Aug. 11, 1959 W. B. WALKER 2,899,028

PANEL CONSTRUCTION

Filed Dec. 21, 1956

FIG-1

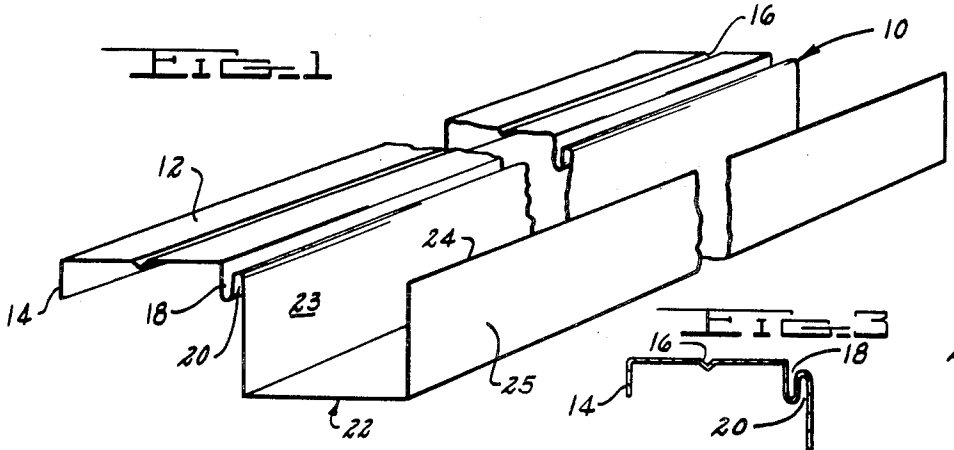


FIG-3

FIG-2

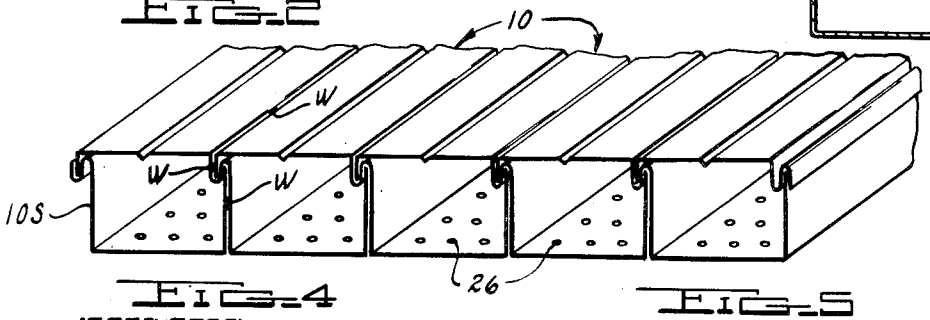


FIG-4

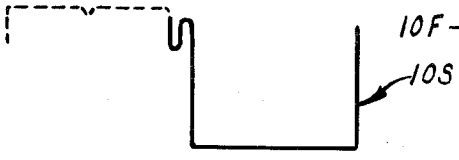


FIG-5

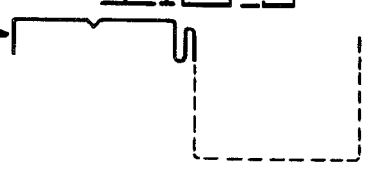


FIG-6

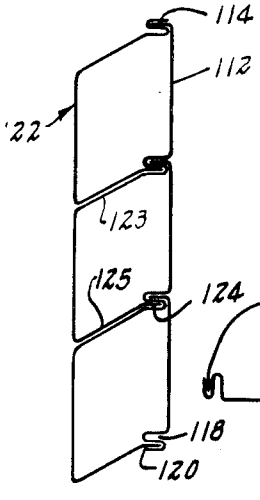


FIG-7

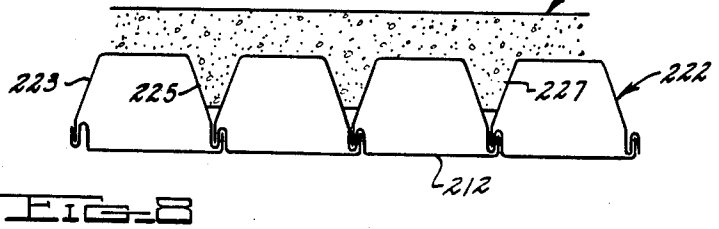
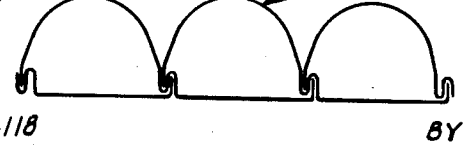


FIG-8



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PANEL CONSTRUCTION

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5 Claims. (Cl. 189—34)

The present invention relates to a building panel construction, and more specifically to a metal building panel construction which is particularly useful in ceiling and floor structures.

In the art of metal building construction, several panel sections have been developed in an effort to provide a strong and attractive design which would readily be accepted by architects and builders. In the creation of such a panel, it is important to consider labor and material costs, efficiency in performing the intended function, and appeal to the building designer.

It is a principal object of the present invention to provide a sturdy building panel which can be quickly and easily handled and assembled in the field, and which also is adaptable for ready assembly at the factory site.

It is another object of the present invention to provide a one-piece building panel which is simple in construction, easy and economical to produce, and efficient in use.

It is a further object of the present invention to provide a metal building panel, particularly adapted for floor and ceiling deck construction, which panel results in a deck formed of box sections disposed closely together to form a flat top and bottom.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawings:

Fig. 1 is a perspective view of a one-piece metal building panel constructed according to the present invention, a portion of the length of the panel being broken out to conserve space. This construction is particularly well adapted for use with a plywood and tile type floor.

Fig. 2 is a fragmentary perspective view of a metal building deck which is constructed of several building panels such as shown in Fig. 1.

Fig. 3 is a cross-section of the panel shown in Fig. 1.

