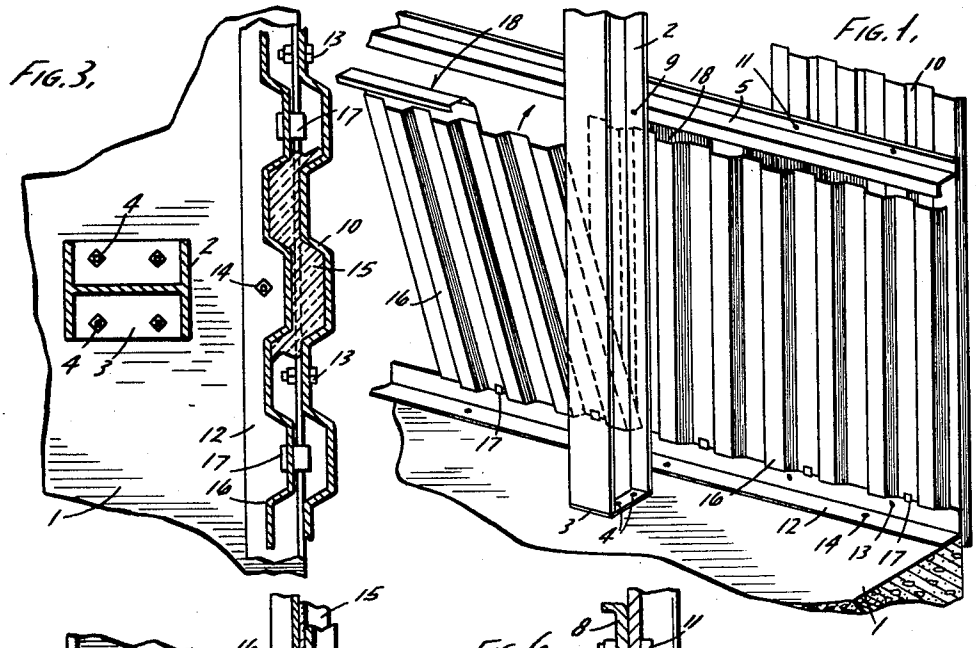
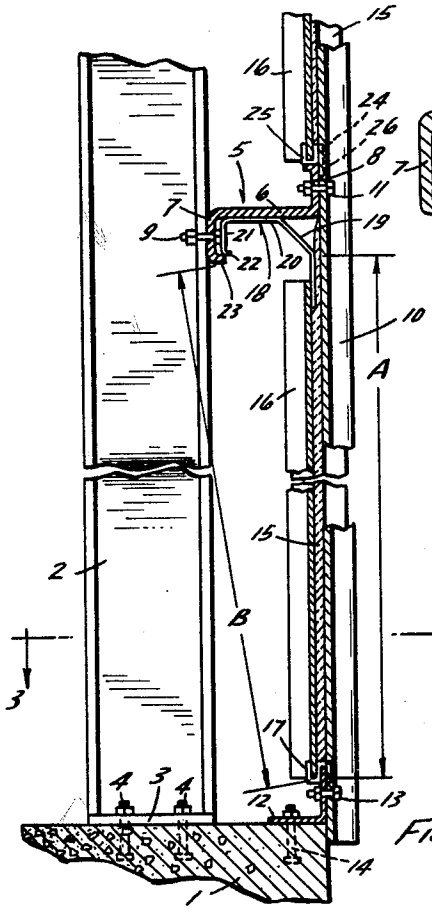
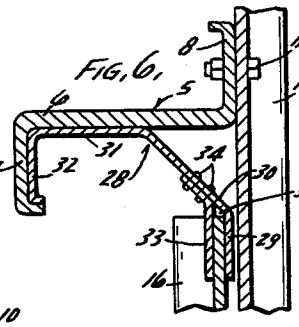
April 6, 1965 R. C. DOOLITTLE, JR 3,176,432

