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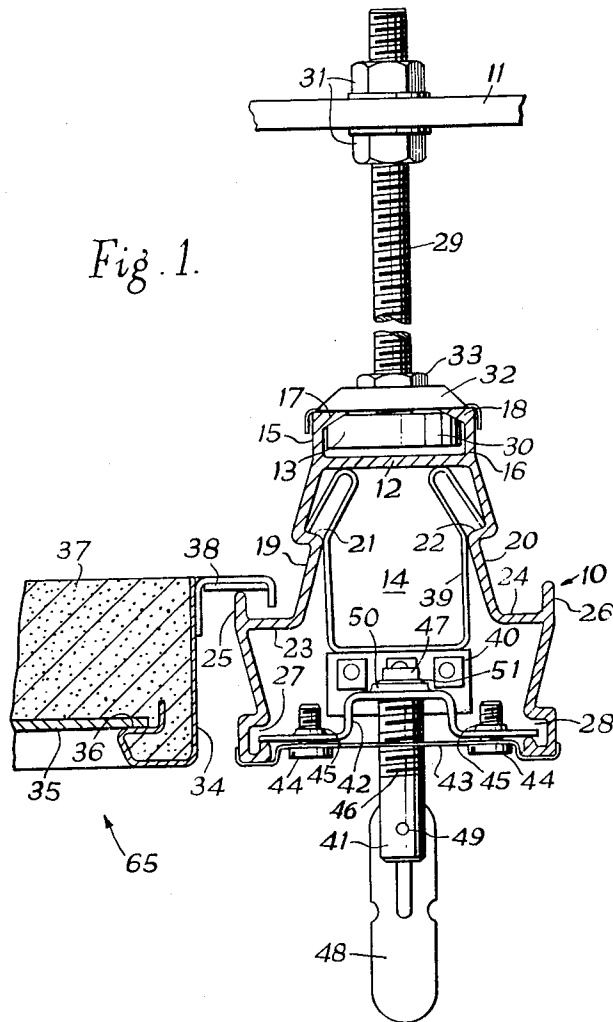
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SUPPORTS FOR SUSPENDED CEILINGS

Filed Jan. 21, 1960

2 Sheets-Sheet 1



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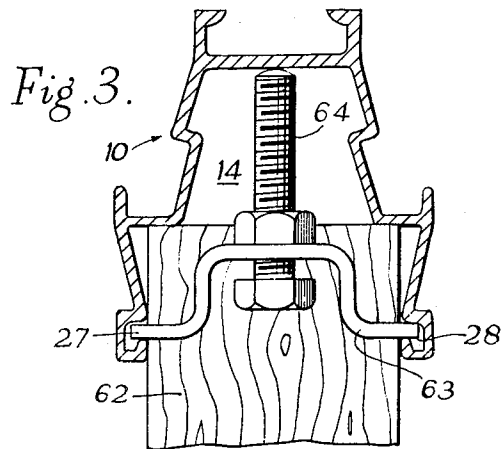
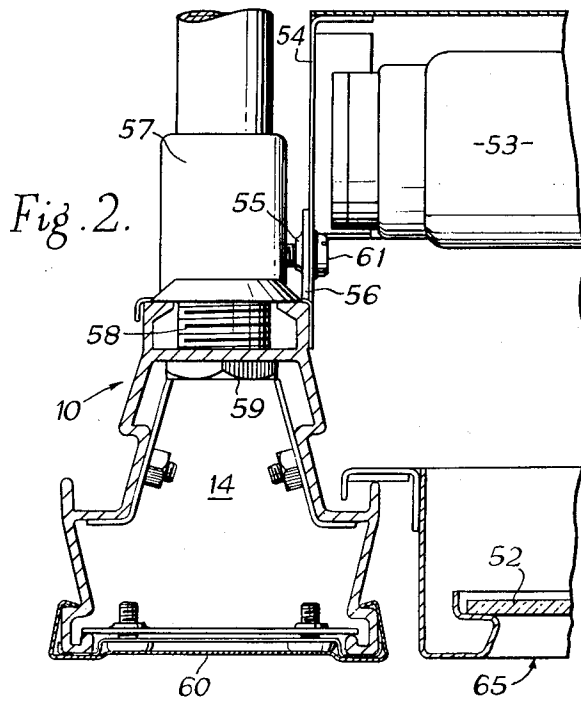
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SUPPORTS FOR SUSPENDED CEILINGS

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The present invention relates to supports for suspended ceilings.

