

July 21, 1931.

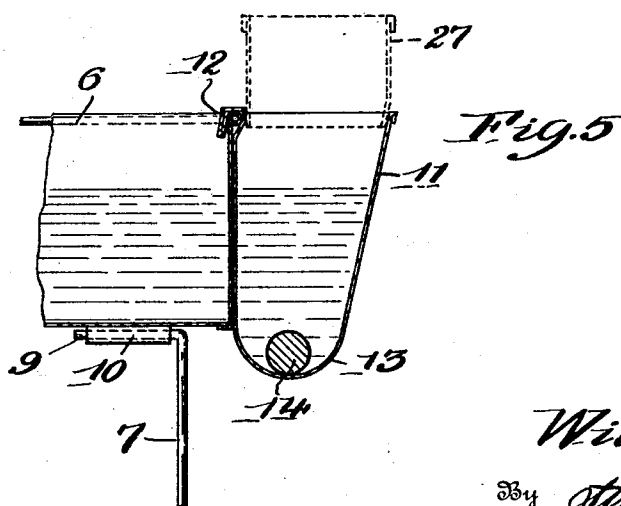
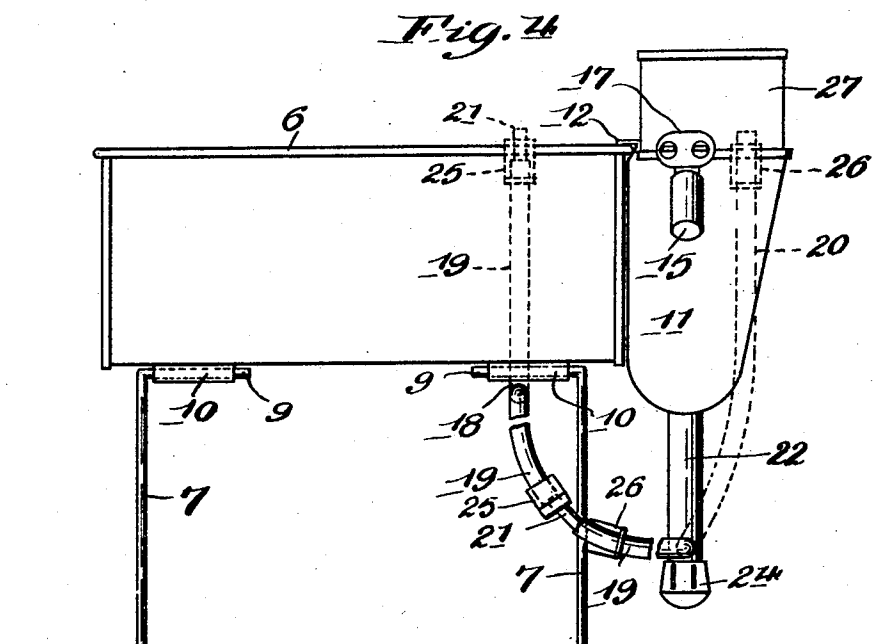
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1,815,318

VAPORIZER

Filed March 1, 1928

2 Sheets-Sheet 2



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VAPORIZER

Application filed March 1, 1928. Serial No. 258,353.

This invention relates to improved means for supplying the air in the room of a patient with vaporized medicants for treatment through the respiratory organs.

It is my object to provide a simple and inexpensive device of this kind adapted to operate for long periods of time with safety and without requiring an attendant or attention of any kind, and at the same time employ a small boiler and heating unit adapted to rapidly vaporize liquid and minimize the time required to initially bring the liquid in the boiler to boiling temperature.

Other objects are to facilitate cleaning the device after use and to reduce the cost of the device by eliminating all valves. The invention also includes certain other novel features of construction which will be more fully pointed out in the following specification and claims.

In the accompanying drawings Figure 1 is a plan view of my device with the connections between the boiler and reservoir broken or opened for separation of the boiler and reservoir; Fig. 2 is a vertical section taken on the line 2-2 of Fig. 1, but showing the connections completed as in operation; Fig. 3 is a detail perspective view of the removable boiler extension; Fig. 4 is a side view of the device and Fig. 5 is a fragmentary section taken on the line 5-5 of Fig. 1.

As shown in the drawings, I provide a reservoir 6 for water or other liquid. This reservoir has an open top and is elevated on suitable legs 7. The legs are preferably formed from heavy gauge wire bent to form horizontal foot portions 8 (Fig. 2) and attaching portions 9 on their upper ends which are removably inserted in sockets 10 secured to the bottom of the reservoir 6. A boiler 11 having an open top is supported upon one side of the reservoir 6 being formed with a flange 12 along one upper edge. As best shown in Figs. 1 and 5 the flange 12 is bent into hook shape to engage the upper edge of the reservoir 6. The boiler 11 is formed with a rounded bottom 13 projecting somewhat below the bottom of the reservoir 6. Within the bottom of the reservoir I prefer to place an electric heating element 14 of

the common immersion type having a goose-neck handle 15 projecting above the liquid in which it is immersed. Suitable connections for electric current wires 16 (Fig. 1) are provided on a branch 17 of the handle 15 which projects from an end of the boiler.

To transmit liquid from the reservoir 6 to the boiler 11 I provide a rigid L-shaped pipe 18 communicating with the bottom of the reservoir, flexible tubes 19 and 20 connected by a coupling 21 and a rigid vertical pipe 22 communicating with the bottom of the boiler 11. This vertical pipe 22 is of larger size than the other connections and has a laterally projecting nipple 23 adapted to receive one end of the flexible tube 20. A removable cap 24 on its lower end is arranged to facilitate cleaning the pipe 22. The rigid coupling 21 is merely a straight section of small pipe fitting snugly into the ends of the flexible tubes 19 and 20. Secured near the ends of the tubes 19 and 20 adjacent to the coupling 21 are hooks 25 and 26 respectively adapted to engage the upper edges of the reservoir 6 and boiler 11 as hereinafter described. A removable extension 27, open at its top and bottom, is adapted to be mounted on the top of the boiler 11 to prevent splashing when the liquid contents are agitated as by violent boiling. This extension 27 is formed to fit snugly into the top of the boiler and has at one end a notch 28 arranged to receive the handle 15.

