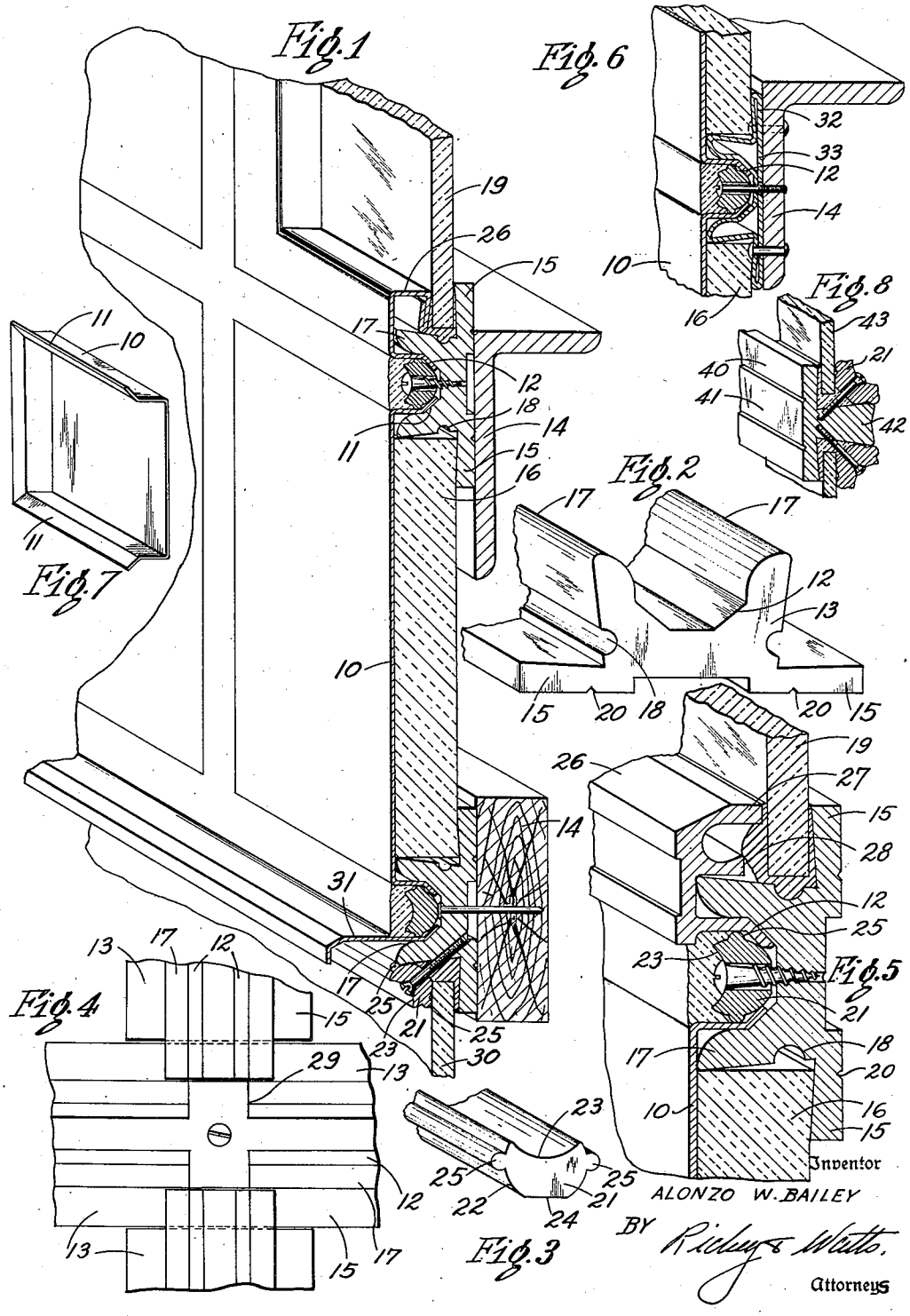
Sept. 1, 1936. A. W. BAILEY 2,052,739

BUILDING CONSTRUCTION

Filed Jan. 25, 1934



Patented Sept. 1, 1936 2,052,739

UNITED STATES PATENT OFFICE

2,052,739

BUILDING CONSTRUCTION

Alonzo W. Bailey, Cleveland Heights, Ohio

Application January 25, 1934, Serial No. 708,215

11 Claims. (Cl. 189—85)

This invention relates broadly to building materials and more specifically to improvements in metal sheathing and the supporting structure therefor.

