

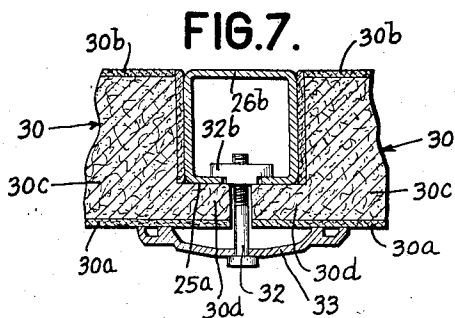
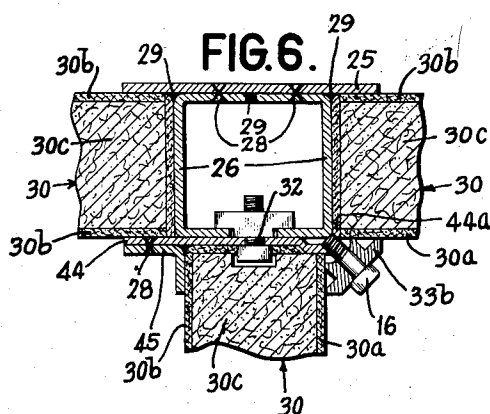
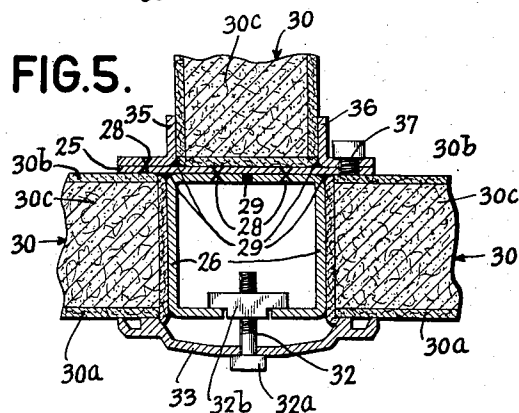
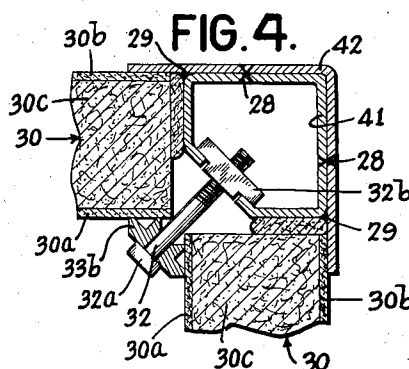
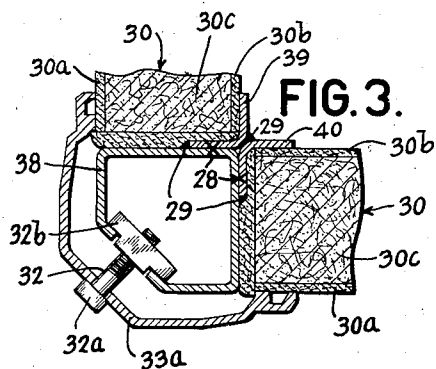
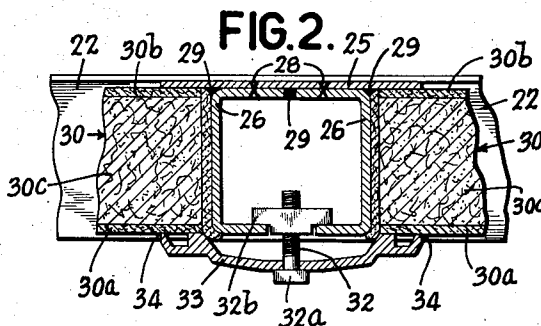
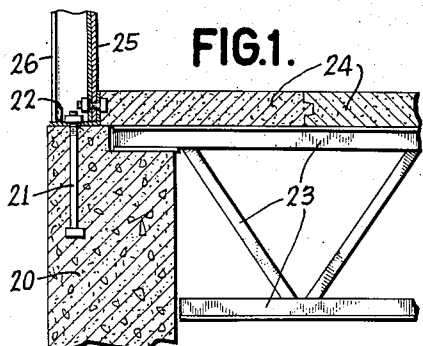
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2,113,067

STUDING CONSTRUCTION FOR PREFABRICATED HOUSES AND BUILDINGS

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2,113,067

STUDDING CONSTRUCTION FOR PREFABRICATED HOUSES AND BUILDINGS

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2 Claims. (Cl. 189—34)

This invention relates to improvements in studs and like elements for prefabricated houses and prefabricated building construction.

