March 17, 1970 H. J. MACEMON 3,501,627

AIRPORT LIGHTING FIXTURE

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Fig. 1.

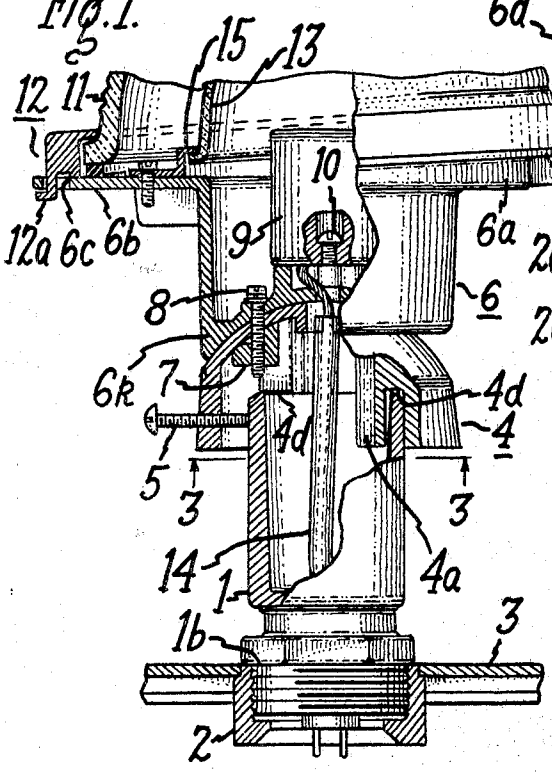


Fig. 2.

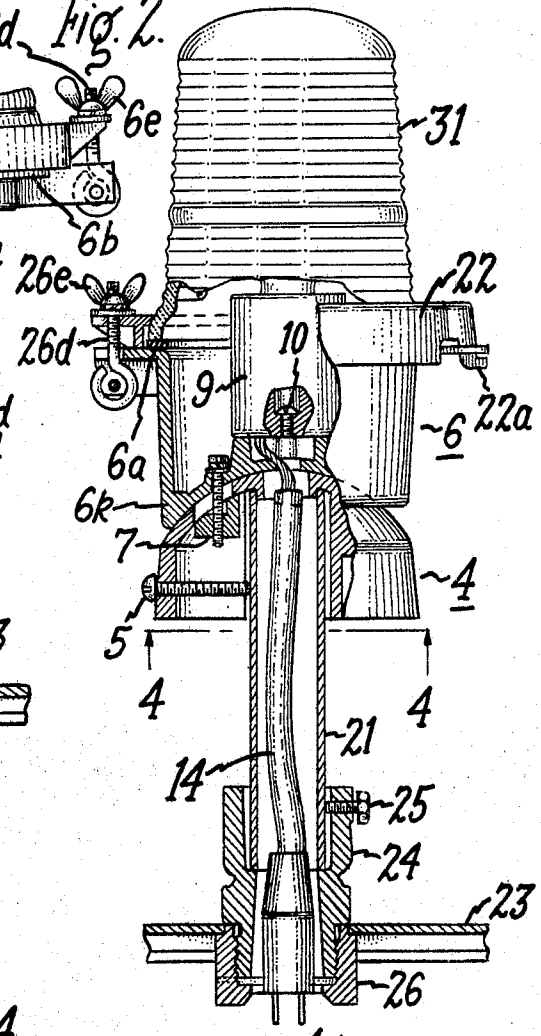


Fig. 3.

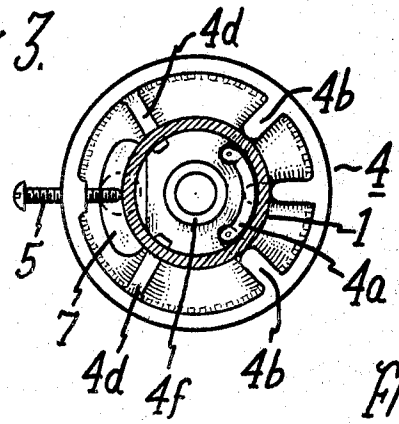
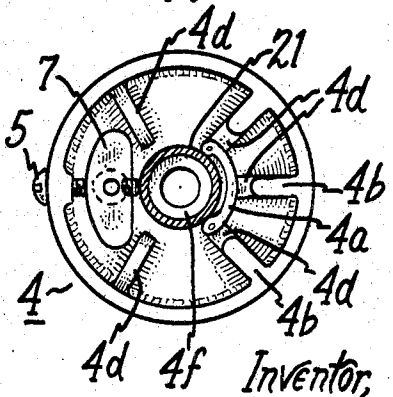


Fig. 4.



