

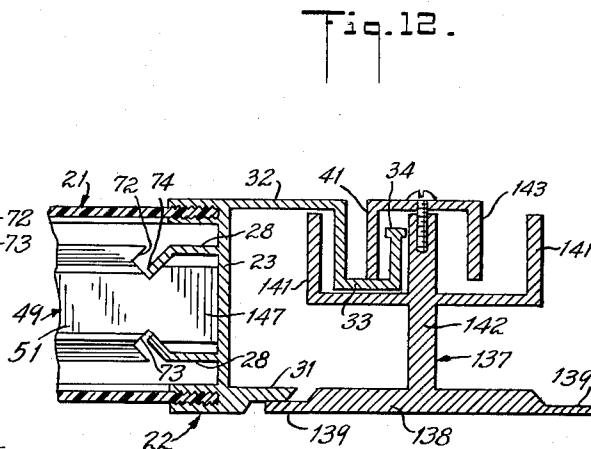
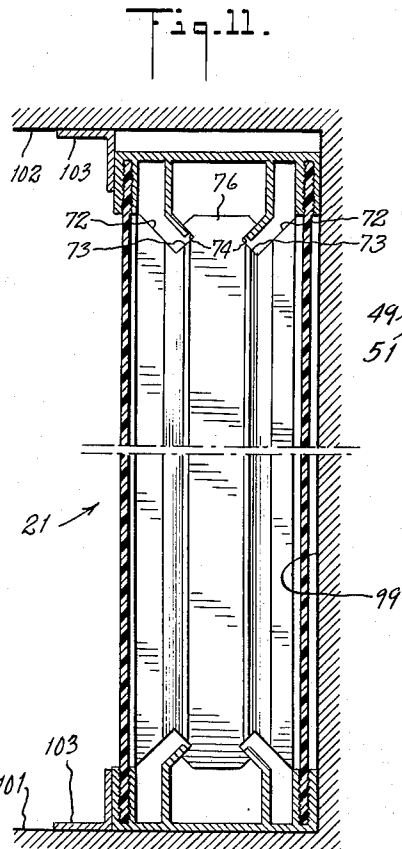
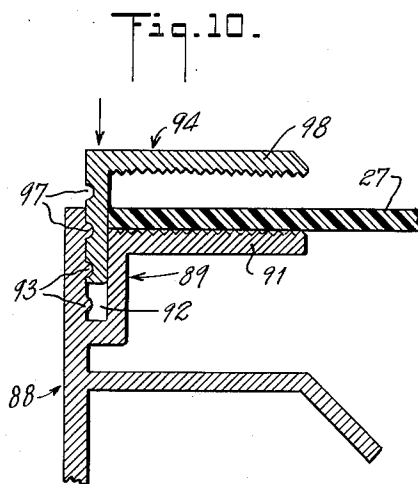
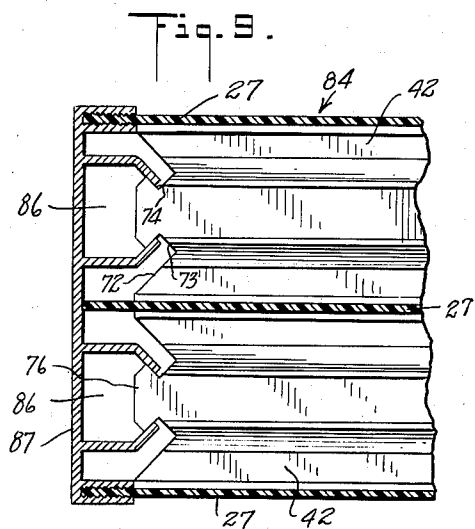
Dec. 26, 1961

G. I. RATNER ETAL
BUILDING PANEL

3,014,561

Filed March 19, 1958

3 Sheets-Sheet 3



INVENTORS
GEORGE I. RATNER
and ROBERT SLATER
BY
Corey, Hart & Stemple
ATTORNEY

Dec. 26, 1961

G. I. RATNER ETAL
BUILDING PANEL

3,014,561

Filed March 19, 1958

3 Sheets-Sheet 2

Fig. 3.

