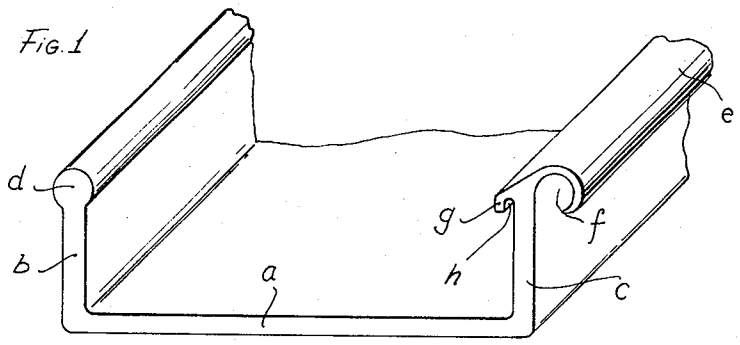
Nov. 28, 1967 P. ABCIUK 3,354,595

ACOUSTIC PANELS AND CEILINGS

Filed July 27, 1965

Fig. 1



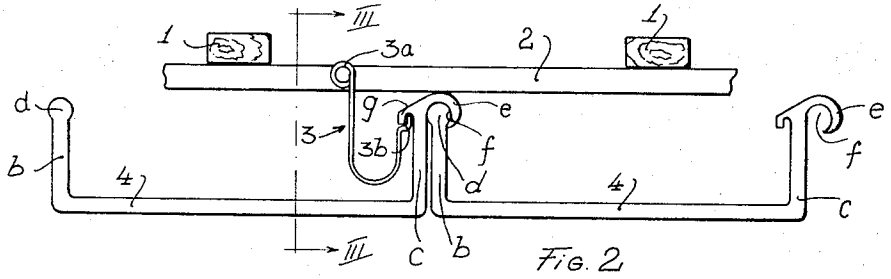




Fig. 2

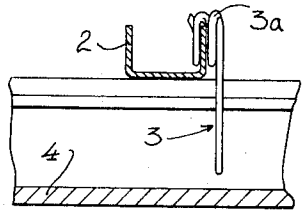



Fig. 3

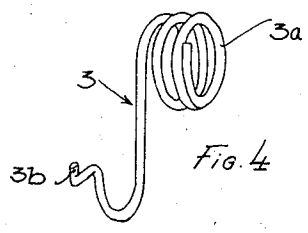



Fig. 4

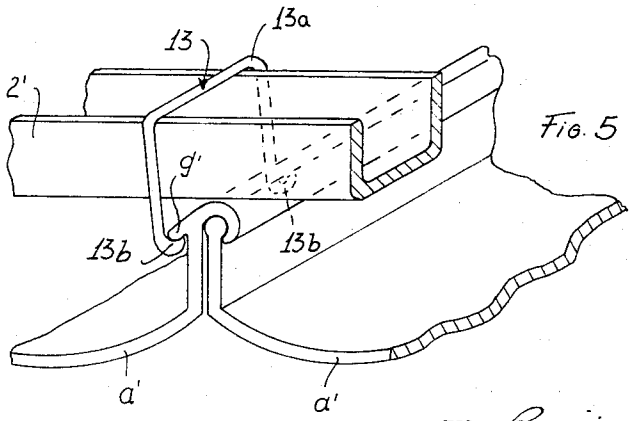



Fig. 5

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# ACOUSTIC PANELS AND CEILINGS

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12 Claims. (Cl. 52—485)

## ABSTRACT OF THE DISCLOSURE

A panel is described particularly useful for making acoustical ceilings, comprising a longitudinal extending bottom wall, a pair of longitudinally extending side walls, and an open top. One of the side walls is formed with a bead of increased thickness or width extending along the top, and the top of the other side wall is resilient and is formed with a longitudinally extending recess adapted to receive the bead of an adjacent panel by a snap-action fit. A rib is formed along the inner surface of the recessed side wall engageable by clips for supporting the panel from the ceiling.

The present invention relates to panels particularly useful for the construction of acoustic ceilings, and more particularly to panels which are suspended below a ceiling to provide improved acoustic conditions in the room so equipped.

