

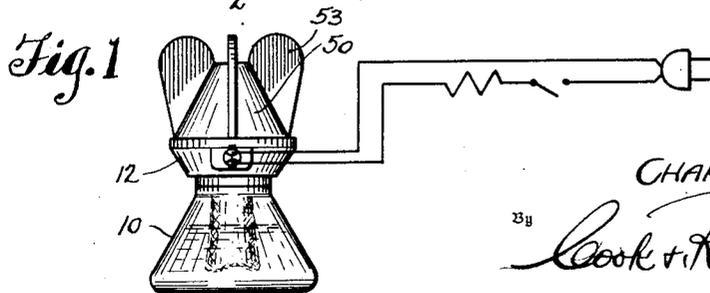
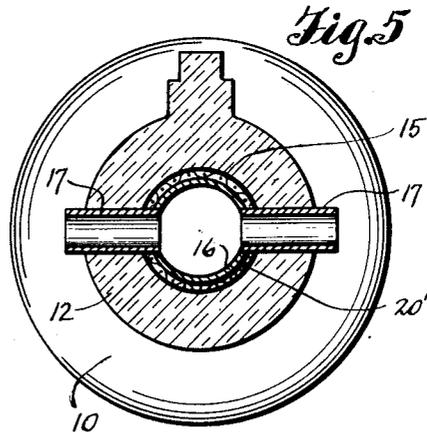
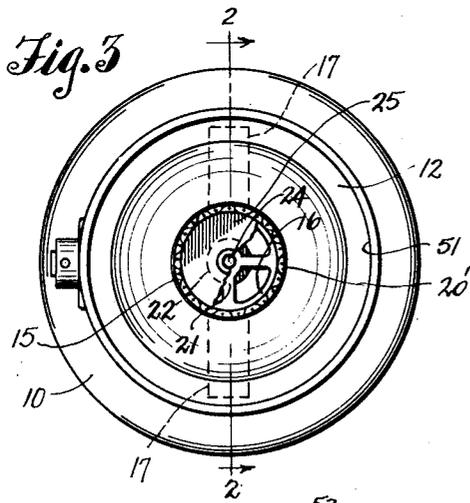
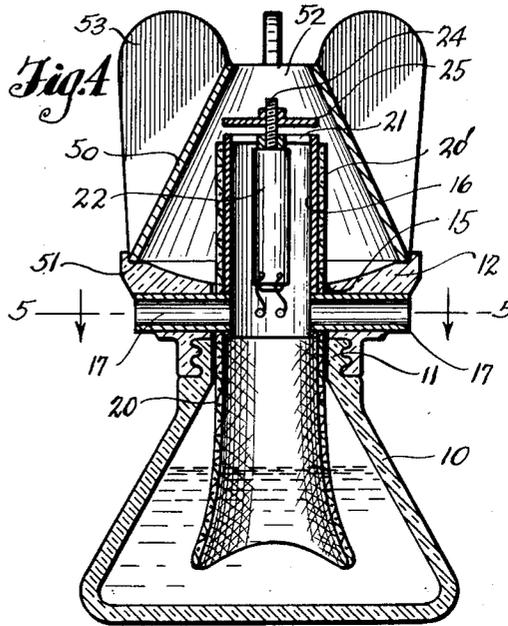
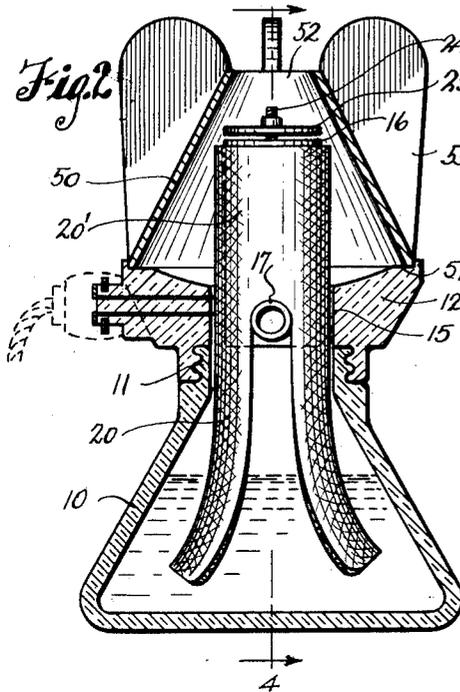
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C. V. SMITH
VAPORIZER

