

June 2, 1942.

T. E. McDOWELL

2,284,878

RUNWAY MARKER LIGHT

Filed Feb. 20, 1941

2 Sheets-Sheet 1

Fig. 1.

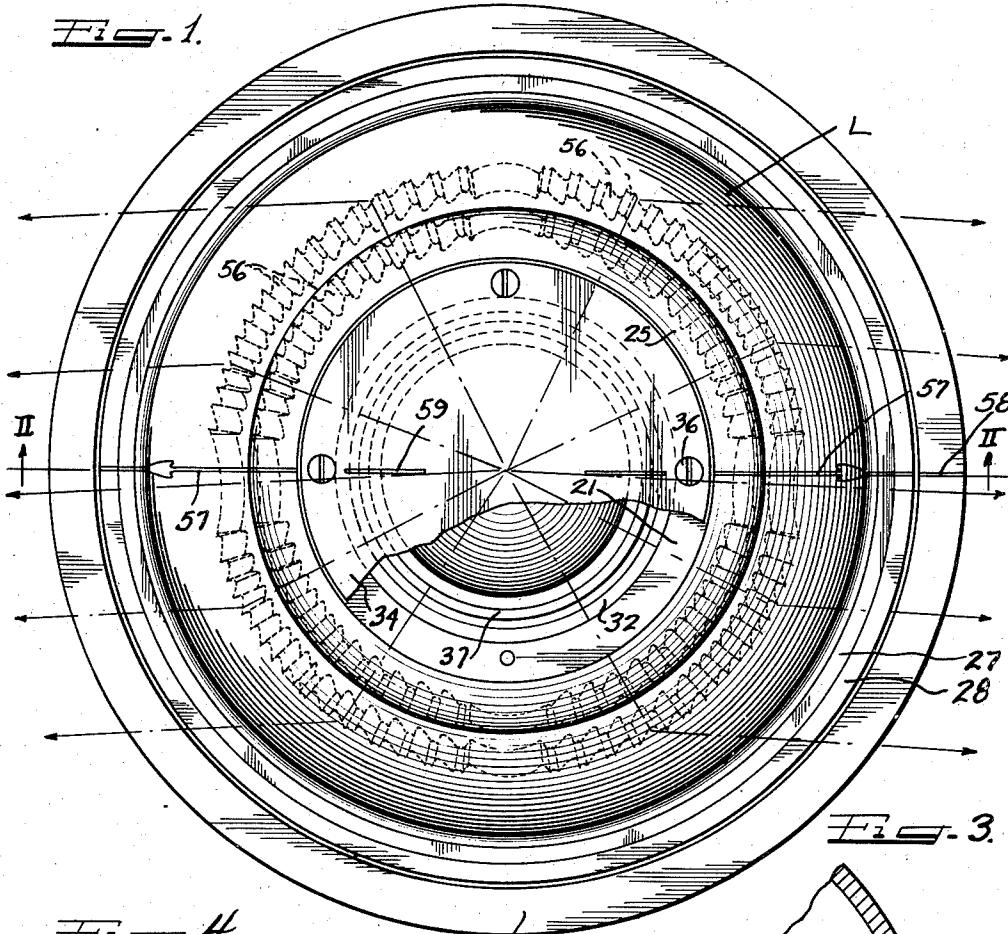


Fig. 3.

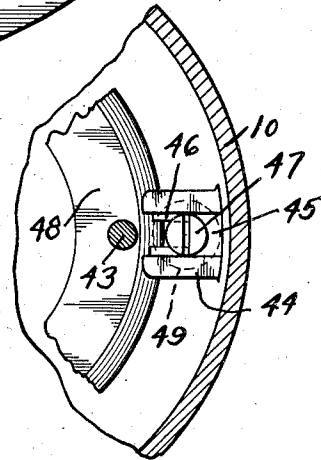
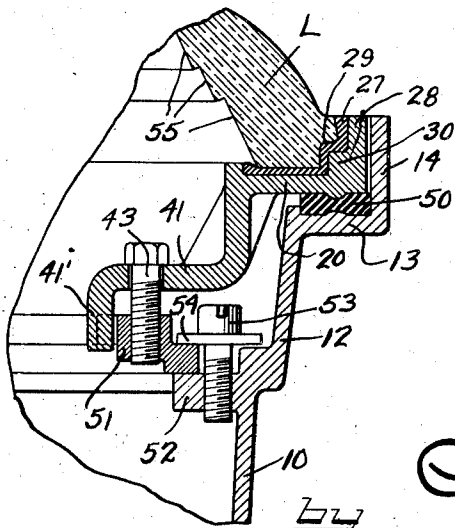


Fig. 4.



THOMAS E. McDOWELL.

Charles E. McDowell

Fig. 2.

