Aug. 24, 1965 B. MOORE 3,202,815

LIGHTING EQUIPMENT

Filed Jan. 8, 1963 2 Sheets-Sheet 1

Fig. 1

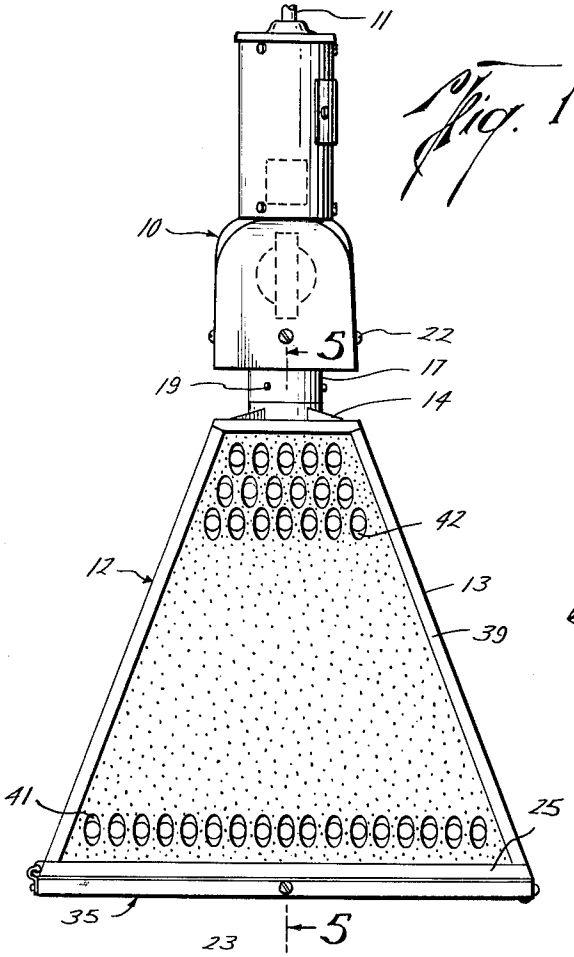


Fig. 2

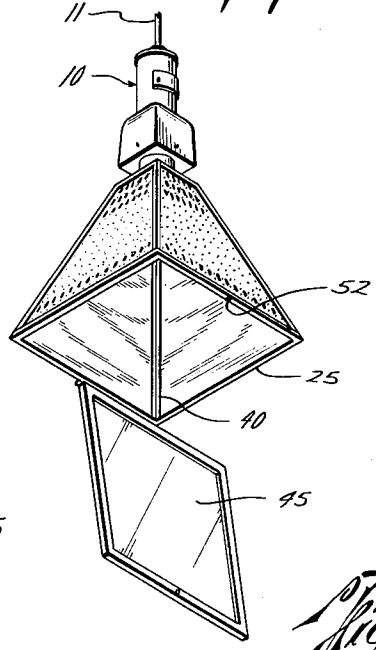


Fig. 3

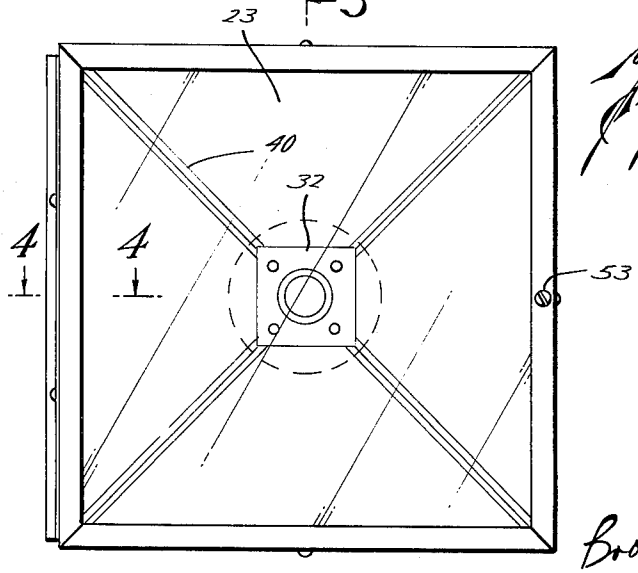
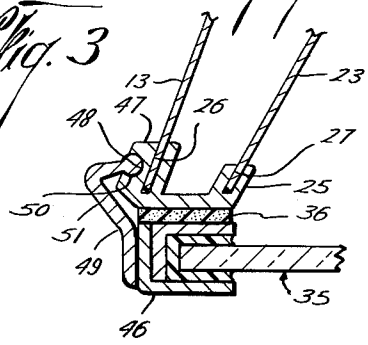


