

(19) AUSTRALIAN PATENT OFFICE

(54) Title
Suspended ceiling gusset stay

(51)⁶ International Patent Classification(s)
E04B 9/30 (2006.01) 2BHAU E04B
E04B 9/18 (2006.01) 9/18
E04B 9/30 20060101ALI2009052
20060101AFI2009052 2BHAU

(21) Application No: 2009201902 (22) Application Date: 2009.05.13

(30) Priority Data

(31) Number (32) Date (33) Country
12/156,778 2008.06.04 US

(43) Publication Date : 2009.12.24
(43) Publication Journal Date : 2009.12.24

(71) Applicant(s)
Worthington Armstrong Venture

(72) Inventor(s)
Platt, William J.; Kelly, Joseph J.

(74) Agent/Attorney
Spruson & Ferguson, Level 35 St Martins Tower 31 Market Street, Sydney, NSW, 2000

2009201902 13 May 2009

SUSPENDED CEILING GUSSET STAY

Abstract

The space above a suspended ceiling grid (25) that extends along a corridor is kept open and free of hang wires by creating a truss (70) at each end of a beam (40) in the grid (25). The truss (70) includes the beam (40) itself, an opposing wall (30, 31) along one side of the space, and a gusset stay (60) that extends from the wall to the beam (40).

AH21(2100430 1):KEH

2009201902 13 May 2009

S&F Ref: 904061

AUSTRALIA
PATENTS ACT 1990
COMPLETE SPECIFICATION

FOR A STANDARD PATENT

Name and Address of Applicant :	Worthington Armstrong Venture, of 9 Old Lincoln Highway, Suite 200, Malvern, Pennsylvania, 19355, United States of America
Actual Inventor(s):	Joseph J. Kelly, William J. Platt
Address for Service:	Spruson & Ferguson St Martins Tower Level 35 31 Market Street Sydney NSW 2000 (CCN 3710000177)
Invention Title:	Suspended ceiling gusset stay

The following statement is a full description of this invention, including the best method of performing it known to me/us:

5845c(2102331_1)

SUSPENDED CEILING GUSSET STAY

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention involves a suspended ceiling having
5 beams formed into a grid that supports either panels laid
on, or drywall sheets attached to, the grid. Hang wires
support the grid from a structural ceiling.

2. Description of Related Art

In U.S. Patents 7,240,460, and 7,278,243, both of
10 which are incorporated herein by reference, there is
disclosed a suspended ceiling that can extend for up to
about eight feet between walls, in building corridors for
instance, without the need for hang wires. Such a ceiling
keeps the space between the suspended ceiling and the
15 structural ceiling open for air conditioning ducts,
electrical conduits, sprinkler pipes, and other building
components, that may extend along the corridor. A beam in
such a ceiling extends between opposing walls, and is
supported at its ends on the ledges of wall moldings.

20 The suspended ceiling described above sometimes
extends beyond eight feet between walls for on up to
generally a maximum of twelve feet.

In such extended suspended ceilings, hang wires are
needed to keep the extended suspended ceiling from sagging

in the middle of the span between walls. The hang wires, as used in the prior art, are embedded at their upper ends in the structural ceiling and are connected at their lower ends to the beams. Such hang wires obstruct the space between the suspended ceiling and the structural ceiling.

Object of the Invention

It is the object of the present invention to substantially overcome or ameliorate one or more of the disadvantages of the prior art, or to provide a useful alternative.

Brief Summary of the Invention

The present invention at least in a preferred embodiment relates to a suspended ceiling that extends between opposing sidewalls spaced apart at a distance between about eight feet to a maximum of about 12 feet, and is supported on wall moldings, gusset stays are used to provide additional support to the beams, eliminating the need for hang wires, so that the space between the suspended ceiling and the structural ceiling is kept open for building components. The invention involves the use of such gusset stays to form a truss that supports the ceiling at each end of the beams that extend between the opposing sidewalls.

The gusset stays are secured at their upper end to a horizontally extending support track attached to the wall, above the wall molding disclosed in U.S. Patent Nos. 7,240,460 and 7,278,243. The gusset stays extend diagonally downward, in a vertical plane, from the support track to the ceiling grid, and are attached to a beam in the grid that extends between opposing walls.

By placing the support track about two feet above the wall molding so that a stay attached to the track can be attached to a beam about two feet from its end, the span of beam between walls can be increased to a distance of about 5 12 feet, with the space above the suspended ceiling continuing to remain clear of the hang wires that would have been necessary in the prior art.

The support track is desirably attached to studs that support the wall. The gusset stays can be attached 10 anywhere along the track, in registry with the cross beams. The load from the stays is distributed along the support track to the wall studs to which the support track is attached.

