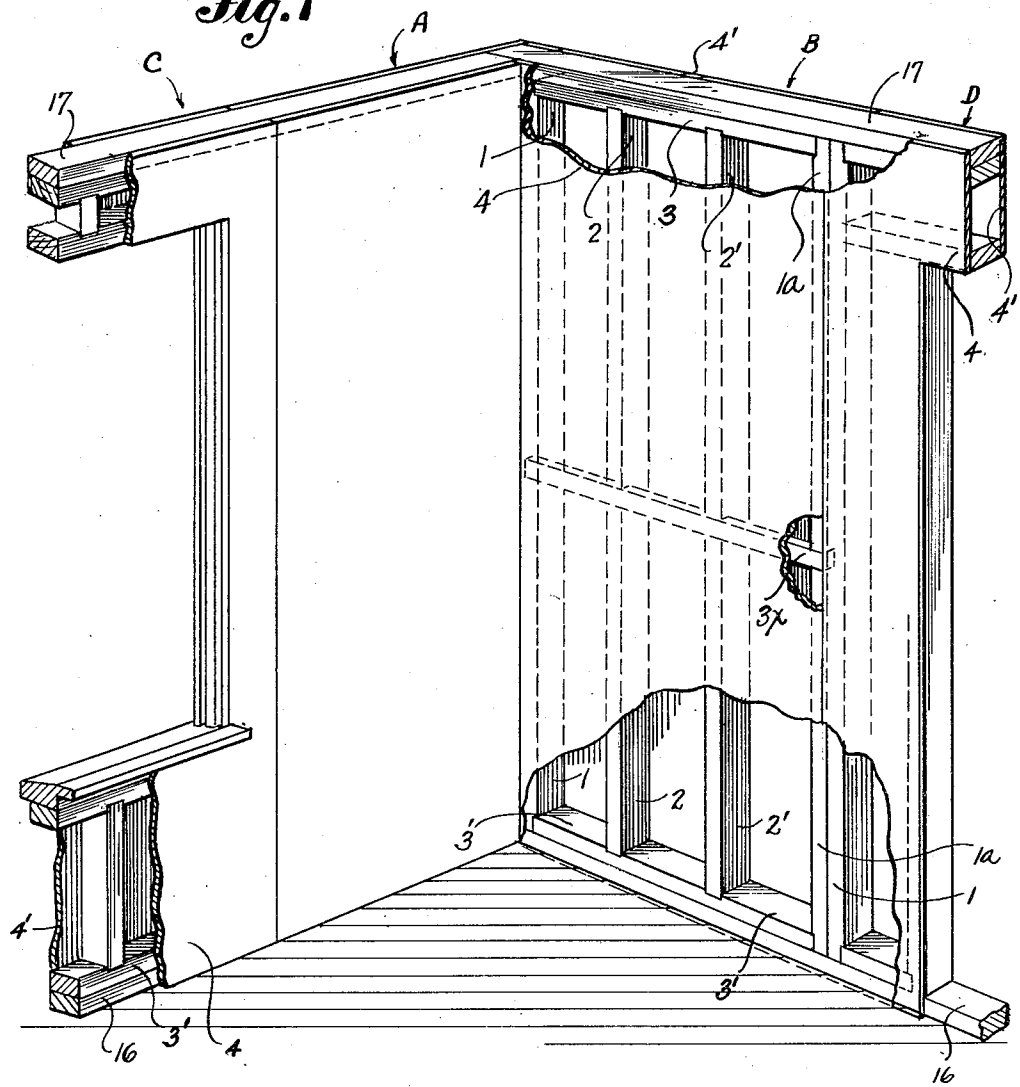
Oct. 16, 1956 G. J. DANIELSON 2,766,488

INTER-LOCKING WALL CONSTRUCTION

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Fig. 1



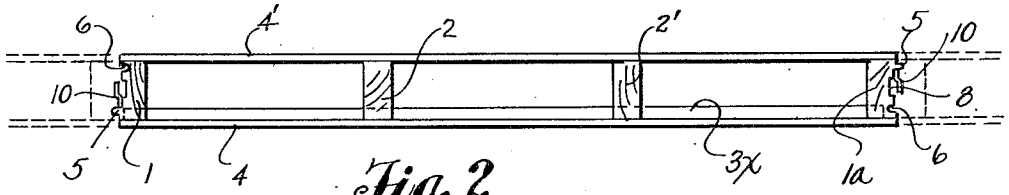




Fig. 2

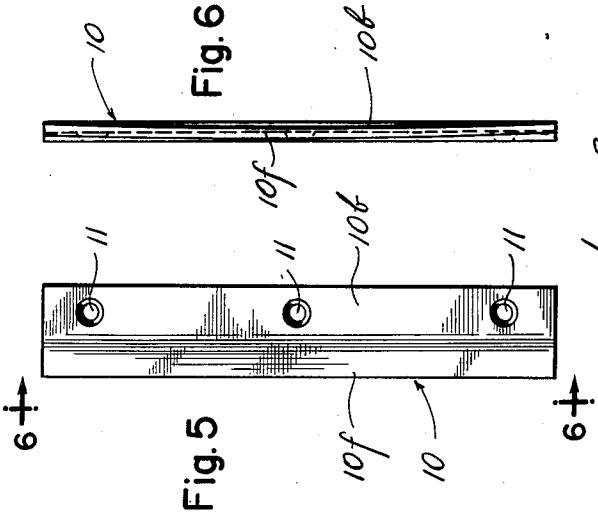