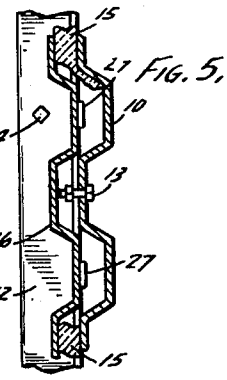
WALL PANEL

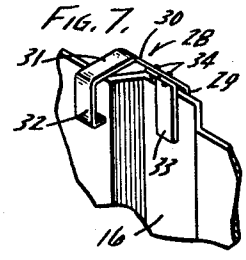
Filed Oct. 23, 1961

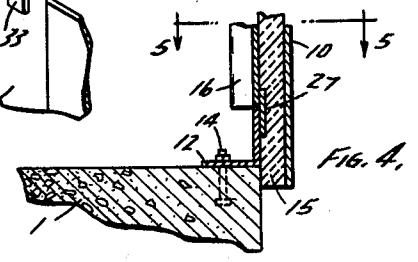
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# WALL PANEL

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This invention relates to a building structure and more particularly to a wall panel construction adapted to be used as the interior wall surface of a building to protect blanket insulation.

A great many commercial and industrial buildings are being fabricated from metal or plastic panels secured to an internal frame or skeleton. In some applications it is desired to apply blanket insulation to the walls and roof of the structure to reduce the heat loss. The insulating material, which may be rock wool or fiber glass, is generally paper backed and if it is not protected with an interior wall surface, the insulation will tear or be ripped away.

The present invention is directed to a simple and inexpensive interior panel construction to be applied to the walls or roof of a building to retain and protect the insulation. In a typical building fabricated from panels or sheets, the walls include a series of spaced vertical columns which are supported on the foundation and which are tied together by a series of horizontal Z bars. One flange of each Z bar is connected to the vertical column, while the other flange of the Z bar is connected to and supports the exterior panels which compose the outer wall surface of the building. A base angle or other support member is secured to the foundation and supports the lower edge of the panels.

A layer of blanket insulation is applied to the inner surface of the exterior wall panels and, according to the invention, a series of interior wall panels are secured to the framework and cover the insulating material. More specifically, the lower edges of the interior panels are provided with clips or lugs which engage the base support, or a lower Z bar, and the upper portions of the panels are flexible and snap into engagement with the upper Z bars to firmly hold the panel in position. The side edges of the interior panels overlap to provide a continuous interior wall for the building.

The panel of the invention is of simple construction and requires no auxiliary fasteners and can be readily assembled to the preexisting framework of the structure. The panels are merely slipped into place and the upper flexible retainer is snapped into engagement with the Z bar to firmly hold the panel in place.

The interior panels serve to protect the insulation and also add strength and rigidity to the wall or roof structure.

Other objects and advantages will appear in the course of the following description.

The drawings illustrate the best mode presently contemplated of carrying out the invention.

In the drawings:

FIGURE 1 is a perspective view of a portion of a vertical wall of a building showing an interior wall panel locked in position and a second panel being assembled with the existing framework;

FIG. 2 is a transverse section through the wall with the panel in position;

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FIG. 3 is a sectional view taken along line 3—3 of FIG. 2;

FIG. 4 is a transverse section similar to FIG. 2 and showing a second embodiment of the invention;

FIG. 5 is a section taken along line 5—5 of FIG. 4;

FIG. 6 is an enlarged fragmentary transverse section showing a modified form of the flexible retaining member; and

FIG. 7 is a fragmentary perspective view of the retaining member of FIG. 6 attached to a panel.

The drawings illustrate a wall construction for a commercial or industrial building including a foundation 1 which supports a series of vertical columns 2 having a generally H-shaped cross section. A base plate 3 is connected to the lower end of each column 2 and is secured to the foundation by a plurality of bolts 4.

The vertical columns 2 are connected together at spaced locations throughout their height by a series of Z bars 5. The drawings show only a single Z bar but in the normal building a series of Z bars will be employed with the particular number depending upon the height of the wall.

As best shown in FIG. 2, each Z bar includes a horizontal web 6, a downwardly extending flange 7 connected to one end of the web, and an upwardly extending flange 8 extending from the other end of the web. The flange 7 is connected to the columns 2 by bolts 9 while the flange 8 is secured to and supports an exterior wall panel 10 by means of bolts 11.