Fig. 4 is a cross-section of a panel such as shown in Fig. 1, the portion shown in dotted lines being removed to provide a starting section.

Fig. 5 is a cross-section of a panel such as shown in Fig. 1, the portion shown in dotted lines being removed to provide a finishing section.

Fig. 6 is a top plan view of a section of a wall formed by modifying the panel design shown in Fig. 1.

Fig. 7 is a fragmentary sectional elevation of a concrete floor structure formed by use of a modified panel.

Fig. 8 is a fragmentary sectional elevation of a deck section showing a rounded cell configuration.

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is

to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring particularly to Figs. 1 and 3 of the drawings, a metal building panel is designated at **10**. The panel is formed of a suitable sheet material, such as steel or aluminum, by a rolling operation without further fabrication. The sheet is formed into a flat top portion **12** which is normally six or eight inches wide. A downturned flange **14** is provided at one end of the top portion **12**. This flange **14** is disposed at substantially a right angle to the top portion **12** and is approximately one inch long. A reinforcing rib **16** may be formed in the flat top portion **12** by a V-shaped depression as shown.

At the other end of the flat top portion **12**, the panel is bent downwardly and then upwardly to provide an upwardly opening channel **18**. This channel **18** is slightly more than one inch in depth since it is intended to seat a flange **14** on an adjacent panel in a completed deck construction.

The panel is then bent downwardly again to a suitable depth such as 1½, 3 or 4½ inches, depending on the intended usage, to complete a substantially S-shaped bend. This provides a downwardly opening channel **20**. The panel bending is continued until an open top box-shaped cell section **22** is provided having sidewalls **23** and **25** and an upwardly extending edge **24**. The cell section is preferably six or eight inches wide.

Fig. 2 of the drawings shows how several panel sections **10**, such as shown in Fig. 1, are joined to form a construction such as a ceiling or floor deck. The starting panel section is shown at the left end in Fig. 2, and is also shown in Fig. 4. It will be noted that the flat portion **12** has been removed. The starting panel section is designated as **10S**.

