Feb. 28, 1939. R. M. CALKINS ET AL 2,148,434

PANEL BUILDING CONSTRUCTION

Filed Oct. 28, 1936

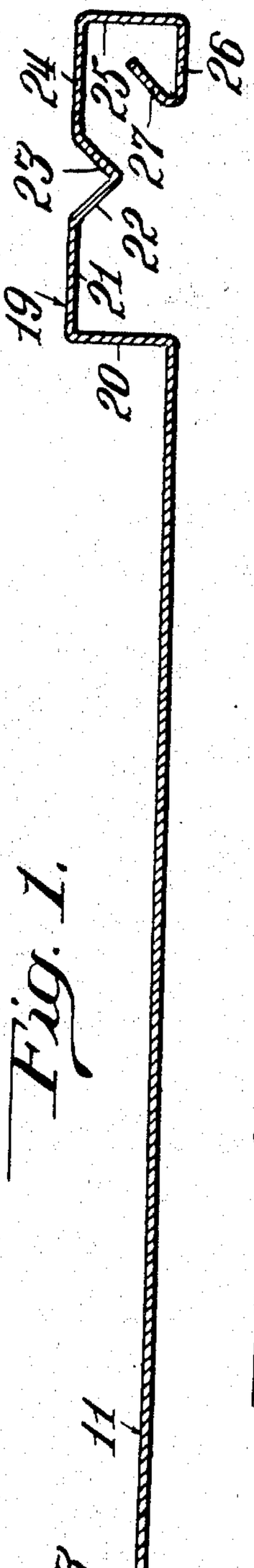

Fig. 1.

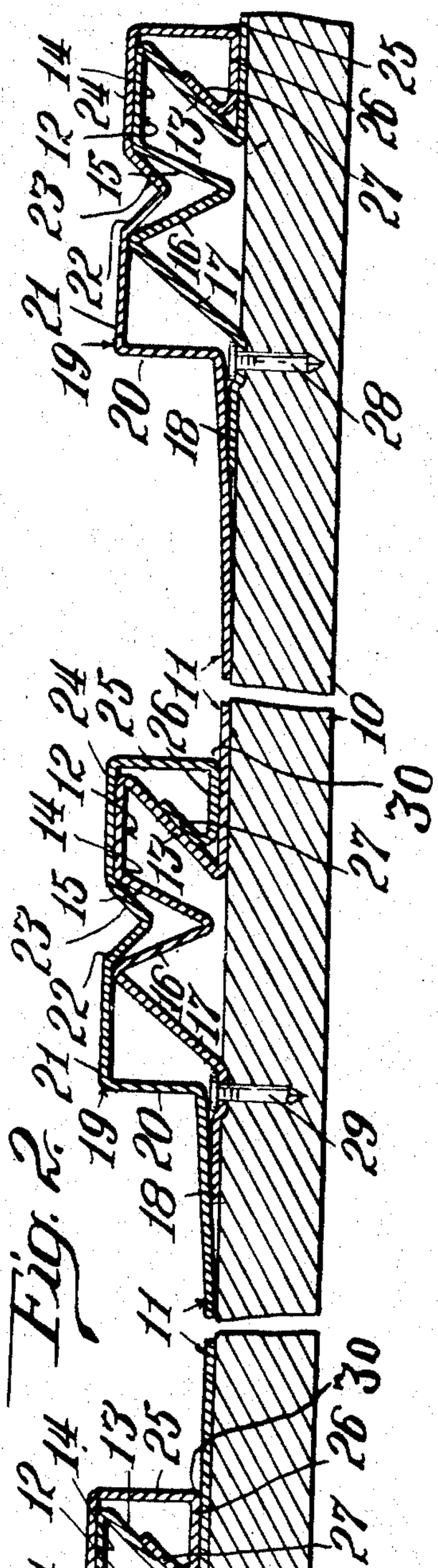

Fig. 2.