The lower end of each wall panel 10 is connected to the upstanding flange of a base angle 12 by bolts 13, and the horizontal flange of the base angle is secured to the foundation by bolts 14.

The external wall panel 10 is corrugated with the side edges of each panel overlapping the side edges of adjacent panels to provide a continuous exterior wall surface.

A layer of insulation 15 is applied to the interior surface of the exterior wall panels 10 to reduce heat transfer between the interior of the building and the exterior. The insulation may be any of the common types such as rock wool, glass fiber or foam plastic insulation.

To protect the insulation 15 from damage, a series of interior wall panels 16 are connected to the wall structure. The interior wall panels 16 are corrugated with the corrugations running vertically. The lower edge of each wall panel 16 is connected to the base angle 12 by a series of S clips 17 with one open end of the S clip fitting freely over the upstanding flange of base angle 12 and the other open end of the S clip supporting the lower edge of the panel 16.

The panels can be metal, plastic, wood or the like and can be flat or corrugated or provided with any other surface contour. It is preferred to employ corrugated panels for the corrugations provide increased strength for a given thickness of material.

A flexible or deformable retaining member 18 is secured to the upper edge portion of the panel 16 and is adapted to be snapped into engagement with the Z bar 5 to retain the panel in position. The retaining member 18 is formed from a generally flat piece of sheet metal and may extend a portion of the width of the panel 16, as shown in the drawings, or it may extend substantially the full width of the panel.

The retaining member 18 is provided with a diagonally extending portion 19 and a connecting horizontal por-

tion 20 which is disposed flatwise beneath the web 6 of the Z member.

A vertical section 21 of the retaining member 18 extends downwardly from horizontal section 20 and is disposed flatwise with respect to the depending flange 7. The retaining member 18 is also provided with a lip 22 which engages the inwardly extending lip 23 of the flange 7 of Z bar 5 to prevent the retaining member from moving downwardly.

To assemble the panel 16 with the pre-existing external wall structure, the S clips 17 are initially installed on the base angle 12 and the lower edge of the panel 16 is inserted into the open end of the S clips. The retaining member 18 is then bent downwardly and the panel is pivoted toward the external wall with the retaining member passing beneath the lip 23 of the Z bar. It is important, of course, that the distance A shown in FIG. 2 is less than the distance B so that the panel can be moved outwardly against the layer of insulation 15 when the retaining member 18 is deformed.

After the panel 16 is disposed flatwise against the insulation, the retaining member 18 is released and it springs back into engagement with the Z bar to firmly retain the panel against the insulation.

As best shown in FIG. 3, the side edges of the panels 16 are overlapped to provide a continuous interior wall structure and the overlapping portions may be secured together by screws if desired.

In the normal building construction there may be a series of Z bars spaced throughout the height of the wall in which case a series of panels 16 could be disposed between each pair of Z bars. When installing the panels between the Z bars, a series of clips 24 are employed to connect the panels 16 and the lower Z bar of the pair. As best shown in FIG. 2, each clip 24 includes a U-shaped section 25 which rests on the flange 8 of the lower Z bar and also includes a tail 26 which extends downwardly behind the flange 8 and prevents outward displacement of the clip.

While the above description is directed to the use of the panels in a wall construction, it is contemplated that the panels may also be employed in the roof, ceiling, floor or any other portion of a building construction. The term "wall" as used in the description is intended to include any portion of the building and is not limited to the vertical side walls thereof.

FIGURE 4 shows a second embodiment of the invention in which the S clips 17 are replaced by a series of lugs 27 which are permanently secured in spaced relation to the lower edge of the panel 16. The lugs 27 are welded to the outer surface of the panels 16 and are adapted to extend behind the upstanding flange of the base angle 12 with the lower edge of the panel 16 resting on the upper edge of the flange of the base angle. The shape and function of the retaining member 18 is identical to that described above.