With the economic developments of sheet and extruded aluminum stock, stainless steel and vitreous enameled products it has been found feasible to employ such materials in building construction as a sheathing medium for both interior and exterior wall surfaces. In the development of this art the metallic sheathing heretofore employed has been formed of rectangular plates having flanged marginal edges adapted for frictional engagement with anchor rails affixed upon the frame of the building structure. In such construction it has been found difficult during erection to maintain the assembly tolerances necessary to assure uniform securement of the panels upon the supports. In fact in many instances it was found that the anchorage of the sheathing was inadequate to withstand wind pressure in certain portions of the construction, while in other areas of the same construction the plates had been distorted under the compressive effort necessary to snap the flanged edges of the plates upon their keepers during assembly.

The improvements embodying the present invention contemplate certain refinements in the supporting structure and sheathing plates which in addition to obviating the foregoing objections, facilitates the production of more rigid structure, an assembly of superior æsthetic appearance and an organization which will accommodate the support of structural forms of building materials other than the aforesaid sheathing members.

Among the various objects of the invention the present improvements comprehend a retention strip which is formed to effect tensional strain upon the flanged portions of the sheet so that the panel will be drawn in intimate engagement with its support throughout the entire perimeter thereof.

A further object of the invention is to provide a supporting rail which is adapted to accommodate the retention of a glass plate or similar panel without structural modification of said rail and which moreover is formed to accommodate the support of a molding or retention strip for the opposed face of the glass in the same manner as that employed to secure the metallic sheathing.

Another object of the invention is to construct a sheathing supporting rail which is adapted to accommodate the ready assembly of such rail with similar contiguous members, by cutting or shearing, of certain portions thereof, during installation.

Another object of the invention is to construct a retention strip for metallic sheathing which is formed to lie subjacent the surface of the sheathing when mounted thus providing a channel for the reception of caulking material intermediate the contiguous panel sections.

Other objects more or less ancillary of the foregoing and the manner in which all the various objects are realized will appear in the following description, which, considered in connection with the accompanying drawing, sets forth the preferred embodiment of the invention.

Referring to the drawing in which a preferred embodiment of the invention is illustrated—

Figure 1 is a perspective view, partially in section, through a wall construction embodying metallic sheathing and supporting members therefor. In this figure several forms of application are illustrated.

Figure 2 is a fragmentary view in perspective of a portion of the sheathing supporting rail.

Figure 3 is a view in perspective of a fragmentary portion of the retaining strip employed in the securement of the metallic sheathing upon the supporting rails.

Figure 4 is an elevational view of a fragmentary portion of the supporting rail and a pair of similar rails positioned normal thereto and illustrating the manner in which the flanges of the supporting rails are sheared for the reception of the corner portion of the plate.

Figure 5 is a sectional view, partially in perspective, illustrating a glass plate support, modified in form from that shown in Figure 1.

Figure 6 is a perspective view, partially in section, illustrating the supporting member of sheet metal construction.

Figure 7 is a perspective view, partially in section, of one of the panels of the sheathing.

Figure 8 is a perspective view, partially in section, of another modified form of glass plate support.

As illustrated in Figures 1 and 7 the metallic sheathing 10 comprises rectangular pressed metal panels having marginal flanges 11, the edges thereof being flared outwardly at suitable angles for engagement upon the faces of a channel or groove 12 in the supporting rail 13. The rails 13 are adapted to be secured upon the vertical or transverse frame members of a building structure, as for instance, upon the angle iron or purlin strips 14 shown in Figure 1. Although the frame

members shown herein are disposed in transverse position it is to be understood that any of the conventional forms of framing or an uninterrupted wall surface will accommodate the support of the sheathing supports or rails 13.

