

No. 711,045.

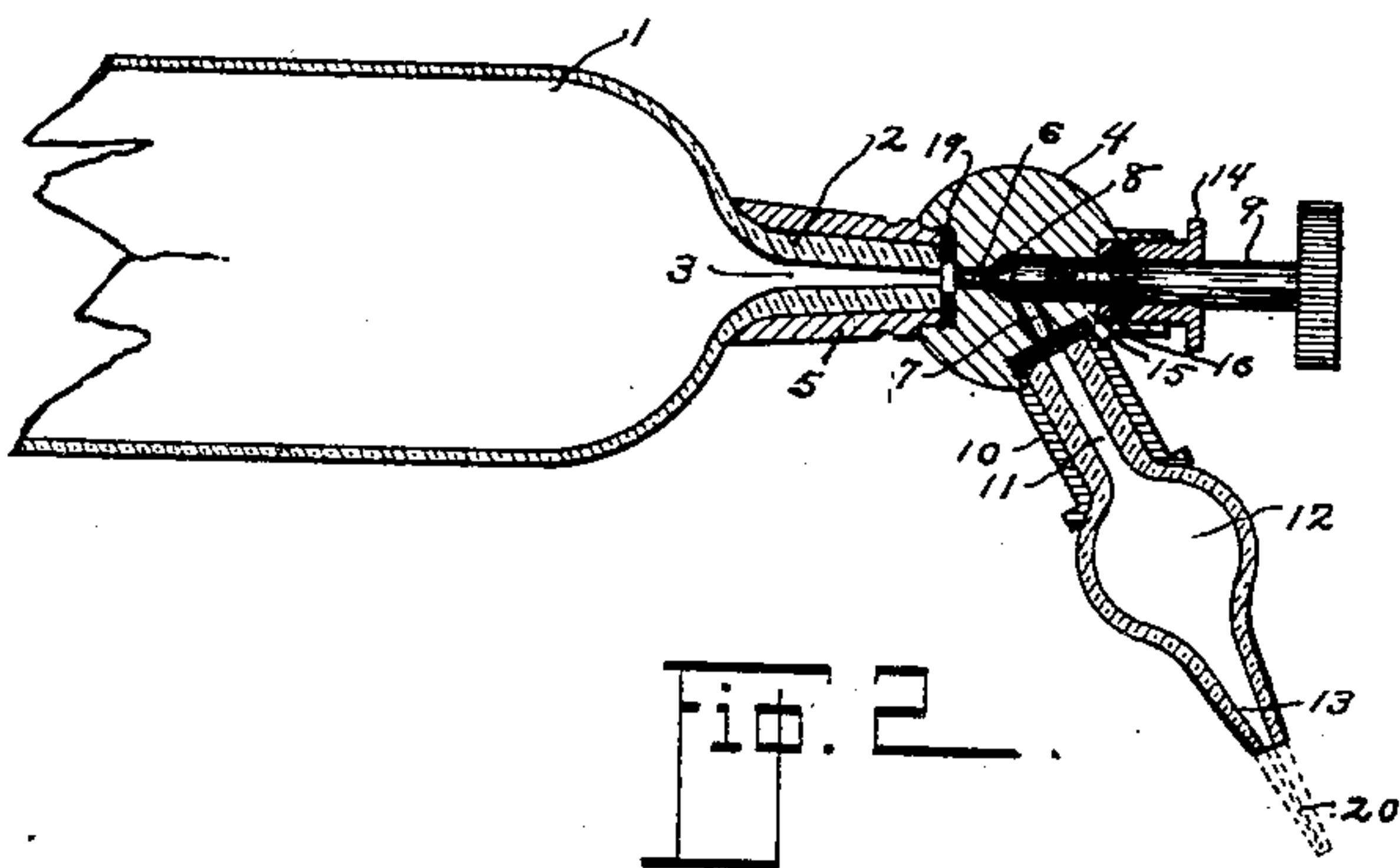
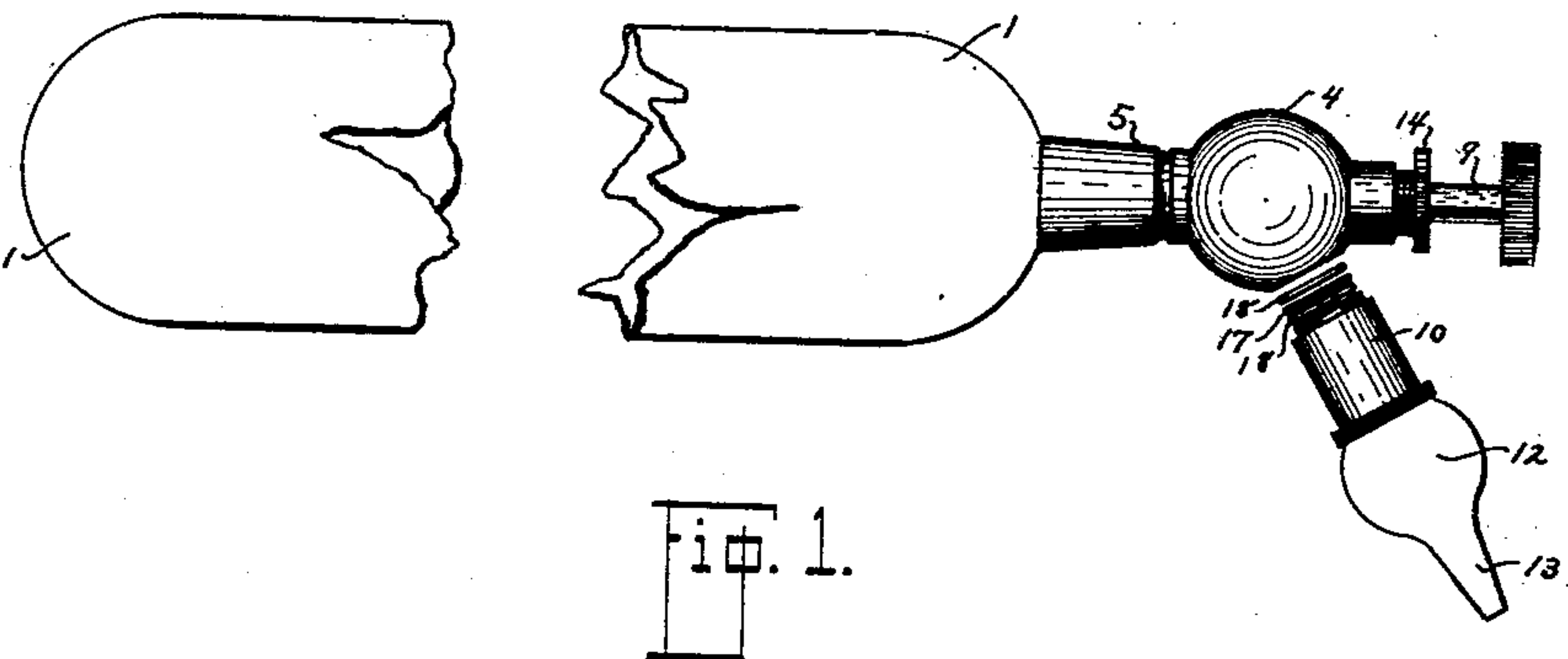
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C. L. GEBAUER.

