

Nov. 24, 1964

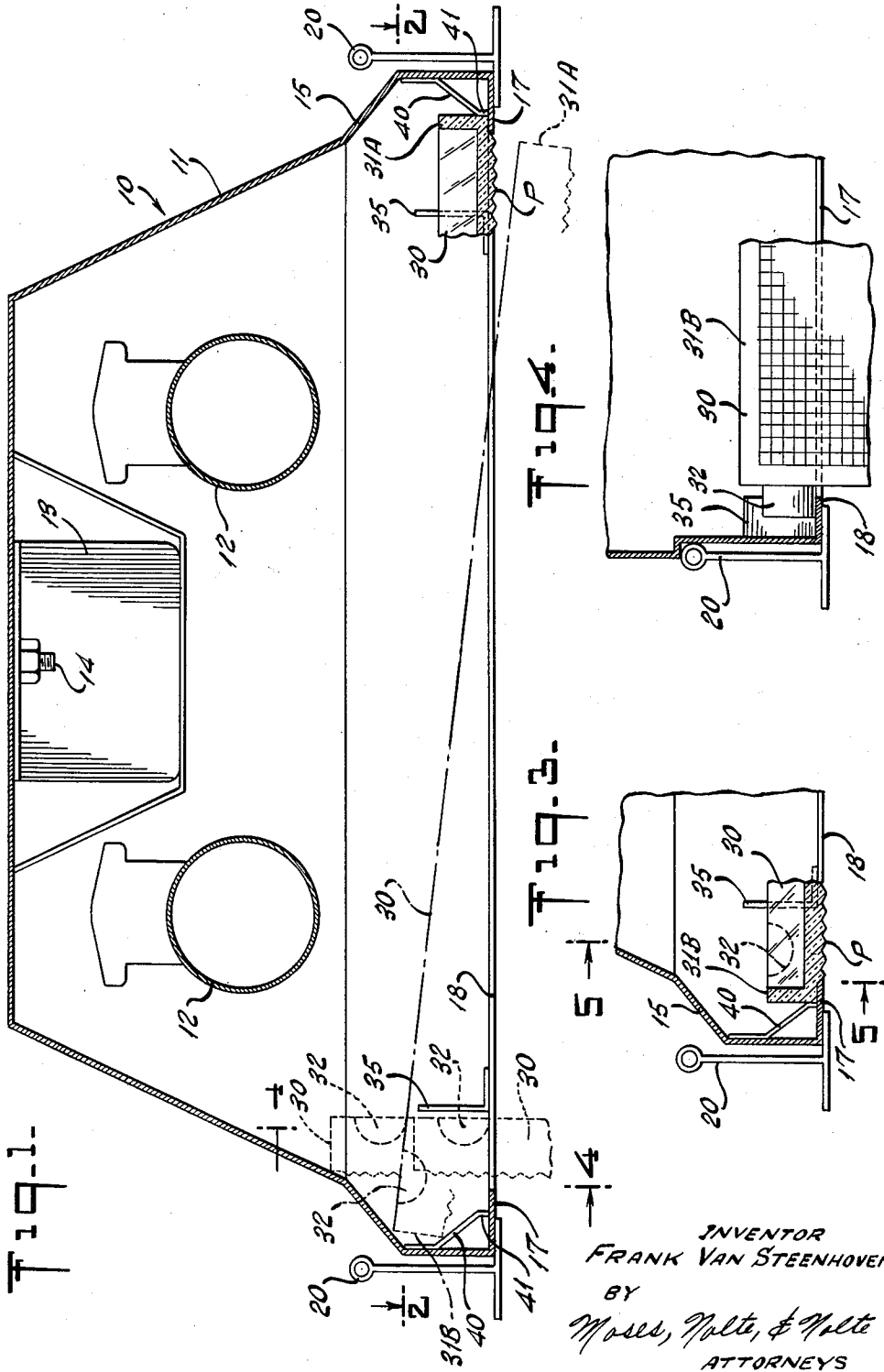
F. VAN STEENHOVEN

3,158,330

LIGHTING FIXTURE

Filed June 5, 1961

2 Sheets-Sheet 1



Nov. 24, 1964