Inventor
GUSTAV J. DANIELSON

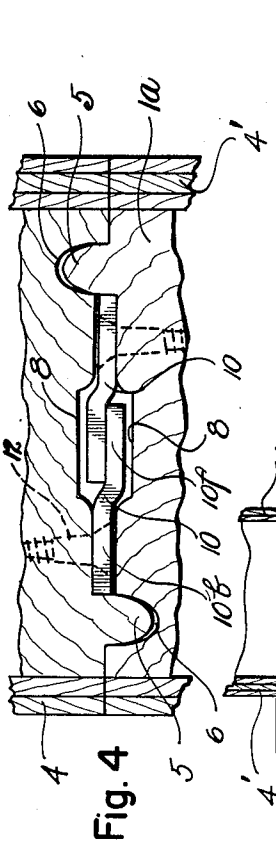
By Cook & Robinson
Attorneys

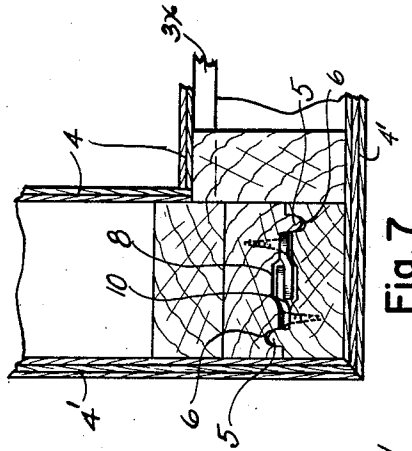
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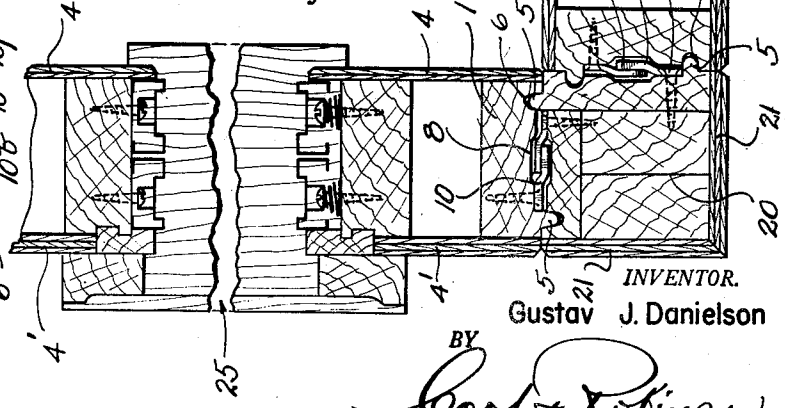
INTER-LOCKING WALL CONSTRUCTION