BRIEF DESCRIPTION OF SEVERAL VIEWS OF THE DRAWING

15 Figure 1 is a partial perspective view, taken from above, of the suspended ceiling of the invention.

Figure 2 is a vertical cross sectional view of the ceiling of the invention, taken on the line 2-2 of Figure 1, with part of the ceiling between gusset stays broken 20 away.

Figure 3 is a perspective view, taken from above, of a gusset stay about to be secured to a support track, and to a beam, in the suspended ceiling of the invention.

Figure 4 is a sectional view, taken on the line 4-4 of Figure 2.

DETAILED DESCRIPTION OF THE INVENTION

A suspended ceiling 20, as seen in Figure 1, extends
5 between opposing walls 30,31, below a structural ceiling, creating a space between the suspended ceiling 20 and the structural ceiling. Such space is open and free of supporting hang wires, and is available for air conditioning ducts, power lines, and other building
10 components. The invention is particularly suited for installation in a corridor of a building, where the span between walls 30,31 is generally from about eight feet, up to about twelve feet.

Beams 40 in the grid 25, each of which spans the
15 distance between opposing walls 30,31, engage tabs 22 in a horizontal ledge 23 of the wall molding 21, which is attached to an opposing wall 30,31, by fasteners 27. Beams 41 extend between, and are connected to, beams 40 in grid 25. A connection 42 between beam 41 and 40 may be of a
20 stab-in type as disclosed, for instance, in U.S. Patent 6,178,712, incorporated herein by reference, wherein a connector on beam 41 is inserted into a slot in beam 40.

The wall moldings 21, are alone adequate to support the suspended ceiling 20 for spans between opposing walls

30,31 of up to about eight feet, as disclosed in the '460 and '243 patents.

The present invention is desirably used in suspended ceilings 20 that extend between opposing walls 30,31 beyond
5 from about eight feet on up to about twelve feet, to eliminate a need for hang wires to further support such length of beams.

The invention, as seen in the drawings, uses a support track 50 that is secured to each of the opposing walls
10 30,31 by fasteners 51 that desirably extend into vertical wall studs 52 that support the wall 30,31. The support track 50 extends horizontally along the wall, about two feet above the wall molding 21.

Diagonally extending gusset stays 60 are secured to
15 the support track 50. A gusset stay 60, secured at the upper end to the support track 50, extends diagonally downward, suitably at a 45° angle from the horizontal, and is attached to a beam 40 of the ceiling grid 25, that extends between wall 30,31 at the lower end of the gusset
20 stay 60.

The support track 50, as seen particularly in Figure 3, is formed by continuously rolling a strip of sheet metal into a channel cross section having a base 53, an upper offset 54, and a lower ledge 55.

Any load placed on the support track 50 at a specific point, by a gusset stay 60 of the invention, in its support of grid 25, is distributed along the support track 50 to the various points along the wall 30,31 and to the wall studs 52.

The gusset stay 60 extends diagonally from the support track 50 to a cross beam 40. The gusset stay 60 has a channel cross section with a base 61, and arms 62 and 63.

The gusset stay 60, at its upper end, has a profile 64 that conforms to the cross section of the support track 50, so that the stay can be hooked onto the track as seen particularly in Figure 3. A hook portion 65 engages upper offset 54, and a projection 66 fits below edge 55, of support track 50. The gusset stay 60 can slide along support track 50, into registry with a given beam 40, and then fastened, at its lower end, to the beam 40.

The profile of the gusset stay 60, at its lower end, conforms generally to the cross section of the top of beam 40, so that the gusset stay can be fitted to the beam 40 and then secured to the bulb 25 of the beam 40 with self-tapping screws, as seen particularly in Figure 3.

The gusset stay 60, can be suitably formed by rolling or stamping from sheet metal.

The support track 50 and gusset stay 60 give support and rigidity to the beam 40, and thus to the ceiling grid 25, at a point about two feet in from each opposing wall 30, 31. Such support and rigidity permits a span of up to 12 feet between walls 30, 31, when used with wall moldings 21 as disclosed in US Patent Nos. 7,240,460 and 7,270,243, 5 without the need for hang wires to support the grid 25. This allows the space above the suspended ceiling 20 to remain unobstructed.

The above described structure creates a truss 70 that supports the beam 40 inwardly from its end, thus reducing the length of an unsupported span of beam 40. The vertical leg of the truss is formed by an opposing wall 30, 31, the horizontal leg of the 10 truss is formed by a portion of the beam 40, while the gusset stay 60 forms the diagonal element of the truss 70.

The claims defining the invention are as follows:-

1. A grid in a suspended ceiling having a span between opposing parallel walls, the grid having:

(a) a wall molding secured along each of the opposing parallel walls,

5 (b) inverted T-beams extending between the opposing parallel walls that are supported at their ends on the wall moldings,

(c) a span of up to about twelve feet having a support track secured along each opposing parallel wall, above the wall molding, and

(d) a gusset stay:

10 1) connected at its upper end to a support track,

2) that extends diagonally downward from the support track, and

3) that is connected at its lower end to an inverted T-beam

extending between the opposing walls.

