May 2, 1944. D. J. KIELY 2,347,954

AIR STERILIZING APPARATUS

Filed Aug. 13, 1941

Fig. 1.

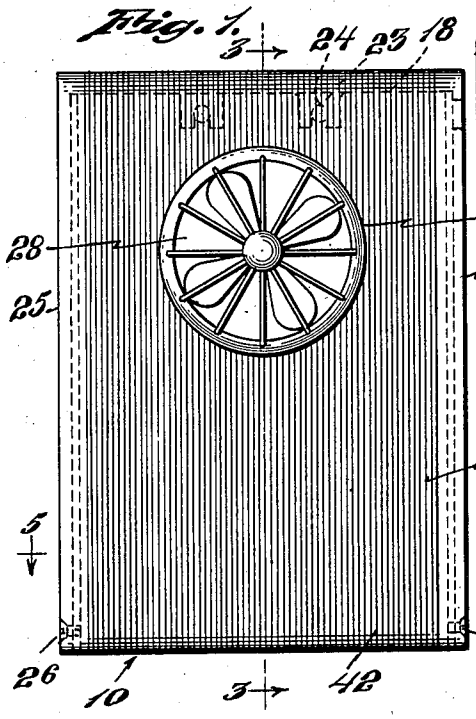


Fig. 2.

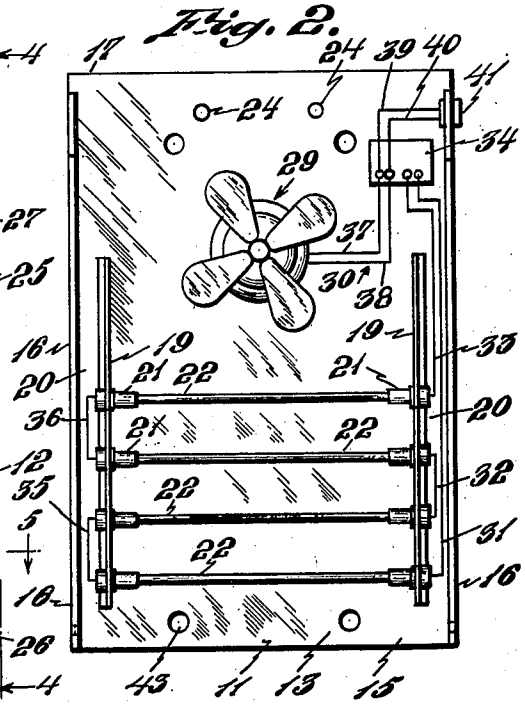


Fig. 3.

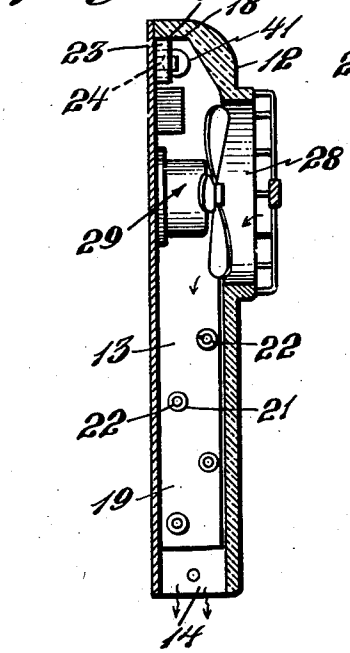


Fig. 4.

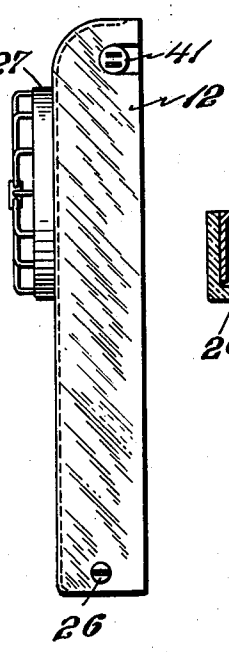
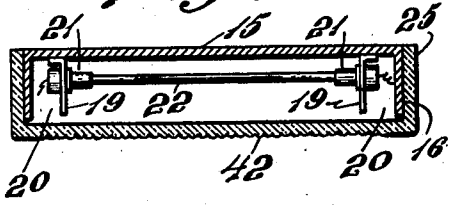


Fig. 5.