According to the present invention there is provided a support for use in a suspended ceiling, the support comprising a channel member including an elongated partition which separates two oppositely-facing channels, the first channel consisting of the partition and two upstanding walls one along each edge of the partition, the open side of the first channel being restricted in width by two inwardly-directed flanges on the two walls respectively, and the second channel consisting of the partition and two further upstanding walls on the opposite side of the partition to the first mentioned upstanding walls, one along each edge of the partition, the second channel having in or on its two walls respectively two inwardly-directed channel portions disposed opposite one another and the walls of the second channel being provided, between the partition and the said inwardly-directed channel portions, with two outwardly-directed shoulders disposed opposite one another and two inwardly-directed shoulders disposed opposite one another.

Employed as part of a suspended ceiling structure the support may be arranged with its first channel facing upwardly and its partition horizontal, ceiling panels being fitted over and resting on the outwardly-directed shoulders of the support. In this case the outwardly-directed shoulders of the support may carry upwardly-directed flanges for engagement with horizontally extending edge flanges of the ceiling panels, the said edge-flanges being downturned along their outer edges. The ceiling panels may include trays filled with a solid material, or an acoustically-absorbing material. Alternatively the ceiling panels may be of a light-transmitting material. In this case a lamp or lamps, such as a fluorescent lamp or lamps, may be fitted between the upper part of the support and the upper part of a second such support, disposed parallel to and in the same horizontal plane as the first-mentioned support, the light-transmitting ceiling panels being suspended between the two supports and below the lamp or lamps.

Auxiliary supports for cables and associated equipment may be suspended from the inwardly-directed shoulders. The said inwardly-directed channel portions may be used to support lighting fittings such as fluorescent lamps. An elongated lighting fitting, such as a fluorescent lamp, may be supported either from a single support and parallel thereto or transversely between two neighbouring supports.

The support may be employed to position the upper ends of a vertical post fitted into the second channel. To position the post longitudinally relative to the support two positioning members may be provided. Each consists of two limbs, extending laterally into the two inwardly-directed channel portions and a stub extending from a bridge between the two limbs and urged against the partition. The two positioning members are spaced along the support by the width of the top of the post which is accommodated between them. Further posts may be positioned in like manner at intervals along the second channel of the support and wall panels attached between the posts.

Alternatively, a single positioning member may be employed having means for fixing it to the top of a post.

The suspended ceiling structure may be supported from

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above by suspension members adapted at their lower ends to fit into the first channel of the support, and being retained in position by the inwardly-directed flanges of the first channel.

Embodiments of the invention will now be described, by way of example, with reference to the drawings.

FIGS. 1, 2 and 3 are cross-sections of parts of suspended ceiling structures embodying the invention, like parts in the different figures having the same reference.

Referring to FIG. 1, a suspended ceiling structure includes a plurality of elongated supports 10 (only one of which is shown in FIG. 1) suspended, parallel to one another and in a common horizontal plane, from a framework 11 of a building. Between the supports 10 are suspended ceiling panels 65, part of one of which is shown in FIG. 1.