Many efforts have been made to reduce the cost of building operations, particularly in the building of homes. In usual house-building operations, it is the general practice to cut and shape the structural and covering materials upon the job and such procedure has been necessary since the plans and dimensions of different houses varied so widely. Although efforts have been made heretofore to provide pre-cut, house-building material, the resulting structures were not particularly sightly and required considerable labor on the job not only in the erecting of the structure but in the shaping on the job of certain materials used in the construction. Such previous structures furthermore were not capable of being readily altered or changed in plan or dimension.

The present invention is directed to improvements in the construction of prefabricated houses and buildings to the general end that previous difficulties associated with this general type of construction may be overcome, costs lowered, erection facilitated, adjustability obtained, so that additions or alterations can be made at any time practically without loss of material, and fire-resistant and insulating properties provided.

A further object of the present invention is the means of an improved frame construction with provisions for receiving and securing thereto closure members, in the form of side boards or slabs, doors and windows, in such a manner that interchangeability and uniformity of width of the wall slabs, doors and windows may be secured irrespective of their location upon the frame.

A further object of the present invention is the provision of a frame construction for a prefabricated house which is adapted to have outside corners, inside corners and like sections and to receive and secure closure members without the necessity of cutting or specially shaping them at the corners and at other points.

A further object of the present invention is the provision of improved vertical studding, including corner post studding, with improved means which afford an abutment and clamping means for securing wall boards or slabs or other closure members to said studding.

The aforesaid and other objects of the present invention will be hereinafter set forth in the accompanying specification and claims and illustrated in the drawing which shows, by way of illustration, a preferred embodiment and the

principle thereof and what I now consider to be the best mode in which I have contemplated applying that principle. Other embodiments of the invention, employing the same and/or equivalent principle, may be used and structural changes made as desired by those skilled in the art without departing from the present invention and within the spirit of the appended claims.

In the drawing:

Figure 1 is a detail sectional view showing the manner in which the vertical stud assemblies are connected to the sill member of the frame-work and the manner of supporting the floor beams or joists on the foundation;

Fig. 2 is a detail, enlarged, cross-sectional view showing the construction of one of the vertical frame work stud assemblies and the manner of supporting the wall panels thereby;

Fig. 3 is another, enlarged, sectional view showing the corner post construction for an outside corner and the manner of supporting the wall panels or sections thereby;

Fig. 4 is another sectional view showing the stud construction at a so-called inside corner;

Fig. 5 is a cross-sectional view of a vertical studding assembly and shows the manner in which support for the wall members is provided at a point where a cross partition wall is to be erected;

Fig. 6 is another cross-sectional view showing another wall-supporting construction where a T connection is to be made; and

Fig. 7 is a view of a modified form of studding and wall-board support.

Before the details of construction are described, the general features will be briefly alluded to.

The wall-board, side, closure members are in the form of laminated or composition boards. They are of uniform width and have a weather-proof or weather-resistant exterior, and a finished interior surface and have an intermediate cellular body which provides insulating properties. The inner and outer surfaces may be of asbestos or similar material and the cellular body may be any material which provides the required porous and cellular characteristics. The boards are adapted on their exterior to resist the influence of weather and on their interior to provide a finished surface for directly receiving wall covering such as wall paper, paint or the like. The wall boards are of substantial thickness to provide substantial heat insulating characteristics. The doors and windows are mounted in frames, which frames are interchangeable with the side wall members. Heat insulation material such as

mineral wool, may be packed in the hollow interior of the vertical studding assemblies and a dead air space is provided underneath the ornamental battens which are secured to such studding assemblies. These finishing battens are of metallic construction and are provided to cover the vertical joints of the side members, to cover the framing adjacent such joints and to secure the closure members to the frame. Different configurations of battens are provided for the different locations, i. e., on the straight walls and on the inside and outside corners. The battens are arranged to seal tightly with the side closure members and protect the frame work against the influence of the weather. The vertical studding assemblies of the frame-work, being hollow, may be used to receive wiring, piping and the like.

