

Dec. 14, 1937.

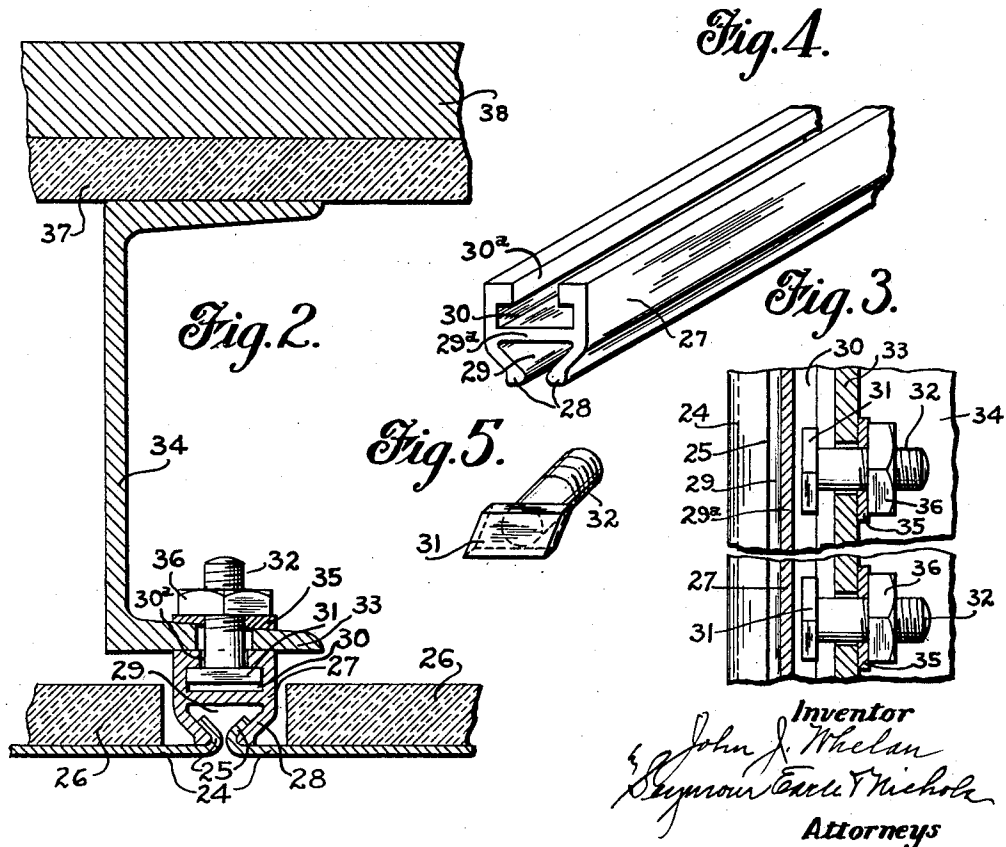
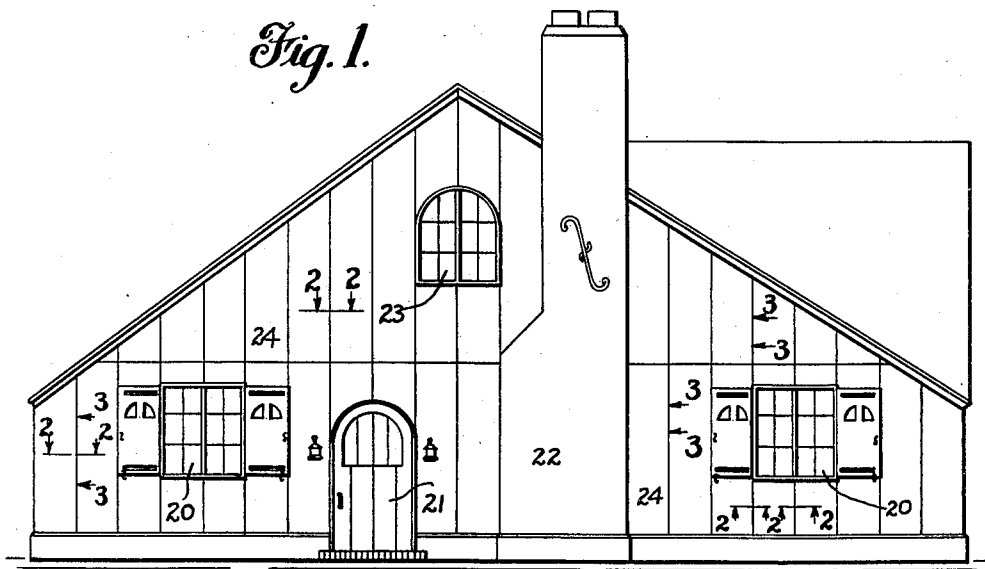
J. J. WHELAN

