July 22, 1947. H. W. ALEXANDER ET AL 2,424,531

REFLECTOR

Filed Feb. 3, 1944 2 Sheets-Sheet 1

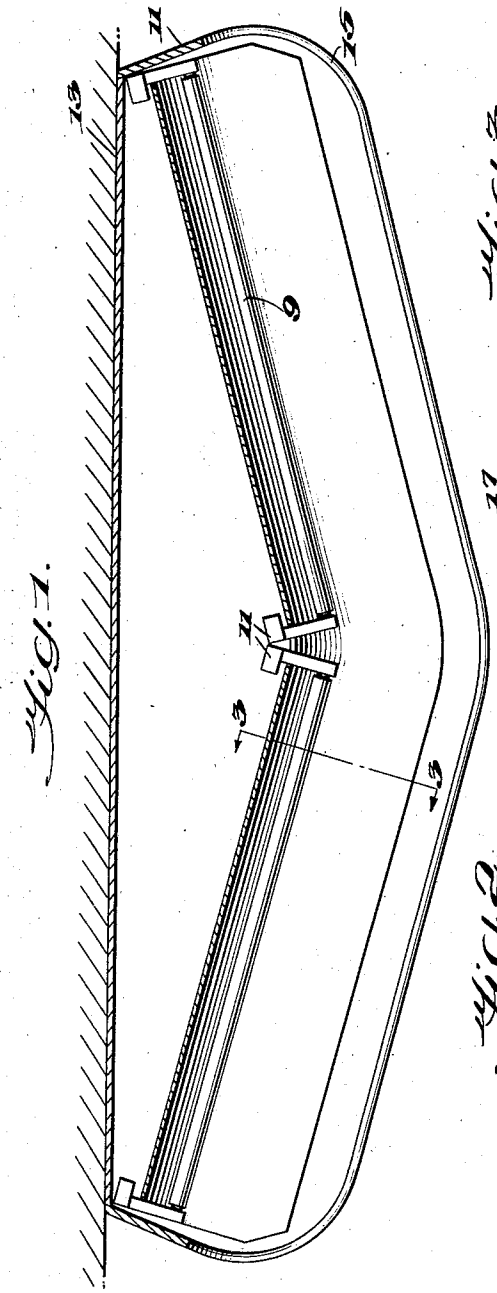


Fig. 1.

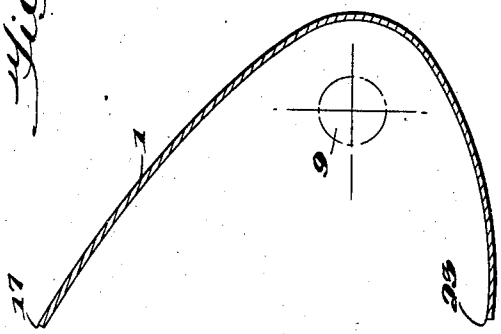


Fig. 3.

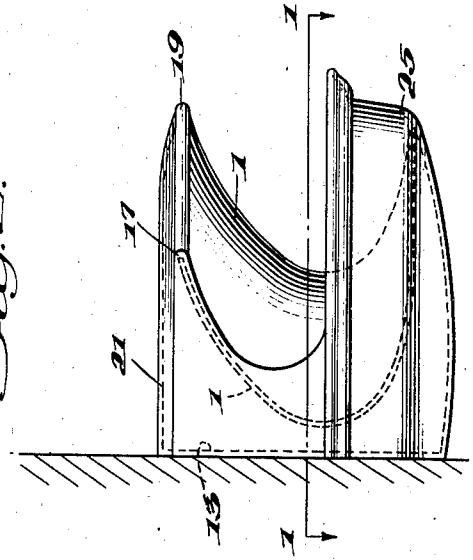


Fig. 2.

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Filed Feb. 3, 1944 2 Sheets-Sheet 2

Fig. 4.