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INTER-LOCKING WALL CONSTRUCTION

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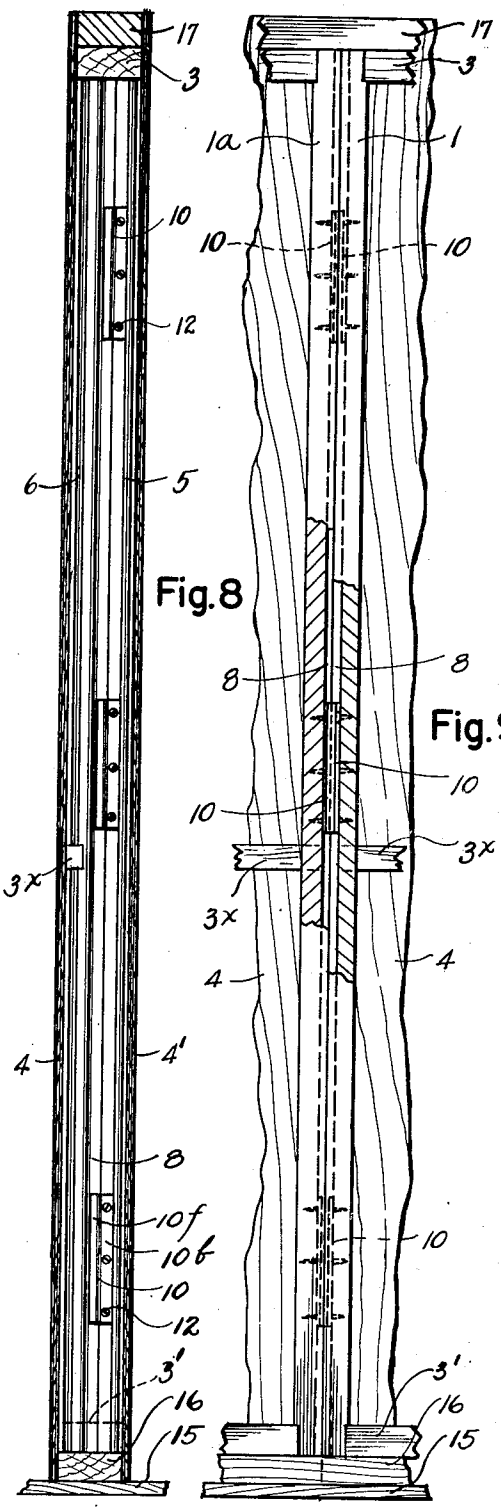