2,102,247

SHEET MATERIAL BUILDING CONSTRUCTION

Filed Oct. 4, 1935

3 Sheets-Sheet 1



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SHEET MATERIAL BUILDING CONSTRUCTION

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3 Sheets-Sheet 2

Fig. 16.

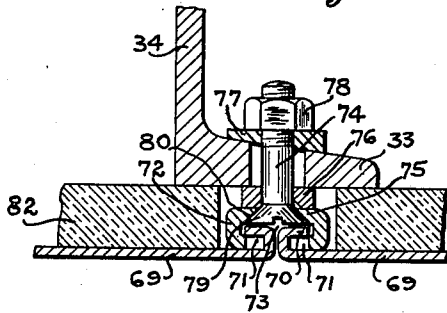


Fig. 17.

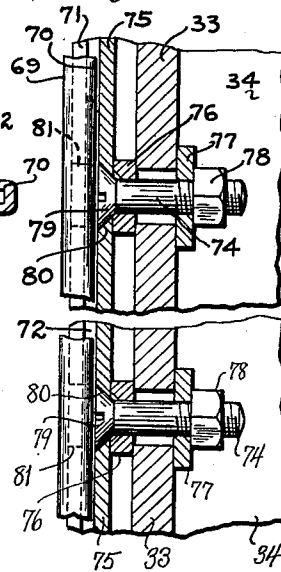


Fig. 18.

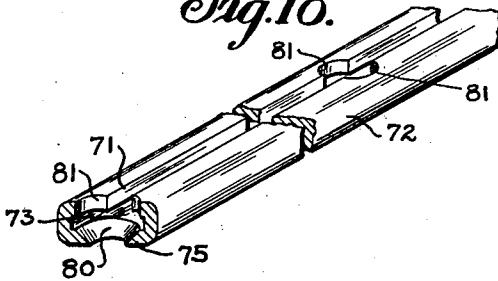
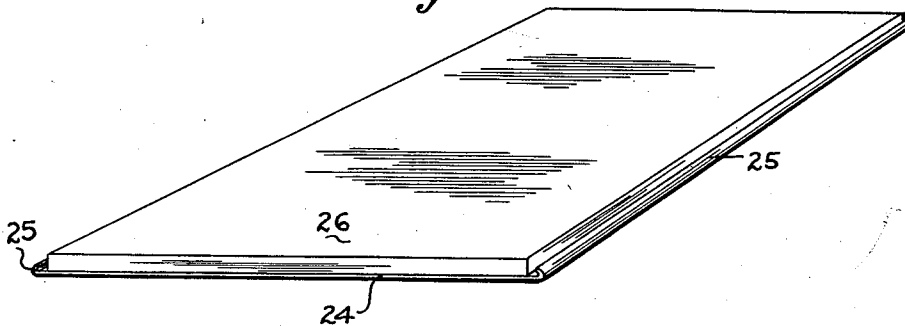


Fig. 6.