FIGS. 6 and 7 show a modified form of flexible retaining member. In this embodiment the retaining member 28 is removably connected to the upper edge of the panel 16. The retaining member 28 includes a vertical section 29 which is located behind the panel 16, a diagonal section 30, a horizontal section 31 which extends outwardly from the diagonal section and is disposed flat against the web 6 of Z bar 5, and a vertical section 32 which extends downwardly from horizontal section 31 and is disposed flat against flange 7 of the Z bar 5. In addition, the retaining member includes an outer member 33 which is connected to diagonal section 30 by rivets 34. The lower end of member 33 is spaced from section 29 to provide a slot 35 which receives the upper edge of panel 16.

To assemble the panels, the retaining members 28 are attached to the panels 16 by inserting the upper edge of the panel into the slots 35 of the retaining members. The retaining members 28 are then deformed or bent in the manner described with respect to members 18 and snapped into position with the Z bar 5.



The present invention provides a simple and inexpensive means for applying an interior wall surface to a building construction to protect the layer of insulation and provide added strength and rigidity for the wall. The panels may be readily slipped into place and locked without the use of any auxiliary fasteners or the like. By eliminating fasteners and cutting or forming operations, the panels can be quickly installed with a minimum of labor which thereby reduces the overall cost of the panel installation.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter regarded as the invention.

I claim:

1. In a building, a foundation, a generally vertical support member mounted on the foundation, a base member secured to the foundation and having an upwardly extending portion, a beam disposed generally parallel and in spaced vertical relation to the base member and secured to said vertical support member, said beam having an outer flange and a downwardly extending inner flange spaced inwardly of said outer flange, an outer panel having a series of generally vertical inwardly and outwardly extending convolutions with the inwardly extending convolutions extending inwardly of the building, first connecting means connecting the outer panel to the upwardly extending portion of said base member, second connecting means connecting the outer panel to the outer flange of the beam, an inner panel located inwardly of the outer panel and having a series of generally vertical inwardly and outwardly extending convolutions with the inwardly extending convolutions of the inner panel being disposed in alignment with the inwardly extending convolutions of the outer panel, third connecting means connecting the inner panel to the upwardly extending portion of the base member, and a flexible retaining member connected to the upper edge portion of the inner panel, said retaining member having a deformable section extending upwardly and inwardly at an angle to said inner panel in a direction away from the outer panel and disposed in yieldable bearing engagement between the inner flange of the beam and the outer panel and holding the inner panel in position with respect to the outer panel.

2. The structure of claim 1 in which said third connecting means comprises a series of S-shaped clips with each clip having oppositely opening ends, one open end of each clip being engaged with the upwardly extending portion of the base member and the other open end receiving the lower edge of the lower panel.

3. The structure of claim 1 in which said third connecting means comprises a lug connected to the lower edge portion of the inner panel and is disposed between said upwardly extending portion of the base and the outer panel to prevent inward displacement of the inner panel with respect to the outer panel.

4. In a building, a supporting structure, a first support member secured to said supporting structure, a second support member secured to said supporting structure and disposed generally parallel and in spaced relation to said first support member and having an outer flange and an inner flange, said inner flange being spaced inwardly relative to said outer flange and facing in a direction toward said first support member, an outer panel having a series of inwardly and outwardly extending convolutions with the inwardly extending convolutions extending inwardly of the building, first connecting means connecting the outer panel to said first support member, second connecting means connecting the outer panel to the outer flange of the second support member, an inner panel located inwardly of the outer panel and including a series of inwardly and outwardly extending convolutions with the inwardly extending convolutions of the inner panel being disposed

in alignment with the inwardly extending convolutions of the outer panel, third connecting means connecting the inner panel to the first support member, a layer of insulating material disposed between said inner and outer panels, and a flexible retaining member connected to the edge portion of the inner panel adjacent said second support member, said retaining member having a deformable section extending upwardly and inwardly at an angle to said inner panel in a direction away from the outer panel and disposed in yieldable bearing engagement between the inner flange of the second support member and the outer panel and holding the inner panel in position with respect to the outer panel.



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