Fig.8




Fig.9

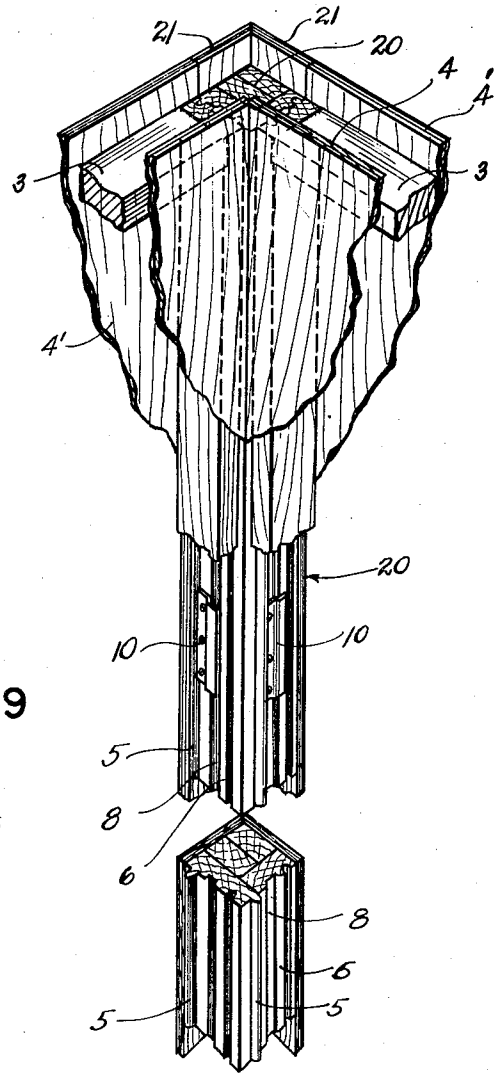



Fig. 10

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# INTER-LOCKING WALL CONSTRUCTION

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Application May 20, 1952, Serial No. 288,838

2 Claims. (Cl. 20—4)

This invention relates to building construction and it has reference more particularly to improvements in the construction of and means for effecting the weather-tight assembly and the rigid and secure interlocking of adjoining wall forming sections as used in the construction of prefabricated wooden buildings; the present invention being a modification of and an improvement upon the construction of building units, and in the manner of and means for effecting the joining and interlocking thereof, as disclosed in the application of Alfred Smith, filed December 26, 1948, under Serial No. 718,461 and now abandoned.

It is the principal object of this invention to provide wooden wall forming units of panel form, in standardized and other predetermined dimensions, that can be readily assembled edge to edge, and rigidly and securely united; each section being characterized by providing it, along its opposite vertical edge surfaces, with tongue and groove joining portions that are adapted to be interfitted with the complemental parts of adjoining units to provide weather sealed joints between the units, and said units further being equipped on their adjoining vertical edge surfaces, with flange plates of special form that, in the assembling of units, are adapted to be engaged and interlocked in such manner as to draw the units firmly together, to maintain the tight sealing of joints and the rigid, interlocked connection of the units.

More specifically stated, the present invention resides in the details of construction of those particular parts of the prefabricated units that are designed to be interfitted and interlocked to effect the weather tight sealing of joints; the rigid and secure joining of adjacent sections and the protecting of the metal flange plates against damage.

Further objects and advantages of the invention reside in the particular relationship of the flange plates, as applied along the center lines of the end surfaces of the various types of units, to the sealed tongue and groove joints as extended longitudinally of the units at opposite sides of the line of flange plates, thus to protect the plates against moisture and incident damage of rust and corrosion that would be detrimental to their utility and life.

It is a further object of the invention to utilize flange plates of thin flat metal, and to so form, apply and secure them that they will be entirely within the limits of the interfitted joint sealing portions, thus not to be so extended or exposed as to be subjected to possible deforming damage, nor to cause damage by gouging contact with surfaces or parts of other units liable to occur during handling or assembling operations.

Furthermore, the invention has as an object, the practical utilization of interlocking flange plates that are light in weight and of relatively low cost, both in respect to manufacture and application which are easy to functionally apply and are exceptionally effective in their intended use.

Still further objects and advantages of the present invention reside in the details of construction of those surfaces and parts that are to be interfitted and joined, and which make possible the assembly of units of various kinds in a variety of ways, as may be desired or required for various adaptations or types of buildings.



Yet another object of the invention resides in the application of the features of the present invention to corner posts, as used for the joining of the panel sections at right angles to each other, either at inside or outside corners.

In accomplishing the above mentioned and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view showing a typical assembly of building units embodying the features of the present invention therein.

Fig. 2 is an upper end view of a typical wall unit made according to this invention.

Fig. 3 is a horizontal sectional view of assembled wall forming units embodying the improvements of the present invention therein.

Fig. 4 is an enlarged horizontal sectional view, taken through the joint between two assembled units that have been interlocked by the flange plates of this invention.

Fig. 5 is a face view of one of the flange plates.

Fig. 6 is an edge view of the same.

Fig. 7 is a horizontal sectional view showing one manner of joining corner forming units.

Fig. 8 is an edge view of a wall forming unit as applied to a base plate.