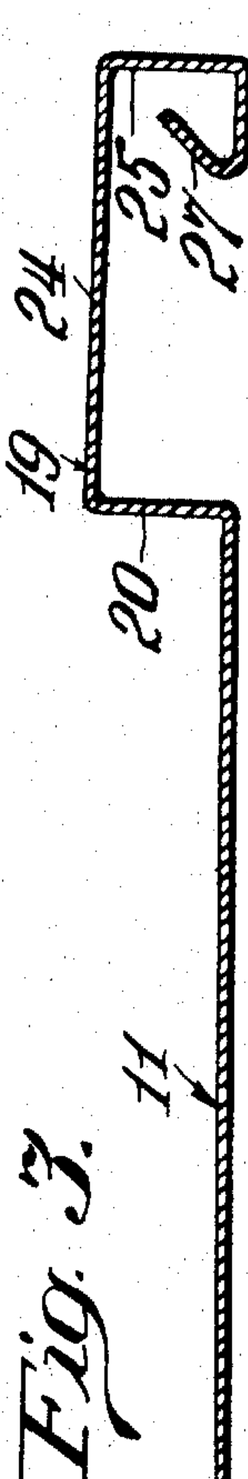

Fig. 3.

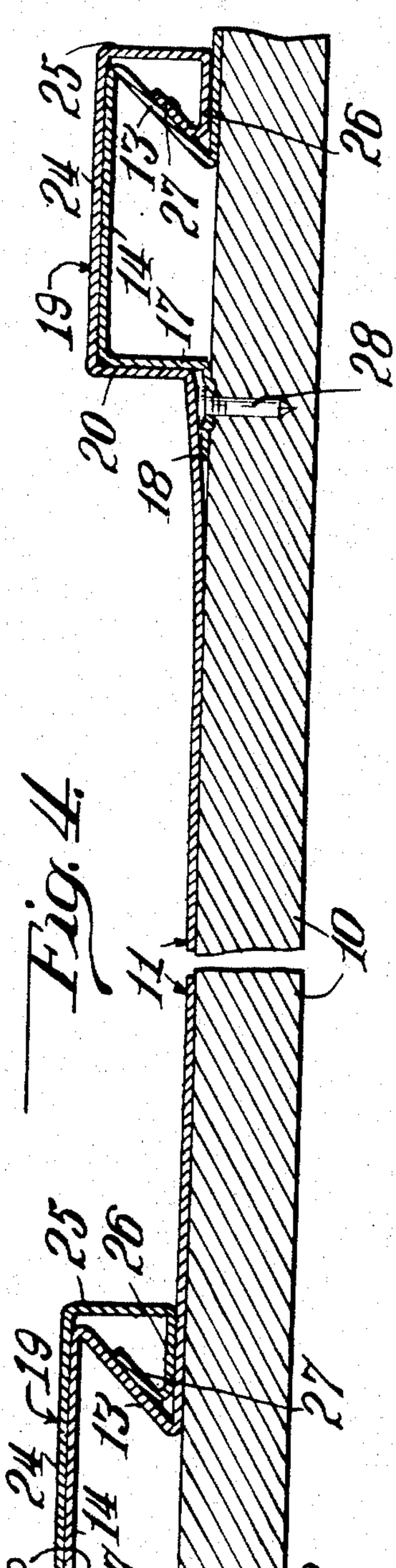

Fig. 4.

Inventors:
Raymond M. Calkins,
and James W. Swank,
By Fricke & DeBusk
Attorneys

Patented Feb. 28, 1939

2,148,434

UNITED STATES PATENT OFFICE

2,148,434

PANEL BUILDING CONSTRUCTION

Raymond M. Calkins, Deerfield, and James W. Swank, Chicago, Ill.

Application October 28, 1936, Serial No. 108,014

3 Claims. (Cl. 189—86)

Our invention relates to panel building construction and it has for its object the provision of a new and improved form and arrangement of parts whereby a sheet metal panel arrangement may be provided comprising such a joint structure at the meeting edges of the panels as to be effective for preventing the passage of water through the joint and as to provide for the ready escape of any small amount of moisture which may be gathered by condensation or otherwise within the joint.

