

Oct. 21, 1969

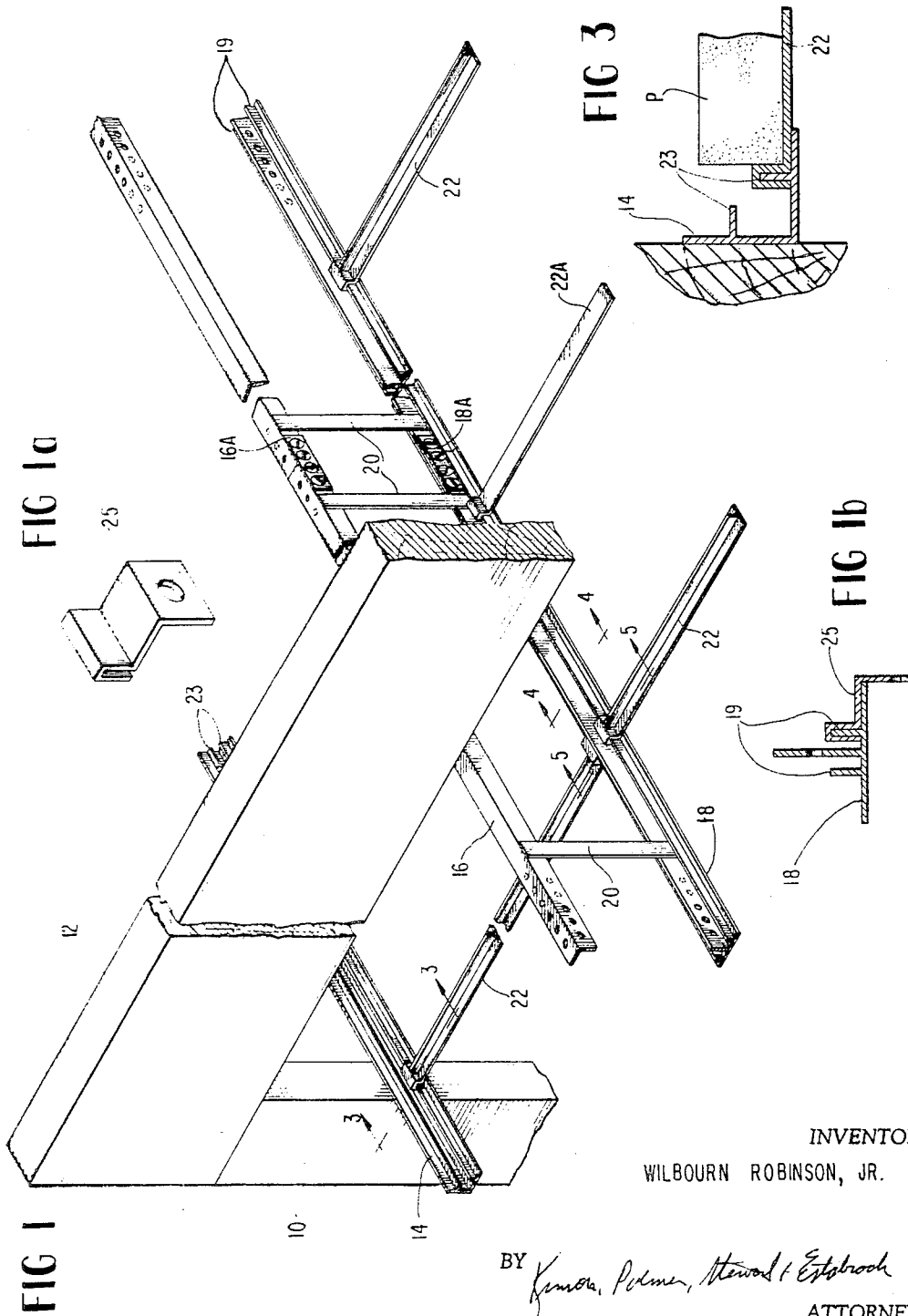
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3,473,282