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AIR STERILIZING APPARATUS

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Application August 13, 1941, Serial No. 406,663

3 Claims. (Cl. 250—43)

This invention relates to improvements in air sterilizing apparatus, particularly to apparatus for destroying and controlling pathogenic bacteria by bactericidal radiant energy.

In prior apparatus of this character, ultra-violet ray lamps are employed for the bactericidal radiant energy and these lamps usually are supported in fixtures suspended directly above and over the area or zone which it is desired to sterilize. In such prior apparatus persons within the zone of sterilization must usually protect their eyes from the rays of the lamps. This type of apparatus is necessary limited to sterilizing very small areas and suitable for only a particular situation and location.

In other instances in order to destroy pathogenic bacteria ultra-violet ray lamps have been placed in existing structures and the addition of these lamps has enhanced the value of such existing structure which, however, were designed for other purposes, generally of a built in character, requiring considerable labor to install, requiring mutilation of walls, etc., and costly to install.

One object of this invention is to provide an apparatus for the control and extermination of air-borne pathogenic bacteria by bactericidal radiant energy differing from these described in that the apparatus will be a complete unit, entirely self contained; adapted to be permanently or temporarily positioned in place, and in which the bactericidal rays will be substantially shielded to persons in the vicinity thereof.

Another object of the invention is to provide an apparatus of the above character in which a flow of air will be maintained across the bactericidal rays in proportions to obtain the most efficient results.

With these and other objects in view, the invention consists of certain novel features as will be hereinafter more fully described and claimed, and illustrated in the accompanying drawing, in which

Fig. 1 is a front view illustrating my improved apparatus;

Fig. 2 is a view similar to that shown in Fig. 1, with the cover part removed;

Fig. 3 is a sectional view taken substantially on line 3—3 of Fig. 1;

Fig. 4 is a side elevational view of the illustration of Fig. 1 looking towards the same in the direction of the arrows 4—4; and

Fig. 5 is a sectional view taken substantially on line 5—5 of Fig. 1.

According to the present invention, there is provided a complete unit apparatus in the form of a cabinet in which a chamber is provided having a restricted entrance opening and an exit opening. In the chamber of this cabinet there is positioned a bactericidal ray emitting device or devices, in the instant case ultra-violet ray lamps elongated in form and mounted to extend widthwise of the cabinet. An impeller in the form of a motor fan is mounted in the chamber and is controllable as to R. P. M. and is actuated to circulate a stream of air through the chamber about the lamps and out of the exit opening. The velocity of the air through the chamber is controlled so as to provide for the most efficient control of bacteria in accordance to the amount of radiation provided in the chamber. All connecting wires and necessary elements forming the electric circuit for actuating the motor fan and lamps are located within the cabinet and a plug receptacle is located in the electric circuit at a location to be readily connected by the well known electric cord plug connection to the usual house lighting or other active electric circuit. This unit apparatus is self contained and of a dimension to adapt the same to be suspended in position by means of hooks or it may be permanently secured in position by screw bolts passing through openings provided in the rear wall of the cabinet. It is intended that the sterilizing apparatus be placed in private as well as public assembly places in which air sterilization will to a great extent prevent sickness.

Now referring to the drawing for a more detail description of the invention and in which I have illustrated a preferred embodiment of my invention, the numeral 10 designates generally a casing or cabinet having a body portion 11 and a cover 12, providing when in assembled relation a chamber 13 having in the lower end thereof an opening 14. The body portion 11 of this cabinet may be made of a plastic or other suitable material and is substantially U-shape in cross-section providing a rear wall 15 and side walls 16 terminating short of the upper edge 17 of the rear wall 15 providing a support upon which the upper wall 18 of the cover rests.