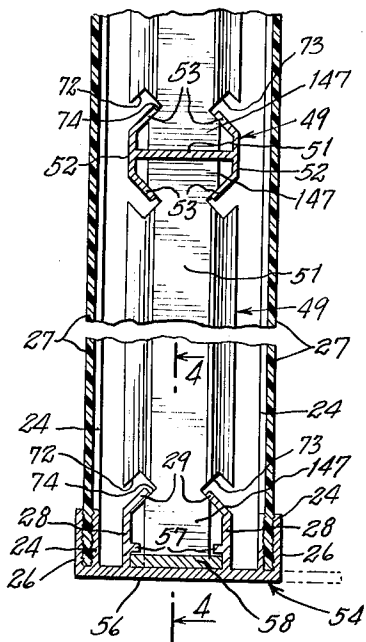


Fig. 4.

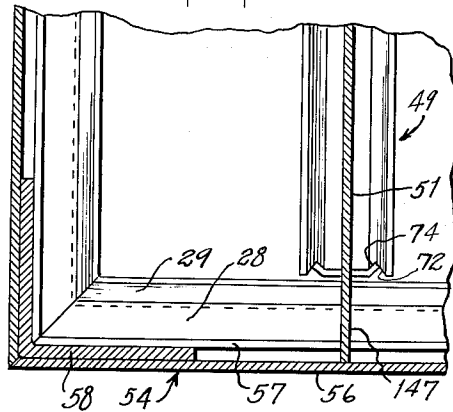


Fig. 5.

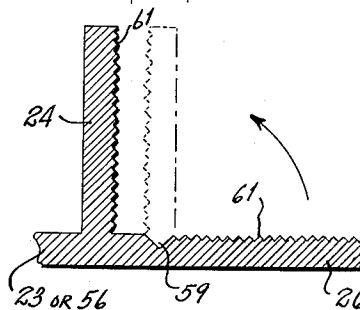


Fig. 6.

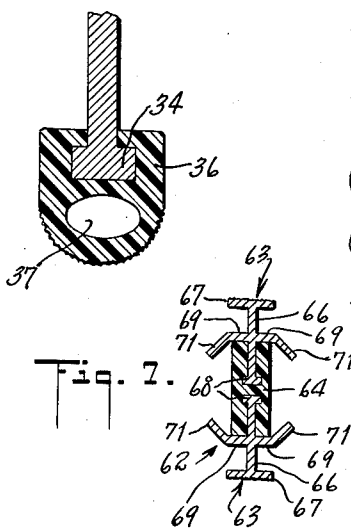
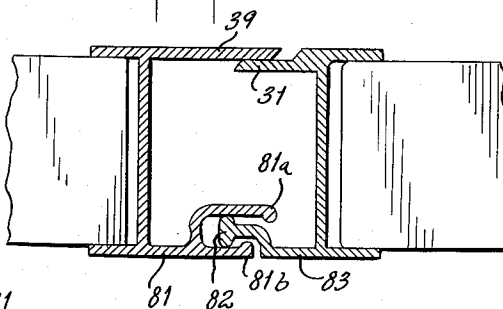


Fig. 7.



INVENTORS
GEORGE I. RATNER
BY and ROBERT SLATER
Corey, Hart & Stemple
ATTORNEY

1

3,014,561

BUILDING PANEL

George I. Ratner, Parsippany, and Robert Slater, Morristown, N.J., assignors to The Marco Company, a corporation of New Jersey

Filed Mar. 19, 1958, Ser. No. 722,510
15 Claims. (Cl. 189-34)

This invention relates to new and useful improvements in prefabricated double-walled building panels that are light in weight, exhibit high strength, and have excellent insulating properties. The panels may be readily and firmly secured to one another or other structure or may be used as single units. The panels may optionally be provided with novel interior beams or various other grid networks.

It would be beneficial for the building industry to have available economical prefabricated panels of spaced double-walled construction that can readily be joined together or to other building structure by unskilled laborers, have strength, simplicity, durability and which may have, if desired, readily insulated air- and/or watertight joints.

It is an object of this invention to provide prefabricated building panels of spaced double-wall construction that may be readily manufactured by using simplified integral extruded beams for the perimeter and optionally a grid network of integral extruded means onto which may be laminated the spaced walls or surface sheets.

It is another object of this invention to provide prefabricated building panels of spaced double-wall construction formed from extruded integral beams that may readily be secured to one another or other building structure by interlocking arrangement of the leading and/or trailing perimeter beams.

It is a further object of this invention to provide prefabricated panels of the character described that will have numerous versatile applications in the building industry including, but not limited to, exterior wall panels, interior wall panels, skylights, canopies, and decorative panels.

