Sept. 11, 1956 R. C. PARKES ET AL 2,762,470

BUILDING CONSTRUCTION

Filed Feb. 26, 1952

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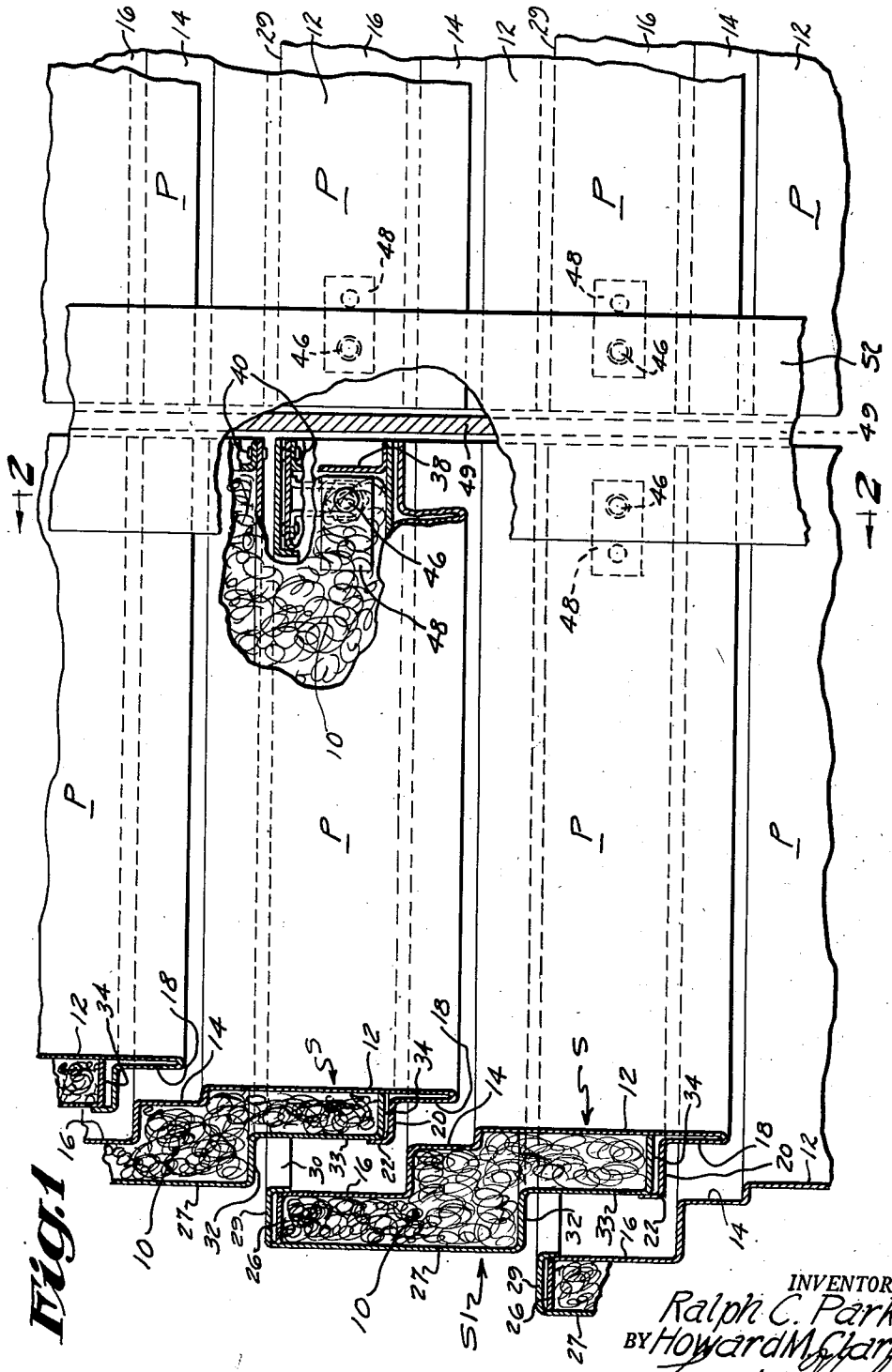


