No. 648,656. Patented May 1, 1900.

A. DE VILBISS.

ATOMIZER.

(Application filed Mar. 17, 1899. Renewed Mar. 8, 1900.)

(No Model.)

Fig. 1.

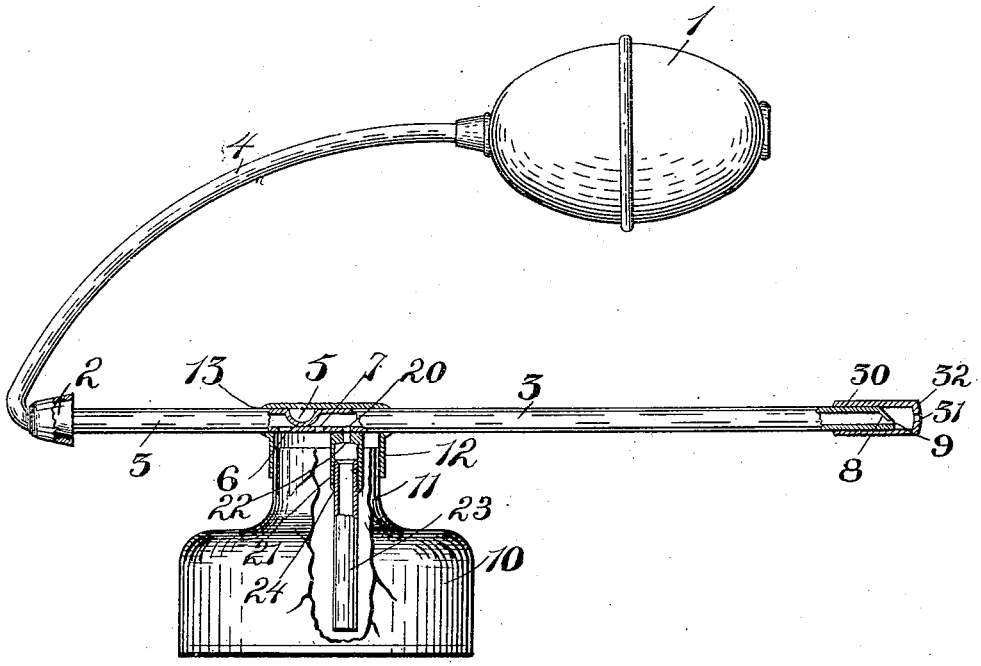
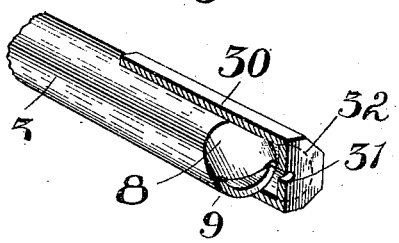


Fig. 2.



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ALLEN DE VILBISS, OF TOLEDO, OHIO.

ATOMIZER.

SPECIFICATION forming part of Letters Patent No. 648,656, dated May 1, 1900.

Application filed March 17, 1899. Renewed March 8, 1900. Serial No. 7,931. (No model.)

To all whom it may concern:

Be it known that I, ALLEN DE VILBISS, a citizen of the United States, and a resident of Toledo, Lucas county, State of Ohio, have invented certain new and useful Improvements in Atomizers; and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with claims particularly specifying the novelty.

This invention relates to atomizers; and the object of the same is to produce an improved atomizer which can be manufactured at a minimum of expense and yet will meet all requirements demanded of the ordinary instrument.

To this end the invention consists, primarily, in the simple means of connecting and supporting the pipes and in the specific form of nozzle employed, and, secondarily, in details of construction which coöperate therewith to produce an efficient whole.

The same is fully described in the following specification and shown in the accompanying drawings, wherein—

Figure 1 is a general side elevation of the atomizer with certain parts in section; and Fig. 2 is an end view in detail, showing half of the cap in full lines and half of the interior portion of the nozzle in section.

Similar numbers refer to the same parts in both views.

Referring by numerals to the said drawings, 1 is a bulb or any other equivalent source of air-supply, and 2 is the head of the main tube 3, onto which the delivery-pipe 4 from the air-supply is fastened. At some suitable point within its length the body of this (preferably metallic) tube is pinched or depressed from its upper side, as at 5, so as to close the opening therethrough and form a partition or dividing-wall between its end portions. At either side of this wall are inlet and outlet apertures 6 and 7, respectively, and formed in the lower side of the tube adjacent the outlet-aperture is a third aperture 20. At one end is the head 2, above mentioned, and at the other end the upper side of the tube is depressed, as at 8, so as to leave an outlet-port 9 at the lower side only of the tube at this end.

The numeral 10 designates the reservoir, (usually a bottle, as of glass,) and 11 is its neck, whereon is mounted the stopper 12, having a transverse opening 13, of a size to receive the tube 3. This reservoir is of any desired size, shape, and material, and its stopper is only necessarily constructed in such a manner as to coöperate with the parts already described.