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3 Sheets-Sheet 3

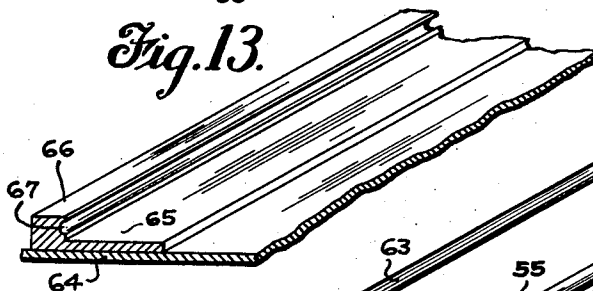
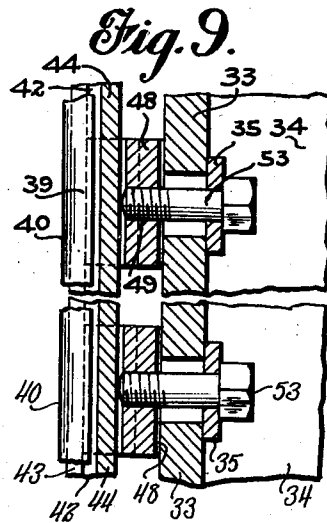
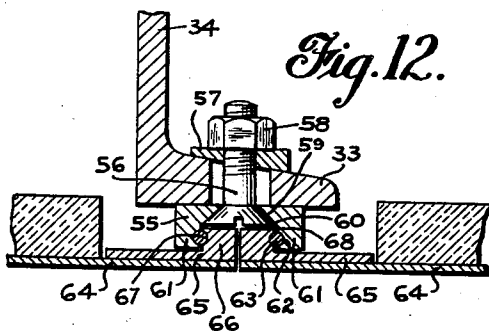
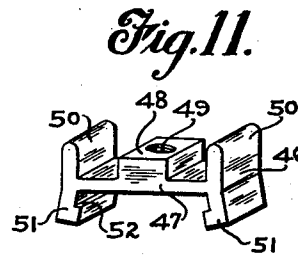
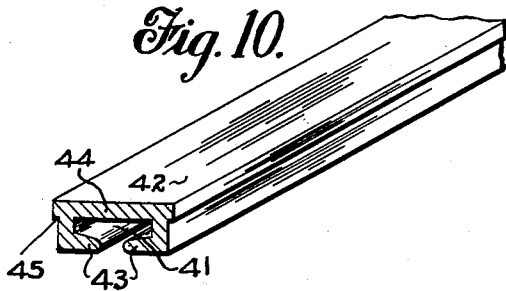
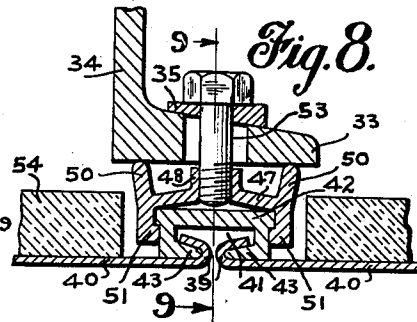
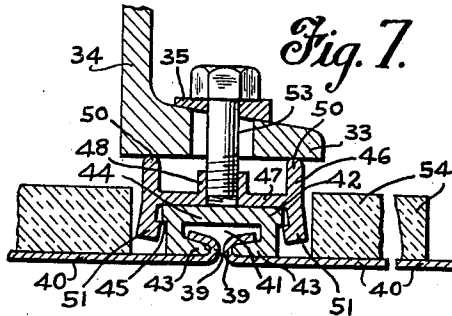
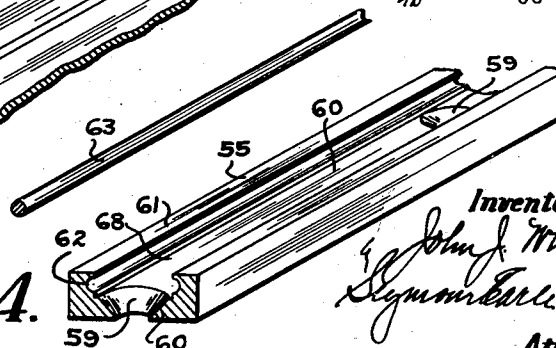


Fig. 15.

Fig. 14.



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UNITED STATES PATENT OFFICE

2,102,247

SHEET MATERIAL BUILDING CONSTRUCTION

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Copper Houses, Inc., New York, N. Y., a corporation of Maryland

Application October 4, 1935, Serial No. 43,577

7 Claims. (Cl. 189—34)

This invention relates to an improvement in buildings having wall areas of sheet-material such, for instance, as copper, brass, etc., though other suitable sheet-materials may be employed if desired.

One of the objects of the present invention is to provide a superior building construction in which wall areas of sheet-material may be so employed as to result in both attractiveness and economy.

A further object is to provide a sheet-material building construction having superior means for attaching sheet-metal panels to the supporting structure.