It is an additional object of this invention to provide prefabricated panels of the character described that may readily be filled with various types of insulating material during fabrication.

It is also an object of this invention to provide prefabricated panels of the character described which may readily be secured together with insulation positioned at the sealing joint.

It is another object of this invention to provide means to secure prefabricated panels of the character described in various desirable arrangements in building construction.

With these and other objects in view, the nature of which will be more apparent, the invention will be more fully understood by reference to the drawings, the accompanying detailed description and the appended claims.

We have found that spaced sheets of fiberglass, aluminum, glass and most any sheet building material may be laminated to a metal framework, preferably of extruded beams. The framework optionally includes an interior reinforcing grid and two opposed edges of the perimeter framework being formed to interlock so that successive panels may be securely attached to one another without additional elements. We have further found that the perimeter framework may be securely interlocked to an interior grid system by a novel arrangement of flanges provided on the interior surface of the perimeter beams and corresponding notches cut in the interior grid beams. Moreover, the interior beams are interlocked to one another in the same novel manner. We have also found various ways in which to mount our novel panels.

2

In the drawings:

FIG. 1 is a vertical plan view showing three interlocking panels in position in accordance with this invention, the interior grid network being shown as it will generally be visible through the translucent fiberglass surface sheet;

FIG. 2 is a horizontal section taken along line 2-2 of FIG. 1;

FIG. 3 is a vertical section taken along line 3-3 of FIG. 1 except that the beams are shown in a modified form;

FIG. 4 is a vertical section taken along line 4-4 of FIG. 3;

FIG. 5 is an enlarged plan view of the end of a perimeter beam as it is extruded and before binding of the surface sheets by the guarding flange;

FIG. 6 is an enlarged sectional view of the free locking end of a leading beam showing a sealing gasket carried thereby;

FIG. 7 is a transverse section taken through a modified three piece interior beam;

FIG. 8 is a section through a modified locking device for adjacent panels;

FIG. 9 is a section through a modified panel having a double air space;

FIG. 10 is a section showing a modified member for locking the surface sheets to the perimeter beams;

FIG. 11 is a schematic vertical section showing how a wall panel may be secured to the building structure; and,

FIG. 12 is a schematic vertical section showing a wall panel removably attached to a building in a general horizontal plane.

Referring to the drawings in detail, this invention as illustrated is embodied in building panels that may be used for vertical or horizontal, exterior or interior walls and various means for mounting the panels.

A vertical plan view is shown in FIG. 1 wherein a group of three panel members 21 are shown attached to each other with a plain exterior perimeter and with the design of an M shown on the face of one of the panel members. Any design may be chosen or the panels may be plain.

FIGS. 2 to 7 show the details of the interior of these panel members and certain modifications, FIG. 2 being a section running through the trailing and leading edge of a panel member and showing the detail of the beams used in the construction thereof. The leading edge is formed of an integral extruded single beam 22 which includes a primary member 23 and at each end thereof a sheet supporting flange 24 and a sheet guarding flange 26 adapted to receive in the channel therebetween the associated surface sheet 27. Intermediate of the sheet supporting flanges 24 and also integral with the primary member 23, is a pair of spaced internal locking flanges 28, transverse to the primary member and generally parallel to the sheet flanges 24, 26. The internal locking flanges at their free end are provided with angular flanges 29 disposed toward one another. On the opposed side of the primary member 23 at one end thereof and integral therewith is an inner guide flange 31 and at the opposed end a long interlocking flange 32 provided at its free end with an integral U-shaped member 33. At the free end of the U-shaped member is an enlarged head 34 adapted to optionally receive a vinyl gasket 36 for sealing purposes. The gasket is provided with an open space 37 to insure flexibility.

At the trailing end of said panel member is an integral extruded single beam 38 which is provided with a primary member 23, sheet supporting flanges 24, sheet guarding flanges 26, surface sheets 27, internal locking flanges 28 and angular flanges 29 which are similar to the same

members on the leading beam and have been given the same reference numerals. However, on the opposed side of the primary member 23 and extending outwardly from the panel is an inner base flange 39 on one end and a short interlocking U-shaped flange 41 at the other end, one leg of the U being formed by a portion of the primary member 23.

