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ILLUMINATING UNIT

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Fig. 1.

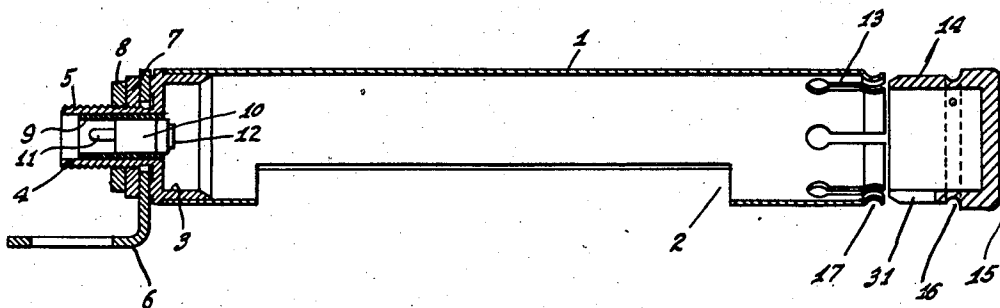


Fig. 2.

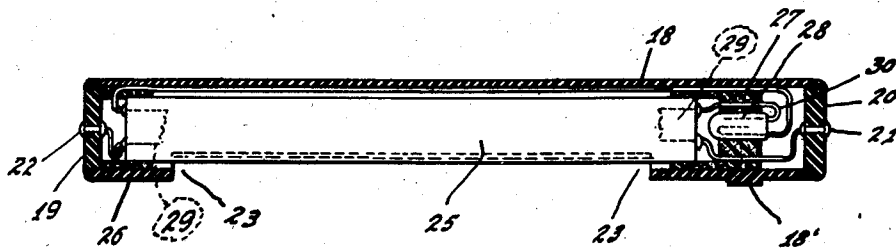
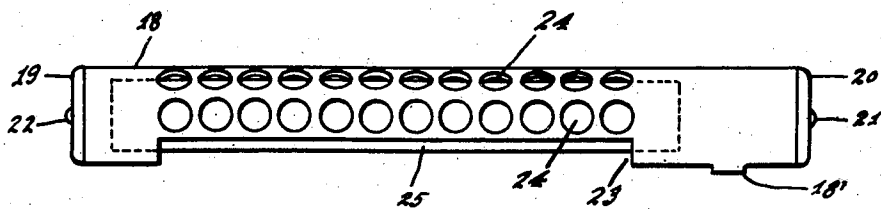


Fig. 3.



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ILLUMINATING UNIT

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404,145, now Patent No. 2,337,745, dated De-
cember 28, 1943. Divided and this application
September 24, 1943, Serial No. 503,615

6 Claims. (Cl. 176-122)

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The present invention relates to improvements in illuminating units.

More particularly, the invention relates to a type of lamp unit for emitting what has been commercially designated as a "black" light.

In certain types of illumination as, for instance, in cockpit illumination of airplanes and the like, it is desirable and in numerous instances essential, that while the instruments be visible to the pilot, there be present in the cockpit no apparent source of light. It has been found that light rays which would ordinarily not only illuminate the instruments but also illuminate the cockpit, have a tendency to distort the pilot's vision during night flying and after he has been looking into darkness ahead for a considerable length of time. As a result of this condition, there has been developed a so-called "black" light through the medium of which the instrument indicators, which have been colored with a fluorescent material, may be illuminated by ultra-violet or near ultra-violet rays developed by a lamp which ultra-violet or near ultra-violet rays are not visible to the eye.

The present invention relates to a lamp unit having the above characteristics.

It has for one of its objects that of providing a compact lamp unit capable of emitting ultra-violet or near ultra-violet rays and capable of being made in connection with means for controlling the intensity of these rays.

For the purpose of disclosing the invention, certain embodiments thereof are illustrated in the accompanying drawings, in which

Fig. 1 is a longitudinal section of a casing which may be used in connection with my invention.