Fig. 1

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Fig. 4

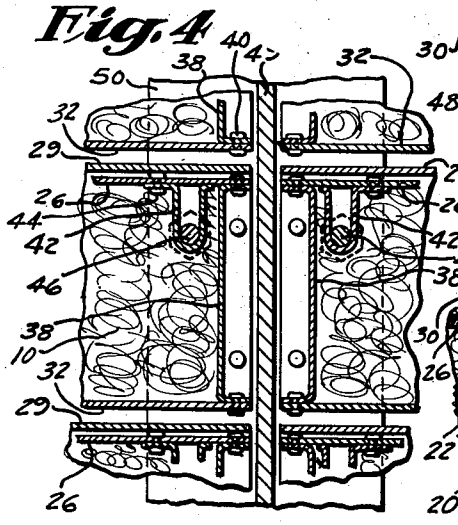


Fig. 5

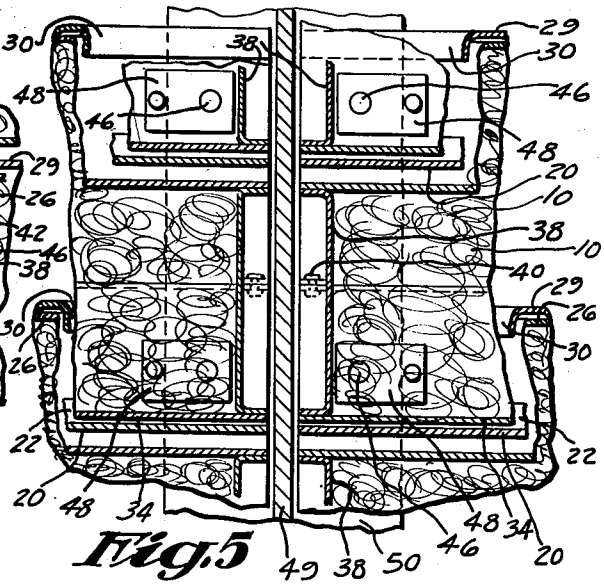


Fig. 2

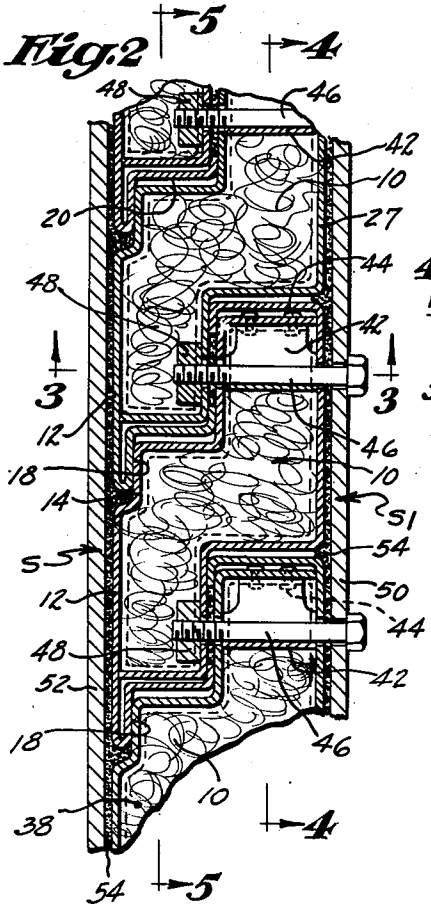
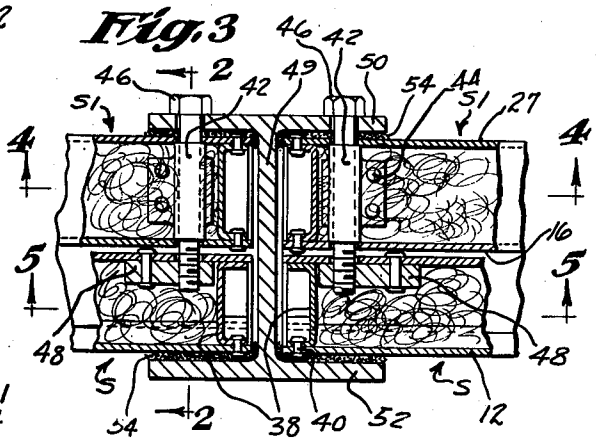


