Aug. 15, 1933. W. H. LAPP 1,922,771

VAPORIZING APPARATUS

Filed April 16, 1930 2 Sheets-Sheet 1

Fig. 1.

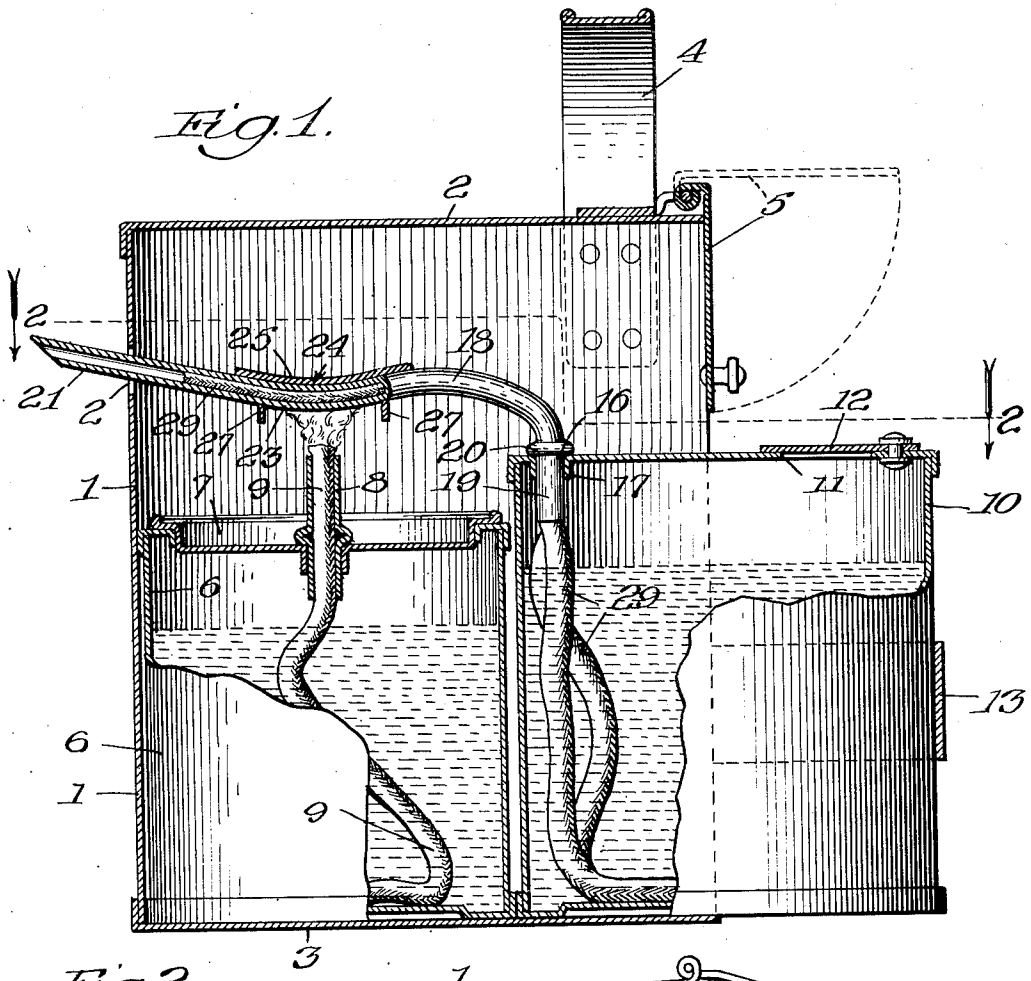
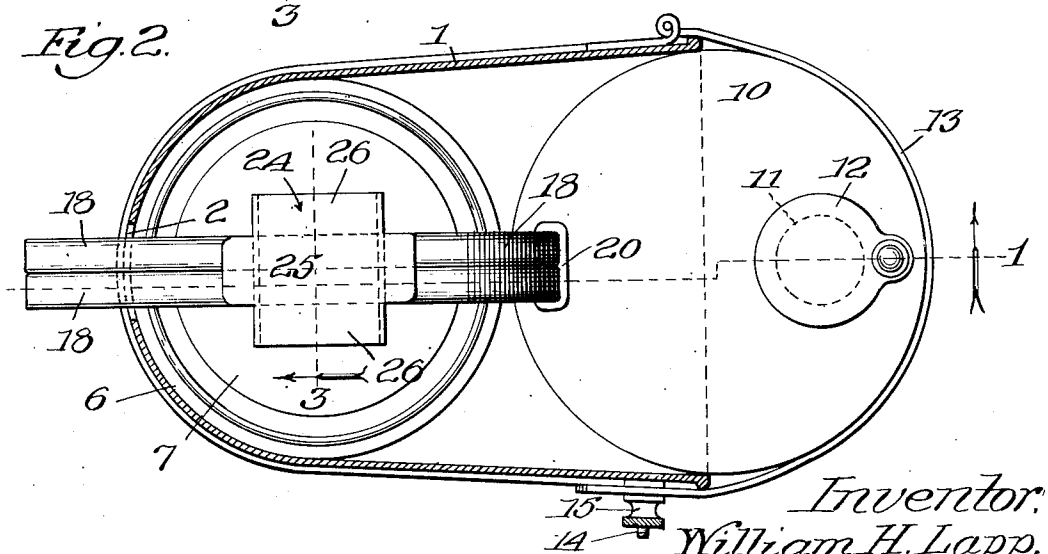