RECEPTACLE FOR CONTAINING AND ADMINISTERING VOLATILE LIQUIDS.

(Application filed Aug. 21, 1901.)

(No Model.)



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CHARLES L. GEBAUER, OF CLEVELAND, OHIO.

RECEPTACLE FOR CONTAINING AND ADMINISTERING VOLATILE LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 711,045, dated October 14, 1902.

Application filed August 21, 1901. Serial No. 72,829. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. GEBAUER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Receptacles for Containing and Administering Volatile Liquids, of which the following is a specification.

My present invention relates to that type of receptacle for containing and administering volatile liquids which forms the subject-matter of my Patent No. 668,815, granted February 26, 1901, and has for its objects the improvement of said receptacles, so as to render them cheaper in construction and more economical in operation. Moreover, while the tube shown in my patent discharges the liquid in a spray my present invention is adapted for the administration of the liquid in either a continuous stream or a spray.

In the drawings forming part of this application, Figure 1 is a side elevation of a receptacle having my invention applied thereto, the central part of the main tube being broken away; and Fig. 2 is a central longitudinal section through the same.

Like reference characters designate corresponding parts throughout the views shown in the drawings.

My patent above referred to discloses a form of tube which is provided with a detachable nozzle, said nozzle being formed in part of a tube with a capillary opening, through which the liquid is adapted to be discharged. After passing through this capillary opening the liquid enters an expansion-chamber, beyond which it issues through an opening larger than the capillary opening on the other side of the expansion-chamber. Because of the difference in the sizes of these two openings the pressure on the liquid is reduced as it enters the expansion-chamber, which permits the liquid to partially evaporate and to issue from the nozzle in the form of a spray. While it is deemed necessary in order to secure a spray from an apparatus of this character to cause the liquid to pass through an opening before it reaches the expansion-chamber, which is smaller than the opening connecting the said chamber with the outside air, I have found that it is not necessary to provide the nozzle with the cap-

illary opening, since the size of the opening at the valve may be so controlled as to produce the same result. This enables me to save a large per cent. in the cost of manufacture of these receptacles, for the reason that the glass tube containing such an exceedingly-fine opening as is necessary is very expensive. Furthermore, as is stated in my former patent, these openings often become clogged, so that it is difficult and often impossible to get the tube in working order again. In my present invention the opening in the nozzle leading to the expansion-chamber is comparatively large and does not become clogged. It is also sometimes desirable to discharge the liquid in a continuous stream, as when it is desired to treat some part to which the tube cannot be brought sufficiently close to administer the liquid in the form of a spray. As has been stated, when the opening leading to the expansion-chamber is smaller than that leading from the chamber to the outside air the pressure is reduced in the chamber and the liquid issues in the form of a spray. If, however, this first opening can be made larger than the second, the pressure will be maintained and the liquid will issue in a continuous stream. Therefore by merely dispensing with the capillary opening I not only effect a distinct economy in the manufacture of my tube, but I avoid the annoyance due to clogging of the capillary opening and also produce a tube from which the liquid may be discharged in either a spray or a continuous stream.

In the drawings, 1 designates the main receptacle in which the liquid is contained, said receptacle being preferably formed of glass, although it may be made of any other suitable material. This receptacle is formed with a neck at 2, through which passes the opening 3, leading to the valve-piece 4. This valve-piece is secured to the tube 1 by being screwed to a thimble 5, which is cemented to the neck of the main receptacle. Openings 6 and 7 are formed in the valve-piece communicating with the opening 3, and near the center of the valve these openings enter an enlarged chamber 8, into which projects the conical end of the valve-stem 9. This stem is threaded for a portion of its length in order that it may be screwed into the valve-

piece 4 to close the opening 6. Screwed or otherwise secured to the valve-piece 4 opposite the opening 7 is a thimble 10, in which is secured the nozzle. This nozzle is provided with an opening 11, which communicates with the opening 7, and is also provided with an expansion-chamber 12 and with a discharge-opening 13. The discharge-opening is smaller in area than either of the openings 3, 6, 7, or 11, so that when the valve 9 is opened with sufficient width the liquid will fill the expansion-chamber and will issue from the discharge-opening in a continuous stream. It will of course be understood that when the valve is screwed tightly against its seat the opening 6 will be entirely closed and that when the valve is but slightly moved from its seat the liquid will enter the expansion-chamber slowly, will partially evaporate, and will be discharged in a spray.

In the tube shown in my former patent difficulty was experienced in preventing the escape of the liquid along the valve-stem, as the exceedingly-fine opening through the capillary tube created a very high pressure in the chamber in the valve-piece. While the loss is very slight from that cause in my present tube, owing to the greatly enlarged opening 11, at the same time I have deemed it advisable to surround the valve-stem with a packing-gland 14, which screws into a flange extending from the valve-piece. Surrounding the valve-stem are washers 15 and 16, made, preferably, of leather and rubber, respectively, which are pressed tightly about the valve-stem when the gland is screwed down and effectually prevent the escape of any liquid in this direction.

In order to prevent the entrance of any solid matter into the nozzle, I place a layer of filtering material, preferably medicated cotton, between the nozzle and the valve-piece 4, through which the liquid is filtered. This filtering material, which is indicated in Fig. 1 at 17, is held in position by two washers 18 on either side thereof. The thimble 5 and the neck of the main receptacle are caused to compress a washer 19 in the valve-piece in order to prevent the leakage of the liquid therefrom.

