Sept. 10, 1929. C. L. GEBAUER 1,727,876

ETHYL CHLORIDE DISPENSING TUBE

Filed Oct. 12, 1928

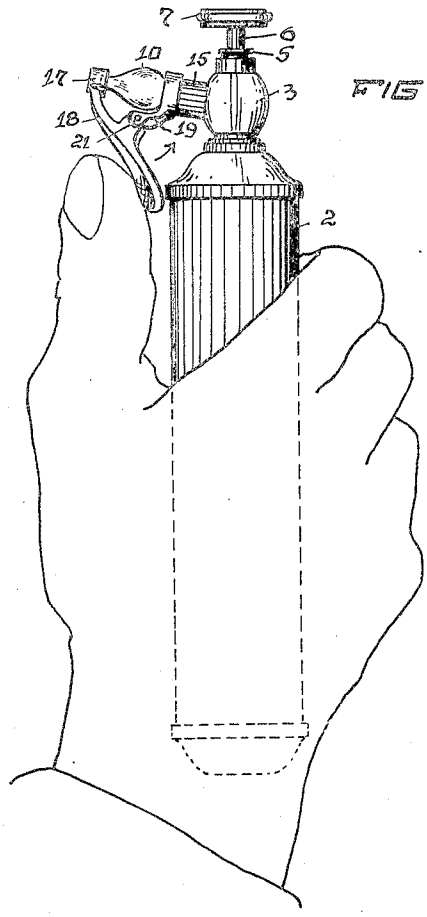


FIG. 1

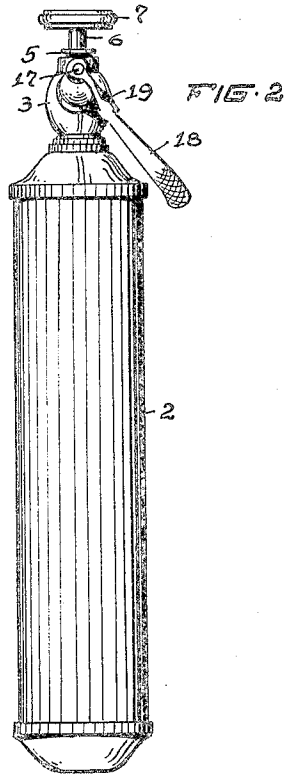


FIG. 2

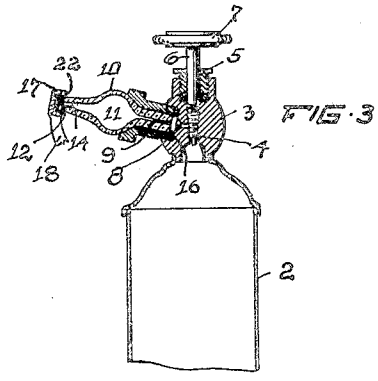


FIG. 3

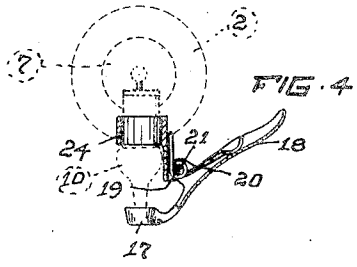


FIG. 4

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UNITED STATES PATENT OFFICE.

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ETHYL-CHLORIDE-DISPENSING TUBE.

Application filed October 12, 1928. Serial No. 312,032.

My invention relates to ethyl chloride dispensing tubes, and the invention is an improvement in the tube or container shown and described in my Letters Patent No. 668,815, dated February 26, 1901, and more particularly in the means for controlling the discharge of a stream or jet of light volatile liquid from the tube while holding it in the hand. Thus, in the accompanying drawing, Fig. 1 is a side elevation of a tube embodying the improvement, and Fig. 2 is a front view of the same tube. Fig. 3 is a sectional view of the discharge nozzle and valve portion of the tube, and Fig. 4 is a sectional view of a slightly modified form of support for the closure valve for the nozzle.

The invention consists of a cylindrical container or tube 2 of small diameter which is closed at both ends and provided at one end with a globular valve body 3 having a needle or reducing valve 4 extending axially thereof. A screw-threaded gland 5 seals valve stem 6, and a thumbpiece 7 at the outer end of the stem permits the valve to be easily manipulated, that is, opened and closed. A lateral opening 8 in valve body 3 communicates with a minute passage or capillary opening 9 at the inner end of a detachable nozzle 10 of bulbous formation having an expansion chamber 11 therein. The tip 12 of the nozzle tapers to smaller dimensions and contains a central discharge passage 14, and this nozzle is made of glass and mounted within a nipple 15 having screw-connection and a sealed joint 16 with valve body 3. In administering ethyl chloride as a local anæsthetic the needle or reducing valve may be opened in greater or lesser degree to discharge the liquid from the nozzle either in a stream or spray, assuming that the nozzle is open to the atmosphere.