The supporting rail is preferably formed of extruded aluminum bars and comprises in detail a pair of opposed flanges 15, the upper faces whereof are slightly inclined inwardly in order to compress the marginal edges of paneled heat insulating material 16 disposed between the sheathing 10 and said faces of the flanges 15. Intermediate the flanges 15 there is a pair of ribs 17, the free ends of the inner faces thereof being formed with arcuate faces to accommodate irregularities in the corners between the sheathing and the flanged portions 11 thereof. The configuration of the rail intermediate the ribs 17 which constitutes the groove 12 is formed with converging faces disposed at suitable angles to receive the outwardly flared edges of the sheathing plates 10. The outer faces of the ribs 17 converge slightly toward the base of the strip and are formed with grooves 18 throughout their length which, as illustrated in Figures 1 and 5, provide a chamber for the reception of putty or caulking material within which the glass plate 19 is set. The lower faces of the flanges 15 are formed with grooves or scores 20 disposed in aligned relation with the outer walls of the ribs 17 provided to serve as guides in shearing or cutting portions of the flanges 15 from the rails which, in assembly, would interfere with contiguous flanges of appurtenant members. The lower faces of the rail 13 is recessed to accommodate the reception of the various forms of locking instrumentalities with the sheathing or clamping members.

The sheathing plates are retained within the groove 12 of the supporting members by a molding strip 21 which likewise is preferably formed of extruded aluminum and embodies a cylindrical body portion 22, having a concave upper face 23 and a flattened base portion 24. The molding is also provided with opposed ribs 25, which, as illustrated in Figures 1, 5 and 6, are arranged for intimate engagement with the flanges 11 of the sheathing plates and preferably adapted to lie contiguous the break in the outwardly flared portion thereof. The molding 21 may be secured in place by machine screws or with tapered screws of the type capable of cutting its own thread when driven into an opening of suitable diameter in the aluminum supporting rail 13. Clearance holes for the retaining screws are provided in the molding strips to facilitate transverse movement or floating adjustment of the strip upon irregular or deformed portions of the flanges. The molding is likewise capable of supporting a glass retention strip or frame 26 which may be formed either of pressed sheet metal stock (see Figure 1) or from extruded aluminum bars as shown in Figure 5. In the latter embodiment it will be noted that the inner flange 27 of the bar extends beyond the contiguous flange 28 thereof, so that rails of uniform section may be manufactured and by suitably shearing the edge of the flange 27 glass plates of various thickness may be accommodated.

The corner construction is formed by longitudinally sawing the lower portion of the rail intermediate the grooves 18 and transversely shearing a sufficient portion of the flanges 15 to permit the remaining body of the rail to abut a rail section which is disposed normal thereto. Such construction is illustrated in Figure 4, where, as indicated, the ribs 17 of the transversely disposed rail is notched to permit the entry of the corner portions of the flanges 11 of the sheathing. In assembly, in order to provide a more rigid structure, the molding strip 21 is preferably positioned within the grooves 12 of the abutting members and extended through the notched portion of the unbroken rail.

In the lower portion of Figure 1 an alternate glass supporting medium is illustrated. In this embodiment the molding 21 is adjusted so that the ribs 25 will abut the glass 30 and the outer edge of one of the ribs 17 of the supporting rail 13. Putty or other suitable caulking material may be applied coincident the application of the molding strip and the strip may be anchored upon the supporting rail by machine screws or other suitable locking devices. Should it be desired to provide a water shed or drip plate above the glazed opening such member may be readily retained by forming the inner flange thereof to conform to the angular face of the groove 12 in the supporting rail and assembling the molding to effectuate the retention thereof in the same manner as the sheathing. In structures having large glazed areas muntin strips 40 may be employed which, as illustrated in Figure 8, comprise a flanged base portion 41 with a longitudinal rib 42 extended upwardly therefrom. The glass 43 may, in such construction, be set in putty and retained by the molding strip 21 anchored by machine screws threaded in the body of the muntins 40.

The supporting strip 13 may be constructed from rolled or die formed sheet metal stock, such as illustrated in Figure 6. In this embodiment the rail is formed from a single sheet of strip stock, the flanges 32 being folded with relatively large radii at the corners thereof in order to produce the inclined upper face upon the flanges for clamping the fibrous insulating material 16. The inner ends 33 of the sheet metal may, if desired, be welded to the base of the stock forming the channel or groove 12, thus providing a more rigid rail.

