United States Patent [19]

Wilkin

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[54] **MODULAR CEILING ASSEMBLY**

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[52] **U.S. Cl.** ..... **52/28,** 52/488, 240/9 R

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

[58] **Field of Search** ..... 52/28, 484, 488; 240/9 R

[56] **References Cited**

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[57] **ABSTRACT**

A modular light fixture and sound absorbing panel assembly which can be easily inserted into place in a preassembled suspension system with the support hangers for the suspension system being symmetrically located with respect to the supporting legs of the modules.

6 Claims, 6 Drawing Figures

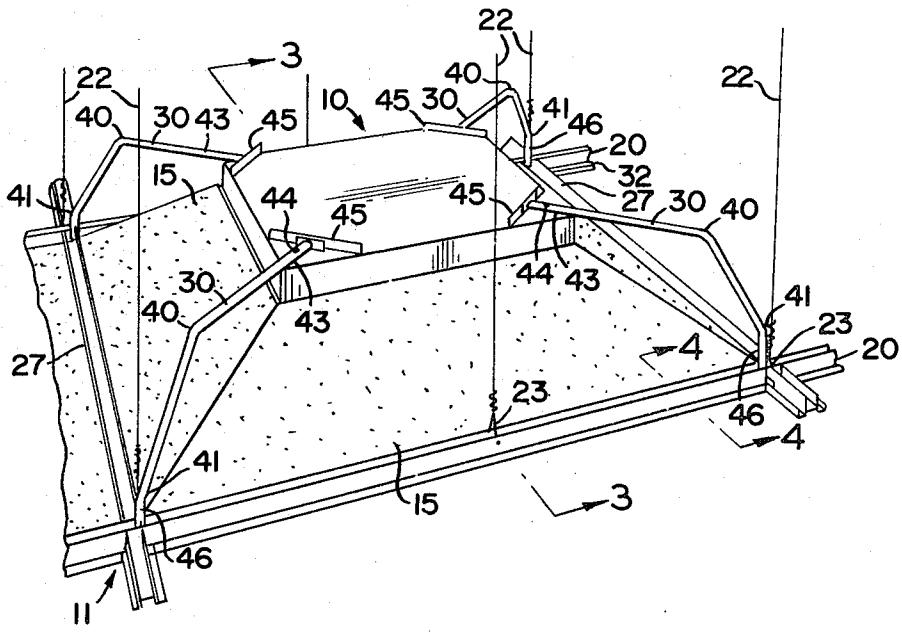
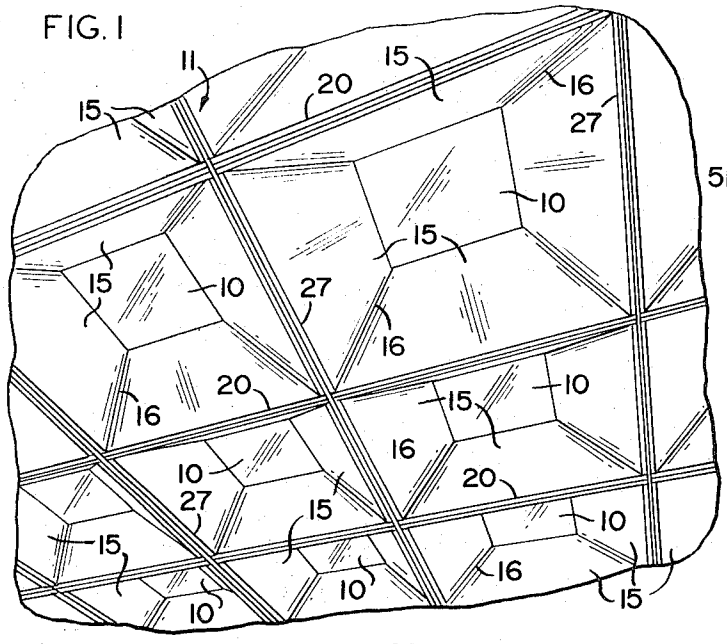


