

No. 629,752.

Patented July 25, 1899.

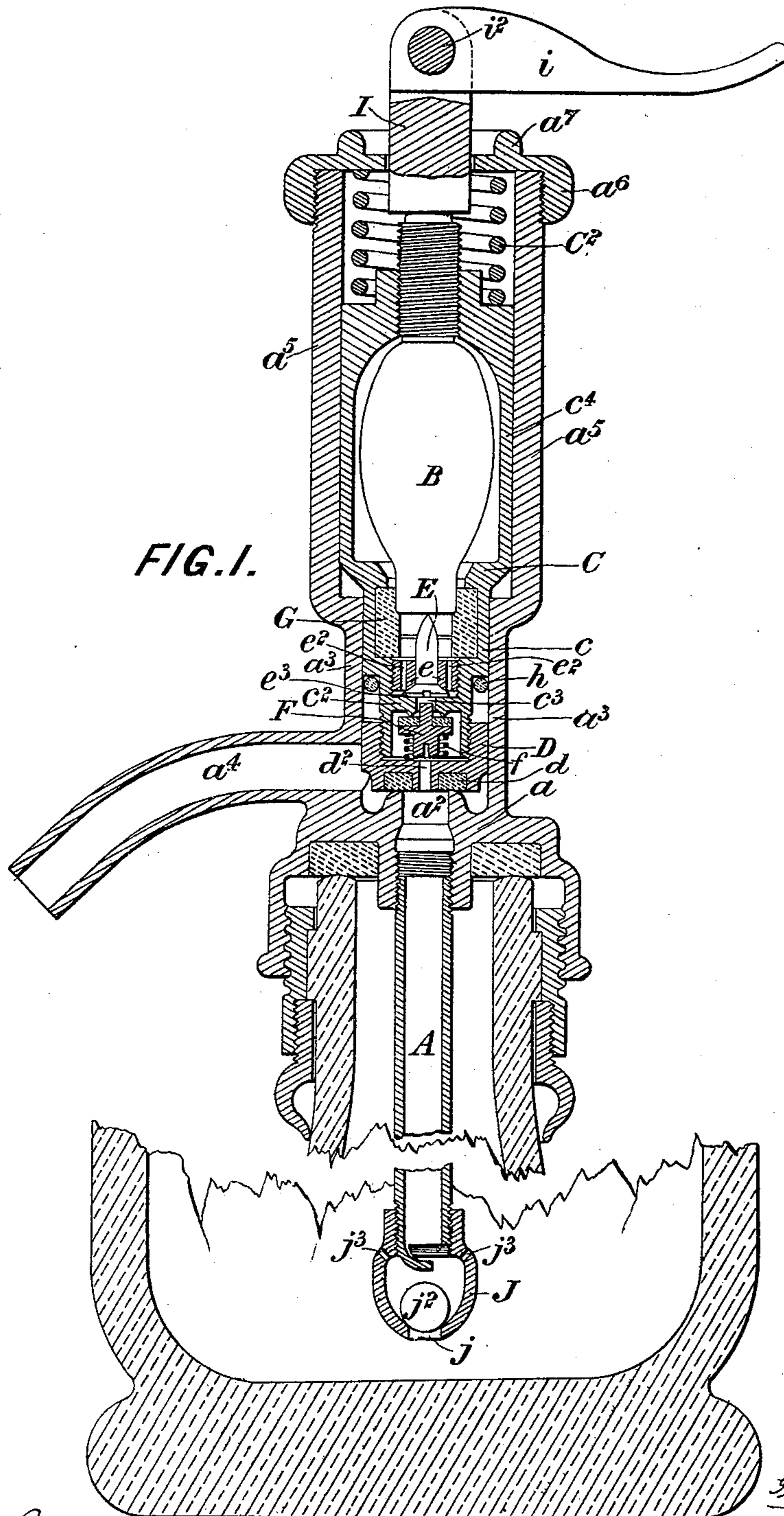
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MEANS FOR EFFECTING AERATION OF LIQUIDS IN BOTTLES.