June 2, 1942.

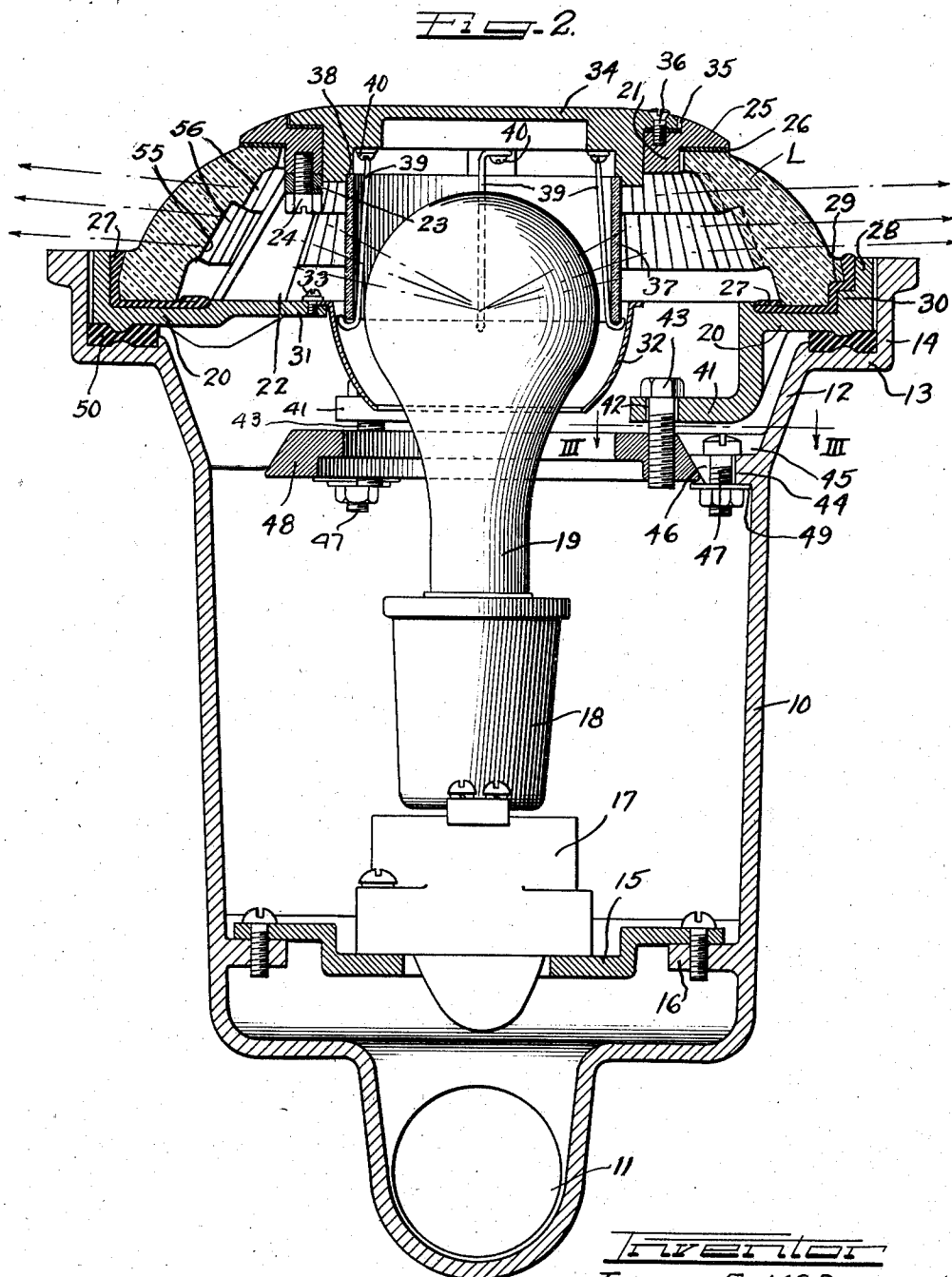
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2 Sheets-Sheet 2



THOMAS E. McDOWELL.

Charles Hill
Attys.

UNITED STATES PATENT OFFICE

2,284,878

RUNWAY MARKER LIGHT

Thomas E. McDowell, Oak Park, Ill., assignor to
The Pyle-National Company, Chicago, Ill., a
corporation of New Jersey

Application February 20, 1941, Serial No. 379,751

3 Claims. (Cl. 240—1.2)

My invention relates to lighting units adapted particularly for use in airports for lighting the runways and for guiding pilots for proper approach and landing. Lighting units for this purpose usually comprise a metallic container-shaped housing to be set into or adjacent to the runway with its upper end flush with the runway surface, the housing being adapted to support a lighting unit, and a cover structure for the housing supporting lens structure for the proper directioning and distribution of the light relative to the runway surface.

