

Jan. 18, 1927.

L. K. MOBLEY

1,614,532

MEANS FOR APPLYING LIQUID MEDICAMENTS UNDER PRESSURE ACTION

Filed Feb. 26, 1921

2 Sheets-Sheet 1

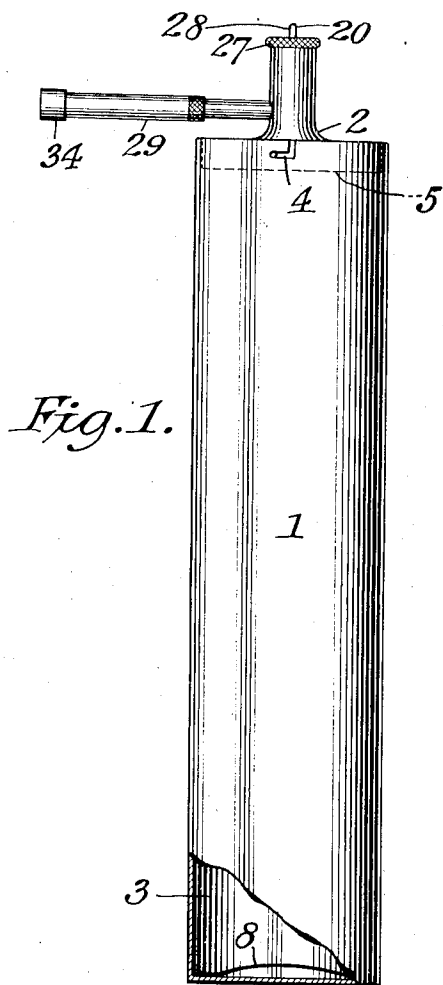


Fig. 1.

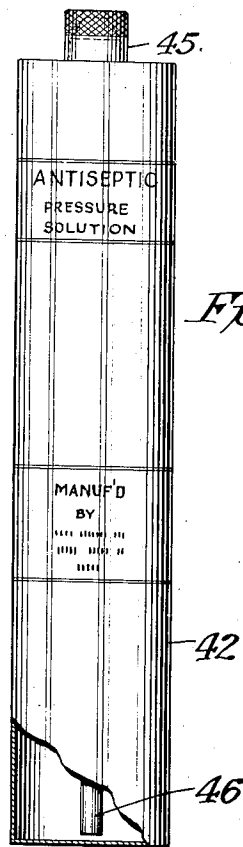


Fig. 3.

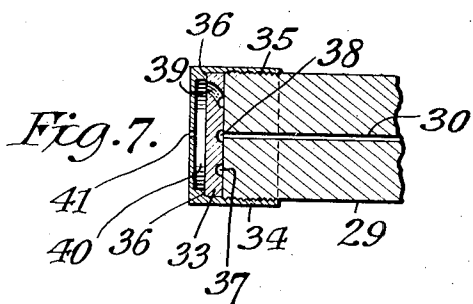


Fig. 7.

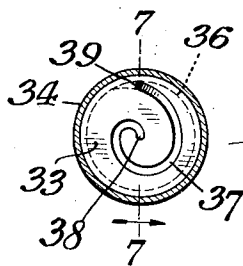


Fig. 6.

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2 Sheets-Sheet 2

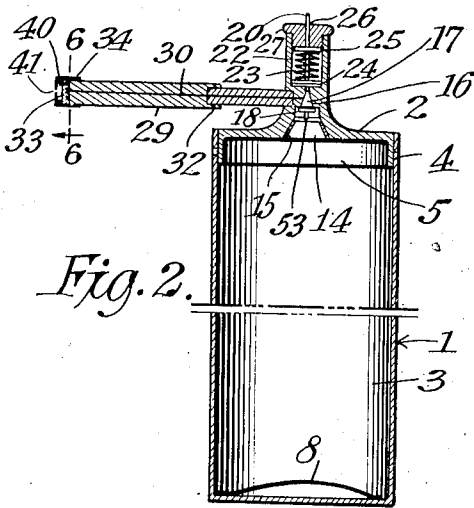


Fig. 2.