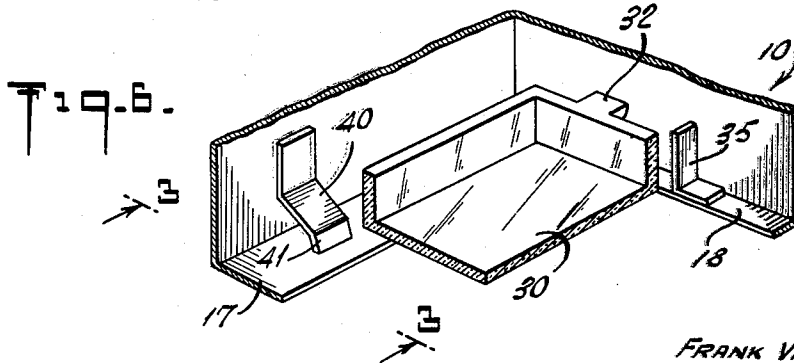
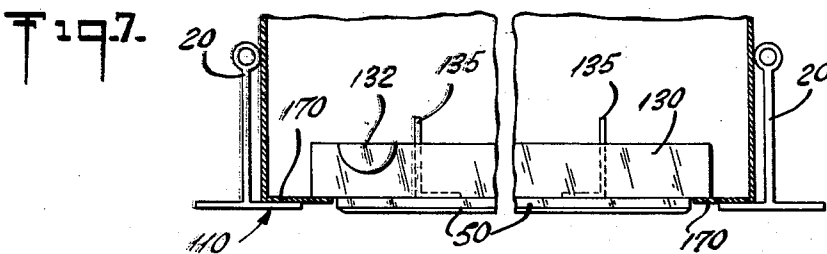
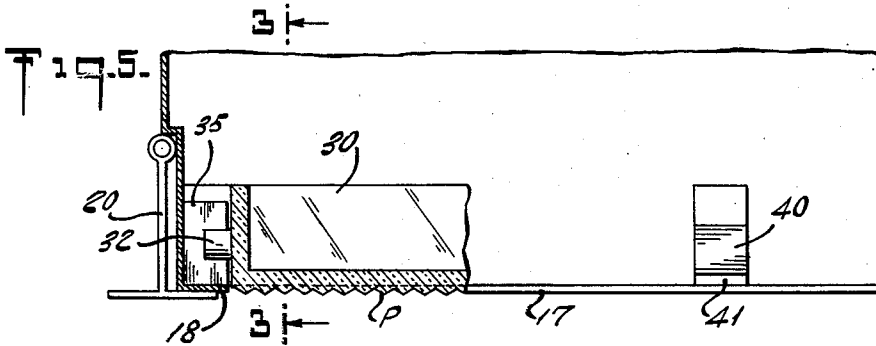
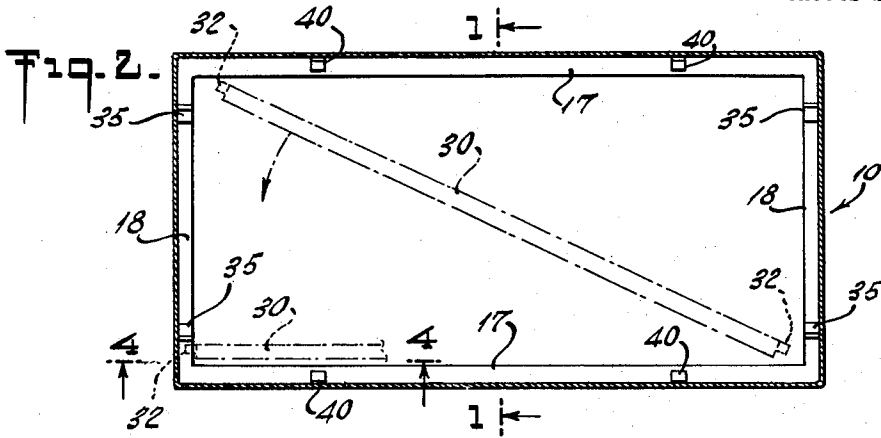
F. VAN STEENHOVEN