It is well known to attach panels of different materials to the ceiling of a room. The arrangements used, however, are rather costly both in view of the materials used and methods of making the panels, and in view of the difficulties in firmly and lastingly attaching the panels to a cast or otherwise constructed ceiling.

It is also known to suspend metal boxes or box-like structures from special holders which are affixed to the ceiling creating an airspace between the built-up ceiling of the room and the lowermost side of the box-like structures. This arrangement has also not proved satisfactory, probably in view of the fact that the metal boxes or box-like structures tend to vibrate in resonance with acoustic effects in the respective room.

It is an object of the present invention to provide improved elements for constructing acoustic ceilings, which elements could be made of plastic having the advantage of being an inexpensive material and easily produced by extrusion methods. It is a further object of the invention to provide means for quickly, firmly and lastingly affixing the elements in a room to be equipped with an acoustic ceiling.

According to the invention, the new elements are in the form of panels comprising a longitudinally extending bottom wall, a pair of longitudinally extending side walls, and an open top. One of the side walls is formed with a bead of increased thickness extending along its top and the top of the other side wall is resilient and is formed with a longitudinally extending recess for receiving with a forced or snap-action fit the bead of an adjacent panel. In addition, one of the side walls is further formed with an inwardly extending projection adapted to be engaged by a supporting member for supporting the panel from the ceiling.

The invention also concerns holding or supporting arrangements for the panels, and it further concerns the acoustic ceiling produced by use of these panels and their holding members.

The invention may take several forms, but is herein described with reference to the accompanying drawings which illustrate, by way of example only, several preferred embodiments of the invention.



In the drawings:

FIG. 1 is a fractional perspective view of one panel constructed in accordance with the invention;

FIG. 2 is an end elevational view of two of such panels mounted to the ceiling, and thereby constituting a part of an acoustic ceiling;

FIG. 3 is a sectional view along lines III—III of FIG. 2;

FIG. 4 is a perspective view of one form of clip used for holding or suspending the new panels from a ceiling; and

FIG. 5 is a perspective view, partly in section, illustrating a slightly different form of panel and also different means for suspending the panel from the ceiling.

With reference first to FIG. 1, it is seen that the new panel illustrated is a trough or gutter-like structure having a longitudinally extending bottom wall *a*, a pair of longitudinally extending side walls *b* and *c*, and an open top. The bottom wall may, if desired, be provided with perforations. Side wall *b* is formed with a bead *d* of increased thickness or width along its top free edge. Side wall *c* is formed at its top with a bent-over edge *e* which defines a recess or groove *f* opening in the direction of the bottom panel *a*. This recess *f* is adapted to receive in a snap-action fit the bead *d* of an adjacent panel, as shown in FIG. 2 (also see FIG. 5), when the panels are assembled for making an acoustic ceiling.

Sidewall *c* is formed with an inwardly extending projection in the shape of a rib *g* extending longitudinally along the inner surface of the upper portion of the side wall. This rib is adapted to be engaged by a supporting member, generally designated **3**, for supporting the panel from the ceiling. Rib *g* is formed with a longitudinally extending groove or recess *h* along its under surface for receiving the supporting member **3**.

The supporting member **3** is in the form of a clip having a first part **3***a* adapted to be releasably held to the ceiling, and a second part **3***b* adapted to engage the rib *g* of the panel. Clip **3** is made by bending a wire to form a plurality of coils constituting part **3***a* at one end, and a hook-shaped configuration constituting part **3***b* at its opposite end.

The arrangement for affixing the new panels to a ceiling is illustrated in FIG. 2. A number of timber beams **1** are secured to the ceiling, and to these are attached several profile bars **2**, which are preferably of U-shape in cross-section but which may also be L-shape in cross-section. These bars may be affixed by nailing or screwing them to the beams **1**, or they may be mounted and attached to the cast or otherwise constructed ceiling by other conventional means. The coiled portion **3***a* of clip **3** is applied to a vertical flange of the bar **2**, and the other end **3***b* of the clip is applied to the underside of rib *g* of one of the acoustic panels. An appropriate number of clips **3** are placed along the length of the bar **2** and of the panel. Another panel is then mounted by forcing bead *d* into recess *f* of the mounted panel, whereby the mounted one supports, by a snap-action fit, the bead *d* end of the new one. Another group of clips are then mounted at the opposite end of the newly mounted panel, and the process is repeated until the complete ceiling is assembled.

