

Feb. 5, 1957

R. R. SUNDELIN ET AL

2,779,979

WALL AND WALL UNIT CONSTRUCTION

Filed March 16, 1953

2 Sheets-Sheet 1

Fig. 1.

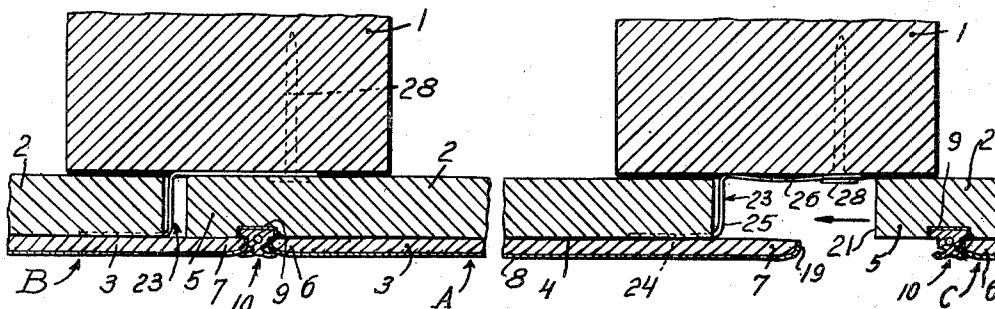


Fig. 3.

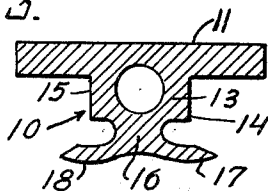


Fig. 2

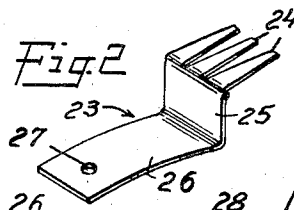


Fig. 4.

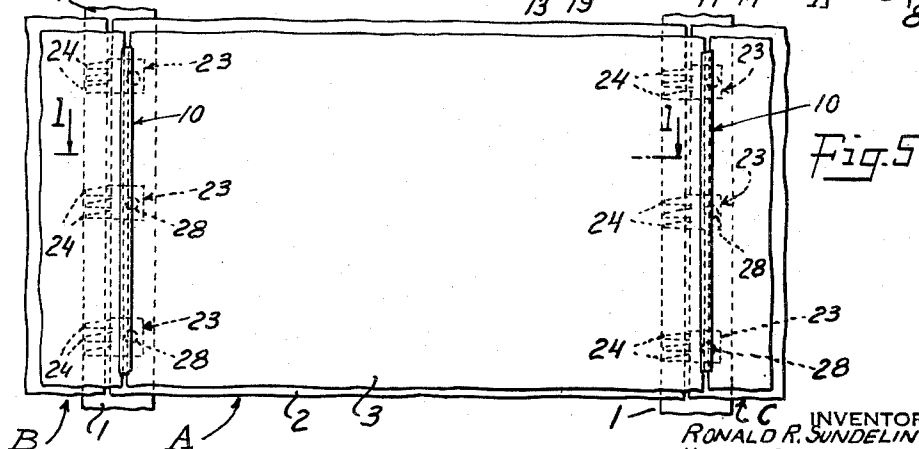
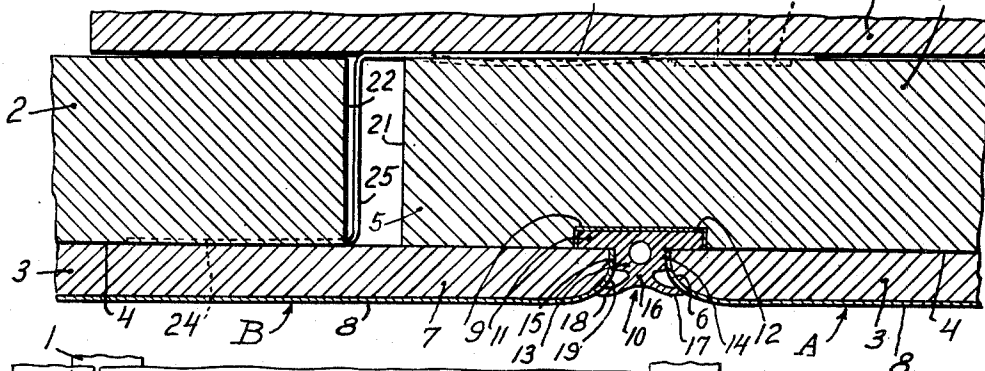


Fig. 5

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Fig. 6.

