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2,846,569

RECESSED LIGHTING FIXTURE

Filed Feb. 23, 1955

2 Sheets-Sheet 1

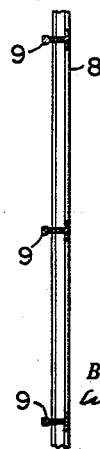
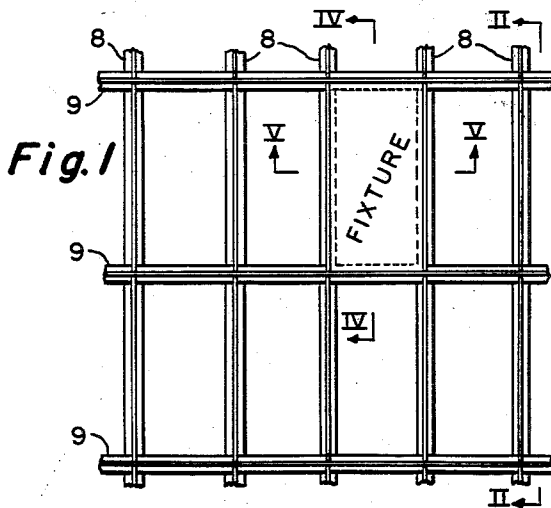
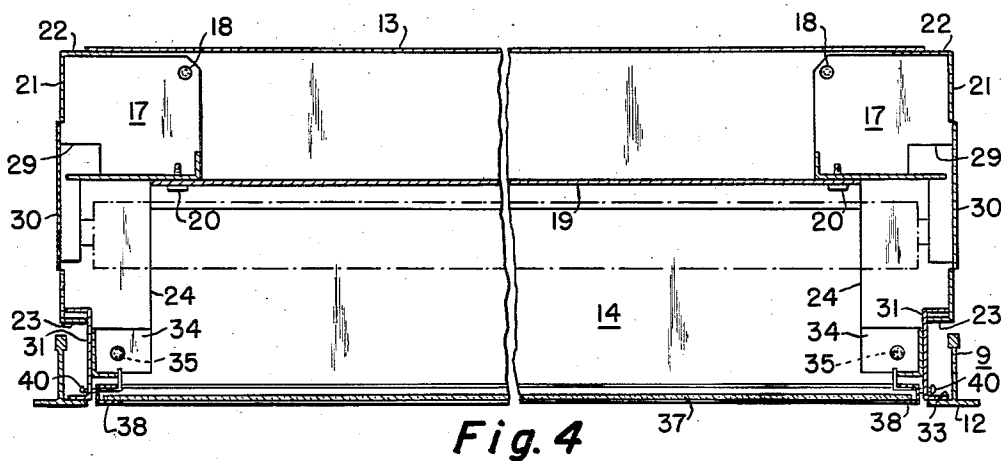
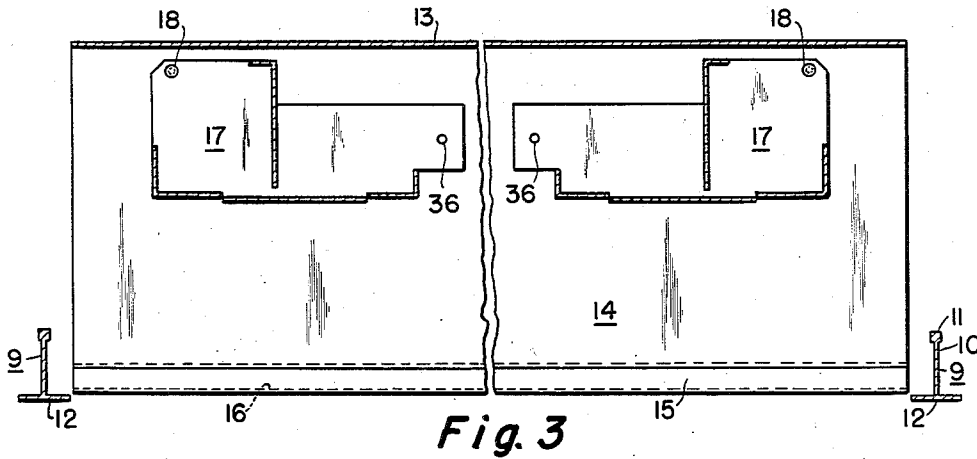