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Fig. 5

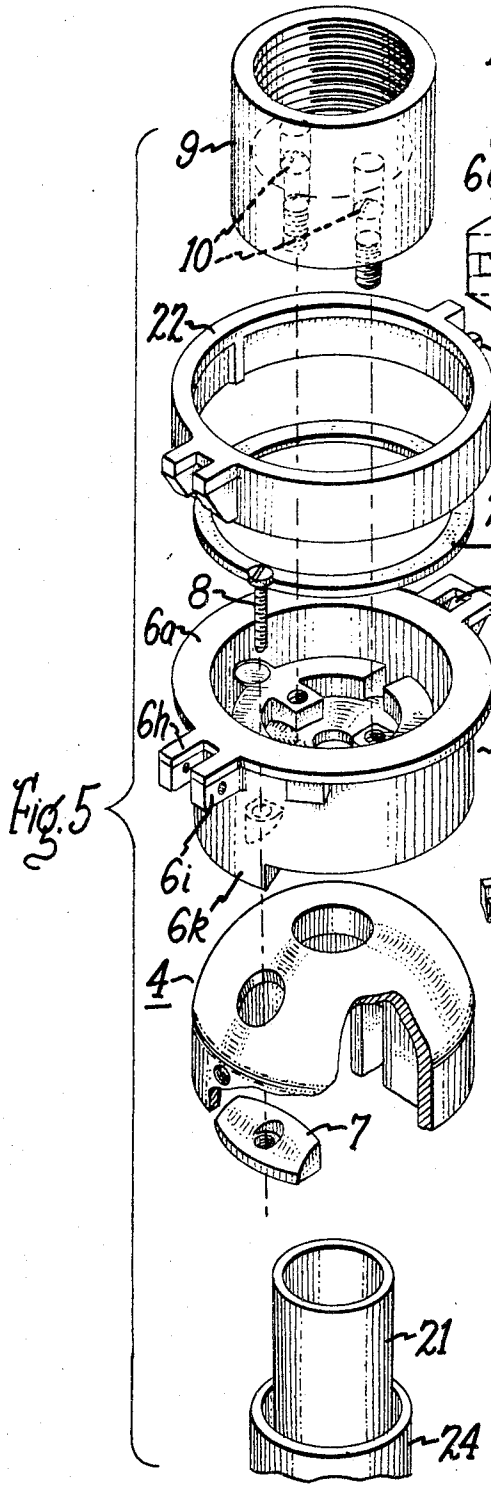


Fig. 6.

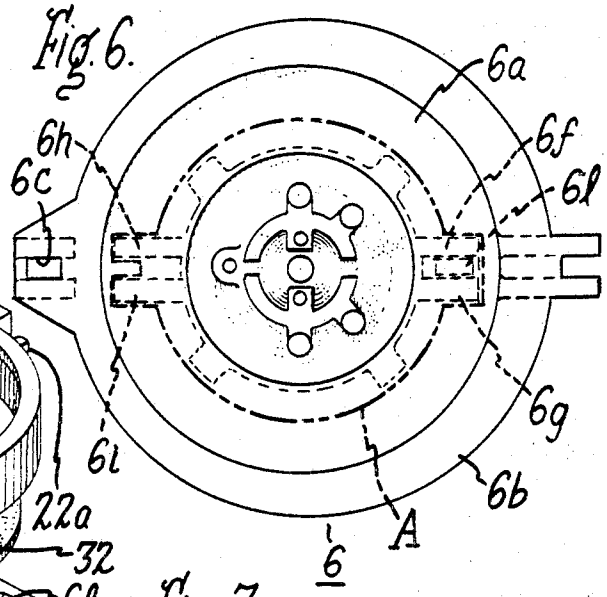


Fig. 7.