SUSPENSION SYSTEM FOR CEILING PANELS

Filed Oct. 11, 1967

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

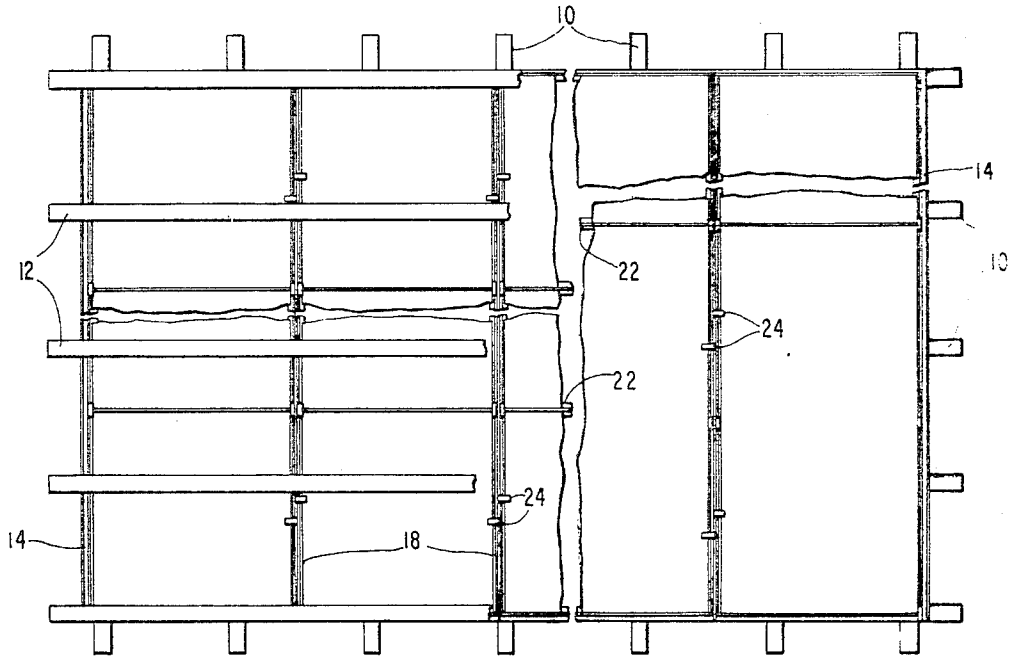


FIG 2

FIG 5

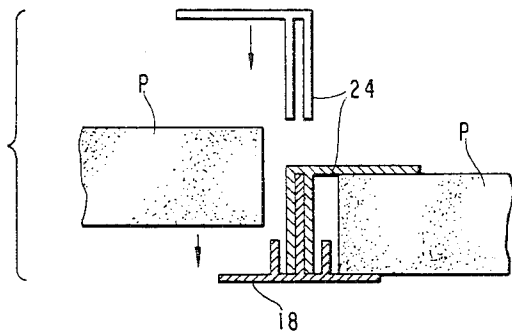
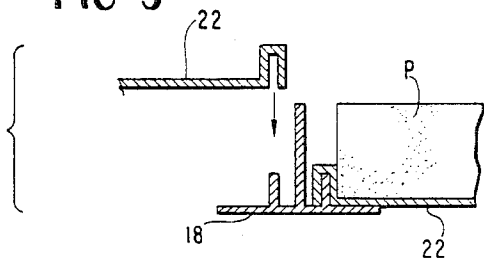