In the accompanying description, like reference numerals will be used to identify like parts. In the erecting of a house or building of this character, the foundation, which may be of any form such as one of concrete or concrete blocks and generally designated 20 in Fig. 1, is first laid. In the foundation suitable still-supporting bolts 21 are disposed. These bolts 21 receive and secure to the foundation 20 the sill parts of the steel frame-work structure. This steel frame-work preferably comprises an angle-shaped, metallic, sill member 22. The vertical part of the member 22 is toward the interior of the house or other structure, the interior being to the right in Fig. 1. The foundation 20 also provides a support for the cross beams or joists 23. This joist is preferably of prefabricated steel construction with upper and lower angle members and transverse, metallic, truss members. The steel joists 23 support flooring slabs 24 which may be of any conventional and desired construction.

Frame-work and studding

The frame-work of the structure comprises vertical studding assemblies and corner post assemblies which are bolted to the sill 22. These vertical studding and corner post assemblies are so disposed relatively to each other and provided with receiving portions of such shape and nature that side-wall slabs, of dimensions identical as to width, can be used in all portions of the structure, irrespective of whether the slab is to be disposed in a straight run of wall or adjacent an inside or outside corner. Therefore, special cutting and shaping of the wall slabs is obviated.

A typical studding member used on one of the sides of the house or structure will now be described with reference to Fig. 2. The studding assembly here shown comprises a rear plate 25, to which are secured two channels 26, the open troughs of which channels face one another as shown in Fig. 2. In lieu of two channels, a slotted tubular member may be used. The channels 26 are preferably secured to the plate 25 by welding the same as indicated by the crosses at 28 and by the welding material at 29. Such studs are bolted to the sills as shown in Fig. 1. The part of the plate 25 which projects beyond the bottoms of the channels 26 forms a rear support for receiving the side-wall boards or slabs. Such side-wall boards or slabs are generally designated 30 in Fig. 2 and preferably comprise an outer impervious board layer 30a, which provides an outer wall surface, an inner impervious board layer 30b, which provides an inner, finished, wall surface, and intermediate insulating material 30c. The slabs are so fabricated that they are received and erected as a unit.

To hold the side slabs 30 in place on the studding a preferable and convenient arrangement is provided which comprises a toggle bolt structure as indicated at 32. The toggle bolt comprises a cap stud element 32a and a cross member 32b. The cross member 32b may be turned on the stud 32a so as to pass between the facing edges of the channels 26 which define a continuous bolt receiving slot. The slot being continuous, the toggle bolts or other fastenings can be inserted in any position therein with alignment of the parts.

It will be further seen that the arrangement of the studding members is such that a continuous vertical slot is provided for bolt, fastening means, whereby a bolt may be secured to the stud in any vertical location, thus obviating the necessity of lining up bolt holes. After the bolt is in position, by turning the bolt the T-shaped nut 32b can be engaged and held against rotation between the two channels. The toggle bolts are used to hold batten elements 33 in place. Such batten elements, preferably, are made of suitable aluminum or alloy or composition and are provided with sharp portions, as at 34, to bite into the outer surface of the wall boards and provide a weather-tight joint and at the same time to hold the wall boards in place against the abutments provided by the back plate 25. If desired, insulating material can be packed in the hollow interior of each, metallic, stud assembly to provide heat insulation at such points. Also, during the setting up of the parts, a mastic composition may be introduced between the side edges of the wall slabs and the back of the channels 26 to provide a tight seal.

The studding construction shown in Fig. 5 will next be described. This construction comprises the plate 25, the channels 26 welded thereto, the batten 33, the toggle bolt assembly 32 as before. With this construction three wall boards 30 are to meet at the stud in place of two wall boards in alignment as with the Fig. 2 construction. To support the extra wall section, two additional angles 35 and 36 are provided. Angle 35 is preferably welded to the plate 25 as indicated by cross mark and angle 36 is preferably bolted to plate 25 by a bolt 37. The bolted on angle permits introducing the wall board in place.

For a corner post where an outside corner is to be provided, the construction shown in Fig. 3 is employed. This construction comprises a metallic section 38, shaped as shown and arranged to receive the toggled bolt 32 in the slotted opening between the edges. Supplemental angles are provided as indicated at 39 and 40 which are united to the member 38 by welding at the points indicated by the crosses and at the notch between angles 39 and 40 and at the ends thereof as shown. In this figure, two wall boards or slab sections 30 are shown extending toward each other at right angles and such wall boards are secured in position by the batten member 33a.

