April 29, 1952 L. W. WALLACE ET AL 2,595,029

VAPORIZER

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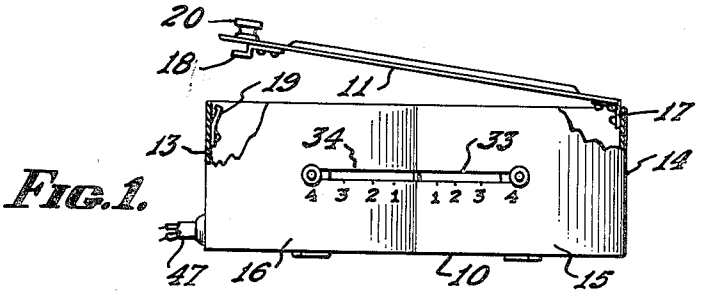


FIG. 1.

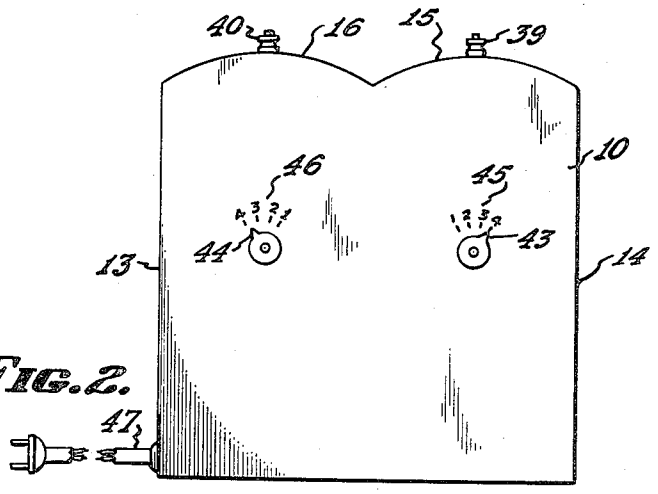


FIG. 2.

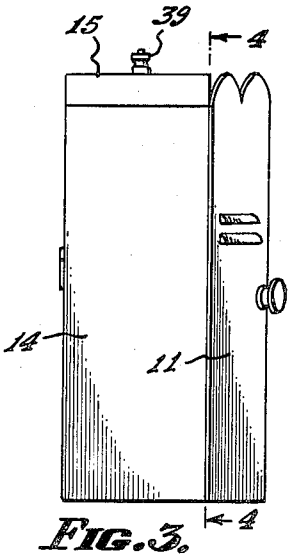


FIG. 3.

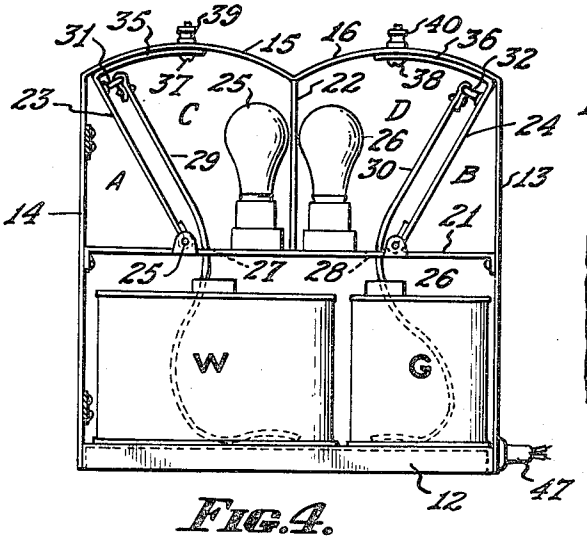


FIG. 4.

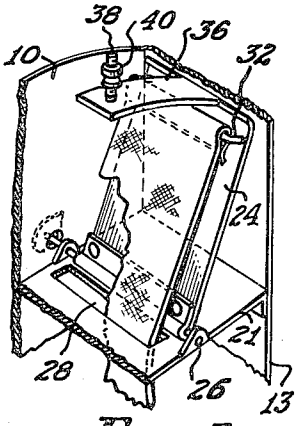


FIG. 5.