Fig. 4



Buell Moore
INVENTOR.

BY Browning, Bennett, Hyer & Eickenroht
ATTORNEYS

Aug. 24, 1965 B. MOORE 3,202,815

LIGHTING EQUIPMENT

Filed Jan. 8, 1963 2 Sheets-Sheet 2

Fig. 5

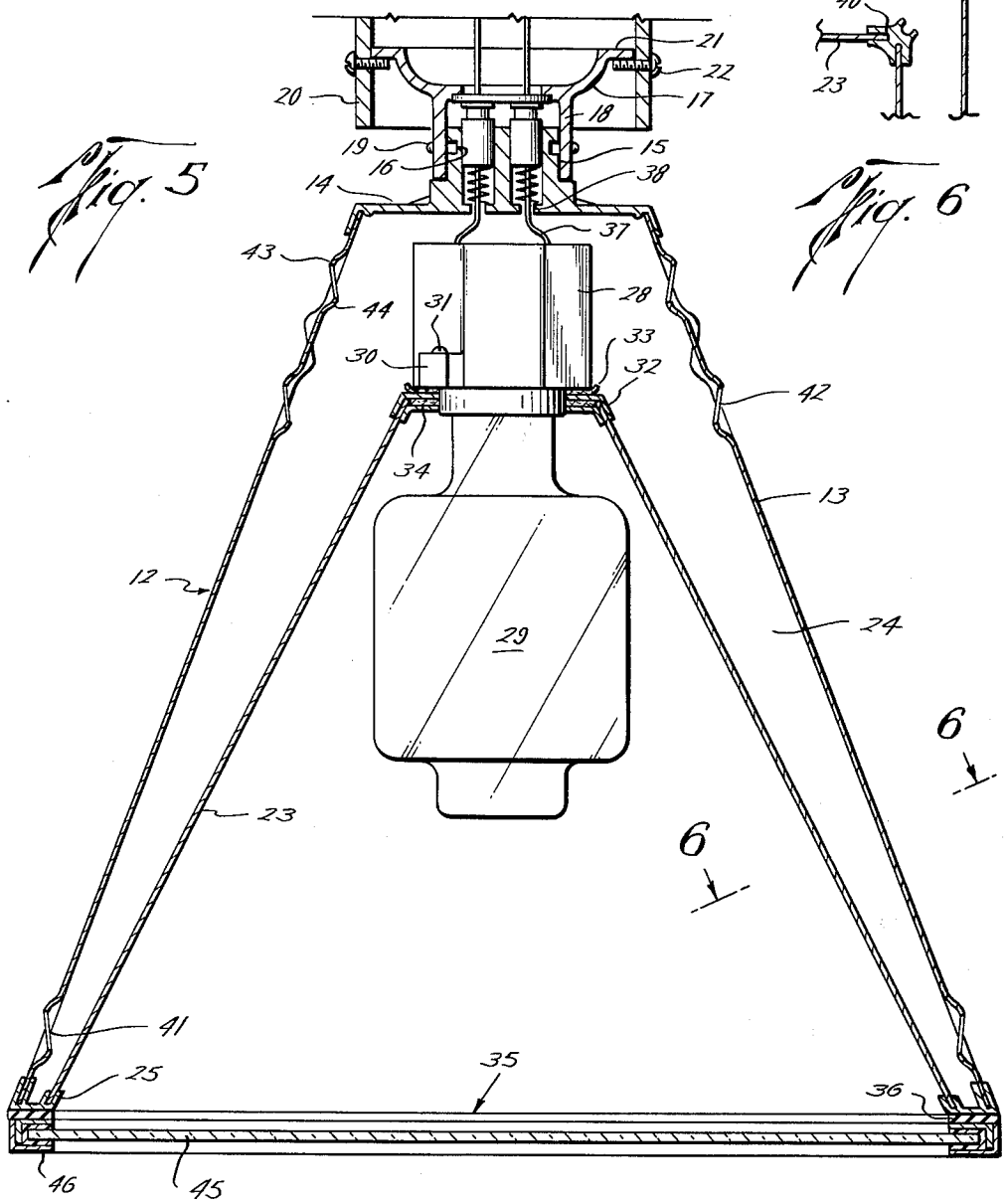


Fig. 6

Buell Moore
INVENTOR.

BY Browning, Simmons, Hager & Eickenroht
ATTORNEYS

United States Patent Office 3,202,815 Patented Aug. 24, 1965

3,202,815

LIGHTING EQUIPMENT

Buell Moore, Houston, Tex., assignor to Esquire, Inc., New York, N.Y., a corporation of Delaware

Filed Jan. 8, 1963, Ser. No. 250,073
2 Claims. (Cl. 240—78)

This invention relates to improvements in lighting equipment. In one of its aspects, it relates to an improved combination transformer and light fixture of the type which is enclosed, and more particularly of the type which is adapted to be suspended from the ceiling.

Although it would be more convenient and structurally desirable to mount the transformer closely adjacent the light fixture, heretofore this has not been practical due to the excessive heat created by the fixture, particularly when the fixture uses a mercury vapor lamp. As a result, it has been the practice to mount the transformer at a location sufficiently remote from the suspended light fixture that the transformer is not adversely affected by the heat from the fixture.

It is an object of this invention to provide a combination transformer and light fixture of this general type wherein the fixture is of such construction that the transformer may be mounted closely adjacent thereto, and more particularly in such a manner that both the transformer and fixture may be suspended from a single support.

Another object is to provide an enclosed and suspended type of light fixture which dissipates its own heat in such a manner as to permit it to be disposed closely adjacent the transformer, and more especially to be suspended just beneath the transformer when the two are suspended from a single support.