Fig. 2

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2 Sheets-Sheet 2

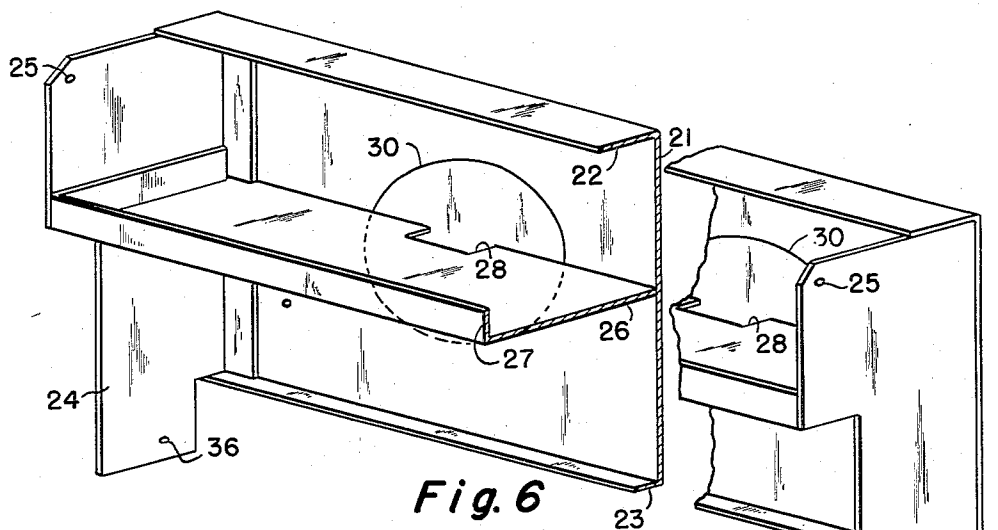


Fig. 6

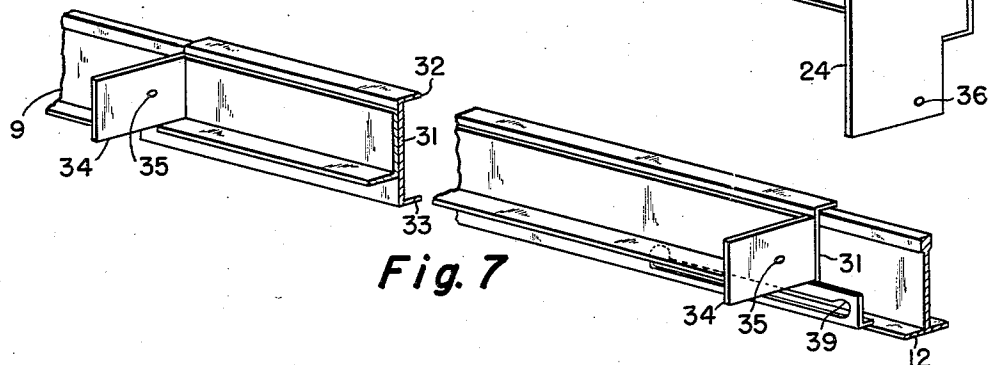


Fig. 7

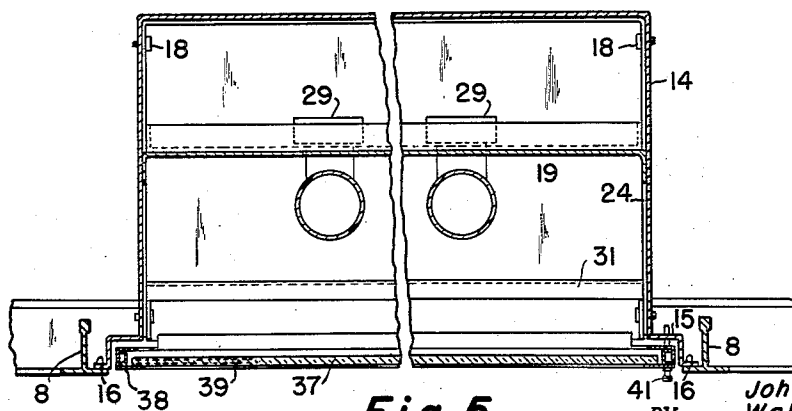


Fig. 5

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RECESSED LIGHTING FIXTURE

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6 Claims. (Cl. 240—51.11)

This application relates to a recessed lighting fixture, particularly a lighting fixture for installation in suspended ceilings.

Suspended ceilings have become increasingly popular for finishing offices, storerooms, and even homes. Such ceilings comprise frames made up from lightweight metal T-beams having horizontally extending flanges, which beams are suspended from structural joists or beams by wires, metal straps, etc. The channels extend lengthwise of the room as stringers and crosswise of the room as spacers. They are spaced from each other a uniform standard distance, and ceiling blocks or tiles are supported on the horizontally extending flanges of the stringers and spacers.