Fig. 3



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Fig. 12

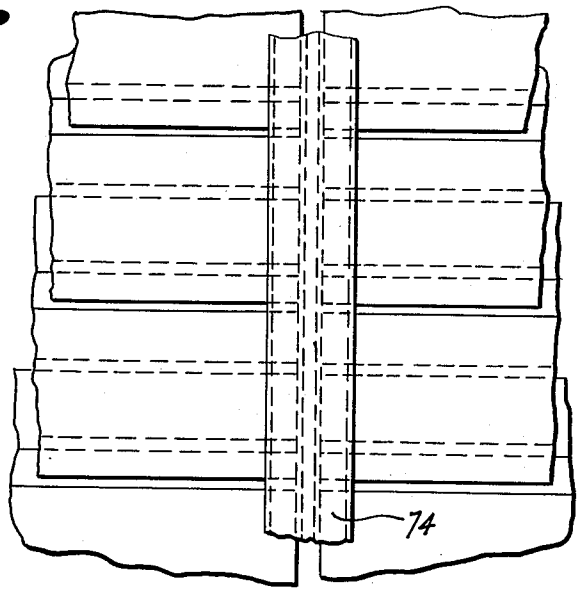



Fig. 14

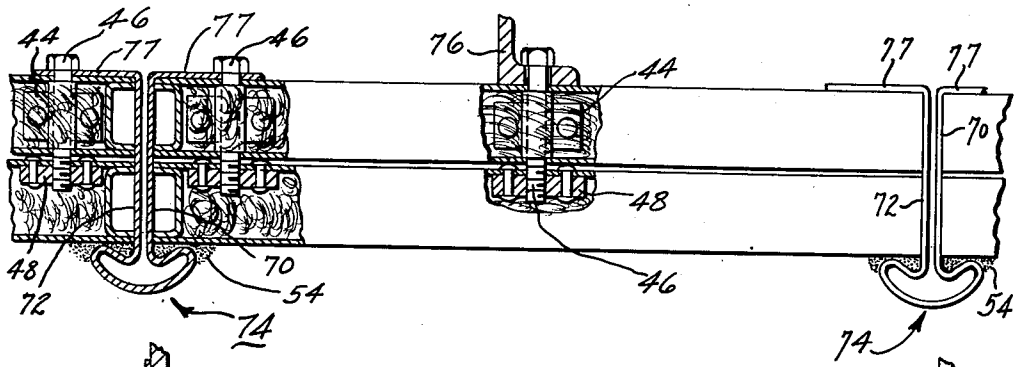
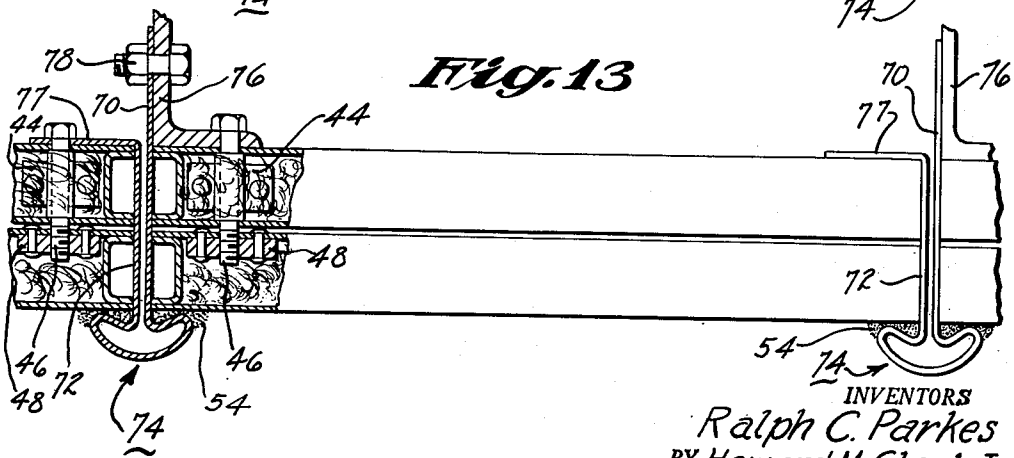