3,158,330

LIGHTING FIXTURE

Filed June 5, 1961

2 Sheets-Sheet 2



INVENTOR
FRANK VAN STEENHOVEN
BY
Moses, Nolt, & Nolt
ATTORNEYS

1

2

3,158,330

LIGHTING FIXTURE

Frank Van Steenhoven, Newark, Ohio, assignor to Holophane Company, Inc., New York, N.Y., a corporation of Delaware

Filed June 5, 1961, Ser. No. 114,930

1 Claim. (Cl. 240-147)

The present invention relates to lighting fixtures and more particularly to diffuser or lens support means in lighting fixtures.

It is a principal object of the invention to provide a novel fixture construction for permitting ready access to the internal parts thereof while permitting the diffuser element to be supported during relamping and servicing.

The objectionable features of lighting fixtures, having lens elements or the like disposed beneath a light source, have included the necessity for removing the lens elements for servicing of the fixture with the attendant possibility and oft-times inevitability of the lens elements being dropped and broken.

Prior art structures have attempted to circumvent this undesirable characteristic of such fixtures by providing various framing structures about the periphery of the lighting fixture and for the lens element which permits pivotal mounting of the lens element on the fixture. Obviously this is exceedingly expensive and is not aesthetically desirable in modern lighting fixture installations.

Prior art attempts to do away with framing elements have resulted in rather intricate pivot hinge structures within the fixture housing requiring comparatively excessive installation maneuvers.

It is an object of this invention to eliminate the undesirable characteristic of prior art lighting fixtures by providing a novel and inexpensive hinge arrangement for a lens, which hinge arrangement utilizes existing pivot elements extending directly from the lens and provides simple additional structure within the fixture structure itself for receiving the lens pivot elements in such a manner as to reduce installation and servicing maneuvers to a minimum.

The advantages and further objects of the invention will be better understood by reference to the following specification and the drawings which form a part thereof and in which:

FIG. 1 is a transverse sectional view through a lighting fixture and is taken along the line 1-1 of FIG. 2;

FIG. 2 is a sectional view taken along the line 2-2 of FIG. 1;

FIG. 3 is a sectional view taken along the lines 3-3 of FIGS. 5 and 6;

FIG. 4 is a sectional view taken along the lines 4-4 of FIGS. 1 and 2;

FIG. 5 is a sectional view taken along the line 5-5 of FIG. 3;

FIG. 6 is a perspective view, broken away and in section at a corner area of the lighting fixture; and

FIG. 7 is a transverse section of a lighting fixture showing a modification of the invention.

Referring to FIGS. 1-6, there is shown a Troffer type lighting fixture 10 comprising the usual inverted tray housing 11 within which are mounted a plurality of elongated light sources 12. Ballast means 13 occupy the upper region of the fixture 10 and are secured thereto in any convenient manner, such as by nut and bolt arrangements 14. The lower portion of the fixture 10 includes a flared portion 15 with inwardly extending peripheral side flanges 17 extending longitudinally on either side of the fixture and end flanges 18 extending transversely of the fixture. External ceiling brackets 20 in the form of inverted T's underlie the inwardly extending flanges 17, 18 of the fixture 10 to support the same adjacent a ceiling

and are themselves supported from ceiling structures by any convenient means, not shown.

The inner edges of the flanges 17, 18 define a longitudinally extending open area through which light from the light sources 12 is permitted emission and in which area a lens 30, having prism formations P on its outer surface, is supported for properly diffusing or otherwise controlling the light emitted from the light sources 12.

The lens 30 is dimensioned transversely so that its longitudinally extending edges 31A and 31B will lie upon the upper surfaces of the inwardly and longitudinally extending side flanges 17 of the fixture 10 when the lens 30 is in the closed, supported position, shown in FIGS. 1, 3, 5 and 6. The lens 30 has a longitudinal dimension slightly smaller than the distance between the edges of the end flanges 18 of the fixture 10. This dimensioning permits the lens 30 to be pivoted within the open area about a longitudinal axis, and for this purpose integral pivot elements or bosses 32 are provided at either end of the lens 30 adjacent one side thereof.