The finishing section is designated as **10F**. This section has the cell portion **22** removed. Between the starting section **10S** and the finishing section **10F** (Fig. 2), four regular panels **10** are disposed. The panels are joined together by welding in suitable places such as shown at W. This panel deck construction provides a substantially flush top surface and a substantially flush bottom surface. In addition, the cell portions, which are disposed closely together, greatly strengthen the deck construction. The one piece panels are suitable for easy trimming to provide modified sections such as the starting and finishing sections. A multiple piece assembly would be difficult to cut to size.

The cell portions **22**, in addition to providing maximum strength, provide housings within which wires or conduits can be positioned. Also, insulating material can be placed within those housings if desired.

The deck shown in Fig. 2 could be used as a floor deck, for example. In such an instance, a material such as plywood would be applied on top of the deck, and a finishing material such as tile would be applied over the plywood. The bottom portion of the deck might well constitute a ceiling for the space beneath it. If so, the holes **26** can be provided in the cell portions to afford an acoustical type ceiling.

Fig. 6 demonstrates the use of my panel in an outside wall construction. The flat portion **112**, downturned edge **114**, channels **118** and **120**, cell portion **122**, cell sidewalls **123** and **125**, and upturned edge **124** are provided similar to the embodiment shown in Fig. 1. However in this embodiment the sidewalls **123** and **125** of the cell **122** are slanted. This renders the wall construction air tight, since the outside air does not blow directly into the juncture of adjoining cells.

Fig. 7 shows a modified form of my panel which is used with a concrete surface, such as a floor construction for example. It will be noted that in this construction

the cell sidewalls 223 and 225 are slanted toward each other. Also, the flat portions 212 face downwardly, and the cells 222 extend upwardly. In this position, notches are provided between the cells to form step portions 227 in the concrete C. The resulting concrete surface is securely affixed to the metal panel deck.

Fig. 8 is another modification of the present invention showing the use of rounded cells 322.

From the foregoing description, it will be seen that I have provided a simple and effective panel construction which is conducive to versatile and attractive building design.

Having thus described my invention, I claim:

1. A one piece building panel, comprising a flat sheet formed into two adjacent opposed box members, each having a flat body portion and end flanges; a narrow downturned first end flange at the outer end of the first flat body portion; a wide upturned end flange at the opposite outer end of the second flat body portion; both box members integrally joined by an S-shaped intermediate section formed by the inside end flanges of the opposed box members, said S-shaped section forming an upwardly opening first groove and a downwardly opening second groove; said box members being of substantially the same width but different depths, the upwardly opening first groove of the S-shaped section being adapted to seat the downturned narrow end flange of a similar panel and the downward opening second groove beam adapted to seat the upper end portion of the upturned end flange of a similar panel.

2. A one piece building panel as defined in claim 1 wherein the flat body portion of each opposed box member has a decorative longitudinal strengthening rib placed therein.

3. A one piece metal building panel which is cooperable with a plurality of similar panels to render possible a cellular deck construction that is substantially flat on both top and bottom, comprising a flat top portion having a down-turned channel at one end thereof and an up-turned channel at the other end thereof, said up-turned and down-turned channel members separated by an S-shaped intermediate section forming an upwardly opening first groove and a downwardly opening second groove on the inside integrally joined ends of said channel members, the upwardly opening portion of the S-shaped section being adapted to seat the down-turned end flange of a similar panel, the downwardly opening portion of the S-shaped section seating the up-turned edge flange of another similar panel.

4. A building panel as defined in claim 3, wherein a section of the cell has sidewalls slanted in the same direction; the cooperation of said similar panel members to form a double walled cellular structure, the flat top and bottom portions of said panel members being maintained in generally parallel relationship.

5. A building panel as defined in claim 3 wherein a section of the cell has sidewalls slanted toward each other; the cooperation of said similar panel members to form a double walled cellular structure, the flat top and bottom portions of said panel members being maintained in generally parallel relationship.

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