In the erection of a building structure in which metallic sheathing of this character is utilized the supporting rails 13 are secured in vertical and horizontal relation upon the frame of the building so that the grooves 12 will accommodate the support of the vertical and horizontal flanges 11 of the sheathing. The fibrous insulating material 16 is applied intermediate the flanges 11 in the sheathing and the plates or panels 10 then mounted upon the rails, the flanges 11 being inserted within the grooves 12 of the rails. The molding strip 21 is then secured in place intermediate the panels and locked by machine screws or other suitable clamping devices. As the final step the grooves intermediate the sheathing sections and above the molding are filled with caulking material of any of the well known types. It will be noted that as the screws for retaining the molding strips are drawn in place the arcuate surfaces 22 of the molding will draw the outwardly bent flanges 11 of the sheathing into intimate engagement with the angular surfaces of the grooves 12, thus providing a metal to metal contact between the sheathing plates and the supporting members. Moreover, the ribs 25 of the molding strip, when drawn to seated position, will snugly engage the flanges 11 and overcome any warped or longitudinal irregularities therein which would tend to hold such distorted portion of the flange

away from its seated engagement with the rail. It will be noted that the inwardly inclined faces of the flanges 15 and the ribs 17 provide adequate recess for the glass caulking material and that the structure of the glass retaining frame 26 is susceptible of sufficient flexure to accommodate expansion or retractive variance due to thermal changes and thus avoid glass breakage.

The sheathing plates 10 may be formed of various materials such as glass, non-ferrous metal, stainless steel or sheets having an iron base which are painted or coated with vitreous or porcelain enamel to withstand the weather; also for decorative work the sheathing thus provided lends itself readily to the application of design treatment before assembly, for instance, buffed or lacquered copper or metal alloy plates may be employed or panels made from sheathing plates upon which there has been painted or enameled single or composite designs which may be assembled to complete the architectural or decorative motif of the study.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of structural detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

I claim:

1. A sheathing wall construction, comprising rails mounted in substantially rectangular lineation upon the frame of a building structure, ribs in each of said rails defining grooves, metallic sheathing comprising rectangular panels having flanges upon the peripheral edges thereof adapted for assembly within the grooves of the respective rails, the outer edges of said flanges being bent outwardly to form a shoulder, the surface of the rail intermediate the ribs being configured for the reception of the shouldered portions of the flanges of adjacent panels, a molding strip within said groove adapted to retain the shouldered portions of the respective flanges and means for securing said molding strip in clamping engagement upon the shoulders of said flanges.

2. A metal sheathing wall construction, comprising rails mounted in substantially rectangular lineation upon the frame of a building structure, ribs in each of said rails defining grooves, metallic sheathing comprising rectangular panels having flanges upon the peripheral edges thereof adapted for assembly within the grooves of the respective rails, the outer edges of said flanges being bent outwardly to form a shoulder, the surface of the rail intermediate the ribs being configured for the reception of the shouldered portions of the flanges of adjacent panels, a molding strip within said groove adapted to effect a line contact engagement with each of the flanges and each of the shoulders of the flanges assembled within the groove in said rail and means for securing said molding to said rails.

3. A metal sheathing wall construction comprising panels having bent marginal flanges, supporting rails for said panels embodying longitudinal ribs defining a groove for the reception of the respective flanges of contiguous panels, a molding strip within said groove adapted to clamp said flanges therein, the outer walls of said flanges converging inwardly and having a groove therein, said groove and said inclined face of said ribs constituting a chamber for the reception of caulking material for the support of a glass plate mounted upon said rail.

4. A metal sheathing wall construction comprising panels having bent marginal flanges, supporting rails for said panels embodying longitudinal ribs defining a groove for the reception of one of the flanges of each of a pair of adjacent panels, a molding strip within said groove adapted to clamp said flanges therein, the thickness of the molding strip being proportioned in relation to the depth of the groove and thickness of the flanges held thereby so that the molding will be subjacent the surface of the contiguous panels thereby forming a channel for the reception of caulking material therein.