Each support 10 is a unitary structure consisting of an elongated double channel-shaped member of aluminium comprising an elongated strip-shaped partition 12 which separates two channels 13 and 14 facing upwardly and downwardly respectively. The channel 13 consists of the partition 12 and two upstanding walls 15 and 16 extending along opposite edges of the partition and carrying at their upper edges inwardly-extending flanges 17 and 18 respectively. The downwardly-facing channel 14 is considerably deeper than the upwardly-facing channel 13, and consists of the partition 12 and two walls 19 and 20 extending from opposite edges of the partition. These two walls 19 and 20 are so formed as to present throughout their length two inwardly-directed shoulders 21 and 22 respectively and two outwardly-directed shoulders 23 and 24 respectively, the latter carrying vertical flanges 25 and 26. The lower edges of the walls 19 and 20 are in the form of inwardly-directed channel portions 27 and 28.

Suspension of the support 10 from the framework 11 is effected by means of bolts 29 (only one is shown in FIG. 1) disposed at spaced positions along the support 10 and having heads 30 retained within the upwardly-directed channel 13 by the flanges 17 and 18. The bolts 29 are secured to the framework 11 by means of nuts 31. During construction of the ceiling the flanges 17 and 18 of the channel 13 may be slid over a row of heads 30 and then fixed in position by means of fixing members 32 and co-operating nuts 33.

The ceiling panels comprise rectangular trays each consisting of four side walls 34 and a base 35. The side walls 34 are turned inwardly along their lower edges, the inwardly-turned parts being turned back towards their corresponding walls and upwardly to present a continuous shoulder 36 along the lower inner side of the walls. The edges of the base 35 fit over the shoulder 36. If necessary spring clips (not shown) may be clipped over the shoulder 36 and the edge of the base 35 to retain the latter in position. An infill 37 of sound-absorbing material fills the tray to the height of the side walls 34. Along the upper regions of two opposite side walls 34 of each tray 12 are fixed supporting rails 38 which are in the form of inverted channel-shaped members.

The supporting rails 38 fit over the vertical flanges of the corresponding outwardly-directed shoulders of the two neighbouring supports 10 between which the ceiling panel in question is suspended. The space between two neighbouring supports 10 is filled with a plurality of ceiling panels, suspended in abutting relation to one another between the supports. The two supporting rails 38 of a ceiling panel are staggered by a small distance relative to the side walls 34 to which they are fixed in such a manner that they project slightly at one end of the side walls concerned and are slightly recessed from the other end of the said side walls. The projecting portions of the supporting rails of one tray fit into the recessed parts of the adjacent tray. This arrangement permits quick

and easy alignment of the panels during construction of the ceiling structure.

The downwardly-facing channels 14 of the supports 10 are employed as "trunking" supports for fluorescent electric lamp fittings, that is, as supports for supply cables and for the lamps themselves.

Support for supply cables and terminal blocks is provided in each of the supports 10 by a number of clips 39 of generally U-shaped cross-section, having the outer ends of their limbs bent inwardly, at an angle of about 60° to one another, and turned back upon themselves outwardly at their extremities. These clips are fitted, at spaced positions along the supports, into the downwardly facing channels 14, the open end of the U-shaped sections facing upwardly. The ends of the turned-back extremities of the limbs fit against the inwardly-directed shoulders 21 and 22 of the support, while the turned-back extremities as a whole are confined between the last said shoulders and the partition 12.

Supply cables (not shown) for electric lamps suspended from the supports 10 are supported by the clips 39. The clips are also employed for supporting terminal blocks 40 for fluorescent lamps.

Reflectors (not shown) for the fluorescent lamps are supported by means of fixing devices 41 (only one of which is shown in FIG. 1). The fixing device 41 is screwed into a hump-shaped plate 42 fixed to a retaining plate 43. The extremities of the hump-shaped plate 42 fit into the channels 27 and 28 and are retained therein by the plate 43 which is shaped to fit over the lower edges of the walls 19 and 20, and the plate 42 is fixed to the plate 43 by means of screws 44 screwed into threaded bosses 45 on the plate 43.

