Oct. 12, 1954 C. W. FARRIER 2,691,433

PANEL FOR PREFABRICATED BUILDING

Original Filed Feb. 2, 1951

FIG. 1.

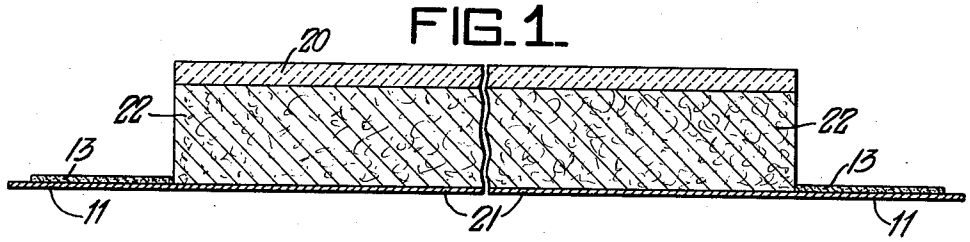


FIG. 2.

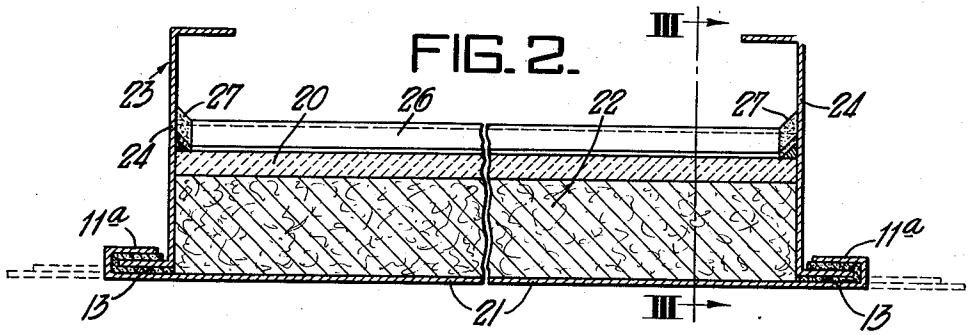


FIG. 3.

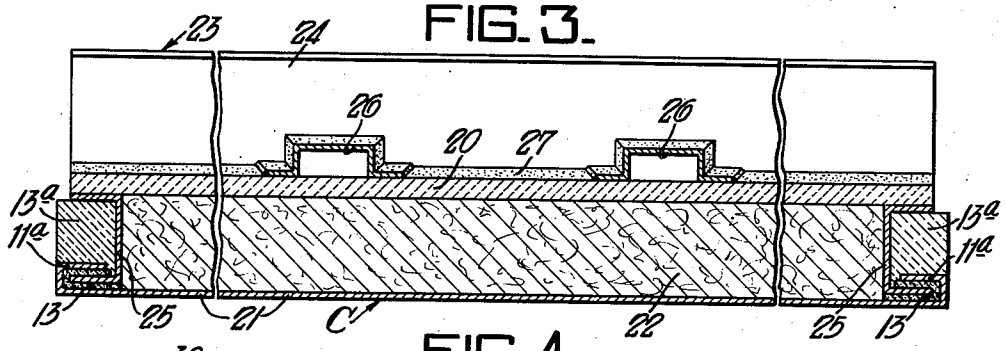
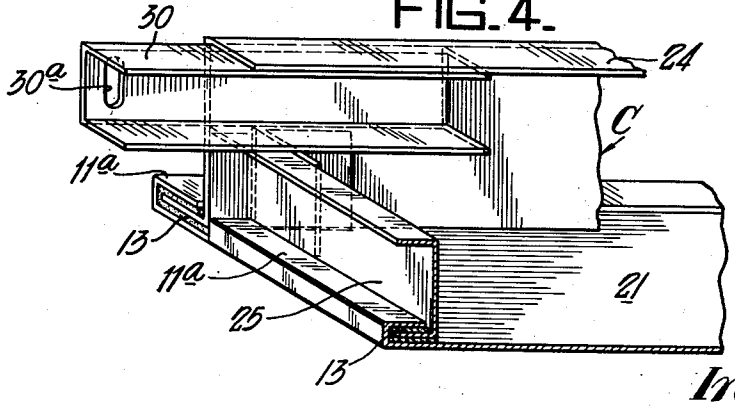


FIG. 4.



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UNITED STATES PATENT OFFICE

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PANEL FOR PREFABRICATED BUILDING

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Original application February 2, 1951, Serial No. 209,097. Divided and this application October 17, 1951, Serial No. 251,712

4 Claims. (Cl. 189—34)

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This invention relates to a construction panel a plurality of which are adapted, when laid side-by-side, spanning the side walls of a building, to form the ceiling thereof.

This is a division from my application Serial No. 209,097, filed February 2, 1951, for "Metal Building Structure Utilizing Prefabricated Panels and Method of Making the Latter."