(Application filed May 9, 1899.)

(No Model.)

4 Sheets—Sheet 1.



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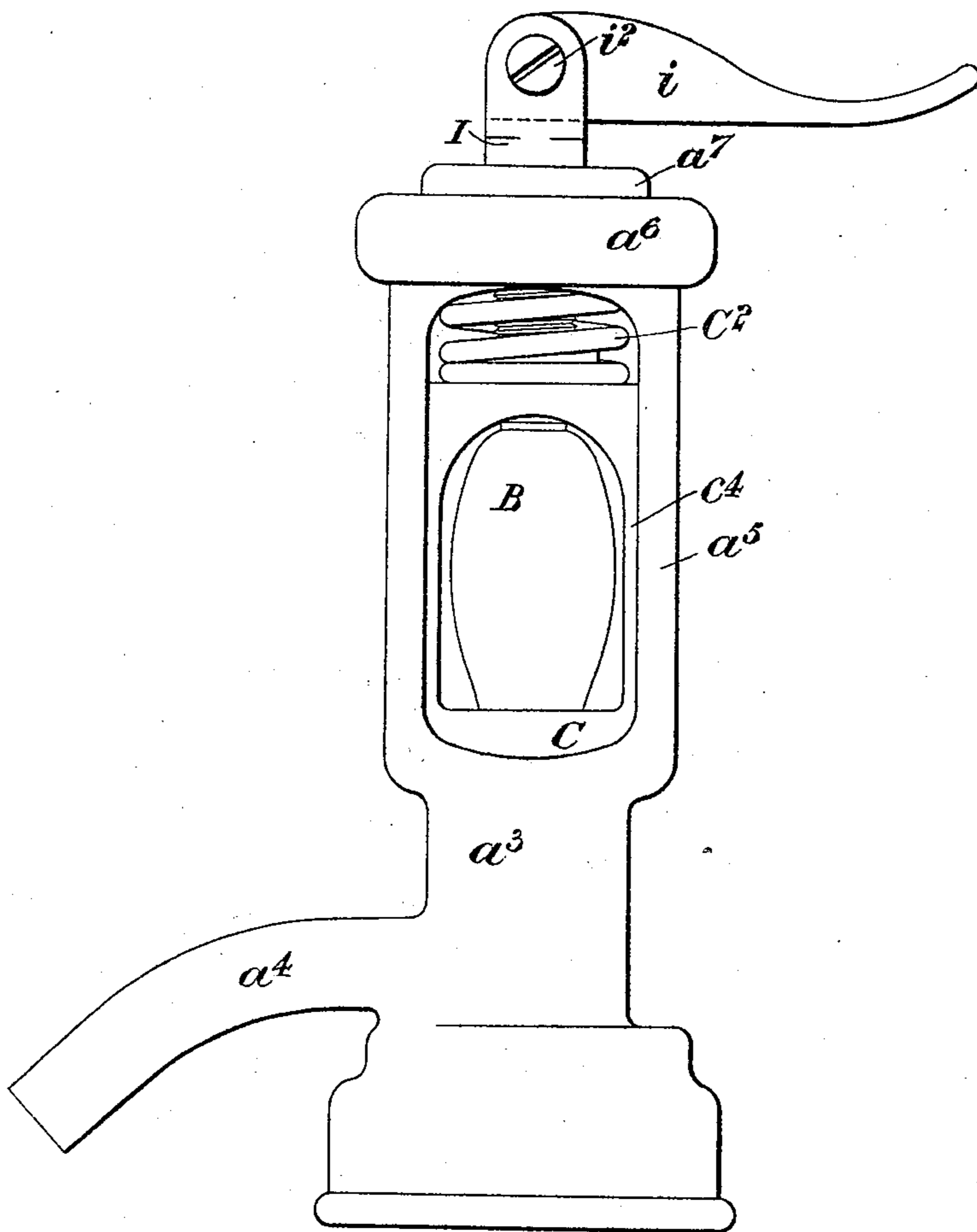
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4 Sheets—Sheet 2.

