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Alderman

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[54] **SUSPENDED CEILING**

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[52] **U.S. Cl.** ..... **52/484,** 52/63, 52/647, 52/660, 52/665, 287/189.36 A

[51] **Int. Cl.** **E04b 5/52**

[58] **Field of Search** ..... 52/63, 144, 145, 647, 650, 52/660, 662, 664, 665, 474, 686, 484, 485, 486, 483; 287/189.36 A

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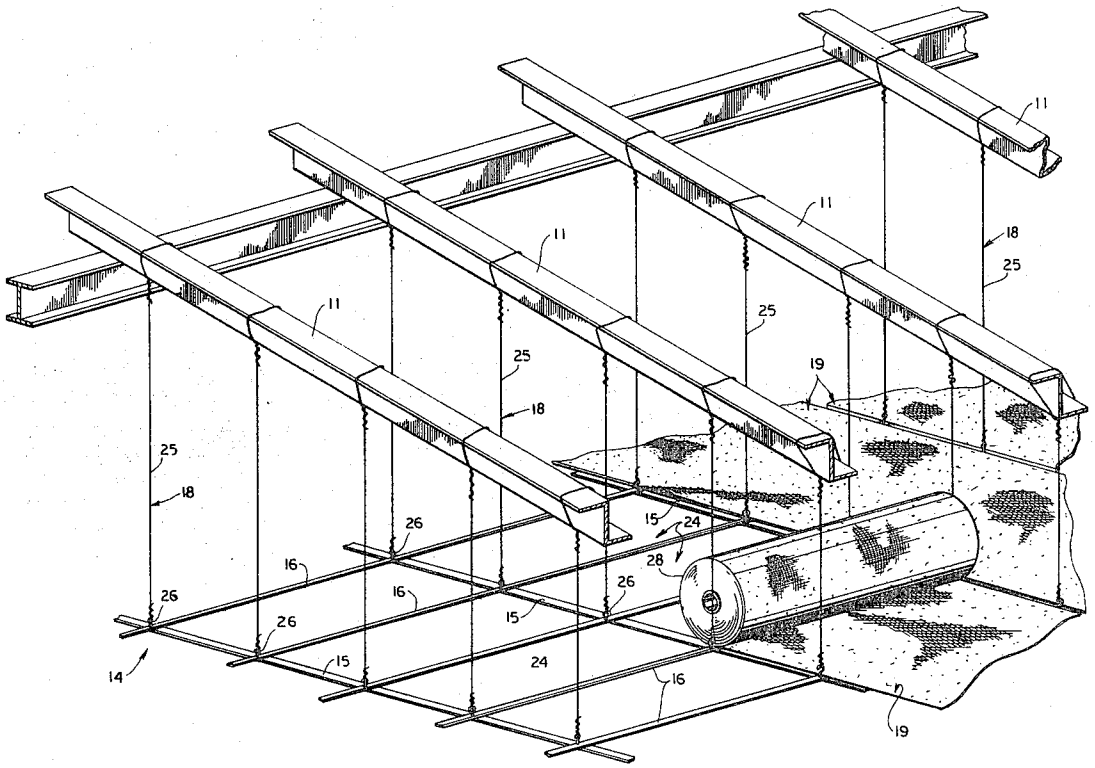
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[57] **ABSTRACT**

A ceiling assembly is provided wherein a support lattice defining a plurality of rectangular openings is suspended in a horizontal attitude below the roof of the building. A plurality of elongated sheets of ceiling material rest upon and are supported by the support lattice and each sheet extends across a plurality of the rectangular openings. The lattice is supported by wires suspended from the roof structure of the building, with the wires connected at points on the lattice arranged in rows across the lattice, and the sheets of material are placed upon the lattice in rolls and the rolls are unrolled between the suspension wires of the lattice.