In the specific embodiment shown, the pivot bosses 32 are integral with the lens 30 and take the form of "half moons," presenting the flat surface thereof in a plane in common with the upper surface of the lens 30 and with the curved surface extending arcuately downwardly therefrom.

In accordance with the invention, the upper surfaces of the end flanges 18 of the fixture 10 are utilized as the hinging means for the pivotal mounting of the lens 30. For this purpose transversely and inwardly extending corner areas for freely receiving the bosses 32 are provided and are delineated by upstanding L stops 35, which act to restrain the lens 30 near the side of the fixture and are sufficiently spaced inwardly of the side flanges 17 so that the lens may roll on the arcuate surfaces of the pivot bosses 32, as will be explained. These stops 35 are provided at each corner on the upper surface of the end flanges 18 so that the lens 30 may be pivoted on either side of the fixture 10. In the embodiment shown, the L stop faces inwardly and the back surface of its vertical leg is positioned so that when the lens 30 is in the pivoted down or open position, shown in phantom in FIG. 1, the flat surface of the boss 32 is face to face therewith, and the rounded surface is in position for rolling movement on the end flanges 18 as the lens 30 is pivoted upwardly to the closed position.

The lens is initially brought into the open area defined by the inner edges of the flanges 17, 18 by disposing the lens diagonally between diagonally opposite corners of the opening (FIG. 2) and then lifting the lens 30 until the bosses 32 are above the upper edge of the vertical leg of the L stop 35. The lens may then be turned (arrow direction FIG. 2) into a vertical position with the bosses 32 to the rear of the stops 35, on one side of the fixture 10, as shown in the broken phantom view in FIG. 2. In this position, the lens 30 may be lowered, as shown in the two dotted indications in FIG. 1, until it is in the opened position supported on the end flanges 18 via the lens boss elements 32.

To close the fixture, the lens 30 is manually swung upwardly at its free side causing rolling movement of the pivot bosses 32 along the end flange corner areas until the edge 31B of the pivoted side contacts the sloped surfaces of longitudinally spaced guide and centering brackets 40, secured along the sides of the fixture housing 11 and extending between the housing walls and the side flanges 17. (This position is shown in phantom in FIG. 1.)

The rolling sidewise movement of the lens 30 disposes the pivoted side edge 31B and the free side edge 31A off center with respect to the closed position of the lens wherein these edges lie upon the upper surfaces of the

side flanges 17. Resultingly, there is sufficient clearance at the free side edge 31A and its associated side flange 17 to permit further lifting of the free side edge 31A past the edge of the side flange 17.

As this latter movement is performed, the pivoted side edge of the lens is resting on the sloped surfaces of the brackets 40, and as the pivoted connection between the lens 30 and fixture housing is unrestrained with respect to vertical movement of the pivot lugs 32, the lens 30 will be pivoted about the support point of the pivoted edge 31B of the lens upon the brackets 40. The lens 30 is then moved in the direction of its free side edge 31A during which the pivoted side edge 31B of the lens 30 slides down along the sloped surfaces of the brackets 40, at the bottom of which vertical legs 41 of the brackets 40 on both sides of the fixture act to center the lens within its closed, supported position.

In a modification of the invention, shown in FIG. 7, the guiding and centering brackets 40 are eliminated in favor of centering means integral with the lens 130. These means take the form of peripheral prismatic formations 50 extending along the end and side edges of the lens 130 and downwardly in vertical planes inwardly of and adjacent to the edges of the support flanges 170. These formations 50 may be advantageously utilized for controlling light emission from the light sources 12. For instance, high angle rays may be diverted by the formations 50 into useful directions.

The operation of the modified lighting fixture 110 for installation of the lens is exactly the same as the diagonal positioning, lifting and side aligning operation of the embodiment just described.