Heretofore in lighting units of this class no provision was made for adjustment of the cover structure relative to the housing, and therefore the housing had to be set very accurately so that, after application of the cover structure and securing thereof to the housing, the light rays would be directed properly in the desired direction. An important object of my invention is therefore to provide in a unit of this type simple and efficient means by which accurate adjustment can be made of the lens supporting cover structure on the embedded housing so that, if the housing had not been properly set, the cover structure can be readily adjusted and then secured for the proper and accurate functioning of the lens element.

A further important object of the invention is to provide a cover structure to which a lens element is permanently secured, and with the cover structure provided with a cover plate which may be readily removed for access to the lamp or the cover structure adjusting means without disturbing the position of the lens relative to the cover structure.

My invention also includes other features of structure and arrangement and all the various features are incorporated in the structure shown on the drawings, in which drawings:

Figure 1 is a plan view of the lighting unit;

Figure 2 is a section on plane II—II Figure 1;

Figure 3 is a section on plane III—III Figure 2; and

Figure 4 is a vertical section of part of the structure showing a modified adjusting arrangement for the cover structure.

In the structure shown, the housing 10 is in the form of a cylindrical container having at its lower end an inlet 11 for connection with conduits or piping for the electrical circuit with which the unit is to be connected. The container has the flaring neck 12 which terminates in the horizontal seating flange 13 and the surrounding vertical flange 14. At the lower end of the hous-

ing, a supporting plate 15 is detachably mounted on seat projections 16 forming part of the housing. The plate 15 supports the base 17 on which is mounted a socket member 18 for the lamp 19.

The cover structure comprises the annular horizontally extending bottom wall 20 and an annular top wall 21. From the inner edge of the bottom wall 20, a number of posts or brackets 22 extend upwardly and terminate in seating heads 23 against which the top wall 21 is secured as by means of screws 24. The upper wall 21 is of less diameter than the bottom wall 20 and has a flange 25 between which and the bottom wall 20 an annular lens L is interposed. A sealing gasket 26 is inserted between the flange 25 and the top of the lens, and the lens at its lower end is seated in suitable sealing material 27 which extends along the bottom wall 20 and also between the lens and the flange 28 surrounding the bottom wall. When the screws 24 are tightened, the lens will be clamped between the upper and bottom walls and the gasket and sealing means will be compressed to form weather-tight sealing joints, the lens thus becoming a permanently secured part of the cover structure.

At one side the lens may be provided with a slot 29 for receiving a projection 30 on the flange 28 so that the lens may be properly positioned on the cover structure when the cover structure is assembled.

The cover structure bottom wall 20 has a number of radially extending arms 31 from which a reflector 32 may be suspended to encircle the lamp 19, and this reflector is detachably secured as by means of screws 33.

A cover plate 34 is seated in the annular recess 35 in the top wall 25 and is detachably secured as by means of screws 36. Surrounding the lamp is a screen 37 which may be of glass or other suitable material for coloring the rays as desired. As shown, this screen is supported by the cover plate 34, the upper end of the screen resting against shoulders 38, and suitable hook members 39 detachably secured as by screws 40 to the cover plate engaging around the lower edge of the screen to hold it concentric relative to the lamp and lens. Upon removal of the cover plate, a screen for the desired illumination control may be readily installed.

Describing now the adjusting arrangement for the cover structure, L-shaped arms 41 extend from the inner edge of the cover structure bottom 20, the arms being provided in their radially extending ends with holes 42 for screws 43. Extending radially inwardly from the housing 10 at the

base of its neck portion 12 is a number of abutment lugs 44, preferably three such lugs being provided equally spaced circumferentially on the housing. These lugs have upper channels 45 and slots 46 below the channels, the channels receiving the heads and the slots the shanks of bolts 47, as shown on Figures 1 to 3. At their inner ends, the lugs 44 are beveled for engagement by the beveled outer surface of a securing ring 48 which has threaded openings for receiving the screws 43 extending through the arms 41 on the cover structure. Washers or plates 49 are secured against the under side of the lugs 44 to form seats on which the securing ring 48 may rest when the screws 43 are loosened or withdrawn from the ring.

The lamp structure, the securing ring structure, and the cover structure are installed in the housing 10 after the housing has been set into the ground. The lamp supporting structure is first installed, and the securing ring 48 placed on the supporting washers 49, and then the cover structure is applied, a suitable sealing gasket 50, preferably of pure gum rubber, being applied between the seating flange 13 and the cover structure. The cover plate 34 being removed, the screws 43 are accessible, and the screws are engaged with the securing ring 48, and then before tightening of the screws, the cover structure is rotated to bring the lens into the proper position relative to the runway, whereafter the screws are tightened for engagement of the beveled edge of the securing ring against the beveled ends of the lugs 44 so that the cover structure is drawn down for compression of the gasket 50 and secure and rigid mounting of the cover structure on the housing. The cover plate 34 with the proper screen 37 thereon is now applied and secured. For re-lamping, the cover plate 34 is removed without in anywise disturbing the lens and its supporting cover structure.