A further object is to provide a building structure which includes a plurality of panels of sheet-material which are coupled together in a simple, reliable and effective manner.

A still further object is to provide a structure of the class referred to, in which panels of sheet-material may be attached to the supporting structure in a manner which will preclude, to an effective degree, the passage of moisture through the joints.

A still further object is to provide a building construction having panels effectively secured in place in such manner as will avoid the undue marring of their exposed surfaces.

With the above and other objects in view, as will appear to those skilled in the art from the following, considered in conjunction with the accompanying drawings and appended claims, the present invention includes all features disclosed therein which are novel over the prior art.

In the accompanying drawings:

Fig. 1 is an elevational view of a house constructed in accordance with the present invention;

Fig. 2 is a broken horizontal-sectional view taken on any one of the lines 2—2 of Fig. 1;

Fig. 3 is a broken vertical-sectional view taken on any one of the lines 3—3 of Fig. 1;

Fig. 4 is a perspective view of a fragment of one of the coupling-bars;

Fig. 5 is a perspective view of one of the coupling-bolts;

Fig. 6 is a perspective view of one of the panel-units;

Fig. 7 is a broken horizontal-sectional view corresponding to Fig. 2, but showing a modified construction with the attaching-clip being shown prior to clamping the coupling-bar;

Fig. 8 is a similar view, showing the clip as bent to clasp the coupling-bar;

Fig. 9 is a broken vertical-sectional view taken on the line 9—9 of Fig. 8;

Fig. 10 is a perspective view of a fragment of the coupling-bar of the construction shown in Figs. 7, 8 and 9;

Fig. 11 is a perspective view of one of the clips of the structure of Figs. 7, 8 and 9;

Fig. 12 is a broken horizontal-sectional view corresponding to Fig. 2, but showing still another form which certain features of the present invention may assume;

Fig. 13 is a fragmentary view of one edge of the panel-unit employed in the structure of Fig. 12;

Fig. 14 is a perspective view of a fragment of the coupling-bar of the structure of Fig. 12;

Fig. 15 is a perspective view of a fragment of one of the key-rods of the structure of Fig. 12;

Fig. 16 is a broken horizontal-sectional view corresponding to Fig. 2, but showing another form which the present invention may assume;

Fig. 17 is a broken vertical-sectional view taken on the line 17—17 of Fig. 16; and

Fig. 18 is a perspective view of a fragment of the coupling-bar of the structures of Figs. 16 and 17.

Houses or other buildings embodying the present invention may assume a wide variety of forms, but the residence chosen for illustration in Fig. 1 of the accompanying drawings has the vertical front wall of its first story provided with windows 20—20, respectively located on the opposite sides of a main entry 21, and a chimney 22. The second story is, as shown, also provided with a window 23.

Figures 2 to 6 inclusive

The vertical walls of the first and second stories of the building are composed of a series of vertically-extending panels 24, formed of sheet-material such, for instance, as copper, and having their adjacent side edges arranged in close proximity to provide a substantially-continuous surface.

Each panel 24 is formed on its respective opposite edges with a reversely-bent coupling-flange 25 (Fig. 6) and preferably has cemented or otherwise secured to its back-surface a substantially-coextensive backing-slab 26 of sound-deadening and heat-insulating material. The said backing-slabs 26 may be composed of fiber-board, for instance, or other suitable material, and it has been found that they may be conveniently cemented in place to the back surface of

the panels 24 by means of waterglass, asphaltum, or the like.

Located back of the junction point of any given two of the panels 24 is a vertical coupling-bar, generally designated by the numeral 27, and having a pair of turned coupling-flanges 28—28 producing a vertically-extending flange-receiving channel 29 of V-shaped form in cross-section. The said coupling-flanges have their inner faces respectively reversely sloped to correspond to the reversely-bent coupling-flanges 25—25 of the panels 24 and are entered into the flange-receiving channel 29, as indicated particularly well in Fig. 2 of the accompanying drawings.