Fig. 9 is a vertical section through adjoining wall sections as assembled with base and top plates.

Fig. 10 is a perspective view illustrating a corner construction.

The general embodiment of the present invention resides in the provision of prefabricated wall forming units, panels or sections, in predetermined and standardized sizes that renders them practical for storage, hauling and handling, and which panels may be easily assembled on the job by inexperienced workmen. It has been found practical to make such wall sections in various widths to meet the usual requirements. Their height generally is uniform. Ordinary wall forming units are made up of vertical studs to which inner and outer surface panels of suitable sheathing material are secured; these panels of sheathing being extended beyond the upper and lower ends of the studs to coact therewith in the formation of seats or channels designed to receive base and top plates whereby the wall sections after assembly, are held in proper alignment.

Some of the panels may include door and window openings, in which doors and windows are fitted. Other panels may have special features of construction embodied therein as required. However, the present invention is characterized by the features of construction that provide for the interfitting joining and interlocking of elements that are along or are applied to the vertical edges of the adjoining units. These features will hereinafter be fully described both as to details of construction and mode of use.

Referring more in detail to the drawings—

In Fig. 1, I have shown, in perspective view, some assembled wall forming units, or panels, embodying the novel features of the present invention. In this view, typical units designated generally at A and B are joined to form a right angle corner, and other units designated at C and D are joined thereto; the unit C having a window opening framed therein, and unit D having a door opening framed therein.

A typical wall unit is shown in end view in Fig. 2. This corresponds to unit B of Fig. 1. In its present preferred dimensions, this unit would be four feet wide and seven feet eight inches high, and would comprise

four vertical studs joined across upper and lower ends by horizontal plates 3 and 3' as well shown in Fig. 1. However, such units of lesser width or of greater width might have a more or less number of intermediate studs.

In Fig. 2, I have designated the outside studs by reference numerals 1 and 1*a*, and the intermediate studs by numerals 2 and 2'. To this core structure, that is formed by the four studs and cross-plates, inner and outer panels of sheathing 4 and 4' are secured. The sheathing preferably is plywood, ⅜" thick, glued or otherwise permanently secured to the studs, and it will be understood by reference to Fig. 8 that the sheathing panels 4—4' extend beyond the upper and lower plates, for the reception between them of the base and top plates of the building structure as presently described.

In order to hold the studs in proper spacing prior to the sheathing being glued thereto, it is desirable that a strip, or cross-tie of wood, as at 3*x* in Fig. 1, be applied to the studs; this strip being set into the studs flush with their outer surfaces. The position of these strips is shown also in Figs. 8 and 9.

The inside studs 2—2' of this unit are plain, as they have no interlocking requirements with any other part. The two studs, 1 and 1*a*, which are used at the opposite vertical edges of all the interlocking units, are of special construction to make possible their being interfitted and interlocked with the complemental parts of adjacent units. The novel features of construction, as embodied in the various panels or units, will now be described.

It should be noted first that the studs 1 and 1*a*, as used in any unit, are set between the sheathing panels 4 and 4', flush with their vertical edge surfaces. Each stud 1 and 1*a* is formed on its exposed side surface, to the full length, with a projecting tongue 5; the tongue being parallel to the adjacent side edge of the stud and slightly inset therefrom as best shown in Fig. 4. Also, formed in the exposed side surface of the stud, at the side of its longitudinal center line opposite that containing the tongue, is a groove 6. This is designed to receive therein the tongue of an adjoining section that is of the same dimensions of the tongue 5. Extending the full length of the exposed side of the surface of the stud, medially of the tongue 5 and groove 6, is a shallow channel 8 of substantial width.

