

H. H. WALKER AND F. ENOS, JR.

DEODORIZER.

APPLICATION FILED AUG. 27, 1918.

1,323,800.

Patented Dec. 2, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

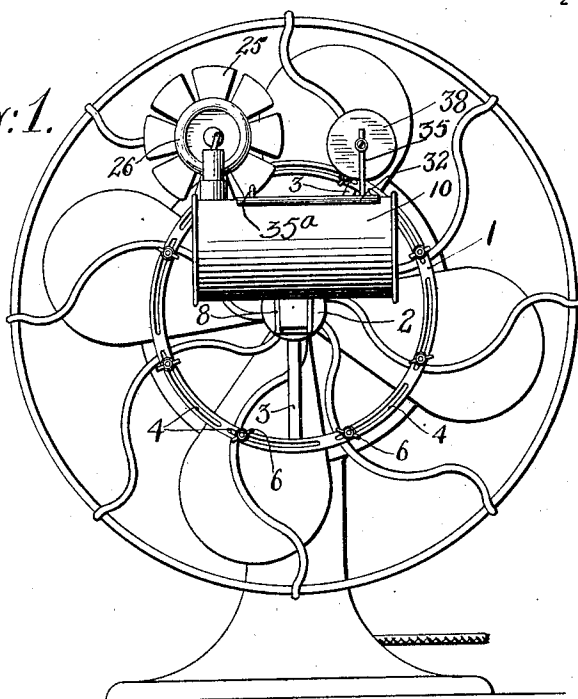
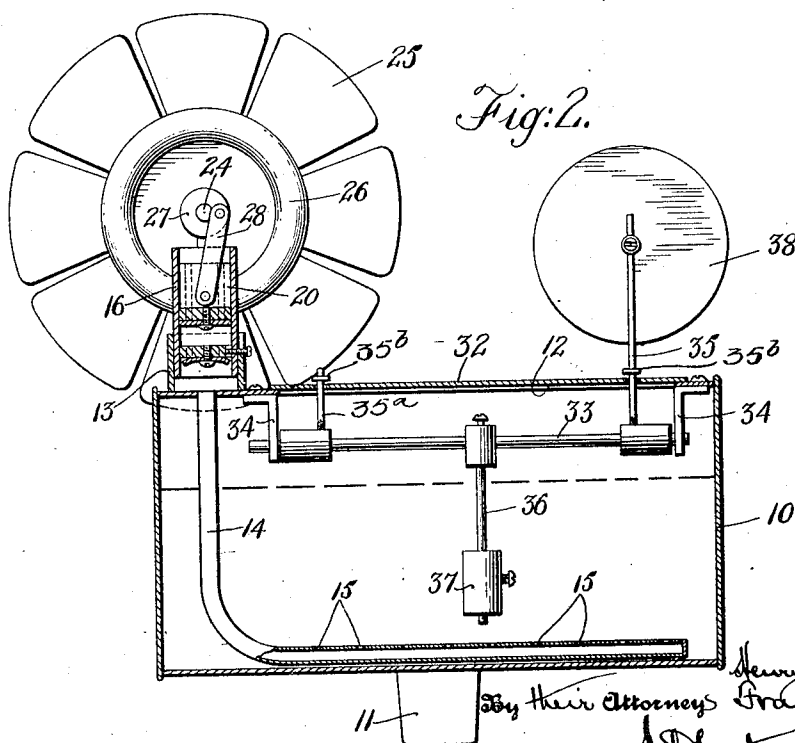


Fig. 2.

