Nov. 9, 1971 A. E. HILL ET AL 3,618,281

PANEL CONSTRUCTION

Filed Feb. 3, 1970

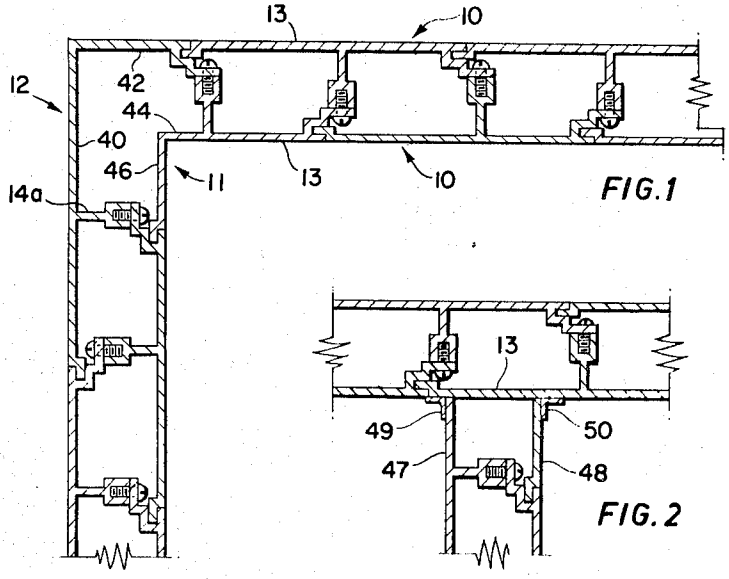


FIG. 1

FIG. 2

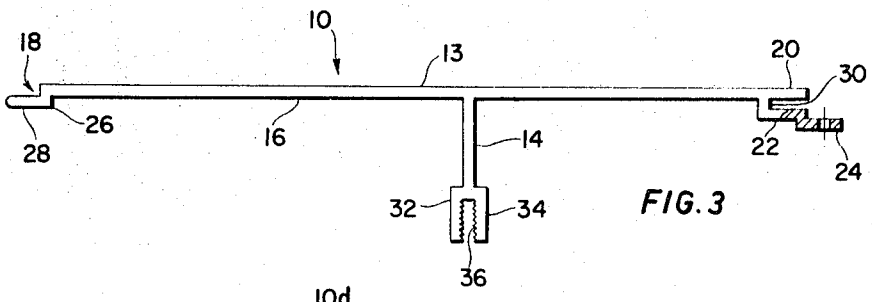


FIG. 3

FIG. 4

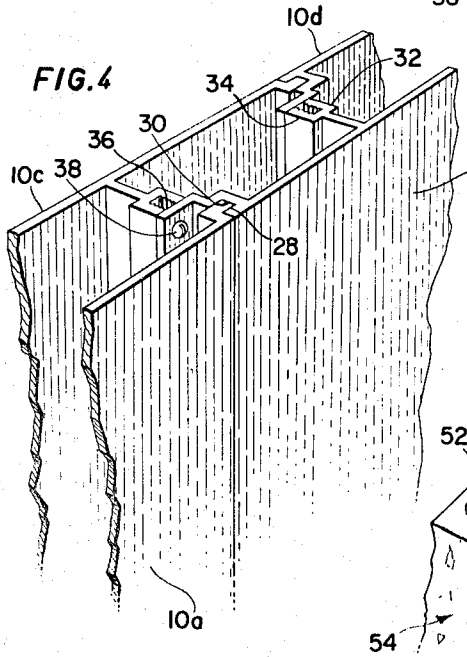
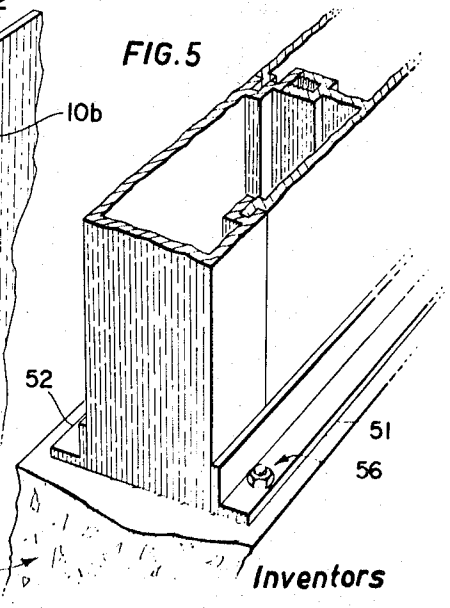