FIG 4

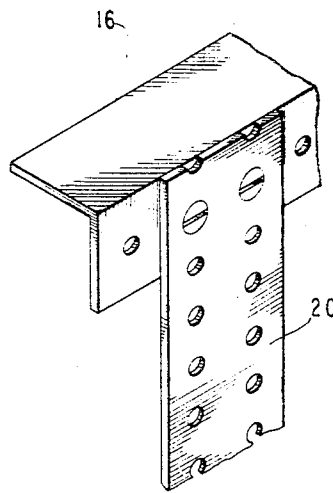


FIG 6

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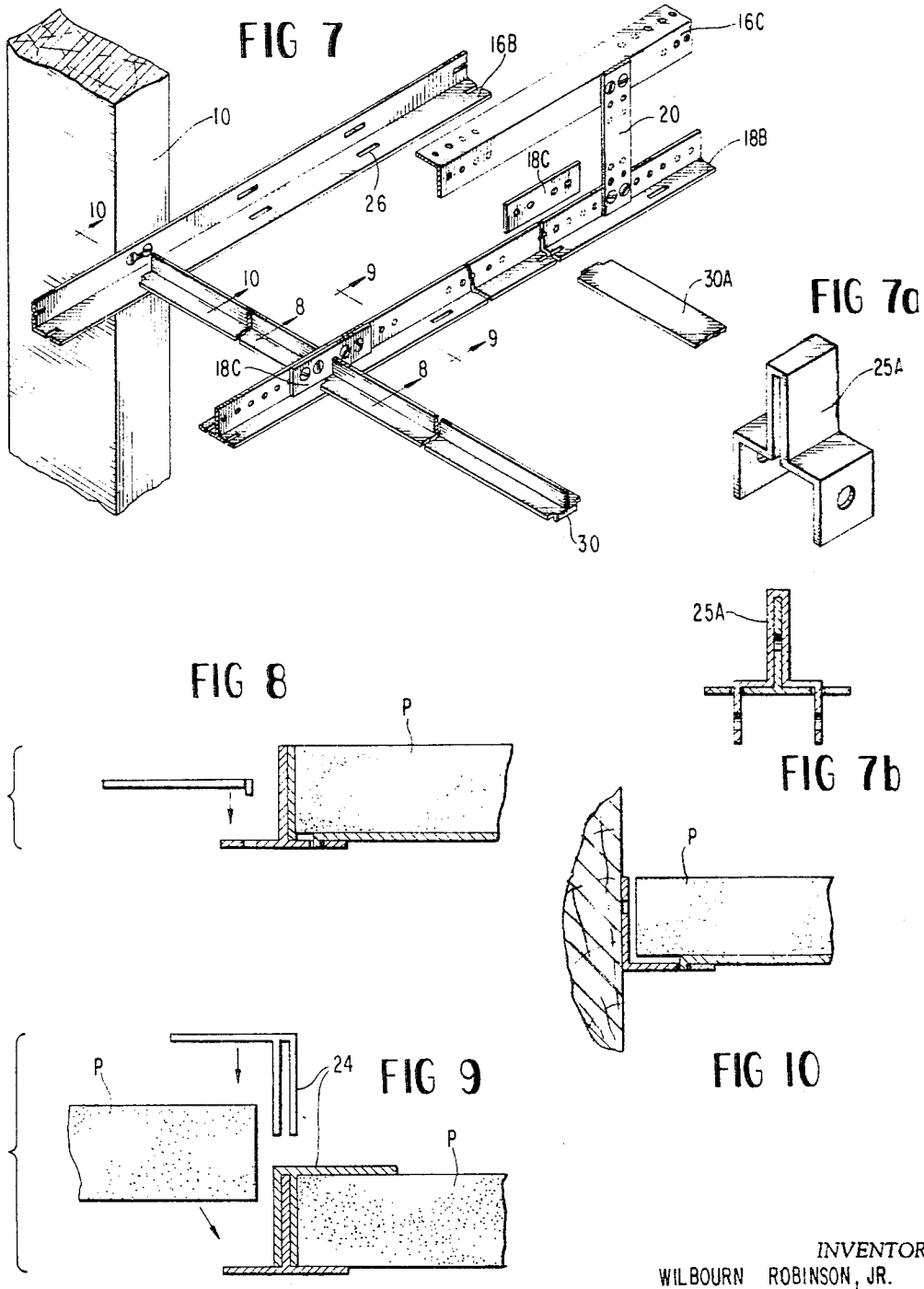
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SUSPENSION SYSTEM FOR CEILING PANELS

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3 Sheets-Sheet 3



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3,473,282
SUSPENSION SYSTEM FOR CEILING PANELS

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4 Claims

ABSTRACT OF THE DISCLOSURE

A suspended ceiling hanger system constructed entirely of rigid members includes horizontal angle irons rigidly attached to vertical studs disposed around the entire perimeter of the ceiling. Elongated parallel T-shaped runners are mounted in inverted position in spaced relation to the overhead from which the ceiling is to be hung and these runners are rigidly connected by vertical spacer members to elongated angle irons which in turn are rigidly attached to horizontal structural members such as floor joists from which the ceiling is to be hung. Additional horizontal T-shaped panel supporting members are interconnected at right angles to the T-shaped runners to define a multi-pocket grid for direct support of the ceiling panels.

BACKGROUND OF THE INVENTION

There are numerous systems in the prior art for supporting suspended type ceilings. One example of the prior art suspension systems of the type to which the present invention is addressed may be found in the U.S. patent to Findlay 3,084,401 of Apr. 9, 1963. In all of the prior systems known to applicant, the panel supporting members are hung from the overhead by means of wires or the like such as shown at 12 in FIGURE 1 of the above-noted Findlay patent. Installation of these systems requires careful supervision of the length of each of the wire members to insure a level arrangement and this is a difficult thing to accomplish in actual practice. In addition, there is little or no rigidity to the systems of the prior art due to the more or less flexible suspension and the panel supports therefore do not lend any structural rigidity to the building in which they are installed.