Secured to the tube 3 is the liquid-pipe, consisting of the member 21, with an aperture 22 in its end registering with that numbered 20 in the tube 3, and the member 23, extending from near the bottom of the reservoir 10 upward and adjustably secured at 24 (as by threads) to said member 21.

Obviously other details of construction may be employed without departing from the spirit of my invention.

In connection with the above parts I preferably employ a nozzle, constructed as now set forth.

30 is a cap substantially square on its exterior and having an axial outlet 31 in its closed end 32, while this cap is on its interior of a shape to fit upon the end of the round tube 3 with some considerable degree of friction. This cap, like other parts of my device, may be of any desired size, shape, and material, and considerable change in the exact construction thereof may be made without departing from the general idea.

In construction and use the reservoir or bottle 10 is first brought into play and filled. The main pipe 3 is then inserted through the opening in the stopper, the liquid-pipe 21 23 brought into place and connected therewith, and the stopper fitted upon the neck. The source of air-supply is then attached, and, finally, the cap is adjusted to the delivery end of the main tube 3. The body or reservoir being partially filled with the liquid from which it is desired to atomize the contents to the patient, pressure is applied to the bulb or other source of air-supply. This drives air into the tube 3 through the inlet 6 into the body 10 upon the liquid therein, out the outlet 7, and along the tube 3. The pressure thus set up upon the liquid standing within the body 10 will cause a small portion thereof to rise through the liquid-pipe 21 23, which, passing out the aperture 20, will mingle with the air flowing along the tube 3 and be de-

livered out the nozzle. Here again the specific construction of parts is advantageous, for as the mixed air and liquid passes out the port 9, which is at the lower side of the tube 3, it is trapped within the chamber formed by the cap 30 beyond the port 9 and is delivered in a fine spray at and through the outlet 31, and any drops or particles of liquid that would under ordinary circumstances accumulate within the cap 30 or at the outlet-port 9 are dissipated and disintegrated by the blast of air. The construction of parts is intended to be such that the space within the cap beyond the port 9 permits the air and liquid to be so commingled that when passing out the outlet 31 it will be in a perfect spray. Furthermore, this space is so small and trivial that no appreciable amount of liquid can remain therein without being blown out of the nozzle by the blast of air therethrough. I preferably construct the cap with a square or angular exterior in order that it can be adjusted axially upon the tube 3 to regulate its action in connection with the delivery-port 9 thereof. The adjustable connection between the members 21 and 23 of the liquid-pipe is obviously for the purpose of permitting the lower member to be moved to a proper depth within the liquid in the bottle or to be replaced by other members when desired.

I call especial attention to the fact that the reservoir 10 has a neck 11 of glass and the stopper 12 is of light sheet metal, (preferably brass,) so shaped and proportioned that when slipped onto said neck it accommodates itself to all irregularities therein, so as to make a substantially if not perfectly air-tight joint between these parts. This detail of construction I consider essential in an atomizer, for the reason that while some air-tight joint must be formed between the neck and stopper this small arrangement accomplishes the end in view in a quick and efficient manner without the use of a cork or its equivalent and yet leaves the parts capable of separation when desired.

What is claimed as new is—

1. In an atomizer, the combination with the liquid-reservoir having an open-topped neck, and a stopper fitting thereon and having a transverse opening; of a straight air-tube extending transversely and completely through said opening and having three apertures within the stopper, a source of air-supply at one end of the tube, a nozzle at the other end, a partition within the tube between two of its apertures, and a liquid-pipe within the reservoir leading to the third aperture, all as and for the purpose set forth.

2. In an atomizer, the combination with the liquid-reservoir, a stopper therefor having a transverse through-opening, and a liquid-pipe; of a metallic air-tube extending through said opening and having the material thereof depressed from its upper side to close its body, inlet and outlet apertures in the lower side of this tube on opposite sides of said depression, connections between the liquid-pipe and air-tube, and at opposite ends of the latter a source of air-supply and a nozzle, all as and for the purpose set forth.

3. In an atomizer, the combination with the liquid-reservoir, the single tube crossing its upper end and having in its under side air inlet and outlet and liquid-outlet, and the bulb and nozzle; of a liquid-pipe comprising an upper member secured at right angles to the lower side of the air-tube over its liquid-outlet and a lower member screwed to the upper member and standing within the liquid, as and for the purpose set forth.

4. In an atomizer, the combination with the main tube having an outlet-port eccentric to its axis, the reservoir, and means for forcing mixed air and liquid along said tube; of a cap angular on its exterior and cylindrical interiorly so as to fit adjustably on the delivery end of said tube, the closed outer end of said cap having an axial and central exit-opening, substantially as described.

5. The combination with the main delivery-tube of an atomizer depressed at its upper side at the delivery end so as to leave a port at the lower side thereof; of a cap fitting around and beyond such end so as to form a chamber, and an exit-aperture in the axial center of the outer end of the cap, as and for the purpose set forth.

In testimony whereof I have hereunto subscribed my signature this 14th day of March, A. D. 1899.

ALLEN DE VILBISS.

Witnesses:
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