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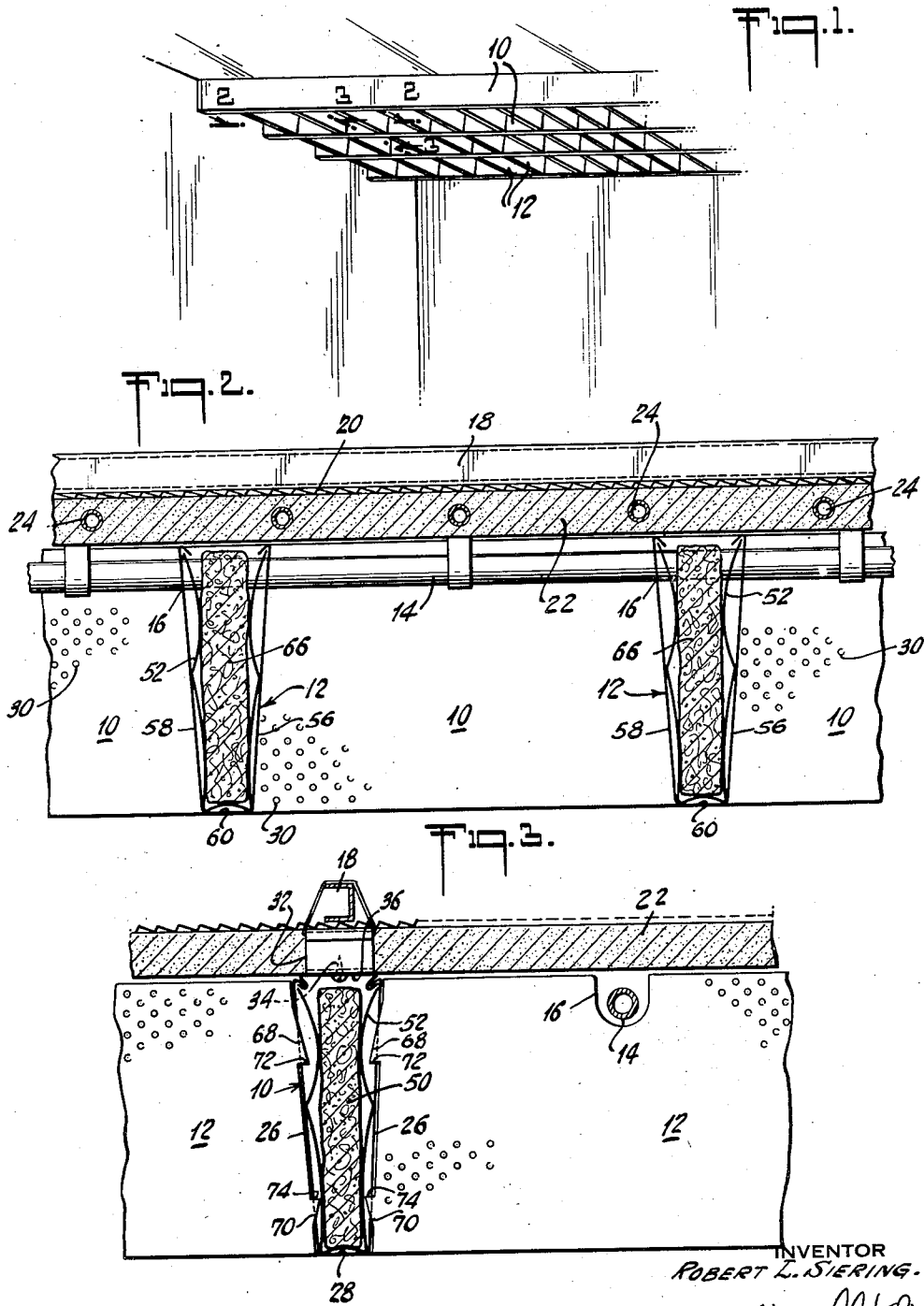
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SOUND ABSORBING WALL TREATMENT