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VAPORIZER

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This invention relates to improvements in apparatus for conditioning air in rooms or other enclosures with deodorant, aromatic, therapeutic, antiseptic, germicidal or bactericidal agents in liquid form by vaporization, while at the same time maintaining in such room a desirable relative humidity. The word "room" which will be used for convenience hereinafter will be understood to include any enclosure which is to be conditioned, regardless of whether or not it is designed or intended for human occupancy.

Generally speaking, the object of the present invention is the provision of an improved, simple and inexpensive means for conditioning and sterilizing the air in a room with deodorant, aromatic, therapeutic, antiseptic, germicidal or bactericidal agents, or water, in liquid form by vaporization.

Another object of the present invention is the provision of an improved and efficient means for the control of the evaporization rate of liquid with which a room is to be conditioned.

Where the room is to be conditioned with triethylene glycol, for example, it is yet another object of the invention to provide means whereby the humidity in a room may be maintained above a predetermined level, since it has been found that the bactericidal activity of triethylene glycol is enhanced when the humidity is maintained above a certain level.

Yet another object of the invention is the provision of an apparatus of the class described above which is adapted for use with any type of means for heating the air in the room being conditioned. The apparatus according to the present invention is especially well suited to use with residential or office air heating or cooling systems.

In connection with the above mentioned object of providing improved control means for the evaporization rate, it is still another object to provide such control means in simple and inexpensive form and to provide control means whereby a wide range in evaporization rate may be achieved.

A still further object of the present invention is the provision of an apparatus for vaporizing concurrently, where desirable, two or more different deodorant, aromatic, therapeutic, antiseptic, germicidal or bactericidal agents, or water, in liquid form by vaporization. In connection with the last named object, it is yet another object of the invention to provide means whereby the vaporization rate of the different agents may be controlled independently.

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These and other objects of the invention which we shall point out in more detail hereinafter, or which will be apparent to those skilled in the art upon reading these specifications, we accomplish by that certain construction and arrangement of parts of which we shall now describe an exemplary embodiment.

Reference is made to the drawings forming a part hereof and in which:

Figure 1 is a plan view of a vaporizer according to the invention with parts broken away to show the construction;

Figure 2 is an elevational view of the same;

Figure 3 is an end elevational view of the same;

Figure 4 is an elevational view of the device with the door removed taken on line 4—4 of Figure 3;

Figure 5 is a fragmentary perspective view of one of the vaporizing chambers showing the displaceable partition and wick.

Briefly, in the practice of our invention we provide a casing with two compartments, the lower compartment is provided with space for a container for the liquid or liquids to be vaporized, and the upper compartment consists of an evaporating chamber for each of the liquids to be vaporized.

In the drawings we have shown a device arranged for the vaporization of two liquids. As for example, triethylene glycol and water. Thus we have shown in Figure 4 a reservoir for water and a reservoir for triethylene glycol. We have likewise shown two vaporizing chambers, one for the water and one for the triethylene glycol.

A wick extends from each of the reservoirs through apertures in the horizontal partition separating the upper and lower compartments of the casing and is attached to the upper end of a displaceable partition in the respective evaporating chamber which is immediately above the reservoir of the liquid to be vaporized.

The rate of evaporization of either liquid may be increased or decreased independently and as desired. If it is desired to increase the rate of vaporization the cubic capacity of the vaporizing chamber is reduced by moving the displaceable partition towards the source of heat, which concurrently brings the wick containing the liquid to be vaporized closer to the source of heat.

The rate of vaporization may be reduced by increasing the cubic capacity of the vaporizing chamber by moving the displaceable partition farther from the source of heat, which concurrently removes the wick farther from the source of heat.

It will be understood, of course, that the basic capacity of the unit can be varied by a change in the size of the heating element and by a change in the width or thickness of the wick. These two variables will normally be fixed in any given vaporizing apparatus. Nevertheless, the user will be able to change the rate of evaporation by adjustment of the displaceable partition to change the size of the vaporizing chamber and, concurrently the distance of the saturated wick from the heat source.