The vertically-extending coupling-bars 27 may be conveniently formed of extruded brass and each is provided in its rear portion with a longitudinally-extending T-shaped attaching-groove 30, separated from the flange-receiving channel 29 by a wall 29^a and adapted to receive the rectangular heads 31 of a series of attaching-bolts 32, each of which is adapted to pass through the front flange 33 of the adjacent one of a series of vertical channel-iron studding 34. The said studding are horizontally spaced from each other a distance corresponding to the width of panels 24 and serve as studding for the building. Each attaching-bolt 32 also passes through a wedge-shaped washer 35 and has applied to its threaded inner end a nut 36, the tightening of which latter serves to draw the coupling-bar 27 into firm engagement with the outer face of the front flange 33 of the adjacent one of the said studding 34.

The heads 31 of the coupling-bolts 32, as particularly well shown in Fig. 5, are preferably of a width such as to permit their ready lateral introduction into the bolt-receiving groove 30 of each coupling-bar through the contracted inner throat-portion 30^a of the groove.

The mode of sealing the upper and lower ends of the various panels 24 may vary widely, depending upon circumstances, architectural treatment, etc., and may, for instance, be accomplished as shown in my co-pending application, Serial No. 33,951, filed July 31, 1935.

To the inner face of the channel-iron studding 34 may be secured, in any approved manner, plaster-board 37 or other suitable material, to receive a plaster-coat 38. If desired, the inner walls of the building, instead of being plastered as shown, may obviously be formed of panels 24 and, if desired, the space between the inner and outer walls may be filled with mineral wool, or other insulating and sound-deadening material.

A series of panels may be coupled together by the coupling-bars 27 before the said coupling-bars are secured to the studding 34 or, if desired, the said coupling-bars may be lightly attached in place by means of the attaching-bolts 32, and the various panels "interleaved," so to speak, with the said coupling-bars by passing them longitudinally over the complementary coupling-flanges 28—28. After the coupling-bars are firmly clamped to the studding by means of the coupling-bolts 32, the various panels 24 will be firmly held in place with capacity for longitudinal expansion and contraction inasmuch as the flanges 25 of the panels may slide with respect to the coupling-flanges 28 of the said coupling-bar.

Furthermore, by virtue of the wall 29^a interposed between the V-shaped flange-receiving channel 29 and the T-shaped bolt-receiving

groove 30 of the coupling-bar 27, the access of water to the interior of the wall structure is effectively precluded. The said channel 29 will serve to downwardly conduct such water as may enter thereinto between the respective edges of adjacent panels. Such water may be drained off of the lower end of each of the drainage-channels 29 of the coupling-bars in any suitable manner, requiring no detailed description herein.

Figures 7 to 11 inclusive

In the structure now under consideration, the flanges 39—39 on the adjacent edges of a given pair of panels 40—40 are entered into a longitudinal drainage-channel 41 in a coupling-bar 42 and are respectively engaged with oppositely-projecting coupling-lips 43—43 constituting a partial front wall for the said drainage-channel 41. On each of the respective opposite sides of the coupling-bar is provided a forwardly-facing anchoring-ledge 45 coextensive with the said bar.

For the purpose of securing a coupling-bar 42 to the front flange 33 of one of the studding 34, any desired number of distortable attaching-clips 46 (Fig. 11) may be employed. Each of the said clips includes a central web 47 having extending rearwardly from its rear face a lug 48 having a threaded bore 49 therein. Extending rearwardly from the opposite sides of the central web 47 are bearing-flanges 50—50 respectively, the inner ends of which bear against the front flange 33 of the studding 34. Extending forwardly from the opposite sides of the central web 47 of each clip 46 are L-shaped clamping-arms 51—51, each of which has a rearwardly-facing anchoring-ledge 52 adapted to engage with one of the forwardly-facing anchoring-ledges 45 on the coupling-bar.

The anchoring-clip 46 may be formed of extruded metal severed into suitable lengths and prior to installation has its complementary clamping-arms 51—51 separated to a sufficient degree to permit the coupling-bar to be entered between the said arms, as indicated in Fig. 7. Thus, a pair of adjacent panels 40 may be coupled together by the coupling-bar 42 and the said coupling-bar may then be entered between the arms 51—51. Now, by tightening an attaching-bolt 53 extending outwardly through the front flange 33 of the studding 34 and into the threaded bore 49 of the said clip, the latter may be distorted so as to cause its clamping-arms 51—51 to move inwardly and engage with the anchoring-ledges 45 on the respective opposite sides of the coupling-bar, as indicated in Fig. 8, whereupon the coupling-bar 42, and hence the panels 40, become firmly anchored to the supporting structure.