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2 Sheets-Sheet 1



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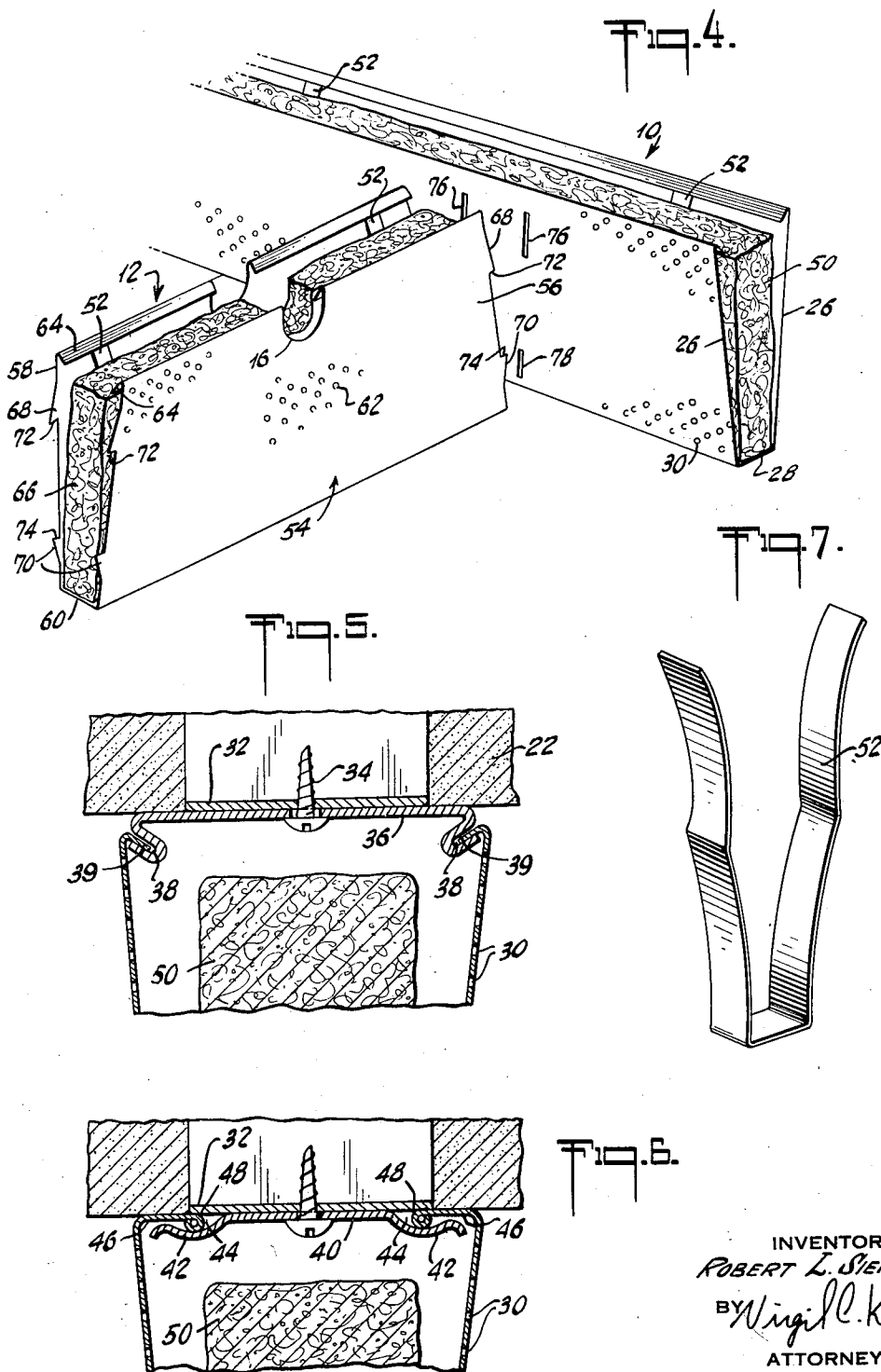
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SOUND ABSORBING WALL TREATMENT

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4 Claims. (Cl. 20—4)

The instant invention relates to treatments for walls such as ceilings and more particularly to treatments which will provide for acoustical correction, i. e., sound-absorption and, at the same time permit the treated wall to be employed as a radiant heating surface.

