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[21] Appl. No. 667,567
[22] Filed Sept. 13, 1967
[45] Patented Jan. 12, 1971
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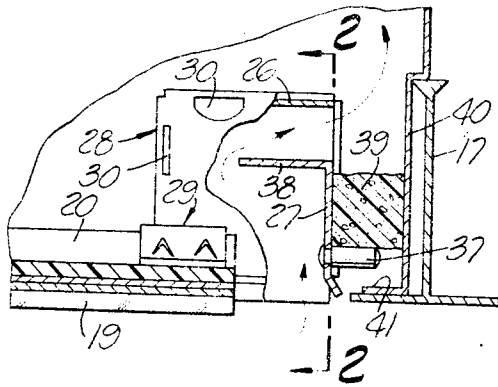
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[54] VENTILATED LIGHTING FIXTURE
7 Claims, 6 Drawing Figs.

[52] U.S. Cl..... 240/47,
240/9, 240/51.11, 240/147: 98/40
[51] Int. Cl..... F21v 29/00
[50] Field of Search..... 240/51.11,
47, 9, 147; 98/40DL

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ABSTRACT: A recessed lighting fixture having a ventilating channel positioned at one or both ends thereof. The channel is formed by plates, one having an offset portion and the other extending into the offset portion to form a tortuous path for air flowing into the fixture. The channel acts as a dust trap and prevents any light from escaping therethrough.



VENTILATED LIGHTING FIXTURE

BACKGROUND OF THE INVENTION

Recessed lighting fixtures for housing fluorescent or incandescent lamps are in almost universal use in industrial commercial and residential buildings. These fixtures generally comprise a metal housing having a flange around the bottom thereof for supporting a sheet of light-transmitting glass or plastic which can be removed in some fashion to provide access to the lamps positioned within the housing. The housings are usually supported by channels that are suspended from the ceiling of the building or supported by the walls thereof, the individual lighting fixtures usually being separated by acoustical tile or other suitable ceiling materials which are also supported by the channels.

In operation, such lighting fixtures generate appreciable amounts of heat. If the lamps are fluorescent, the heat is generated by the ballast transformer as well as by the lamps whereas if the lamps are incandescent, they themselves generate a large amount of heat. In the past, although vents have sometimes been provided in the metal housings, the fixtures have not been constructed to insure that sufficient ventilating air is passed through the fixture. Thus, while the space above the ceiling in which the fixtures are mounted provides what is in effect a large heat sink that is itself usually vented, the heat in the presently available fixtures is primarily retained within the fixture causing appreciable reduction of the average lifetime of the lamps. Moreover, such air as does enter the fixtures carries with it dust which is deposited on the lamps or on the light-transmitting sheet, thus reducing the illumination produced.

SUMMARY OF THE INVENTION

According to the present invention, a lighting fixture is provided which has a ventilating channel that provides sufficient air to the interior of the fixtures such that the ambient temperature in the fixture is less than that in conventional fixtures. The channel is constructed in such a manner that it provides a tortuous path for the entering air and thus acts as a dust trap thereby keeping the lamps and the light-transmitting sheet or diffuser clean for a longer time than is possible with conventional fixtures. This both increases the illumination from the fixture and decreases the amount of maintenance required. The ventilating channel serves as a light shield and thus does not reduce the aesthetic appeal of the fixture. The ventilating channel is mounted directly on the diffuser so that no separate lens frame with its attendant hinges, slots and light shields is required.

It is therefore an object of the present invention to provide a ventilated lighting fixture.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an end elevational view, partly broken away and partly in section, of the lighting fixture of the present invention;

FIG. 2 is a sectional view taken along lines 2-2 of FIG. 3;

FIG. 3 is a sectional view taken along lines 3-3 of FIG. 2;

FIG. 4 is an exploded perspective view showing the construction of the ventilating channel of the present invention;

FIG. 5 is a perspective view of one end of the ventilating channel of the present invention and the manner in which it is mounted; and

FIG. 6 is a detailed view showing the manner in which the lighting fixture of the present invention may be opened for access to the lamps thereof.

DESCRIPTION OF THE INVENTION

Turning now to the several FIGS., there is shown the lighting fixture of the present invention. The lighting fixture 10 has a metal body or housing 11 in the upper portion of which are formed a plurality of louvred slots 12. The interior of the fixture body 11 is provided with an enclosure plate 13

and a transformer shield 14, the transformer shield 14 enclosing a region 15 in which the ballast transformer is positioned. As can be seen, the fixture body 11 is also provided with horizontal flanges 16 (only one of which is shown) which are supported by the horizontal flanges of the various ceiling grid members 17. These members also serve to support other ceiling material 18, for example, acoustical tile.

A light-transmitting sheet or diffuser 19 is formed with an upwardly extending flange 20 having a horizontal lip 21 extending therefrom. The lip 21 rests on the flange 16 of the fixture body 11 whereby the diffuser 19 is maintained in place. Although only one edge of the diffuser 19 is shown, the other is identical. The lamps 22, supported by mounting means 43, are positioned within the fixture body 11 below the enclosure plate 13, the latter being provided with louvred slots 42 on either side of the transformer shield 14 to permit air to circulate from the interior of the fixture around the lamps 22 into the upper portion around the transformer shield and thence out of the slots 12. The slots 12 are preferably centered along the length of the fixture and extend for a distance approximately equal to, or greater than, the length of the transformer shield. The slots 42 are preferably positioned immediately below the slots 12.