2. The grid of claim 1 wherein:

15 (a) the support track has a cross section that includes a base, and edges extending from the base, and

(b) the gusset stay has an upper end with a cut-out having a profile that conforms to the cross section of the support track;

20 whereby the gusset stay can be (1) engaged with the support track, and (2) slid along the support track to position the gusset stay in registry with a beam.

3. The grid of claim 1, wherein the gusset stay has a shape at its lower end conforming to the top of beam whereby it can be secured to a beam with a self-tapping screw.

4. The grid of claim 1, wherein the opposing walls form a corridor below 25 the suspended ceiling.

5. In a suspended ceiling having a grid with beams that extend between opposing walls up to about twelve feet apart that form a corridor below the suspended ceiling, a truss at each end of a beam, having:

(a) a vertical leg formed by a length of opposing wall,

30 (b) a horizontal leg formed by a segment of beam, and

(c) a diagonal gusset stay extending between, and connected to, the vertical leg by a support track extending horizontally along the length of opposing wall, and to the horizontal leg,

2009201902 13 May 2009

wherein the truss creates a support at a point on the beam, away from an opposing wall, which reduces the length of an unsupported span of beam.

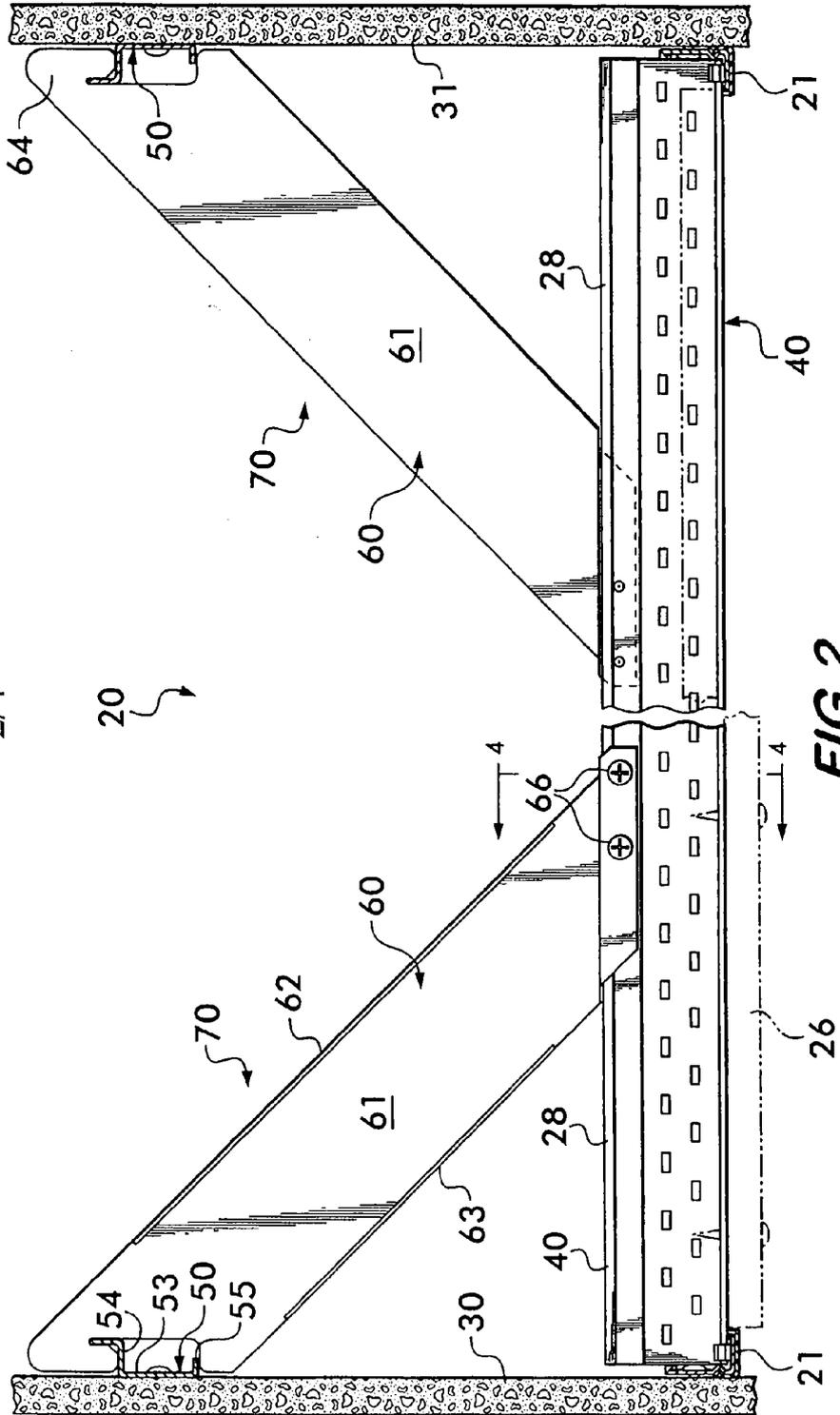
6. A grid, substantially as hereinbefore described with reference to Figures 1 to 4 of the accompanying drawings.