Fig. 2.



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Filed April 16, 1930 2 Sheets-Sheet 2

Fig. 3.

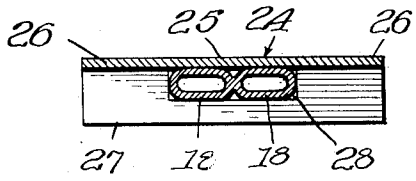


Fig. 5.

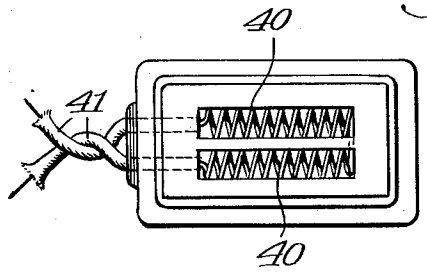
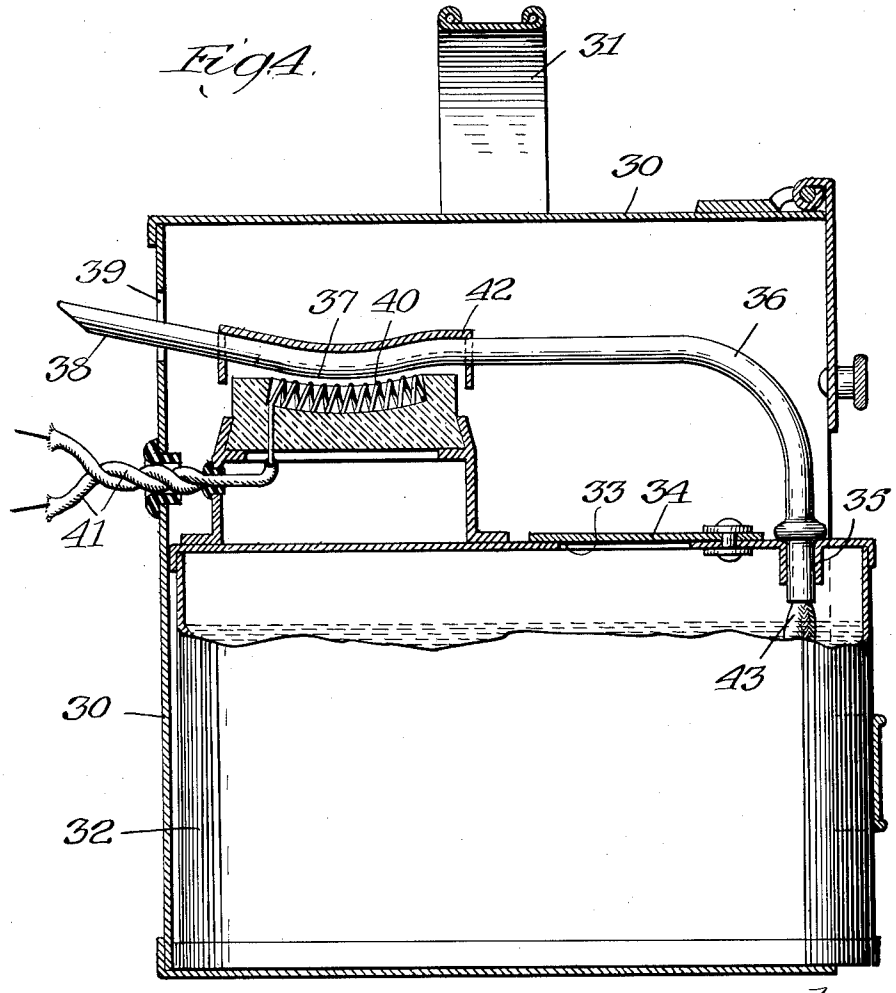


Fig. 4.



