May 5, 1931. T. C. HOWARD 1,803,390

ACOUSTIC WALL OR CEILING STRUCTURE

Filed Nov. 20, 1928 2 Sheets-Sheet 1

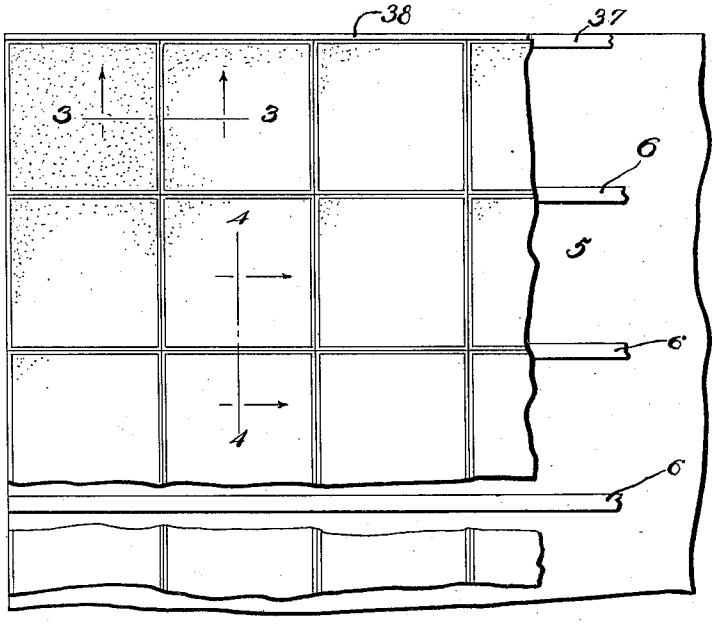


Fig. 1

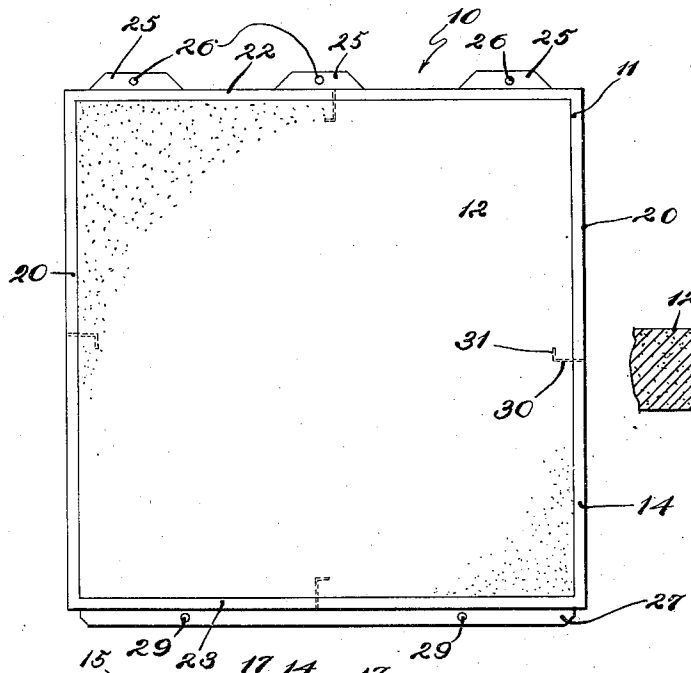


Fig. 2

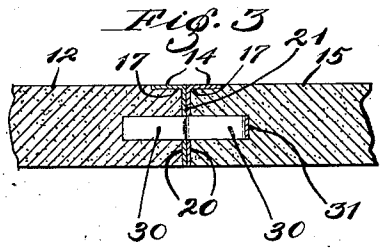


Fig. 3

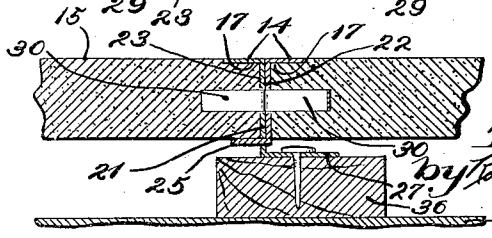


Fig. 4

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ACOUSTIC WALL OR CEILING STRUCTURE