5. A metallic sheathing construction comprising panels having flanges bent downwardly at right angles about its marginal edges, said flanges being bent outwardly at angles adjacent the edges thereof, grooved rails adapted to be secured upon the walls of a building structure and disposed so that the flanges of adjacent panels may be received within said grooves, a molding strip within said grooves adapted for engagement with the outwardly bent portions of said flanges, said molding comprising a cylindrical body portion adapted for engagement with said outwardly bent portions of said flanges, longitudinal ribs on said molding adapted for engagement with the downwardly bent portions of said flanges, means for securing said molding upon said rail and means including the cylindrical body portion of said molding and the ribs thereon for drawing the flanged portions of the panels into seated position within said groove.

6. A metal sheathing wall construction comprising sheet metal panels formed with marginal flanges, the outer edges thereof being flared angularly outward, supporting members for said panels comprising rails, longitudinal spaced ribs on the face of said rails defining grooves, the surface thereof being configured for the reception of the angularly flared edges of the flanges of said panels, clamping members for said flanges comprising molding strips embodying cylindrical body portions, opposed longitudinal ribs thereon, said ribs being adapted upon assembly for engagement with the flanged portion of said panels, the cylindrical portion of said molding being adapted for engagement with the outwardly flared portion of said flanges, means for securing said molding to said rail, said means being adapted to facilitate transverse movement of the molding so that it may be floatingly adjusted upon the surfaces within which it is engaged during assembly.

7. In a panelled sheathing structure embodying a plurality of panels having outwardly flared flanges, a supporting rail comprising longitudinal ribs thereon defining grooves for the reception of said flanges, molding strips within said grooves arranged to clampingly retain said flanges within said grooves, screws for securing said molding to said supporting rail, flanges in said rail forming the base thereof, said flanges being sheared to effect a protruding end portion of said ribs adapted to abut a notched portion of the ribs of a second rail disposed normal thereto thereby forming corner supports for the flanges of a plurality of said panels.

8. In a panelled sheathing structure embodying a plurality of plates having outwardly flared flanges, a supporting rail comprising longitudinal ribs thereon defining grooves for the reception of said flanges, molding strips within said grooves

arranged to clampingly retain said flanges within said grooves, longitudinal ribs upon said molding adapted for engagement within the flanges of said plates and adapted for engagement with the face of a glass plate in forming a glazed window structure.

9. In a panelled sheathing structure embodying a plurality of plates having outwardly flared flanges, a supporting rail comprising longitudinal ribs thereon defining grooves for the reception of said flanges, molding strips within said grooves shaped to clampingly retain said flanges within said grooves, said flanges being formed so that the upper face of said ribs will engage the inner face of said plates during assembly and said flanges will parallel the lower surface of said groove when positioned therein, the molding being disposed in its assembled position to lie in the groove below the plane of the outer face of said plates, so that caulking material may be applied in the groove over the moulding and provide a smooth unbroken surface.

10. A metal sheathing wall construction comprising grooved rails adapted for securement upon the frame of a building structure, sheet metal sheathing panels having out-turned flanges on the marginal edges thereof adapted for reception within the grooves in said rails, said rails each having laterally projecting base flanges, fibrous insulating material between said rails and lying against the inner faces of said panels, and a molding and retaining strip disposed within each of the rail grooves against the said out-turned flanges of the panels and adapted when affixed in intimate engagement therewith to lock the panels to the rails and also cause the insulating material to be clamped between the base flanges of the rails and the panels, the laterally projecting base flanges being formed with biting edge portions which become embedded in said fibrous material and insure against displacement thereof.

11. A metal sheathing wall construction comprising grooved rails adapted for securement upon the frame of a building structure, sheet metal panels having out-turned flanges upon the marginal edges thereof adapted for reception within the grooves in said rails, said rails each having laterally projecting base flanges whose upper faces lie in downwardly and inwardly inclined planes, fibrous insulating material between said rails and lying against the inner faces of said panels, and a molding and retaining strip disposed within each of the rail grooves against the said out-turned flanges of the panels and adapted when affixed in intimate engagement therewith to cause the panels to be drawn into engagement with the fibrous insulating material and the inclined faces of the laterally projecting base flanges of the rails to be embedded in said fibrous material.

ALONZO W. BAILEY.