

FIG. 3 represents a cross-sectional view of a typical wall and floor connection;

FIG. 4 represents a cross-sectional view of a basic wall timber;

FIG. 5 represents a perspective view of a manner of forming the multi-sectional panels;

FIG. 6 represents a cross-sectional view of a multi-sectional panel at an intermediate point of assembly;

FIG. 7 represents a perspective view of a manner of forming a completed wall from the multi-sectional panels;

FIG. 8 represents a cross-sectional view of a completed wall;

FIG. 9 represents a perspective view of a manner of forming a panel using a frame covered with sections;

FIG. 10 represents a partial cross-sectional view of the panel of FIG. 9;

FIG. 11 represents a perspective cross-sectional view of an alternate wall and floor connection; and

FIG. 12 represents a cross-sectional view of another wall and floor connection.

Referring to FIGS. 1 to 3, a typical building unit comprises a foundation wall 1, which is made of concrete, concrete block or the like, a floor plate unit 2, a wall 3, a floor 4, a ceiling plate unit 5 and a ceiling 6.

The floor plate unit 2 is constructed of a grooved plate 7 which is secured in any suitable manner to the foundation wall 1, for example, by bolts 8, and a tongued plate 9 which is secured to the grooved plate 7 in any suitable manner, for example, by bonding glue. Alter-

natively, the floor plate unit 2 can be made in one piece which can be suitably secured to the foundation wall 1 such as by bolts. This one piece floor plate would possess the necessary tongue and groove.

Referring next to FIGS. 4 to 6, the wall 3 is constructed of panels 10 which are fabricated from a plurality of timbers 11. Each timber 11 is formed initially from a block of wood approximately of the dimensions 4 inches by 6 inches by 8 feet. After each timber 11 is properly dressed it possesses the commonly used size of 3½ inches by 5½ inches by 8 feet. Each timber 11 is kiln-dried to a moisture content in the range of from 4% to 15% and is then subjected to a milling operation to have the desired final configuration imparted to it. The milling operation is performed under very close tolerances by a suitable milling machine.

Each timber 11 is milled to be provided with a groove 12 along one longitudinal and one transverse end face and a tongue 13 along the opposite longitudinal and transverse end faces. The tongue 13 is dimensioned to be one-eighth inch shorter in projection than the groove of the timber into which it will project so that there will be a gap between adjoining timbers to receive bonding materials. Further, in order to impart a more pleasing appearance to the assembled panels 10, the corners of each timber 11 adjacent the groove in the longitudinal end face can be milled with a recess of a dimension three-eighths inch by three-eighths inch. Also, where it is necessary to insure against shrinkage and warpage, each timber can be drilled out to form a one inch core along its central lineal axis.

After the milling operation has been performed, the individual timbers 11 are secured to each other to form the desired panel 10. The securement is accomplished by initially mating and bonding a pair of timbers 11 by means of their respective tongue and groove and a suitable bonding glue 14, for example, an epoxy-resin glue. The bonding glue 14 is placed between the timbers 11 and fills the gap formed by the mating tongue and groove (see FIG. 6). Succeeding timbers are individually secured to the previously secured timbers until the desired panel 10 is formed. Preferably, the wall panels should be approximately forty inches in width. Therefore, by securing eight timbers together, a panel forty and five-eighths inches will be formed.

In order to insure the securement of the timbers 11 together, successively mated timbers can be provided with a plurality of spikes 15, preferably three in number, driven on equal spacings into their main body portions along the longitudinal axis thereof.

The completed panels may then be dipped in a suitable fire, termite and/or mildew retardant, as required, drained and dried. They are then ready for delivery to the construction site.

Referring next to FIGS. 7 and 8, in order to construct the wall 3 of the building unit, the wall panels 10 are positioned in mating engagement on the floor plate unit 2 by means of the tongue plate 9 and the groove 12 in the transverse end surfaces thereof. A suitable gasket 16 which, by way of example, can be made of neoprene or plastic foam is positioned between adjacent panels 10 in order to provide a suitable expansible joint seal therebetween. Preferably, the gasket 16 is bonded to the tongue portion of each panel 10 before the panels are put in place.