The character of the jet or spray is greatly affected by the size of the discharge-orifice 13, and in order to enable the user of the receptacle to vary the size of this orifice I extend the end of the nozzle so as to reduce the opening gradually toward the end. This is indicated in dotted lines at 20 in Fig. 2. By simply scratching the nozzle with a file it can be readily broken at any point desired, so as to give as great an opening 13 as the user of the tube may think most suitable.

The liquid which is intended to be used is so volatile that when the receptacle is held in the hand the heat therefrom causes it to evaporate, thus creating a pressure within the receptacle. If, then, the receptacle be held so that the liquid fills the opening 3 and

the valve is turned to open the passage through the valve-piece 4, the liquid will be forced outwardly through the nozzle. If the valve is turned but slightly, the liquid will be discharged in the form of a spray, owing to the reduction of pressure in the expansion-chamber, the amount of such reduction and the character of the spray depending upon the size of the opening past the valve; but if the valve is turned so as to give a larger opening in the passage leading to the expansion-chamber than the discharge-opening 13 the chamber will be filled and the liquid will issue in a continuous stream.

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

1. In a device of the character described, a main chamber, a passage leading from said chamber, an expansion-chamber in said passage, the most constricted part of the passage leading to the expansion-chamber being normally larger than the most constricted part of the passage leading from the chamber, and means between the main chamber and the expansion-chamber for regulating the size of the opening through that part of the passage.

2. As a means for discharging a liquid either a continuous stream or a spray, a passage through which said liquid is forced at a temperature above its boiling-point, an expansion-chamber in said passage, the most constricted part of the passage leading to the expansion-chamber being normally larger than the most constricted part of the passage leading therefrom, so that the liquid is ejected in a continuous stream, and means for closing the said passage leading to the chamber to make it smaller than that leading therefrom, so that the liquid is ejected in a spray.

3. In a receptacle for containing and administering volatile liquids, a passage through which the liquid is forced at a temperature above its boiling-point, said passage throughout its length being relatively large as distinguished from a capillary passage, an expansion-chamber in the passage, and means for regulating the size of the passage on one side of the chamber to change at will the character of the spray issuing from the end of the passage.

4. In a receptacle for containing and administering liquids, a passage through which the liquid is forced at a temperature above its boiling-point, said passage throughout its length being relatively large as distinguished from a capillary passage, an expansion-chamber in the passage, and means for regulating the size of that part of the passage leading to the chamber to change at will the character of the spray issuing from the end of the passage.

5. In a device of the character described, a main chamber, a nozzle connected with said chamber, a tubular passage connecting said chamber and nozzle, means for regulating the size of the opening through said passage, an expansion-chamber in the nozzle, a discharge-

opening leading from said expansion-chamber, and an opening connecting said expansion-chamber and said passage, said opening being larger than the discharge-opening.

5 6. In a device of the character described, a main chamber, a passage leading therefrom through which the contents of the chamber are discharged, a valve for closing said passage, said valve having a stem, a packing-
10 gland surrounding said stem to prevent the escape of the liquid alongside the same, and an expansion-chamber in the passage beyond the valve, that part of the passage beyond the chamber being smaller than the smallest part
15 of the passage leading thereto, for the purpose specified.

7. In a device of the character described, a main receptacle, a valve-piece secured to said receptacle, a nozzle secured to said valve-
20 piece, a passage leading from the main chamber through the valve-piece and nozzle, an expansion-chamber in the nozzle, and a filter between the nozzle and the valve-piece, the most constricted part of the passage leading

to the expansion-chamber being normally 25 larger than the most constricted part of the passage leading therefrom, for the purpose specified.

8. In a device of the character described, a main receptacle, a valve-piece secured to said 30 receptacle, a passage through said valve-piece, a valve for closing said passage, a packing-gland about the stem of said valve, a nozzle secured to the valve-piece and communicating with the passage therein, a filter be- 35 tween the nozzle and the valve-piece, and an expansion-chamber in the nozzle, the most constricted part of the passage leading to the expansion-chamber being normally larger than the most constricted part of the passage 40 leading therefrom, as and for the purpose set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES L. GEBAUER.

Witnesses:

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BRENNAN WEST.