Fig. 13




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Fig. 6

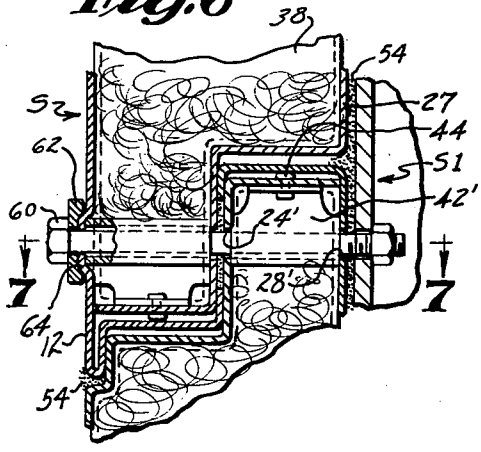



Fig. 7

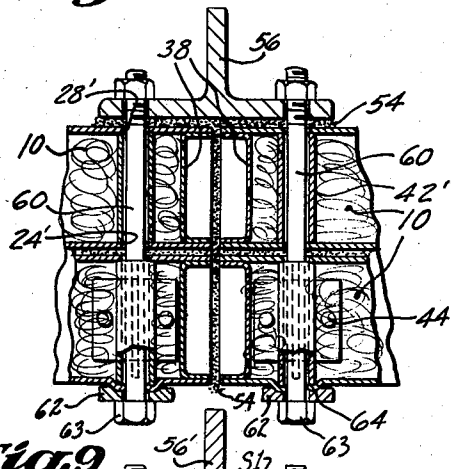



Fig. 8

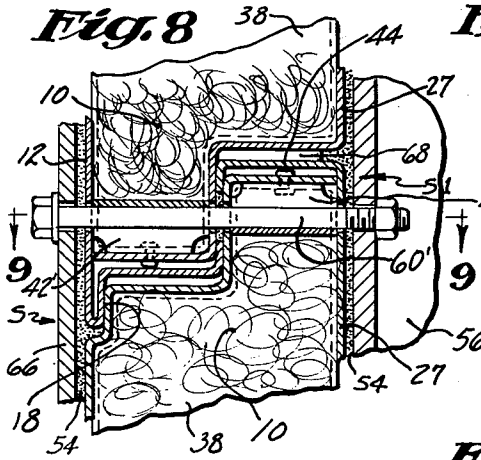



Fig. 9

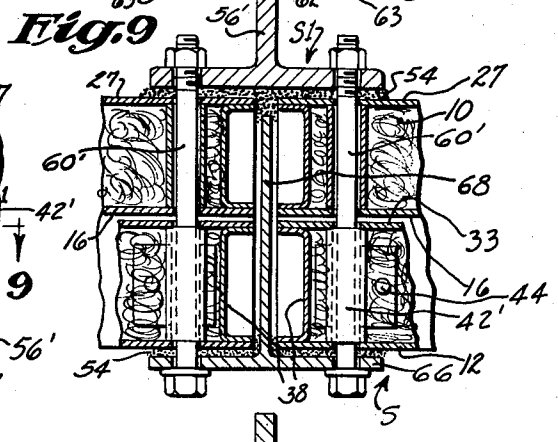



Fig. 10

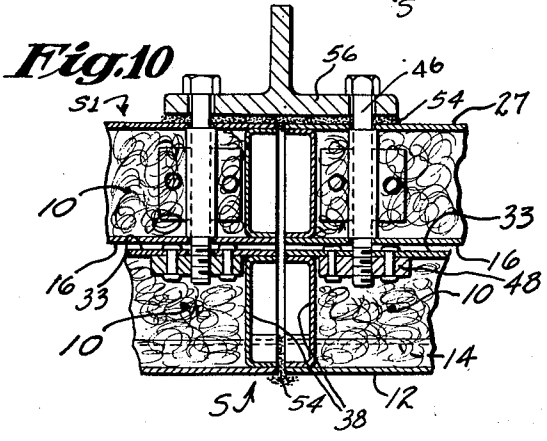
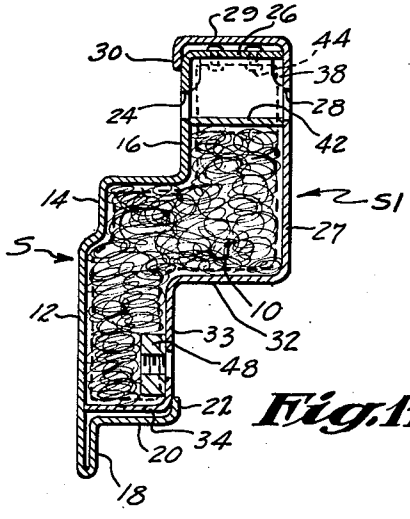



Fig. 11




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2,762,470

# BUILDING CONSTRUCTION

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Application February 26, 1952, Serial No. 273,394

2 Claims. (Cl. 189—1)

This invention relates to a building construction of the type which is erected by assembling prefabricated parts.

One object of the invention is to produce an improved building construction of this type.

A further object is to produce a building construction which is light, durable, and relatively inexpensive to prefabricate and erect.

A still further object is to produce an improved building construction which will be weather-proof and thermally insulated and which can be maintained and repaired at a relatively low cost.

These and other objects are attained by my invention as set forth in the following specification and as shown in the accompanying drawings in which:

Fig. 1 is a view, partly in side elevation and partly in section, showing a portion of the vertical or side wall of a building embodying my invention, certain parts being broken away to show details of construction.

Fig. 2 is a sectional view taken on line 2—2 on Figs. 1 and 3.

Fig. 3 is a sectional view taken on line 3—3 on Fig. 2.

Fig. 4 is a sectional view taken on line 4—4 on Fig. 3.

Fig. 5 is a sectional view taken on line 5—5 on Fig. 3.

Fig. 6 is similar to Fig. 2 but showing a second embodiment of my invention.

Fig. 7 is a sectional view taken on line 7—7 on Fig. 6.

Fig. 8 is similar to Figs. 2 and 6 but showing a third embodiment of the invention.

Fig. 9 is a sectional view taken on line 9—9 on Fig. 8.