It is one of the objects of our invention to provide an improved joint arrangement in which the surface contact of the engaging parts of two adjoining panels is broken at one or more points so as to prevent water from passing by capillary attraction completely through the joint and so as to provide at an intermediate point in the joint a trough arrangement along which the water is free to drain independently of any capillary attraction effect and within which air is free to circulate so as to promote evaporation of any water finding its way to that point. It is another object of our invention to provide such a trough at an intermediate point transversely of the joint and closely adjacent to the outer edge of the joint so as to limit the distance to which water can penetrate the joint and thus limit the amount of water retained in the joint under capillary attraction conditions after a rain, with such small amount of retained water located at only a short distance from the open outer edge of the joint so as to be adapted to evaporate quickly.

It is another object of our invention to improve constructions of this type in sundry details hereinafter pointed out. The preferred means by which we have accomplished our several objects are illustrated in the drawing and are hereinafter specifically described. That which we believe to be new and desire to cover by Letters Patent is set forth in the claims.

In the drawing,—

Fig. 1 is a cross sectional view through the preferred form of our improved panel;

Fig. 2 is a cross sectional view through a roof embodying a series of such panels, the roof being broken away at points between the joints;

Fig. 3 is a view similar to Fig. 1 but showing a modified form of arrangement; and

Fig. 4 is a view similar to Fig. 2 but showing a modified form of panel as illustrated in Fig. 3.

Referring now to Figs. 1 and 2 of the drawing, in which corresponding parts are indicated by the same reference characters, 10 indicates a roof deck of any approved type arranged to have a substantial inclination from the horizontal so as to drain water readily therefrom. A covering for the top face of the deck 10 is provided comprising a plurality of panels 11 of sheet metal, each having a rib or offset portion 12 formed thereon at one side edge portion, such rib being provided by bending the sheet metal into the form of flanges. In the arrangement shown in Fig. 1, the rib 12 comprises five flanges 13, 14, 15, 16 and 17, the inner flange or web portion 13 being bent backwardly at an acute angle with respect to the body portion of the panel so as to make the rib 12 undercut at its inner face. At the outer face of the rib 12 a nailing strip 18 is provided in alignment with the body portion of the panel 11. At its opposite edge, a box-like structure 19 is provided, also made by bending the metal into the form of flanges, the box 19 as shown in Fig. 1 comprising eight flanges numbered 20 to 27 inclusive. The arrangement is such that the box arrangement 19 of one panel is adapted to fit over the rib 12 of the adjacent panel, with the flange 27 of the box engaging the flange 13 of the rib so as to secure the two adjacent panels very firmly together.

In the use of our improved form of panel as illustrated in Figs. 1 and 2, one of the panels is placed in position upon the deck 10 and the nailing strip 18 thereof is secured by means of nails 28 to the deck 10. A second panel is then placed in position with its box structure 19 engaging the rib 12 of the first placed panel, and its nailing strip 18 is secured in position upon the deck by means of a series of nails 29.

As will be appreciated from an examination of Fig. 2 of the drawing, any water which enters the joint between two adjacent panels 11 at the point 30 is adapted to travel by capillary attraction between the body 11 and the flange 26 toward the left in Fig. 2 and is adapted to travel then upwardly and toward the right also by capillary attraction between the flange 27 and the flange 13 and down over the edge of the flange 27. The spacing between the adjacent parts is such, however, that the water thus passing over the edge of the flange 27 is free to drain out of the joint by reason of the inclination of the deck 10. The water entering at 30 is thus prevented from being carried by capillary attraction beyond the edge of the flange 27, the water passing over the edge of the flange 27 being unable to attain access to the space between the flanges 14 and 24. The joint is thus made effective for