To impart a better understanding of the features of construction, relationship and use of the present building units, reference is directed to Figs. 1, 2 and 3. The studs 1 and 1*a*, preferably, are of the usual 2" x 4" dimensions. The tongue and groove of each stud are equally inset from the adjacent longitudinal corner edges of the stud, preferably to about ¼", and each has a width of approximately ⅜". The channel 8 has a width of ⅞", and a depth of about ⅛". Between the bounding edges of the channel and the tongue and groove of each of said studs, are flat surfaces, each about ¾" wide, and the longitudinal marginal portions of the side of the stud along the outer side of the tongue and groove being flat. In the stud surfacing operation, whereby the tongue, groove and channel are formed, the flat surfaces at opposite sides of the channel 8 are cut below the plane of those outside of the tongue and groove about 3/32", thus to give a desired clearance between the faces of studs of assembled sections for containing the interlocking flange plates, as will presently be explained.

The studs 1 and 1*a* are alike in formation and in their application to the various types of wall forming units. In every unit the tongue and groove surfaces of the studs at opposite sides of the units are faced in opposite directions, as shown in Fig. 2. Therefore, in the assembling of units edge to edge, the tongue of each stud will be received in the groove of the adjoining stud, and the channels 8 of the adjacent studs will register. Also, side surfaces of sheathing of adjoining units will be in flush alignment.



It is the intent that the interfitting of tongues and grooves of adjoining units shall effect the weather tight joining of the sections; will give rigidity to the structure and will help in keeping assembled sections in proper alignment. However, to maintain the interlocked relationship and give the desired strength and rigidity to the structure, I have provided each panel or section, along the end surfaces that are formed by the studs 1 and 1*a*, with special flange plates that are adapted to be brought into interlocking connection. The special character of these plates, their mode of application to the studs, and their use will now be described.

Each flange plate is herein designated in its entirety by reference numeral 10. All are alike in size, shape and mode of application. Each comprises a rectangular plate of sheetmetal, as shown in Fig. 5, so bent approximately along a longitudinal center line, as to cause the parts thereof at opposite sides of the bend to be disposed in parallel planes, but offset from each other substantially to the thickness of the plate as well shown in Fig. 4. The part of the plate at one side of the bend is designated as the flange, 10*f*, and the part at the other side of the bend is designated as the flange base, 10*b*; this latter part being formed with holes 11 through which anchor screws 12 are applied to secure the plate to the stud. The plates 10 are fixed to the exposed side surfaces of the studs 1 and 1*a*, lengthwise thereof and in alignment along their longitudinal center lines. Also, they are spaced distances that are greater than the length of the plates. It has been found quite practical, and adequate to attach three of the flange plates to each stud in the manner shown in Figs. 8 and 9. Furthermore, the plates are attached at the same levels to all studs by disposing the parts 10*b* thereof flatly against those flat surfaces of the studs that are adjacent the insides of the tongues, as in Fig. 4, and with their flange portions 10*f* overlying and outwardly spaced from the channel 8. Therefore, the flange plates 10 as applied to the adjoining studs of adjacent units will have their flange portions, 10*f*, so disposed that they can be overlapped, one back of the other as shown in Fig. 4 to effect the secure joining of adjacent units with the longitudinal flat marginal portions along the outer side of the tongue and groove of confronting side joining surfaces of the units in abutting relation.

The present form of construction makes possible the easy assembling of units on a base plate as in Figs. 1 and 8, wherein 15 designates a floor and 16 a base plate secured thereon. The lower end portions of the sheathing panels 4—4' which extend beyond the lower ends of the studs 1, 1*a*, 2 and 2', receive the plate 16 between them and can be nailed thereto. Likewise a top plate 17 is disposed between the extended upper end portions of the sheathing panels 4—4' of a plurality of assembled sections and this can be nailed to the studs and panels as indicated in Fig. 9 to insure rigidity of construction.