Fig. 10 is similar to Fig. 3 but showing a fourth embodiment of the invention.

Fig. 11 is a longitudinal sectional view of one of the panels better to show details of construction.

Fig. 12 is a top plan view of a portion of the roof of a building embodying my invention.

Fig. 13 is a view, partly in section and partly in elevation, looking in the direction of line 13—13 on Fig. 12.

Fig. 14 is similar to Fig. 13 but showing a different way of supporting the roof.

The side walls and the roof of the building are formed of thermally insulated panels and rigid supports to which the panels are secured. The panels are all identical and therefore a description of one of them will suffice. For this purpose reference is made to Fig. 11 from which it will be seen that each panel is made of an outer sheet S and an inner wall S1 with insulation 10 therebetween. The outer wall includes a main portion 12 one end of which is bent to form stepped portions 14 and 16, and the other end of which is bent back upon itself to form an overhanging lip 18 the end of which is again bent to form an inwardly extending wall 20 and which, in turn, terminates in a lateral marginal portion 22 which is substantially parallel to main portion 12. The stepped portion 16 is provided with a hole 24 and terminates in an inwardly extending end wall 26. The inner wall S1 includes a main portion 27, having a hole 28 formed therein and one end of which is bent outwardly to form an end wall 29 which abuts end wall 26. The wall 29 is



again bent to form a lateral marginal portion 30 which abuts the adjacent end of portion 16. The other end of main portion 27 is bent to form outwardly extending walls 32 and 34 which are connected by an intermediate lateral wall portion 33 which is parallel to main portion 12. The open ends of the panels thus formed are closed by means of channel shaped plates 38 which are secured in position by rivets, or the like, 40. See Fig. 3.