At one or both of the ends of the fixture 10 there is provided a ventilating channel or air entry assembly 25. This assembly comprises an air path enclosure 26, a lens end plate 27, a pair of end caps 28 and a pair of retainer clips 29. The air path enclosure 26 and the lens end plate 27 are provided with tabs 30 and 31, respectively, that fit into suitable slots in the end caps 28 and which are then folded over to unitize the structure. The end caps 28 are provided with a stepped flange 32 to fill the void between the end of the diffuser 19 and the next transverse grid member as is shown in FIG. 5. The end cap 28 is also provided with a slot 33 for receiving a tab 34 of the retainer clip 29. As can be seen, the retainer clip 29 is provided with a hooked portion 35 which fits over the vertical flange 20 of the diffuser 19. The hooked portion 35 is preferably provided on either side with punched tangs 36 which serve to engage the flange 20 in a springlike manner. The lens end plate 27 is provided with a pin 37 for a purpose to be described hereinafter.

As can be seen, the lens end plate 27 is provided with a horizontal flange 38 which extends into the offset portion of the air path enclosure 26 thus forming a tortuous path for air entering this enclosure from below the fixture as can best be seen in FIG. 3. The assembly 25 thus serves as a dust trap to collect the dust that would normally settle on the lamps 22 or on the diffuser 19, and also serve to create good circulation within the body of the fixture as the air travels from the air entry assembly to the exit slots 42 and 12. As shown in FIG. 3, a strip of packing material 39 is preferably positioned between the air entry assembly 25 and the end wall 40 of the fixture body 11 to prevent the entry of air or the exit of light.

In order to gain access to the interior of the fixture body 11, for example, for the purpose of changing the lamps 22, the diffuser 19 can be raised and slid to the left so that the right-hand side of the diffuser comes clear of the right side of the horizontal flange of the fixture body 11. The pin 37 will then rest on a horizontal flange 41 of the end wall 40 of the body 11 and serve as a pivot point so that the diffuser 19, together with the air entry assembly 25 mounted thereon, can be swung away from the remainder of the fixture. This is best shown in FIG. 6. Although only one air entry assembly 25 is shown, it should be understood that such an assembly can be provided at each end of the fixture if desired.

From the foregoing description, it can be seen that a lighting fixture has been provided in which ventilation is easily accomplished. Air is introduced at either or both ends of the fixture and is circulated therethrough exiting at the top. The air is circulated past the lamps and past the transformer enclosure so that the heat generated from both is dissipated. The air leaving the fixture is passed to the area above the ceiling where it can be collected by any suitable means, for example, the plenum

of the building air-conditioning system. As a result of the structure of the present invention, the lamps and ballast transformer are operated at an optimum temperature so that the efficiency and lifetime of these components is increased. Moreover, the structure is such that dust is collected remote from the lamps and diffuser so that their illumination is increased and the maintenance necessary for them is decreased. In addition, the air entry enclosure assemblies are mounted directly on the diffuser and thus an integral unit is provided without the necessity of utilizing a separate lens frame which need be provided with hinges, slots with built-on light shields and the like.

While there has been described what is at present considered a preferred embodiment of the present invention, it will be apparent to those skilled in the art that various modifications and changes may be made without departing from the essence of the invention, and it is intended to cover herein all such modifications and changes as come within the true scope and spirit of the appended claims.

I claim:

1. A lighting fixture comprising: a housing, means for mounting lamps in said housing, a plurality of slots formed in said housing above said lamp mounting means whereby air may exit therefrom, diffuser means mounted on said housing, said diffuser means having an upstanding flange along each longitudinal edge thereof, and means positioned at the end of said housing for permitting air to enter said housing, said means comprising a first plate having an offset portion, a second plate having a portion extending into said offset portion of said first plate whereby a tortuous path is formed, said path having a first end opening within said housing and a second end opening exteriorly thereof; a pair of end plates for mounting said first and second plates, and clip means mounted on each of said end plates, said clip means being mounted on said upstanding flanges of said diffuser means.

2. The fixture of claim 1 wherein said second plate is provided with pin means adapted to cooperate with said housing

to permit said diffuser means to be moved away from said housing.

3. The fixture of claim 1 wherein said flanges of said diffuser means are each provided with a horizontally extending lip, and wherein said housing is provided with intumed flanges for supporting said lips of said diffuser means.

4. A lighting fixture comprising: a housing, an enclosure plate within said housing, means in said housing below said enclosure plate for mounting lamps therein; a transformer enclosure within said housing and above said enclosure plate, a plurality of slots formed in said enclosure plate adjacent said transformer enclosure, a plurality of slots formed in said housing above said enclosure plate whereby air may exit from said housing, diffuser means mounted on said housing, said diffuser means having an upstanding flange along each longitudinal edge thereof, and means positioned at one end of said housing for permitting air to enter said housing, said means comprising a first plate having an offset portion, a second plate having a portion extending into said offset portion of said first plate whereby a tortuous path is formed, said path having a first end opening within said housing and a second end opening exteriorly thereof; a pair of end plates for mounting said first and second plates, and clip means mounted on each of said end plates, said clip means being mounted on said upstanding flanges of said diffuser means.

5. The fixture of claim 4 wherein said second plate is provided with pin means adapted to cooperate with said housing to permit said diffuser means to be moved away from said housing.

6. The fixture of claim 4 wherein said flanges of said diffuser means are each provided with a horizontally extending lip, and wherein said housing is provided with intumed flanges for supporting said lips of said diffuser means.

7. The fixture of claim 4 wherein each of said clip means has a U-shaped portion for receiving said flange of said diffuser means, said U-shaped portion having tangs for firmly grasping said flange.

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