Suitably attached to the rear wall 15 of the body portion of the cabinet are supports 19 located in spaced relation with each other and with the side walls 16 forming between them and the side walls open channels 20. To these supports 19, mounted in a usual manner are two rows of lamp receiving receptacles 21 in which are received the ultra-violet ray lamps 22, with

the lamps in one row lying in staggered relationship with the lamps in the other row.

The cover part 12 of the cabinet may be made of any suitable material but preferably of a translucent plastic material and is in part supported in position on the body part by spaced lugs 23 depending from the upper wall 18 and engaging pins 24 secured to and extending from the rear wall 15, the side walls 16 and this cover is detachably retained in place by screw bolts 26. The front portion of the cover is provided with an apertured boss 27 near the upper portion thereof and centrally located thereon, providing a restricted opening 28 extending into the chamber 13.

In this opening 28 an impeller is positioned in the present instance in the form of a motor actuated fan generally designated 29 and secured to the rear wall 15. The motor of this fan is of the type that may be regulated as to R. P. M. and may be of any suitable make having this general qualification.

This motor fan 29 and the ultra-violet ray lamps 22 are positioned in an electric circuit generally indicated 30 to be simultaneously actuated and comprises the connecting wires 31—32 and 33 extending in one of the channels 20 and connecting one side of the lamps 22 to a transformer 34 carried by the body portion, and wires 35—36 extending in the opposite channel 20 and connecting the opposite side of the lamps in the circuit. Connecting wires 37—38 extend from the transformer 34 to the motor of the motor fan 29 and connecting wires 39—40 extend from the transformer 34 to a plug receptacle 41 provided in one of the walls 16. Electrical energy may be supplied to the electrical circuit to energize the elements therein by employing the well known flexible electric cord and plug connection. The connection being made through the plug receptacle 41 to any convenient wall plug receptacle of an electrical house circuit. A switch may be interposed in the circuit if desired, however, disconnecting the electric cord plug connection will open the circuit.

The translucent material of the cover will permit observation of the lamps when lit. However, in order to provide for a more definite indication of the proper functioning of the lamps, the outer surface of the cover is arranged to diffuse the rays emitting from the active lamps, in the instant case by ribbing the outer front surface as at 42. This ribbed surface will diffuse the rays over the surface of the cover adjacent the lamps in a manner that can be observed from a considerable distance.

While I have shown four ultra-violet ray lamps, this number of lamps may be increased or decreased to suit varied conditions of installation. Holes 43 are provided in the rear wall 15 through which screw bolts may extend to secure the cabinet in place at the desired location or the cabinet may be suspended from proper supports by means of hooks or the like passing through these openings.

I claim:

1. An air sterilizing apparatus, comprising a cabinet having a chamber therein of greater width than depth and an inlet opening at the upper portion thereof and an outlet opening at the lower end extremity thereof, a plurality of elongated ultra-violet ray lamps in said chamber positioned at a location intermediate said openings and extending widthwise in said chamber and in staggered relation to each other, an impeller in said chamber and regulative means in said chamber for actuating said impeller to circulate a continuous stream of air about said lamps.

2. An air sterilizing apparatus, comprising a cabinet having a chamber therein provided with air inlet and outlet openings therein, a plurality of ultra-violet ray lamps in said chamber positioned at a location intermediate said openings and in staggered relation to each other and with each lamp spaced from the adjacent lamp a distance to be within the overlapping effective bactericidal range thereof, an impeller in said chamber, and means within said chamber for actuating said impeller to circulate a stream of air about said lamps.

3. An air sterilizing apparatus comprising a cabinet having a body part and translucent plastic cover detachably secured to each other providing a chamber therebetween opened at one end and provided with an air inlet at a location spaced from said opening, a bactericidal ray emitting element in said chamber and means within the chamber for circulating a stream of air about said element, said cover having a ribbed surface for diffusing the rays of the lamps transmitted through said cover.

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