Within the body of the panel member running both parallel and transverse to the leading and trailing beams are interior grid beams of two lengths, the spanning beams 42 and the short beams 43, both of identical cross-section and which are provided with a regular I-beam section having a primary member 44 with top and bottom plates and on each side of the primary member are a pair of spaced internal locking flanges 47, each of which is provided with an angular flange 48 disposed toward the other angular flange on the same side of the primary member. These internal locking flanges 47 and angular flanges 48 will be recognized as similar to flanges 28 and 29 of the perimeter beams except that the flanges of the internal beams project in both directions from the primary member and the flanges normal to the primary member are shorter than those provided in the perimeter beams, these relative lengths being practical but having no patentable significance.

A modified interior beam 49 is shown in FIG. 3 and includes a shorter primary member 51 which is terminated at top and bottom by locking flanges 52 which are provided with angular flanges 53 similar to those described previously. FIG. 3 also shows a plain perimeter beam 54 which has primary member 56 provided with sheet supporting flanges 24, sheet guarding flanges 26, internal locking flanges 28 and angular flanges 29 which are similar to the same numbered elements of the leading and trailing beams. It will be appreciated that the interior sides of all the perimeter beams described hereinbefore are identical and that the difference in the beams is concerned with the exterior face. Each of the locking flanges 28, however, is provided with a small boss 57 facing the other boss and spaced slightly from the primary member 56 so as to receive and retain an angle corner clip 58.

All of the beam members and associated flanges are extruded members although the sheet guarding flange 26 on all perimeter beams extends in the same plane as the primary member 23 (or 56) when extruded, as shown in FIG. 5. After the sheet has been placed in position on the supporting flange 24, the guard flange 26 is rotated into guarding position parallel with the sheet surface so as to hold it in position, this rotation being facilitated by notch 59 to avoid breaking the flange. The surfaces of these flanges facing toward the sheets are serrated as at 61 so as to better grasp and hold the sheet surfaces, this being a desirable but not necessary feature of the invention.

The beams in FIGS. 1 to 6 are all integral one piece metal beams which have been found economically and structurally desirable in most instances. However, FIG. 7 shows a modified three piece interior beam 62 which is desirable in certain instances as discussed hereinafter. This beam comprises two identical metal extrusions 63 which are joined together by a plastic extrusion 64. The metal extrusions are in the shape of a T-beam and include a primary member 66, a sheet supporting flange 67, an enlarged head 68 and a pair of oppositely disposed transverse locking flanges 69 provided at their free ends with an angular flange 71. As will be noted from the drawing, the plastic extrusion is shaped to receive the enlarged heads and terminal section of the primary members 66 so that beam 62 is functionally the same as interior beams 42 and 43. Moreover, any of the other integral one piece beams could be made in the same manner.

In constructing individual panels, the four selected perimeter beams are first cut to proper lengths and

mitered at the ends inwardly from the primary member. There is no need to miter outwardly from the primary member unless two interlocking beams were being joined at a corner. This is possible but will not happen generally as the leading and trailing beams will appear on opposed edges in spaced parallel relationship as far as a single panel is concerned. The mitred corners may be secured together by many ways including welding (not shown) or an angle corner clip 58 may be slid into position on one beam (FIGS. 3 and 4), and the other corner beam then slid into position along the clip of the beams that have been extruded with bosses 57. The beams may then be secured to the clip by set screws, indentations, edges, etc. Thereafter, the spanning interior beams 42 are cut to the proper length, notched and positioned. As will be noted in FIG. 2, the interior beams 42 and 43 are provided with notches to engage the locking flanges of transverse beams, whether on the perimeter or in the interior. The notches are angularly cut in the beam end with a long wall 72, an end wall 73 and a short wall 74. There are a pair of notches at each end of a beam at an angle corresponding to the angular disposition of the terminal angular flanges 29, 48, 53, i.e., pointing toward each other. The angularly disposed notches thus form a neck at their closest point which defines an enlarged head 76 that engages the corresponding angular flanges of a transverse beam. The notches are cut so that the associated angular flange will rest snugly on the short notch wall 74, i.e., the two walls closest one another, whereas the end wall 73 and the long wall 72 are cut larger than the associated flanges so as to permit rotation of the interior beams into the proper engaging positions.