While the panels illustrated in FIGS. 1–4 are shown as having a flat or plane bottom wall substantially perpendicular to the side walls, it will be appreciated that the bottom wall could be of another configuration, such as of a convex configuration, in which case the acoustical ceiling produced will have somewhat of a corrugated appearance. This is shown in FIG. 5, and also shown in this figure is the use of a different type of supporting member or clip. In this case, the U-bars **2'**, affixed to the ceiling in any conventional manner, carry the panels by means of clips **13**. Each of the latter clips is in the form

of a wire bent into a U-shaped configuration **13***a* constituting the holding part of the clip, and terminating in a pair of hook-shaped ends **13***b* constituting the panel-supporting part. The panel itself is of the same shape and construction as in the embodiment illustrated in FIGS. 1–4, except the bottom wall *a'* is convex rather than flat.

The panels illustrated in FIG. 5 are assembled by use of the clips **13** in the same manner as in the embodiment illustrated in FIGS. 1–4, except that the clip **13** is applied to straddle the U-bars **2'** and the hook ends **13***b* of the clips are applied to the underside of grooves *g'* to support the panels.

The panels and supporting members described are very efficient sound deadening elements. They do not vibrate in resonance with sounds produced in the room and are of light weight, of inexpensive construction as they can be produced by extrusion, and can be suspended easily from the clips described. Moreover, they can be produced in different colored plastics and can be easily cleaned. In addition, they may be simply and quickly removed and reapplied, for example to provide access to electrical conduits or the like between the acoustic panels and the actual ceiling.

While the panels illustrated are particularly useful for making acoustic ceilings, it will be appreciated they can also be used for lining ceilings, walls or the like for decorative or other purposes. Moreover, they can be made of materials other than plastic, for example aluminum.

Many further changes, variations and applications of the illustrated embodiments of the invention may be made within the scope of the invention as defined in the following claims.

I claim:

**1.** A panel particularly useful in making acoustical ceilings, comprising a longitudinally extending bottom wall, a pair of longitudinally extending side walls, and an open top, one of said side walls being formed with a bead of increased thickness extending along the top, and the top of the other side wall being resilient and formed with a longitudinally extending recess adapted to receive by a snap-action fit the said bead of an adjacent panel, one of said side walls being further formed with an inwardly extending projection adapted to be engaged by a supporting member for supporting the panel from the ceiling.

**2.** A panel according to claim **1**, wherein said inwardly extending projection is formed on said other side wall and extends along the upper portion thereof.

**3.** A panel according to claim **1**, wherein said inwardly extending projection is in the shape of a rib extending longitudinally along the inner surface of the upper portion of the side wall.



**4.** A panel according to claim **2**, wherein said rib is formed with a longitudinally extending groove along its under surface for receiving the supporting member.

**5.** A panel according to claim **1**, wherein said longitudinally extending recess of said other side wall is formed by a bent-over edge thereof opening in the direction of the bottom of the panel.

**6.** A panel according to claim **1**, wherein said side walls are both substantially perpendicular to said bottom wall.

**7.** A panel according to claim **1**, wherein said bottom wall is substantially flat.

**8.** A panel according to claim **1**, wherein said bottom wall is convex in cross-section.

**9.** In combination, a panel as defined in claim **1** and a supporting member, said supporting member being in the form of a clip comprising a first part adapted to be releasably held to the ceiling and a second part adapted to engage said inwardly extending projection of the panel.

**10.** The combination according to claim **9**, wherein said clip comprises a wire bent to form a plurality of coils constituting said first part, and terminating in a hook-shaped end constituting said second part.

**11.** A combination according to claim **9**, wherein said clip comprises a wire bent into a U-shaped configuration constituting said first part and terminating in a pair of hook-shaped ends constituting said second part.

**12.** An acoustic ceiling comprising an assembly of a plurality of panels each according to claim **1**, the bead of one panel being received in the longitudinally extending recess of the adjacent panel, and a plurality of supporting members, supporting said assembly from the ceiling.


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