FIG. 1



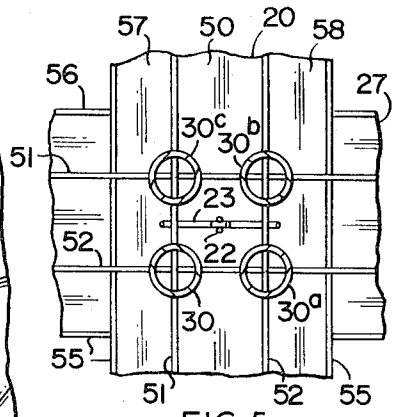


FIG. 5

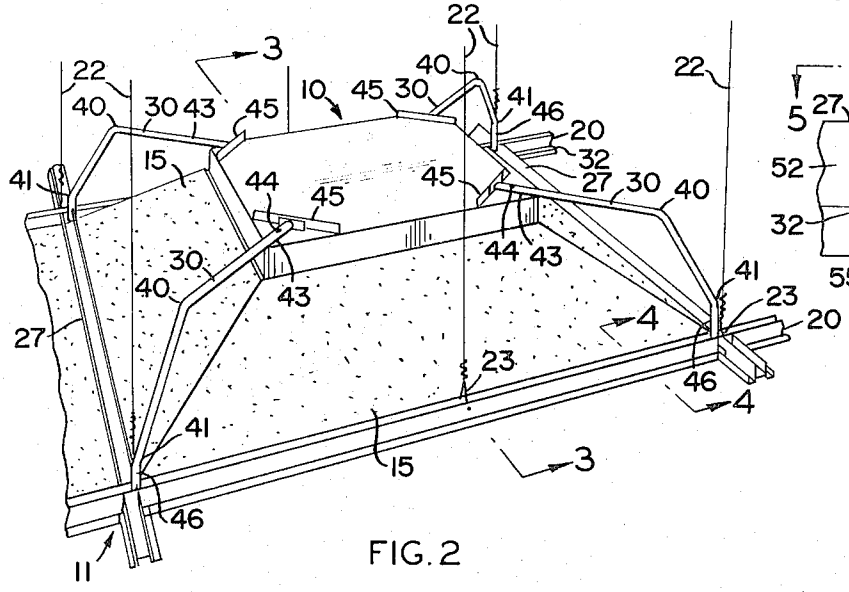


FIG. 2

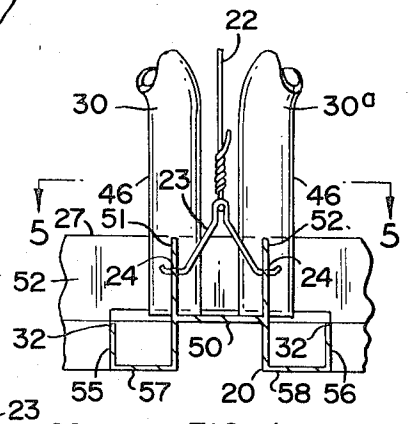


FIG. 4

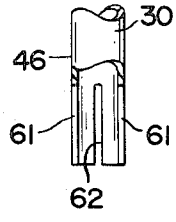
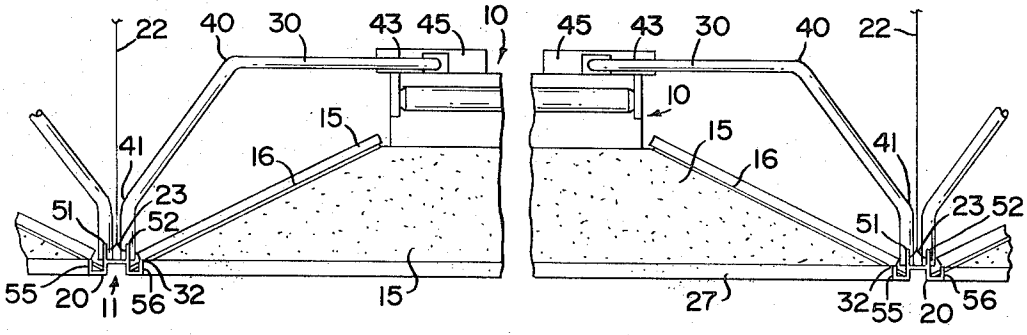


FIG. 6

FIG. 3



MODULAR CEILING ASSEMBLY

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention is directed to suspended ceilings having modular light and sound absorbing units supported by a preassembled suspension system.

2. Description of the Invention

The invention relates to a suspended ceiling arrangement and more particularly to a light fixture and sound absorbing panel assembly which can be easily assembled on the job site with a minimum of labor.

More recent architectural trends in ceiling design have moved away from a flat, monolithic ceiling structure to a modular ceiling in which a series of spaced, downwardly-opening, truncated pyramidal assemblies present an aesthetically attractive appearance. Some of these more modern ceilings have been constructed of individual modular sections which must be aligned in a common plane. This type of ceiling assembly is time consuming.

Another type of ceiling construction comprises a preset suspension structure hung from an overhead support and aligned in place. After alignment, a series of modular units are supported on flanges of the grid suspension members. It has been found to be more desirable to mount the modular unit on the vertical web of the suspension member rather than on a horizontal flange. In this way the weight of the modular unit is carried directly by the suspension system supporting means; thus, avoiding any tendency of the suspension members to tilt out of a horizontal plane.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a novel modular assembly which can be easily installed on the job-site with a minimum of labor.