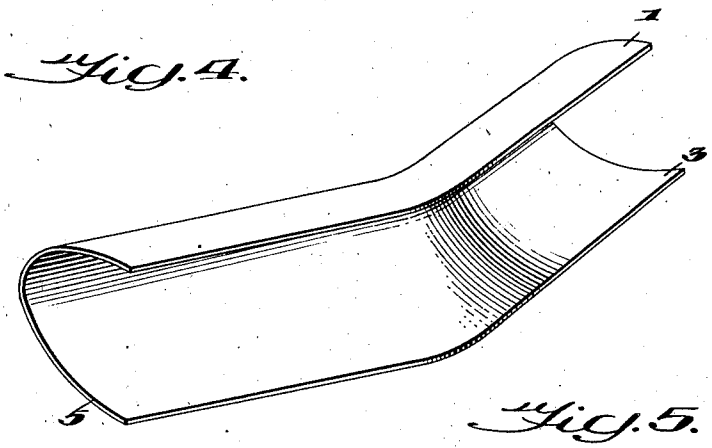
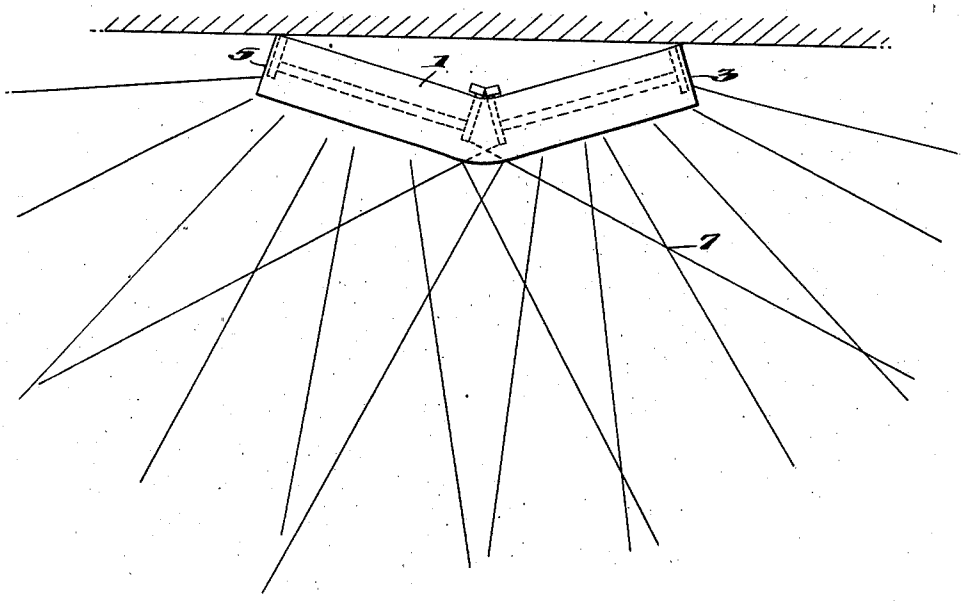


Fig. 5.



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2,424,531

REFLECTOR

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Application February 3, 1944, Serial No. 520,953

2 Claims. (Cl. 240—41.37)

1

This invention relates to a radiation projector, and more particularly to a novel form of reflector whereby a substantially flat horizontal beam of radiations produced by tubular fluorescent or ultra violet generators may be projected outwardly throughout an angle of 160° to 180°.

An object of the invention is to provide a light ray reflector retained within a casing or housing in which at least two tubular light ray generators are positioned to give a light ray spread or fan-shaped beam in the major plane of the reflector to cover a wide area without substantial depth or thickness and with a minimum of stray radiations.

Another object of the invention is to construct such a radiation projector in which two tubular generators may be mounted in approximately end to end relation and in adjacent but spaced relation to the point of inflection of an elongated parabolic reflector of anticlastic form. The reflector per se is preferably fabricated from a continuous longitudinal trough-like strip bent into anticlastic form having an approximately fifteen degree angle convex curvature adjoining the opposite curvatured outwardly extending portions and with the concavity of the perpendicular section being of generally unsymmetrical parabolic form.

A still further object is the present construction of this novel anticlastic form of reflector for use with ultra violet germicidal lamps whereby the lamps and associated reflector and housing may be positioned on a vertical wall and adapted to project a horizontal, substantially flat fan-shaped beam of ultra violet light of lethal intensity across a room, such as a hospital operating room, school classroom or the like.

In the drawings:

Fig. 1 is a horizontal section taken on line 1—1 of Fig. 2 and showing the relationship of the anticlastic form of reflector with its associated tubular light generators and housing;

Fig. 2 is a side elevation showing details of the reflector casing or housing and the position of the reflector within the housing;

Fig. 3 is a transverse cross-section taken on line 3—3 of Fig. 1, showing the generally unsymmetrical parabolic reflector and the spaced relation of the generator tube to the point of inflection of the reflector;

Fig. 4 is a perspective view of the anticlastic form of reflector per se; and

Fig. 5 is a plan view illustrating the angulated generator tube housing mounted on a vertical wall with indications illustrating the spread of the horizontal fan-shaped beam therefrom.