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Patented Aug. 15, 1933

1,922,771

UNITED STATES PATENT OFFICE

1,922,771

VAPORIZING APPARATUS

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Application April 16, 1930. Serial No. 444,844

3 Claims. (Cl. 126—350)

This invention relates to vaporizing or humidifying apparatus and more particularly to a type of apparatus adapted to yield a definite or predetermined amount of vapor.

One of the objects of the invention is to provide simple means for supplying a definite amount of vapor per unit of time. Another object is to provide simple apparatus by which the desired humidity may be secured with a minimum amount of heat. A further object is to provide portable apparatus of staunch and compact construction which is adapted to furnish a constant flow of vapor containing a uniform amount of moisture.

Further objects and advantages will appear as the specification proceeds.

The humidifying apparatus has been found to be particularly useful for supplying moisture for incubators and brooder houses for raising young chicks. The apparatus is also found desirable for use in cold storage rooms to supply the additional moisture required.

The invention is fully described in the following specification and shown in the accompanying drawings, in which

Figure 1 is a broken sectional view of apparatus embodying my invention; Fig. 2 is a sectional view, the section being taken as indicated at line 2 of Fig. 1; Fig. 3 is a sectional view, the section being taken at line 3 of Fig. 2; Fig. 4 is a broken sectional view of a modified form of apparatus; and Fig. 5 is a top plan view of a heating element employed in the modified form of apparatus shown in Fig. 4.

In the illustration given in Figs. 1, 2 and 3, 1 designates a large container of substantially U shape and having its top and bottom sides closed by walls 2 and 3, respectively. The rear side of the case or container 1 is left open. The member 1 is preferably provided with a handle 4 and a swiveled draft-controlling door 5. The door 5 is adapted to swing over a portion of the open rear side of the container 1.

Located in the forward portion of the container 1 is a closed fuel can or tank 6. The top wall 7 of the tank 6 is provided with a wick-thimble 8 adapted to support the wick 9 which extends down into the body of liquid within the vessel 6. Located behind the fuel tank 6 is a second closed tank 10 which is adapted to contain a liquid to be vaporized. The tank 10 is provided at its top side with an opening 11 through which liquid may be introduced into the tank and a swiveled top 12 adapted to close the opening 11. The tank 10 is secured in the container 1 by means of a metal band 13 which is fixedly secured to one side of container 1 and is releasably secured to the other side of the casing 1. The free end of the band 11 is perforated and adapted to receive a screw 14. A nut 15 is employed to secure the end of the band 3 in locked position.

The top wall of the tank 10 is provided near its forward side with an opening 16, the edges about the opening being spun downwardly to form an oblong flange 17.

A pair of discharge tubes 18 of copper, or other suitable metal, are provided near their inner end with vertical portions 19 adapted to extend through the flanged opening 16, and with a collar 20 adapted to engage the top wall of the tank 10. The tubes 18 are provided with spout portions 21 which are adapted to extend through an opening 22 in the front side of the casing 1.

The tubes 18 are preferably bent at an intermediate portion 23 to form a sag or depression.

A hood or baffle 24 is carried by the tubes 18 over the portion of the tube which lies above the wick 9. Preferably the bent or depressed portions 23 of the tubes 18 lie just above the wick 9 so that the flame from the wick will bear against the sagging or depressed portion of the tubes. The hood 24 comprises a main body portion 25 which extends along the top of the tubes 18, wing portions 26, and depending flanges 27. The flanges 27 are provided with a rectangular opening 28 adapted to receive the pair of tubes 18.

Each of the tubes 18 is provided with an asbestos wick 29 which extends into the liquid contained within tank 10. Preferably the wicks 29 are drawn into the tubes 18 to a point ahead of the bent or depressed portions 23.

In the operation of the apparatus, the parts are assembled by first introducing into the container 1, the fuel can 6, which has been filled with alcohol or other suitable fuel, and after the removable lid 7 has been sprung securely into position. The tank 10, after it has been filled with water or other liquid which it is desired to vaporize, is placed within the container next to the can 6 and the tubes 18 are extended through opening 22 in the front side of the container. The parts are so adjusted that the wick 9 lies just below the bent portions 23 of the tubes 18 and just below the hood 24. Tank 10 is then secured in position by extending the band 13 around the tank and securing the free end by means of nut 15 to the screw rod 14. The swinging door or damper 5 may be ad-

justed to give the proper draft through the apparatus. Preferably, the damper 5 almost reaches the tank 10 when it is in its lower position.