6 Claims, 7 Drawing Figures



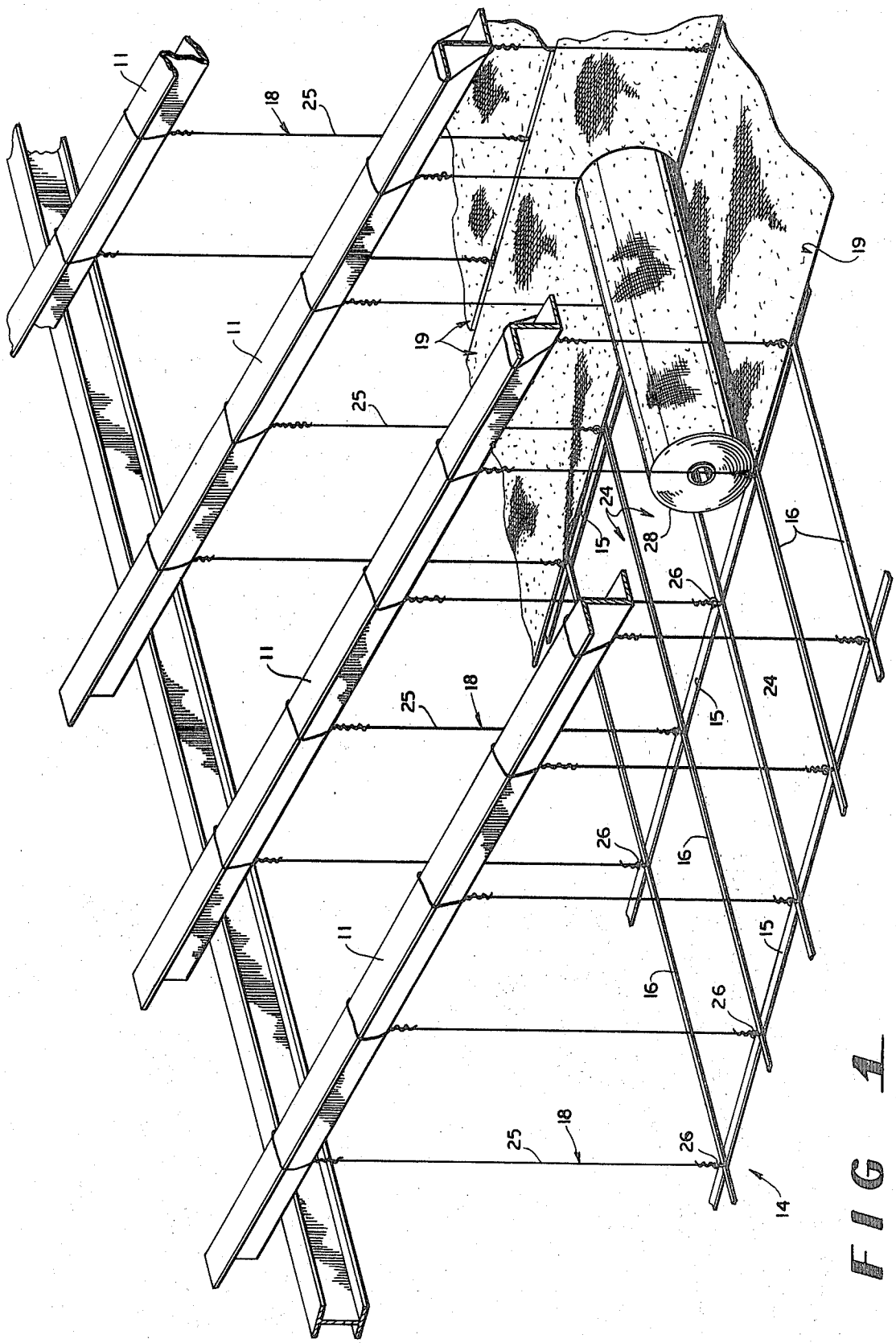


FIG 1

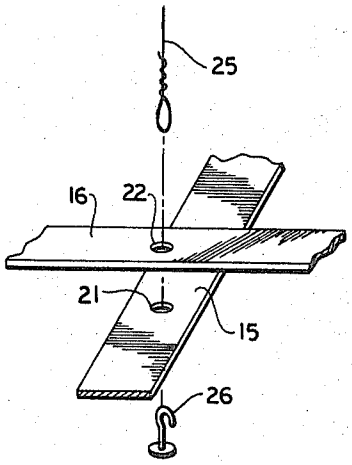


FIG 2

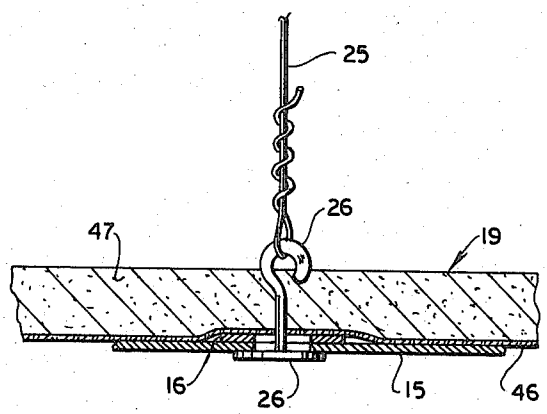


FIG 3

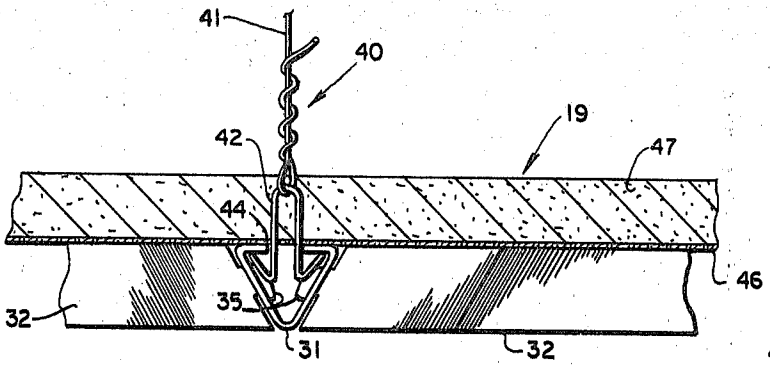


FIG 4

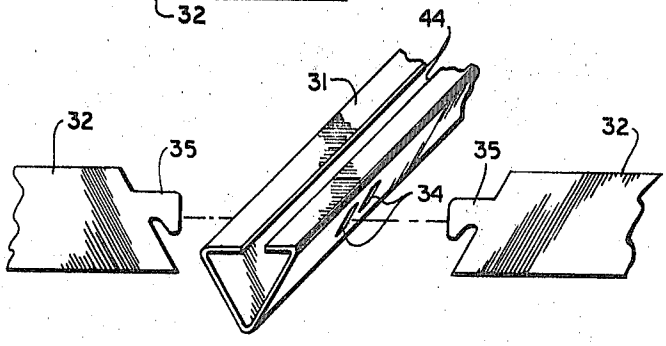


FIG 5

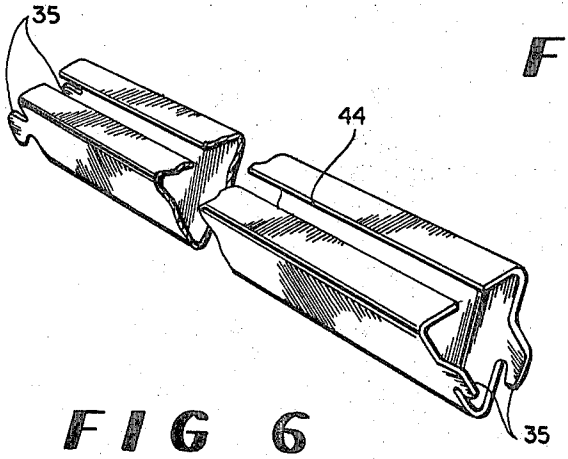


FIG 6

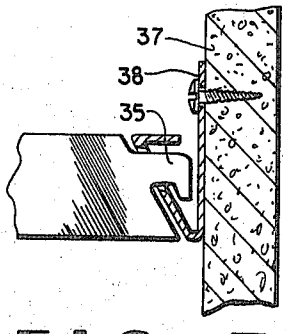


FIG 7

SUSPENDED CEILING

BACKGROUND OF THE INVENTION

Suspended ceilings in homes, offices, and other building structures have become popular because they can be expediently installed by relatively unskilled labor. The appearance of the typical suspended ceiling is pleasing and provides space for electrical conduits, air ducts, and other typical building components above the ceiling and below the roof or unfinished ceiling portion of the building structure.

While the typical suspended ceiling assembly has many desirable features, there are various disadvantages associated with the typical ceiling in large building structures. For instance, the typical ceiling assembly comprises a support lattice or grid formed from rigid runners or support bars extending in one direction which are usually T-shaped in cross section and which are about twelve feet in length, and from connecting or cross bars of similar cross sectional configuration extending normal to and connected at their ends to the support bars. The openings in the support lattice are filled with relatively rigid rectangular ceiling tiles. In a large building structure, the longer elements or runners of the lattice must be connected end to end to reach across the building structure, a large number of cross bars must be connected between the runners, and the large number of rectangular openings formed in the lattice must be filled individually with the ceiling tiles. The runners and support bars of the support lattice must be leveled by adjusting the stringers or support wires extending upwardly from the support lattice to the supporting elements of the building structure above.