Fig. 2 is a longitudinal sectional view of the lamp unit embodying my invention.

Fig. 3 is a side elevation of the unit shown in section in Fig. 2.

Referring to the casing structure illustrated in Fig. 1, there is provided a tubular casing 1 which may be formed of metal, preferably of aluminum, for lightness. This tubular casing 1 is provided on one side with a cutout section or opening 2 which provides a view opening in the casing. Mounted within the casing 1, at one end, is a hollow plug 3 which telescopes the end of the casing and makes a snug fit therein. This plug

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is provided with a hollow stem 4 screwthreaded on its exterior as at 5 to receive a supporting bracket 6 and the clamping screws 7 and 8 for maintaining the bracket in position. The interior of the stem 4 is provided with an insulating bushing 9 and within this bushing is fitted a contact plug 10 having a spring contact 11 capable of making engagement with the conducting wire and provided at its opposite end with a contact 12. The opposite end of the casing 1 is split longitudinally as at 13 to provide a series of spring fingers adapted to surround the cylindrical portion 14 of a rotatable cap having a closed end 15. This cap is provided with an annular groove 16 capable of receiving an annular bead 17 in the spring fingers formed at the end of the casing whereby when the cap is telescoped in position, it will be held against longitudinal displacement while permitting rotation thereof.

The unitary illuminating unit is mounted within the above described casing. This unit comprises a shell 18 which may be formed of insulating material and has its ends closed by end caps 19 and 20. Contact studs 21 and 22 extend through these end caps, the stud 22 being adapted to contact the contact 12 and the stud 21 being adapted to make electrical contact with the interior of the closure cap rotatably mounted on the casing, which casing may be grounded. This tubular shell likewise is provided with an elongated slot or view opening 23 in one portion thereof and with a series of view openings 24-24 gradually diminishing in size.

Mounted within the shell 18 is a lamp comprising a bulb 25 with insulating end sleeves 26 and 27 and mounted within the end sleeve 27 is a starting switch 28. This lamp bulb 25 is of the fluorescent tube type. The glass of the bulb, however, may be formed of material which, while permitting the passage there through of ultra-violet or near ultra-violet rays is impervious to the passage of visible light rays.

If desired, the interior of the glass bulb may be coated with a fluorescent material capable of regenerating the ultra-violet rays developed by the lamp and converting these ultra-violet rays into visible and near ultra-violet rays which near ultra-violet rays are invisible to the eye. However, due to the characteristic of the glass of

which the bulb is formed the near ultra-violet rays will be passed therethrough. The lamp bulb contains the usual quantity of mercury and the usual heaters 29—29 for heating or ionizing the mercury for the provision of a mercury arc to develop the ultra-violet rays. At each end of the lamp bulb, there is provided a pair of contacts, one of which at one end is connected with the contact 21 and the other of which, at the same end, is connected through a suitable conductor 30 with one terminal of the starting switch. The opposite terminal of this starting switch is connected to one contact, at the opposite end of the bulb, and the other contact at the same end is connected to the terminal 22.

This bulb, as is illustrated in Fig. 2, is mounted within and rotatable with the shell 18 which is preferably formed of material impervious to the passage of any light rays. This shell is provided with a lug 18' adapted to fit within an elongated slot 31 in the sleeve portion 14 of the cap so that the entire casing is capable of rotation with this cap. The contact 21, as before stated, makes contact with the cap and through the cap and casing 1 is grounded for the completion of the lamp circuit.

The above described illuminating unit thus provides a compact self-contained unitary structure which may be inserted in the casing shown in Fig. 1 and which may be quickly and easily replaced when worn out. It is obvious that when the slot 23 in the casing 18 coincides with the slot 2 in the casing 1, a maximum passage of the near ultra-violet rays developed by the lamp is permitted. For changing the intensity of the rays emitted by the lamp, the casing 18 may be rotated through the medium of the rotatable cap to cause the openings 24, of various sizes, to coincide with the slot 2 in the casing to thereby permit the passage of light rays of various intensity. I have heretofore referred to ultra-violet and near ultraviolet rays and it will be understood that where I have used the term "ultraviolet," in certain of the appended claims, such a term comprehends the near ultraviolet rays as well.