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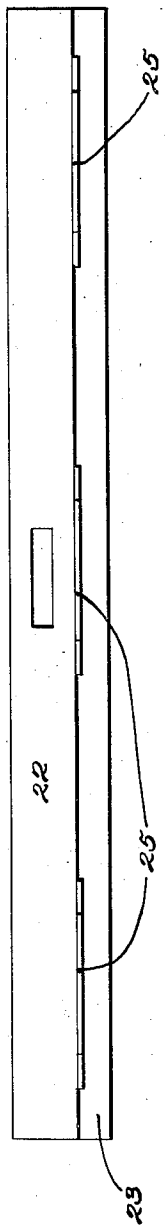


Fig. 5

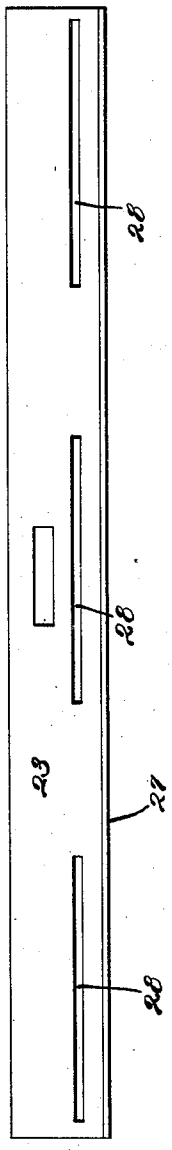


Fig. 6

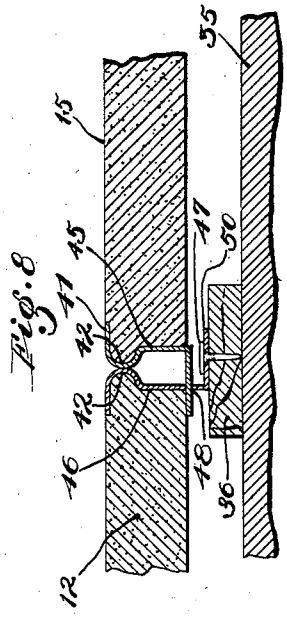


Fig. 8

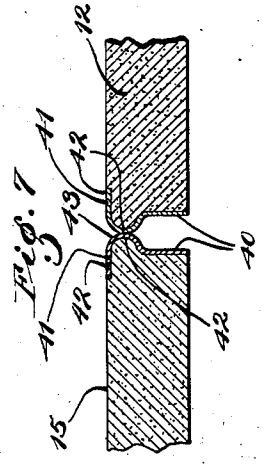


Fig. 7

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Patented May 5, 1931 1,803,390

UNITED STATES PATENT OFFICE

THOMAS CLARK HOWARD, OF BROOKLINE, MASSACHUSETTS

ACOUSTIC WALL OR CEILING STRUCTURE

Application filed November 20, 1928. Serial No. 320,696.

This invention relates to an improvement in an acoustic wall or ceiling structure and more particularly in acoustic units, in certain of the details of construction thereof, and in the method of acoustic treatment by installing such units.

This invention is shown and described in connection with acoustic tiles, one element of which is acoustic casting plaster, but is obviously applicable to other forms of acoustic material, and hence the reference to acoustic casting plaster is to be taken merely as illustrative and not as limitative. Prior to this invention acoustic tiles have been installed almost exclusively in new buildings due to the fact that it has previously been necessary to install them with the help of masons or plasterers, the tiles being attached directly to the surface to be treated by cement, plaster or similar material, which material must be allowed to dry for several days under certain fixed conditions of temperature. Furthermore, the gaps between the tiles must be pointed in the usual manner. While such can be done in old buildings, it is very objectionable because of the amount of delay, muss and disorder that necessarily results from such installation.

The primary object of this invention is to provide means and a method for the acoustic treatment of surfaces in either old or new buildings without the need of masons or plasterers but with the help only of carpenters or even of unskilled laborers, the installation being quickly and rapidly made and the delay, muss and disorder mentioned above being eliminated.

A further object of this invention is to provide an acoustic structure comprising a plurality of units, each unit including a tile of acoustic material and a frame therefor, said units being assembled so that the outer faces of the tiles are exposed thus forming a substantially continuous acoustic surface.