It is another object of the present invention to provide a novel modular assembly which is compatible with existing ceiling suspension systems.

It is still another object of the present invention to provide a novel modular assembly which when in place will be mounted on the web of the suspension members.

BRIEF DESCRIPTION OF THE DRAWING

These and other objects will become evident upon consideration of this invention in conjunction with the accompanying drawing in which like elements are designated by like numerals and in which:

FIG. 1 is a perspective view of a modular ceiling showing the modular unit of the invention in place,

FIG. 2 is a perspective view of the modular unit of the invention connected to a suspension system,

FIG. 3 is a cross-sectional view of the modular unit and suspension system taken along line 3—3 of FIG. 2,

FIG. 4 is an enlarged elevational view of a part of the novel modular ceiling showing the meeting of modular units at a corner,

FIG. 5 is a cross-sectional view of a corner of the ceiling suspension system taken along line 5—5 of FIG. 4 showing the connection of four adjacent modular units to the suspension system and their symmetrical support, and

FIG. 6 is a detailed view of the lower end of one of the support legs of the invention.

Referring now to FIG. 1, rectangular light fixtures 10 are supported above a suspension system 11 and the spaces between the fixtures 10 and the suspension system 11 are bridged by acoustical panels 15. Board moldings 16 form a decorative closure between adjacent acoustical panels 15 to hide any imperfections along their mating edges.

In constructing the ceiling, main suspension members 20 are placed in parallel rows in coplanar relationship and are suspended on hanger wires 22 (shown in FIG. 2) below a supporting member (not shown) which is usually the underside of a floor above the ceiling. Hanger wires 22 are connected to the suspension members at pre-selected distances by means of clips 23 which engage holes 24 drilled into the upright parallel webs of suspension members 20.

Cross-suspension members 27 are connected to suspension members 20 at predetermined splice points.

The installation, alignment and interconnection of the main suspension members 20 and cross-suspension members 27 is done in a conventional manner. In the preferred embodiment the main suspension members are spaced on 5-foot centers and the cross-suspension members are also connected on 5-foot centers to form a 5 × 5 feet square modular pattern. Obviously, modular patterns with other dimensions may be used, if so desired.

For details of the modular light fixture and sound absorbing unit, reference may be had to FIGS. 2 and 3 in which rectangular light fixture 10 is centrally supported above the ceiling suspension grid formed by main suspension members 20 and cross-suspension members 27 by means of four outwardly and downwardly extending tubular legs 30.

Light fixture 10 is a rectangular sheet metal box and in the preferred embodiment is of square lateral dimensions for design purposes. In certain constructions, where the opening in the suspension system is an approximate 5 × 5 feet module, the light fixture 10 may be a square of 2 feet, 2.5 feet or 3 feet linear dimensions. Its thickness dimension is much less than either its length or width. Disposed within the light fixture box are the various ballasts, lamps, lamp holders, clips and wire connections necessary to constitute a light fixture. Along the lower edge of the metal box there may be a small outwardly extending flange against which the upper edges of the acoustical panels 15 and the board moldings 16 can rest.

The lower edges of the acoustical panels and the board moldings rest on the top edges 32 of upturned flanges 55 of the suspension members 20 and 27. (See FIG. 4.)

Tubular support legs 30 are generally bent in two places 40 and 41 intermediate their ends. A In this way a top portion 43 of each leg 30 extends parallel to and abuts the top surface of light fixture 10. The lower terminal end or portion 46 of leg 30 is elongated and extends perpendicularly downwardly to engage the vertical webs of both main suspension member 20 and cross-suspension member 27 at their connections.

With this arrangement, it has been found that the connection of the top portion 43 of leg 30 to the flat top surface of the light fixture 10 is simplified. A bracket 45 has a hole (not shown) to receive the end of top portion 43 of leg 30 and a small bolt 44 holds the top portion 43 tubular leg 30 securely in place, as top

portions 43 overlie respective underlying right angle corners of fixture 10.

In addition the lower terminal end or portion 46 of leg 30 being perpendicular to the upright webs 51 and 52 of the suspension members 20 and 27 directs the supported weight of the light fixture 10 vertically downwardly so that the suspension members have little tendency to tilt out of their horizontal plane.

By providing two bends 40 and 41 in each leg there is a better distribution of the weight forces while providing a clear area for the panels 15 to be put in position after the light fixture and extending leg assembly is put into place on the suspension members 20 and 27.

