Jan. 26, 1943. A. D. DIRCKSEN ET AL 2,309,104

UTILITY AIRPLANE COCKPIT LAMP ASSEMBLY

Filed May 2, 1941

FIG. 1.

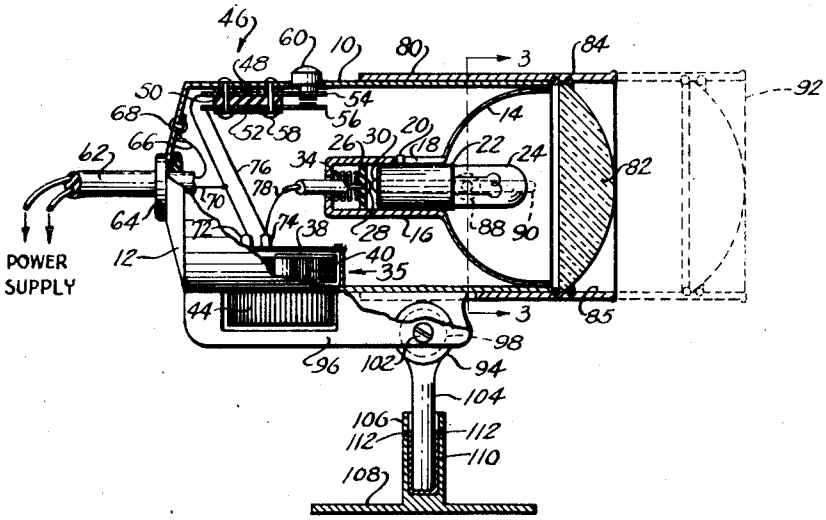


FIG. 2.

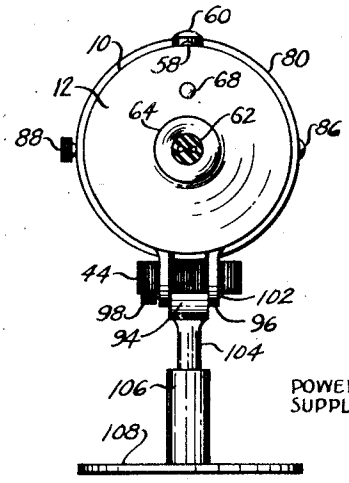


FIG. 3.

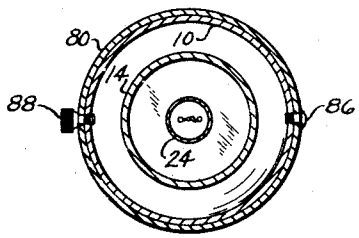
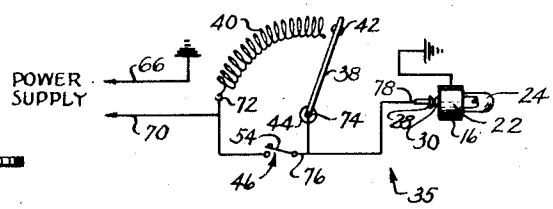


FIG. 4.



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Patented Jan. 26, 1943 2,309,104

UNITED STATES PATENT OFFICE

2,309,104

UTILITY AIRPLANE COCKPIT LAMP ASSEMBLY

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Application May 2, 1941, Serial No. 391,572

1 Claim. (Cl. 240—41.3)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to us of any royalty thereon.

This invention relates to electric lamps, and particularly to a utility lamp for use in the cockpit of an airplane.

In night flying, pilots of small or medium planes usually carry, as part of their regular equipment, several separate lamps, as for instance, a hand lamp for locating objects in their immediate vicinity, a floodlight for lighting the instrument panel, and a spotlight for concentrating light on a distant point, as when inspecting distant parts of the wings for ice formation or other possible trouble.

Because of space limitations within the cockpit, and the requirement of minimum weight in equipment of this kind, it is made an object of this invention to so construct and arrange the several parts of a single lamp assembly that it may quickly and effectively be adapted to the several duties required in a situation of this kind, to the end that not only is weight reduced and space conserved, but, by having a single unit answer the purpose of several separate devices, the laying down of one and subsequent search for the other is often avoided.

More specifically, an object of the invention is to provide a simple and easily adjusted lens carrier and light shield, whereby, by appropriate adjustment, the light beam may be either spread or concentrated, as the case may require.

Another specific object is to provide for the lamp a convenient base affixed to a wall or other part of the plane having swivel means associated therewith, whereby, when the lamp is being used for a floodlight, as when lighting the instrument panel, it may be adjusted appropriately and secured in that position.

Another object is to so construct and arrange the aforesaid base and swivel mechanism that when it becomes necessary or desirable to remove the lamp from an adjusted floodlight position for use as a hand lamp, it may be removed and returned without greatly disturbing the adjustments.

For well-known reasons, aircraft of the class to which this invention is applicable are often required to travel with minimum illumination and, in that event, it may become desirable that the intensity of the floodlight being thrown on the instrument panel be considerably reduced or momentarily shut off; and it is therefore another object of this invention to provide regulating means in the form of a rheostat switch whereby the current flow may be regulated or discontinued.

Again, it may happen that after the desired illumination has been attained by rheostat regulation, it becomes necessary to use the device as a hand lamp, and that full illumination is preferably available for this purpose; and it is another object of the invention to meet such requirements by providing a press-button switch which is in parallel with the rheostat switch, whereby full current value may be momentarily applied without disturbing the setting of the rheostat.

