

June 6, 1944.

R. I. JOHNS

2,350,462

PORTABLE LAMP

Filed Oct. 9, 1942

2 Sheets-Sheet 1

Fig. 1.

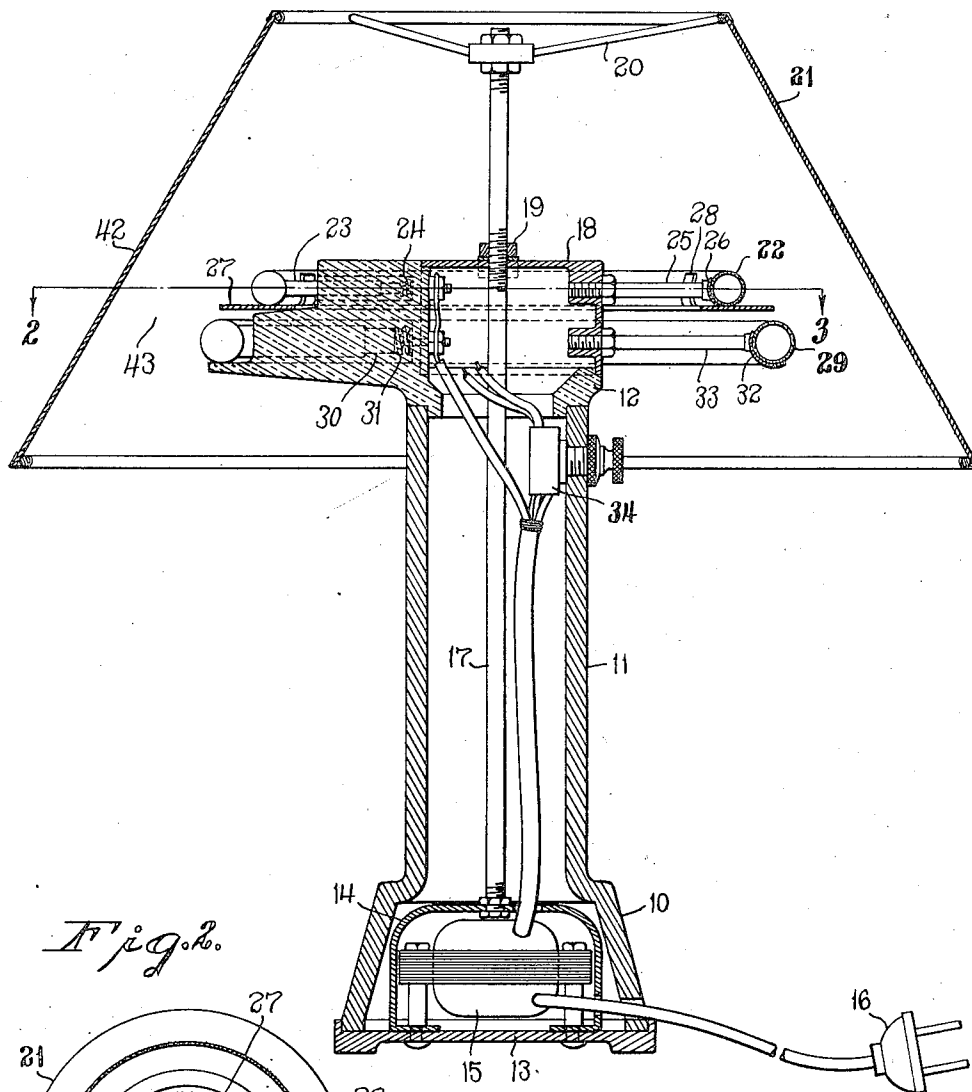
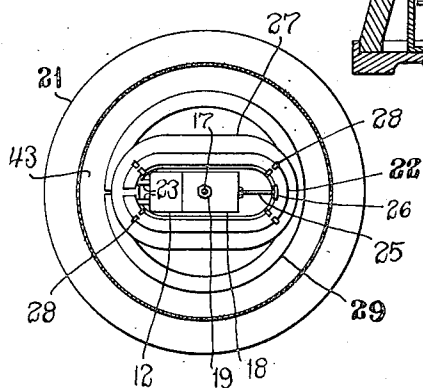


Fig. 2.



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2 Sheets-Sheet 2

Fig. 3.