This application is a division of my co-pending application, Serial No. 404,145, filed July 26, 1941 eventuating in United States Letters Patent No. 2,337,745, dated December 28, 1943.

I claim:

1. An illuminating unit comprising in a self-contained unitary structure, an elongated open ended shell impervious to the passage of light and having a plurality of openings in the walls thereof extending longitudinally thereof and varying in size circumferentially thereof, an insulating cap at each end of said shell closing said open ends, a contact terminal mounted in each of said caps and a fluorescent lamp bulb mounted within said shell in fixed relationship therewith and having contact terminals at its opposite ends connected with the contact terminals in said end caps, said bulb and its contacts being wholly mounted within and enclosed by said shell.

2. An illuminating unit comprising in a self-contained unitary structure, an elongated open ended shell impervious to the passage of light and having an opening in the wall thereof extending longitudinally thereof, an insulating cap at each end of said shell closing said open ends, a contact terminal mounted in each of said caps, a fluorescent lamp bulb impervious to the passage of visible light rays mounted within said shell in fixed relationship therewith and having

contact terminals at its opposite ends connected with the contact terminals of said caps, said bulb and its contacts being wholly mounted within and enclosed by said shell.

3. An illuminating unit comprising in a self-contained unitary structure, an elongated open ended shell impervious to the passage of light and having a plurality of openings in the wall thereof extending longitudinally thereof and varying in size circumferentially, an insulating cap at each end of said shell closing said open ends, a contact terminal mounted in each of said caps and a fluorescent lamp bulb capable of transmitting ultra-violet light only mounted within said shell in fixed relationship therewith and having contact terminals at its opposite ends connected with the contact terminals in said caps, said bulb and its contacts being wholly mounted within and enclosed by said shell.

4. An illuminating unit comprising in a self-contained unitary structure, an elongated open ended shell impervious to the passage of light having an elongated opening in the wall thereof extending longitudinally thereof, an insulating cap at each end of said shell closing said open ends, a contact terminal mounted in each of said caps, a fluorescent lamp bulb mounted within said shell in fixed relationship therewith and having a contact terminal at its opposite ends connected with the contact terminals in said end caps and a starting switch for the lamp of said bulb mounted within said shell and operably connected with said lamp, said bulb and its contacts being wholly mounted within and enclosed by said shell.

5. An illuminating unit comprising in a self-contained unitary structure, an elongated open ended shell impervious to the passage of light having a plurality of openings in the wall thereof extending longitudinally thereof and varying in size circumferentially, an insulating cap at each end of said shell, a contact terminal mounted in each of said caps, a fluorescent lamp bulb mounted within said shell in fixed relationship therewith and having contact terminals at its opposite ends connected with the contact terminals in said caps and a starting switch for the lamp of said bulb mounted within said shell and operably connected to said lamp, said bulb and its contacts being wholly mounted within and enclosed by said shell.

6. An illuminating unit comprising in a self-contained unitary structure, an elongated open ended shell impervious to the passage of light, a portion of said shell being open longitudinally thereof, an insulating cap at the end of each end of said shell closing said open ends, a contact terminal mounted in each of said caps, a fluorescent lamp bulb mounted within said shell in fixed relationship therewith and having a pair of contact terminals at each end, one of each of said pair being connected to the contact terminals in said caps, an insulating cup receiving one end of said lamp bulb and a starting switch for said lamp bulb mounted in the bottom of said cup and having a pair of contacts, one of which is connected to one of the pair of contacts at one end of said bulb and the other of which is connected to one of the pair of contacts at the opposite end of said bulb, said bulb and starting switch being wholly mounted within and enclosed by said shell.

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