FIG. 2.



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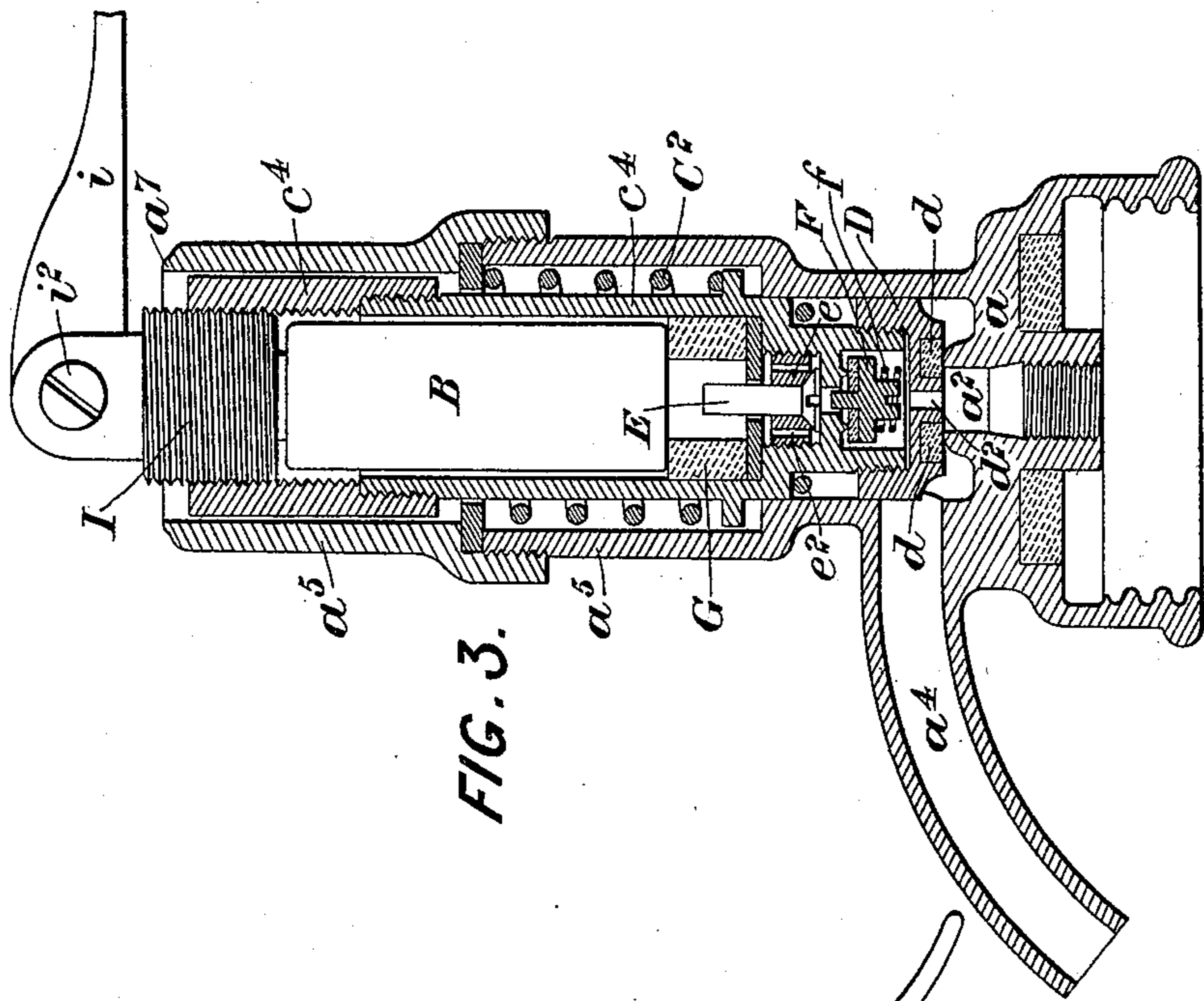


FIG. 3.