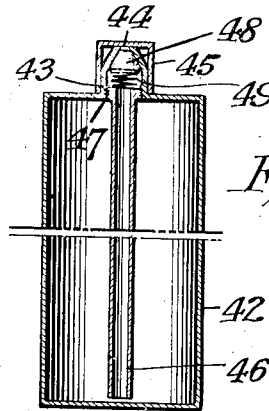


Fig. 4.

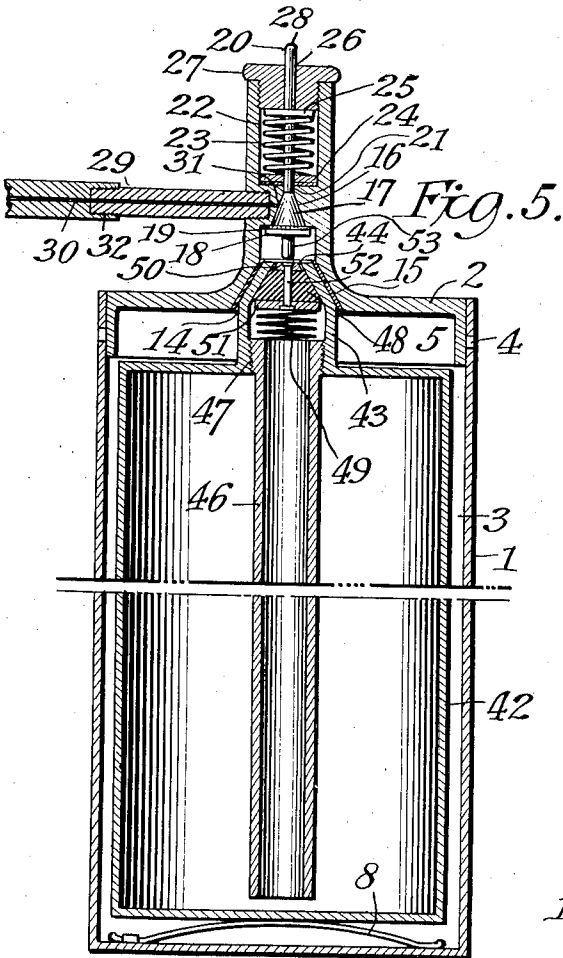
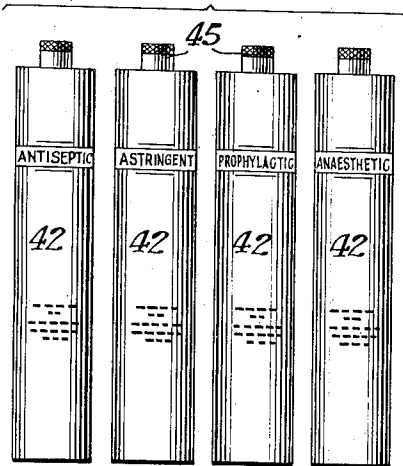


Fig. 5.

Fig. 8.



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UNITED STATES PATENT OFFICE.

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MEANS FOR APPLYING LIQUID MEDICAMENTS UNDER PRESSURE ACTION.

Application filed February 28, 1921. Serial No. 448,216.

This invention relates to means for applying liquid medicaments under pressure action, and it has for its object to provide an improved means of this character which will possess advantages in point of convenience, economy, safety, facility of operation, effectiveness, and general efficiency.

The invention has particular relation to the conditions of the application of medicinal solutions according to the improved method as set forth in my application for patent Serial No. 311,947, filed July 19, 1919, and the means for carrying out said method as comprised in my application for patent Serial No. 313,371, filed July 25, 1919; but it will be understood that my present invention and improvements are adapted for employment and effective service under any circumstances and conditions in which it is desired to discharge in a jet or atomized spray a medicinal solution or fluid element which is carried in a normally hermetically-sealed container under inherent pressure conditions which are active to effect the discharge of the fluid when desired.

The conditions of the method to which the means as comprised in my present invention are particularly related, as above mentioned, involve the placing of a liquid medicament in combination with a volume of carbonic acid gas sufficient to carbonate the liquid medicinal solution to the desired degree of pressure in the reservoir chamber of a normally hermetically-sealed container, discharging a volume of the combined solution from said container under the said pressure whereby the liquid medicament is applied by action of the gas, and simultaneously with said gas-pressure discharge converting the combined solution at the point of ejection into the outer air and by the pressure action of the combined gas into a medicated carbonated spray.