Conventional acoustical treatments for rooms such as offices, restaurants, auditoriums and the like, consist of sound-absorbing units or panels which cover all, or the greater portion of, the area of a wall of the room, usually the ceiling. One of the most effective and commercially successful treatments of this type is illustrated in patent to Norris #1,726,500, issued August 27, 1929, and comprises perforated metal pans suspended from the ceiling structure, the pans containing sound-absorbing bodies such as mineral wool pads. In this type of treatment the faces of the metal pans constitute substantially the entire exposed area of the ceiling.

In recent years it has been proposed to control the temperature of rooms by radiant heat, the recommended systems requiring the embedding of the heating elements, whether they be pipes for conducting hot water or steam or electrical units, in the ceiling plaster. It has, of course, proved impractical to use this system in conjunction with the acoustical treatment referred to above and the principal object of the invention is the provision of a treatment having the advantages and many of the structural features of the known sound-absorbent type but which exposes most of the ceiling area for use as a heat radiant surface.

More specifically, an object of the invention is the provision of a ceiling treatment involving metal or similar casings having sound-transparent surfaces, and containing sound-absorbing pads, supported in a manner to permit the major portion of the ceiling to serve as a radiant heating surface, but without adversely affecting the sound-absorbing properties of the treatment.

Another object of the invention is the provision of a ceiling treatment of the type referred to in which the acoustical elements are in the form of partitions suspended from the ceiling and extending a short distance, say a foot below the ceiling, the partitions leaving intervening spaces where the ceiling is exposed. The construction further includes sound-absorbing units spanning the spaces at intervals. Such a construction provides a checker-board or egg-crate appearance. Also, as will be appreciated units may be supported from the transverse units to provide other ceiling patterns.

A further object of the invention is the provision of a construction of the type referred to which enables elongated lighting fixtures, such as fluorescent tubes, to be supported from the ceiling. To attain this object the units spanning the spaces between the partitions are provided with suitable passageways for the lighting tubes and are mounted in a manner to permit them to be quickly and easily removed when access must be made to the lights for re-lamping and the like. The partitions and transverse units serve as diffusers of the light supplied by the fixtures.

Another object of the invention is the provision of a ceiling treatment of the type referred to having structural features which promote rapid assembly of the partitions and mounting of the transverse units thereon.

A further object of the invention is the provision of a ceiling treatment including longitudinally extending partitions and transverse units in which the transverse units have means extending from their opposite ends for entry into openings in the partitions, the latter being of such

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character as to permit the inward springing of their side walls for installation and removal of the units.

The invention will be more fully understood and further objects and advantages thereof will become apparent when reference is made to the more detailed description of a preferred embodiment of the invention which is to follow and to the accompanying drawings in which:

Fig. 1 is a perspective view of a room interior illustrating the instant invention;

Fig. 2 is a sectional view on an enlarged scale, taken on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view on an enlarged scale, taken on the line 3—3 of Fig. 1;

Fig. 4 is a detail view illustrating the assembly of transverse units with the longitudinal partitions;

Fig. 5 is a detail sectional view on an enlarged scale, illustrating the partition suspension means;

Fig. 6 is a view similar to Fig. 5 illustrating a modification of the suspension means; and,

Fig. 7 is a perspective view of a spring element employed in both the partitions and transverse units.

Referring now to the drawings, there is shown a treatment in accordance with the instant invention applied to a ceiling of conventional type. A suspended plaster lath ceiling is indicated but it will be understood that this is only for purposes of illustration and that any other ceiling or sub-ceiling construction may be employed. The treatment comprises spaced partitions 10 suspended from the ceiling structure in a manner later explained. The spaces between the partitions 10 are spanned at intervals by transverse units 12 supported from the partitions. In the preferred embodiment partitions 10 and units 12 are both sound-absorbers. The partitions are of suitable depth, say 12", and the transverse units are preferably, although not necessarily, of the same depth. To provide a space for longitudinally extending fluorescent lighting tubes diagrammatically illustrated at 14, the transverse units are provided with recesses 16 in their upper edges.