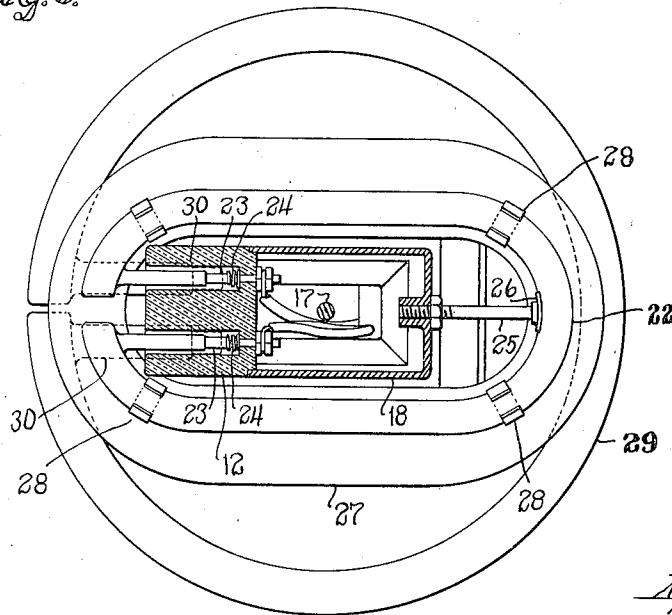


Fig. 5.

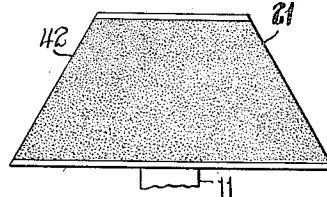


Fig. 4.

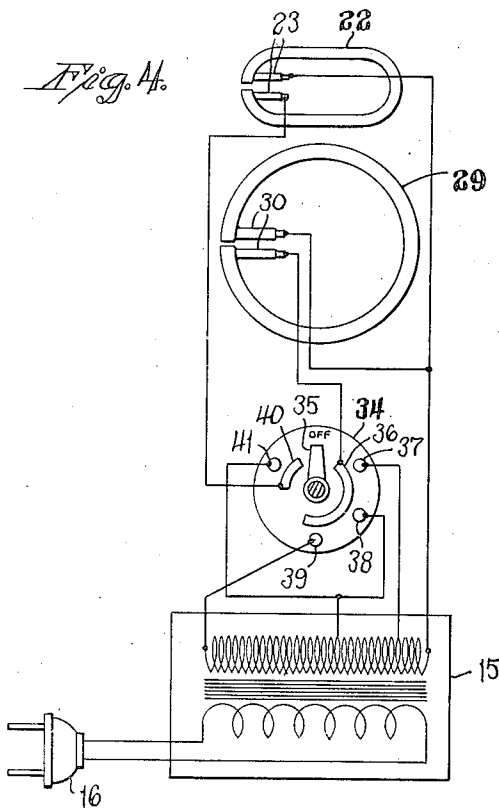


Fig. 6.

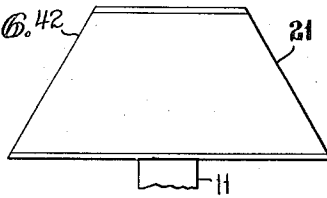
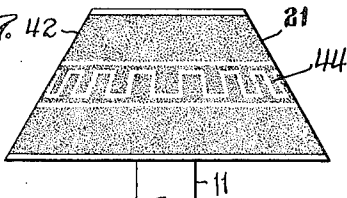


Fig. 7.



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UNITED STATES PATENT OFFICE

2,350,462

PORTABLE LAMP

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Application October 9, 1942, Serial No. 461,371

2 Claims. (Cl. 240—81)

This invention relates to improvements in portable lamps.

One object of this invention is to provide an improved portable combined germicidal and reading lamp with a visible light source and an ultraviolet light source and a shade surrounding and spaced from the light sources and providing an annular upwardly-extending convection-channel for the passage of air upward to be sterilized by the ultraviolet light.

Another object of this invention is to provide an improved portable combined germicidal and reading lamp in which the shade has fluorescent material adapted to fluoresce when ultraviolet light impinges upon it.

Another object of this invention is to provide an improved portable germicidal lamp having an annular convection-channel surrounding an ultraviolet light.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art.

In the accompanying drawings, forming part of the present disclosure, in which one way of carrying out the invention is shown for illustrative purposes:

Fig. 1 is a vertical central sectional view, with parts in elevation, illustrating one embodiment of the invention;

Fig. 2 is a sectional view on a reduced scale on line 2—3 of Fig. 1 with most of the parts shown in elevation;

Fig. 3 is a sectional view on line 2—3 of Fig. 1 with the shade omitted;

Fig. 4 is a schematic view illustrating the electrical connections; and

Figs. 5, 6 and 7 are side elevations of the upper portion of the lamp with the shade of the respective figures illustrating the lamp under different conditions of light.