2,597,195

Filed March 18, 1950

2 SHEETS—SHEET 1



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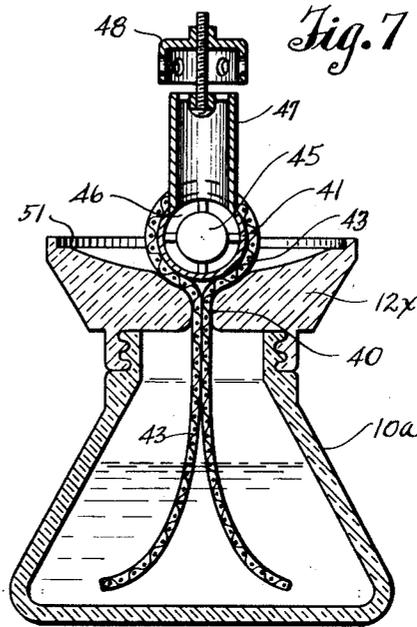
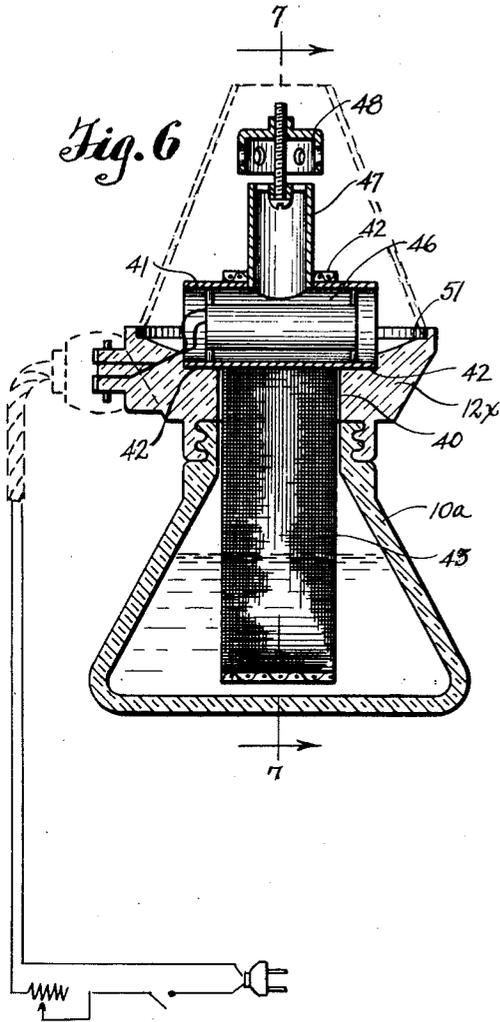
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2,597,195

VAPORIZER

Filed March 18, 1950

2 SHEETS—SHEET 2



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UNITED STATES PATENT OFFICE

2,597,195

VAPORIZER

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2 Claims. (Cl. 21—119)

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This invention relates to improvements in devices of those kinds generally known or referred to as vaporizers, or evaporators. More particularly the present invention has to do with the details of construction and mode of use of a vaporizer that is designed for a controlled production of vapors from a liquid. Specifically stated, the present vaporizer is one designed for the generation and dissipation therefrom, by means of heat, of vapors from a liquid solution that contains germicidal agents, for example, glycol, or to produce from various selected liquids or solutions, vapors of medicinal value, or which counteract undesirable odors.

It is the principal object of this invention to provide a vaporizer of the above stated character that is effective and satisfactory for its intended uses; that is attractive and ornamental in its appearance; that is relatively inexpensive to manufacture; that provides for a controlled variation in its output of vapors; that is spill proof and which comprises a vaporizing unit that may be interchangeably applied to liquid containers of various sizes or designs.

It is also an object of this invention to provide a device that, for the vaporizing action utilizes a heating element in the form of an electrical resistor, located within a metallic housing of tubular form, and about which housing a wick which depends into the solution to be vaporized, is applied, and through which tubular housing air may be permitted to flow in regulated amounts as a means of controlling the amount of heat transmitted from the heating element to the housing and in this way to regulate the production of vapors from liquid contained in that portion of the wick that contacts the heated tube.

A further object is to provide a device in which only that liquid that is to be immediately vaporized is heated.

Further objects and advantages of the present invention reside in the details of construction of parts embodied in the vaporizer, and in their relationship and mode of use, as will hereinafter be fully described.