2

In general, the present invention is an improvement over the light ray projector disclosed and claimed in the application of Horace W. Alexander, Serial No. 434,597, filed March 13, 1942, now Patent 2,350,664, issued June 6, 1944. This prior reflector has particular advantage in projecting a substantially flat horizontal beam of light across a space whereby a lethal ultra violet light beam is generated through which virile bacteria cannot penetrate. At the present time the use of ultra violet generators for sterilizing large areas has come into considerable use and is well recognized by the medical profession, as shown in the patent to Fair et al., 2,198,867, issued April 30, 1940. The Horace W. Alexander application Serial No. 434,597, filed March 13, 1942, now Patent 2,350,664, issued June 6, 1944, and its divisional application, Serial No. 480,692, filed March 26, 1943, now Patent 2,350,665, issued June 6, 1944, disclose and claim an ultra violet germicidal method and reflector whereby the radiations from an ultra violet tubular generator are projected in a flat fan-shaped beam, but the spread or angle of the beam produced by the prior Alexander apparatus is limited and covers approximately 80° or 90°. The present construction, however, due to its angulated, or more properly, anticlastic form, provides a single unit in which the desired fan-like beam of lethal ultra violet radiations or light are projected and spread over approximately 180°. This important advantage is accomplished by forming the reflector per se, 1, shown in Fig. 4, of generally anticlastic form, that is, providing a reflector having opposite curvatures, at a given point curved convexly along a longitudinal plane section and concavely along the perpendicular section. Preferably the angle of curvature between the oppositely extending curved portions 3 and 5 is approximately a fifteen degree deviation from a straight line drawn between the ends 3 and 5. A reflector of anticlastic form having this deviation will produce a fan-shaped beam of light rays covering approximately 160° to 180°, as indicated by the outwardly extended radiation lines 7 shown in Fig. 5.

The reflector 1 may be made from any suitable material, such as a strip of metal, having a polished surface or a surface coated with some suitable reflecting material. In forming the elongated parabolic reflector of anticlastic form, the concavity of the perpendicular section thereof is adapted to assume an unsymmetrical parabolic shape with the tubular light sources 9 mounted in end to end relation and held in sockets 11 so

positioned that the axes of the generator tubes 9 are in spaced relation to the point of inflection of the unsymmetrical parabola thereof. The reflector 1 with its associated light or ultra violet generators 9 is completely mounted within an elongated casing or housing 11. This housing is provided with a flat back wall 13 and a continuous side and front wall 15, which is bent or angulated in such a manner as to encompass the anticlastic form of reflector. The casing has an open front as shown in Fig. 2 and preferably, though not necessarily the upper outwardly extending edge 17 of the reflector, which is inclined upwardly to a marked degree, is retained by a bead 19 formed on the top or cover plate 21 of the housing. The horizontally extending lower edge 23 of the reflector 1 is retained within a lower plate or upstanding baffle 25 which extends across the front of the housing and it will be observed that the height of this plate or baffle 25 is such that it prevents radiations from the generators 9 which are projected through the open front wall from diverging downwardly. This is important for the reason that where ultra violet lamps are used their rays are detrimental to human vision, and this front baffle prevents the rays from spreading downwardly to strike the eyes of persons within the space where the apparatus is being used. Thus, this form of casing with the anticlastic shape of reflector projects a substantially flat horizontal beam of lethal intensity outwardly from the projector when it is mounted upon a vertical side wall of a room or space, and the reflector with its plurality of tubes gives a wide spread lethal beam of 160° to 180°.

As before stated the present projector with its anticlastic form of reflector may be used for lighting apparatus, although its prime purpose is for the generation and projection of ultra violet radiations of lethal intensity.

We claim:

1. An ultraviolet projector unit for projecting a horizontal beam of ultraviolet radiation throughout an approximate semicircle for germicidal treatment of air-borne bacteria in the space defined by the beam, comprising a continuous elongated reflector of generally anticlastic form having the cross-sectional shape of an unsymmetrical parabola with a horizontal major axis, tubular ultraviolet generating means mounted within the reflector and uniformly spaced from the point of inflection of the parabolic cross section, and a housing surrounding the reflector, said housing being constructed and arranged to provide a flat wall portion spanning the ends of the reflector on the back thereof, recessed opposite

end portions covering the adjacent ends of the ultraviolet generating means, a top portion extending over the upper edge of the reflector, and an upstanding baffle extending around the lower front portion of the reflector in a position to intercept ultraviolet radiation directed below the horizontal.

2. An ultraviolet projector unit for projecting a horizontal beam of ultraviolet radiation throughout an approximate semicircle for germicidal treatment of air-borne bacteria in the space defined by the beam, comprising a continuous elongated reflector of generally anticlastic form having the cross-sectional shape of an unsymmetrical parabola with a horizontal major axis, the reflector being symmetrical about its point of anticlasticism and having approximately 15° deviation from a straight line connecting its ends, and the lower portion of the reflector adjacent its edge extending in a horizontal direction and the upper portion of the reflector being inclined upwardly to a marked degree, tubular ultraviolet generating means mounted within the reflector and uniformly spaced from the point of inflection of the parabolic cross section, and a housing surrounding the reflector, said housing being constructed and arranged to provide a flat wall portion spanning the ends of the reflector on the back thereof, recessed opposite end portions covering the adjacent ends of the ultraviolet generating means, a top portion having its front edge beaded to receive and retain the upper edge of the reflector, and an upstanding baffle extending around the lower front portion of the reflector in a position to intercept ultraviolet radiation directed below the horizontal.

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