The fixing device 41 consists of a bolt having a threaded cylindrical portion 46 with a smaller diameter cylindrical extremity 47 having a groove (not shown in FIG. 1) formed in it at the junction between the portion 46 and the extremity 47. An arm 48 can be swivelled about a pin 49 so as to be aligned with the portion 46 or at right angles to it. The threaded portion 46 engages with a threaded bush 50 and in the position shown is prevented from being screwed out of the bush 50 by a clip 51 sprung into the groove between the extremity 47 and the threaded portion 46. A reflector having apertures formed in its upper side, when being mounted, is slipped over two spaced fixing devices 41 supported as described from a single support 10 or from two neighbouring supports 10, and the arms 48 of the fixing devices 41 are swivelled to their positions at right angles to the portions 46, and are then screwed up to hold the reflector firmly against the plate 43.

An alternative form of fixing device comprises a stiffened generally square plate having formed along two opposite edges laterally extending ears, a centrally located upstanding threaded cylindrical portion being fixed to the plate.

The plate is inserted into the downwardly-facing channel 14 of a support 10, the threaded portion being directed vertically downwards from the plate, and the plate is then so turned that the ears extend into the inwardly-directed channel portions 27 and 28 and thereby support the plate between the walls 19 and 20 of the support 10. The ears and corresponding edges of the plate are so curved as to allow the plate to be turned when fitting the ears into the channel portions 27 and 28.

A reflector is mounted by slipping it over the threaded portions of two such fixing devices mounted either on a single support 10 or on two neighbouring supports. Co-operating nuts and washers are then screwed onto the threaded portions and hold the reflector firmly against the plates of the fixing devices.

In order to support ceiling panels which are required to be suspended between a support 10 and a wall (not shown) a supporting member is fixed to the wall and

shaped so as to fit under the supporting rails 38 of the panels concerned.

Instead of an in-fill 37 of acoustic material, the trays of the ceiling panels (or some of the ceiling panels) may have an in-fill of solid material.

Referring now to FIG. 2, another suspended ceiling structure embodying the invention includes supports 10 as described with reference to FIG. 1, supported from the frame of the building as described and supporting ceiling panels 65 having walls of the same shape as those already described, but including a base 52 of translucent material, and no in-fill. Between two neighbouring supports 10 (only one is shown) is fixed a fluorescent lamp 53 to which access may easily be gained by lifting the panel 65 and lowering it through the space between the supports 10. The lamp 53 is mounted on a bracket 54 and retained by screws 61 which are screwed into a threaded boss 55 fixed to a bracket 56 which is carried by the support 20.

FIG. 2 also shows a conduit entrance assembly secured to the top side of the support 10 and through which cables for lamp fittings may be led. The assembly comprises a cylindrical conduit end piece 57 and a male screw-threaded hollow bush 58 which passes through an aperture (not shown) in the partition 12 and screws into the conduit end piece 57. In the case in which no fluorescent lamps are required to be suspended below the support 10 in the manner described with reference to FIG. 1 of the drawings, the downwardly-facing channel 14 of the support 10 may be closed by a closure plate 60.

Referring now to FIG. 3, there is shown a part of a ceiling structure embodying the invention in which a wooden post 62 for use in supporting wall partitions (not shown) and supported from below, is held in position at its upper end within the downwardly-facing channel 14 of a support 10 by means of two positioning members 63 (only one of which is shown in FIG. 3) disposed on opposite sides of the post.

Each positioning member 63 consists of two limbs extending laterally into the two inwardly-directed channel portions 27 and 28 and a screw-threaded stub 64 extending through an aperture in a bridge between the two limbs and screwed through a nut fixed to the bridge, thereby being urged against the partition 12 of the support 10. The two positioning members 63 are spaced along the support by the width of the top of the post which is accommodated between them. Thus the upper end of the post 62 is prevented from moving longitudinally of the support 10. The provision of supports having such means for positioning the upper end of wall posts is of convenience in rooms having suspended ceilings where it is desired to avoid vertical posts extending through the ceiling to the frame above. The latter arrangement increases the complexity of the ceiling because ceiling panels must be provided having apertures, in the desired places, through which the vertical posts can extend.