Still another object is a provide an enclosed type of light fixture for use in this or other environments wherein the lens for covering the open end of the case for the lamp is connected to the case for movement between opened and closed position by a hinge which is of simple and inexpensive construction and which facilitates the quick removal and replacement of the lens.

These and other objects are accomplished by a light fixture which includes, similarly to conventional fixtures of this type, a reflector having an open end, socket means for mounting a lamp within the reflector and opposite the open end, and a lens across the open end of the reflector for enclosing the lamp. Although the enclosure of the lamp enhances its optical characteristics, and protects it as well as the reflector against weathering, dirt, bugs, and the like, it nevertheless raises the temperature of the fixture above that of an open, air-cooled fixture. As previously noted, this increased temperature would in many instances require that the transformer for the fixture be mounted at a location remote from the fixture. However, in accordance with this invention, the fixture has means for circulating air upwardly past the outer surface of the reflector sufficiently to permit the transformer to be disposed closely adjacent thereto.

More particularly, the air circulating means is of such construction and so arranged on the light fixture that the light fixture may be suspended beneath and closely adjacent the lower end of the transformer housing and the transformer housing may, in turn, be suspended in a vertical position from a suitable support. Thus, the transformer housing has means at its upper end for connection with a suspension pipe or the like together with means at its lower end for connection with the upper end of the light fixture, whereby both the transformer housing and fixture are suspended substantially symmetrically of the pipe and one another.