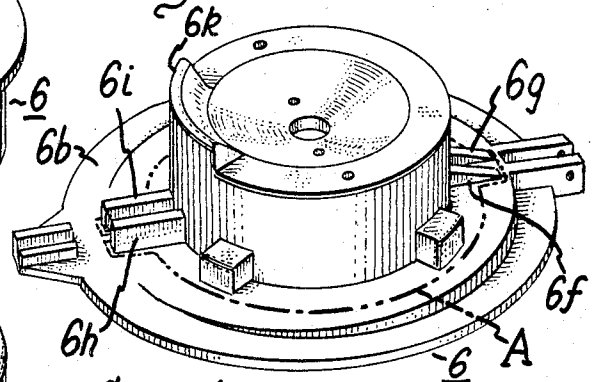
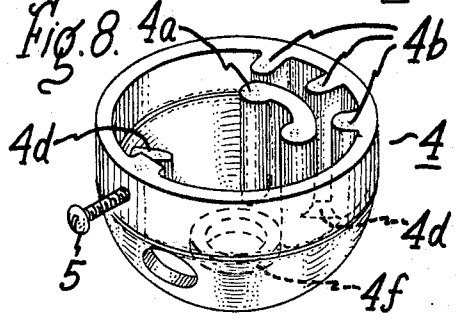


Fig. 8.



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AIRPORT LIGHTING FIXTURE

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U.S. Cl. 240—1.2 10 Claims

ABSTRACT OF THE DISCLOSURE

An airport runway light has a lampholder housing with a lens support flange which cooperates with lenses for high and low intensity lighting. The housing is mountable on a support member and is adjustable to move on the support member to the desired degree of inclination. Coaxial projections in the support member cooperate with support pipes of various diameters which are used for the different intensity lighting units.

It is an object of the invention to provide an improved airport lighting fixture adapted for use with different light intensity illuminating systsms.

It is another object of the invention to provide an airport lighting fixture of the above type adapted to accommodate mounting supports of different sizes.

It is still another object of the invention to provide airport runway lighting fixtures of the above type which may be readily and conveniently adjusted to proper orientation.

Other objects and advantages will become apparent from the following description and the appended claims.

With the above objects in view, the present invention relates to an airport lighting fixture comprising, in combination, a hollow support member having a top with a centrally arranged aperture therein, the support member being formed on its interior surface with a plurality of radially spaced, coaxial projecting portions extending at least partially around the axis of the aperture, a tubular support member extending axially into the interior of the hollow support member with the wall thereof at its inner end fitting between adjacent ones of the coaxial projecting portions so as to be retained in position thereby, means for securing the tubular support member in the thus positioned assembly with the hollow support member, a lampholder housing formed of a cup-shaped portion having a bottom wall resting on the top of the hollow support member, the cup-shaped portion having a radially outwardly projecting flange for supporting a lens thereon, and means for securing the lampholder housing and the hollow support member in assembly.

The invention will be better understood from the following description taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a view in elevation, partly in section, of an airport runway lighting fixture constructed in accordance with the invention for mounting a high intensity illuminating system;

FIGURE 2 is a similar view of the FIGURE 1 fixture modified in accordance with the invention for use with low and medium intensity illuminating systems;

FIGURE 3 is a view of the device shown in FIGURE 1 taken along the line **3—3**;

FIGURE 4 is a view of the modified arrangement shown in FIGURE 2 taken along the line **4—4**;

FIGURE 5 is an exploded view of a part of the assembly shown in FIGURE 2;

FIGURE 6 is a top plan view of the lampholder housing shown in the FIGURE 1 device;

FIGURE 7 is a perspective view of the lampholder housing, in inverted position, shown in FIGURE 6; and

FIGURE 8 is a perspective view of the dome-shaped support adapter, in inverted position, shown in FIGURES 1–5.

Referring now to the drawings, and particularly to FIGURE 1, there is shown a lighting fixture assembly constructed in accordance with the invention and adapted to mount a high intensity lamp and lens illuminating system for use in defining the edges of airport runways. The fixture comprises a tubular support column **1** having a threaded lower end **1***b* for mounting the fixture in a socket **2** of a base plate **3** suitably secured at ground level. Dome-shaped support adapted **4** is seated on top of frangible support tube **1** and is secured thereto by set screw **5** which passes through a threaded aperture in the wall of adapter **4** and engages the wall of support tube **1**. Adjustably mounted on top of adapter **4** is cup-shaped lampholder housing **6** having a concave bottom wall complementary to the curvature of the domed top of adapter **4** and being secured thereto by a clamp member **7** threadably engaged by screw **8** which passes through the bottom of lampholder housing **6** and which, when tightened, firmly clamps housing **6** to support adapter **4** in adjusted position relative to one another. As is evident, the complementary curved bearing surfaces of support adapter **4** and lampholder housing **6** permit these parts to be universally adjusted relative to one another to level the lampholder. Housing **6** is formed in the clamp region with a downwardly projecting portion **6***k* forming a partial extension of the bottom curved surface to provide an adequate bearing surface to ensure that the parts are held in adjusted position when clamped together. In its interior bottom surface housing **6** is formed with suitable bosses for receiving lamp socket **9** and for securing the latter therein by means of screws **10**.