5

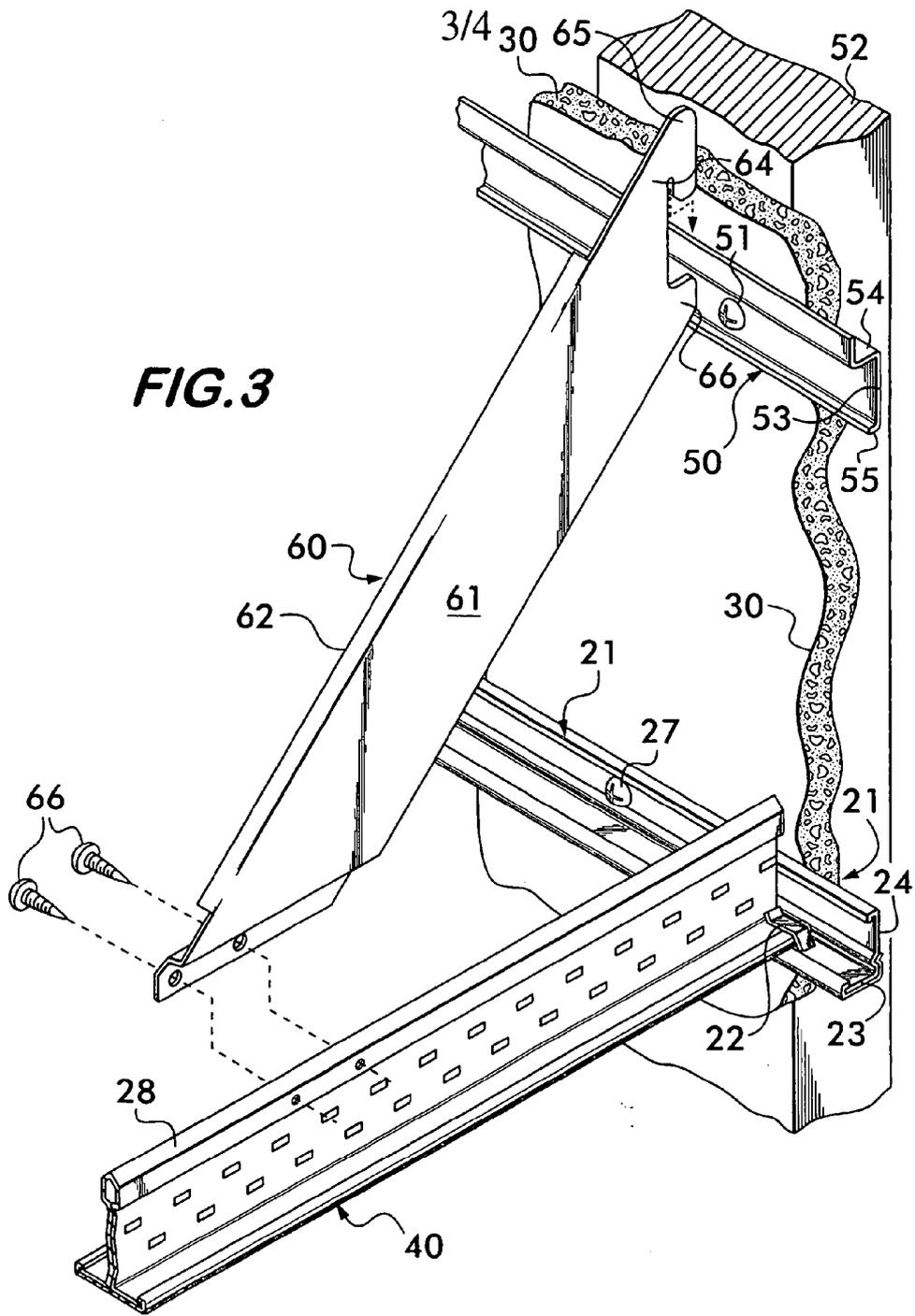
Dated 12 May, 2009

**Worthington Armstrong Venture
Patent Attorneys for the Applicant/Nominated Person
SPRUSON & FERGUSON**

2/4



2/4



4/4

FIG.4