In the modified arrangement shown on Figure 4, the securing or clamping ring 51 seats on the lugs 52 extending from the housing 10, the ring receiving the screws 43 extending through the arms 41 of the cover structure. At their inner ends the arms 41 have the depending extension 41' projecting into the ring to hold it laterally against displacement on the lugs 52. Threading into the lugs 52 are screws 53 having abutment collars or flanges 54 for engaging against the top of the ring. After the lens supporting cover structure has been properly adjusted on the housing 10, the screws 53 are tightened to securely clamp the ring 51 to the lugs 52 so that then, by tightening of the screws 43, the cover structure is rigidly secured in its adjusted position.

The lens has the prism zones 55 which direct the light rays radially in all directions into a vertically narrow zone preferably extending at a slight angle to the ground level, as indicated on Figure 2, while other prism formations 56 will deflect the radial rays into substantially parallelism to concentrate the light in two opposite zones. As shown on Figure 1, indicating lines or arrows 57 are marked on top of the cover structure, these arrows being in a line parallel to the center line of the runway if the cover structure has been properly adjusted on the housing 10. The center lines of the two opposite concentrated light zones created by the prism formations 56 are at slight angles with the center line through the arrows 57 to be inclined toward the center line of the runway so that the concentrated beams coming from units at opposite sides of the run-

way are better observable by a pilot in order to more accurately guide him to the center of the runway. After adjustment of the cover structure of a unit has been made to bring the line of the arrows into parallelism with the center line of the runway, an indicating mark 58, such as a chisel cut, is made on the flange 14 of the cover structure so that, if the cover structure is ever removed from the housing, it may be accurately reset into proper position. Indicating lines 59 may also be provided on the cover plate 54 which, when the cover is applied, are brought into alignment with the line of the arrows 57 so as to be sure that the cover plate is in proper position for proper functioning of the screen 37. The concentrating prism formations 56 are preferably provided on the inside of the lens L with the outer side of the lens remaining smooth so that it may be readily cleaned on the outside.

I thus provide an improved and efficient runway marker light unit in which a single lens functions to produce the vertically narrow light zone and the concentration of the rays into two opposite zones at the proper angle with the runway surface for accurately guiding a pilot for proper landing, the lens being a permanent rigid part of the cover structure. By my improved adjusting arrangement the cover structure may be readily set on the installed housing for proper adjustment of the lens relative to the runway.

I have shown practical and efficient embodiment of the features of my invention but I do not desire to be limited to the exact construction, arrangement and operation shown and described as changes and modifications may be made without departing from the scope of the invention.

I claim as follows:

1. A runway marker light comprising a housing to be set into the ground adjacent to the side of a runway and providing an annular seat at its upper end, a cover structure for mounting on said seat, a lamp supported within said housing for extension into said cover structure, an annular lens on said cover structure for deflecting the light rays from the lamp to form zones along the runway, abutments within said housing, an annular securing member for engagement against the under sides of said abutments, arms extending from said cover structure above said abutments, screws connecting said arms and said annular securing member, said screws when loosened permitting rotational adjustment of said cover structure on its seat for the proper locationing of the light zones by the lens along the runway, said screws when tightened causing said abutments to be clamped between said arms and said securing member for rigidly holding the cover structure in its adjusted position.

2. A runway marker light comprising a housing to be set into the ground adjacent to the side of a runway and having an annular seat at its upper end, a cover structure engaging said seat, a light element supported within said housing, a lens on said cover structure for deflecting the light rays to create light zones along the runway, a clamping ring within said housing, supporting means supporting said clamping ring for rotational movement with said cover structure whereby said cover structure may be rotatably adjusted for the desired light zone directioning by said lens, abutments within said housing for said clamping ring, said supporting means being adjustable to effect clamping of said ring against said abutments to thereby rigidly secure said

cover structure in its seat after adjustment thereof.

3. A runway marker light comprising a housing to be set into the ground adjacent to a runway, an annular cover structure for said housing, a lamp supported within said housing, an annular lens on the cover structure for direction-
ing the rays from said lamp relative to the runway, a clamping member within said housing carried by
said cover structure, stationary abutment means 10

within said housing engageable by said clamping member, and securing means on said cover structure for engaging said clamping member with said abutment means to rigidly secure said cover structure to the housing, said securing means being releasable so that said cover structure may be rotatably adjusted on said housing for the proper light directioning of said lens.

THOMAS E. McDOWELL.