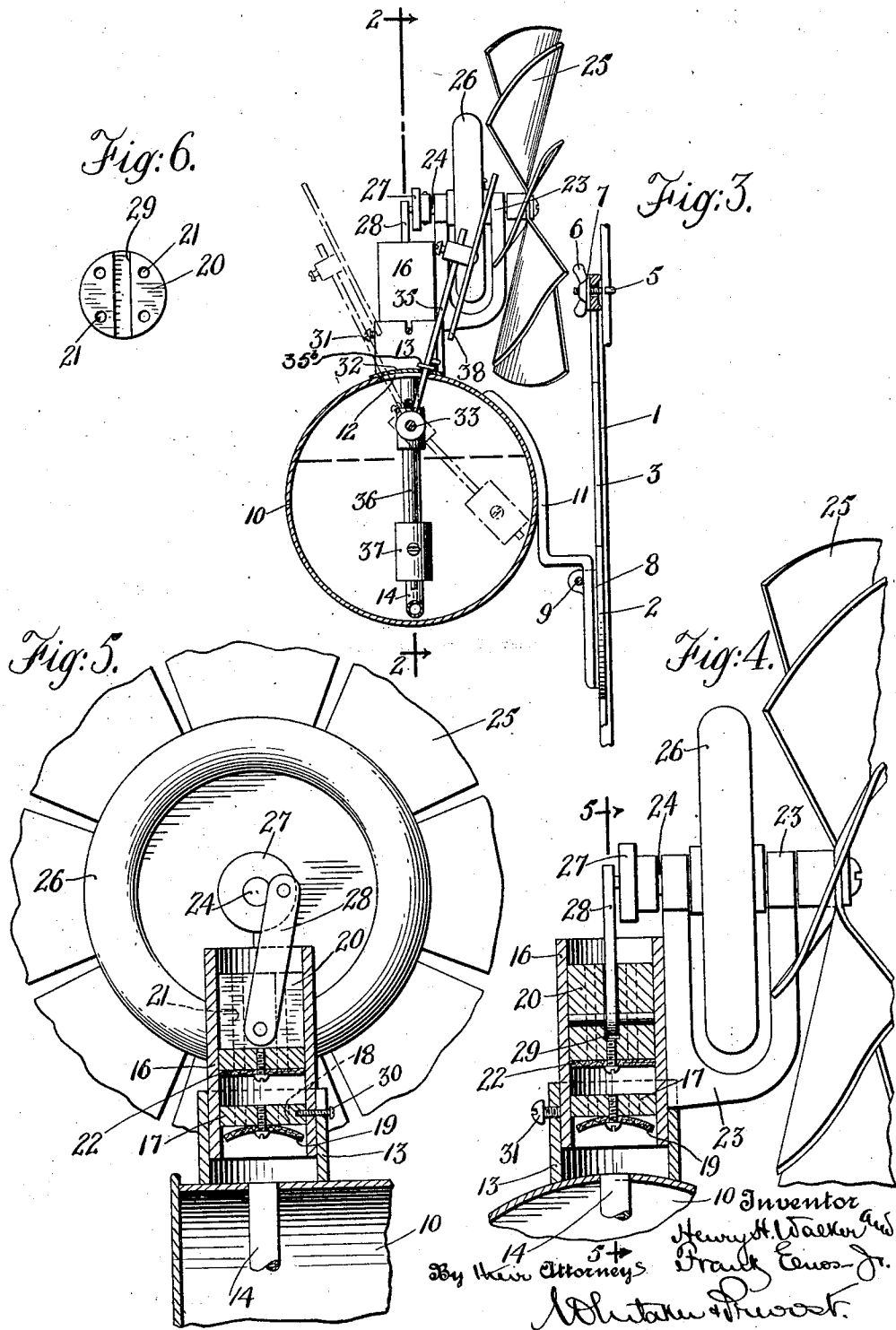


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UNITED STATES PATENT OFFICE.

HENRY H. WALKER, OF NEW LONDON, AND FRANK ENOS, JR., OF NORWICH, CONNECTICUT, ASSIGNORS TO THE NORWICH AUTOMATIC FEEDER COMPANY, OF NEW LONDON, CONNECTICUT, A CORPORATION OF CONNECTICUT.

DEODORIZER.

1,323,800.

Specification of Letters Patent.

Patented Dec. 2, 1919.