Wick 9 may now be lighted. The heat furnished by the fuel lamp is preferably just sufficient to vaporize the liquid conveyed to the depressed sections 23, so that a steady stream of vapor will flow from the spouts 21. As fast as the liquid is vaporized, the asbestos wicks 29, by capillary attraction convey liquid in definite quantity to the portion of the tubes just above the heating element. By having the wicks 29 extend beyond the portion 23, the vapor is prevented from carrying moisture in entrainment and in the form of bubbles or globules of water 4 out of the spout 21. In this respect, the portion of the wick ahead of the depressed portion 23 serves as a baffle to prevent entrainment. By having the tubes 18 bent at an intermediate portion 23, a trap is provided which will prevent liquid conveyed to this point by the wicks 29 from flowing back again into the tank 10.

If desired, the tank 10 may be filled with a liquid medicinal preparation and vaporized in the same manner as has been described for the supplying of moisture to a room.

In the modified form of apparatus illustrated in Figs. 4 and 5, 30 designates a container provided with a handle 31. In the lower part of the container is carried a liquid tank 32 which is equipped with an opening 33 and a swiveled cap 34 adapted to close the opening. The top wall of the tank 32 is provided with another opening 35 which receives a pair of tubes 36 similar to the tubes 18. These tubes are provided with a bent portion 37 and a spout portion 28 which extends through an opening 39 in the front wall of the container 30. Supported upon the forward top wall of the vessel 32 are electric resistance elements 40 which are preferably disposed just beneath the bent portion 37 of each tube. Electric wires 41 having suitable connections lead to the electric resistance elements 40. The tubes 36 carry a hood 42 similar to hood 24 adjacent the sagging or depressed portions 37.

The operation of the modified form of apparatus is substantially the same as is that of the apparatus shown in Figs. 2 and 3. Heat sufficient to provide ample vaporization of the liquid conveyed by the wicks 43 is provided by the electric resistance elements 40. If desired, the humidity of the room may be automatically controlled by use of a hygrometer or hydrostat of a well known type to control the heat furnished by the electric resistance elements 40.

In either form of apparatus, the wicks 43, in conjunction with the heating means employed furnish a steady stream of vapors. With the temperature remaining constant, the rate of moisture furnished to a room has been found to be substantially definite and uniform. The apparatus may operate continuously for days without requiring attention while furnishing to the room of a dwelling house, brooder house, etc., the required amount of moisture.

While in the illustration given, two vaporizing tubes have been shown, it is obvious that a single tube or a much greater number of tubes may be employed. It is also obvious that the number of container units may be multiplied without departing from the spirit of the invention.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

I claim:

1. A humidifier comprising a container closed on all sides except one and having an aperture in the wall opposite the open side, a fuel tank disposed within the container adjacent the apertured wall, a wick supported in said fuel tank, a water tank behind said fuel tank and partially closing said open side, a tube extending from said water tank over the wick from said fuel tank and through the aperture in said wall, a wick in said tube, and an adjustable draft controlling door hingedly secured to said receptacle adjacent the rear side thereof and co-acting with the top of said water tank to approximately close said open side.

2. A humidifier comprising a container closed on all sides except the rear side, the front wall of said container being provided with an aperture, a wick equipped fuel tank disposed in the front part of said container, a water tank adjacent the fuel tank and forming a closure for a portion of the open rear side of said container said water tank having water conducting means extending over said wick in vaporizing relation therewith, a releasable strap secured to said container and engaging the rear wall of said water tank, and a damper hingedly connected to the rear of the top wall of said container and co-acting with the top of the water tank to approximately close the said open rear side.

3. A humidifier comprising a container closed on all sides except one and having an aperture in the wall opposite the open side, a fuel tank disposed within the container adjacent the apertured wall, a wick supported in said fuel tank, a water tank behind said fuel tank and partially closing said open side, a tube extending from said water tank over the wick from said fuel tank and through the aperture in said wall, a wick in said tube, and an adjustable draft-controlling door secured to said receptacle adjacent the rear side thereof and coacting with the top of said water tank to approximately close said open side.

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