Referring again to FIGS. 1 and 2, the ceiling plate unit 5 is constructed of a pair of grooved plates 17, 18 which are secured together by bonding glue. The lowermost grooved plate 17 receives the tongue portion of each wall panel 10 in mating relation while the uppermost grooved plate 18 receives the tongue portion of a ceiling panel which has been constructed in the above manner. Alternatively, the ceiling plate unit 5 can be made in one piece provided it possesses the necessary tongue receiving grooves.

The floor 4 and ceiling 6 are made of panels which are fabricated in a manner similar to the wall panels 10 as set forth above. These floor and ceiling panels each possess a tongue and groove configuration which allows the assembly of the panels into mating engagement with the floor and ceiling plate units 2 and 5. Alternatively, in order to provide for excessive expansion or contraction and to provide added support for the floor the wall to floor construction may be connected as shown in FIGS. 11 or 12. Referring to FIG. 11 the wall panel 10 is mated by means of a tongue and groove configuration to plate 9 which is secured to the foundation wall 1 by means such as bolts 8. A floor bearing plate 9a is likewise secured to the foundation wall 1 by means, such as bolts, in lengthwise abutting relation to wall bearing plate 9. The floor bearing plate 9a is not milled to form tongue or groove configurations and in this construction the floor 4 rests on and is supported by this second plate 9a. Referring to FIG. 12 the wall panel 10 is mated by means of a tongue and groove configuration to plate 9 which is secured to the foundation wall 1. A floor bearing plate 9b is likewise secured to the foundation wall 1 in lengthwise abutting relation to wall bearing plate 9. This floor bearing plate 9b is milled along its upper surface to form a tongue configuration and a second floor bearing plate 9c having a groove milled along the lower surface thereof, is secured to floor bearing plate 9b by means of the mating tongue and groove configurations. This second floor bearing plate 9b has a flat upper surface and the floor 4 rests on and is supported by this upper surface 1. The ceiling to wall connection can also be modified to provide connections similar to those shown in FIGS. 11 and 12.

Referring to FIGS. 9 and 10, an alternate manner of forming panels is shown. In this embodiment the panel 10 is fabricated by constructing a frame 19 having peripheral dimensions equal to the desired dimensions of the finished panel. Each of the components of the frame 19 are milled to form groove 12 or tongue 13 configurations along the outer edges thereof whereby, when these components are assembled, the frame will have exposed mating edges adapted to engage adjacent panels or plates in accordance with the detailed description set forth herein with respect to the panels formed from a plurality of timbers. The fabrication of the panels of this embodiment is completed by attaching a plane section 20, formed from plywood or other like material, to opposing sides of the frame 19 by gluing or otherwise. Such panels fabricated in this alternate manner may be treated in all respects in the same manner as the panels fabricated from a plurality of timbers as set forth herein.

It is noted that a number of modifications can be made within the scope of this invention which have not been set forth herein. For example, the members which connect two walls at their point of intersection are fabricated with a suitable tongue and groove on adjacent faces rather than on opposed surfaces. Further, all door and window jams and window sills are constructed in a similar manner. It is therefore contemplated that an entire building unit can be constructed from the above tongue and groove method of assembly and that the major components of such a building unit, for example, the walls, can be fabricated in tongue and groove panels.

While the invention is thus described, it is not wished that it be limited to the precise details described, as changes may be readily made within the scope of the claims without departing from the spirit of the invention.

What is claimed is:

1. A building unit comprising foundation wall; floor means; wall means; ceiling means; each of said means including a plurality of panels joined together, each of said panels having a mating configuration on each end thereof, said mating configuration comprising an integral tongue on two adjacent edge surfaces thereof and a groove on the opposite edge surfaces thereof, each said panel having a tongue received in a groove of an adjacent panel and a

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groove receiving a tongue of an adjacent panel; and connecting means at each intersection of one of said means with another of said means joining said floor means, wall means and ceiling means together, said connecting means between said floor means and said wall means including a first plate having a mating configuration in one edge thereof receiving a respective mating configuration of said floor means in mating relation, means for securing said first plate to the foundation wall, and a second plate secured to said first plate, said second plate having an integral mating configuration on the upper edge surface thereof received in a respective mating configuration of said wall means.