FIG. 5



Inventors

ARNOLD E. HILL

HOWARD G. HILL

by:

United States Patent Office 3,618,281
Patented Nov. 9, 1971

3,618,281

PANEL CONSTRUCTION

Arnold E. Hill and Howard G. Hill, both of 130 Hogarth Ave., Toronto, Ontario, Canada

Filed Feb. 2, 1970, Ser. No. 7,920
Int. Cl. E04c 1/10, 1/12, 2/46
U.S. Cl. 52—404 4 Claims

ABSTRACT OF THE DISCLOSURE

A generally T-shaped prefabricated wall panel. The crossbar of the T has an offset portion at one end and a pair of limbs at the other end which define a continuous groove. An outwardly projecting third limb is connected to one limb which defines a part of the groove. The end of the upstanding member of the T opposite the crossbar has a pair of branches which define a continuous groove. Two like wall panels are joined by inserting the offset portion of one panel into the groove defined by the pair of limbs of the other panel. When the panels are so joined, their crossbars are in the same plane. A third like panel is connected to the first two panels by contacting the third limb of the third panel to the groove defined by the pair of branches of any one of the other two panels, then screwing or spot welding the contacting surfaces together. When the third panel is so connected, its crossbar defines a wall parallel to and spaced apart from the wall defined by the crossbars of the first two panels.

This invention relates to building constructions and is particularly directed to pre-fabricated wall and partition panels.

It is well known to construct walls, doors and partitions of a number of building panels. These known structures however exhibit numerous disadvantages. For example, they require nails or other fasteners to secure the panels together and generally employ intermediate studs sandwiched between the panels to provide additional structural support. Further, these structures require skilled labor to assemble, are relatively complex and expensive.

It is accordingly an object to provide an improved panel construction.

It is another object to provide an economical panel construction having a minimum of parts and which can be quickly and easily assembled.

It is another object to provide a panel construction in which all bolt fastenings are concealed.

Another object is to provide a panel construction which has the ability to support a substantially load.

A further object is to provide a panel construction in which a number of identical panel members can be quickly and easily assembled.

Another object is to provide an insulating panel construction which is quickly and easily assembled.

These and other objects may be accomplished by providing a panel member for use in combination with other like members to form a wall, each panel member including an elongated flange having a substantially planar intermediate portion, an L-shaped portion defining one lateral edge of the flange, the portion having first and second legs, the first leg extending from the planar portion to the second leg, a pair of spaced apart limbs, and a third limb offset from one of the spaced apart limbs, the three limbs defining the other lateral edge of the flange, the spaced apart limbs defining a groove for receipt of a second leg of a like panel member; and an elongated web extending perpendicularly from the intermediate portion of the flange and parallel to the lateral edges thereof to define a structure having a substantially

T-shaped cross-section, the edge of the web remote from the flange terminating in a pair of opposed branches which together define a slot.

A fuller understanding of the invention may be had by referring to the following descriptions and claims taken in conjunction with the accompanying drawing in which:

FIG. 1 is a plan view of a number of panel members each member disposed vertically to form a wall;

FIG. 2 is another plan view showing the manner in which a wall and partition formed of panel members may be joined;

FIG. 3 is a plan view of a single panel member;

FIG. 4 is a partial perspective view of a wall or partition; and

FIG. 5 is a partial perspective view of the wall and a footing.

Like reference characters refer to like parts throughout the description of the drawing.