For a better understanding of the manner in which the lower ends of legs 30 are connected to and supported by the suspension members 20 and 27 reference may be had to FIG. 4. Focussing on the cross-sectional view of main suspension member 20, the member 20 is mainly in the shape in the shape of the letter H with the cross-spanning central portion 50 being slightly below the center of the upright web portions 51 and 52. To form supports for the lower edges of the panels 15, there are outwardly and upwardly extending flanges 55 and 56 integrally connected to the lower outwardly, extending flanges 57 and 58 respectively which extend integrally and coextensively with web portions 51 and 52. Each cross-suspension member 27 has the same cross-sectional configuration as that of main suspension member 20 so that at the junction of the cross-suspension members 27 and the main suspension members 20 the top view at the level of the tops of the upright web portions would be that of two pairs of railroad rails meeting at right angles.

This configuration is better seen in FIG. 5 which shows the connection of four tubular legs, 30, 30*a*, 30*b* and 30*c*, one for each of four adjoining modular units at the juncture of a main suspension member 20 and a cross-suspension member 27. Slots 60 and 61 (shown in greater detail in FIG. 6) are cut upwardly into the lower portion 46 of legs 30. Lower terminal portion 46 is longer than the length of slots 60 and 61. Slots 60 and 61 fit over and engage the upright webs 51 and 52 of main suspension members 20 and cross-suspension members 27. It can be seen that because the lower end portions 46 of the legs 30 are supported vertically by the web portions 51 and 52 the weight of modular unit of the invention does not tend to tilt the suspension members out of their horizontal plane.

Furthermore, the weight is carried by the hanger wires 22 which through clips 23 symmetrically support the weight of each corner of the modular units.

In summary, there is provided a novel modular light fixture and sound absorbing panel assembly which connects to a suspension system with a non-distorting distribution of weight and a simplified manner of assembly on the job site.

What is claimed is:

1. A modular light fixture and sound absorbing panel assembly adapted to be supported on upstanding perpendicularly intersecting webs of a preassembled suspension system having a rectangular openings between spaced suspension members comprising:

a rectangular light fixture having a top surface lying in a horizontal plane and having lower edges in a plane parallel with and spaced from said top surface,

outwardly and downwardly extending tubular legs, each having a top portion connected to said top surface and overlying respective corners thereof,

each of said top portions overlying and being connected to an area of said top surface of said light fixture at a respective underlying right angle formed by said rectangular top surface of said light fixture,

each of said legs having a lower elongated terminal portion remote from said top portion and terminating in a plane parallel with and spaced from said plane formed by said lower edges,

said lower elongated terminal portion being disposed in the vertical planes in which the perpendicularly intersecting webs connect,

each of said lower terminal portions of said legs having slots therein adapted to fit over and engage at least two of said upstanding webs at their intersection, said lower terminal portion being longer than the length of said slots, and

panels of sound absorbing material supported on said suspension system and lying against said lower edges of said light fixture.

2. A modular light fixture and sound absorbing panel assembly as recited in claim 1, in which said preassembled suspension system has square openings and said light fixture is of square configuration.

3. A modular light fixture and sound absorbing panel assembly as recited in claim 1 in which each of said tubular legs has at least two bends intermediate its ends.

4. A modular light fixture and sound absorbing assembly as recited in claim 1 in which said slots are in aligned pairs with each pair of slots being in a vertical plane perpendicular to the other of said pair of slots.

5. In combination a modular light fixture and sound absorbing panel assembly, and a ceiling suspension assembly adapted to be fixed to an overhead support,

said ceiling suspension assembly comprising a rectangular grid formed of interconnected perpendicularly intersecting coplanar suspension members,

each of said suspension members having at least one central upstanding vertical web,

means attached to said suspension members at said intersections and adapted to be secured to said overhead support for maintaining said suspension assembly in a horizontal plane;

said light fixture comprising:

a rectangular light fixture having a top surface lying in a horizontal plane and having lower edges in a plane parallel with and spaced from said top surface,

outwardly and downwardly extending tubular legs, each having a top portion connected to said top surface and overlying respective corners thereof,

each of said top portions overlying and being connected to an area of said top surface of said light fixture at a respective underlying right angle formed by said rectangular top surface of said light fixture,

each of said legs having a lower elongated terminal portion remote from said top portion and terminating in a plane parallel with and spaced from said plane formed by said lower edges,

said lower elongated terminal portion being disposed in the vertical planes in which the perpendicularly intersecting webs connect,

each of said lower terminal portions of said legs having slots therein adapted to fit over and engage at least two of said upstanding webs at their intersection, said lower terminal portion being longer than the length of said slots, and

panels of sound absorbing material supported on said suspension system and lying against said lower edges of said light fixture.

6. In combination a modular light fixture and sound absorbing panel assembly and a ceiling suspension assembly as recited in claim **5** in which each of said suspension members has a central longitudinal cross-section of inverted U-shaped configuration with a pair of spaced parallel upstanding webs.

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