Preferably and as shown, the panels 40 are each backed by a slab 54 of sound-deadening and heat-insulating material secured thereto in any approved manner and acting, in addition to providing thermal insulation, to effectively deaden such resonance as the said panels might otherwise possess.

Figures 12 to 15 inclusive

In the structure illustrated in the figures just above listed, a coupling-bar 55 of substantially U-shaped form in cross-section is secured to the outer face of the front flange 33 of a studding 34 by means of a suitable number of flat-headed screws 56 passing rearwardly through the coupling-bar and through the said flange 33. On the inner end of each of the screws 56 is mounted a wedge-shaped washer 57 and a suitable nut 58.

For the purpose of its attachment to the studding 34, the coupling-bar 55 is provided at predetermined intervals with conical countersinks 59 into which the conical heads of the screws 56 are adapted to set so as to have the outer faces of the said heads substantially flush with the bottom wall 60 of the coupling-bar.

Each coupling-bar is, as before stated, of substantially U-shaped form in cross-section and includes, in addition to its bottom wall 60, opposed side-flanges 61—61, each of which is formed on its inner face with an inwardly-opening longitudinal coupling-groove 62 of substantially-semicircular form in cross-section and adapted to receive a portion of a key-rod or wire 63 which in the structure illustrated is of circular form in cross-section.

Each panel 64, instead of having integral inturned coupling-flanges as in the constructions previously described, has a plain edge and has secured to the inner face thereof, by brazing, soldering, or other suitable means, a coupling-flange bar, of substantially L-shaped form and generally designated by the numeral 65. In the inner lateral face of its rearwardly-projecting leg 66, each coupling-flange bar is formed with a coupling-groove 67 of substantially-semicircular form in cross-section, and positioned so as to be juxtaposed with respect to the coupling-groove 62 in the adjacent one of the side-flanges 61 of the coupling-bar, as clearly illustrated in Fig. 12.

By the construction shown in Figs. 12 to 15 inclusive, the coupling-bars 55 may be first secured to the studding, after which the panels may be erected in place so as to enter the rib-like leg-portions 66 of their coupling-flange bars into the outwardly-facing longitudinal drainage-channel 68 in the said coupling-bars. The key-rod or wire 63 may now be longitudinally inserted so as to extend substantially half of its diameter into each of an opposed pair of the coupling-grooves 62 and 67. As will be obvious by reference to Fig. 12, when the key-rods 63 are in place as shown, the adjacent edges of the panels are firmly locked in place to the supporting structure, with capacity, however, for being conveniently removed by withdrawing the said key-rods longitudinally.

Figures 16 to 18 inclusive

In the building structure shown in these figures of the drawings, the panels 69 of sheet-material are provided on each of their respective opposite edges with inturned coupling-flanges 70 for engagement with a given one of two inturned coupling-flanges 71—71 respectively formed upon the opposite sides of a coupling-bar 72 having a forwardly-opening longitudinal drainage-channel 73 therein. The coupling-bar 72 is secured to the front flange 33 of the studding 34 in spaced relationship forwardly thereof by flat-headed screws 74, each of which extends rearwardly through the inner wall 75 of the coupling-bar, through a spacing-block 76 interposed between the said inner wall and the outer face of the flange 33 and through the said front flange and through a wedge-shaped washer 77. The threaded inner end of the said screw has a nut 78 applied thereto which bears against the said washer 77.

The conical head 79 of the screw 74 is seated in one of a series of conical countersinks 80 formed in the inner wall 75 of the coupling-bar 72 at spaced intervals. To permit the front-to-rear introduction of the screw 74 through the coupling-bar 72, the coupling-flanges 71—71 of

the said bar are notched as at 81 to permit the passage of the said head during the installation of the screw. Preferably and as shown, each panel 69 is backed up by a slab 82 of heat-insulating and sound-deadening material.