In use, assuming that the device is assembled as shown in Figs. 2 and 4, the reservoir and boiler are charged with liquid and the heating element 14 placed in operation so as to heat the contents of the boiler. The liquid is quickly brought to a boil and as it is vaporized is replaced by water (or other liquid) from the reservoir 6. The flow is by gravity through the connections 18, 19, 20, 21, 22 and 23 into the bottom of the boiler. Obviously the liquid is substantially upon the same level in the boiler as in the reservoir when the apparatus is started. Starting with an equal level in the two vessels, this level is reduced by boiling in the boiler, and after reduction has taken place, the level is reestablished by gravity flow. On account of the lighter

weight of the hot water, and, furthermore, on account of the bubble content of same, the water stands slightly higher in the boiler than it does in the reservoir and yet flows from the reservoir to the boiler.

Flow of liquid from the boiler back into the reservoir is prevented by my arrangement of piping. Thus as the water is heated in the bottom of the boiler and is vaporized it is replaced by a rising column of cool water in the pipe 22. Flow in the reverse direction is prevented because as the liquid is vaporized and driven off from the top of the boiler a continuous flow toward the boiler through the connections with the reservoir is maintained and the hot water will not flow down through the colder water in the pipe 22. By my arrangement of pipes, I form what may be termed a "cold water seal" for the connection between the reservoir and boiler. This is an important feature of my invention. If medicant from the boiler 11 were transmitted back through the connections into the reservoir stoppage of the connections and fouling of the reservoir would be apt to result. I have found that stoppage of the connections and fouling of the reservoir is particularly troublesome where a thick or gummy medicant, such as benzoin, is used in the boiler. A quantity of such a medicant is commonly placed in a relatively large volume of water so that with my device pure water is supplied to the reservoir and the medicant in the boiler cannot reach the reservoir or small connections. To further insure against the stoppage of the small connections between the boiler and reservoir I provide the upright receiver and connecting nipple 23 located substantially below the bottom of the boiler. The receiver pipe 22 is sufficiently large to insure against stoppage even when a gummy medicant reaches the upper portions thereof and by reason of my arrangement for maintaining upward flow in this pipe 22 the medicant is prevented from reaching the nipple 23 or small pipes connected thereto.

After use the boiler may be quickly and easily removed from the reservoir for cleaning. To break the connections where some liquid remains in the boiler and reservoir after use, the coupling 21 is merely elevated above the level of the liquid and the tubes 19 and 20 are then separated at said coupling. Now the hook 25 is placed in engagement with the upper edge of the reservoir 6 and the hook 26 is secured upon the upper edge of the boiler 11, as shown in dotted lines in Fig. 4, to prevent escape of the liquid from either of said tubes. Enough clearance is allowed between the extension 27 and boiler to permit insertion of the hook 26. I thus obviate the necessity for one or more valves in the connections. Further, by eliminating all valves I promote safety in the operation of the device because where valves are provided

there is danger that the operator may leave one closed with consequent failure of the apparatus to replenish the boiler and destruction of the heating element when the liquid in the boiler is exhausted. It will now be understood that the extension 27, heating unit 14, cap 24 and the tube 20 may be removed from the boiler to facilitate the cleansing operation or removal of the residue from the medicant.

Having described my invention what I claim is new and desire to protect by Letters Patent is:

1. A portable vaporizer comprising a reservoir open at its top, an open boiler of relatively small size having its bottom projecting below said reservoir, connections for delivering liquid from said reservoir to said boiler, said connections including a rising member communicating at its upper end with the boiler below the reservoir, and means for heating said boiler to vaporize the contents thereof, said connections being arranged to allow flow by gravity from said reservoir to said boiler and to maintain the liquid in said boiler at substantially the same level as that in said reservoir.

2. A vaporizer comprising a reservoir, a boiler supported upon said reservoir, an upright unheated receiver for liquid communicating with said boiler at its upper end, connections adapted to deliver liquid from the reservoir to said receiver, said connections having passages therethrough of smaller size than the passage through said receiver, and means for heating the contents of said boiler to vaporize the same, said connections being arranged to maintain the liquid in said boiler at substantially the same level as that in said reservoir.

3. The vaporizer specified in claim 2 in which said receiver projects downward from the bottom of said boiler and said connection communicates with said receiver at a point removed from the boiler.

4. A portable vaporizer comprising, a reservoir open at its top, a boiler supported upon said reservoir, means for heating the contents of said boiler to vaporize the same and connections arranged to allow flow by gravity from said reservoir to said boiler comprising, at least two flexible sections normally joined by a rigid coupling and adapted to be separated at said coupling, said sections severally communicating with the reservoir and boiler, and means for supporting the free ends of said sections upon the reservoir and boiler above the level of liquid therein when separated at said coupling.

5. A vaporizer for medicants and water comprising a reservoir for water, a boiler for water and medicants, connections adapted to deliver water from said reservoir to said boiler, means for heating the contents of said boiler to vaporize the same and a cold

water seal in said connections immediately adjoining said boiler whereby flow and diffusion of hot liquid from the boiler into said connections and reservoir is prevented.

5 In testimony whereof, I have hereunto signed my name to this specification.

WILLIAM C. KOCH.

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