SUMMARY OF THE INVENTION

Briefly described, the present invention comprises a suspended ceiling assembly which includes a support lattice arranged to receive elongated strips of ceiling material each of which spans several openings in the lattice. In one form of the invention, the lattice is formed from a grid of rectilinear resilient straps which are placed under tension by connection to the sides of the building structure, and which are suspended from the building structure at the intersections of the crossing members, and the ceiling material is unrolled from reels across the support lattice between the suspension wires. In another form of the invention the support lattice is formed from rigid support bars, but the upper surfaces of the support lattice are substantially flat and receive the elongated sheets of ceiling material.

Thus, it is an object of the present invention to provide a suspended ceiling assembly which is expedient to install, inexpensive to fabricate, andd which provides an eye appealing ceiling appearance.

Other objects, features and advantages of the present invention will become apparent upon reading the following specification, when taken in conjunction with the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a schematic perspective illustration of a partially completed suspended ceiling assembly.

FIG. 2 is an exploded detail illustration of a pair of crossing support bar members of the support lattice of the suspended ceiling assembly.

FIG. 3 is a detail side cross sectional view of the suspended ceiling assembly at the intersection of a pair of crossing support bar members.

FIG. 4 illustrates a modified form of the invention and shows the intersection of the support bars in a suspended ceiling assembly.

FIG. 5 is an exploded detail of the intersection of crossing support bars in the modified form of the invention.

