Oct. 29, 1963 D. A. SWEETSER 3,108,529

CEILING LIGHT AND AIR DIFFUSING FIXTURE

Filed Oct. 3, 1961 2 Sheets-Sheet 1

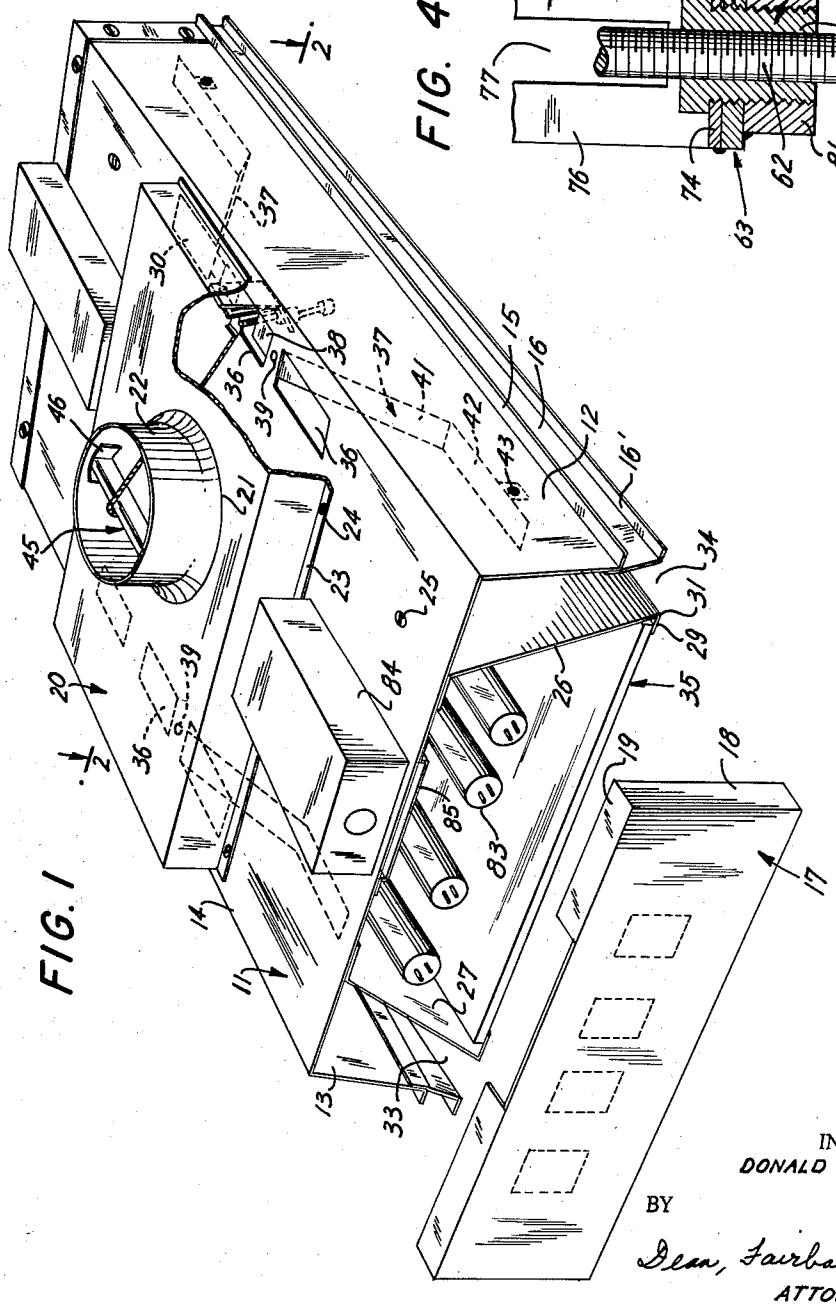


FIG. 1

FIG. 4

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2 Sheets-Sheet 2

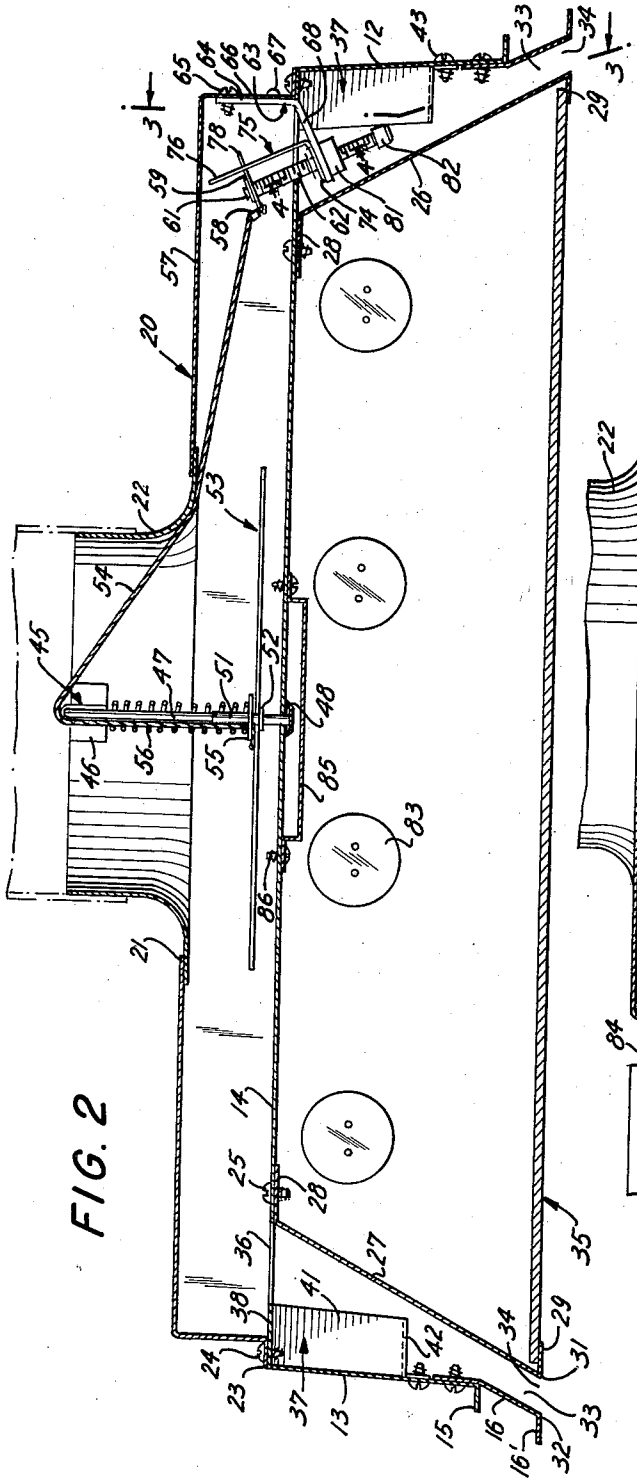


FIG. 2

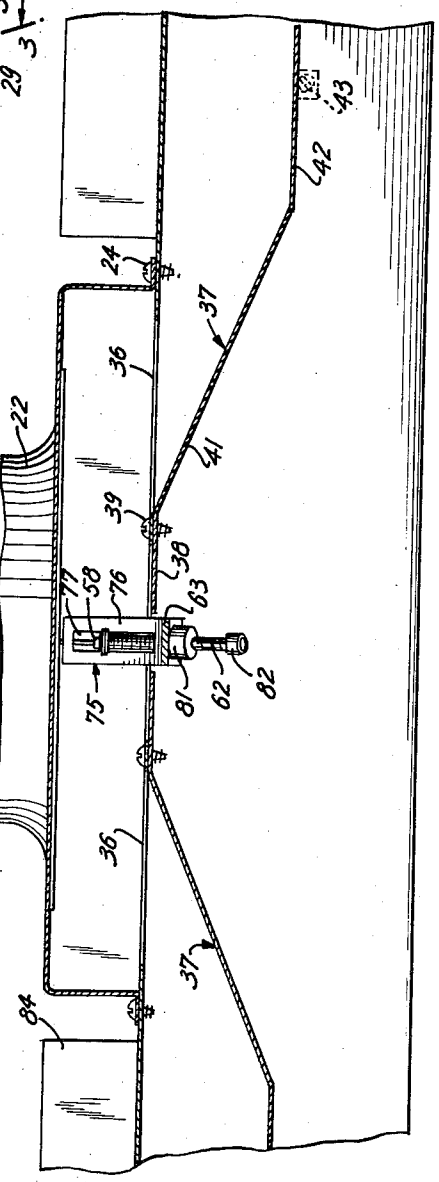


FIG. 3

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United States Patent Office

3,108,529

Patented Oct. 29, 1963

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3,108,529

CEILING LIGHT AND AIR DIFFUSING FIXTURE

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Filed Oct. 3, 1961, Ser. No. 142,560

7 Claims. (Cl. 98—40)

This invention relates to the art of ceiling light and air diffusing fixtures.

It is among the objects of the invention to provide a combination light and air diffusing fixture which is relatively simple in construction and may readily be fabricated at relatively low cost, which will provide a balanced air flow along substantially the entire length of the fixture without impingement of such air on the fluorescent lamps normally employed, which causes the color of the light emitted by the lamps to change so that when fixtures are used with lamps not subject to air flow, the different colors of the light emitted from the various fixtures would be noticeable and undesirable, and in which the quantity of air discharged may readily be regulated with but a simple manipulation without need for any special tools or opening of the lighting fixture in any manner.