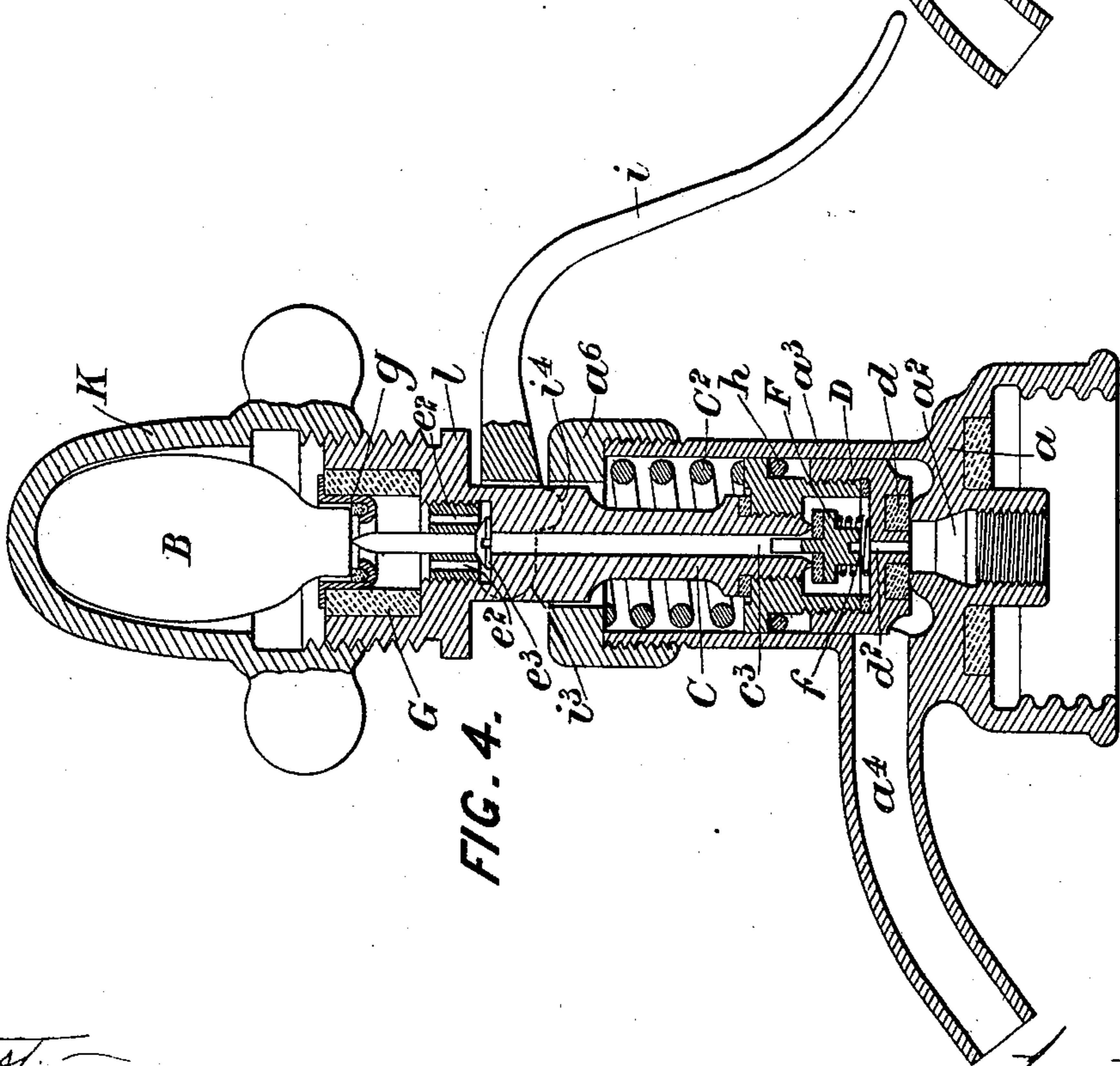


FIG. 4.