In closing the lens 130, however, the pivoted side may be either manually lifted at the end of the swinging up operation in order to permit movement of the lens in the direction of the pivoted side so that the free side can clear the edge of its associated supporting side flange 170, or, the arcuate surfaces of the pivot bosses 132 may be dimensioned so that their rolling movement along the end flanges will dispose the peripheral prismatic formation 50 along the pivoted side of the lens so that it will overlie the supporting side flanges 170 on the pivoted side. Then the lens 130 is moved in the direction of its free edge and the depending peripheral prismatic formations will center the lens as it drops to its supported position on the side flanges 170.

Opening the lens in either embodiment described herein is the same basic operation. The pivoted side is lifted and the lens moved sidewise in the direction to clear the free side past its associated supporting side flange and the lens will then be free to pivot about its pivot bosses via the rolling action of the arcuate surfaces upon the surfaces of the end flanges. Excessive inward movement of the pivoted side is prevented by the L stops 35 (135 in the FIG. 7 embodiment) and when so stopped, the lens is again in position for closing when desired.

Now it will be seen that the present invention provides an extremely inexpensive but highly efficient pivot construction for a light fixture and lens. A basic minimum of parts are utilized for the entire construction and the arrangement is such that misadventure on the part of service men is kept at a minimum, both in the installing of the lens and in the maintenance of the fixture thereafter.

Various structures have been described in setting forth the specific embodiment of the invention. It is intended that only the following claim however will define the breadth and scope of the invention.

I claim:

A luminaire comprising, a fixture incorporating elon-

gated fluorescent lamps and having inwardly extending end and side flanges, said fixture flanges having horizontally oriented substantially flat upper surfaces, the inner edges of said fixture end and side flanges defining a horizontally oriented opening, a rectangular diffuser movable between a horizontally closed position and a vertical opened position and constructed from a single piece of plastic material and having upwardly extending side and end strengthening flanges, complementary coaxial pivot means on said diffuser end flanges and on said fixture adjacent one side strengthening flange, said complementary pivot means on said diffuser end flanges lying completely above the lowermost plane of said diffuser and said fixture end flanges when said diffuser is in the horizontal closed position, said diffuser having a dimension between its sides greater than the distance between said fixture side flanges and overlying said fixture side flanges in supported relationship upon said upper surfaces of said fixture side flanges when said diffuser is in said horizontal closed position and a dimension between its ends slightly smaller than the distance between said fixture end flange to permit movement thereof in transverse planes to said vertical opened position via said pivot means when the sides of said diffuser are free from such supported relationship upon said fixture side flanges, the construction and arrangement being such that when said diffuser is in said horizontal closed position in supported relationship upon said fixture flanges, said complementary pivot means on said diffuser and on said fixture are out of contact with one another and the engagement between the sides of said diffuser and the upper surfaces of said fixture side flanges constitutes the sole support for said diffuser, said complementary pivot means comprising pivot bosses extending from said diffuser end flanges and means extending upwardly directly from the horizontally oriented flat upper surfaces of said fixture end flanges and spaced inwardly from the fixture side flanges and inwardly of said pivot bosses and defining the inner-most points of corner areas along said horizontally oriented flat upper surfaces of said end flanges, said corner areas freely receiving said pivot bosses of the diffuser for pivotal support of the diffuser only when the diffuser is moved from the closed horizontal position off of its support upon said side flanges and the free side of said diffuser is swung downward to dispose said diffuser in vertical opened position, said upwardly extending means comprising stop means past which said pivot means may not move during pivotal support of said diffuser in said corner areas, diffuser guide means overlying the side flanges and sloping downwardly and inwardly of the fixture toward the inner edges of the side flanges and supporting the pivoted side of the diffuser as the diffuser is pivoted upwardly toward the closed position, said guide means providing a surface along which the pivoted side of the diffuser slides downwardly and inwardly to the upper surface of its associated side flange when the free side of the diffuser is pivoted above its associated side flange, whereby the diffuser is guided to the horizontal closed position supported along its sides on the side flanges, and vertical abutment means extend downwardly from said guide means at the bottom thereof and position and restrain the diffuser in said fixture opening against further transverse displacement.

References Cited in the file of this patent

UNITED STATES PATENTS

2,721,635	Fullerton	Oct. 25, 1955
2,978,575	Cohen	Apr. 4, 1961