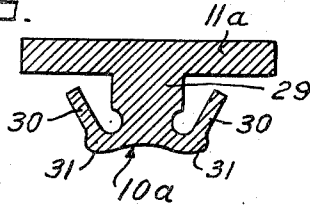


Fig. 10.

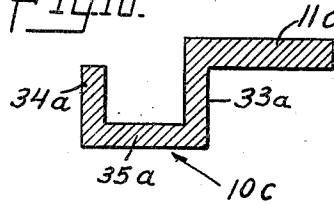


Fig. 7.

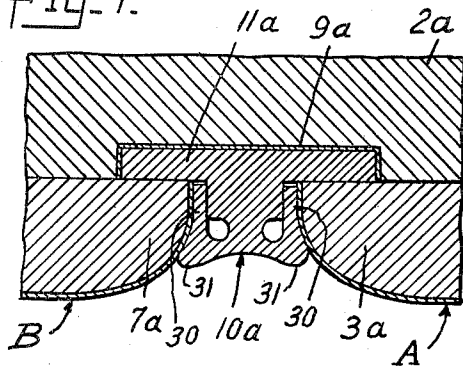


Fig. 11.

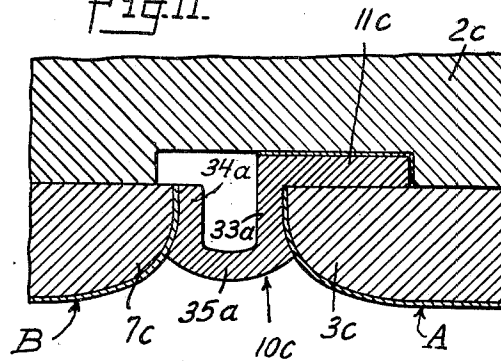


Fig. 8.

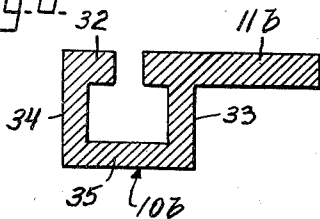


Fig. 12.

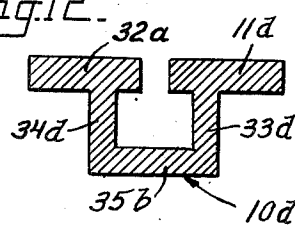


Fig. 9.

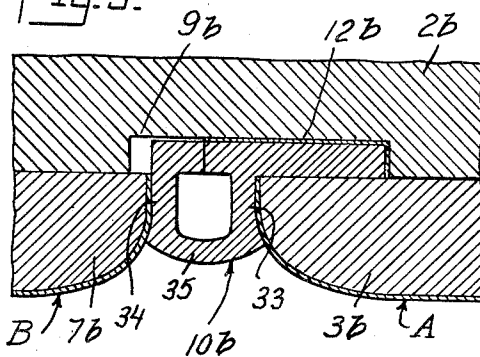
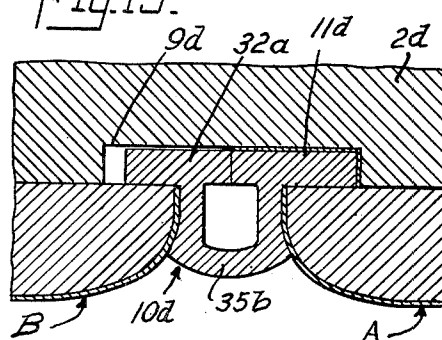


Fig. 13.



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WALL AND WALL UNIT CONSTRUCTION

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Application March 16, 1953, Serial No. 342,384

6 Claims. (Cl. 20—15)

This invention relates to improvements in the construction of building walls, particularly interior walls, and to an improved wall unit or panel.

The general object of the invention is to provide a wall construction of prefabricated units so constructed that they can be quickly assembled and attached to the studing, or other wall supporting structure.