excluding water effectively from the building being protected. After the rain, a small amount of water may be held by capillary attraction between the flanges 13 and 27 and between the flange 26 and the body 11, but such retained water is located at so small a distance from the outer mouth of the joint at 30 that it is adapted quickly to evaporate. By reason of the arrangement of the flanges 15 and 16 of the rib 12 in channel formation with respect to each other, and the arrangement of the flanges 22 and 23 of the box structure 19 in shallower channel form, any moisture which might gather by condensation or otherwise inside of the joint is adapted to drain from the roof along the channel formed by said flanges 15 and 16. By the provision of the comparatively wide spacing at an intermediate point in the joint between panels, a circulation of air through the joint longitudinally thereof is also provided for, by which evaporation of any water in the joint is greatly expedited.

By our improved arrangement, each of the panels is secured at one edge by means of the nailing strip 18 which is fully protected from moisture by the box arrangement of the next adjacent panel. At its opposite edge, said panel is secured firmly in position by engagement with the rib of the other panel. The panels are thus effectively protected against the entrance of water to any considerable distance, this protection being particularly effective with respect to the nailing strip 18 and the nails penetrating said strip where the protection is particularly required.

In the arrangement shown in Figs. 3 and 4, the construction is substantially the same as that above described except that the channels provided by the obliquely disposed flanges 22 and 23 of the box arrangement and the diagonally disposed flanges 15 and 16 of the rib arrangement are eliminated. The arrangement as shown in Figs. 3 and 4 is very effective from a practical standpoint even though it involves one less possibility for the drainage of water from the joint.

While we prefer to employ the form of arrangement as shown in our drawing and as above described, it is to be understood that our invention is not limited thereto except so far as it may be so limited by the claims, it being understood that changes might well be made in the form and arrangement of the parts without departing from our invention.

We claim:

1. In a panel building construction, the combination of a panel of sheet metal bent to provide a rib along the side edge of the panel and a nailing strip in alignment with the body portion of the panel along the outer face of the rib, said rib being under-cut at its inner face adjacent to the body of the panel, and a second panel of sheet metal in alignment with said first named panel and having a side edge portion bent into substantially a box arrangement comprising a flange portion disposed in cross relation to the body of the panel, a flange portion connected with said first named flange portion and extending toward the body of the panel, and a flange portion connected with said second flange portion at an acute angle thereto so as to have hooked engagement with said rib for effectively connecting said two panels together, said second panel serving to cover the nailing strip of said first named panel.

2. In a panel building construction, the combination of a panel of sheet metal bent to provide a plurality of flanges in the form of a rib along the side edge of the panel integrally therewith and a nailing strip in alignment with the body portion of the panel along the outer face of the rib also integral with the body portion, the inner face of the rib being in the form of a straight flange rising directly from the body of the panel in acute angle relationship thereto, and a second panel of sheet metal in alignment with said first named panel and having a side edge portion bent into substantially a box arrangement adapted to have hooked engagement with said rib closely adjacent to the face of the body portion of said first named panel for effectively connecting said two panels together, said second panel serving to cover the nailing strip of said first named panel and the several flanges of the rib and cooperating box being differentially arranged so as to cause said flanges to be in such spaced relation to each other at an intermediate point transversely of the box structure as to prevent water from travelling by capillary attraction completely through the joint between the panels.

3. In a panel construction, the combination of a panel of sheet metal bent along one margin to provide an offset portion one edge of which is provided with a nailing strip and the other edge of which is directly connected to the body of the panel by a web portion disposed at an acute angle to the body of said panel, and a second panel of sheet metal bent along one margin into a box-like arrangement which comprises a flange portion disposed substantially at a right angle to the body of the second named panel, a flange portion connected with said first named flange portion and extending in substantial parallelism to the body of the second panel, and a third flange portion connected to said second flange portion and disposed at an acute angle thereto and adapted to have hooked engagement with said web portion thereby locking the two panels together, said second panel overlying the nailing strip of the first panel.

RAYMOND M. CALKINS.
JAMES W. SWANK.