FIG. 6 is a perspective illustration of the ends of a support bar of the modified form of the invention.

FIG. 7 is a detail illustration of the junction of a support bar with the wall of the building structure in the modified form of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now in more detail to the drawing, in which like numerals indicate like parts throughout the several views, FIG. 1 illustrates a partially completed suspended ceiling assembly which is suspended or hung from purlins 11 of the building structure. The suspended ceiling assembly comprises a support lattice 14 formed from crossing support bar members 15 and 16, suspension means 18, and elongated sheets of ceiling material 19. As is illustrated in FIGS. 2 and 3, the support bar members 15 and 16 are elongated metal straps which are sufficiently resilient to be coiled up in reels. Each of the metal straps 15 and 16 are formed with holes 21 and 22 at spaced intervals along their lengths. Since the purlins 11 in a typical building structure are spaced horizontally from one another at five foot intervals, support bar members 15 are arranged parallel to purlins 11 in a horizontal plane and are spaced five feet from one another. Support bar members 16 can be spaced from one another at any desirable intervals. In one embodiment of this invention, the support bar members 16 are spaced at two and one-half foot intervals from one another. The holes 21 are formed at two and one-half foot intervals along the lengths of the support bar members 15, while the holes 22 are formed at five foot intervals along the lengths of the support bar members 16. The support bar members 15 and 16 cross each other at holes 21 and 22 and suspension means 18 are connected to the support bars at the aligned openings. Thus, rectangular openings 24 are defined in the lattice or grid or support bar members 15 and 16.