In the preferred embodiment of the in the invention,

the open end of the reflector faces downwardly and the air circulating means comprises a ventilated space about the reflector which creates a draft for drawing air upwardly therethrough. Thus, the fixture includes a case arranged in spaced relation about the reflector and joined at its lower end to the open lower end if the reflector. More particularly, there are openings in the case opposite the upper and lower ends of the reflector, with the upper openings facing substantially horizontally so that the air circulating therethrough will be directed away from the transformer and its housing above the fixture.

In accordance with another novel aspect of the invention, the particular light fixture above described, or, for that matter, an enclosed type of light fixture suitable for use in other environments, has a lens connected to the case by a hinge made up of an arcuate groove extending longitudinally of one side of the case adjacent an edge of its open end and means along a side edge of the lens including an arcuate rod pivotally mounted within the groove to permit swinging of the lens between opened and closed positions. More particularly, one end of the groove is open so that the rod may slide longitudinally into and out of the groove, and the lens is secured to the case in its closed position by any suitable means, which preferably comprises a single screw. The rod is formed on a strip which is welded or otherwise secured to the side edge of the lens, and both the strip and the means in which the groove is formed, and comprising the only parts necessary for the hinge, may be formed from extrusions so as to further simplify fabrication of the hinge.

In the drawings, wherein like reference characters are used throughout to designate like parts:

FIG. 1 is a side view of a combination transformer and light fixture constructed in accordance with the present invention;

FIG. 2 is a perspective view of the lighting equipment shown in FIG. 1, as seen from one corner and the lower end thereof and with the lens for closing the lower end swung into an open position and moved laterally toward removal from the case;

FIG. 3 is a lower end view of the light fixture shown in FIG. 1;

FIG. 4 is an enlarged sectional view, as seen along broken line 4—4 of FIG. 3, of a portion of the lower ends of each of the case and reflector of the fixture as well as the hinge connecting the lens to the case;

FIG. 5 is an enlarged sectional view of the light fixture shown in the preceding figures, and taken along broken line 5—5 of FIG. 1; and

FIG. 6 is a sectional view of a corner of the case and reflector of the light fixture, as seen along broken line 6—6 thereof.

With reference now to a detailed description of these figures, the lighting equipment comprises, as best shown in FIGS. 1 and 2, a transformer situated in a housing **10** suspended from a pipe **11** at its upper end and a light fixture **12** having its upper end suspended beneath and closely adjacent the lower end of the transformer housing. The pipe **11** which is threaded or provided with other means at its lower end for connection with the upper end of the transformer housing not only suspends the transformer and its housing, but also provides a conduit for the electrical wiring leading to the transformer from a suitable power source.

In the present instance, the electrical wiring leads into the upper end of the transducer housing so that electricity is fed therethrough into its lower end for connection with a socket (to be described) within the light fixture **12**. Although "feed-through" transformers of this type

are well known in the art, it is nevertheless important to note that the transformer housing is suspended symmetrically of the pipe 11, and further that, as shown in FIG. 1 and as will be apparent from the description to follow, the light fixture 12 is suspended symmetrically of the transformer housing, so as to balance the weight of the entire equipment.

The light fixture 12 comprises a case 13 which has flat sides which extend downwardly and outwardly from a cover 14 at the upper end of the case. More particularly, the upper edges of the sides of the case are at least substantially vertically coextensive with the flat sides of the lower portion of the transformer housing 10, and the enlarged lower end of the case is vertically symmetrical with both the transformer housing and the upper end of the case.