The head 76 has its ears 77 considerably shortened from their potential length. This is necessary in order to easily engage the head and notches with the angularly disposed flanges without being forced to slide them into engaging position from an open end. With the notches cut as shown, if the notched beam is rotated about 40° about its longitudinal axis from its ultimate engaging position, the head 76 can be inserted into the space between the angularly disposed flanges so that on reverse rotation to the engaging position, the head, notches and angular flanges will be engaged as shown. The top and bottom plates 46 are flush with and abut the sheet supporting flanges 24 of the other beam and therefore there can be no relative movement between the two transverse and engaged beams.

The short interior beams 43 are notched and positioned between the spanning beams 42 in the same manner as the spanning beams are placed between the perimeter beams. The spanning beams 42 are shown running the long way in the building panels in FIG. 1, as it is deemed desirable for appearance to run them vertically. The short beams thus are horizontal and are shown in a staggered pattern for increased strength. However, the directions and staggering of the beams are merely a matter of routine design choice.

After the grid network has been finished, an adhesive will be placed on the top and bottom plates, sheet supporting flanges, and sheet guarding flanges and a proper sized sheet placed on the top and bottom panel surface. The guard flanges 46 will then be rotated until they are parallel with and firmly contact the sheet to make a leak proof joint.

As shown in FIG. 2, the left panel (only trailing edge shown) was first placed in position and attached to the wall by means of screw 78. Thereafter, the right panel (shown completely) is positioned by first placing the free end 34 of U-shaped member 33 within the U-shaped member 41 of the trailing edge. At this point the free right panel will be angularly disposed relative to the attached left one. However, the right panel will then be rotated into the position shown in FIG. 2, after which it will be secured into that position. A strip of insulation 79 is shown in the space defined between the two succeed-

ing panel members although it may be left out, if desired. Another optional feature is the vinyl gasket 36 with the open space 37 (FIG. 6) which provides flexibility to make a positive seal between the succeeding panels and has been found to be very desirable. This could, of course, be arranged on the free end of member 41 in the same manner.

It will be readily appreciated that the U-shaped members 33 and 41 provide a loose joint between succeeding panels which permits expansion and contraction. FIG. 8 shows a modified joint which will also permit expansion. The trailing beam is provided with an elongated female member 81 adapted to receive the head 82 of a male member 83 which can be released only when one panel is not in alignment with the other and yet permits expansion or contraction, one leg 81a overhanging the other leg 81b.

It is not necessary that the trailing edges of the building panels be attached to the wall as shown but it can readily be done by screws or otherwise, if so desired. Moreover, various other ways can be utilized to maintain proper alignment of successive panels. In mounting several panels in alignment, the associated leading and trailing beams will normally be used at all joints between panels. However, the plain beams 54 will be preferred at the final perimeter edge of the larger structure, for example, as shown around the perimeter of FIG. 1. In fact, it is possible and will undoubtedly be desirable in many instances, to have plain beams around all four sides of a single panel. Moreover, the interlocking trailing and leading beams may be used on one, two, three or four sides of a single panel, depending on the interlocking arrangement that is desired with other similar panels or mounting structure. It is possible with these beams to construct a panel having an aperture, using plain beams 54 to define such an aperture and, of course, cutting the surface sheets accordingly.

FIG. 9 shows a further modified panel 84 having double air spaces 86 between three surface sheets 27 instead of two as shown otherwise. The perimeter beam 87 is shown as a single extrusion that represents practically a double beam. However, the interior beams and their notching engagement are identical with the interior beams 42 and 43. It will be noted that the middle surface sheet is maintained in a fixed position by the interior beams from both sides. Although the modified beam 87 is shown plain, it will be readily appreciated that it may have an exterior shape adapted to interlock in the same manner as beams 22 and 38.

FIG. 10 shows a modified perimeter beam 88 providing a modified locking or guarding means for the surface sheet 27. This beam does not have guard flanges but instead has an enlarged end section 89. The enlarged section carries a sheet support flange 91 and a deep narrow notch 92 that is provided with a series of bosses 93. The surface sheet will be sized to rest on the support flange 91 but not to cover the notch 92. After the surface sheet is in position, a locking angle member 94 provided on an arm 96 with indentations 97 to correspond with bosses 93 is inserted and forced into the notch to guard the surface sheet. The bosses 93 fit into indentations 97 to securely maintain the position of the angle member with arm 98 being parallel and adjacent to the surface sheet. Obviously, various other means could be used to secure arm 96 in the notch 92 or to secure the surface sheet to the perimeter beams. In fact, it will be sufficient in many instances merely to secure the surface sheets to the sheet supporting flange without any guard, in which case the sheet will generally be flush with the exterior perimeter beam wall.