To assemble two adjoining units or sections, they are first brought properly into edge to edge relationship for joining. Assuming that one unit has been applied to a base plate, and properly secured, the other unit is then raised relative thereto to dispose its flange plates 10 intermediate the corresponding plates of the secured unit. Then the tongues and grooves of the adjoining studs of the two units are interfitted as noted in Fig. 3, and the raised unit is then moved directly downward in such manner as to cause the flanges 10*f* of the three plates 10 fixed thereto, to pass back of the flanges 10*f* of the plates fixed on the other, as has been illustrated in Fig. 9, thus to lock the sections together. It is preferred that the flanges 10*f* of the plates be just slightly curved or crowned in a lengthwise direction, as shown in a somewhat exaggerated manner in Fig. 6 so that in bringing them to locked relationship by this relative

endwise adjustment above described, a drawing action will be effected that causes the tongues to be tightly seated in the grooves and the two units rigidly and securely united.

In Figs. 3 and 10 I have shown a built up corner post embodying the present improvements and adapted for the joining of walls of inside or outside corners. The post 20, in its final form is square in cross section, with dimensions that correspond to the width of studs of the side wall sections plus the thickness of the inside sheathing panel, for the purpose shown in Fig. 3. It is formed on two adjoining sides with surfaces substantially like the outer surfaces of the studs 1 and 1*a*, and is likewise equipped with flange plates 10. The other two sides of the post have strips 21 of plywood sheathing attached thereto to match up with the inner and outer sheathing panels of adjoining units. The mode of attaching wall forming units to this corner post is the same as used in the joining of adjacent wall units and the advantages and results are comparable.

Units that are to contain door or window openings are constructed substantially in the same manner as are the common wall units, but the opening is framed in for reception of a door or window. In Fig. 3, a window containing unit is designated at 25 and a door containing unit is designated at 26. These correspond to the window and door units designated by references C and D in Fig. 1.

Fig. 7 illustrates a modification of the corner post construction, utilizing the present flange plates for joining corner forming panels.

After the various units of a wall have been properly assembled and secured to the base plate, a top plate is applied between the extended upper end edges of the sheathing and nailed therein, thus to give added rigidity to the wall and maintain alignment of the sections. Ceilings and roofs of various forms may be applied to meet requirements.

Such mode of assembly and securement of units insures weather-tight joints between units, as well as secure, holding connections. Furthermore, since the flange plates 10 are located between the two longitudinal joints as formed by the interfitted tongues and grooves, they are adequately protected against moisture that might cause rusting or corrosion, and are also protected against bending damage thereto, or their possible damage to other objects.

The present means for uniting wall units is relatively inexpensive to apply; they are effective in use and are so disposed on their studs that they are out of the way and do not interfere with easy handling of the units.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent is:

1. A wall structure comprising a plurality of pre-



formed panels disposed in coplanar relationship, each panel including a wooden framework and facing sheets on opposite sides thereof, the vertical side edges of said panels being joined in face to face relationship, the vertical edges of each panel each having a tongue and a groove disposed in spaced vertical parallelism and spaced inwardly from the opposite outer faces of the panel, the respective tongues and grooves on the contacting side edges of adjacent panels being in engaging relationship and the contacting side edges of each panel also having flat coplanar marginal edge portions on opposite sides thereof, each defined between a respective tongue and groove and a respective outer face of the panel with the tongue and the groove projecting respectively outwardly and inwardly of such marginal portions, a vertically extending channel disposed between and in spaced parallelism with the tongue and groove, and flat longitudinal edge portions defined respectively between the opposite sides of the channel and the adjacent tongue and groove, each such longitudinal edge portion being inset from said marginal edge portions so that opposed longitudinal edge portions of adjacent panels are disposed in spaced relation, an elongate plate secured to each vertical side edge, each such plate having a flange base secured to one longitudinal edge portion within the aforementioned space defined between such longitudinal edge portion and the corresponding portion of the adjacent panel and having a flange overlying its associated channel and outwardly offset from said flange base to be disposed within the channel of the adjacent panel edge, and said plates being in alignment such that the flanges of plates on adjacent panel edges are interlocked behind each other to retain such edges in face to face contact.

2. The wall structure as defined in claim 1 wherein the outwardly offset flange of each plate is inwardly curved longitudinally toward the panel to which it is attached between the upper and lower edges thereof whereby the curved flanges coact against each other to hold the panels in tight face to face contact.


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