With reference to FIG. 1, the illustrated panel construction is composed of a plurality of panel members, indicated generally **10**, and corner elements indicated generally **11** and **12**. Each member **10** includes a flange **13**, and the flanges of connected members **10** combine to define the interior and exterior surfaces of a building wall or partition. In FIG. 2, one way in which panel members forming the wall of a building can be connected to a partition is illustrated.

With reference to FIG. 3, there is illustrated a plan view of an embodiment of panel member **10** according to the invention. Preferably member **10** is formed of metallic material such as aluminum which may be quickly and inexpensively extruded or moulded in any particular form. Member **10** may also be formed of plastic material. As depicted, member **10** is substantially T-shaped in cross-section and includes a flange **13** or cross-bar of the T, and an integrally formed, substantially perpendicular stem portion or web **14**.

Flange **13** is composed of a substantially planar intermediate portion **16**, an L-shaped portion **18** which defines one lateral edge of flange **13** and limbs **20**, **22** and **24** define the other lateral edge of flange **13**. L-shaped portion **18** is composed of legs **26** and **28**, leg **26** extending from intermediate portion **16** of leg **28**. At the opposite side of flange **13**, limbs **20** and **22** are spaced apart from one another to define a groove **30** and limb **24** is connected to, but offset from, limb **22**.

Web **14** extends substantially parallel to the lateral edges of flange **13**. At the edge of web **14** remote from flange **12** is a pair of opposed branches **32** and **34**. As seen, branches **32** and **34** combine to define a continuous slot **36** and preferably the slot is threaded along the entire length thereof.

As seen in FIG. 4, panel members **10** interconnect to form a continuous panel construction. Members **10*a*** and **10*b*** are arranged so that leg **28** of member **10*a*** fits into the corresponding groove **30** of member **10*b***. When members **10*a*** and **10*b*** are so arranged, flanges **13** of both members are coplanar and form a continuous surface. Members **10*a*** and **10*b*** are connected to member **10*c*** by passing a screw or bolt **38** into threaded slot **36** of member **10*c***.

With further reference to FIG. 4, in the assembly of the panel construction, the assembly conveniently takes place from right to left. Member **10*d*** is first placed in position, then member **10*b*** is positioned so that the free edges of forks **32** and **34** contact the face of limb **24**. Holes are then drilled along the length of limb **24** where desired and a bolt is passed through each hole and into threaded engagement with slot **36** of member **10*b***. Member **10*d*** is thus secured to member **10*b***. Leg **28** of member **10*c*** is then inserted into groove **30** of member **10*d*** to secure member **10*c*** in position. Holes are then drilled

into limb **24** of member **10***b* and a bolt **38** is passed through each hole and into threaded slot **36**. It will be understood that as slot **36** of each member **10** is continuously threaded along its length, it is unnecessary to match drill holes in pre-determined locations in limb **24** as holes may be drilled anywhere along the length of limb **24**.

A channel may be used to cap the members at the top of the wall or partition. Ceiling or roof joists may be secured to the channel by any convenient means.

Instead of employing bolts or screws **38** for securing members **10** together, the members may be joined together by continuously or spot welding branches **32** and **34** of each member to, limbs **24** in contact therewith. Other means for joining members together will readily occur to those skilled in the art.

The assembly of the panel construction is therefore quite simple and a continuous wall is formed by placing each member **10** in turn in position, drilling holes in limb **24** of each member where desired and passing a bolt through each hole and into the threaded slot of the member in contact with the limb. When assembled, the panel construction is composed of a pair of spaced parallel panels defined by flanges **12** of the members. The distance between the panels will depend upon the length of webs **14** of the members. Insulation may be secured in the space between the panels and so also may pipes and electrical wires. Thus the panel assembly may be used to form both walls and partitions of a building.

Walls or partitions made up of such panel members have the ability to support a substantial load. For example the allowable column load of a bearing wall composed of 0.125 inch gauge aluminum panel members where the bearing wall is 8 feet in height and 2 inches thick (the distance between flanges measured along the web) is in excess of 7.8 tons per lineal foot.