Another object of the invention is to provide a prefabricated wall construction having moistureproof joints between the sections or panels constituting the wall units.

Another object of the invention is to provide a wall construction which has superior sound insulating as well as vapor sealing properties.

A further object of the invention is to provide a wall unit which is constructed to provide moistureproof joints between adjacent units, when they are assembled to form a wall without the use of calking compound, or the like.

A still further object of the invention is to provide a wall construction wherein the joints between the sections thereof provide for expansion and contraction of the sections or units.

It will be understood that the term "wall" as used throughout this application includes also the ceiling of a room, since the improved wall units can be used for the construction of ceilings as well as side walls.

The invention will be understood from a consideration of the accompanying drawings and the following detailed description. In these drawings:

Fig. 1 is a somewhat enlarged horizontal section of the improved wall construction taken on line 1—1 of Fig. 5;

Fig. 2 is a perspective view of a detail;

Fig. 3 is an enlarged cross section of one form of molding which forms part of the wall unit of the invention;

Fig. 4 is a greatly enlarged section of the joint shown at the left of Fig. 1 between two adjacent wall units;

Fig. 5 is a fragmentary front elevation showing the improved wall construction and drawn to a much smaller scale than the other figures;

Fig. 6 is a view similar to Fig. 3 showing a modified form of molding;

Fig. 7 is a fragmentary sectional view drawn to the same scale as Fig. 6 and showing the exposed portion of the joint between two wall sections employing this form of molding;

Figs. 8 and 9 are views similar respectively to Figs. 6 and 7 showing another modified form of molding;

Figs. 10 and 11 are also similar respectively to Figs. 6 and 7 showing a further modified form of molding; and

Figs. 12 and 13 are similar views showing still another modified form of molding.

Referring now to these drawings, a wall unit, indicated generally by reference character A and made in accordance with the invention, is shown in front view in Fig. 5 with portions of the adjacent units B and C, respectively, at left and right, but with the upper and lower portions of all three units broken away. Fig. 1 shows these units in section, unit C, however, not yet being in position. The

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units are supported along their opposite vertical side edges upon a pair of upright studs 1. These are usually of wood, two by four inches (2" x 4") and are usually spaced sixteen inches (16") apart. Accordingly, the wall unit or panel is customarily made to have a width to span two studs. It, of course, can be made to span three or more studs, if desired.

The wall units (of which unit A is typical, shown broken away at the center of Fig. 1) are each composed of a rigid body member 2 and a facing sheet member 3. These two members are of equal width but are secured together, by means of a layer of adhesive 4, in such a way as to leave a portion 5 of body member 2 projecting beyond one edge 6, for example the left edge of facing sheet 3, and also leaving a portion 7 of facing sheet member 3 projecting beyond body member 2 along the opposite or right-hand edge of the unit.

The body member 2 is preferably about three eighths of an inch ($\frac{3}{8}$ ") thick and the facing sheet member 3 about one eighth of an inch ($\frac{1}{8}$ ") thick making the overall thickness of the unit approximately one half of an inch ($\frac{1}{2}$ "). These dimensions, however, can be varied to suit conditions. The body member 2 is preferably made of asphalt impregnated wood fiber insulating board, although it can be made of plasterboard, asbestos cement-board, plywood, or the so-called sawdust boards, cellular plastic or rubber, and other materials of this general character. The facing sheet member 3 is preferably made of tempered compressed wood fiberboard, but it can also be made of glass or metal, or plastic, if desired. Advantageously, the adhesive material 4, used to bond together the two members 2 and 3, may be synthetic rubber latex. Other adhesives, however, may be used, such for example as a mixture of asphalt and reclaimed rubber, asphalt alone, or neoprene rubber latex.

The facing sheet member 3 is preferably provided with a suitable finish coating 8. Advantageously coating 8 may be a synthetic baked enamel, such for example as an enamel made of alkyd and melamine resins, or modified alkyd melamine resins. Such coating, however, may consist of an air-dried paint or of a sheet of suitable plastic material laminated to the surface of facing sheet member 3, or the coating 8 may consist of a suitable lacquer. It will be understood, however, that the surface of facing sheet 3 may be left unfinished, and the wall painted in the usual manner, after installation.