In carrying out the illustrative form of this invention the selected acoustic material is shaped into the form of tiles and mounted in suitably formed frames. Each frame and tile thus constitutes a unit which can be quickly and easily installed upon the surface to be treated. When acoustic casting plaster is used either exclusively or as an element the material is cast directly into the frame which thus acts not only as a mold for the plaster but also as a protection for the edges of the plaster, preventing them from being chipped or broken. In following the former practice there was considerable breakage of the tiles under the handling which they must of necessity undergo due to the lack of protection at the edges. Furthermore the frame when the tiles are installed removes the necessity of the pointing previously required.

In the drawings,

Fig. 1 is a fragmentary view, partly broken away, of a surface which has been treated with acoustic units in accordance with this invention;

Fig. 2 is a front elevation of one form of acoustic unit that might be employed;

Figs. 3 and 4 are sectional views on an enlarged scale taken along the lines 3—3 and 4—4 of Fig. 1;

Fig. 5 is an enlarged elevation of the upper edge of the unit as shown in Fig. 2;

Fig. 6 is a similar view of the opposite edge of the unit; and

Figs. 7 and 8 are sectional views similar to Figs. 3 and 4, illustrating another form of unit that might, if desired, be employed.

The acoustic unit 10 comprises a frame 11 which may be, as here shown, rectangular in conformation and a body of acoustic material 12 hereinafter for convenience designated as a tile supported at its edges by the frame. The frame 11 which engages the edges of the tile has a continuous flange 14 extending over the outer face 15 of the tile. The frame is bounded by four walls which as shown in Figs. 3 and 4, provide with the flange 14 pockets 17 in which the outer edges of the tile are received.

As shown in the drawings, the walls 20 of the frame 11 abut upon the surface 21 while the walls 22 and 23 not only abut upon the surface 21 but are also provided with interlocking means at the inner face of the unit for a purpose to be described.

The frame is provided with a plurality of tongues 25 which project outwardly from the

wall 22 at the inner face of the unit (see particularly Fig. 4) each tongue having a hole 26 therein. The wall 23 is longer than the other walls and terminates in a tongue 27 which also projects outwardly from the body of the unit, as shown particularly in Fig. 4, and extends substantially the length of the wall. In the wall 23 are provided a suitable number of slots 28 which receive the tongues 25 when the units are assembled as will be set forth hereinbelow, while the tongue 27 has holes 29 therein.

The tile 12 when formed of acoustic casting plaster is cast directly into the frame 11 which acts as a mold therefor, the outer edges of the tile entering the pockets 17. In order to tie the tile to the walls of the frame each wall is provided with one or more inwardly projecting fingers 30 which may be, as shown, integral with the wall. Each finger 30 extends at right angles to the wall and is provided with a flanged tip 31 parallel to the wall. After the plaster has set, the fingers prevent any separating movement of the walls relative to the tile.

The surface to be treated is indicated generally in Fig. 1 by the numeral 35 and preferably is provided with a series of furring strips 36 which extend parallel to each other and are secured to the surface 35 in any desired manner and to which strips the units are attached. The furring strip at one edge of the surface 35, for example the upper one 37 in Fig. 1, preferably is made thicker than the other furring strips 36. The units are installed in the following manner beginning with those attached to the furring strip 37.

The unit at one corner, which may be arbitrarily selected, is attached to the upper furring strip 37 by tacks, nails, screws or other fastening means passed through the holes 26 in the tongues 25. The unit is then secured to the next furring strip 36 by similar fastening means passed through the holes 29 in the tongue 27. The difference in height between the furring strip 37 and the other furring strips is preferably such that the upper row of units are secured parallel to the surface 35. All the units in the upper row may first be installed and the other units are fixed in position by inserting the tongues 25 of each unit through the slots 28 in the unit above. Each unit is then attached to the surface in this position by fastening means passed through the holes 29 in the tongues 27. The units below the upper row are in the plane thereof as shown in Fig. 4, the slots 28 being formed in the walls 23 at the inner face of the tile.