The various beams used in this construction can readily be made of integral aluminum extrusions which we have employed with success. The surface sheets may be made of fiberglass reinforced polyester plastic which has excellent insulation and light transmission characteristics.

However, our concept is not limited to the materials from which these structures are formed. The beams might be brass, steel, plastic, die castings, etc., whereas the surface sheet might be glass, aluminum, other plastics, copper, steel, etc. Moreover the surface sheet may be secured to the grid by means other than conventional adhesives.

The insulating value of these units is quite high but may be improved to even greater efficiency. Most of the heat transfer through the building panel shown in FIG. 2 will be from one sheet surface to the other through the metal gridwork used to reinforce the panel. There are several ways of avoiding most of this heat loss. As shown in FIG. 3 the interior grid beams may be shortened so that they do not touch either surface sheet of the panel. FIG. 7 shows an interior beam having discontinuous metal pieces separated by plastic. FIG. 9 shows a double air-space between the two surface sheets and the top and bottom interior beams could be arranged so as not to be in vertical alignment. In these ways heat transfer through the panels will be reduced to negligible levels.

Another way of reducing heat transmission is to eliminate the interior grid beams entirely, utilizing only the perimeter beams as shown in FIG. 8. Whether this is done or not, depends, of course, somewhat upon the size of the panel and on the ultimate load to be carried thereby. Where the interior grid beams completely span the distance between the surface sheets, an insulating material may be used between the grid beam and the surface sheet to reduce heat transmission.

In all of these modifications, regardless of the size, shape, presence or absence of the interior grid beams, the interior of the panel may be filled with insulating material and the panels are quite adaptable to be filled with expanding types of insulation which greatly expand after introduction of the insulating material into a space and later become set, e.g., various foamed insulations. Sheet insulation could, of course, be used fairly easily if the grid beams are absent or shortened but free flowing types of insulation are preferred when full grid beams are present. These same type insulations could, of course, be used in the void space formed by the interlocking flanges of succeeding panels.

FIG. 11 shows a schematic outline of a building panel 21 which rests against a building wall 99, extends from the floor 101 to the ceiling 102 and is secured in position by angle members 103 which can be easily secured to the floor and ceiling by nails or otherwise.

FIG. 12 shows another desirable method of utilizing the building panel of this invention, i.e., as a sunshade. A cantilevered T-beam 137 is shown in cross-section of its length as it would project outwardly from the wall of a building and is provided with a bottom plate 138 or flange which is notched at 139 to provide engagement with the inner guide flange 31 of the framing member 22 of the panel 21. Extending in opposite directions from the primary member or leg 142 of the T are L-shaped arms 141 forming integrally with the leg 142 a pair of upwardly extending channels. The panel 21 is so arranged that the U-shaped member 33 fits into the larger channel formed by arm 141 and bears on this arm to and in supporting the weight of the panel on the cantilevered T-beam and the guide flange 31 rests upon notch 139 of the bottom plate. A cap member 143 is then secured to the top of the I-beam and extends over the interlocking U-shaped member of the building panel to lock the panel into its position. It will be appreciated that another panel member could be inserted on the right side of the I-beam in the same manner as shown here to the left. In this instance, the remaining three perimeter beams of the panel member will likely be plain beams similar to beam 54 shown in FIG. 3.

Many other uses of these novel building panels will be suggested to those in the art such as skylights, canopies,

roofing, marquis, etc. and are deemed to be within the scope of this invention.

In the embodiment of FIGS. 3 and 12 is shown in elevation a modified beam member 49 of which the typical section is shown in FIG. 3. In the beam member 49, as above described, the conventional plates or flanges of the I section are omitted to avoid conduction of heat through the grid beam structure from one surface sheet to the other at opposite faces of the panel. In order to prevent endwise movement of the member 49 after being rotated, as above described, into the locking position shown in FIG. 12, the primary member or web 51 is extended beyond the notches 72, 73, 74 to form head 147 of generally rectangular form and of such length as to abut the primary member or web 23 of the leading beam 22 on the surface thereof between the locking flanges 28. The grid member 49 thus becomes locked between the primary member 23 and the angular flanges 29. This form of the grid members may be used in different combinations with the other embodiments shown and described, e.g. in FIG. 3.