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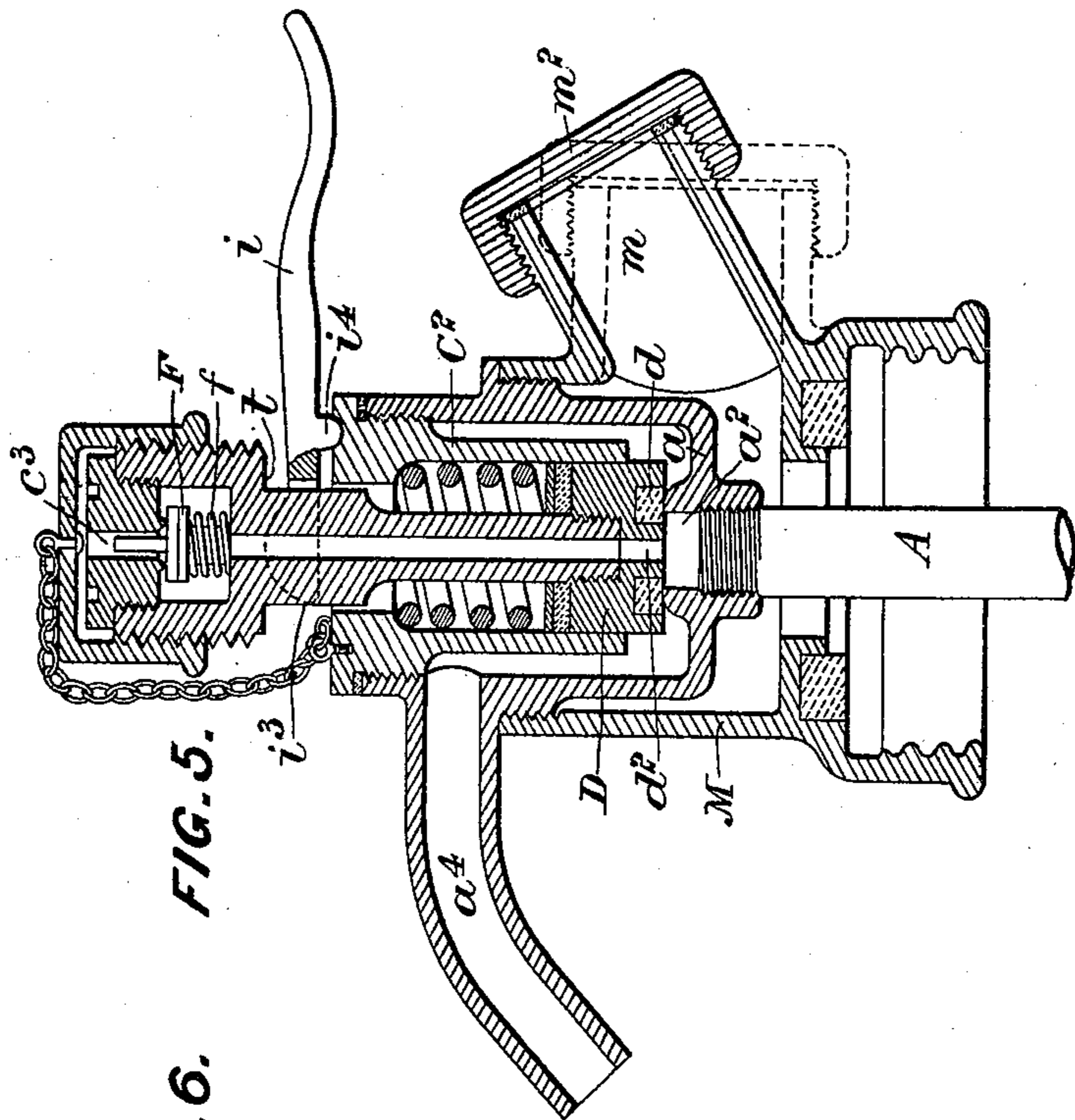


FIG. 5.