The object of the invention is to provide a ceiling panel which can be manufactured at low cost and has great strength, low thermal conductivity and a finished surface on the lower side. Other objects and advantages of the invention will become apparent or will be particularly pointed out hereinafter.

In a preferred embodiment, I provide a frame composed of spaced longitudinal and transverse rails having flanges turned outwardly. I bond a preformed slab of insulation onto a metal sheet and fit the frame around the slab. I then fold the edges of the sheet around the flanges of the rails. The slab of insulation has a sheathing board bonded to the side opposite that in contact with the sheet. Bearing pieces are attached to the ends of the side rails for attachment to the wall panels.

A complete understanding of the invention may be obtained from the following detailed description of a preferred embodiment illustrated in the accompanying drawings. In the drawings,

Figure 1 is a longitudinal section through a panel at an intermediate stage of manufacture;

Figures 2 and 3 are transverse and longitudinal sections, respectively, through the completed panel; and

Figure 4 is an isometric view showing a corner of the panel frame and sheet.

Referring in detail to the drawings, the construction of the panel can best be understood from an explanation of its manufacture. In making a ceiling slab C, a metal sheet 21 has its corners notched and strips 13 of insulation laid along the edges thereof. A slab 22 of preformed thermal insulation such as adhesive-bonded glass fibers, is bonded to the sheet by a rubber-base adhesive laid thereon in closely spaced strings or ribbons. Slab 22 has a sheathing board 20 of plywood or the like already bonded thereto (or it may be applied subsequently) in the same manner. A structural frame 23 is then lowered onto the sheet over the slab and board.

The frame consists of spaced longitudinal or side rails 24 of Z section connected together at their ends by cross rails 25 of channel section. Connecting corner brackets (not shown) are spot

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welded to the side and cross rails. As shown in the drawings, the flanges of the rails 25 and the bottom flanges of the rails 24 extend outwardly. Intermediate cross bars 26 extend between the rails 24 at a level intermediate the flanges thereof. The bars 26 are of channel section with outturned flanges.

When the frame 23 has been pressed in position, the edges of the sheet 21 are then bent around the lower flanges of the rails 24 and 25 as indicated at 11a in Figure 2. Calking is applied in the corners between the webs of rails 24 and the exposed surface of board 20 as indicated at 27. Filler blocks 13a of thermal insulation like that of which slabs 18 are composed, are inserted between the flanges of rails 24. Panel C is finished by painting in any desired manner.

As shown in Figure 4, the ceiling panel C has bearing pieces in the form of channels 30 extending longitudinally therefrom at each corner. The channels 30 are disposed with their flanges inwardly, the upper flange engaging the upper flange of the side rail 24 and the web engaging the web of that rail. The lower flanges of pieces 30 bear on the upper edges of cross rails 25. Pieces 30 are adapted to be connected to the side walls of a building in any convenient manner.

It will be apparent from the foregoing that the panel construction of my invention is characterized by numerous advantages. Generally speaking, it provides a weather tight fully insulated panel structure composed of standardized parts adapted for quantity production at low cost and for erection by unskilled labor. The bending of the metal sheet edges around the frame rail edges with a thermal insulation strip therebetween prevents metal-to-metal contact and provides a cushion which permits limited contraction without tending to unbend the sheet edge or stress the panel frame. In addition, the bending of the sheet edges stretches the sheet in both directions to remove any buckles. The bent sheet edges also reinforce the rail flanges. The adhesive bonds the insulation slab to the metal sheet and sheathing board and the application thereof in strings or ribbons reduces the amount of adhesive required, yet affords adequate bonding. The insulation slab, by its adherence to the metal sheet, prevents buckles therein and, by its semi-rigid character, increases the transverse load-bearing strength of the panel.

The building panels effectively withstand both horizontal and vertical loads whether continuous or intermittent. They easily carry the weight of members of the erection crew and may be walked

on as soon as they are laid, without injury thereto. The panels are "sandwich" structures and both longitudinal and transverse elemental sections thereof form composite beams in which the metal sheet and sheathing board sustain the tension and compression while the insulation affords sufficient shear strength to maintain them in properly spaced relation.

Although I have disclosed herein the preferred embodiment of my invention, I intend to cover as well any change or modification therein which may be made without departing from the spirit and scope of the invention.

I claim:

1. A panel for building construction comprising a frame including spaced side rails connected by cross rails secured to the ends thereof, said rails having out-turned flanges in a common plane, a metal sheet overlying said frame on one side, said sheet having its edges bent over the flanges of said rails, a slab of thermal insulation of less depth than said side rails fitting snugly in said frame, a covering sheet overlying said slab and intermediate cross members extending between said side rails in contact with said covering sheet.

2. A panel as defined by claim 1 characterized by blocks of insulation filling the space between the flanges of said cross rails.

3. A panel as defined by claim 1 characterized by said side rails being of Z-section and said cross rails of channel section.

4. A panel as defined by claim 1 characterized by said intermediate cross members being of channel section, extending between the side rails and resting on the covering sheet with their flanges disposed downwardly.

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