In the specific embodiment illustrated in the drawings we have provided two vaporizing chambers each with its own displaceable partition, each with its own wick, each also provided with its own heating element. A substance like triethylene glycol, or other desired deodorant, aromatic, therapeutic, antiseptic, germicidal or bactericidal agent in liquid form, may be vaporized at a predetermined rate from one of the vaporizing chambers, while water may be vaporized from the other vaporizing chamber at a rate calculated to obtain and maintain the desired relative humidity in the room being treated.

Referring now in more detail to the drawings I have shown a casing indicated generally at **10**. This casing has a front wall seen in elevation in Figure 2 and a rear wall in the form of a door **11**. It is provided with a base **12** and end walls **13** and **14**. In the particular example shown in the drawings the top is constituted by two arcuate members **15** and **16**. The door **11** may be suitably hinged as indicated at **17** in Figure 1, and may be provided with suitable cooperating latch elements **18** and **19**. A knob **20** is provided for opening and closing the door **11**.

Within the casing **10** we provide a partition or shelf **21** which generally divides the casing into an upper and lower compartment. The upper compartment is further subdivided by a partition **22**. The partition **22** divides the upper compartment of the casing into two chambers indicated generally at A and B. In each of the chambers A and B there is provided a displaceable partition member **23—24**. In the particular embodiment shown in the drawings the partitions **23** and **24** are displaceable by means of a hinged mounting about the pintles **25** and **26**.

Each vaporizing chamber is provided with a wick aperture in the member **21** as shown at **27**, **28**. Wicks **29**, **30**, pass respectively from containers W and G through the apertures **27**, **28** into the respective vaporizing chambers C and D. The partitions **23**, **24**, are provided with securing elements **31**, **32**, to which the ends of the wicks **29**, **30**, are respectively fastened. The container G may be a container or reservoir for triethylene glycol or other deodorant, aromatic, therapeutic, antiseptic, germicidal or bactericidal liquids, while the container W may be a reservoir for water. Since generally speaking it will be necessary to vaporize more water than other substance, we have shown the container W as being considerably larger than container G, so that they may both be filled at the same interval.

The top members **15** and and **16** are provided respectively with slots **33** and **34** which constitute egress apertures for the chambers C and D respectively. Each of the partitions **23**, **24** is provided with a plate **35**, **36** which is arcuate to conform with the configuration of the respective top members **15**, **16**. The plates **35**, **36** are adapted to cover a part or all of the respective slots **33**, **34**. To each of the plates **35**, **36**, there is secured a screw **37**, **38**, extending through the slots **33**, **34** and provided with a thumb nut **39**, **40**.

In operation triethylene glycol or other substance is drawn from the reservoir G by means of the wick **30** into the vaporizing chamber D. Similarly water is drawn from the reservoir W by the wick **29** into the vaporizing chamber C. The respective liquids are vaporized by heat from the heating members **25** and **26** and the vapors pass out through the slots **15**, **16**.

It will be observed that the rate of vaporization of either the triethylene glycol or the water can be adjusted independently. For example, if the nut **39** is loosened and the partition **23** is swung toward the right in Figure 4, it will be clear that three things are accomplished: First the cubic content of the chamber C is reduced; Second the distance of the wick **29** from the heat source **25** is reduced, and Third the area of the egress opening **15** is reduced. When these three factors are all concurrently reduced the vaporization rate is increased and will be at its maximum when the partition **23** is swung in a clockwise direction as far as it will go. In the position shown in Figure 4 with the egress aperture **15** wide open, with the cubic content of the chamber C as large as possible, and the wick **29** at its maximum distance from the heat source **25**, the vaporization rate will be at its minimum.

If desired pointers **43**, **44** may be provided to cooperate with suitable scales **45**, **46**.

Electric current to operate the heating elements is supplied through an electric cord **47** in conventional manner.