In the description and claims, the various parts and steps are identified by specific terms for convenience, but they are intended to be as generic in their application as the prior art will permit.

Referring to the drawings showing the particular form of the invention chosen for illustration, the hollow base 10 of the portable lamp has a tubular support or standard 11 extending upwardly from the base and having mounted on its upper end a head or block 12 of porcelain or other material if properly insulated.

Mounted on the base-plate 13 is a frame 14

and a transformer 15 conducted to a plug-connector 16. A rod 17 is secured to the frame 14 and extends upwardly through the hollow standard 11 and clamps the head 12 onto the top of the standard 11 by means of a clamp-plate 18 and nut 19, the rod 17 extending upwardly further and having secured at its upper end, a frame 20 carrying a shade 21.

A tubular ultraviolet-light lighting-ring 22 of annular or ring-like form has terminals 23 pressed against electric spring-contacts 24 by means of an arm 25 which has a shoulder-member 26 on its end which both supports the right end of the ring 22 and holds it pushed to the right against the action of the spring-contacts 24. A flat ring-like shield 27 of cellulose acetate, glass or other suitable material which is substantially impervious to ultraviolet light, is connected on the underside of the lighting-ring 22 by spring-clips 28. Instead of employing a shield 27, the lighting-ring 22 could have a portion of its outer surface coated with plastic or other suitable material to prevent the passage of ultraviolet light down through the lower opening through the shade 21 in order that there may be little or no risk of ultraviolet light being reflected from a surface on which the lamp stands and into the eyes of any person near the lamp.

A tubular visible-light lighting-ring 29 of annular or ring-like form has a pair of terminals 30 urged against spring electric contacts 31 by means of a supporting-shoulder or -member 32 on a rod 33 secured to the block 12.

In the particular construction illustrated in the drawings, the visible-light lighting-ring 29 can be given any desired one of three light intensities or the ultraviolet-light lighting-ring 22 can be activated, by means of any suitable switch 34.

Thus, for example, by rotating the switch-member 35 of the switch 34 to close the circuit through contacts 36 and 37, the visible-light lighting-ring 29 can be activated by low-intensity light such for example as seven and a half watts power. By further rotating the switch-member 35 until the circuit is closed through contacts 36 and 38, a larger amount of power such for example as twenty watts are caused to pass through the lighting-ring 29 to thus light it brighter, and by moving the switch-member 35 to cause the circuit to be made through contacts 36 and 39, full lighting power such for example as fifty watts can be passed through the lighting-ring 29 to thus light it to maximum brightness. And

by moving the switch-member 35 to close the circuit through contacts 40 and 41, the ultraviolet-light lighting-ring 22 will be activated.

Preferably, the lighting-ring 29 is of the type of fluorescent tube which has its inside wall coated with any usual or suitable fluorescent material, as is well known to those skilled in the art, the fluorescent material generating visible light from ultraviolet light which is generated by an arc of mercury and argon at low pressure which is sealed in the lighting-ring or tube, which latter preferably is operated as a cold cathode tube without the need of employing any filament to initially heat the mercury.

The shade or housing or shield 21 to be used on the portable lamp, whether a table lamp or floor lamp, will preferably have its shade or shield portion 42 of upwardly-tapered annular form and made of fabric, plastic, glass or any other suitable material. The material used is preferably translucent so as to be illuminated by the visible or optical light-ring 29. This shield or shade portion 42 is preferably stenciled or otherwise treated with fluorescent salts or a compound of the same in a general coating or integral impregnation, or the treatment with fluorescent salts can be laid on in the form of designs, the area of the shield or shade not so covered with fluorescent salts preferably being coated with acetate of cellulose or other material not penetrable by ultraviolet rays, but preferably translucent under optical or visible light. Where the shade is to be made of fabric, for example, instead of treating the non-fluorescent salt area with cellulose acetate or other material not penetrable by ultraviolet rays, the fabric could be a closely-woven fabric of cellulose acetate strands or other strands not penetrable by ultraviolet rays. The shade 21 surrounds and is spaced from the light sources 22 and 29 and thereby provides an annular convection-channel 43 for the passage of air upward between the ultraviolet-light source 22 and the main portion 42 of the shade 21.