The upper end of housing **6** is formed with a composite flange (see FIGURE 6) having inner and outer annular bearing surfaces **6***a* and **6***b*, of which inner bearing surface **6***a* extends in a plane perpendicular to the axis of lampholder housing **6**, so as to be horizontal in the normal installed position of the fixture, and outer bearing surface **6***b* extends in a plane tilted at 4° to the plane of the inner bearing surface **6***a*. Outer flange surface **6***b* is dimensioned to receive the bottom edge of large refracting lens **11** which is mounted atop the fixture for enclosing a high intensity lamp (not shown), the lamp being adapted to be secured in socket **9** so as to extend upwardly along the axis thereof. Lens **11**, in the installed position of the fixture adjacent the runway, is thus tilted 4° toward the runway in accordance with Federal Aviation Agency (FAA) Specification L–819 covering high intensity runway lights. Clamp ring **12** holds lens **11** in assembly on flange **6***b* by means of tongue **12***a* on one side thereof which projects into aperture **6***c* in the corresponding side of flange **6***b* and by eye-bolt **6***d* pivotally attached at the opposite side of flange **6***b* and having wing-nut **6***e* for engaging and holding clamp ring **12**, and thereby lens **11**, in tight assembly on outer flange surface **6***b* with an intervening gasket as shown in FIGURE 1.

A light transmitting color filter **13** is also mounted as shown within lens **11** by means of clips **15** for providing

the desired color for the light transmitted through lens **11**, in accordance with usual practice.

An electrical conductor **14** connected to lamp socket **9** passes from the latter through aligned axial apertures in the bottom of housing **6** and the top of support adapter **4** and through support tube **1** to a suitable connection below the latter to an electrical power source.

As seen in FIGURES 3 and 8, support adapter **4** is formed on its inside surface with an arc-shaped boss *4a* projecting downwardly from the top of adapter **4** concentric with the outer wall of the latter and spaced inwardly from circumferentially spaced bosses *4b* extending radially inwardly from the adapter wall. As seen in FIGURES 1 and 3, the radial spacing between boss *4a* and bosses *4b* is sufficient to accommodate the tubular wall of support tube **1**. The upper end of the latter in the assembly abuts stop surfaces *4d* on bosses formed in the adapter (see FIGURE 4).

In installation of the high intensity unit of FIGURE 1, the fixture without lens, filter or lamp attached is normally secured in position to the base plate **3**, and with screw **8** loosened, lampholder housing **6** is adjusted on adapter **4** so that inner flange surface *6a* is horizontal, and screw **8** is then tightened to hold these parts in the adjusted position relative to each other. The lamp, filter **13**, and lens **11** are then assembled on the fixture in the positions indicated in FIGURE 1.

Medium and low intensity units, in accordance with FAA Specifications L–802 and L–822, employ refracting lenses which are not tilted and are of smaller diameter than the high intensity units, and use supporting tubes of smaller diameter than those of the larger (high intensity) units. By virtue of the construction provided by the invention, the above-described fixture for high intensity units is readily converted for use in the medium and low intensity units.

As shown in FIGURE 2, which illustrates a fixture for use with either medium or low intensity units, the larger diameter support tube for the high intensity unit is replaced by the smaller diameter support tube **21**, the latter fitting at its upper (i.e., inner) end around annular boss *4f* surrounding the aperture at the top of adapter **4**. In this unit, as seen best in FIGURE 4, tube **21** rests against the inside surface of arc-shaped positioning boss *4a* and is held thereagainst by set screw **5**. At its lower end tube **21** is mounted in base plate **23** by tubular frangible coupling **24** which holds tube **21** by means of set screw **25** and is screwed at its lower end within threaded socket **26**.

