

D. N. CALKINS.
FUMIGATING APPARATUS.
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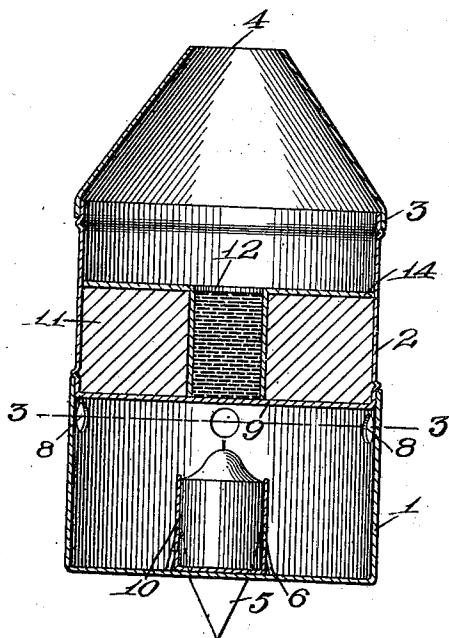


Fig. 1.

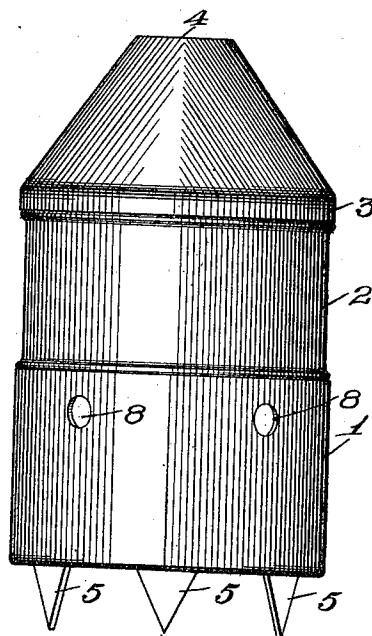


Fig. 2.

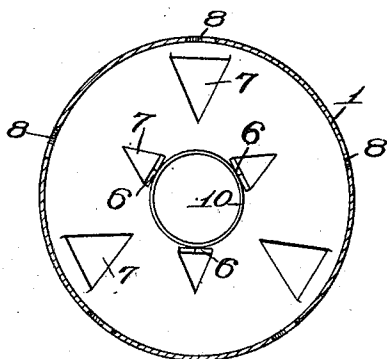


Fig. 3.

Witnesses

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FUMIGATING APPARATUS.

996,399.

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To all whom it may concern:

Be it known that I, DANIEL N. CALKINS, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Fumigating Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention relates to fumigation and it has for its object to improve the method of distributing the fumes of formaldehyde for disinfecting purposes whereby their effectiveness is increased and greater convenience is attained in carrying out the process.

A further object of my invention is to provide a suitable apparatus for obtaining these results complete which will be simple in construction and manner of use and capable of production at such a low cost as to warrant the user, if he so desires, in discarding it after having used it but once rather than recharging, the apparatus being preferably furnished ready charged in the first instance.

To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a central vertical section through a fumigating apparatus constructed in accordance with and illustrating one embodiment of my invention; Fig. 2 is a side elevation thereof, and Fig. 3 is a horizontal section taken substantially on the line 3—3 of Fig. 1.

Similar reference numerals throughout the several figures indicate the same parts.

While formaldehyde is essentially a gas in its strictly chemical meaning it is commercially produced in the three forms, viz., solid, liquid and gaseous. Of these the solid form is more practicable for general use in fumigation, particularly for general use as a disinfectant, as it can be more readily handled and does not deteriorate or dissipate as quickly as the other forms. The term formaldehyde as used herein, will therefore be meant to refer to this solid sub-

stance it having, as a matter of fact, a pasty consistency.

In fumigating with formaldehyde gas it is desirable that the gas be liberated, or at least distributed, in a humid atmosphere or in the presence of water vapor in order that it may readily permeate and take hold upon the surfaces under treatment. It is also desirable that the gas and water vapor be intimately mixed to effect this end preferably when each is in its nascent or more active condition. Formaldehyde and water having very nearly the same temperature of volatilization, by my improved method of fumigation with the former a suitable quantity of each are placed preferably in adjacent positions and jointly raised to a vaporizing temperature preferably by subjection to the action of a common heating element, each being exposed directly to the heat at one point and having free surfaces at another from which the vapors may be thrown off. The former exposure insures a practically uniform raise in temperature of both, while the latter allows the vapors from each to escape independently without interfering one with another, yet in such close proximity that they are readily mixed in their nascent condition and discharged into the atmosphere while intimately associated.