In thus applying liquid medicinal solutions under the inherent pressure action of the combined carbonic acid gas according to the conditions of the said method as comprised in my preceding invention, if the means for application embody as one permanent unit the reservoir container and the control elements for effecting the discharge of the combined solution as a spray under the pressure action of the gas, it is then necessary to refill the reservoir chamber of such unitary

means with a new charge of the combined solution and gas after its contents have been fully discharged, and such unitary means are also only adapted for employment with one character of liquid medicament or solution under each refilling. These circumstances restrict and render inconvenient a wider range of use.

The improved means as comprised in my present invention provide primarily a main permanent entity embodying all the control mechanism for effecting the discharge of the combined solution or fluid under its inherent pressure action and adapted for employment in successive temporary operative connection with separate normally hermetically-sealed cartridges or containers carrying the liquid medicinal solution or fluid under the inherent pressure action of the combined gas.

The invention thus enables a wide latitude and unlimited range of convenient use and service under the conditions as related to the application of liquid medicaments or fluids as above set forth, the permanent discharge-control unit or entity being adapted for successive and variable employment with different temporary cartridge containers respectively carrying all desired characters or formulas of liquid medicaments or solutions or other fluids which it is desired to apply as a spray or jet under inherent pressure action. Important economic conditions and commercial advantages are also attained, in that the normally hermetically-sealed cartridge containers can be placed upon the market in a wide variety of contents, to supply any desired antiseptic, liquid medicament, solution, or fluid, under pressure action, and attached by the user to the permanent discharge-control entity for operative service and thereafter detached and set aside for repeated use or discarded when the contents are exhausted.

My improvements are adapted for a wide range of convenient usage, but are especially related to the use of a small hand spraying-device for convenient service and operation by individual users in the application of antiseptics or medicinal solutions or fluids under pressure to affected parts or desired points, and enable the employment with one permanent device of various medicaments or fluids of different character or formula supplied in respective attachable and detachable cartridges or containers under in-

herent pressure conditions, and the improved means also afford serviceable conditions of enhanced effectiveness and efficiency and convenience in dental and medical practices when a simple and easily-handled medium is desired for the effective treatment of cavities or other parts by a liquid medicament discharged as an atomized spray under high pressure.

10 In the drawings—

Fig. 1 is a side view of the main operative member which constitutes as an entity the outlet-control and spraying means and is adapted for permanent use.

15 Fig. 2 is a vertical cross-section of the permanent outlet-control member.

Fig. 3 is a side view of one of the attachable and detachable cartridges or containers in which the liquid medicinal solution or fluid is supplied under inherent pressure action.

Fig. 4 is a vertical cross-section of the temporary cartridge or container.

Fig. 5 is a vertical cross-section, on an enlarged scale, showing the complete operative means with the permanent outlet-control member and the temporary cartridge container in assembled and attached operative position.

Fig. 6 is an enlarged detail cross-section on the line 6—6, Fig. 2.

Fig. 7 is an enlarged detail cross-section on the line 7—7, Fig. 6.

Fig. 8 is a side view of a set of cartridges or containers as supplied with various different solutions or fluids and adapted for respective use in connection with the permanent outlet-control member.

Corresponding parts in all the figures are denoted by the same reference characters.

Referring to the drawings, 1 designates the permanent discharge-control entity which is adapted for operative connection attachably and detachably with the temporary cartridges or containers. The member 1 carries all the control mechanism for effecting the discharge of the medicament or fluid under its inherent pressure, and in the preferred construction herein illustrated comprises a cap piece, 2, carrying the discharge-control mechanism and serving as a top closure for a tubular body or casing, 3, which is adapted to enclose and carry the temporary cartridge container, the cap-piece 2 and casing 3 being detachably connected as by a bayonet-joint, 4, as herein shown, or other suitable means, in which relative construction the cap-piece has a depending circumferential bottom flange, 5, corresponding to and fitting the open top of the body casing 3. Said tubular casing has a closed bottom and side walls, and has interiorly mounted above its bottom a spring, 8, operative to exert its pressure upwardly against the bottom of the enclosed temporary cartridge container to

firmly hold the latter to its seat with relation to the outlet-control cap-piece 2.