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To all whom it may concern:

Be it known that we, HENRY H. WALKER and FRANK ENOS, JR., citizens of the United States, residing, respectively, at New London, in the county of New London and State of Connecticut, and at Norwich, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Deodorizers; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention consists in the novel features hereinafter described, reference being had to the accompanying drawings which illustrate one embodiment of our invention selected by us for purposes of illustration, and said invention is fully disclosed in the following description and claims.

Referring to the said drawings:

Figure 1 represents a front elevation of a ventilating fan of ordinary construction showing our invention applied thereto.

Fig. 2 is an enlarged sectional view of the embodiment of our invention herein shown, on the line 2—2 of Fig. 3, parts being shown in elevation.

Fig. 3 represents a transverse sectional view of the embodiment of our invention showing the attaching plate connected therewith.

Fig. 4 is an enlarged detail sectional view of the air forcing device and its actuating means and the portion of the liquid receptacle adjacent thereto.

Fig. 5 is a sectional view on line 5—5 of Fig. 4.

Fig. 6 is a top plan view of the piston of the air forcing device.

The object of our invention is to provide a deodorizer adapted to be used in connection with a ventilating fan, and especially in auditoriums where moving pictures are displayed, theaters and other places of assemblage, for the purpose of refreshing, purifying, deodorizing and sterilizing the atmosphere of such places of assemblage. The atmosphere of moving picture theaters, and to a greater or less degree, of other places of assemblage, where large numbers of people are constantly breathing it for a considerable period of time, becomes very close and unpleasant and various means have been

proposed for treating the atmosphere of such places of assemblage, which, however, have been more or less inadequate or else have been unduly wasteful of the materials employed or unsanitary, or have required too much personal attention from operatives in order to keep them in operation. It is customary in such places of assemblage to provide ordinary electrically operated ventilating fans disposed at different parts of the building which are under control by means of an electric switch or switches, so that they can be stopped or started at will.

One of the objects of our invention is to provide a cheap, simple and efficient apparatus which can be readily attached to the ordinary fan plate housing of any of the many forms of electric fans now on the market and used for such purposes, the apparatus being so constructed that the starting and stopping of the fan by means of its controlling apparatus, usually located at a distant point from the fan, will correspondingly start and stop the distribution of a deodorizing, sterilizing, perfuming or other type of liquid. Another object of our invention is to provide for an exceedingly economical distribution of the liquid employed, which is usually a composite liquid, by forcing a small quantity of air into a liquid containing receptacle located in the path of the current of air from the fan and having a considerable air discharge opening, the air forced into the receptacle being distributed below the liquid level and caused to bubble up through the liquid thereby agitating it so as to prevent the separation of its constituents, and rising from the liquid saturated or charged with portions of all the liquid ingredients, the charged air being discharged directly into the much larger volume of air flowing as an air current from the fan and being diluted further and infinitely distributed throughout the atmosphere of the auditorium as the operation of the device proceeds.

Another object of our invention is to prevent the loss of the liquid employed, when the device is not in operation, by providing the air discharge aperture of the liquid receptacle with a closure normally held in closed position by a yielding means, and in connection therewith to employ a blade or vane having a considerable area of surface directly disposed in the air current from the

fan so that when the fan is started the current of air produced thereby acting upon this vane will effect the opening of the closure. While the air forcing device may be operated by any desired means, in the simplest form of the apparatus as herein shown, we prefer to provide a pin wheel or other air actuated motor operatively connected with the pump and having its vanes disposed in the path of the air current from the fan so that upon starting the fan the air current will not only open the closure, as before indicated, but will also start and continuously operate the pump for forcing air into the liquid receptacle below the liquid level and the pump will be continuously operated so long as the fan is operating, under ordinary conditions.