With further reference to FIG. 1, the corner of a building may be formed by means of corner elements **11** and **12**. Element **12** is composed of members **40** and **42**.

Member **42** is a panel member **10** from which web **14** and L-shaped portion **18** have been removed. To form the illustrated member **40**, a panel member **10** is taken and limbs **20**, **22** and **24** are removed from the lateral end of the flange. A planar extension is then attached to the member at the lateral end. It is preferred however that the member at the corner be so positioned that there is no necessity for an extension. Thus if reference is made to FIG. 1, web **14***a* will be spaced a smaller distance apart from member **42** than that illustrated. If limbs **20**, **22** and **24** are removed from member **40**, the free lateral edge of the member will contact member **42** and there will be no necessity for an extension. Preferably elements **40** and **42** are connected by welding. Similarly element **11** is composed of portions of one or two panel members. As shown, elements **11** and **12** are connected to contiguous panel members in the same manner as are contiguous panel members **10**.

With reference to FIG. 2, elements **47** and **48** are employed to join panel members forming exterior walls with members forming partitions. Elements **47** and **48** are merely portions of panels which are cut along the length thereof. The severed edges are placed in contact with flange **13**. To hold elements **47** and **48** in contact with flange **13**, use is made of angles **49** and **50**. The angles are disposed in abutting contact with the corners defined by flanges **13** and elements **47** and **48**. The angles may be bolted or welded to the elements **47** and **48** and flange **13**.

In place of elements **40**, **42**, **46**, **47**, and **48** use may be made of a vertically disposed angle shaped or channel shaped member for joining a planar member **16** of a wall to a planar member of a partition.

With reference to FIG. 5 the manner in which a wall

composed of panel members is secured to a footing is illustrated. Angles **51** and **52** are secured to footing **54** by means of bolts and nuts **56** and panel members are bolted to angles **51** and **52**.

It will be seen that a number of like panel members will stack readily substantially without deformation. In addition, where the panels make up a wall, there is a division between the exterior and interior surface of the wall and very simple precautions will ensure that condensation forming on the exterior surface will not pass to the interior surface. Moreover by use of such panel members, bolt fastenings are concealed.

What we claim as new and desire to protect by Letters Patent of the United States is:

1. A panel member including: an elongated flange having a substantially planar intermediate portion, an L-shaped portion defining one lateral edge of said flange, said L-shaped portion having first and second legs, said first leg extending from said planar portion to said second leg, a pair of spaced apart limbs, and a third limb offset from one of said spaced apart limbs, said three limbs defining the other lateral edge of said flange, said spaced apart limbs defining a groove for receipt of a second leg of a like panel member; and an elongated web extending perpendicularly from the intermediate portion of said flange and parallel to the lateral edges thereof to define a structure having a substantially T-shaped cross-section, the edge of said web remote from said flange terminating in a pair of opposed branches which together define a slot; said slot being continuously threaded.

2. A panel construction comprising a plurality of panel members each including: an elongated flange having a substantially planar intermediate portion, an L-shaped portion defining one lateral edge of said flange, said L-shaped portion having first and second legs, said first leg extending from said planar portion to said second leg, a pair of spaced apart limbs, and a third limb offset from one of said spaced apart limbs, said three limbs defining the other lateral edge of said flange, said spaced apart limbs defining a groove; and an elongated web extending perpendicularly from the intermediate portion of said flange and parallel to the lateral edges thereof to define a structure having a substantially T-shaped cross-section, the edge of said web remote from said flange terminating in a pair of opposed branches which together define a slot; said slot being continuously threaded, said panel members being connected together by inserting a second leg of one member into the groove defined by the spaced apart limbs of a second like member and by securing the branches of the first member to the third limb of a third like member.

3. The panel construction according to claim **2** wherein each said panel member contains insulating material.

4. The panel construction according to claim **2** further including a plurality of bolts each passing through an aperture formed in the third limb of each panel member and into the threaded slot in contact with said third limb.

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JOHN E. MURTAGH, Primary Examiner

U.S. Cl. X.R.

52—275, 570, 574, 588