The permanent cap-piece entity comprises a tubular body having within its bottom portion a chamber, 14, opening downwardly, the base portion of which chamber forms a seat for the outlet top of the temporary cartridge container under the pressure action of the controlling spring 8, for which purpose said base portion, in the preferred construction, is conical in contour, converging upwardly, and has its walls cushioned by a gasket or washer, as at 15, of rubber or other suitable material. Above the top portion of the initial chamber 14 and opening thereto is a supplementary chamber, 16, the closure of which is controlled by a valve 17.

In the particular class of devices or means to which my invention especially relates, it is desirable that said supplementary chamber 16 be of relatively small dimensions and that its area under operative conditions be slight or limited, for the reason that when the valve 17 is suddenly closed an "after-flow" of the solution or fluid would result if the chamber afforded any substantial degree of space or area after the valve is operated to shut off further passage of the solution or fluid under its inherent pressure to said outlet chamber 16. The desired operation is best effected by the preferred construction which is herein shown, in which the supplementary outlet chamber 16 is of conical shape, converging upwardly, and the valve 17 is of corresponding conical shape and adapted to entirely close the space area of the chamber when it is at the limit of its upward movement, and to open up only a slight chamber space between the walls of the chamber and the surface of the valve when the latter is operated in the opening movement downwardly.

The conical valve is controlled by any suitable operating means, but in the preferred construction its body has a bottom lateral flange, 18, adapted to bear upwardly against the top wall of the top portion of the initial main chamber 14 and carrying at its top surface a cushion or gasket, 19, to effect a tight-joint closure when the valve is at the limit of its upward movement, the valve body being carried by a stem, 20, extending upwardly through the tubular body of the cap-piece 2 and slidably bearing in a bore, 21, in the body of the latter just above the supplementary outlet chamber 16, and a tubular chamber, 22, being provided above said bearing 21 and housing a coiled spring, 23, surrounding the valve stem and operative to hold the valve up in normally closed position. At the base of the spring chamber 22, a cushion or packing, 24, is provided beneath the spring, to effect a tight closure at the stem-bearing 21, and above

the spring the valve stem carries a fixed lateral flange or disc, 25, operative to depress the spring when the valve stem is operated downwardly as a plunger, the preferred convenient plunger operation of said valve stem being effected by an extension of the stem through a guide bearing, 26, in a removable plug, 27, forming a closure for the spring chamber 22, at the top of the cap-piece 2, the externally-projective end, 28, of said extension being adapted to be readily depressed by the thumb or finger. The outlet control in the special class of devices here referred to requires but a delicate or slight movement, and the operation of the small valve, 16, may be effected by any other suitable or convenient constructional means.

An outlet nozzle, 29, extends laterally from the tubular body of the cap-piece 2 and consists of a tube of desired length having a longitudinal bore, 30, communicating with the supplementary outlet chamber 16 at a point in the wall thereof which will be coincident with the closure surface of the valve 17, as indicated at 31, the bore being preferably of small or minute diameter relative to the small-area chamber 16 for co-operation therewith in precluding an after-flow as hereinbefore mentioned. The tubular outlet nozzle is preferably detachable in its connection with the cap-piece 2 and constituted of plural sections separably connected by a threaded joint, as at 32, or other suitable constructional means. At its outer end, said nozzle is provided with means for retarding the jet of liquid passing under pressure from the outlet bore 30 and for deflecting the jet and imparting to it a spiral whirling motion and converting it into an atomized spray at the point of ejection into the outer air. Said conversion and deflecting and retarding means, in the preferred construction as herein shown, comprises a block-partition, 33, having its inner face abutting the outer end of the nozzle-tube 29 immediately in front of the bore thereof and of large or increased diameter with relation to said bore, the partition being seated and retained in position by a terminal thimble, 34, mounted detachably upon the outer end of the nozzle-tube by a threaded connection, as at 35, or otherwise, and having an internal shoulder, 36, bearing against the peripheral edge of the outer face of the block-partition. The block-partition is thus interposed between the bore of the nozzle member 29 and the terminal chamber 40 of the nozzle, and in its inner face which abuts the end of the nozzle tube it is provided with a spiral channel, 37, extending from an inlet end, 38, at the center or axis of the partition and intersecting the end of the nozzle-tube bore 30, to an outlet orifice, 39, formed by a channel through the partition-block and terminating at the outer face thereof adjacent its pe-