Fig. 5 illustrates a side view of the shade when both of the light sources 22 or 29 are turned off, the stippling indicating that the shade is dark. When it is desired to use the lamp as a reading lamp or decorative lamp, the switch-member 35 will be turned to supply current to the optical light-tube 29 whereupon the lamp will be lighted up with the shade portion 42 all lighted up as shown by the absence of stippling from Fig. 6. When it is desired to utilize the lamp solely as a germicidal lamp or a decorative lamp, or for its combined decorative and germicidal effect, the switch-member 35 is turned to turn on the ultraviolet ray tube 22, whereupon the ultraviolet rays impinging upon the fluorescent salts such, for example, as indicated by the unstippled portion 44 on the shade portion 42 in Fig. 7, cause the decorative design formed by the fluorescent salts to appear brilliantly illuminated through the shade while the remainder of the portion of the shade 42 appears dark as is indicated by the stippled portion.

If desired, such suitable fluorescent salts can be applied to produce the design 44 of the shade-portion 42, or even the whole fabric portion 42 of the shade, so that although the shade-portion 42, for example, may be made of one color of cloth such, for example, as yellow, when the fluorescent salts are activated by the ultraviolet light, the fluorescent salts can, for example, cause the shade or that portion of the shade carrying the illuminated salts to have a pink or other desired

color. The particular colors referred to are merely used for illustrative purposes.

Thus, there is provided a lamp which can be made to yield polychromatic color effects. And where only a portion of the shield or shade is treated with fluorescent salts, since the other portion of the shade remains relatively dark, the portion treated with fluorescent salts will appear as cut-outs. Nevertheless, since the dark areas will preferably be treated to render them impenetrable to ultraviolet rays, they will prevent passage through the shield or shade of the ultraviolet rays so as to prevent possible injury to the eyes of persons in the vicinity. Thus, the shield or shade can be made polychromatic and preventive of injury to the eyes.

The top of the shield may be left open, or could be provided with a shield to substantially close the upper space except for air vents, as desired. But this will ordinarily not be needed where the shade is sufficiently high to prevent passage of ultraviolet rays to a person nearby.

In order that the ultraviolet rays produced by the light source 22 may have a maximum germicidal or sterilizing effect upon air to be treated by the lamp, it is preferable to use an ultraviolet ray source which will produce a considerable portion of ultraviolet rays or wave lengths as near as practical to twenty-six hundred and fifty angstroms, this being accomplishable in practice by means of an ultraviolet-light tube employing mercury which produces a considerable proportion of radiation of wave lengths twenty-five hundred and thirty-seven angstroms which has very high germicidal or bactericidal effectiveness. When the ultraviolet ray tube 22 is turned on, not only does it develop a substantial temperature, but also the transformer 15 in the base-portion of the lamp also develops heat. Thus, each of these heats the air in the vicinity causing an annular column of air to pass up through the annular space or convection-channel 43 between the ultraviolet ray tube 22 and the shade 42 in sufficiently-close proximity to the ultraviolet ray source 22 to effectively accomplish sterilization of the air of the room where the lamp is placed, since the convection current of air continuously passes upwardly through the annular convection-channel so that in time substantially all the air in the room will have received germicidal treatment.

Thus, the shield or shade can be made highly decorative, and also cooperates in accomplishing the sterilization of the air of a room, and also can function as a shade of an ordinary reading lamp. The term "reading lamp" is used in the claims for convenience, but is intended to be broad enough to include a lamp used for ornamental or decorative effect. The ultraviolet ray light itself performs the two functions of activating the fluorescent salts in the treated shade to accomplish a decorative effect and at the same time sterilizes the air.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiment is, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. A portable combined germicidal and reading lamp including: a visible-light source; a

germicidal ultraviolet-light source; switch-means for selectively lighting either of said light sources; and a shade surrounding and spaced from said light sources and forming the outer wall of an annular upwardly-extending convection-channel for the passage of air upward between said ultraviolet-light source and said shade, said shade substantially preventing the passage of germicidal ultraviolet rays there-
through and having fluorescent material adapted to fluoresce when ultraviolet light impinges upon it, the light from said fluorescent material being visible from the outside of said shade.

2. A portable combined germicidal and reading lamp including: a supporting-standard having a head on the upper end thereof; a hori-

zontal visible-light ring-like tube mounted on said head; a horizontal germicidal ultraviolet-light ring-like tube mounted on said head; electrical connections from said standard to said light tubes; switch-means for selectively lighting either of said light tubes; a shade-support rising from said head; and a shade on said shade-support and substantially preventing the passage of germicidal ultraviolet rays therethrough and surrounding and spaced from said light tubes and forming the outer wall of an annular upwardly-extending convection-channel for the passage of air upward between said ultraviolet light tube and said shade.

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