Between the stepped outer portion 16 and the inner main portion 27, there is a tubular, or U-shaped, member 42 which is secured in position by rivets, or the like 44. See Fig. 4. The member 42 serves rigidly to space the inner and outer walls of the panels against the compressive stress of bolts 46 which pass through holes 24 and 28 and engage threaded nuts 48, which are fixed to the wall portions 33, to secure the panels together and to the supporting frame of the building. See Fig. 2.

It will be noted that the contour of the upper portion of the panel, as viewed in Fig. 11, is complementary to the contour of the lower portion thereof whereby, when the panels are arranged as shown in Fig. 2, the return portion 18 of one panel will overlap the stepped portion 14 of a panel therebelow to form continuous inner and outer surfaces. It will also be seen that, because of the overlap shown in Fig. 2, a natural water shed is formed whether the panels are used to build the vertical walls of a building as shown in Fig. 2, or whether they are used to build the slanting roof of such buildings as shown in Fig. 12. The stepped off portions 14 merely serve to seat the overhanging portions 18 so as to produce a wall which is flush, or smooth. It is within the scope of this invention to dispense with the stepped off portions 14 in which case the outer side of the wall will have a shingled effect.

To erect a vertical, or a sloping wall of a building, according to the embodiment of Figs. 1 to 5, H-beams or girders are spaced apart, according to the length of the panels, and the panels are secured to the beams by the same bolts 46 which secure the overlapping portions of the panels to each other. As will be seen from Fig. 3, the ends of the panels abut the opposite sides of the web 49 of the H-beam and the inner and outer heads 50 and 52 of the H-beam overlap the inner and outer junctions of the panels with the web 49 of the H-beam. To make the construction air-tight, gaskets, or a caulking compound 54 may be used.

From the foregoing it will be seen that with the H-beam in position, it is merely necessary to assemble the panels, as shown in Figs. 1 and 2, and to secure the overlapping portions of the panels to each other and to inner heads of the H-beams. This can be done easily and rapidly and it produces a tight, weatherproof and thermally insulated wall. If the panels are relatively long, such as eight, ten or twelve feet long, their overlapping portions may be additionally secured together at intervals between the spaced H-beams, by bolts 46 and nuts 48 as above described. It will be noted that, because the blind bolts do not extend to, or through, the outer surface of the panels, they can not conduct heat to the outside atmosphere and this is important, especially when the panels are used to build drying chambers the interior of which may be heated to about 400 degrees F. Also, by the use of blind bolts, no perforations are formed in the outer surfaces of the panels.

In Fig. 10, I show an embodiment which differs from that above described only in that a T-beam is substituted for the H-beam. In this construction, the head 56 of the T-beam will overlap the inner junction of the ends of adjacent panels. In this embodiment, the space between the ends of the contiguous panels is sealed with a gasket or with the caulking compound 54 above mentioned.

In the embodiment of Figs. 6 and 7 I use the T-beam,

shown in Fig. 10, but instead of the blind bolts **46**, I use through bolts **60** which extend clear through from the inner to the outer surfaces of the panels. In this construction, the nuts **48** are omitted and spacing members **42'**, similar to spacing members **42**, are used between walls **12** and **13** and additional openings **24'** and **28'** are provided in walls **12** and **13**, which, when the panels are assembled, will be in registration with holes **24** and **28**. In order to insure a weather proof joint around the outer ends of through bolts **60**, I use grooved nuts **62** so that, when the bolts **60** are drawn tight, the outer walls of the panels will be crimped between the inner grooved walls of the nuts and the outer ends of spacing members **42'**, as shown at **64** in Figs. 6 and 7.

In Figs. 8 and 9 I use through bolts **60'** and inner and outer T-beams with the head **56'** of the inner T-beam covering the inner junction of the ends of the panels and with the head **66** of the outer T-beam covering the outer junction of the ends of the panels. In this construction, the web **68** of the outer T-beam is disposed between the ends of the panels.