riphery. The channel 37 thus forms a gradually widening spiral from the centered inlet orifice 38 to the peripherally-located outlet orifice 39, and in the preferred construction as described the longitudinal extent of the gradually-widening spiral is located in the same plane transversely of the body of the nozzle and thus at true right angle to the longitudinal nozzle-bore 30. The terminal thimble-end 34 of the nozzle has an interior chamber, 40, beyond the block-partition and preferably of small area or dimension, the diameter of said chamber transversely of the nozzle member being substantially greater than the diameter of the bore 30 and channel 37 and intersecting the outlet orifice 39 of the latter adjacent the circumferential plane of the chamber at the circular wall thereof, and in the outer wall of said chamber, which is constituted by the end of the thimble 34, is formed a small orifice, 41, centrally or axially of the circular chamber.

In operation, the pressure jet entering from the relatively small nozzle-bore 30 to the inlet orifice 38 of the interposed block-partition 33 is retarded by the spiral channel 37 of the partition and is deflected and converted by the gradually-widening spiral into a spirally-rotating jet of high speed under pressure, which passes from the outlet orifice 39 of the conversion partition into the circular chamber 40 of the end-thimble 34, in which it passes forwardly at high speed, in a spiral whirling motion guided by the circular wall of said chamber, and is ejected at the final terminal orifice 41 of the nozzle-tube into the outer air in a fine whirling atomized spray.

Within the generic scope of my present invention and improvements, in their general character relating to the employment of a main permanent entity embodying all the control mechanism for effecting the discharge of a solution or fluid under inherent pressure action and co-operative in successive temporary connection with respective individual cartridge containers carrying the solution or fluid, any suitable and adapted outlet-nozzle means and valve control mechanism, and any desired and effective relative construction for the operative attachment successively of the temporary cartridge containers in connection with the permanent outlet-control entity, may be employed in the practical embodiment of the device or means for carrying out the invention.

The cartridge containers for carrying the solution or fluid under the inherent pressure action of the combined gas are of a normally hermetically-sealed construction, and are of comparatively inexpensive character, as they are designed to be supplied commercially as carriers or packets respectively containing a wide variety of medi-

nal or antiseptic solutions or other fluids as used in dental or medical or other practices or in personal use, and alternately or variably employed in connection with the permanent discharge-control entity 1, and then discarded when their contents are exhausted.

In the preferred construction, with relation to the cap-piece member 2 as herein shown and described, the temporary cartridge container, 42, comprises a reservoir body of tubular shape and corresponding to and adapted to fit within the casing 3 of the permanent member 1, said body having at its top a tubular neck, 43, with a conical top adapted to seat firmly within and against the conical base portion of the bottom chamber 14 of the member 1, under action of the bottom spring 8 within the latter, and internally carrying valve means normally operative to hermetically seal the content of the reservoir body. Said conical neck has a small outlet-orifice, 44, at its apex, and in the commercial marketing of the cartridge containers a tubular temporary cap-closure, 45, is provided to cover and enclose said orificed neck and is first removed when the cartridge is applied to the permanent member 1 for service.

A siphon action is afforded in the cartridge container by an outlet tube, 46, depending longitudinally within the reservoir chamber of the closed body 42 of the container and terminating at its lower end a short distance above the bottom thereof, said tube being open at both its top and bottom ends and being mounted preferably by a threaded connection, 47, between its top end and the wall of the base portion of the tubular neck 43.

The valve means of the cartridge container preferably consists of a conical valve, 48, seating upwardly within and securely against the walls of the conical top portion of the tubular neck 43, the valve being normally closed by action of a coiled spring, 49, interposed within the neck between the bottom of the valve body and the top of the siphon tube 46. Said valve body is preferably of elastic or cushion material, as rubber, to effect a tight closure action, and to retain the elastic body against "buckling" or distortion it is provided with metallic or rigid plates, 50—51, respectively at its top and bottom surfaces and connected rigidly by a rod or pin, 52, extending longitudinally through the valve body. When the temporary cartridge container is in operative connection with the permanent outlet-control entity 1, the contents of the cartridge under inherent pressure action of the combined gas are hermetically sealed by the cartridge valve 48, and in the discharge operation said valve is actuated by downward pressure exerted by a small pin, 53, extending from the bottom of the valve 17 of the

cap-piece member 2 and projective through the orifice 44 of the neck 43 of the cartridge container to contact with the valve 48.