SUMMARY OF THE INVENTION

In accordance with the present invention, the panel supporting members which in assembled relation define a multipocket grid structure for direct support of the ceiling panels are rigidly connected to the overhead in such a way that the assembled grid structure is particularly rigid and actually adds to the structural integrity of the entire building. In contrast to the wire supported panel supports of the prior art, the panel supporting members of the present invention are rigidly connected to the overhead by rigid structural vertically disposed members attached at their lower ends to the panel supporting members and at their upper ends to angle irons which in turn are rigidly affixed to the floor joists or the like from which the ceiling is to be hung.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a perspective view of a portion of the panel supporting members in accordance with one embodiment of the present invention;

FIGURES 1A and 1B are perspective and end views, respectively, of a decorator clip attachment for the suspension system of FIGURE 1;

FIGURE 2 is a plan view with parts broken away of an entire ceiling structure;

FIGURE 3 is a section on the lines 3—3 of FIGURE 1;

FIGURE 4 is a section on the lines 4—4 of FIGURE 1;

FIGURE 5 is a section on the lines 5—5 of FIGURE 1;

FIGURE 6 is a perspective view showing the attachment of a strut to an overhead angle iron;

FIGURE 7 is a perspective view of an alternative embodiment of the structure shown in FIGURE 1;

FIGURES 7A and 7B are perspective views and end views respectively of a decorator clip attachment for the suspension system of FIGURE 7;

FIGURE 8 is a section on the lines 8—8 of FIGURE 7;

FIGURE 9 is a section on the lines 9—9 of FIGURE 7; and

FIGURE 10 is a section on the lines 10—10 of FIGURE 7.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring first to FIGURE 1, the vertical studs of the building structure in which the ceiling is to be installed are indicated at 10 and the horizontal floor joists at 12. A basically angle iron shaped member 14, a portion of which is shown in FIGURE 1, is rigidly connected by screws or nails to the studs 10 around the entire perimeter of the room and at the desired spacing from the joists 12. Angle irons 16 are rigidly connected as by screwing or nailing to the joists 12 and it is these angle irons which serve to support the panel supporting members in rigid spaced relation from the overhead. The runners 18 which comprise the main panel supporting members are basically of T-shaped cross section and are mounted in inverted position by rigidly interconnecting them with the angle iron 16 by means of rigid vertical spacer members 20. Preferably, the spacer members 20 are attached to the angle iron 16 and runners 18 by machine screws or the like. As will be apparent to those skilled in this art, the runners 18 will be installed at the same level as the angle irons 14. The runners 18 and the angle irons 14 are interconnected at right angles by further T-shaped panel supporting members 22. Connector plates 16A and 18A may be used to assembly any desired running length of angle irons 16 and runners 18. As will be apparent in FIGURE 1, the runners 18 in addition to their basic T shape, include on either side of the leg of the T a further vertical rib 19 parallel to the leg of the T and one disposed on each side thereof. The angle iron 14 may also include ribs 23. The cross members 22 as shown most clearly in FIGURES 3 and 5 include end portions with a configuration adapted to mate with the vertical ribs of both the runners 18 and the angle irons 14 so that they may be readily assembled following installation of the angle irons and the runners. Assembly of the cross members to interconnect the runners and also to interconnect the outermost runners with the angle irons 14, then defines a grid structure having a multiplicity of pockets for direct support of the ceiling panels as shown in FIGURES 2, 3 and 5. Between the cross members 22 as shown in FIGURE 1 is an alternative flat form of cross support member 22A which is useful for supporting panels at points other than around their perimeter.

A decorator clip 25 for attachment to the runners is shown in FIGURES 1A and 1B. This provides a convenient means for the hanging of displays or decorations from the ceiling support.

Clip members 24 shown in FIGURE 4 may be used to engage the leg of the T-shaped runner as well as the upper surface of the ceiling panels. These clips may be used at any desired interval spaced longitudinally along the runners 18.

The above-described structure has numerous advantages

not possessed by suspension systems of the prior art and among these advantages may be listed the following:

The angle iron portions which attach to the overhead serve as a brace for the overhead framing members; these members are predrilled in both the vertical and horizontal surfaces to permit attachment at any point in a building structure regardless of the spacing the joists or the like. The predrilled openings in the main runner members by means of the interconnecting struts at any desired location and greatly facilitate accurate leveling of the panel supporting runners. If desired, the entire angle iron vertical strut and runner may be preassembled at floor level before attachment to the overhead structural members. The cross connecting panel supporting members by virtue of the fact that they have only a friction fit with the ribs on the runners may be installed at any desired location and may be readily shifted after installation to accommodate variations in panel size or the like. This is in direct contrast with the above-mentioned Findlay patent in which the cross members are connectable only at fixed locations. Also, the panels may be installed on the hangers as soon as each hanger section is complete. This allows more work room for handling the panels and also increases the speed of their installation. All in all, the hanger system of the present invention is stronger, more easily installed, and can be adapted to any desired system of heating, cooling, sound insulation, electrical installation, and there is little or no waste.