It also will be understood from a consideration of FIGS. 2, 8 and 12 that the guide flange 31 is disposed inwardly relative to the adjacent face of the panel with respect to the base flange 39 of FIGS. 2 and 8 or the flange carrying notch 139 of FIG. 12, having regard to the disposition of the free end 34 of the U-shaped member of the long interlocking flange 32 within the U of the short interlocking flange 41. This arrangement of the flanges secures the requisite interlock and holds the trailing and leading ends of the panels together, since these adjacent ends of the two panels cannot move apart to an undesirable extent when they are disposed in the positions relative to each other as in FIGS. 2, 8 and 12, although provision is made for movement for expansion and contraction parallel to the plane of the panel, as above mentioned.

It will be appreciated that the building panels described herein have several novel features including the provision of external interlocking flanges on the leading and trailing beams so that two successive panels may be easily and readily attached to one another by unskilled labor. These external flanges may be altered within the scope of this invention as long as successive panels are readily interlocked to one another. This external interlocking feature may be used independently of the particular internal grid system here shown, i.e., the external features are possible without any interior grid system or with another type grid system (e.g., the internal grid systems of our copending application, Serial No. 645,706, filed March 13, 1957, now Patent No. 2,969,618). In fact, as shown in FIG. 8, entirely independent panels may be mounted within the interlocking perimeter beams disclosed herein.

The particular internal grid system disclosed herein is also novel and can be used with or without the exterior interlocking flanges shown here. It is possible, e.g., to make a single building panel having an internal grid system as described herein but with all perimeter beams being plain like beam 54 or the perimeter beam surfaces may be formed in other desired shapes, e.g., as shown in our aforementioned copending application.

We claim:

1. A frame construction comprising two elongated extruded framing members disposed with their lengths transverse to each other generally parallel to a common plane, said members each being of I section and having the flanges of the I parallel to said plane, a given one of said members having a pair of cantilever locking flanges extending from the web of the I intermediate the ends thereof generally parallel to said plane and respectively provided with portions at the free ends thereof reverted toward each other in angular relation to said plane, the web of the other member being formed at the end thereof adjacent said given member with notches extending in-

wardly of said web and toward each other from said end of said other member, said notches forming therebetween a locking element disposed between said reverted end portions of said locking flanges, said locking element providing two edge surfaces of said web extending substantially in the same angular relation to each other as said angular relation of said reverted end portions of said locking flanges and respectively engaging the adjacent surfaces of said angular portions of said flanges for locking said members together.

2. A frame construction as defined in claim 1 in which the ends of the flanges of the I of said other member at the end of said other member adjacent said given member abut the respective lengthwise edges of the flanges of the I of said given member and cooperate therewith and with said locking element and said locking flanges to hold said members against movement relative to each other.

3. A frame construction as defined in claim 1 in which the two projections of said locking element formed between said notches are truncated to provide clearance in bringing said locking element into locking position with respect to said angularly reverted flanges of said given member.

4. A framing member for a construction utilizing two elongated extruded members extending transversely of each other generally parallel to a common plane, said framing member comprising a web disposed transversely of said plane when said framing member is assembled in said construction, a pair of locking flanges having portions extending from said web intermediate the ends thereof generally parallel to each other transversely of said web and respectively provided with portions reverted toward each other in angular relation to said parallel portions, said web of said framing member at an end thereof providing a locking element defined by two edge surfaces of said web extending from said end along said member substantially in the same angular relation to each other as said angular relation of said reverted portions of said locking flanges thereof, said locking element being adapted to be inserted between said locking flanges of another framing member extending transversely of said first framing member at said end thereof generally parallel to said plane for locking said framing members together.

5. A framing member as defined in claim 4 in which said two edge surfaces of said locking element of said web are defined between notches extending inwardly of said web from said end along said member.

6. A framing member as defined in claim 4 in which said web extends in the plane thereof outwardly beyond said locking flanges and is provided with plates at the extremities of said web extending along said member in planes transverse to said web to provide longitudinal beam flanges along said web.

7. A framing member as defined in claim 4 in which said web is provided by two portions respectively connected to said locking flanges, said portions being separated in the plane of the web at a point intermediate said locking flanges, and a connecting element of insulating material rigidly connecting said two portions to complete the web.