Extending vertically in the surface of body member 2 adjacent the left-hand edge 6 of facing sheet member 3 there is a recess 9 within which is mounted a molding, indicated generally by numeral 10. Molding 10 comprises a flat base 11 (Fig. 3) which is secured in recess 9 by means of suitable adhesive 12 (Fig. 4). Extending along the front of base 11 (and centrally thereof in the form of molding shown in Figs. 1—4) there is an outwardly projecting and generally rectangular rib or bead section 13 of yielding and resilient material and having substantially flat and parallel opposite side portions 14 and 15, the purpose of which will presently appear. Outwardly of the rib or bead section 13 there is a cap section 16 having two laterally projecting wing portions 17 and 18 facing in opposite directions. These wing portions are also flexible and resilient.

The molding 10 is preferably made of vinyl plastic, extruded. It also can be made of natural rubber, or synthetic rubber such as neoprene, or of combinations of these materials, or of any convenient material which will provide the characteristics of flexibility and resiliency in rib section 13 and in wing portions 17 and 18.

When the molding 10 is mounted and adhesively secured in recess 9 as above described, the extreme edge 6 of facing sheet member 3 projects over a part of base 11 of the molding and into contact with the right-hand

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vertical surface 14 of the rib or bead section 13. Also, one of the wing portions, for example the right-hand wing portion 17, is engaged by the edge 6 of facing sheet 3, which edge is preferably curved, as shown in the drawings. The engagement of edge 6 with surface 14 compresses rib section 13 somewhat, and its engagement with wing portion 17 forces the wing portion outwardly somewhat, as may be seen by comparing Figs. 3 and 4. In this way, a moistureproof and vaportight seal is formed throughout the height of the panel or unit.

The wall unit, therefore, comprises the body member 2, the facing sheet member 3 and preferably also the molding 10, these parts being assembled and adhesively secured to one another as described. That is to say, in order to obtain full advantage of the invention, the molding forms a part of the prefabricated unit. This saves time in installation as it eliminates the calking of the joints between the wall units on the job. However, if desired, the molding 10 may be put in place at the site during the construction of the wall.

When a series of units are mounted on the studs 1, or other wall supporting means, to form a wall, the projecting portion 5 of body member 2 of each unit is placed beneath the projecting portion 7 of facing sheet member 3 of adjacent wall unit B, and its edge 19 (Fig. 4) engages the exposed vertical edge 15 of molding 10 attached to wall unit A. The two units are mounted sufficiently close to one another to cause the rib or bead portion 13 of the molding to be compressed or squeezed somewhat. Also, the edge of the second wing portion 18, opposite wing portion 17, is forced outwardly to some extent. This squeezing of the resilient molding 10 between the edges of the facing sheets of the adjacent units produces effective moistureproof and vaporproof joints between them.

Inasmuch as the two main elements of the units, namely, body member 2 and facing sheet 3, are of the same width, and since the facing sheets of adjacent panels are separated from one another by the width of the rib portion 13 of molding 10, the ends 21 and 22 of the respective adjacent body portions 2 are separated from one another by a like distance (Fig. 4). This leaves a space between these edges which accommodates the fastening means by which the panels are attached to the studs 1.

The wall units are not nailed directly to the studs but are attached by means of a particular form of Z-shaped metal clip 23 (Fig. 2). This clip comprises a mid-section 25, a shank portion 26, and a toothed portion having a series of teeth 24. The teeth are tapered leaving spaces between them to facilitate application to the wall units. They are stamped from thin gage resilient sheet metal, with the shank and toothed portion substantially parallel and projecting in opposite directions from, and at right angles to, the central portion 25. Central portion 25 corresponds in length to the thickness of body portion 2, and shank 26 is arranged as shown in Fig. 2 to constitute a flat spring, a single nail hole 27 being provided near the outer end.

In mounting the panels on the studs 1, a series of these spring clips 23 are applied along the right-hand edge of a wall unit, for example wall unit A of Fig. 1, these clips being arranged on approximately a twelve inch spacing from the bottom to the top of the unit. In applying the clips to the unit the teeth 24 are worked into the joint between the outer surface of body portion 2 and the inner surface of the facing sheet 3. The teeth can be worked in by hand or driven in with a hammer applied to the end of the clip.