It will be understood that the vaporizer illustrated in the drawings has been shown by way of example only. It will be clear that various types of heating elements could be used instead of the individual electric light bulbs **25**, **26**. As a matter of fact, the device would function equally well with a single heating element arranged to heat both compartments and incorporated in the wall **22**. Similarly, it will be understood that the displaceable partitions **23**, **24**, could be displaced by a simple sliding movement rather than by a hinged movement. Likewise liquids other than triethylene glycol and water may be vaporized.

Fundamentally what we have shown and described above is a vaporizer wherein a vaporizing chamber is provided, together with means for varying concurrently the cubic content of the chamber, the proximity of the wick to the heat source, and the area of an egress opening whereby the vaporization rate may be controlled. We have also provided for a double vaporizing device whereby the humidity of a room may be controlled concurrently with the dissemination therein of a deodorant, aromatic therapeutic, antiseptic, germicidal or bactericidal liquid.

For the foregoing reasons we do wish to be limited in any way other than as described in the claims which follow.

Having now fully described our invention what we claim as new and desire to secure by Letters Patent is:

1. A vaporizer comprising a casing divided into at least two compartments, one a reservoir compartment of fixed volume, and the other a vaporizing compartment, a reservoir of liquid to be vaporized in said reservoir compartment, a displaceable partition in said vaporizing compartment providing on one side thereof a vaporizing chamber of variable cubic content, a heating element in said vaporizing chamber, a wick aperture communicating between said reservoir compartment and said vaporizing chamber, and a wick extending from said reservoir through said

wick aperture and into said vaporizing chamber and secured to said displaceable partition, whereby upon displacement of said partition the cubic content of said vaporizing chamber and the proximity of said wick to said heating element are varied concurrently, to vary the evaporation rate of said liquid.

2. A device according to claim 1, in which an egress aperture for vapors from said vaporing chamber is provided, and in which displacement of said partition also changes the area of said egress aperture.

3. A device according to claim 1, in which said partition is hingedly connected to a wall of said first mentioned compartment, the wall opposite said last mentioned wall being arcuate and having a radius substantially equal to the length of said partition.

4. A device according to claim 3, in which said arcuate wall is provided with a slot constituting the egress aperture and in which said partition is provided with a plate arranged to substantially close said egress aperture when said partition is moved to its limit position in the direction of reducing the cubic content of said vaporizing chamber.

5. A device according to claim 4 in which said plate is provided with means extending through said slot for adjusting and securing said partition.

6. A vaporizer comprising a casing divided into two compartments, one a reservoir compartment of fixed volume, and the other a vaporizing compartment, two reservoirs of liquids to be vaporized in said reservoir compartment, said vaporizing compartment being divided into two sections, a displaceable partition in each of said sections, each providing on one side thereof a vaporizing chamber of variable cubic content, means for heating said vaporizing chambers, two wick apertures communicating respectively between said reservoir compartment and each of said vaporizing chambers, and a wick extending from

each of said reservoirs through the respective wick apertures and into the respective vaporizing chambers and secured respectively to said displaceable partitions, whereby upon displacement of a partition the cubic content of the respective vaporizing chamber and the proximity of the respective wick to said heating means are varied concurrently, to vary the evaporation rate of the respective liquid.

7. A device according to claim 6, in which an egress aperture is provided for each vaporizing chamber, and in which displacement of the respective partition also changes the area of the respective egress aperture.

8. A device according to claim 6, in which each of said partions is hingely mounted on a wall of its respective section, the wall opposite said last mentioned wall being arcuate and having a radius substantially equal to the length of said partition.

9. A device according to claim 8, in which each of said arcuate walls is provided with a slot constituting the egress aperture, and in which each of said partitions is provided with a plate arranged to substantially close the respective egress aperture when the respective partition is moved to its limit position in the direction of reducing the cubic content of the respective vaporizing chamber.

10. A device according to claim 9, in which each of said plates is provided with means extending through its respective slot for adjusting and securing the respective partition.

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