No. 675,180. Patented May 28, 1901.

J. WALDMAN.

ATOMIZER.

(Application filed Feb. 8, 1901.)

(No Model.)

Fig: 1.

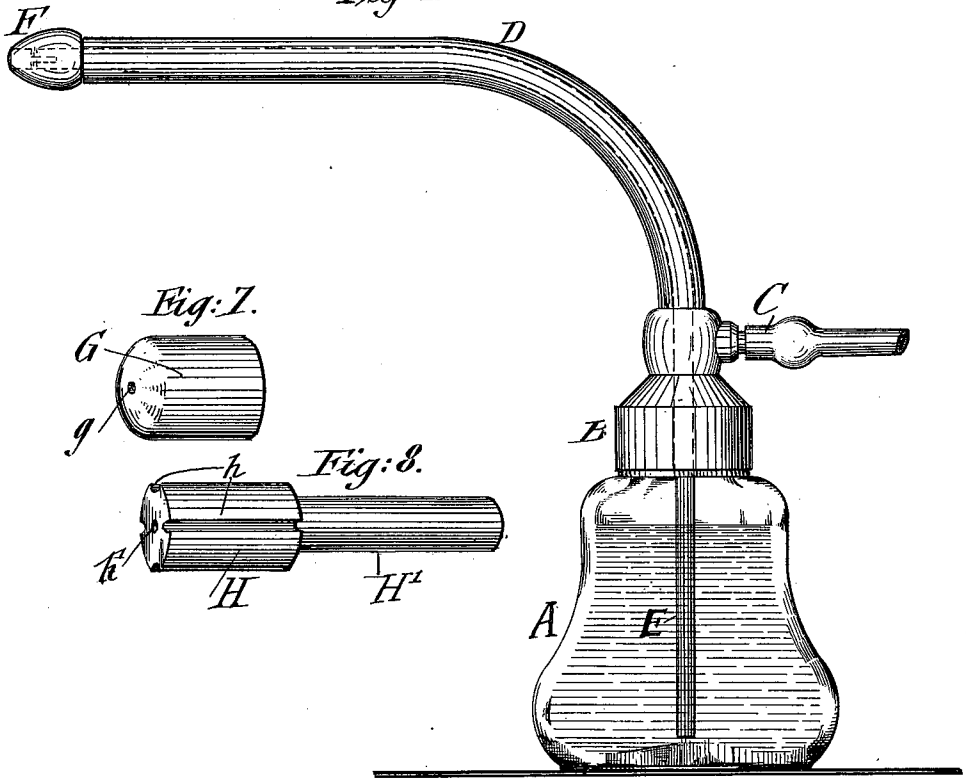
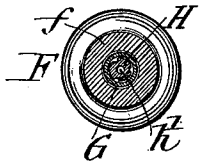


Fig: 7.

Fig: 8.

Fig: 4.



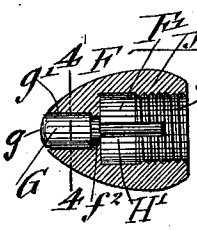


Fig: 2.

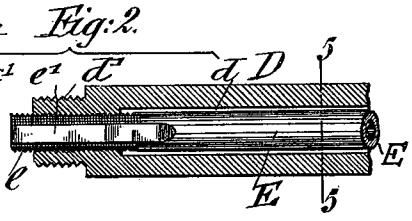


Fig: 5.

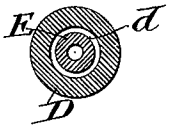


Fig: 6.

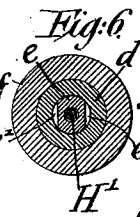
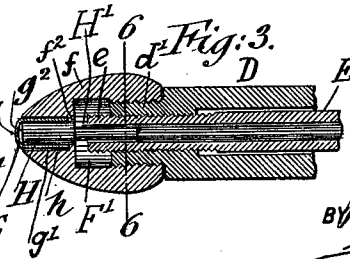


Fig: 3.



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UNITED STATES PATENT OFFICE.

JACOB WALDMAN, OF NEW YORK, N. Y.

ATOMIZER.

SPECIFICATION forming part of Letters Patent No. 675,180, dated May 28, 1901.

Application filed February 8, 1901. Serial No. 46,524. (No model.)

To all whom it may concern:

Be it known that I, JACOB WALDMAN, a citizen of the United States, residing at New York, borough of Manhattan, and State of New York, have invented certain new and useful Improvements in Atomizers, of which the following is a specification.

My invention relates to atomizers which are used for spraying medicinal, perfuming, disinfecting, and other liquids; and the object of the invention is to enable the throwing of an extremely fine or nebulous spray through a specially-constructed spray-nozzle, the invention being applicable to nozzles shaped for any meatus.

My invention consists of a spray nozzle or cap for atomizers, which comprises a tip, an apertured capsule fixed in the tip, and a grooved plug set in the capsule and provided with an insertion-stem, said plug and its stem being provided with a longitudinal bore or passage and the spray-nozzle being constructed for application to the air and liquid tubes, so that streams of spraying-air may pass through the grooves of the plug to reach the liquid flowing through the passage of the plug, and thereby eject the liquid in a fine spray or cloud from the apertured capsule, all as will be hereinafter described and then particularly claimed.