After these clips have been applied, the wall unit is placed in position. In doing this, projecting portion 5 of this panel A is worked in beneath the projecting portion 7 of the facing sheet 3 of the previously mounted panel B, in a manner to be described in detail presently. The wall unit is held in place against the right-hand stud

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1, and a nail 28 is driven through the shank of each clip. The clip shanks 26 are long enough to place the nail holes 27 beyond the edge of projecting portion 7 of the facing sheet so that this projecting portion does not interfere with the driving of the nails.

This completes the mounting of the right-hand edge of the wall unit on the stud, and leaves the exposed shank portions 26 of the spring clips 23 bowed outwardly as shown in full lines in Fig. 1 and in dotted lines in Fig. 4.

The working of the left edges of each panel into place will be described in connection with the next unit, or panel C. The arrow at the right of Fig. 1 indicates this operation. In carrying it out, the ends of the spring clips 23 and heads of the nails 28 may cut shallow channels or depressions in the inner surface of body member 2 allowing this surface to touch, or almost touch, the outer surface of the studding 1, avoiding the outward springing of the projecting portion 7 of the facing sheet of the previously mounted panel B. The spring action of the clip shanks 26 forces the outer surface of projecting portion 5 into close engagement with the inner surface of the facing sheet projection 7, thereby providing substantially tight joints between these two surfaces and reinforcing the joint formed between the molding 10 and the edges of the facing sheets of the two wall units.

As described, the panels are placed progressively in position from left to right. Obviously, if desired, the facing sheet projecting portion 7 can be arranged to project from the left of the panels instead of the right, in which case the assembly of the units would proceed in the opposite direction.

With this wall unit construction and mounting, expansion and contraction can take place both horizontally and vertically. Horizontal expansion and contraction can take place because of the presence of the spaces between the edges of the body member 2 in which the mid sections 25 of the spring clips are positioned, and also because of the yielding and resilient molding 10 between the edges of the facing sheets 3 of the respective panels. The rib sections 13 and opposing wing portions 17 and 18 of such molding can be squeezed to a greater extent, or to a lesser extent, without affecting the tightness of the joints or seal between the panels.

Expansion and contraction can take place in the vertical direction because of the fact that the wall units are not directly nailed to the studding but are indirectly secured through the medium of the spring clips 23, which can shift slightly with respect to the wall units and with respect to the studding without affecting their ability to hold the wall units in place.

Referring now to the modified forms of molding shown in Figs. 6-13, it will be understood that any of these forms can be used in place of the form of molding shown in Fig. 3. All five forms of molding have in common the presence of a rib or bead section having substantially flat and parallel opposite side portions which are engaged and squeezed by the edges of the adjacent panel sheets.

Thus in the form shown in Figs. 6 and 7, the rib or bead section is made up of a central section 29 having on each side thereof two side sections 30 which are biased to stand in an outwardly directed angular position with their inner edges out of contact with the sides of portion 29. When the base 11a of molding 10a is mounted in its recess 9a, the right-hand side section 30 of the molding is forced against the right side of central portion 29 by the edge of facing sheet 3a of the wall unit, as shown in Fig. 7. This leaves the left-hand side portion 30 projecting outwardly as in Fig. 6, but when the panel is mounted in position, the facing sheet projection 7a of the adjacent panel forces the left-hand side portion 30 into symmetrical position. These side portions 30 are formed with protuberances 31, which with the surfaces of side sections 30 of the rib or bead section 29 engages the edges of the two facing sheet portions 3a and 7a along a

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partially straight and partially curved surface to provide the desired moistureproof joint.

In Figs. 8 and 9 the base member of the molding 10b is divided into two sections, a longer section 11b and a shorter section 32, and the rib or bead section is in the form of a nearly closed hollow square having leg portions 33 and 34 which are joined together by an exposed portion 35. Leg portion 33 is formed integral with base member 11b, and the base member 32 constitutes a foot portion for the inner end of the opposite leg portion 34.