Lighting fixtures are, of course, installed in these ceilings. A particularly desirable lighting arrangement is to use fixtures which lie flush with the ceiling and which have their operating parts, such as housings, reflectors, etc., extending up above the stringers and spacers into the space between the ceiling and the structural beams or joists. However, suspended ceilings present unusual problems in the installation of such lighting fixtures and heretofore there has not been a fixture which solved these problems.

When fixtures which lie flush with a suspended ceiling are used, it is obviously desirable that the support for the fixture not be seen from below but be covered over by the flanges on the stringers and spacers. It is also desirable that the lighting fixtures be installed from beneath the metal framework of the ceiling because of convenience and because such frameworks frequently do not have sufficient strength to support the weight of a man. Also, it is desirable, and frequently necessary, to limit the space which the fixture occupies above the horizontal plane of the ceiling. These requirements create special installation problems because the edges of the flanges on the stringers and spacers define an opening in the ceiling which is less than the cross-sectional space which the fixture will occupy after it is in the ceiling and its edges are resting on or covered by the flanges of the stringers and spacers.

We have invented a recessed lighting fixture which meets all of the requirements for such a fixture listed above and which solves the problem of the inwardly extending horizontal flanges of the stringers and spacers. We provide a recessed lighting fixture which has pivoted end sections. Before the fixture is installed in a suspended ceiling, the ends are folded up into the fixture housing and the fixture can then be inserted into the ceiling opening. After the fixture has been lifted beyond the level of the stringers and spacers, the ends are unfolded and the length and width of the fixture are then such that the edges of the fixture can rest on the horizontal flanges of the metal framework of the ceiling. The fixture can be quickly and easily installed by one man from below the ceiling framework and does not require any tools other than a screw driver.

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In the accompanying drawings, we have illustrated certain present preferred embodiments of our invention, in which:

Figure 1 is a partial plan view of the metal framework used in a suspended ceiling, in which one of our fixtures is indicated by dotted lines and identified by the legend, "Fixture," when in position in the framework;

Figure 2 is a section along the lines II—II of Figure 1;

Figure 3 is a broken transverse section of our lighting fixture;

Figure 4 is a broken longitudinal section of our lighting fixture along the lines IV—IV of Figure 1;

Figure 5 is a broken transverse section of our lighting fixture along the lines V—V of Figure 1;

Figure 6 is a broken isometric view of a pivotal end and lampholder support used in our fixture; and

Figure 7 is a broken isometric view of a locking channel used in our lighting fixture.

Figure 1 shows a framework for a suspended ceiling, such a framework comprising stringers 8 which are suspended from structural joists or beams and spacers 9 carried on the stringers. The spacers and stringers are in the form of small T-beams having vertically extending webs 10 generally reinforced with a bead 11 along their top edge and having flanges 12 which extend horizontally from each side of the web 10 at its lower edge. Ceiling blocks or tiles are inserted between the stringers and spacers and their edges rest on the flanges 12. We use these flanges to support our lighting fixture.

The stringers and spacers are spaced from each other a uniform standardized distance, so as to form a number of horizontal spaces across the ceiling. A common dimension for these spaces is 2' x 4', measured center to center of the beams. The flanges generally extend 1/2" outwardly from each side of the web of the beam, leaving a space between flanges of 23" x 47". A lighting fixture in accordance with our invention which can be installed in such a space is 48" long and 24" wide, but nevertheless it can be installed through an opening which is 23" wide and 47" long.

Figure 3 shows our fixture ready for installation and between two spacers 9. The fixture comprises an elongated housing having a top 13 and sides 14 and open ends. The sides 14 have an outwardly extending ledge 15 and a flange 16 which extends outwardly and horizontally from adjacent the bottom of the ledge 15. An end and lampholder support, designated by the general reference number 17 and which acts as an end closure for the housing, is pivotally mounted adjacent each end of the housing and is supported on pivot screws 18 which pass through each side 14 of the housing.

When our fixture is installed, it is raised into one of the openings formed by the stringers and spacers. During this operation, the end and lampholder supports are pivoted about the screw 18, so that they are entirely within the space between planes passing parallel and against the ends of the housing, preferably within the housing as shown in Figure 3. It will be noted from Figure 3 that the length of the housing is less than the distance between the horizontal flanges of the spacers between which the fixture is being mounted, so that there is no difficulty in lifting the fixture to the position shown in Figure 3 so far as the distance between spacers is concerned. Also, while the fixture is being raised into the ceiling opening, the sides 14 of the housing are sprung inwardly towards each other so that the flanges 16 extending from the housing sides will clear the flanges 12 of the stringers 8.