Stringers or wires 25 are connected at their upper ends to purlins 11 and at their lower ends to connectors 26. Connectors 26 each comprise a J-shaped element with an enlarged head at one end of the J. The curved portion of the connector is inserted from below up through the aligned openings 21 and 22 of the support bar members 15 and 16, and the enlarged head of the connector abuts the lower surface of the lower one of the support bar members. The curved portion of the J-shaped connector 26 is connected to the stringer 25 in the manner illustrated. Stringers 25 and connectors 26 thus form the suspension means 18 for the lattice 14.

The ends (not shown) of the elongated support bar members 15 and 16 normally are connected to the side wall of the building structure (not shown) by nailing or by other conventional connecting means, and the support bar members are placed under tension so that sagging of the support bar members will be minimized. The suspension means 18 which are connected at the points of intersection of the lattice of support bars are

adjusted so that no sagging will occur in the support bar members even in the largest of the building structures.

The elongated strips of ceiling materials **19** are delivered to the job site in the form of rolls or coils **28**, and the workmen lift the rolls **28** up into the support lattice. Since the suspension means **18** are connected to the support lattice **14** at points along the support lattice arranged in rows which correspond to the intersection of the support bar members, the rolls of the insulating material **28** can be unrolled across the lattice in the manner illustrated in FIG. **1**. The insulating material **19** is of a width which corresponds to the spacing of adjacent ones of the parallel support bar members, and the length of the sheet material spans several of the rectangular openings **24**. Preferably, the width of the sheet material **19** is five feet in width, which corresponds to the center spacing of the support bar members **15**, and the length of the sheet material is as long as practical so that it covers a large number of the rectangular openings in the support lattice **14**. The unrolling of the roll **28** will not be encumbered by any of the suspension means **18** since the suspension means intersect the lattice **14** at the side edges of the sheets of ceiling material **19**. If the length of the sheet material **19** from the roll **28** is not sufficient to span the entire building structure, the end of the sheet material will be trimmed back to the last support bar member **16**, and another length of sheet material **19** will begin at the same support bar member **16**. Thus, the abutting seam formed in the ceiling material **19** will appear above the support bar member **16** and will not be visible from below. Adhesives, tapes, staples, or other conventional connecting means can be used to connect the abutting lengths of ceiling material.

As is illustrated in FIGS. **4–7**, the lattice **14** can be formed from support bar members which are not of the configuration illustrated in the previous Figures. For instance, the V-shaped or triangular-shaped runners **31** can be placed in spaced parallel disposition with respect to one another, and the cross bars **32** can be connected to the runners **31**. The runners **31** define slots **34** at intervals along their lengths, and the cross bars **32** include connecting protrusions **35** at their ends for insertion into the slots **34**. The runners **31** and cross bars **32** are rigid and are not normally placed under tension. As is illustrated in FIG. **7**, the runners and cross bars are connected to the wall **37** of the building structure by the insertion of the tabs **35** in the slots of modified support bar members **38** which are shaped to be nailed or otherwise attached to the wall **37** of the building structure.

As is illustrated in FIG. **4**, suspension means **40** are connected to the lattice formed by the support bar members and includes stringers **41** connected at their upper ends to the purlins of the building structure and connected at their lower ends to connectors **42**. Connectors **42** comprise expandable brackets insertable into the slot **44** of the support bar members. The arrangement of the suspension means **40** is similar to that of the suspension means **18** in that the suspension means **40** are connected to the lattice formed by the support bar members at points arranged in rows along the lattice, leaving space for the rolls **28** of insulating material **19** to move across the lattice. Thus, the rolls of ceiling material can be placed on the lattice and unrolled between the rows of points of connection of the suspension means with the lattice.