In accomplishing the above mentioned and other objects of the invention, I have provided the improved details of construction the preferred forms of which are illustrated in the accompanying drawings, wherein

Fig. 1 is a side view of a vaporizer of a preferred form, and embodying the improvements of the present invention therein.

Fig. 2 is a somewhat enlarged, central cross-sectional view of the vaporizer taken on line 2—2 in Fig. 3.

Fig. 3 is a top, or plan view of the vaporizer with the cover member removed to better show the vaporizing unit.

Fig. 4 is an enlarged, vertical section of the

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vaporizer taken on line 4—4 in Fig. 2 showing the disposition of the heater.

Fig. 5 is a horizontal section, taken on line 5—5 in Fig. 4.

Fig. 6 is a vertical cross-sectional view of a vaporizer unit of an alternative or modified form of construction.

Fig. 7 is an enlarged sectional view of the vaporizing unit of the device of Fig. 6.

Referring more in detail to the drawings—

First describing the device of Fig. 1: This comprises a suitable container 10 for a supply of the particular liquid solution or substance that is to be evaporated or vaporized. As here shown, the container is in the form of a conically tapered bottle, having a neck portion 11 of reduced diameter and exteriorly threaded to receive the mounting base 12 for a vaporizer unit.

The design of the container 10 may be varied. It may be made as desired or required to adapt it for any specific use, or to hold more or less liquid. Furthermore, the container might be made of glass, plastic, metal or any other suitable material. Preferably, it would be of an ornamental character.

The base member 12 of the vaporizing unit, in its present preferred form of design, is circular in plan and has a downwardly dished top surface. It is formed centrally in its bottom side, with an internally threaded socket into which the neck portion 11 of container 10 is threaded in a leak tight connection. Formed centrally of the member 12 is a circular hole or opening 15 designed for the passage of a wick as presently explained, whereby liquid from the container is supplied to the vaporizer.

The vaporizer of the unit comprises a vertically disposed tube 16 of aluminum supported coaxially of the base member 12, with its lower end portion downwardly extended into the hole or passage 15 of the base, with clearance thereabout as required for passage of the wick. The tube 16 is closed at its lower end, and it is rigidly supported from the base 12 by means of two small tubes 17—17 that extend radially from the tube 16 in opposite directions, at its lower end. The tubes 17—17 are open at their outer ends and serve to supply room air to the vertical tube 16. The tubes 17—17 are contained in the base member 12 as best shown in Fig. 4 and serve to functionally support the vaporizer elements. In a practical size for ordinary home use, the tube 16 would be about two and one-half inches long and one inch in diameter and the tubes 17 would be about 3/8 inch in diameter. These dimensions may be varied to suit various uses.

A wick 20 with tubular upper end portion 20' is fitted to the tube 16 and has its lower end portion longitudinally split or divided along opposite sides for passing at opposite sides of the tubes

17—17 and downwardly through the hole 15 into the container 10 to contact with the supply of liquid contained therein for vaporization. The tubular part of the wick fits snugly in the opening 15 through the base and prevents leakage or spill should the device be upset.

At its upper end the tube 16 has a spider 21 fixed therein. Supported by this spider, within and coaxially of the tube, is an electrical resistor 22. This is of tubular coil form and of substantially lesser diameter than the tube 16, and it is connected in an electric circuit as indicated in Fig. 1. The resistor 22 is supported by a bolt 24 that is applied coaxially therethrough with its upper end extended centrally through and fixed in the spider. The annular passage between the resistor and tube 16 provides for upflow of air through the tube as supplied through tubes 17—17. Threaded onto the upper end portion of the bolt 24, is a disk 25 adapted by rotation to be adjusted toward and from the open end of tube 16 as a means of controlling the upflow of air through tube 16 for regulating its heating and thus regulating the amount of vapor produced from the liquid in the heated part of the wick.

In using this device, assuming it to be constructed and assembled as described, first, a quantity of the selected liquid solution is placed in the container 10. Then the base member 12 of the vaporizing unit is threaded onto the neck of the receptacle. With the understanding that the central passage, or hole 15, is of such diameter as to closely receive the wick and lower end portion of tube 16, it will be apparent that there will be no leakage or evaporation possible through this passage nor will there be any spill even though the device is upset.