The apparatus of my invention, by means of which these results may be conveniently obtained, is illustrated in the drawings wherein the reference numerals 1, 2 and 3, respectively, indicate three superposed casings preferably separable and preferably composed of thin sheet material, in whole or in part, such as thin sheet metal. The lower casing 1 is, in the present instance, cup-shaped and constitutes a combustion chamber or burner containing member in which is preferably telescopically fitted the intermediate section 2. This latter forms what may be termed the volatilizing chamber and is surmounted by the top section 3 forming an also preferably telescopically joined hood having converging walls terminating in a restricted opening 4 at the apex. Downwardly projecting portions 5 are struck from the material forming the bottom of the burner section 1 to provide legs for the apparatus, while similarly formed upwardly projecting portions 6 constitute fuel holding members, the openings resulting from

these structural arrangements furnishing lower draft openings 7. Upper draft openings 8 are provided in the side walls of the burner casing adjacent to the bottom 9 of the volatilizing chamber or casing 2. An ordinary candle may be held in the burner by the members 6, or they may support a cup 10 filled with a suitable fuel, such as paraffin, provided with an asbestos or other wick, but it is preferable that either be so arranged as to produce a flame in the center of the chamber and of the bottom 9 of the volatilizing chamber.

The formaldehyde I provide in the form of a cake 11, cylindrical in contour in the present instance, which fits snugly within the casing 2 and flat against the bottom 9 thereof. Extending through the cake from side to side is an opening 12 which is so arranged as to come directly above and in vertical alinement with the fuel cup 10 which, in the present instance, would cause its position to be centrally of the cake giving the latter an annular shape. The upper exposed surface of the cake is preferably provided with a protective covering 14 of a fusible material, such as wax or paraffin, which prevents the relatively slow dissolution thereof and escape of the formaldehyde fumes at ordinary temperatures while being held for future use and this covering should adhere at its edges to the walls of the chamber and extend over the walls of the opening as well to constitute a continuous film normally completely sealing the cake from contact with the air.

In use, the opening 12 is utilized as a well which is filled with water and the fuel beneath then ignited. Because of the draft openings 7 and 8 the resulting flame spreads over the under surface of the bottom 9 of the reducing chamber in which both the water and formaldehyde are in contact. These are uniformly heated and the fusible protective covering 14 finally broken up so that the water vapor and formaldehyde fumes rise independently from the top surfaces but issue from the apparatus together and are sufficiently mixed by their joint passage through the restricted opening 4 of the hood 3.

Of course, the diameter of the well or opening 12 may be proportioned so that a sufficient quantity of water can be accommodated to last during the period of complete volatilization of the formaldehyde. It is also pointed out that the formaldehyde is protected by the continuous surface of the casing 2 and hood 3 from becoming ignited

in case the flame of the burner is projected from the upper draft openings 8.

Other substances than formaldehyde could in some cases be volatilized for similar purposes by utilizing the apparatus of my invention.

I claim as my invention:

1. In a disinfecting apparatus, a burner chamber and a volatilizing chamber arranged above the same, the burner chamber being formed by a casing of sheet material having upper draft openings in its side walls adjacent to the bottom of the volatilizing chamber and provided with upwardly extending portions and downwardly extending portions, respectively, struck from the material of its bottom wall forming lower draft openings, the upwardly extending portions constituting a fuel holder and the downwardly extending portions constituting legs supporting the apparatus.

2. In a disinfecting apparatus, the combination with a casing forming a volatilizing chamber, of a cake of formaldehyde arranged therein and provided with an opening extending completely therethrough from top to bottom to accommodate a well of water with the latter directly in contact with the bottom of the casing and exposed to the action of heat applied beneath the latter.

3. In a fumigating apparatus, the combination with a casing forming a volatilizing chamber, of a cake of formaldehyde arranged therein and provided with an opening extending therethrough from top to bottom adapted to accommodate a well of water with the latter directly exposed to the action of heat applied to the bottom of the casing, and a burner connected below the latter and provided with a fuel holder arranged directly beneath the well opening.

4. In a fumigating apparatus, the combination with a burner casing having a centrally arranged fuel holder therein and provided with upper and lower draft openings, of a second casing forming a volatilizing chamber arranged above the first and a cake of formaldehyde arranged in the volatilizing chamber and provided with a central opening extending therethrough from top to bottom in vertical alinement with the fuel holder of the burner for the purposes set forth.

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Witnesses:

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