When this form of molding is attached to a wall unit (Fig. 9) the leg section 11b is secured in the recess 9b by means of a layer of cement 12b, the other base section 32, however, being left free and uncemented. Before such unit is mounted in position the leg portion 34 is adjacent to the left-hand wall of recess 9b, but after assembly in position adjacent another panel the legs 34 and 33 and the exposed portion 35, forming the rib or bead section of this molding, are squeezed between the edge of facing sheet 3b and the edge of facing sheet projection 7b. This not only produces the same effective moistureproof joint or seal between the adjacent wall units, but also causes the exposed portion 35 to assume an arched or outwardly curved position as shown in Fig. 9, the material being both deformable and resilient. Thereby, an attractive molding or beading of simple design between the panels is produced.

The molding 10c of Figs. 10 and 11 is similar to molding 10b, with the shorter base portion 32 omitted. The leg portions 33a and 34a are compressed together by approximately the same amount and the exposed portion 35a arches in substantially the same manner, when two adjacent panels are mounted in position and the molding is squeezed between opposing edges of the facing sheet 3c and facing projection 7c.

The form of molding 10d shown in Figs. 12 and 13 is also similar to molding 10b of Figs. 8 and 9. The difference is that the base sections 11d and 32a are symmetrical, the leg portions 33d and 34d and the exposed portion 35b all being like the corresponding parts of the molding 10b.

When this molding is fixed in position on a panel, only the right-hand base section 11d is cemented to the walls of the recess 9d, the left-hand base section 32a being left uncemented. When this panel is mounted in position adjacent to a corresponding panel, the legs 33d, 34d and exposed portion 35b are deformed in substantially the same manner as in the case of the molding 10b, as shown in Fig. 13.

It will be understood that all of these moldings can be made of any of the materials referred to hereinabove, it being essential, however, that the material be both yielding or flexible, and resilient, in order that adequate pressure be produced between the contacting edges of the molding and the edges of the facing sheet members of the wall units. It will also be understood that additional changes can be made in the form and arrangement of the moldings and of the wall units, it being the intention that the scope of the invention shall be set forth in the appended claims.

I claim:

1. As an article of manufacture, a wall unit comprising a rectangular panel member and a superposed facing sheet member substantially coextensive in area with said panel member, the contacting surfaces of said mem-

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bers being adhesively secured together, said panel member projecting beyond said facing sheet member along one edge of the unit and the facing sheet extending beyond the panel member along the opposite edge of the unit, said panel member having a recess in the outer surface thereof on the same side as the facing sheet member and extending along the edge of the facing sheet, and a molding secured within said recess, said molding having an outwardly projecting continuous rib section of yielding resilient material, one side of said rib section engaging the edge of said facing sheet member.

2. A wall construction having a framework, a plurality of wall units secured to said framework in juxtaposition, each unit having a rectangular panel member and a facing sheet member adhesively secured thereto, said panel member having a portion projecting beyond the facing sheet along one edge of said unit and the facing sheet having a portion projecting beyond the panel member along the opposite edge of the unit, said panel member having a recess in its outer surface extending along the edge of the facing sheet, and a molding seated within said recess, said molding having a continuous rib section of flexible resilient material, one side of said rib section engaging the edge of said facing sheet, each of said wall units being secured to said framework along the edge of said panel member thereof which is adjacent the projecting portion of said facing sheet, and the projecting portion of the panel member of the adjacent wall unit being disposed beneath said projecting facing sheet portion, the edge of said facing sheet portion engaging the opposite side of said flexible resilient rib section of said molding.

3. A wall construction as claimed in claim 2 in which the edge of the panel member of each wall unit is secured to the framework by a series of spaced metal clips each clip having a shank portion lying against the framework and extending beyond the edge of the projecting portion of the facing sheet and nailed to said framework.

4. A wall construction as claimed in claim 3 in which the shank portions of the metal clips are formed as plate springs disposed between the framework and the projecting panel portions of the adjacent wall unit and urge the outer surface of said projecting portion against the inner surface of the projecting facing sheet member.

5. A wall construction as claimed in claim 2 in which the sides of the rib section of the molding have oppositely projecting flexible resilient wing portions and one side of the rib section and its wing portion engage the edge of the facing sheet of the wall unit on which the molding is mounted.

6. A wall construction as claimed in claim 2 in which the molding has a rib section whose surface is below the surface of the facing sheets.

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