The ceiling material **19** disclosed herein comprises an air and water impervious sheet **46** which rests on the lattice, and an insulating material **47** which adheres to the sheet **46**. The ceiling material **19** can comprise various other laminations of materials or a plurality of individual layers of material, as may be desired. Preferably, the ceiling material is flexible so that it can be shipped and handled at the job site in rolls and unrolled over the support lattice.

Since the sheets of ceiling material are of a width corresponding to the spacing between the support bar members, the seams in the ceiling material formed at the side edges of adjacent sheets of material will be hidden from view by the support bar members. Thus, the ceiling will appear as a lattice or grid with the openings in the lattice being closed by the ceiling material.

While this invention has been described in detail with particular reference to preferred embodiments thereof, it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinbefore and as defined in the appended claims.

I claim:

1. In a suspended ceiling assembly, a support lattice disposed in an approximately horizontal attitude comprising a plurality of first support bar members extending parallel to one another and equally spaced from one another and a plurality of second support bar members extending parallel to one another and equally spaced from one another and extending at right angles with respect to said first support bar members and defining with said first support bar members a plurality of rectangular openings, a plurality of sheets of elongated ceiling material supported by said support lattice, said sheets of ceiling material being oriented with their long dimensions extending approximately parallel to said first support bar members, said sheets of material being of a width sufficient to span the space between adjacent ones of said first support bar members and of a length sufficient to extend across several ones of said second support bar members so that the rectangular openings between said first and second support bar members are closed by said sheets of ceiling material, holes defined in both said first and second support bar members at their intersections with one another, and suspension means connected to said first and second support bar members at their holes for suspending the ceiling assembly from above the support lattice.

2. The suspended ceiling assembly of claim **1** and wherein said first and second support bar members comprise elongated metal straps under tension.

3. The suspended ceiling assembly of claim **1** and wherein said second support bar members cross over and rest upon said first support bar members.

4. A method of forming a suspended ceiling in a building or the like comprising the steps of forming a support lattice from a supply of flat strap material defining holes at equally spaced intervals along its length by positioning a first plurality of lengths of strap material in spaced parallel relationship with respect to one another and a second plurality of lengths of strap material in spaced parallel relationship with respect to one another and in overlying intersecting relationship with respect to the first plurality of lengths of strap material with the holes of the first and second pluralities of lengths of strap material located at the overlying intersecting portions of the lengths of strap material, insert-

ing connectors through the holes of the first and second pluralities of lengths of strap material at the intersections of the lengths of strap material, and placing rolls of ceiling material on the support lattice and unrolling the rolls of ceiling material across the support lattice between the rows of connectors.

5. The method of claim 4 and further including the step of applying tension to the lengths of strap material at the ends of the lengths of strap material.

6. A suspended ceiling assembly, a support lattice disposed in an approximately horizontal attitude comprising a first plurality of elongated resilient flat straps each extending parallel to one another and equally spaced from one another and a second plurality of elongated resilient flat straps each extending parallel to one another and equally spaced from one another and extending at right angles with respect to and overlying said first plurality of straps and defining with said first plurality of straps a plurality of rectangular openings, a plurality of sheets of elongated ceiling material supported by said support lattice, said sheets of ceiling material being oriented with their long dimensions extending parallel to each other and parallel to one of said first or second pluralities of straps, and sheets of material being of a width sufficient to span the space between adjacent ones of one of the first or second pluralities of straps and of a length sufficient to extend across several ones of the other of the first or second pluralities of straps so that the rectangular openings defined by said first and second pluralities of straps are closed by said sheets of ceiling material, and suspension means connected to said first and second pluralities of straps at their overlying portions for suspending the ceiling assembly from above the support lattice.

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