In Figs. 12, 13 and 14 we have shown an improvement which is especially useful in connection with the roof of the building but which is obviously also usable in connection with side walls of the building. This improvement consists in adding an expansion joint which will insure a weather proof construction, regardless of contraction of the panels in cold weather.

As shown in Figs. 13 and 14, the expansion joint is made of a sheet of flexible, form-retaining, non-corroding material such as stainless steel, aluminum or aluminum alloy, which is bent to form two side walls **70** and **72** and an intermediate loop **74** which is adapted to overlap the outer junctions of adjacent panels. The expansion joint may be made long enough to overlie the junctions of a number of panels or it may be long enough to overlie the junctions of all of the panels, from the lower edge to the peak of a roof. Between the loop **74** and the outer junctions of the panels a gasket or caulking material **54** is used.

The panels forming the roof of the building may be supported as shown in Fig. 13 or as shown in Fig. 14, or in some other manner.

When supported as shown in Fig. 13, a beam **76** of any desired cross section is used and only one end of each of the panels is secured to it by the bolt **46** above mentioned in the manner above described. In this arrangement, the other end of the panel is secured to the adjacent end of the next panel by the expansion joint only. This produces a floating end structure which permits free movement of the panel at the unsupported end in response to changes in temperature.

When supported as shown in Fig. 14, the panels are secured to beam **76**, in the manner shown, or in other suitable manner, at their centers, so that the ends of adjacent panels are secured together only by means of the expansion joint so as to permit free movement at the ends of each panel in response to changes in temperature.

When the arrangement of Fig. 13 is used the end of one of the walls **70** of the expansion joint is bent to overlie the inner end of one of the adjacent panels, as at **77** to which it is secured by the bolt **46**, and the other wall **70** of the expansion joint is secured to the supporting beam **76** as at **78**.



In the arrangement of Fig. 14 the ends of both walls **7** of the expansion joint are bent to overlie the inner ends of contiguous panels, as at **77**, and are secured in position by the bolts **46**.

It will be noted that, in all of the foregoing embodiments, the contiguous portions of the panels overlap as shown in Fig. 2 so that if they are used in erecting a vertical wall or a slanting roof a natural water shed will be produced and that, in all cases, the panels are secured at their ends or at points intermediate their ends, or both, to each other and/or to a supporting beam, in a detachable and air and water tight manner. The blind bolt embodiment of Figs. 1 to 5 is preferred for use in building drying chambers, and other heated, enclosures while the other embodiments are somewhat less expensive and are satisfactory for most other purposes.

What we claim is:

1. A building construction formed of prefabricated panels each having an inner wall and an outer wall forming a space for insulation, each panel also having a first side of a predetermined, stepped off contour, and a second side of a predetermined stepped off contour which is complementary to the contour of the first side whereby the first stepped off side of one panel will coact with the second stepped off side of an adjacent panel to form an overlapping, water-shedding joint on the outer side of the wall, and an expansion joint between the ends of adjacent panels, said expansion joint including a generally U-shaped member with the bight portion thereof overlying the outer junction of the ends of the panels and with the limbs thereof passing between the ends of adjacent panels, the end of at least one of said limbs being flattened against the surface of an adjacent panel, and means securing said end of said limb to said surface of said adjacent panel.

2. The structure recited in claim 1 and at least one girder abutting the side of at least one of said panels at its junction with an adjacent panel, and means securing the end of at least one of the limbs of the expansion joint to said girder.


**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,312,056 | Shaw | Aug. 5, 1919 |
| 2,100,238 | Burgess | Nov. 23, 1937 |
| 2,114,155 | Streich | Apr. 12, 1938 |
| 2,190,806 | Small | Feb. 20, 1940 |
| 2,226,248 | Lunkin | Dec. 24, 1940 |
| 2,263,943 | Barnes | Nov. 25, 1941 |
| 2,347,756 | Swenson | May 2, 1944 |

FOREIGN PATENTS

| | | |
|---|---|---|
| 421,077 | Great Britain | Dec. 13, 1934 |