Referring now particularly to Figs. 2-7 inclusive, the construction features of the partitions 10 and transverse units 12 and their supporting structure will be described. The conventional metal lath and plaster ceiling includes channels 18, the channels carrying the metal lath 20 which supports plaster 22. Clips 32 are wired to the channels 18 at suitable intervals. The plaster coat is leveled with the bases of the clips. The plaster layer may be used as a radiant heating surface by embedding heating units, such as hot water pipes 24, in it at the required intervals. The heated fluid conveyed by the pipes raises the temperature of the plaster layer which in turn radiates heat to the room below.

Partitions 10 comprise elongated metal casings consisting of side panels 26 integrally connected at their lower edges by a bottom panel 28. These casings may be made of sufficient length to extend completely across the ceiling, or of shorter length, as desired. The casings are made of a suitable gauge of metal such as sheet steel, of 22 to 24 gauge, and at least the side panels are provided with a multiplicity of closely spaced perforations 30 to permit the passage of airborne sound therethrough. The size and spacing of the perforations may conform to conventional practice for acoustical elements of the type disclosed in said patent to Norris, #1,726,500. The upper edges of the side panels are provided with turned flanges for cooperation with plates secured by screws 34 to the clips 32. Two forms of the plates and cooperating portions of the casings are shown in Figs. 5 and 6, respectively. In the embodiment of Fig. 5, plate 36 has its lateral edges bent backwardly and then forwardly into a U-shape to define pockets 38 of a width to snugly receive flanges 39 of the side panels. The upper edges of the side panels of the casings are bent inwardly and somewhat downwardly to define flanges 39, the downward slant being originally less than that of the pockets, whereby when the flanges are forced into the pockets, they are retained by spring pressure.

In the embodiment shown in Fig. 6 clip 40 has its lateral edges bent to define spring lips 42 defining pockets 44 between the lips and the ceiling. In this case the side panels of the casings are provided with inwardly directed flanges 46 having beads 48 at their inner edges, the beads

being of a diameter to require the lips to yield for entry of the beads into the pockets. In securing the casings in position the beads are snapped into the pockets and retained therein by the resiliency of the spring lips.

In both constructions the spacing of the upper edges of the side panels is greater than the spacing of the lower edges whereby the panels flare upwardly and outwardly.

The hollow interiors of the casings contain sound-absorbing pads 50, such as pads or mats of mineral wool or other fibrous material. The pads are centered within the casing and the side panels are pressed resiliently outwardly by U-shaped metal spring elements 52 (see Fig. 7) spaced at suitable intervals longitudinally of the partitions and extending outwardly on both sides of the pad. Elements 52 are suitably shaped as shown to have outwardly projecting central and end sections to contact the panel, and intermediate, inwardly bowed sections to contact the pad.

Laterally extending units 12 are of similar construction to the partitions and each includes a casing 54 of substantially U configuration and including side panels 56 and 58 connected by a bottom panel 60 and flaring upwardly and outwardly therefrom. Side panels 56 and 58 are sound-pervious and preferably are provided with perforations 62 of the same size and spacing as perforations 30 of the partitions. The upper edges of casing 54 are inwardly turned to provide flanges 64 preferably of the same character as flanges 39 or 46 of the partition. In other words the casings for the partitions and units are preferably of identical shape whereby the same basic construction may be used for both. Casings 54 contain a sound-absorbing pad 66 of suitably the same type as pad 50. The pads are in centered position with respect to the side panels and the latter are yieldably pressed outwardly by the clips 52 placed at suitable intervals.