According to the invention these objects are accomplished by the arrangement and combination of elements hereinafter described and more particularly recited in the claims.

In the accompanying drawings in which is shown one of various possible embodiments of the several features of the invention,

FIG. 1 is an exploded perspective view of the fixture with parts broken away,

FIG. 2 is a transverse sectional view taken along line 2—2 of FIG. 1,

FIG. 3 is a sectional view taken along line 3—3 of FIG. 2, and

FIG. 4 is a detail sectional view taken along line 4—4 of FIG. 2.

Referring now to the drawings, the unit comprises an elongated, substantially trough-shaped outer housing 11, having substantially parallel side walls 12 and 13, and a top wall 14. Each of the side walls 12 and 13 has an outstanding flange 15 to facilitate mounting of the unit in an appropriate elongated slot in the ceiling and an elongated strip 16 is secured to the lower edge of each side wall and depends therefrom, said strips each having an outstanding flange 16' also to facilitate mounting of the unit.

The ends of the housing 11 are closed by end plates 17 which have end walls 18 and a top wall 19 which respectively are positioned over the side walls 12, 13 and top wall 14 of the housing, said end plates 17 being secured as by welding or in any other suitable manner.

Centrally located on the top wall 14 of the housing 11 and secured thereto, is a substantially rectangular casing or air box 20 which has a central port 21 with a duct 22 rising therefrom to which a source of air of desired temperature such as refrigerated air, for example, may be applied through a suitable conduit (not shown). Although the air box 20 may be secured to the top wall 14 of the casing in any suitable manner, in the illustrative embodiment the air box has outstanding flanges 23 at its lower end secured to the top wall of the casing as by screws 24.

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Secured as by screws 25 to the inner surface of the top wall 14 of the housing 11 are spaced elongated panels 26 and 27 which extend the entire length of the housing from one end wall 17 to the other.

As is shown in FIG. 2, for example, each of the panels 26, 27 has an elongated flange 28, 29 at its upper and lower ends, the panels being secured by the uppermost flanges 28 to the top wall 14. The panels 26, 27 are inclined outwardly so that their lower edges 31 are laterally spaced from the lower edges 32 of the side strips 16 of the housing to define passageways 33, extending the length of the housing adjacent each side thereof, with the outlets 34 of the passageways being defined between the lower edges 31 and 32. The lowermost flanges 29 of the panels serve as a support for a diffuser panel 35 of any suitable type such as a translucent panel for example.

To permit air to enter the elongated passageways 33, defined by the panels 26, 27 and the side walls 12 and 13, the top wall 14 of the housing 11 has one or more apertures 36 aligned with the air box 20 as is clearly shown in FIG. 1, for example.