In view of the fact that it has often been found true in the old buildings that the surfaces are not even, it is sometimes impossible to locate the outer faces of all the tiles in the same plane. Due to the surface lines 21 along which the units abut, it is possible in installing the units to allow for this variance in the contour of the surface 35 and the frames 11 being preferably made of light material the tongues 25 and 27 can be bent as desired in order to interlock the tiles, even though they are not in the same plane. The tongues 25 of the upper row of units and the tongues 27 of the lower row obviously prevent the edges 22 from contacting with the adjoining surfaces which are usually at right angles to the surface 35. The spaces which are therefore left at these edges may be filled by a strip 38 of suitable contour and material. Moreover it is often found that spaces are left adjacent the other outer rows which spaces may be filled with similar strips.

The embodiment shown in Figs. 7 and 8 differs from that previously described solely in the form of the frame which is employed. Referring to these figures, it will be noted that the walls 40, 45 and 46 of the frame terminate at the outer face of the tile in flanges 41 which are at right angles to the walls. The walls preferably are provided adjacent the flanges 41 with beads 42 of semicylindrical contour so that, as shown in Figs. 7 and 8, when units so made are assembled the beads 42 of the abutting edges come into contact. The walls 45 and 46 of this embodiment correspond to the walls 22 and 23 of the first-described embodiment, the walls 45 being also provided with tongues 47 which enter slots 48 in the walls 46. The wall 46 also is provided with a tongue 50 at right angles thereto. The tongues 47, slots 48, and tongues 50 correspond in form, purpose and function to the tongues 25, slots 28, and tongues 27 of the first embodiment and the units are interlocked and mounted upon the surface 35 in the manner described above. These units, due to the line contact between the adjoining instead of a surface contact as in the first embodiment are free to adapt themselves to the contour of the wall being treated.

While two embodiments of this invention have been shown and described, I am not limited thereto since other embodiments could be made without departing from the spirit and scope of this invention as set forth in the following claims.

I claim:

1. An acoustic unit including a frame and a body of acoustic material supported by the walls of said frame, the body being of acoustic casting plaster introduced in plastic form and allowed to set in said frame, the outer face of the plaster being exposed whereby a plurality of such units form a substantially continuous acoustic surface, tongues projecting outwardly from the walls of the frame, said tongues constituting part of the means for interlocking abutting units and fingers projecting inwardly from the walls of the frame to engage the body of acoustic mate-

rial when plastic and to tie it when set to the walls of the frame.

2. A frame for an acoustic unit comprising a continuous band forming an enclosure into which acoustic casting plaster may be introduced in plastic condition, said band including walls, a continuous flange at one edge of said walls, tongues outwardly projecting from the opposite edge of certain walls, one of said tongue providing walls having slots therein through which the tongues of an adjacent frame may be passed so that the edges of said tongues providing walls having slots in the same plane, and means for fastening the slotted wall of the frame to its support.

3. A frame for an acoustic unit comprising a continuous band forming an enclosure into which acoustic casting plaster may be introduced in plastic condition, said band including walls, a continuous flange at one edge of said walls, tongues outwardly projecting from the opposite edge of certain walls, one of said tongues providing walls having slots therein through which the tongues of an adjacent frame may be passed so that the edges of said frames abut with the plaster therein in the same plane, and means for fastening the slotted wall of the frame to its support, said means being concealed by the adjacent frame.

4. A frame for an acoustic unit comprising a continuous band forming a rectangular enclosure into which acoustic casting plaster may be introduced in plastic condition, said band including walls, tongues outwardly projecting from one of said walls, a tongue outwardly projecting from another of said walls, which wall is provided with slots adapted to receive the tongues projecting outwardly from a wall of an adjacent frame whereby the walls abut and the plaster in the adjacent frames are in the same plane, and means for securing the tongue of the slotted wall to the frame support.

5. A frame for an acoustic unit comprising a continuous band forming a rectangular enclosure into which acoustic casting plaster may be introduced in plastic condition, said band including walls, tongues outwardly projecting from one of said walls, a tongue outwardly projecting from another of said walls, which wall is provided with slots adapted to receive the tongues projecting outwardly from a wall of an adjacent frame whereby the walls abut and the plaster in the adjacent frames are in the same plane, and means for securing the tongue of the slotted wall to the frame support, which means are concealed by an adjacent frame.

Signed by me at Boston, Massachusetts, this 19th day of November, 1928.

THOMAS CLARK HOWARD.