From the foregoing general description, the operation and advantages of my invention will be readily understood. The cartridges embody comparatively few mechanical features and can be inexpensively manufactured in their entirety, the tubular body elements being adapted to be produced simply from drawn metal, and they thus afford a commercial container analogous to a packet or bottle in which various medicaments or antiseptics or fluids can be supplied and marketed in conditions of inherent pressure under the action of combined carbonic acid gas and used as desired in connection with the permanent outlet-control means.

I do not desire to be understood as limiting myself to the detail features of construction and arrangement as herein illustrated and described, as it is manifest that modifications and variations therein may be resorted to in the adaptation of the construction to varying conditions of use, without departing from the spirit and scope of my invention and improvements. I therefore reserve the right to all such variations and modifications as properly fall within the scope of my invention and the terms of the following claims.

Having thus described my invention, I claim and desire to secure by Letters Patent:

1. In means for applying liquid medicaments under pressure action, a permanent outlet-control member constituting a separate and detachable entity for effecting a spraying action and comprising a tubular body having an internal chamber, a spray nozzle in communication with said chamber, a controlling valve operative in said chamber, and means for operating said valve, said permanent entity member having means for operative attachment in temporary connection with a separate and detachable normally hermetically-sealed cartridge container carrying a liquid medicinal solution or fluid under the inherent pressure action of a combined gas and means extending from its internal chamber for seating the outlet terminal end of the cartridge container with its hermetically-sealed outlet-orifice in operative relation to said valve-controlled chamber, and means for controlling the outlet discharge from the normally hermetically-sealed outlet-orifice of the cartridge container, whereby said permanent outlet-control member is adapted for successive temporary operative employment in conjunction with various attachable and detachable normally hermetically-sealed cartridge containers.

2. In means for applying liquid medicaments under pressure action, a permanent outlet-control member constituting a separate

rate and detachable entity for effecting a spraying action and comprising a tubular body having an internal chamber, a spray nozzle in communication with said chamber, a controlling valve operative in said chamber, and means for operating said valve, said permanent entity member having means for operative attachment in temporary connection with a separate and detachable normally hermetically-sealed cartridge container carrying a liquid medicinal solution or fluid under the inherent pressure action of a combined gas and means extending from its internal chamber for seating the outlet terminal end of the cartridge container with its hermetically-sealed outlet-orifice in operative relation to said valve-controlled chamber, and supplementary means carried by the control valve of said permanent entity member and operative to control the outlet discharge from the normally hermetically-sealed outlet-orifice of the cartridge container, whereby said permanent outlet-control member is adapted for successive temporary operative employment in conjunction with various attachable and detachable normally hermetically-sealed cartridge containers.

3. In means for applying liquid medicaments under pressure action, a permanent outlet-control member constituting a separate and detachable entity for effecting a spraying action and comprising a tubular body having a conical internal chamber, a spray nozzle in lateral communication with said chamber, a conical controlling valve conforming to and seated in said chamber, means for operating said valve, and a supplementary chamber opening to said conical chamber, said permanent entity member having means for operative attachment in temporary connection with a separate and detachable normally hermetically-sealed cartridge container carrying a liquid medicinal solution or fluid under the inherent pressure action of a combined gas and means extending from its said supplementary internal chamber for seating the outlet terminal end of the cartridge container with its hermetically-sealed outlet-orifice in operative relation to said supplementary chamber, and means for controlling the outlet discharge from the normally hermetically-sealed outlet-orifice of the cartridge container, whereby said permanent outlet-control member is adapted for successive temporary operative employment in conjunction with various attachable and detachable normally hermetically-sealed cartridge containers.