As best shown in FIG. 5, the cover has an upwardly extending neck 15 which is adapted to receive the skirt 18 of a connector 17 releasably suspended from a skirt 20 on the lower end of the transformer housing. Thus, the skirt 18 fits over the neck 15 of the cover and carries pins 19 adapted to fit within the groove 16 for releasably securing the connector 17 to the case. The upper end of the connector has an annular flange 21 adapted to rest upon screws 22 carried within the skirt 20 of the transformer housing. In the assembly of the light fixture with the transformer, the screws 22 are retracted to permit the flange 21 to be moved upwardly into place within the skirt 20, and then moved inwardly to the position illustrated in FIG. 5. The releasable connection of connector 17 to the case 13 facilitates replacement of the connector with another suitable joint for suspending the fixture 12 directly from the pipe 11, if desired.

A reflector 23 is disposed within the case 13 in spaced relation thereto, again as best shown in FIG. 5, to provide an air space 24 surrounding the reflector intermediate its upper and lower ends. Thus, the reflector has flat sides arranged symmetrically of the sides of the case and also tapering downwardly and outwardly to an open lower end. The lower ends of the case and reflector are joined to close the lower end of space 24 by means of strips 25 along each side. As best shown in FIG. 4, each such strip 25 may comprise an extrusion having grooves 26 and 27 therein for receiving lower side edges of the fixture and reflector, respectively.

The upper end of the reflector 23 is connected to and surrounds a socket 28 which is substantially axially aligned with the pipe 11 to suspend mercury vapor lamp 29 centrally within the reflector 23 and thus symmetrically of the transformer housing and fixture. The socket has one or more ears 30 about its base to receive screws 31 or other suitable means for connection to the annular cap 32 which surrounds the socket at the upper end of the reflector. As shown in FIG. 5, the cap includes a pair of plates which receive insulation 34 therebetween and are turned down along their sides to form grooves for receiving the upper edges of the sides of the reflector. Additional insulation 33 is held between the socket and the top of cap 32. The lower open end of the reflector 23 is closed by a lens 35 which, in its closed position, bears against a gasket 36 about the bottom side of strip 25. Thus, in the closed position of the lens illustrated in FIGS. 4 and 5, the lamp 29 is enclosed within the reflector in dust-tight relation.

As shown in FIG. 5, the socket 28 has electrical wires 37 extending therefrom through openings 38 in the cover 14 and into the connector 17. These wires are, in turn, connected to the transformer in a well known manner so that electricity from a suitable source may be fed through the transformer to the socket.

The adjacent side edges of each of the case and reflector of the light fixture are connected together by extruded strips 39 and 40, respectively. As best shown in FIG. 6, these extrusions have grooves to receive the edges of the sides of the case and reflector, similarly to the manner

in which the grooves in the lower strips 25 receive the lower end edges of the same parts. As shown in FIGS. 1 and 2, the side strips 39 and 40 extend substantially vertically between the cap 14 and the lower strips 25. The upper ends of grooves on the inner and outer edges of the strips 39 and 40, respectively, may be threaded to receive screws (not shown) for securing the cover 14 and cap 32 in place on the upper ends of the case and reflector.

As previously described, there are openings 41 in the case 13 adjacent the lower end of the reflector 23 as well as openings 42 in the case adjacent the upper end of the reflector. More particularly, there is a single band of lower openings 41 and a triple band of upper openings 42 to provide substantially equal areas of openings. As also previously described, the ventilated space 24 will create a draft to cause air to circulate upwardly from the lower openings 41 into the space 24 and out the upper openings 42. Means are provided for diverting air flowing upwardly within said case out through said openings opposite the upper end of the reflector and for preventing said air from flowing through the transformer housing. In the illustrated embodiment, this means includes the cover 14 and connector 17 which cooperate to close the upper end of the light fixture and the lower end of the transformer housing. In this manner, the ambient temperature of the fixture about the outer surface of the reflector 23 is reduced sufficiently to permit the fixture to be disposed closely adjacent the transformer housing 10. Still further, even when the light fixture is mounted separately or remote from the transformer housing, the heat dissipated by this circulation of air is useful in prolonging the life of the mercury vapor lamp and in helping to retain proper color correction characteristics.