In that connection it should also be understood that the tube or container is made of metal and the liquid has a low boiling point so that an internal pressure is created by heat exchange when the tube is held in the hand. When an operator, say a dentist, is required to apply an anæsthetic intermittently, his work may require the use of both hands so that the tube must be laid aside temporarily. To enable the operator to do so without cutting off the liquid at the reducing valve, or changing the setting of the valve, I have provided a supplemental valve 17 at the mouth of nozzle 10. This valve is self-closing, and may be opened by the pressure of the thumb of the hand in which the tube is held. To promote that purpose, I mount valve 17 upon one end of a lever 18 having a pivotal connection with an arm or bracket 19 affixed to or made an integral part of nipple 15. Preferably the pivot for lever 18 is at one side of the nozzle and the lever itself projected at an angle toward but apart from the body of the tube so that one end of the lever may be engaged by the thumb and that end swing freely on an arc without striking the tube, see Figs. 1 and 2. Thus in Fig. 1, the lever extends at an angle of sixty degrees from the nozzle toward the tube, and is also inclined at approximately the same angle in another direction away from the tube as indicated more clearly in Fig. 2. A wire spring 20 is coiled around the pivot pin 21 for lever 18 and this spring has straight extremities which press against the nipple and the outer end of the lever respectively to hold supplemental valve 17 normally closed or against the mouth edge of the nozzle. Valve 17 is cupped to seat a resilient sealing washer or a rubber valve member 22, which closes the tip of the nozzle very effectively when the lever is released although only a light spring 20 is employed.

Thus, when the tube is laid at rest upon a table or other support and the hand no longer warms the tube the low boiling liquid cools immediately and produces a vacuum or sufficient suction within the nozzle to draw the resilient valve member 22 tightly against the edge of the mouth of the nozzle. Reducing valve 4 may remain open in the degree as set initially, but as long as supplemental valve 17 closes the nozzle to the atmosphere no liquid will be jetted or sprayed into the nozzle through capillary opening 9, and no leakage will occur at the

mouth of the nozzle. However, when the operator picks up the tube with his hand he may project the nozzle toward any localized area under treatment and by pressing on lever 18 open the end valve 17 and immediately jet a stream or spray of the anæsthetic in the spot or place desired, either continuously or intermittently. This work being accomplished he may lay the device aside without further concern, or attention, and then use it again with facility and dispatch in continuing his operations, all without opening or closing or re-adjusting main reducing valve 4.

Bracket 19 may be a fixed or integral part of nipple 15, or it may be an integral or fixed part of a ring 24 sleeved rotatably upon the nipple as shown in Fig. 4. The valve structure may be modified in other ways, but broadly speaking, the invention resides in a combination and aggroupment of parts substantially as herein described whereby the control and handling of an anæsthetic dispensing or administering tube is greatly facilitated and loss or leakage of a low boiling liquid is materially prevented.

What I claim, is:

1. An ethyl chloride dispensing tube, including an atomizing nozzle, a main valve at the intake side of said nozzle, and a supplemental valve at the discharge mouth of said nozzle.

2. An ethyl chloride dispensing tube, including a reducing valve, a nozzle, and a self-closing valve at the mouth of said nozzle.

3. An ethyl chloride dispensing tube, including a nozzle having a capillary opening, a main valve to control the passage of a liquid of low boiling point through said opening, a secondary valve at the discharge side of said nozzle, and means adjacent the body of the tube for operating said secondary valve.

4. An ethyl chloride dispensing tube, including a valve body having an outlet, a valve controlling said outlet, a nozzle attached to said valve body having a capillary passage and an expansion chamber, and a valve at the mouth of said nozzle having an operating handle at the side of said valve body.

5. An ethyl chloride dispensing tube, including a nozzle, a valve at the intake side of said nozzle, and a spring-pressed valve at the discharge mouth of said nozzle having an operating lever at one side of said tube.

6. An ethyl chloride dispensing tube, including a valve body having a main valve, an atomizing nozzle attached to said body having a discharge opening, and a closure member for said discharge opening, having an operating lever extending at an angle relatively to the longitudinal axis of said tube.

7. An ethyl chloride dispensing tube, including an atomizing nozzle, a reducing valve for said nozzle, a closure member for the discharge end of said nozzle, a spring for closing said member, and finger-engaging means to open said closure member.

8. An ethyl chloride dispensing tube, including a valve body having a reducing valve therein, a nozzle attached to said body having a capillary intake passage, and self-closing means for said nozzle having an operating lever extending at an angle from said nozzle at one side of said tube.

9. An ethyl chloride dispensing tube, including a valve body having a valve axially thereof, a discharge nozzle extending laterally from said body having a capillary opening and an expansion chamber, a lever pivotally mounted at one side of said nozzle having a closure member for the discharge end of said nozzle, and means for seating said closure member.

10. An ethyl chloride dispensing tube, including a valve body having a discharge passage for said tube, a reducing valve in said passage having controlling means outside of said body, a nozzle attached to said body having a capillary intake opening and an expansion chamber and a discharge tip, a lever pivotally mounted adjacent said tube, a cupped valve member at one end of said lever adapted to seat against said discharge tip, and a spring for seating said valve member.

In testimony whereof I affix my signature.

CHAS. L. GEBAUER.