After the fixture has been lifted above the level of the flanges, the sides 14 are allowed to spring back so that the flanges 16 rest on the flanges 12 of the stringers and support the fixture. The end and lampholder supports 17 are then pivoted about the screw 18, so that they ex-

tend vertically, as shown in Figure 4, and substantially close the ends of the housing. A reflector 19 is then placed in position between the end and lampholder supports, and held to them by screws 20, as shown in Figure 4. The sides 14 are prevented from springing inwardly after the fixture is in place on the ceiling beams by a locking channel, which will be later described.

Figure 6 shows one of the end and lampholder supports 17 which constitute end closures. It comprises an end member 21 having top and bottom flanges 22 and 23 which extend inwardly in the direction of the housing when it is mounted on the housing. The ends of each end and lampholder support are closed by wings 24 which extend parallel to the sides 14 of the housing and carry holes 25 adjacent their inner upper ends, through which the pivot pins 18 pass when the end and support brackets are installed in the housing. Each end and lampholder support also has a shelf or bracket 26 with an upwardly turned outer flange 27. The shelf extends across the full width of the end and lampholder support and is secured to the wings 24. It has notches 28 cut in its edge next to the end member 21 into which lampholders 29 (see Figure 5) may be inserted.

Referring to Figure 4, it will be seen that, except for a knockout plug 30 which will be later described, the outer surfaces of the end member 21 of the end and lampholder supports 17 are in line with the vertical center lines of the spacers 9. Thus, the entire space between the spacer beams is utilized, and, as will be later described, two of our fixtures can be installed in adjacent open spaces between beams and the two fixtures can be connected together while, at the same time, the space between them is wholly enclosed. It will also be noted from Figure 4 that the flange 22 extends a short distance beneath the top 13 of the housing and with the wings 24 and end member 21 forms an extension and end closure for the housing except in the space adjacent to the spacer beams 9. The space around the spacer beams 9 is closed off from the space within the extended housing by the flange 23 and a locking channel which will now be described.

Figure 7 shows a locking channel which is secured to each end and lampholder support 17 after the fixture has been placed on the flanges of the spacers. The locking channel comprises a U-shaped channel 31 having flanges 32 and 33. A tab 34 at each end of the channel 31 extends at right angles to the channel and carries a screw hole 35. When a locking channel is installed, it is placed parallel to one of the end and lampholder supports 17, with the tabs 34 inside the wings 24 on the end and lampholder support. Screws are then passed through the holes 35 and through holes 36 adjacent the lower ends of the wings to hold the end and lampholder support and the locking channel together.

From Figures 4 and 7, it will be seen that the flange 33 of the locking channel rests on a flange of a spacer 9, and thereby the ends of the fixture are supported along their lower edges. From Figure 4, it will be seen that the end and lampholder supports 17, when in their downward position, are inside the sides 14 of the housing and, from Figure 5, it will be seen that the locking channels are inside the wings 24 of the end and lampholder supports. Therefore, these locking channels prevent the sides 14 from being moved towards each other and thereby lose the support provided by the flanges of the spacers. It will also be seen that the locking channels 31, the flanges 32 on the channels, and the flanges 23 on the end members 21 close off the portions of the extended housing which are adjacent the spacers 9.

Recessed lighting fixtures generally have a closure which lies flush with the ceiling beneath the fluorescent tubes. Such a closure may be an egg crate louver, a translucent glass panel, etc. In our recessed lighting fixture, the locking channels 31 are used to support such a closure which, in the drawings, is shown as a translucent glass panel 37 mounted in a frame 38 which surrounds

the glass panel and is U-shaped in section (see Figures 4 and 5). The locking channels 31 have double opening elongated keyhole slots 39 adjacent one of their ends. The channels are made left and right hand so that the slots 39 are both adjacent the same side of the fixture. The frame 38 carries on each end and adjacent two corners along one side a headed stud 40, which extends outwardly from the frame.

After the fixture has been installed on the metal framework of the ceiling and the locking channels 31 have been secured in place, the closure is raised and held in a vertical plane extending diagonally across the housing and one of the studs 40 is inserted in one of the keyhole slots 39 near the end of the slot which is nearest the side of the housing. The stud on the opposite end of the closure is inserted into the slot 39 in the locking channel at the other end of the housing. The frame is then turned by sliding the studs 40 in the slots 39 until the sides of the closure lie parallel to the sides of the housing, and the studs 40 are in the enlarged ends of the slots 39 which are closest to the sides of the housing. The closure is then pivoted about the studs 40 to a horizontal position and is held in that position by knurled head screws 41 which pass through the side of the frame 38 away from the studs 40 and which are threaded into the top of the shelf 15 of one side 14 of the housing (see Figure 5).