More particularly, and as best shown in FIGS. 1 and 2, the openings 41 and 42 are so arranged as to face substantially horizontally, despite the downwardly and outwardly tapering configuration of the case 13. This not only prevents rain or other foreign matter from falling into the space within the case, but also, in the case of the upper openings 42, directs the air flow away from the transformer housing 10 above the light fixture.

Again as best shown in FIG. 5, this particular configuration of each of the openings 41 and 42 is provided by means of an upper portion 43 of the case which protrudes outwardly from an adjacent portion thereof and a lower portion 44 which protrudes inwardly from an adjacent portion. As a result, the opening defined by the upper and lower portions extends in a plane which is substantially vertical, but preferably departing from a vertical in that its lower end is disposed slightly inwardly of its upper end.

The lens 35 includes a pane 45 of glass or other transparent material received within a frame 46 disposable, in the closed position of the lens, against the gasket 36. In a manner to be described below, however, the lens is swingable between the closed position and an open position, as shown in FIG. 2, so as to permit access to the lamp 29. More particularly, the lens is hinged to the case in such a manner that it may be removed therefrom by a laterally sliding motion, as also illustrated in FIG. 2.

As shown in FIG. 4, this hinge comprises an enlarged portion 47 on the outer side of one strip 25 having a groove 48 extending longitudinally thereof and a strip 49 secured to the outer edge of a corresponding side of the frame 46 of the lens and having an arcuate rod 50 slidably retained within the groove. An intermediate portion 51 of the strip is bent outwardly from the rod 50 and then inwardly for securement as by welding to the frame of the lens so that, as will be obvious from FIG. 4, the lens may swing downwardly to the position shown in FIG. 2. The groove 48 within enlarged portion 47 of the strip 25 extends from one end to the other thereof so that the rod 50 is free to slide laterally into and out of the groove when it is desired to repair or replace the lens. As previously mentioned, the strip 49 as well as the strip

25 may be extruded to further simplify fabrication of the hinge.

There is a threaded opening **52** in the strip **25** opposite the strip having groove **48** so as to receive a screw **53** carried on the corresponding side edge of frame **46** of the lens. Thus, the lens may be secured in or released from closed position by the simple manipulation of this single screw.

From the foregoing, it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth, together with other advantages which are obvious and which are inherent to the apparatus and structure.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

The invention having been described, what is claimed is:

1. Lighting equipment, comprising a transformer mounted in a housing adapted to be suspended in a vertical position, a light fixture suspended beneath and closely adjacent the lower end of the transformer housing, said fixture including a reflector having an open lower end, socket means for mounting a lamp within the reflector and opposite its open lower end, a lens across the open end of the reflector, a case arranged in spaced relation about the reflector, means providing openings in the case

opposite the upper and lower ends of the reflector, means for diverting air flowing upwardly within said case out through said openings opposite the upper end of the reflector and for preventing said air from flowing through the transformer housing, and means for electrically connecting the socket means with the transformer.

2. Lighting equipment of the character defined in claim **1**, wherein the case tapers downwardly and outwardly from its upper end to its lower end, and each of said openings providing means comprising an upper portion which protrudes outwardly from an adjacent part of the case and a lower portion which protrudes inwardly from a part of the case adjacent to it, whereby each opening faces substantially horizontally.

References Cited by the Examiner

UNITED STATES PATENTS

446,142	2/91	Martin	240—47 X
1,240,452	9/17	Hotchkin	240—47
2,799,773	7/57	Schwartz	240—47
2,878,371	3/59	Hanlin	240—47
2,912,568	11/59	Winkler	240—147
3,019,701	2/62	Brueckner et al.	240—47
3,021,422	2/62	Ogier et al.	240—47
3,027,452	3/62	McGinty	240—147

FOREIGN PATENTS

487,039	6/38	Great Britain.

NORTON ANSHER, *Primary Examiner.*

EMIL G. ANDERSON, *Examiner.*