

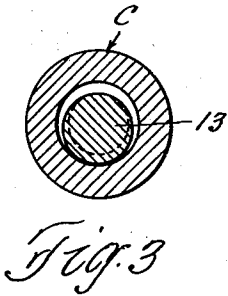
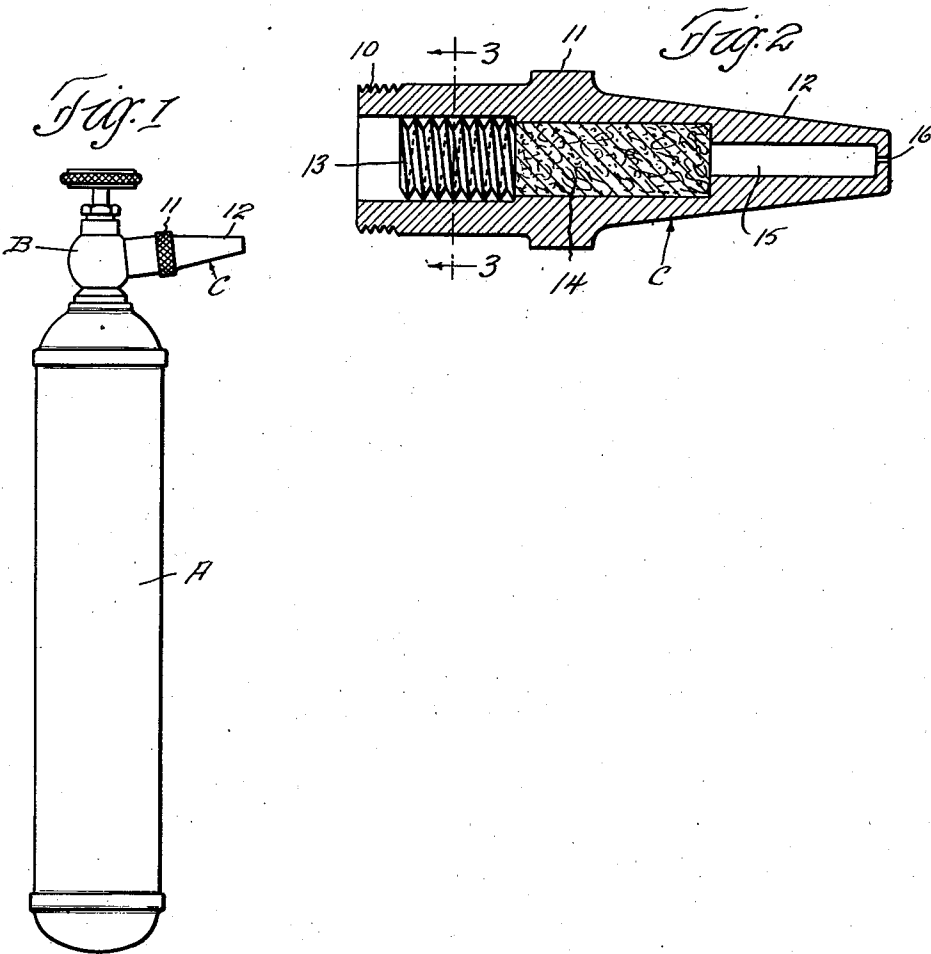
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SPRAY NOZZLE

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SPRAY NOZZLE

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1 Claim. (Cl. 299—107)

This invention relates to spray nozzles for use in dispensing volatile liquids, for example ethyl chlorid for use in minor surgery.

In dispensers of this kind the nozzle has been made of glass which adapts itself to production of small capillary openings by the process of drawing out a tube. It is however difficult to make such glass nozzles and it is especially difficult to secure even substantial uniformity of size in the capillary opening. It is not practical to produce a metal nozzle having a discharge opening as small as is desirable (0.006 inch or less) by the use of drills. About the smallest discharge opening which can be practically produced by drilling is .009 or .010 of an inch.

It is one object of the invention to produce a nozzle which may have a discharge opening .009" or .010" in diameter and still be suitable for dispensing volatile liquids such as ethyl chlorid in the form of an atomized spray. Other and more limited objects will be in part apparent and in part pointed out hereinafter in connection with the accompanying drawing wherein Fig. 1 is an elevational view of an ethyl chlorid tube showing the discharge nozzle; Fig. 2 is a sectional view taken longitudinally through the nozzle; and Fig. 3 is a section on the line 3—3 of Fig. 2.

In the drawing, the reference character A represents a receptacle adapted to contain a volatile liquid such as ethyl chlorid. At its upper end, the receptacle A is provided with a valve B for controlling the escape of the volatile liquid under its own vapor pressure and carries the discharge nozzle C.

As will be clear from Fig. 2 the nozzle comprises a tubular element having an externally threaded portion 10 adapted to be received in an internally threaded portion in the valve B, and a knurled collar 11 beyond which is an elongated, tapered nose portion 12. A passage extends through the nozzle and is of varying diameter in different regions. At the left hand end, the largest passage portion receives a threaded baffle member 13 which preferably is of a size just small enough to be received within the passage portion. At the right of the first mentioned passage portion and adjacent thereto is a reduced passage portion receiving fibrous material 14

which may be cotton, glass wool or the like. At the right of the passage portion which contains the fibrous material 14 is an expansion chamber 15 of further reduced diameter adjacent to which is the discharge orifice or capillary passage portion 16. The volatile liquid, such as ethyl chlorid, which is received within the nozzle is conducted first around the threads of the baffle 13, whereby it is partially vaporized by being forced into contact with the wall of the nozzle surrounding the baffle, the temperature of said wall being governed by the temperature of the surrounding atmosphere. This results in vaporizing a portion of the volatile liquid, and the resultant mixture of the vaporous and unvaporized portions of this liquid is preserved and further vaporization is produced by and during the passage of the mixture through the fibrous material 14. The mixture, consisting of vaporized and unvaporized volatile liquid, then enters the expansion chamber 15, which enables the vaporized portion to eject the unvaporized portion in the form of an atomized spray, as distinguished from a jet stream. Furthermore, I am enabled to accomplish this result by the use of capillary discharge orifices of a size (.009" or .010") which would otherwise be ineffective to produce a spray. The results may be satisfactory for some purposes even though the fibrous material is omitted.

Both the threaded baffle 13 and the fibrous material 14 may be omitted if the discharge orifice is reduced to the order of .006 of an inch or less.

Having thus described my invention, what I claim is:

A spray nozzle for volatile liquids comprising an elongated member having a passage extending longitudinally therethrough, a baffle element comprising a plug fitting in one end of said passage, said plug having external helical grooves adjacent the wall of said passage, whereby the liquid in the grooves will be exposed to the temperature of the said member, the other end of said passage being restricted to a capillary orifice, said passage being enlarged behind said orifice to form an expansion chamber, and a filling of fibrous material in said passage, between said grooved plug and said expansion chamber.

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