For an "inside" corner construction, the arrangement is according to the showing in Fig. 4. Here the vertical studding assembly comprises a member 41 having the shape shown to which is secured by welding, an angle 42. The ends of the angle 42, which project beyond the bent portions of 41, provide for the support of the wall members 30. The clamping of the wall members in place is secured by an inside batten 33b which is secured by the toggle bolts 32.

In certain cases both an inside corner and a through wall or T connection must be provided

for the wall slabs. Fig. 6 illustrates a construction adapted for this purpose. This studding construction comprises a rear plate 25 having secured thereto the two channels 26 with the trough portions facing each other. The toggle bolt in this instance secures to the assembly a supplemental plate 44 which has an angle 45 welded thereto. Plate 44 also has an extending end portion 44a turned at an angle and tapped to receive a cap bolt 46 which cap bolt 46 secures in place the batten 33b.

Fig. 7 shows a modification employing a hollow studding member 26b with portions defining a bolt receiving slot to receive a toggle bolt 32. In this embodiment the abutment portion for the wall slab or side closure element is at 25a. The wall slab is provided with projecting portions 30d to cooperate with the abutment portion 25a. The batten 33 is used as before. This construction eliminates the inside projection which exists with the Fig. 2 construction, but requires special forming of the side edges of the wall slabs or other side closure elements.

Although there has been shown above the studding assemblies, etc., as made of plates, angles, channels and the like secured together by welding, it will be understood that the parts may be fabricated in a unitary manner by special dies, rolling, etc. At the present time welding affords a convenient way of fabricating the special sections.

The manner of erection will be readily understood. The sills 22 are first bolted in place on the foundation. The lower floor joists are placed and bolted in position and the lower floor slabs are placed upon the joists. The vertical studding assemblies are bolted to the cross joists for the second floor or roof (not here shown, but fully shown and described in my copending application, Serial No. 683,721, filed August 5, 1933, of which the present application is a division). The assembling of such parts is preferably made upon the ground. The assembly of stud and joists is then raised by means of an A frame and the studs are bolted to the sills. Thereafter the wall joists (not shown) are secured in position. Although the frame work is preferably erected first, under certain conditions the side slabs or closure members or the like may be swung into position and temporarily held by clamps to the channels. Mastic may then be forced in at the side of the closure members between such members and the frame work. The temporary clamps are then removed and the ornamental slabs and battens are then secured in position.

From the foregoing it will be evident that the type of device herein described is particularly

well adapted for withstanding sudden or continuous stresses which may be applied to the wall or stud elements. The elements so interlock, in the positions specified, that the entire structure stands up, under a variety of either unusual or unexpected forces, not only on account of the strength of the materials used and the clamping action, but also on account of the reciprocal support between the specially interlocked and inter-braced stud and wall closure elements. Thus a force, directed from the upper right in Fig. 4 against the corner of the assembly, might, were the parts not interlocked, push the stud member 41 away from element 32b and loosen the entire assembly, but the presence of the wall elements 30 contacting and bracing member 41 stops any deformation before it can commence and the force is then available for jamming the assembly more tightly together than ever. All this prevents final breakdown under strain and what is equally, if not more, important, the first slight giving or displacement of the parts is prevented. It is, in many cases, such first displacement which is fatal, as thereafter the parts are less and less able to withstand a distorting stress which may be getting stronger and stronger.

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

1. A stud assembly for a building comprising a backing plate, a pair of channels secured thereto with the trough portions thereof facing each other to provide a bolt-receiving slot, a second backing plate secured to said channels to overlie said slot and provided with a bolt-receiving aperture in registry with the slot provided by said channels, means on said second backing plate comprising an abutment element adapted to bear against a wall closure element, a batten, and means associated with said batten and adapted to hold said batten rigidly in position with respect to said second backing plate.

2. A stud assembly for a building comprising an abutment element, a pair of channels secured thereto with the trough portions thereof facing each other to provide a bolt-receiving slot spaced from said abutment element, said abutment element and said channels providing wall-engaging surfaces, a batten adapted to cover said slot, and means for holding said batten rigidly in position with respect to said channels, said abutment element extending beyond the bottom of at least one of said channels to provide a face for the reception of a wall closure element, said batten extending beyond the bottom of the same channel and being adapted to engage a different face of the same wall closure element.

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