From the foregoing, it will be seen that the various panels are conveniently and effectively secured to the supporting structure and hence connected to each other. It will furthermore be seen that provision is made for permitting the longitudinal expansion and contraction of the panels to a degree sufficient to prevent undesirable buckling thereof. It will also be seen that should any water enter between the adjacent edges of a given pair of panels, such water will be prevented to an effective degree from entering the interior of the wall structure.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. A house or like structure including in combination: a supporting framework; a coupling-bar adapted to be secured to the said supporting framework and having both a longitudinal flange-receiving channel and a longitudinal attaching-groove therein; attaching-means entered into the longitudinal coupling-groove of the said coupling-bar and anchoring the same to the said supporting framework; and a pair of panels of sheet-material arranged with their edges adjacent and each having an offsetting coupling-flange entered into the flange-receiving channel of the said coupling-bar and coupled with one of the boundary walls thereof.

2. A house or like structure including in combination: a supporting framework; a coupling-bar adapted to be secured to the said supporting framework and having both a longitudinal flange-receiving channel and a longitudinal attaching-groove therein, the said channel and groove being separated from each other by a substantially-imperforate wall; attaching-means entered into the longitudinal coupling-groove of the said coupling-bar and anchoring the same to the said supporting framework; and a pair of panels of sheet-material arranged with their edges adjacent and each having an offsetting coupling-flange entered into the flange-receiving channel of the said coupling-bar and coupled with one of the boundary walls thereof.

3. A house or like structure including in combination: a supporting framework; a coupling-bar adapted to be secured to the said supporting framework and having two opposed coupling-flanges thereon providing a flange-receiving channel therebetween, and also formed with a longitudinal attaching-groove; attaching-means engaged with the longitudinal coupling-groove of the said coupling-bar and attaching the same to the said supporting framework; and a pair of panels of sheet-material each having an offsetting coupling-flange entered into the flange-receiving channel of the said coupling-bar and coupled with one of the coupling-flanges thereof.

4. A house or like structure including in combination: a supporting framework; a coupling-bar adapted to be secured to the said supporting framework and having two opposed coupling-

flanges thereon providing a flange-receiving channel therebetween, and also formed with a longitudinal attaching-groove, separated from the said drainage-channel by a substantially-imperforate wall; attaching-bolts having head-
 5 portions engaged with the longitudinal coupling-groove of the said coupling-bar and attaching the same to the said supporting framework; and a pair of panels of sheet-material each having an
 10 offsetting coupling-flange entered into the flange-receiving channel of the said coupling-bar and coupled with one of the coupling-flanges thereof.

5. A house or like structure including in combination: a supporting framework; a coupling-
 15 bar adapted to be secured to the said supporting framework and having two opposed coupling-flanges thereon providing a flange-receiving channel therebetween, and also formed with a
 20 longitudinal attaching-groove, the inner walls of the respective coupling-flanges being sloped outwardly and toward each other; attaching-means engaged with the longitudinal coupling-groove of the said coupling-bar and attaching the same to the said supporting framework; and a pair of
 25 panels of sheet-material each having an offsetting coupling-flange entered into the flange-receiving channel of the said coupling-bar and coupled with one of the coupling-flanges thereof.

6. A house or like structure including in combination: a supporting framework; a coupling-
 30 bar adapted to be secured to the said supporting framework and having two opposed coupling-

flanges thereon providing a flange-receiving channel therebetween and also formed with a longitudinal attaching-groove, separated from the said drainage-channel by a substantially-imperforate wall, the inner walls of the respective coupling-flanges being sloped outwardly and toward
 5 each other; attaching-means engaged with the longitudinal coupling-groove of the said coupling-bar and attaching the same to the said supporting framework; and a pair of panels of sheet-material each having an offsetting coupling-flange
 10 entered into the flange-receiving channel of the said coupling-bar and coupled with one of the coupling-flanges thereof.

7. A house or like structure including in combination: a supporting framework; a coupling-
 15 bar adapted to be secured to the said supporting framework and having on its outer face two opposed longitudinal coupling-flanges providing a flange-receiving channel therebetween and provided on its inner face with two opposed substantially L-shaped longitudinal attaching-flanges
 20 providing a coupling-groove therebetween; attaching-means engaged with the L-shaped attaching-flanges of the said coupling-bar and attaching the same to the said supporting framework; and a pair of panels of sheet-material, each having an offsetting coupling-flange entered into the flange-receiving channel of the said coupling-
 25 bar and coupled with one of the coupling-flanges thereof.

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