Further advantages will appear as the detailed description is read in association with the drawing, wherein:

Fig. 1 is a longitudinal central section through the complete device showing its interior construction.

Fig. 2 shows the device in elevation as viewed from the left end of Fig. 1.

Fig. 3 is a transverse section, taken at 3—3 of Fig. 1, through the lens-adjusting means.

Fig. 4 is a diagram of the electric circuits.

In the drawing, a housing 10 is closed at the back end by an integral wall 12, and at the front by the concave reflector 14 which may be secured in the housing in any suitable manner as by soldering or brazing, either of which provides the necessary mechanical, as well as electrical, connection between the parts.

A lamp socket 16 is preferably formed in one piece with the reflector 14, a slot 18 being cut in the well-known manner for the pin 20, thereby providing a bayonet lock for holding the base 22 of the lamp 24 in place in the socket.

An insulating washer 26 carries the contact pin 28 which abuts the inner terminal 30 of the lamp 24, the outer terminal 22 being in contact with the grounded socket 16. A coil spring 34 urges the washer 26 forwardly and thereby compels contact of the pin 28 with the terminal 30.

A rheostat 35 (see Fig. 4) has a blade 38 which may be moved over the coil 40 to introduce more or less resistance into the lamp circuit to vary the volume of current. An "off" point 42 is provided whereby the circuit through the lamp may be opened. A knurled knob 44 on the underside of the housing 10 (see Fig. 1) may be turned to move the blade 38 to regulate the current or shut it off, as may be desired.

A press-button switch 46 is carried on the inner wall of the housing 10 and comprises three insulating strips 48, 50, and 52 interspaced with

two conductive blades 54 and 56, the whole being held to the housing 10 by rivets 58. Rivets 58 may have air-space insulation through the blades, as in common practice. An insulated press button 60 extends through the wall of the housing 10 for flexing the upper blade 54 and thereby bringing its contact surface into engagement with the contact surface of the blade 56.

A two-conductor lamp cord 62 enters the housing 10 through the grommet 64, one conductor 66 being grounded to the housing by a rivet 68, and the other conductor 70 being provided with two branches, one of which is connected to the flexible blade 54 of the press-button switch 46 and the other to the binding post 72 of the rheostat 35. The other blade 56 of the press-button switch and the other binding post 74 of the rheostat are connected to the inner lamp terminal 30 by conductors 76 and 78.

The adjustable lens carrier consists of a sleeve 80 which is slidable axially over the front end of the housing 10. A lens 82 is supported in the sleeve 80 between two spring snap rings 84 which are sprung into internal grooves in the sleeve. The lens is located considerably back from the front edge of the sleeve to provide a shield 85 for stray rays. A screw stud 86 and a knurled thumb screw 88 (see Fig. 3) extend through elongated slots 90 in the sleeve 80 and into threaded holes in the housing 10. The knurled thumb screw 88 is shouldered against the outer surface of the sleeve whereby tightening of the thumb screw holds the sleeve against axial movement with respect to the housing. The screw stud 86 is preferably shouldered against the housing. By loosening the thumb screw 88, the sleeve 80 may be adjusted forwardly until its front edge is on the broken line 92.

The swiveling base for mounting the lamp comprises a hub 94 closely fitted between two ribs 96 which project downwardly from the underside of the housing 10, the ribs having a rectangular opening therethrough to clear the rheostat adjusting knob 44. A knurled thumb nut 98 screws on to the threaded end of a screw 102 to draw the ribs 96 together and thereby clamps the hub 94 in any position to which the hub may be turned.

A round stem 104 depends from the underside of the hub 94 and is rotatable in the hub 106 of the base 108. A U-shaped spring 110 is laid in opposite axially parallel grooves on the inside of the hub 106, the free ends of the U being bent outwardly and extended through small transverse holes in the hub at 112. The spring 110 is under considerable inward tension so as to exert a binding action on the stem 104 to hold it from rotation except against substantial effort.

It will be seen that by arranging the device as herein described it may be quickly and easily adapted to a number of different uses, for instance, in the condition in which it is shown in the drawing, it may be used as a floodlight, the lens being in the extreme retracted position, that is, in the position nearest the lamp 24, the swivel joint 94, 98 adjusted to and held in a selected position, and the rheostat 35 adjusted to the desired light value.

If the need for a hand lamp arises, the stem 104 may be withdrawn from the hub 106, and, without disturbing the lens, swivel, or rheostat adjustments, the button 60 may be pressed to give full light value, spread over a considerable area at close range.

If thereafter a spotlight, for directing a concentrated beam at a distant point, is needed, the only necessary change in adjustment may be had by loosening the thumb screw 88 and moving the sleeve 85 to a selected extended position and again tightening the thumb screw.

Believing that, by a unique arrangement of several old elements, a new and useful result has been achieved, we claim:

The combination, in a utility lamp of the character described, of a housing, a concave mirror reflector at one end of said housing, an electric lamp having its filament positioned on the principal axis of said reflector, a lens adjacent said reflector, the principal axis of said lens and said reflector being coincident, and the lens and reflector being adjustable axially with respect to each other, means to retain the lens in the selected adjusted position, an electric current source, conductive means including a rheostat having an open position, but manually adjustable to restrict current flowing from said source to said lamp to a selected value, a second conductive means including a switch biased to open position but manually closable for conveying full value current from said source to said lamp, both rheostat and switch being supported on the inner wall of said housing and having the said manual means extending through the wall of said housing.

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