Our invention also contemplates the operation of the fan without operating the air pump and closure controlling vane or blade. This may be accomplished in various ways as, for example, by so constructing the means which holds the closure in closed position, and the pin wheel or other form of air motor, that they will not operate unless the fans are driven at a high speed, whereby by lowering the speed of the fan below the critical speed necessary to operate these devices, the fan may be permitted to operate without operating the deodorizer, but this result may be accomplished in other ways. This, however, is a convenient means for accomplishing this result as ventilating fans ordinarily are controlled by a rheostat switch so as to be capable of operation at different speeds in a well known way.

Another object of our invention is to provide for the detachment of the entire apparatus from the supporting plate which is attached to the fan housing for convenience and also to arrange and construct the pump and air driven wheel therefor so that they may be simultaneously detached from the liquid receptacle for examination or repair.

Referring to the accompanying drawings which, as before stated, illustrate one embodiment of our invention selected by us for the purpose of illustrating the invention, 1 represents an attaching plate which is preferably in the form of a spider having an outer annular portion and a central portion, 2, connected to the annular portion by suitable arms, 3. The annular portion of this plate is provided with a plurality of slots indicated at 4, arranged in a circle and these slots are provided with retaining devices of any suitable character comprising, in this instance, a hook-shaped bolt, 5, (see Fig. 3) provided with a wing nut, 6, and washer, 7. The slots 4 are so arranged that when the plate is applied concentrically to the housing of any ordinary electric fan the attaching bolts can be so arranged in their respective slots as to connect the plate with the

radiating bars of the housing no matter what the particular design of the housing as made by different makers may be. We prefer to provide the central portion, 2, of plate, 1, with a socket indicated at 8, which consists in this instance of a pair of inclined guides connected at their upper ends by a cross bar 9 (see Fig. 3).

10 represents the receptacle for holding the liquid to be employed and this receptacle is preferably of cylindrical form having its axis disposed horizontally, the said receptacle being provided with a bracket arm, 11, adapted to fit in the socket 8, 9, detachably and support the receptacle and its attached parts in proper relation with the revolving fan blades of the fan. The receptacle, 10, is provided preferably at the top with a longitudinally disposed air discharge aperture, 12, which is preferably in the form of a slit. The receptacle is also provided, in the form of apparatus herein shown, with a cylindrical casing or seat, 13. On its upper face, preferably at one end of the receptacle and within the socket, the receptacle is provided with a hole in which is soldered or otherwise secured an air distributing pipe, 14, which as shown in Fig. 2 extends down to the bottom of the receptacle and longitudinally thereof along the bottom and is provided on its upper side with a plurality of air-discharge openings, 15, of any desired size and number. The air forcing device, as before stated, is conveniently made separate from the receptacle and in this instance we have shown a small pump cylinder, 16, adapted to fit within the socket, 13, before described, and provided near its bottom with a plug, 17, having a plurality of apertures, 18, and provided with a valve, 19, consisting conveniently of a piece of thin leather or rubber attached by a central screw. 20 represents the piston which comprises simply a small cylindrical block of metal fitting the cylinder, 16, and provided with longitudinal air apertures, 21, extending from top to bottom, the bottom of the piston being provided with a similar valve, 22, to the valve, 19, before described. We prefer to provide a bearing bracket, 23, which is formed integrally with or secured to the cylinder and projects from one side thereof and provides two bearings to receive a short shaft, 24, carrying a small metal pin wheel, 25, a light balance wheel, 26, and a crank or eccentric, 27, the latter being connected by a link, 28, with the piston, 20, the piston being provided with a transverse recess, 29, to accommodate the lateral movements of the link or pitman 28. We prefer to use the balance wheel, 26, as it produces a much steadier operation of the pump. The seat or socket, 13, is preferably notched to accommodate the bearing bracket, 23, and we may also provide the seat with an addi-

tional notch at another point to receive a guide pin, 30; both these notches serving to prevent any torsional movement of the cylinder with respect to its seat and the cylinder may be conveniently secured in its seat by means of a set screw, 31. The pin, 30, may conveniently be a screw which at the same time holds the valve plug, 17, in the cylinder.