The overall diameter of the flanged upper portion of lampholder housing **6** as seen in the FIGURE 2 embodiment is smaller than that in the FIGURE 1 high intensity unit, since it need only be large enough to accommodate the smaller diameter refracting lens **31** for lower intensity light units exemplified by the FIGURE 2 device. In the latter arrangement, the bottom edge of lens **31** rests (via an interposed gasket **32**) on inner flange surface *6a*, which remains after the flanged upper portion of housing **6** is cut away in accordance with the invention along the dashed line A shown in FIGURES 6 and 7. Such cutting down of the width of the flange of the high intensity housing unit thus quickly adapts the latter for use in the medium and low intensity units. Cutting of the flange of housing **6** as described may be achieved by suitable punching apparatus which is designed to cut the flange on the dashed line shown in one operation. The cutting of the housing flange also involves provision of an aperture *6l* through the remaining flange portion between spaced bosses *6f*, *6g* (see FIGURE 6) for receiving the tongue *22a* of clamp band **22** (see FIGURE 5) and provision of a slot between bosses *6h*, *6i* at the opposite side (see FIGURES 5 and 6) in which the eye of bolt *26d* is adapted to be received and pivotally secured as shown in FIGURE 2.

The reduced-diameter housing flange *6a* is thus of the correct size to accommodate the smaller diameter base

of lens **31** which rests on the remaining horizontal surface of flange *6a* and is clamped in place thereon by clamp band **22** in a manner similar to that of the FIGURE 1 arrangement.

There is thus provided an airport runway lighting fixture which is readily adapted for use with optical and support components prescribed by the government for different light intensity units, which is economically manufactured, and which is easily installed and adjusted to the correct orientation.

While the present invention has been described with reference to particular embodiments thereof, it will be understood that numerous modifications may be made by those skilled in the art without actually departing from the scope of the invention. Therefore, the appended claims are intended to cover all such equivalent variations as come within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. Airport runway lighting fixture comprising, in combination, a hollow support member having a top with a centrally arranged aperture therein, said support member being formed on its interior surface with a plurality of radially spaced, coaxial projecting portions extending at least partially around the axis of said aperture, a tubular support member extending axially into the interior of said hollow support member with the wall thereof at its inner end fitting between adjacent ones of said coaxial projecting portions so as to be retained in position thereby, means for securing said tubular support member in the thus positioned assembly with said hollow support member, a lampholder housing formed of a cup-shaped portion with a bottom wall resting on said top of said hollow support member, said cup-shaped portion having a radially outwardly projecting flange, and means for securing said lampholder housing and said hollow support member in assembly.

2. A device as defined in claim **1**, said flange having annular inner and outer bearing surfaces lying in planes at an angle to one another.

3. A device as defined in claim **2**, the plane of said inner bearing surface being substantially normal to the axis of said lampholder housing.

4. A device as defined in claim **3**, the plane of said outer bearing surface being tilted at an angle of about 4° to the plane of said inner bearing surface.

5. A device as defined in claim **1**, said coaxial projecting portions of said hollow support member comprising an annular projection surrounding said aperture, a plurality of bosses projecting radially inwardly from the wall of said hollow support member, and an intermediate arc-shaped projection arranged between said annular projection and said plurality of bosses.

6. A device as defined in claim **5**, said tubular support member being arranged with its inner end fitting between said annular and said arc-shaped projections.

7. A device as defined in claim **5**, said tubular support member being arranged with its inner end fitting between said arc-shaped projection and said inwardly projecting bosses.

8. A device as defined in claim **7**, said flange of said lampholder housing having annular inner and outer bearing surfaces, said inner bearing surface lying in a plane substantially normal to the axis of said lampholder housing, said outer bearing surface lying in a plane at an angle to said first mentioned plane, and means for securing a light refracting member on said outer bearing surface.

9. A device as defined in claim **6**, said flange having an annular bearing surface lying in a plane substantially normal to the axis of said lampholder housing, and means for securing a light refracting member on said annular bearing surface.

10. A device as defined in claim **1**, the top of said hollow support member being dome-shaped, said bottom wall of said lampholder housing being concave with a

curvature complementary to said dome-shaped top, whereby said lampholder housing is universally adjustable on said hollow support member.

References Cited

UNITED STATES PATENTS

2,655,591 10/1953 Clark ..... 240—1.2

3,202,812 8/1965 Berry ..... 240—1.2

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U.S. Cl. X.R.

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