2. A building unit as set forth in claim 1 wherein each said panel includes a plurality of aligned contiguous timbers, each said timber having an integral tongue on two adjacent edge surfaces thereof and a groove on the opposite edge surfaces thereof, the tongue on one of said surfaces of at least one of said timbers being received in a groove in one of said opposite surfaces of a contiguous timber.

3. A building unit as set forth in claim 2 wherein the end portion of said tongue on one of said surfaces is received in spaced relation to the bottom of said groove in said one of said opposite surfaces.

4. A building unit as set forth in claim 1 wherein at least one of said panels includes a frame having a plane section attached to either side thereof, and a timber of one-piece construction secured between said plane sections at each edge of said panel in spaced relation to an opposite timber, the timbers on two adjacent edge surfaces of said panel having said tongue integrally formed thereon and projecting outwardly of said panel, the timbers on opposite edge surfaces thereto having said groove therein, each of said tongues extending outwardly of said panel a distance less than the inwardly extending depth of the groove in an opposite edge surface.

5. A building unit as set forth in claim 1 wherein a sealing gasket means is positioned between a tongue and a groove of at least two contiguous panels.

6. A floor plate unit for mounting a wall panel having a groove in the lower edge surface thereof and a floor panel having an integral tongue projecting therefrom on a foundation wall, said floor plate unit comprising a first plate having a groove in one edge surface thereof for receiving the tongue of the floor panel in mating relation; means for securing said first plate to the foundation wall; and a second plate secured to said first plate, said second plate having an integral tongue projecting from the upper edge surface thereof to be received in mating relation in the groove of the wall panel.

7. A floor plate unit as set forth in claim 6 wherein said means includes bolts.

8. A floor plate unit for mounting a wall panel having a groove in the lower edge surface thereof and a floor panel on a foundation wall, said floor plate unit comprising a first plate having an integral tongue in the upper surface thereof for reception in mating relation in the groove of the wall; means for securing said first plate to the foundation wall; a second plate in lengthwise abutting relation to said first plate having an integral tongue thereon; a third plate having a groove therein receiving said tongue of said second plate and having an upper surface for receiving the end of the floor plate thereon; and means for securing said second plate to the foundation wall.

9. A building unit comprising floor means; wall means; ceiling means; each of said means including a plurality of

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panels joined together, each of said panels having a mating configuration on each end thereof, aid mating configuration comprising an integral tongue on two adjacent edge surfaces thereof and a groove on the opposite edge surfaces thereof, each said panel having a tongue received in a groove of an adjacent panel and a groove receiving a tongue of an adjacent panel; and connecting means at each intersection of one of said means with another of said means joining said floor means, wall means and ceiling means together, said connecting means between said floor means and said wall means including a first plate having an integral mating configuration on the upper edge surface thereof received in a respective mating configuration of said wall means, said first plate secured to a foundation wall, a second plate in lengthwise abutting relation to said first plate having a mating configuration thereon, a third plate having a mating configuration receiving said mating configuration of said second plate and having an upper surface receiving an end of said floor means thereon; and said second plate secured to the foundation wall.

10. In combination with a floor plate unit including a first plate having an integral tongue projecting from the upper surface thereof, plate means secured to said first plate for receiving a floor panel, and means for securing said first plate to a foundation wall, a plurality of inter-joined multi-sectional wall panels mounted on said first plate in mating relation therewith, each said wall panel having a plurality of aligned elongated adjacent timbers, means securing said timbers together, each of said timbers having an integral tongue on two adjacent edge surfaces thereof and a groove on the opposite edge surfaces thereof, each said tongue extending outwardly of a timber a distance less than the inwardly extending depth of said opposite groove, said tongue on one of said adjacent surfaces of at least one of said timbers being received in said groove on one of said opposite surfaces of another of said timbers whereby said panel is provided with a tongue and a groove on opposite edge surfaces thereof, one of said tongues on one of said panels being received within one of said grooves in an adjacent panel, and a sealing means positioned between a tongue of one panel and a groove in an adjacent panel forming an expansible joint seal therebetween, and one of said grooves in each said timber being disposed in mating relation with said integral tongue of said first plate.

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