10 We also provide the air discharge aperture, 12, of the receptacle, 10, with a movable closure to prevent evaporation when the apparatus is not operated and also to exclude dust and other foreign matter which
15 might contaminate the liquid. This closure is conveniently made in the form of a curved plate, 32, which in this instance is located on the outside of the receptacle and is curved concentrically with the cylindrical wall
20 which it engages. Within the receptacle is a longitudinally disposed shaft, 33, mounted in bearings, 34, secured to the wall of the receptacle and provided with collars slipped over the shaft and held in position con-
25 veniently by screw threaded pins forming arms 35, 35^a, which extend up through the aperture, 12, and through apertures in the cover or closure, 32, so as to actuate the closure when the shaft, 33, is rocked. Yielding
30 means are provided for holding the shaft and the arms 35, 35^a, in such position as to maintain the closure in closed position; for example, an arm 36 is shown adjustably secured to the shaft and provided with an ad-
35 justable weight 37 for this purpose. One of the arms, 35, 35^a, in this instance the arm 35, is extended upward to a greater extent than the other and is provided with an adjustable blade or vane preferably in the
40 form of a disk as indicated at 38. Suitable means may be provided on the arms 34, 35, to prevent the closure, 32, from becoming detached, as collars 35^b, which will not interfere with the easy sliding of the valve or
45 closure.

The apparatus hereinbefore described having been assembled and placed in operative position on the housing of an electric fan, as shown in Fig. 1, it will be seen that
50 the air discharge aperture of the liquid receptacle as well as the pin wheel and closure operating blade are within the current of air produced by the fan, the air being permitted to pass freely across the slit or discharge
55 aperture, 12. If now the fan is started the air current therefrom will impinge upon the plate, 38, and open the closure, 32. At the same time the air pump will be actuated by the pin wheel or other actuating means and
60 will force small quantities of air through the distributing pipe, 14, causing it to bubble up through the liquid contained in the receptacle, which may be filled to a greater or less extent as desired. These currents of air
65 passing up through the liquid perform two

important functions. These liquids which are used for deodorizing and disinfecting purposes are usually composed of a mixture of liquid materials, some of which are more volatile than others, and were the air taken
70 over the top of the liquid and the liquid permitted to remain quiescent, the components of greatest volatility would be rapidly carried off and leave the components of less volatility behind and as this latter substance
75 is usually water an equal distribution of the liquid could not be obtained. By our invention, however, the liquid is continually agitated and prevented from separating and the air passing up through it becomes satu-
80 rated with all of its component parts thus administering the liquid with the greatest uniformity possible so that the last ounce withdrawn from the receptacle will have practically the same properties as the first.
85 These fine air currents charged with the liquid material pass upwardly through the aperture 12 and are caught in the larger current of air passing from the fan which dilutes this charged air and distributes it
90 and the liquid components carried thereby very widely and uniformly through the atmosphere of the room. When it is not desired to use the device it is only necessary to operate the control switch of the fan so as
95 to stop the fan when the air pump will immediately cease operating and the weight 37 will cause the closure to move to closed position, thereby preventing any material loss of the liquid in the receptacle by evap-
100 oration or its contamination from dust particles, etc. Thus by starting and stopping the fan by means of its usual control mechanism the deodorizing apparatus is brought into action or put out of action without any
105 personal attention being required, it being only necessary to recharge the liquid receptacle from time to time. This may be done by simply pouring the liquid through the aperture, 12, after opening the closure 32 by
110 hand, or the device can be removed from the plate 1 for filling and replaced, if desired or found more convenient.

In some instances it may be desirable to operate the fan without operating the deo-
115 dorizer. If it is not desired to detach the apparatus from the fan at such times, the pin wheel and blade, 38, can be made of such relatively small size as not to be actuated by a moderate current of air so that the fan
120 may be operated at comparatively slow speed without bringing the deodorizer into action; while by throwing the fan switch so as to produce a higher speed the deodorizer will be caused to instantly operate. The
125 same result could be obtained in other ways. The form of the invention herein shown and described is very simple, compact, inexpensive to manufacture and will operate for an indefinite time without being affected mate-
130

rially by wear of parts and is not at all likely to get out of order. In practice it is usually found sufficient to install these devices on one, two, or more of the usual ventilating fans used in the place of assemblage. They may, however, be used in homes, offices and other places wherever found convenient or desirable.

What we claim and desire to secure by Letters Patent is:

1. In a deodorizer for use in connection with a ventilating fan, a liquid receptacle provided with an air discharge aperture, means for supporting said receptacle with said air discharge aperture in the path of a current of air from a fan, and means for forcing air into said receptacle and discharging it below the liquid level therein, whereby the liquid is agitated and portions thereof are carried into the path of the air current from the fan.

2. In a deodorizer for use in connection with a ventilating fan, a liquid receptacle provided with an air discharge aperture, means for supporting said receptacle so as to bring said discharge aperture in the path of a current of air from a fan, means for forcing air into said receptacle and discharging it below the liquid level therein, a closure for said discharge aperture, yielding means for normally holding said closure in closed position and an air current actuated means for holding said closure in open position.

3. In a deodorizer for use in connection with a ventilating fan, the combination with a liquid receptacle provided with an air discharge aperture, of air current actuated means adjacent to said discharge aperture for delivering air into said receptacle below the liquid level thereof and thereby forcing the air laden with particles of the liquid out through said discharge aperture and into the path of said actuating air current.

4. A deodorizer for use in connection with a ventilating fan, the combination with a liquid receptacle provided with an air discharge aperture above the liquid level of said receptacle, a movable closure for said discharge aperture, means for normally holding said closure in closed position, air current operated means for holding said closure in open position, and air current operated means for delivering air into said receptacle below the air discharge aperture thereof.

5. In a deodorizer for use in connection with a ventilating fan, the combination with a liquid receptacle provided with means for distributing air adjacent to the bottom below the liquid level therein and with an air discharge aperture adjacent to the top, an air forcing device connected with said air distributing means, an actuating pin wheel for said air forcing device, a movable closure

for said discharge aperture, yielding means for normally holding said closure in closed position and an air current actuated blade operatively connected with said closure for opening said closure and holding it in open position.

6. In a deodorizer for use in connection with a ventilating fan, the combination with a liquid receptacle provided with an air distributing pipe having an aperture located adjacent to the bottom of said receptacle and an air discharge aperture adjacent to the top of said receptacle, of an air pump connected with the air distributing pipe, a pin wheel operatively connected with said pump, a closure plate having a sliding engagement with portions of the receptacle adjacent to said discharge aperture, yielding means for holding said closure in position to close said aperture and a pivotally supported blade operatively connected with said closure for moving it to uncover said discharge aperture.

7. In a deodorizer for use in connection with a ventilating fan, the combination with a liquid receptacle provided with an air discharge aperture above the liquid level thereof, an air forcing device, connections therefrom for discharging air into said receptacle below the liquid level, an air actuated rotary device and operative connections between said rotary device and said air forcing device.

8. In a deodorizer for use with a ventilating fan, the combination with a liquid receptacle provided with an air discharge aperture above the liquid level thereof, an air forcing device for discharging air into said receptacle below the liquid level thereof, actuating means for said air forcing device, a movable closure for said air discharge aperture, a rock shaft connected with said receptacle and operatively connected with said closure, a weight connected with said shaft for normally holding said closure in closed position and an air current actuated blade connected with said shaft for holding said closure in open position.

9. In a deodorizer for use with a ventilating fan, the combination with a liquid receptacle provided with an air discharge aperture above the liquid level therein, an air forcing device, connections therefrom for discharging air into said receptacle below the liquid level, an air actuated rotary device, operative connections between said rotary device and said air forcing device, a supporting plate connected with said liquid receptacle and means associated with said plate for securing it to the fan blade housing of a ventilating fan.

In testimony whereof we affix our signatures.

HENRY H. WALKER,
FRANK ENOS, JR.