The units 12 are carried from the partitions by interlocking means of a type which provides a relatively rigid construction but which at the same time permits the units to be easily detached when desired, as for example when the lamps 14 are to be replaced. The construction is the same at both ends of the units and, hence, that for only one end will be described. Each of the side panels is provided with upper projections 68 and lower projections 70, the adjacent sides of the projections defining shoulders 72 and 74, respectively. The side panel 26 of the partition is provided at the location of the transverse unit with pairs of slits 76 and 78 of a size and spacing to accommodate projections 68 and 70 with the shoulders 72 and 74 resting against the corresponding ends of the slits. The lateral spacing of the slits of the pairs is such as to preserve the outward flare of the side panels when the units are mounted on the partitions.

In erecting the treatment of the instant invention, plates 36 or 40, depending on the embodiment selected, are secured to clips 32 by sheet metal screws 34, the successive plates of a row being placed with their pocket-defining edges in alignment. Partition members comprising the casings containing the sound-absorbing pad 50 and the interposed spring elements 52 are then mounted in position by forcing the flanges 39 or 46 into the pockets. The transverse units 12 are then mounted by forcing the side panels toward each other until they diverge to the same extent as the slits 76 and 78 and then springing the side panels of the partitions inwardly against the pressure of elements 52 to permit projections 68 and 70 to enter the slits. The transverse units are held firmly in position both by the pressure of the side panels of the partitions against the ends of the units, and the outward pressure of the side walls of the units. Whenever it is necessary or desirable to remove the transverse units to permit access to the fluorescent lighting fixtures 14 for re-lamping or the like, the side panels of the partitions need only to be sprung inwardly sufficiently to permit the projections on the units to be released from the slits.

The construction provides an attractive, easily assembled ceiling structure which presents a large area of sound-absorbing treatment to airborne sound. At the same time, the major portion of the area of the base ceiling is ex-

posed whereby the latter may be used as a radiant heating surface. The partitions and transverse units serve as light diffusers, that is, they intercept and reflect light rays from the fluorescent tubes to better distribute the light throughout the room. It will be appreciated that, although the ceiling shown provides a checkerboard appearance, other designs may be obtained by different arrangements of the partitions and transverse units. Also, units similar to transverse units 12 may be supported from the transverse units in the same way that the latter are supported from the partitions to provide additional effects.

Having thus described my invention in rather full detail, it will be understood that these details need not be strictly adhered to but that various changes and modifications may suggest themselves to one skilled in the art, all falling within the scope of the invention as defined by the subjoined claims.

What I claim is:

1. In an acoustical treatment for a wall such as a ceiling, sound-absorbing partitions suspended from the wall, said partitions comprising side panels, sound-absorbing pads between said side panels, and spring means interposed between said pads and the adjacent side panels and resiliently pressing them outwardly, laterally extending units between said partitions and comprising side panels with tongues projecting from the ends thereof, and openings in the side panels of said partitions to receive said tongues.

2. In an acoustical treatment for a wall such as a ceiling, sound-absorbing partitions suspended from the wall, said partitions having upwardly diverging sound-pervious side panels, sound-absorbing pads between said side panels, spring means interposed between said panels and pads and yieldably pressing the panels outwardly, a laterally extending unit between the partitions, said unit comprising side panels with tongues projecting from the ends thereof, and openings in the side panels of the partitions to receive said tongues.

3. In an acoustical treatment for a wall such as a ceiling, sound-absorbing partitions suspended from the wall, said partitions having upwardly diverging, sound-pervious side panels, sound-absorbing pads between said side panels, spring means interposed between said panels and pads and yieldably pressing the panels outwardly, laterally extending units between the partitions and including upwardly diverging side panels with tongues projecting from the ends thereof, openings in the side panels of the partitions to receive the tongues, sound-absorbing pads between the side panels of the units, and spring means interposed between the last-named panels and pads and yieldably urging the panels outwardly.

4. In an acoustical treatment for a wall such as a ceiling, partitions suspended from the wall, said partitions comprising sound transparent side panels with sound-absorbing material therebetween, laterally extending units between said partitions and comprising side panels having tongues projecting from the ends thereof, openings in the side panels of said partitions, said tongues being positioned in said openings, and means yieldably pressing the side panels of said partitions outwardly to maintain said tongues in said openings.

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