With the vaporizer unit so applied to the container liquid will be drawn to the upper portion of the wick as fitted about the aluminum tube 16. Then when an electric circuit is closed through the heater coil or resistor 22 it will become heated. Heat from the resistor is transmitted quickly to tube 16, thus to cause the production of vapor from the liquid contained in that part of the wick that surrounds the tube 16. The rate of vaporization may be regulated by controlling the flow of air through the tube 16 as supplied thereto by the tubes 17—17. This control of air is effected by adjusting the disk 25 toward or from the upper end of tube 16. If the disk is closed over the tube outlet, then no air flows through the tube and the heating effect of the resistor will reach its maximum and a maximum amount of vapor produced. The heating effect is reduced from this maximum in accordance with the flow of cold air through the tube, as permitted by adjustment to the disk 25 toward open position.

It will here be explained that a very satisfactory resistor for the present purpose is a present day 1000 ohm 20 watt radio resistor. This should be connected in an electric circuit, as ordinarily available for home lighting, through a variable resistance, as has been illustrated diagrammatically in Fig. 1. Such resistors are suitable, long wearing and inexpensive.

As an alternative construction, or what may be considered a modification of the device of Fig. 1, I have provided the vaporizing unit shown in Figs. 6 and 7. In this device the container 10a, for a liquid to be vaporized, may be like the container 10 previously described. Threaded onto its neck portion is a base 12x for mounting a vaporizing unit. This base is formed with a dished top sur-

face and it is provided across its center portion with a diametrically directed slot or passage 40 designed for the passage of a wick, as presently explained, whereby liquid from the container is supplied to the vaporizer.

Mounted upon the base member, is a tubular housing 41, preferably an aluminum tube about one inch in diameter. This tube is secured at its ends in seats 42—42 provided therefore in the top surface of the base member. The tube 41 is parallel with and directly above the slot 40 and looped about the tube is a wick 43, the opposite end portions of which pass down through the slot 40 and into the liquid contained in the receptacle.

Supported coaxially within the aluminum tube 41 is a heater in the form of a tubular resistance coil 45. A suitable heater for this form of device also is a present day 1000 ohm 20 watt radio resistor. This coil is about half the diameter of tube 16 and thus provides an annular air space 46 about it as has been shown in Fig. 7. The heater coil is connected in an electric circuit as diagrammatically illustrated in Fig. 6.

A chimney 47 is applied centrally to tube 41 at its top side and this has a cap 48 adjustably applied to its upper end for the purpose of regulating air flow through the tube as a means of regulating the heating of tube 41 and rate of production of vapor.

The use and advantage of this latter described device is substantially like that first described.

In each of its described forms the vaporizing unit is fitted with a dome or cover member 50 of conical form, adapted to rest at its lower end within a peripheral channel or seat 51 formed in the base members 12 or 12x. At its top end the cover is formed with a hole 52 for the outflow of vapors. These covers may be decorated in various ways, for example, as by the applying of fins 53 thereto, as shown.

Vaporizers of these kinds are effective and relatively inexpensive. The rate of vaporization may be regulated and no heat is conducted to the supply of liquid in the container which would have the effect of causing polymerization or thickening in the case of the use of glycol.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent is:

1. A vaporizer comprising a liquid container having a top opening, a heater base member mounted on the container over said opening and formed with a vertical opening therethrough in registration with the container opening, an open heater tube disposed vertically above and with its lower end portion centrally located in the opening of said base member with clearance between them, tubular supports for the heater tube extended horizontally into said base member and serving to admit outside air into the said heater tube at its lower end for upflow through the tube, a wick applied about said heater tube and extended through the said base and container openings into contact with liquid in said container, and a heater element disposed in said heater tube with clearance between them and a damper element applied to the upper end of the heater tube and adjustable to control the flow of outside air upwardly therethrough as a means of regulating the heating by its heater tube.

2. A vaporizer of the character described comprising a liquid container having a top opening surrounded by an upstanding neck, a heater base member threaded onto the container neck over

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said opening thereof and formed with an opening therethrough in registration with the container opening, a heater tube disposed vertically on the said base member with its lower end portion contained within the opening of the said base member, and providing an annular passage between them, an open air tube fixed in said base as a support for said heater tube and opening thereinto at its lower end, a wick applied about the heater tube and extended through said annular passage as a closure therefor and into contact with liquid in the container, a heater element located in the heater tube with clearance between them for an upflow of air through the heater tube, and a damper element adjustably mounted on the heater tube to be moved against and away from its open upper end to control flow of air therethrough as a means of heat control

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for the tube and a housing applied to the base member about the said heater tube and wick, and formed at its upper end with an opening for outflow of air and vapor.

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