4. In means for applying liquid medicaments under pressure action, a permanent outlet-control member constituting a separate and detachable entity for effecting a spraying action and comprising a tubular body having an internal chamber, a spray

nozzle in communication with said chamber, a controlling valve operative in said chamber, and means for operating said valve, a supplementary body or casing for temporarily carrying a separate and detachable normally hermetically-sealed cartridge container carrying a liquid medicinal solution or fluid under the inherent pressure action of a combined gas, means for the detachable connection of said tubular body as a cap-piece for said supplementary casing, means extending from said internal valve-controlled chamber for seating the outlet terminal end of the cartridge container with its hermetically-sealed outlet-orifice in operative relation to said valve-controlled chamber, and means for controlling the outlet discharge from the normally hermetically-sealed outlet-orifice of the cartridge container, whereby said permanent outlet-control member is adapted for successive temporary operative employment in conjunction with various attachable and detachable normally hermetically-sealed cartridge containers.

5. In means for applying liquid medicaments under pressure action, a permanent outlet-control member constituting a separate and detachable entity for effecting a spraying action and comprising a tubular body having an internal chamber, a spray nozzle in communication with said chamber, a controlling valve operative in said chamber, and means for operating said valve, a supplementary body or casing for temporarily carrying a separate and detachable normally hermetically-sealed cartridge container carrying a liquid medicinal solution or fluid under the inherent pressure action of a combined gas, means for the detachable connection of said tubular body, comprising a cap-piece for said supplementary casing, said cap-piece member having a seat constituting an extension from its valve-controlled chamber and adapted to receive a corresponding outlet terminal end of the cartridge container with its hermetically-sealed outlet-orifice in operative relation to said valve-controlled chamber, means for controlling the outlet discharge from the normally hermetically-sealed outlet-orifice of the cartridge container, and means carried by said supplementary casing for forcing the normally hermetically-sealed outlet-orifice end of the enclosed cartridge container to said seat, whereby said permanent outlet-control member is adapted for successive temporary operative employment in conjunction with various attachable and detachable normally hermetically-sealed cartridge containers.

6. In means for applying liquid medicaments under pressure action, a cap-piece member comprising a tubular body having an internal chamber, valve means controlling the discharge from said chamber, said cap-

piece having means for operative attachment in temporary connection with a separate and detachable normally hermetically-sealed container carrying a liquid medicinal solution or fluid under the inherent pressure action of carbonic acid gas combined therewith and having its normally hermetically-sealed outlet-orifice in operative relation to said chamber, and a discharge tube in communication with said chamber and operative to check the volume of flow under pressure from the normally hermetically-sealed outlet-orifice of the container and convert the discharge into a jet, said discharge tube having interposed intermediately of the inlet and outlet ends of its bore means operative in a simultaneous action to retard the jet in its passage from the container under the pressure action of the combined gas and convert said retarded jet of the combined solution at the point of ejection into the outer air by pressure action of the gas into a carbonated spray.

7. In means of the class described, a cap-piece member comprising as an entity a tubular body having an internal chamber, a spray nozzle in communication with said chamber, valve means controlling the discharge from said chamber, and a supplementary chamber opening to said valve-controlled chamber and having at its base a seat recess conforming to and adapted to receive the corresponding outlet neck of a container, said cap-piece entity having means for operative attachment in temporary connection with a separate and detachable normally hermetically-sealed container carrying a liquid medicinal solution or fluid under the inherent pressure action of a combined gas and conforming at its normally hermetically-sealed outlet-orifice end to said seat-recess in the base portion of the supplementary chamber.

8. In means of the class described, a cap-piece member comprising as an entity a tubular body having an internal chamber, a spray nozzle in communication with said chamber, valve means controlling the discharge from said chamber, and a supplementary chamber opening to said valve-controlled chamber and having at its base a seat portion conforming to and adapted to receive the corresponding outlet neck of a container, said cap-piece entity having means for operative attachment in temporary connection with a separate and detachable normally hermetically-sealed container carrying a liquid medicinal solution or fluid under the inherent pressure action of a combined gas and conforming at its normally hermetically-sealed outlet-orifice neck to said base seat portion of the supplementary chamber, and said control-valve of said cap-piece member having means operative in said supplementary chamber for operatively

controlling the outlet discharge from the normally hermetically-sealed outlet-orifice of the container.