In order to insure even distribution of air that passes through the openings 36 into the elongated passageways 33 and through the outlets 34 thereof, a pair of deflector strips 37 is provided in each passageway 33 adjacent each of the side walls 12 and 13. Each of the deflector strips has a horizontal portion 38 which may be secured to the top wall of the housing as at 39 between a pair of adjacent openings 36; a portion 41 extending downwardly at an incline toward the adjacent end wall 17 and another horizontal portion 42 at the lower end of the inclined portion 41. The horizontal edge portion 42 of said deflector strips adjacent the side walls 12, 13 may be secured thereto as by a screw 43.

Means are provided to regulate the quantity of air entering the air box 20 through the duct 22.

To this end, a reversely bent strip 45 extends diametrically across the duct 22 at its upper end, said strip having lateral flanges 46 at each end, secured to the inner surface of the duct as by welding. Clamped between the reversely bent sides of the strip and depending therefrom, axially aligned with the duct is a guide rod 47, the lower end of which illustratively extends slightly below the plane of the top wall 14 of the housing into a centering recess 48 in said top wall. Encompassing the rod 47 and slidably mounted thereon is a sleeve 51 which has a collar 52 secured thereto at its lower end to support a damper disc 53, the latter having an axial opening through which the sleeve extends.

As is clearly shown, the diameter of the damper disc is greater than the diameter of the port 21 in the air box 20 so that by appropriate movement of the damper disc 53 in the manner to be described, entry of air through the duct 22 into the air box can be regulated.

Means are provided to effect movement of the damper disc in order to regulate the quantity of air that passes through the duct 22 into the air box.

To this end, as is clearly shown in FIG. 1, for example, a cable 54 is provided which rides over the upper edge of the reversely bent strip 45, the lower end of the cable being clamped against the damper disc 53 as by a clamp washer 55 encompassing sleeve 57. Normally, the damper disc is urged to its lowermost position by means of a coil

spring 56 encompassing the rod 47 and compressed between the strip 45 and the washer 55.

The cable 54 extends through the space between the top wall 14 of the housing and the top wall 57 of the air box and its free end is secured as at 58 to the end of a tab 59 which has an opening through which extends the unthreaded end 61 of an adjustment screw 62, said end being headed to retain the tab in position, yet permit rotation of the screw without corresponding rotation of the tab.

To support the adjustment screw 62, a bracket 63 is provided which has a vertical leg 64 secured as by screws 65 to the side wall 66 of the air box 20, said leg of the bracket desirably having an outwardly extending tab 67 which extends through a corresponding opening in side wall 66 properly to locate the bracket.

As is clearly shown in FIG. 3, the bracket 63 is positioned between the horizontal portions 38 of the deflector members 37 and is transversely aligned with the vertical axis of the duct 22. The bracket 63 has a downwardly inclined leg 68 extending across the upper end of the associated passageway 33 and having an opening 69 therethrough substantially axially aligned with the center of said passageway 33 and the outlet 34 thereof.

Secured as by welding to the leg 68 of bracket 63 is the leg 74 of a guide member 75, said guide member having an upstanding leg 76 extending at right angles to leg 74 and having an elongated slot 77 through which the end 78 of tab 59 extends to serve as a guide for such tab and restrain the latter from rotation. A nut 81 is secured as by welding to the undersurface of leg 68 and accommodates a headed bushing 71 which extends through opening 73 in leg 74 aligned with opening 69 in leg 68 and the bore of nut 81 and which is internally threaded as at 72 to receive the correspondingly threaded adjustment screw 62. The lower end of the adjustment screw 62 desirably has an enlarged head 82 with a suitable recess designed to accommodate the end of an adjustment tool such as, for example, a Phillips head screw driver which can readily be passed through the outlet 34 of the associated passageway 33 into the recess of head 82 for rotation of the adjustment screw.

In conventional manner suitable fluorescent lamps 83 are provided which are mounted in conventional sockets (not shown) affixed to the end walls 17 of the housing. In addition, ballasts required to operate the fluorescent lights are positioned in receptacles 84, mounted on the top wall of the housing 11. As the control for the fluorescent lamps forms no part of this invention, they will not be further described. To facilitate wiring of the unit, a substantially U-shaped channel member 85 extends longitudinally of the housing 11 and is secured to the undersurface of top wall 14 as by screws 86, access being provided to the receptacles 84.

