No. 830,889. PATENTED SEPT. 11, 1906.

C. J. DAVOL.

ATOMIZER.

APPLICATION FILED JUNE 23, 1905.

Fig. 1.

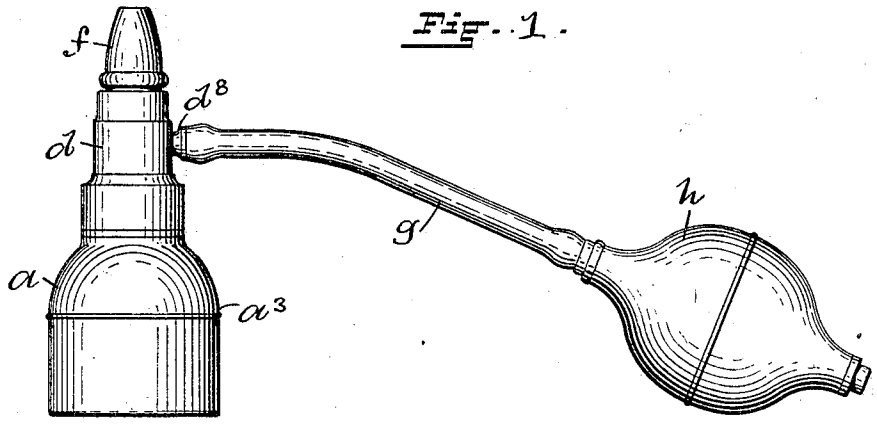


Fig. 2.

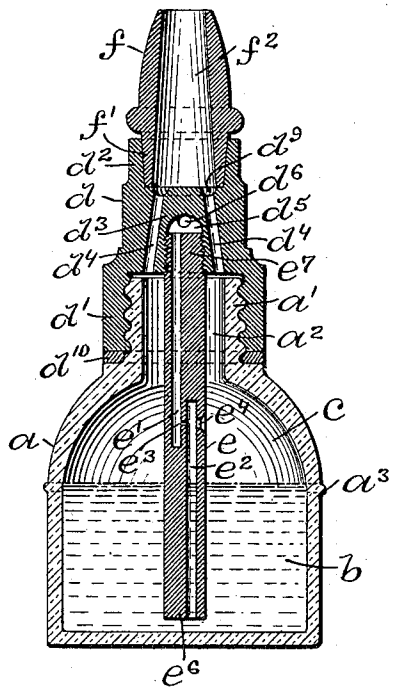


Fig. 3.

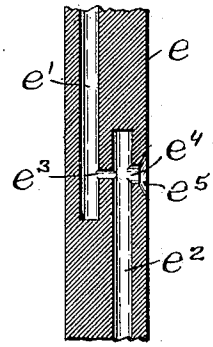
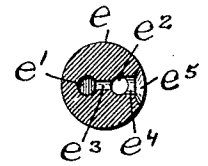


Fig. 4.



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ATOMIZER.

No. 830,889. Specification of Letters Patent. Patented Sept. 11, 1906.

Application filed June 23, 1905. Serial No. 266,559.

To all whom it may concern:

Be it known that I, CHARLES J. DAVOL, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Atomizers, of which the following is a specification.

This invention has reference to an improvement in atomizers whereby a liquid is vaporized before leaving the atomizer.

Atomizers as heretofore constructed vaporize the liquid at the point of exit of the liquid from the atomizer. The perfect vaporization of the liquid in this form of atomizer depends largely on the condition of the atmosphere into which the liquid is vaporized.

The object of my invention is to more perfectly vaporize a liquid in an atomizer than has heretofore been done, and I accomplish this object by providing an atomizer with a chamber into which the liquid is vaporized and with means for ejecting the vaporized liquid from the chamber into the atmosphere.

Figure 1 is a side view of my improved atomizer, showing the usual rubber air-bulb and tube connected to the atomizer for operating the same. Fig. 2 is an enlarged vertical sectional view taken centrally through the atomizer on a line with the outlet-ducts. Fig. 3 is an enlarged detail sectional view of the atomizing-tube, taken lengthwise through the tube on a line with the air and liquid ducts; and Fig. 4 is an enlarged transverse sectional view through the atomizing-tube, taken on a line through the opening in the tube.

In the drawings, *a* indicates the body forming the liquid-reservoir *b* and the vaporizing-chamber *c*, *d* the head, *e* the atomizing-tube, *f* the nozzle, *g* the rubber tube, and *h* the rubber air-bulb, of my improved atomizer.