9. In means for applying fluids under pressure action, a cap-piece member comprising a tubular body having an internal valve-controlled chamber and a spray nozzle in communication with said chamber, in combination with a casing body for carrying a separate and detachable normally hermetically-sealed cartridge container, and means for the operative attachment of said cap-piece in temporary connection with said casing body, whereby the cap-piece and casing body may be detachably separated for the insertion or removal of the separate cartridge containers, said casing body having means for seating the outlet terminal end of the cartridge container with its normally hermetically-sealed outlet-orifice in operative relation to said valve-controlled chamber of the cap-piece.

10. In means for applying fluids under pressure action, a cap-piece member comprising a tubular body having an internal valve-controlled chamber and a spray nozzle in communication with said chamber, in combination with a casing body for carrying a separate and removable normally hermetically-sealed cartridge container, and means for the operative attachment of said cap-piece in temporary connection with said casing body, whereby the cap-piece and casing body may be detachably separated for the insertion or removal of the separate cartridge containers, said cap-piece having a seat-recess constituting an extension from its valve-controlled chamber and adapted to receive a corresponding outlet terminal end of the cartridge container with its hermetically-sealed outlet-orifice in operative relation to said valve-controlled chamber, and said casing body having means for retaining said outlet terminal end of the normally hermetically-sealed cartridge container in the seat-recess of said cap-piece.

11. In means for applying fluids under pressure action, a cap-piece member comprising a tubular body having an internal chamber, a controlling valve operative in said chamber, and a spray nozzle in communication with said chamber, in combination with a casing body for carrying a separate and removable normally hermetically-sealed cartridge container, and means for the operative attachment of said cap-piece in temporary connection with said casing body, whereby the cap-piece and casing body may be detachably separated for the insertion or removal of the separate cartridge containers, said valve of the cap-piece carrying means operative to control the outlet discharge from the normally hermetically-sealed outlet-orifice of the cartridge container.

12. In means for applying liquid medica-
ments under inherent pressure action, an
outlet-control member constituting an en-
tity and carrying all the means for effecting
the discharge and application of the desired
solution or fluid, in combination with a sep-
arate and removable normally hermetically-
sealed cartridge container carrying a liquid
medicinal solution or fluid under the in-
herent pressure action of a combined gas,
and means for the temporary attachable
connection of the hermetically-sealed car-
tridge container with the outlet-control en-
tity member under operative conditions in
which the normally hermetically-sealed
outlet-orifice of the hermetically-sealed car-
tridge container is operated by action of the
outlet-control means of the permanent en-
tity member, whereby various attachable
and detachable normally hermetically-
sealed cartridge containers may be succes-
sively and temporarily employed in connec-
tion with said permanent member and op-
erated thereby.

13. In means for applying liquid medica-
ments under inherent pressure action, an
outlet-control member constituting an en-
tity and carrying all the means for effect-
ing the discharge and application of the
desired solution or fluid, in combination with
a normally hermetically-sealed cartridge
container carrying a liquid medicinal solu-
tion or fluid under the inherent pressure ac-
tion of a combined gas and having a valve-

controlled outlet, and means for the tempo-
rary attachable connection of the hermeti-
cally-sealed cartridge container with the out-
let-control entity member and with its valve-
controlled outlet seated hermetically with
relation thereto under operative conditions
in which the valve means controlling the
outlet of the hermetically-sealed cartridge
containers is operated by action of the outlet-
control means of the permanent entity mem-
ber, whereby various cartridge containers
may be successively and temporarily em-
ployed in connection with said permanent
member and operated thereby.

14. In means of the class described, a
temporary normally hermetically-sealed car-
tridge container carrying a liquid medicinal
solution or fluid under the inherent pressure
action of a combined gas and having a nor-
mally hermetically-sealed outlet orifice and
means for controlling the normally-closed
action thereof, said outlet being so positioned
that it will open to the chamber of an at-
tachably permanently-usable outlet-control
entity device having means for actuating the
control means of said cartridge outlet and
directing the discharge therefrom, and
means for effecting the hermetically-sealed
operative temporary connection of said sep-
arate and detachable cartridge container
with the permanent outlet-control device.

In testimony whereof I have signed the
foregoing specifications.

LEWIS KEMPTON MOBLEY.