The supports for the suspended ceilings described with reference to FIGS. 1, 2 and 3 of the accompanying drawings have the further advantage that individual ceiling panels can easily be disengaged and removed from the supports if, for example, it is required either to replace the ceiling panel in question, or to gain access to the space above the ceiling panels. This is particularly useful in the case described with reference to FIG. 2, where lighting fittings are disposed above the ceiling panels and the appropriate panels are translucent.

Yet another advantage is that the supports are capable of being used for supporting lamps either below the ceiling and exposed to the room as described with reference to FIG. 1 or above the ceiling as described with reference to FIG. 2.

Any convenient combination of the parts of ceiling

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structures shown in FIGS. 1, 2 and 3 may of course be employed in a single suspended ceiling structure.

I claim:

1. A suspended ceiling incorporating at least one support comprising a channel member including an elongated partition which separates two oppositely-facing channels, the first channel consisting of the partition and two upstanding walls one along each edge of the partition, the open side of the first channel being restricted in width by two inwardly-directed flanges on the two walls respectively, and the second channel consisting of the partition and two further upstanding walls on the opposite side of the partition to the first mentioned upstanding walls, one along each edge of the partition, the second channel having on its two walls respectively two inwardly-directed channel portions disposed opposite one another and the walls of the second channel being provided, between the partition and the said inwardly-directed channel portions, with two outwardly-directed shoulders disposed opposite one another and two inwardly-directed shoulders disposed opposite one another, the support being arranged with its first channel facing upwardly and its partition horizontal, ceiling panels being fitted over and resting on the outwardly-directed shoulders of the support.

2. A suspended ceiling according to claim 1 wherein the outwardly-directed shoulders of the support carry upwardly-directed flanges for engagement with horizontally extending edge-flanges of the ceiling panels, the said edge-flanges being downturned along their outer edges.

3. A suspended ceiling according to claim 1 wherein the ceiling panels include trays filled with an acoustically-absorbing material.

4. A suspended ceiling according to claim 1 wherein the ceiling panels are of a light-transmitting material.

5. A suspended ceiling according to claim 4 wherein a lamp or lamps are fitted between the upper part of the support and the upper part of a second such support, disposed parallel to and in the same horizontal plane as the first-mentioned support, the light-transmitting translucent ceiling panels being suspended between the two supports and below the lamp or lamps.

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6. A suspended ceiling according to claim 1 wherein auxiliary supports adapted to support cables and the like are provided in the second channel of the support, the said auxiliary supports including spring retaining means adapted to fit over the inwardly-directed shoulders of the said second channel.

7. A suspended ceiling according to claim 1 wherein at least one fitting is provided adapted to support a lighting fitting and including laterally-extending parts positioned and supported by the inwardly-directed channel portions of the second channel of the support.

8. A suspended ceiling according to claim 1 wherein the upper end of at least one vertical post is fitted into the downwardly-directed second channel of the support, positioning means being provided for positioning the post longitudinally relative to the support.

9. A suspended ceiling according to claim 8 wherein the said positioning means comprise two positioning members each of which consists of two limbs, extending laterally into the two inwardly-directed channel portions of the support, and a stub extending from a bridge between the two limbs and urged against the partition, the two positioning members being spaced along the support by the width of the top of the post which is accommodated between them.

10. A suspended ceiling structure according to claim 1 wherein suspension members are provided for supporting the structure from above, the said suspension members being adapted at their lower ends to fit into the upwardly-directed first channel of the support and being retained in position by the inwardly-directed flanges of the said first channel.

References Cited in the file of this patent

UNITED STATES PATENTS

2,412,404	Jackson	Dec. 10, 1946
2,888,113	Schwartz et al.	May 26, 1959

FOREIGN PATENTS

330,492	Switzerland	July 31, 1958
1,185,518	France	Feb. 16, 1959