As already noted, the outer surfaces of each of the members 21 on the end and lampholder supports 17 is each vertically in line with the vertical center line of the spacers 9. They have knockout plugs 30 which are pressed outwardly and, therefore, extend beyond the center lines. The lampholders 29 are mounted in the slots 28 of the shelf 26 of the end and lampholder supports 17 (see Figure 6), directly back of and against the knockouts 30. If two of our fixtures are installed end to end in adjacent openings in the ceiling framework, the knockouts 30 are removed from the two adjoining ends of the fixtures. The lampholders 29 of the adjoining fixtures are then back to back and, at the same time, the two units are completely enclosed, thus complying with the requirements of the Underwriters Laboratory and many building codes.

From the foregoing, it is apparent that we have invented a recessed lighting fixture which is particularly suited for suspended ceilings. The fixture can be inserted from beneath the framework of the ceiling in spite of the fact that the distance between the flanges of the stringers and spacers are less than the overall dimensions of the fixture after it is installed in the ceiling. The support for the fixture in the ceiling is covered by the flanges of the T-beams and, therefore, the fixture makes a very neat appearance when installed in a ceiling. No headroom above the fixture is required for installation or after installation. The fixture can be quickly and easily installed by one man using only a screw driver.

As appears from Figure 4, the overall length of the fixture is the same as the distance center to center of the spacers so that two of our fixtures can be placed end to end in adjoining openings in the ceiling framework and the electrical equipment in the fixtures is completely enclosed.

While we have described a present preferred embodiment of our invention, it is to be understood that it may be otherwise embodied within the scope of the appended claims.

We claim:

1. A lighting fixture comprising a housing having a top and sides extending down from the top and which is open at each end, and an end closure at each end of the housing, the end closures being pivotally mounted in the housing and movable from a position within the space between planes passing parallel to and against the ends of the housing to a position outside said space and substantially closing said end, the closure extending across the open end defined by the sides of the housing and from a height equal

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to the top of the housing and down to a line above the level of the lower edges of the sides of the housing and a U-shaped channel extending across the width of the end closure and closing the space between the lower edge of the end closure and the bottom of the housing, the ends of said channel contacting the sides of the housing to space them from each other.

2. A lighting fixture adapted when installed to be supported along its bottom edges by a horizontal support having an opening therein with peripheral dimensions less than corresponding dimensions of the fixture along its bottom edge comprising a housing having a top and sides extending down from the top and which is open at each end and at its bottom, and an end closure at each end of the housing, the end closures being pivotally mounted in the housing and movable from a position within the space between planes passing parallel to and against the ends of the housing to a position outside said space and substantially closing said end and means detachably secured to the end closures for holding the sides of the housing a predetermined distance from each other after the fixture has been installed whereby the bottom edges of said sides will rest on portions of said horizontal support.

3. A lighting fixture as described in claim 2, in which the holding means for the sides of the housing is detachably secured to the end closure and forms an extension of said end closure along its lower edge.

4. A lighting fixture as described in claim 2, in which said holding means for the housing sides has means for detachably supporting a closure for the bottom opening of the housing defined by the lower edges of the sides of the housing and of the end closures when the end closures are in a position beyond the ends of the housing.

5. A lighting fixture as described in claim 2, in which said holding means for the housing sides comprises a channel secured at each end to an end closure and having elongated slots for receiving studs secured to a closure member for the bottom opening of the fixture.

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6. A lighting fixture adapted to be installed in a ceiling having a framework of T-beams having horizontally extending flanges and vertical webs, said housing being adapted to be supported along its bottom edges by the uflanges on the T-beam, comprising a housing having a top and sides extending down from the top and which is open at each end, the length of the top and sides being less than the distance between the opposed edges of T-bars extending at right angles to the housing adjacent its ends, and an end closure at each end of the housing, said end closures being pivotally mounted in the housing and movable from a position within the space between planes passing parallel to and against the ends of the housing to a position substantially in line with the webs of said T-bars adjacent the ends of the housing and substantially closing said end, the housing sides being spaced from each other a distance less than the distance between the edges of the flanges on T-beams extending parallel to the housing and having horizontally extending flanges, the outer edges of the flange on each housing side being spaced from each other a distance approximately the same as the distance between the webs of the T-beams, said sides being capable of being sprung towards each other whereby the flanges on the sides of the housing will clear the flanges on the T-beams when the housing is being installed on the T-beams.

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