8. A frame construction comprising two elongated extruded framing members each generally of channel section with a web and the two legs of each channel extending transversely of said web and toward the other member generally parallel to a common plane, one of said legs of a given one of said members extending in overlapping freely sliding engagement upon the adjacently disposed leg of the other member, the second leg of said given member being formed with a U-shaped portion independent of said web, said U being open in the direction transverse to said plane in which said lapping leg of said given member is disposed with respect to the lapped leg of said other member, said other member having the outer portion of its second leg reverted toward and

disposed in said U of said given member in interlocking relation to said second leg of said given member.

9. A frame construction as defined in claim 8 in which said lapping leg of said given member is disposed inwardly of the channel of said other member with respect to and in lapping relation upon the inner surface of said adjacent leg of said other member, said U of said second leg of said given member opening outwardly with respect to the channel between said legs of said given member, said reverted portion of said second leg of said other member being reverted inwardly toward the channel between said legs of said other member.

10. A frame construction as defined in claim 9 which comprises a resilient element extending about the free end of said U of said second leg of said given member and resiliently engaging the inner surface of said second leg of said other member adjacent said reverted portion thereof.

11. A frame construction as defined in claim 8 also comprising a pair of cantilever locking flanges extending from said web intermediate the ends thereof on the side opposite to said legs and generally parallel to said common plane and respectively provided with portions at the free ends thereof reverted toward each other in angular relation to said plane for receiving between said angularly disposed portions a locking element of a third elongated member extending parallel to said plane transversely of said selected member.

12. A frame construction as defined in claim 8 in which the spacing of the legs of said U with respect to said portion disposed therein provides for movement of said two framing members relative to each other parallel to said plane.

13. A frame for a panel having a leading end and a trailing end, said frame comprising an elongated extruded framing member extending parallel to the plane of said panel along said leading end thereof, said framing member having a web and having a guide flange extending generally parallel to said plane from and transversely of said web adjacent a given face of said panel, said framing member having adjacent the opposite face of said panel an interlocking flange extending from and transversely of said web generally parallel to said plane, said interlocking flange having the portion thereof outwardly of said web formed in U shape with the U open away from said guide flange in the direction transversely of said plane, said frame comprising a second elongated extruded framing member extending parallel to said plane of said panel along the trailing end thereof, said second framing member having a web and having a base flange extending generally parallel to said plane from and transversely of said web adjacent said given face of said panel, said second framing member having adjacent the said opposite

face of said panel an interlocking flange extending generally parallel to said plane from and transversely of said web, said interlocking flange of said second member having the portion thereof outwardly of said web of said second member reverted generally parallel to said web of said second member toward said base flange of said second member, said guide flange and said interlocking flange of said first member being disposed with respect to each other and in relation to the disposition of said base flange and said interlocking flange of said second member with respect to each other so as to provide for interengagement of said guide flange and said interlocking flange of the leading end of a panel respectively with the base flange and the interlocking flange of the trailing end of another similar panel disposed in the same plane with said leading and trailing ends adjacent, and means connecting said framing members to complete said frame.

14. A frame for a panel as defined in claim 13 in which said guide flange of said first member at said leading end of said panel is adapted to engage said base flange of said second member at the trailing end of said other panel at the surface of said base flange disposed toward said interlocking flange of said second member with concomitant bearing of the free end of said U-shaped portion of said interlocking flange of said first member upon the inner surface of said interlocking flange of said second member between said reverted portion thereof and said web of said second member.

15. A frame for a panel as defined in claim 13 in which said means connecting said framing members comprises side frame members at opposite sides of said panel and extending transversely of said leading and trailing end members, and an angle clip engaging two adjacent members at a corner, at least one of said adjacent members at said corner having longitudinal ribs spaced from the web of said member and cooperating with said web to hold a leg of said angle clip between said ribs and said web to connect said adjacent members at said corner.

References Cited in the file of this patent

UNITED STATES PATENTS

1,669,382	Smiley -----	May 8, 1928
2,257,001	Davis -----	Sept. 23, 1941
2,300,743	Hauf et al. -----	Nov. 3, 1942
2,302,586	Thelen -----	Nov. 17, 1942
2,411,628	Labaree -----	Nov. 26, 1946
2,444,091	Carlson -----	June 29, 1948
2,649,171	Persson -----	Aug. 18, 1953
2,696,281	Hedgren et al. -----	Dec. 7, 1954
2,742,116	Fitzgerald -----	Apr. 17, 1956
2,806,561	Spangler -----	Sept. 17, 1957
2,849,943	Zurawski -----	Sept. 2, 1958