In the accompanying drawings, Figure 1 is a side elevation of the ordinary atomizer provided with my improvements. Fig. 2 is a longitudinal section showing my spraying-nozzle and the air and liquid tubes separated, parts being in elevation. Fig. 3 is a longitudinal section of the same parts connected. Fig. 4 is a section on line 4 4, Fig. 2. Fig. 5 is a section on line 5 5, Fig. 2. Fig. 6 is a section on line 6 6, Fig. 3; and Figs. 7 and 8 are respectively perspective details of the capsule and plug.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A indicates the liquid vessel, to which is attached the usual head B, from which the pressure-bulb tube C extends and from which also the air-tube D of suitable shape extends.

E indicates the small liquid-tube, suitably fixed within the tube D and the vessel A, so that the pressure of air on the surface of the liquid will force the liquid through the liquid-tube E, while simultaneously the air is forced outwardly through the annular space d between the tubes D and E. As generally constructed the liquid-tube E is screw-threaded at its outer end at e and screwed into the air-tube D, the screw-threaded portion e of the tube E being flattened at e' to provide two ducts, as shown clearly in Fig. 6. The outer air-tube D is formed with a screw-threaded neck d'.

In the present invention the spraying nozzle or cap F is specially constructed and is composed of a hard-rubber tip or cap f, having an interior screw-thread at f' to screw upon the threaded neck d' of the air-tube D.

G indicates a thin sheet-metal capsule, preferably of aluminium, provided with a minute aperture g, and into which is fitted a plug H, which is provided with a stem H', that projects beyond the edge of the said capsule. The outside of the plug H is provided with longitudinal grooves h, forming air-passages, and both the plug and its stem are provided with a longitudinal bore or passage h'. To apply the capsule G with its plug H to the hard-rubber tip f, the latter is subjected to heat, so as to expand its central hole g', and the capsule is then pushed into the hole g' until its apertured end g is slightly in advance of the tip. On cooling the tip f contracts upon the capsule G and this in turn upon the plug H, so that thereby the tip, capsule, and plug are firmly secured together. The tip f is preferably formed with an interior shoulder f^2 at the inner end of hole g', so that the capsule cannot be moved in farther than said shoulder when inserting it into the tip f.

The nozzle F, composed of tip f, capsule G, and plug H, with its stem H', is seen, therefore, to be practically one member, and according to the requirements of the shape of the meatus to which the medicinal or the liquid is to be applied the tip f is differently shaped. The nozzle or cap F is screwed upon the screw-neck d' of the air-tube, and the stem H' of the plug H penetrates into the liquid-passage in the inner liquid-tube E. The size of the stem H' is such as that it will fit snugly yet removably into the liquid-passage of the tube E.

In use the liquid to be atomized passes through the liquid-tube E and through the communicating passage h' in the stem H' and plug H into a small air-chamber g^2 in the top of the capsule just in front of the plug H. From this air-chamber g^2 the liquid is forced through the aperture g in the capsule by means of the stream of air which passes through the air-tube D, ducts e', an air-chamber F' inside the nozzle, and grooves or channels h in the plug into the said air-chamber g^2. By means of the described passages and air-chambers and the minutely-orificed thin capsule the liquid is sprayed through the aperture g in a very fine spray or cloud, and the same is thereby very finely divided.

Spray nozzles or caps constructed as described may be readily substituted the one for the other, according to requirements, and each may possess the same advantage of internal construction.

What I claim as new is—

1. A spray nozzle or cap for atomizers, which consists of a tip having a central perforation at its outer end, an apertured capsule, the apertured end of which capsule is located in said perforation of the tip, so that its aperture will be exposed at the end of the tip so as to form the spray-discharge opening of the nozzle or cap, and a grooved plug in the capsule, provided with a stem, said plug and stem having a passage therethrough leading to a chamber between the plug and the apertured end of the capsule, substantially as set forth.

2. A spray nozzle or cap for atomizers, which consists of an internally-screw-threaded tip, an apertured capsule fixed in the tip, with its aperture located at the front end of the tip, and a longitudinally-grooved plug fixed in the capsule, and provided with a stem beyond the capsule, said plug and stem having a longitudinal passage therethrough, leading to a chamber in the front end of the capsule, substantially as set forth.

3. A spray nozzle or cap for atomizers, which consists of a hard-rubber tip, an apertured metallic capsule fixed in the tip and having its aperture at the front end of the tip, a grooved plug located in said capsule at a short distance from its aperture, and a stem on the plug said plug and stem having a longitudinal passage, substantially as set forth.

4. The combination, with the air and liquid tubes of an atomizer, of a removable spray-nozzle fixed on the air-tube, said nozzle being composed of a tip having a central perforation in its outer end, an apertured capsule set in the perforation of said tip, with its aperture exposed at the outer front end of the tip, so as to form the spray-discharge opening of the nozzle or cap, a grooved plug in the capsule, and a stem on the plug, said plug and stem having a passage, and said stem entering into the end of the liquid-tube, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

JACOB WALDMAN.

Witnesses:
GEO. L. WHEELOCK,
GEO. C. GEIBEL.