The body *a* is in the form of a bottle made of glass or other suitable material and shaped to form the liquid-reservoir *b*, the dome-shaped vaporizing-chamber *c* above the reservoir, the screw-threaded neck *a'*, forming the mouth a^2 for filling the reservoir *b* with liquid and through which the vaporized liquid is ejected from the chamber *c*, and the annular bead a^3, formed on the body *a* at the intersection of the reservoir *b*, and the chamber *c* to indicate the height to which the reservoir is to be filled, as shown in Figs. 1 and 2.

The head *d* is constructed, preferably, of hard rubber and shaped to have the internal screw-threaded lower end *d'* for the screw-threaded neck *a'*, the internal tapered upper end d^2 for the nozzle *f*, the intermediate wall d^3, in which is the vertical outlet-ducts d^4 d^4, the air-chamber d^5, extending downward through the wall d^3, the air-inlet duct d^6, leading from the fitting d^8 on the outside of the head *d* to the air-chamber d^5, and the circular groove d^9 in the upper face of the wall d^3, intersecting the outlet-ducts d^4 d^4. A washer d^{10} is placed intermediate the lower end *d'* of the head *d* and a ledge on the body *a* at the base of the neck *a'*, as shown in Fig. 2.

The atomizing-tube *e* is made, preferably, of hard rubber and constructed to have the air-inlet duct *e'*, the liquid-inlet duct e^2, the small air-outlet duct e^3, connecting the inner ends of the air and liquid ducts, and the side outlet-opening e^4, extending outwardly from the liquid-duct e^2 opposite the air-outlet duct e^3 and having the outwardly-flaring mouth e^5, as shown in Fig. 3. The atomizing-tube *e* is held in its operative position with the lower end e^6 in the reservoir *b* and the outlet-opening e^4 in the vaporizing-chamber *c* by screwing the upper end e^7 into the air-chamber d^5 in the head *d*, as shown in Fig. 2, thus connecting the air-duct *e'* with the air-chamber d^5 and the liquid-duct e^2 with the liquid-reservoir *b*.

The nozzle *f* is made, preferably, of hard rubber and constructed to have the tapered lower end *f'* adapted to fit in the internal tapered upper end d^2 of the head *d* and the contracted outlet-duct f^2, as shown in Fig. 2.

In the use of my improved atomizer the reservoir *b* is filled with the liquid to be vaporized through the mouth a^2 and the head *d* with the vaporizing-tube *e* and the nozzle *f* secured by screwing the head onto the neck *a'* of the body *a*, as shown in Fig. 1. Air is now forced into the air-chamber d^5 through the tube *g* and inlet-duct d^6 by squeezing the rubber air-bulb *h* or from any source of air-supply under pressure. The air under pressure passes down the inlet-duct *e'* in the atomizing-tube *e*, then through the outlet-duct e^3, across the liquid-inlet

duct e^2, and out through the side opening e^4. This forms a partial vacuum in the liquid-inlet duct e^2 above the liquid, which sucks the liquid up into the path of the air, when it is blown through the opening e^4 into the vaporizing-chamber c in the form of a spray, which vaporizes in the vaporizing-chamber c. The vapor from the vaporizing-chamber is now forced upward through the mouth a^2, the ducts d^4 d^4, and the duct f^2 in the nozzle f, from which it is ejected into the atmosphere in the form of a perfect vapor. When a heavy volatile liquid is used, the vapor has the appearance of a cloud of smoke. Any condensation of the vapor in the nozzle f will collect in the groove d^9 and flow from the same through the ducts d^4 d^4, the mouth a^2, and the vaporizing-chamber c to the reservoir b, thus preventing waste of the liquid and assuring cleanliness in using the atomizer. It is evident that the nozzle f may be of any length or shape desired without materially affecting the spirit of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

An atomizer comprising a body, a head secured to said body and extending thereabove, said head being formed with an intermediate wall provided with vertical outlet-ducts, and with a circular groove intersecting said ducts, said wall being formed with an air-chamber which terminates in a lower threaded portion, an atomizing-tube having its upper end threaded into said air-chamber and supported from said wall, said tube being formed with a pair of oppositely-disposed ducts having their inner ends in communication with one another, the lower of said ducts having an outlet-opening.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES J. DAVOL.

In presence of—
ADA E. HAGERTY,
J. A. MILLER, Jr.