In the operation of the unit, above described, the quantity of air admitted into the air box 20 for discharge through elongated outlets 34 may be regulated by rotation of screw 62 by means of a tool readily inserted through outlet 34 into the associated passageway 33 to coact with the recess in the head 82 of screw 62. Upon rotation of the screw 62 in direction to exert tension on cable 54, the damper disc 53 will be moved upwardly against the tension of spring 56 to reduce the outlet through which the air may enter the air box. Upon rotation of screw 62 in the opposite direction, and release of tension of cable 54, the spring 56 will move the damper disc 53 downwardly to open the air outlet.

By reason of the deflector strips, as the air is forced through openings 36 into the passageways 33, some of the air will go directly downward through the outlets 34 between the spaced horizontal portions 38 of the deflector strips 37 and other portions of the air will strike the deflector strips 37 and be guided toward the ends of the passageways 33. As a result, even distribution of the air along the entire length of the outlets 34 is provided to ensure a balanced air flow. As the adjustment screw 62 is accessible through the outlet 34 of the associated passageway, there is no need to disturb the lighting fixture in any manner to permit adjustment of the damper disc to regulate the quantity of air discharged through the outlets.

Consequently, adjustment of the air flow may be readily accomplished and as the fixture need not be opened with the diffuser panel hanging downwardly adjacent one or the other of the outlets 34, which would interfere with the air flow, such air flow from all of the fixtures of the above type, in one room for example, may be accurately balanced as desired. In addition, as the fluorescent lamps are completely shielded from the flow of air, no color variation of the light emitted from such lamps will occur.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A lighting fixture comprising a housing having end and side walls and a top wall, a pair of elongated panels positioned in the interior of said housing and depending from the top wall thereof, said panels extending the length of said housing, and being spaced from said side walls respectively, to define elongated passageways with respect thereto, each passageway having an elongated outlet at its lower end, fluorescent lamp support means in said housing adapted to support fluorescent lamps beneath said top wall and between said panels, said top wall having openings aligned respectively with the upper ends of said passageways to which a source of air may be applied, a damper supported on said housing to control the quantity of air applied to said openings and means accessible through one of the outlets to control the position of said damper.

2. The combination set forth in claim 1 in which each of said panels is inclined outwardly from its upper edge to its lower edge and a diffuser panel is provided, said panels at their lower edges having means to support said panel.

3. The combination set forth in claim 1 in which a second housing is positioned on the top wall of said first housing and extends over said openings in said top wall, said second housing having a top wall with an opening defining an air inlet port, said damper comprising a disc, means mounting said disc for movement axially of said port toward and away from the latter to control the flow of air into said second housing and a control linkage secured at one end to said disc and having its other end leading into one of said passageways and accessible through the associated outlet.

4. The combination set forth in claim 3 in which said control linkage comprises a rigidly mounted guide rod extending axially of said port, said disc being slidably mounted on said rod, resilient means reacting against said disc normally to urge the latter downwardly to open position with respect to said port, a cable secured at one end to said disc, the free end of the cable extending into said passageway, a screw operatively connected at one end to the other end of said cable, means rotatably mounting said screw in said passageway, the free end of said screw being accessible for rotation through the outlet of the associated passageway.

5. The combination set forth in claim 1 in which means are provided in each of said passageways to distribute the air flowing thereinto for substantially uniform discharge along the length of the associated passageway.

6. The combination set forth in claim 1 in which said openings are substantially centrally located along the length of the passageways, means are provided in each

of said passageways to deflect the air flowing thereinto for substantially uniform discharge along the length of the associated passageway, said deflector means having portions extending in opposite directions longitudinally of each of said passageways toward the end walls of said housing, the inner ends of said portions being spaced to provide a free path of air through at least a portion of the associated opening and through the portion of the associated outlet vertically aligned therewith.

7. The combination set forth in claim 6 in which said deflector means comprises a pair of strips of width less than that of the associated passageways, each being inclined downwardly from its inner end so that a portion of the air abutting against the strip will be distributed toward the ends of the associated outlet.

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