Referring now to FIGURE 7 of the attached drawings, substantially the same basic structure is shown as that illustrated in FIGURE 1 except that the runners 18B and the angle irons 16B are plane T and L shaped in cross section, respectively, and include openings 26 to accommodate tongues 30 formed at the ends of the cross members. Connector clips 18C and corresponding clips (not shown) may be used as in FIGURE 1 to assemble any desired running lengths of the runners 18B and angle irons 16C. Also as in FIGURE 1 plane flat cross member 30A may be used along with cross member 30 to support panels at points other than around their perimeters.

A decorator clip 25a similar to the one shown in FIGURES 1A and 1B is shown in FIGURES 7A and 7B.

The vertical members 20 which form the rigid connection between the runners and the overhead supports may be assembled either in situ or they may be assembled in advance so that an entire section, for example, can be first assembled and then fastened to the overhead. Also, the vertical spacers 20 may be affixed to the angle iron and the runners by means of screw threaded fasteners or they may be welded into position. Preferably if the attachment is by way of welding, then an entire section is first welded up and then hung on the overhead.

From the foregoing it will be apparent to those skilled in this art that there is herein shown and disclosed a new and useful hanger system for suspended ceilings and the like.

I claim:

1. A suspended panel ceiling support system for attachment to the vertical and horizontal structural members of a building comprising in combination:

a first plurality of elongated rigid members having at least one vertical and one horizontal surface, and having a plurality of openings through at least the horizontal surface thereof for attachment by fasteners to the horizontal structural members below which the ceiling is to be hung;

a plurality of peripheral ceiling panel supporting members having at least two surfaces at right angles to one another, at least the vertical surface having a plurality of openings therein for attachments by fasteners to the vertical supporting members at the

desired ceiling level around the entire perimeter of the ceiling, the other of said surfaces then extending horizontally into the interior of the area in which the ceiling is to be hung;

a plurality of rigid elongated substantially T-shaped panel supporting runners;

rigid struts supporting said runners in inverted position in vertically spaced relation below said first plurality of members at the desired ceiling height;

and secondary panel supporting members interconnecting said T-shaped members at substantially right angles thereto and also interconnecting those of said runners nearest the periphery of the ceiling with said peripheral ceiling panel supporting members, said runners and said peripheral supporting members including vertical ribs and said secondary panel supporting members including end portions which engage with both sides of said ribs.

2. A suspended panel ceiling support system for attachment to the vertical and horizontal structural members of a building comprising in combination:

a first plurality of elongated rigid members having at least one vertical and one horizontal surface, and having a plurality of openings through at least the horizontal surface thereof for attachment by fasteners to the horizontal structural members below which the ceiling is to be hung;

a plurality of peripheral ceiling panel supporting members having at least two surfaces at right angles to one another, at least the vertical surface having a plurality of openings therein for attachment by fasteners to the vertical supporting members at the desired ceiling level around the entire perimeter of the ceiling, the other of said surfaces then extending horizontally into the interior of the area in which the ceiling is to be hung;

a plurality of rigid elongated substantially T-shaped panel supporting runners;

rigid struts supporting said runners in inverted position in vertically spaced relation below said first plurality of members at the desired ceiling height;

and secondary panel supporting members interconnecting said T-shaped members at substantially right angles thereto and also interconnecting those of said runners nearest the periphery of the ceiling with said peripheral ceiling panel supporting members, said runners and said peripheral supporting members including openings in their horizontal panel supporting surfaces and said secondary panel supporting members terminating in tongues at right angles to their length which engage in said slots.

3. A system as defined by claim 1 in which said struts are welded to said runners and said first members.

4. A system as defined by claim 1 in which said struts are attached to said runners and said first members by screw fasteners.

References Cited

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3,359,697	12/1967	Smith et al.	52—476	X

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P. C. FAW, JR, Assistant Examiner

U.S. Cl. X.R.

52—488, 489, 495

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,473,282

October 21, 1969

Wilbourn Robinson, Jr.

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 8, after "in the" insert -- vertical surface of the angle irons permit attachment of the --.

Signed and sealed this 21st day of April 1970.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents