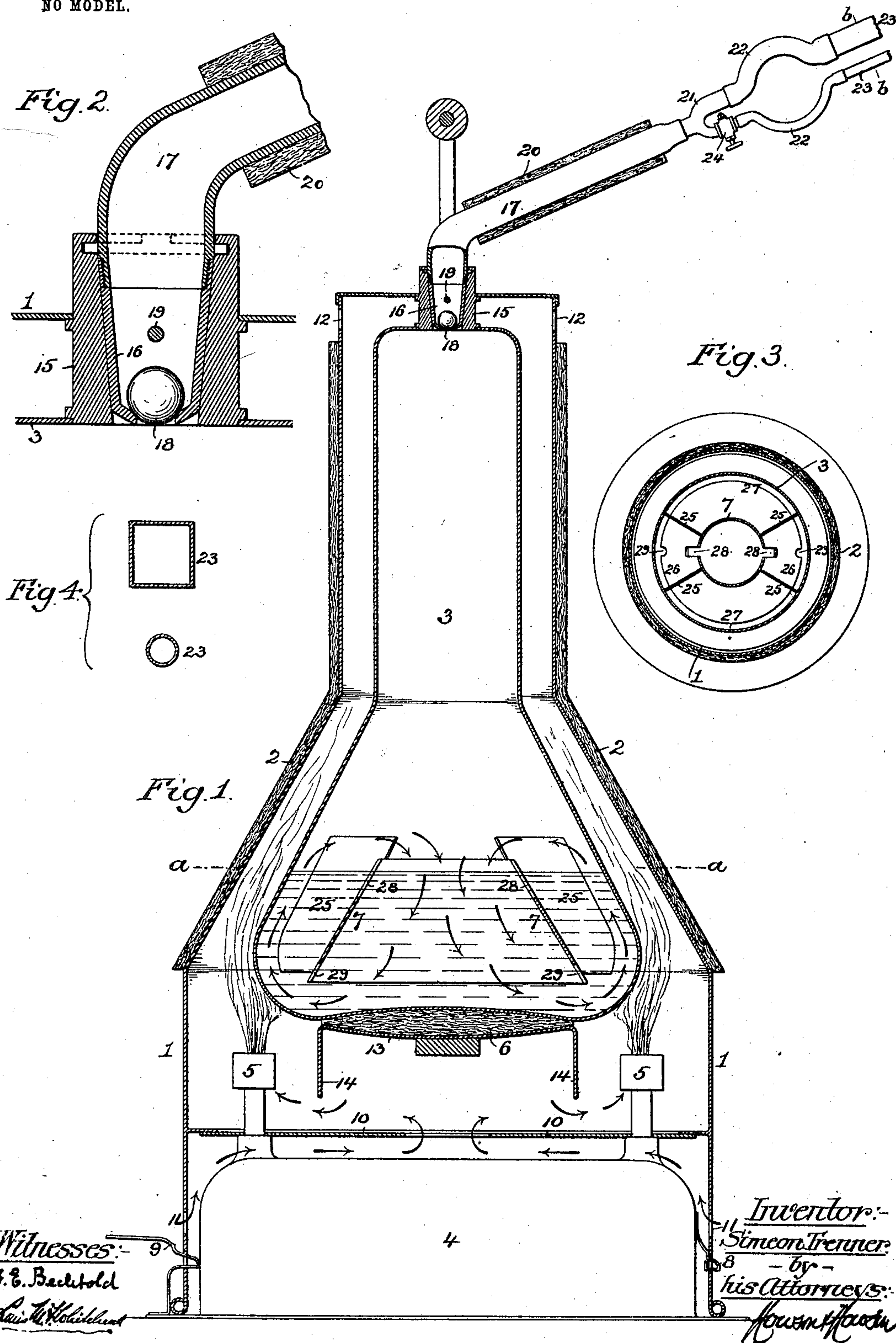


No. 719,277.

PATENTED JAN. 27, 1903.

S. TRENNER.
DISINFECTANT VAPORIZER.
APPLICATION FILED JAN. 8, 1901.

NO MODEL.



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UNITED STATES PATENT OFFICE.

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DISINFECTANT-VAPORIZER.

SPECIFICATION forming part of Letters Patent No. 719,277, dated January 27, 1903.

Application filed January 8, 1901. Serial No. 42,539. (No model.)

To all whom it may concern:

Be it known that I, SIMEON TRENNER, a subject of the Queen of Great Britain and Ireland, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Disinfectant-Vaporizers, of which the following is a specification.

The object of my invention is to construct a portable and easily-operated disinfectant-vaporizer which will be safe against explosion or dangerous ejection of hot solution; will generate vapor without priming and vary rapidly, because of the high degree of heat to which it can be subjected, the economizing of this heat, and the free circulation of the solution provided for; will have no glass or other fragile parts to become broken in use or transportation; will operate in every case with certainty, so as to permit of the disinfecting of a room of known size with an amount of solution which can be accurately predetermined, since it is all vaporized, none being wasted by ejection in a liquid state, and will at once indicate to the attendant when the amount of solution has been exhausted. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a disinfectant-vaporizer constructed in accordance with my invention. Fig. 2 is an enlarged section of part of the same. Fig. 3 is a sectional plan view, on a reduced scale, on the line *a a*, Fig. 1; and Fig. 4 is a transverse section, on an enlarged scale, on the line *b b*, Fig. 1.

The structure comprises an outer casing 1, preferably provided, at least as to its upper portion, with a non-conducting jacket 2, this casing having suspended within it the vaporizing-retort 3, which in the present instance consists of an upper cylindrical portion of comparatively small diameter expanded into conical form at its lower end, so as to provide a receptacle of increased capacity for the solution to be vaporized, increase the area of surface to which heat can be applied, and prevent the vapor as it rises in contact with the heated wall of the retort from throwing up the solution in a vertical direction, the cone deflecting the solution toward the center of the retort.

To the lower portion of the casing 1 is secured the fountain 4 of a lamp, which serves as a means of heating the vaporizer, this lamp having in the present instance two burners 5, located adjacent to the outer portion of the retort on opposite sides of the same, the central portion of the retort-bottom being preferably provided with a block 6 of non-conducting material in order to prevent the application of heat to the central portion of the retort-bottom, the heat being confined to the outer portion of said bottom and to the opposite sides of the same, so that the tendency of the solution is to rise in contact with the outer walls of the retort at the points where heat is applied. As the vapor globules rise they follow along the inclined walls of the lower conical portion of the retort and are directed inwardly toward the contracted upper portion of said retort, so that a ready channel for the escape of vapor is provided, and said vapor collects in the contracted upper portion of the retort without admixture with drops of liquid solution, the liquid descending in the central portion of the retort, so as to be again subjected to the heat, and a continuous circulation being thus maintained, the regularity of action minimizing the danger of throwing off from the retort volumes of hot liquid solution.

In order to aid in effecting the proper circulation of the solution and separation of the vapor within the retort, the lower portion of the latter is by preference provided with a frusto-conical separator-plate 7, so as to form in the lower portion of the retort an outer ascending chamber or conduit and a central descending chamber or conduit to induce circulation in the direction of the arrows, Fig. 1, and this construction may be adopted in cases where a circular burner is employed instead of the two oppositely-disposed burners 5, as shown in the drawings; but when the latter are used I prefer to still further subdivide the lower portion of the retort by means of radial plates 25, extending from the separator-plate 7 to the walls of the retort and serving to divide the lower portion of the latter into ascending chambers 26, adjacent to that portion of the retort to which heat is applied, and descending or reservoir chambers 27, disposed between the opposite

ascending chambers 26, whereby in addition to the descent of the liquid through the central portion of the retort there will, when the ebullition is very rapid and foaming is considerable, be a further descent through the chambers 27 on opposite sides of the retort, thus providing ample opportunity for the liquid portion of the solution to separate from the vapor before the latter rises in the contracted upper portion of the retort and reaches the point of escape.

In order to limit the height to which the liquid is compelled to rise in the ascending chambers 26 before passing into the central descending chamber, I form in the upper portion of the separator-plate 7 slots 28, and in order to increase the freedom of flow of the liquid into the lower portion of the ascending chambers 26 I notch the lower edge of the separator-plate 7 within the limits of said descending chambers, as shown at 29 in Figs. 1 and 3.

It will be observed that with the construction of the retort which I have shown and described a portion only of the entire amount of solution in the retort is in active ebullition at any one time, thereby minimizing the danger of priming and foaming and at the same time economizing heat.

The fountain 4 of the lamp is secured to the casing 1 by means of spring-catches 8 and 9, the latter having a projecting finger, whereby it may be readily operated by the foot in order to release the casing from the lamp when it is desired to separate the two, the operation being thus performed very quickly and without jarring the lamp or risk of injury to the attendant.

Mounted upon the lamp is an annular deflecting-plate 10, and in the lower portion of the casing 1 are openings 11, the upper portion of the casing having openings 12. Hence when the lamp is fitted to the casing air entering the openings 11 is caused to flow over the top of the lamp-font, thence through the central opening of the deflecting-plate 10, and thence to the burners of the lamp to support combustion, the products of combustion passing upwardly between the retort and outer casing and escaping finally through the openings 12 at the top of said casing. Hence the casing acts as a chimney to facilitate combustion and prevents radiation and loss of heat from the retort, this economy of heat being further enhanced by the fact that the air to support combustion is heated, such heating of the air effecting the further object of keeping the fountain of the lamp cool, and thereby increasing the safety of the apparatus. The upper portion of the retort is surrounded by the products of combustion, the heat thus imparted to it tending to prevent foaming, and thereby priming, at the outlet, a result which is further aided by the distance of the vapor-outlet from the point of ebullition.

The plate 13, which secures the mass 6 of non-conducting material to the central portion of the retort-bottom, is preferably provided with a downwardly-projecting edge flange 14, whereby the air for supporting combustion is directed away from that portion of the retort to which heat is applied and approaches the burners from below. It also prevents the flame from coming into contact with the block of non-conducting material at the bottom of the retort, and thus aids the central descent of the liquid in the retort.

The upper portion of the retort has a socket 15 for the reception of a nozzle 16, secured to or forming part of the discharge-pipe 17 of the retort, said pipe being secured to the socket by means of a screw-threaded bayonet-joint or other equivalent connection, which will permit it to be readily detached therefrom. The nozzle 16 is contracted at the lower end, so as to form a seat for a ball or other valve 18, the rise of which is limited by a transverse pin or bar 19 in the nozzle, as shown in Fig. 2, this ball being of such weight that when the retort is at work it will be kept in constant agitation by the outflowing vapor, and hence will serve to indicate to the attendant that the apparatus is in proper operative condition, a cessation of the sound arising from the agitation of the ball indicating that the supply of solution has been exhausted and that the retort must be replenished or the application of heat thereto discontinued. Gage-glasses or other fragile attachments to the retort are therefore rendered unnecessary, and the presence of solution in the retort can be determined as readily in dark rooms, hallways, or corridors as in places where there is an abundance of light, the cessation of the sound of the vibrating ball indicating automatically the exhaustion of the supply of solution, so that the burning out of the retort, such as might arise from failure on the part of the attendant to closely observe a gage-glass, is effectually prevented, while at the same time all of the solution in the retort can be utilized before it becomes necessary to replenish the same. The ball 18 also tends to prevent access of vapor to and condensation of vapor in the discharge-pipe 17 when the vaporizer is first started, and the vibratory motion of the ball also tends to cause rapidly-alternating pressure and relief from pressure, which tends to rupture the bubbles of foam and prevent them from rising to the outlet.

The discharge-pipe 17 of the retort has a non-conducting casing 20 in order to prevent condensation of the vapor, and said pipe terminates in a forked neck 21, each leg of the fork being connected by a flexible tube 22 to a pipe 23, and, as shown in Fig. 4, one of these pipes is of rectangular cross-section, so as to be adapted to fit in the knob-spindle opening of a door-lock, while the other pipe is of rounded cross-section, so as to fit in the

key-spindle portion of the same, thus providing the largest possible area of outlet for the flow of vapor into the room or apartment, and thereby insuring the rapid filling of said room or apartment with vapor in order that the disinfecting action may not be materially delayed by loss due to leakage or other causes.

Instead of being rounded in cross-section the keyhole-pipe 23 may be oblong, so as to conform to the shape of the keyhole.

One of the legs of the forked neck 21 is provided with a valve or stop-cock 24, so that the flow of vapor through one of the pipes 23 may be cut off, if desired, the other pipe, however, being always left open in order to prevent the generation in the retort of such pressure as would be likely to cause explosion.

The ready detachability of the lamp from the casing of the vaporizer provides for the quick removal of heat from the retort when such course becomes advisable, and the detachability of the discharge-pipe 17 permits of the ready refilling of the retort during the progress of the disinfecting operation, such refilling being effected by means of a filling-tube extending down into the lower portion of the retort and carried by a plug fitted to the socket 15 and having a vent-tube large enough to provide for the escape of vapor generated during the refilling of the hot retort, thus preventing the forcing of the liquid out through the filling-tube and onto the person or clothing of the attendant.

As my improved vaporizer does not contain a number of valves, stop-cocks, pressure or level gages, or the like to be attended to in order to cause it to operate properly, no special skill on the part of the attendant is required, and the time necessary for accomplishing disinfection is very materially reduced, because of the rapid generation of vapor provided for the entire inclosure of the lamp, permitting the apparatus to be used in the open air or in places where there are strong drafts.

My improved vaporizer is especially adapted for effecting vaporization of solutions of glycerin and formaldehyde, which by many boards of health have been demonstrated to be preferable to formaldehyde alone, the method of constructing and heating the vaporizer preventing that ejection of foam to which solutions of glycerin and formaldehyde are subject, the thorough circulation provided for insuring the vaporization of the small percentage of glycerin used simultaneously with the formaldehyde solution. Hence there will be no carbonization of the glycerin to scale the retort or choke the outlet-pipes. The vaporizer is of such height that long discharge-pipes are not necessary in order to convey the vapor to the apertures contained in an ordinary door-lock; but it is light and can be conveniently carried in one

hand by means of a handle 30 at the top of the casing.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination in a disinfectant-vaporizer, of a retort having a lower portion with sides which incline inwardly toward the contracted upper portion of the retort, a heating device which directs the products of combustion directly upon the outer portion of the bottom of the retort and upon the inwardly-inclined sides of the same, and means for preventing access of said products of combustion to a central portion of the bottom of the retort which is equal to or greater in area than the contracted top of the retort, substantially as specified.

2. A disinfectant-vaporizer consisting of a retort having an internal separating-plate forming an outer ascending conduit and a central descending conduit, communicating with each other at top and bottom, with means for applying greater heat to the outer portion than to the central portion of the retort, substantially as specified.

3. A disinfectant-vaporizer consisting of a retort having an internal separating-plate with partition-plates extending therefrom to the walls of the retort so as to form a descending conduit within the separating-plate and ascending conduits and descending or reservoir conduits outside of the same, in combination with means for applying heat to the walls of the retort at points coincident with said ascending conduits, substantially as specified.

4. A disinfectant-vaporizer consisting of a retort having an internal annular separating-plate, and partition-plates extending therefrom to the walls of the retort so as to form a descending conduit within the separating-plate and ascending conduit and descending or reservoir conduits outside of the same, said separating-plate having its edges notched or slotted within the limits of said ascending conduits in combination with means for applying heat to the walls of the retort at points coincident with said ascending conduits, substantially as specified.

5. Disinfecting apparatus comprising an outer casing, a retort, a lamp-heater for the latter, consisting of a lamp-font having a burner or burners located near the outer edge thereof, and a deflecting-plate having an opening some distance inwardly from the outer edge of the lamp-font whereby the air for supplying the burner or burners of the lamp is caused to first flow over the font in order to cool the same, substantially as specified.

6. Disinfecting apparatus comprising a retort, an outer casing, a lamp-heater, a deflector above the lamp-font, and a deflector extending downwardly from the bottom of

the retort whereby the air for supplying the burner or burners is caused to pass over the top of the font and is then directed to the bases of said burner or burners, substantially as specified.

7. Disinfecting apparatus comprising a retort having means for heating the same, and two outlet-pipes, one of circular cross-section to enter the keyhole-opening and the other
10 of rectangular cross-section to enter the

knob-spindle opening of a door-lock, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIMEON TRENNER.

Witnesses:

F. E. BECHTOLD,
JOS. H. KLEIN.