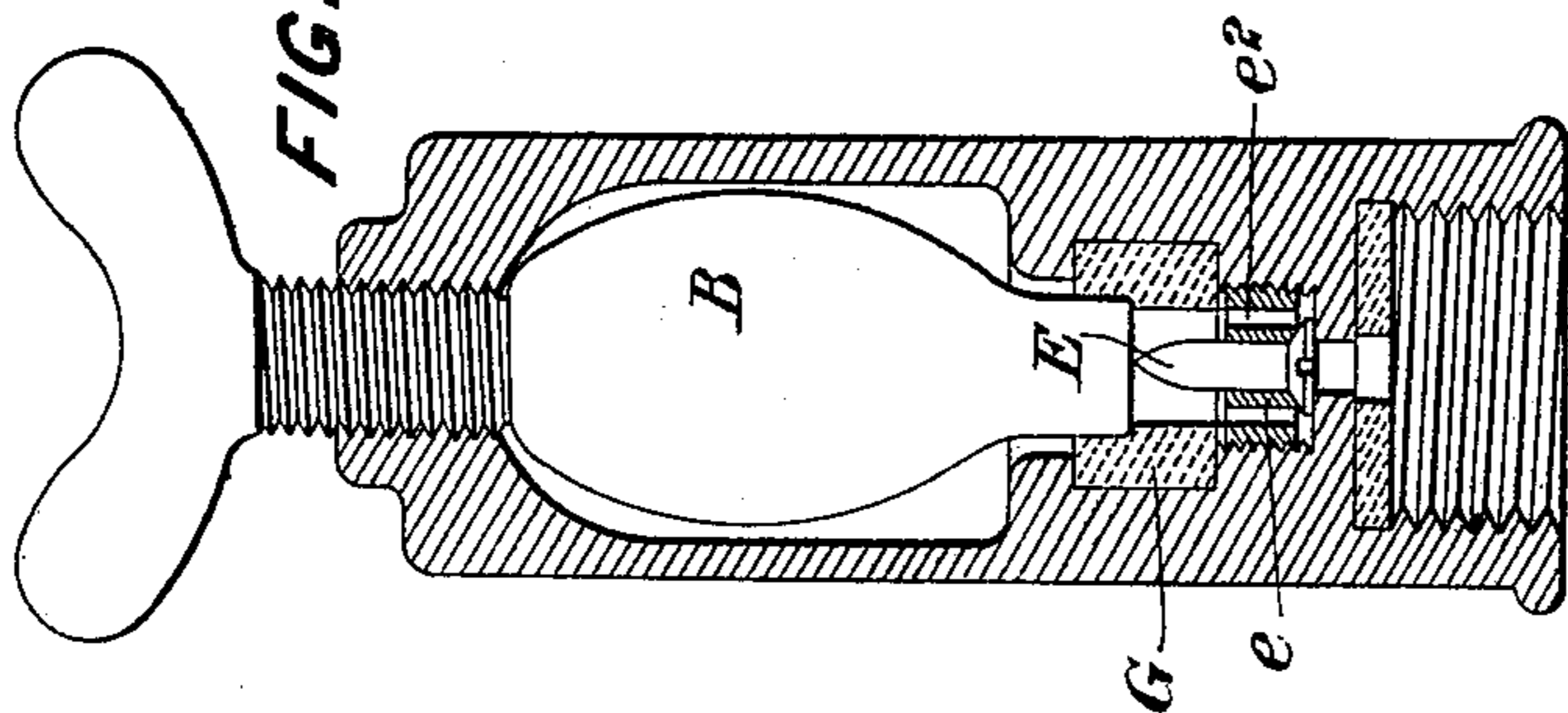


FIG. 6.

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UNITED STATES PATENT OFFICE.

KENNETH S. MURRAY, OF LONDON, ENGLAND, ASSIGNOR TO THE AERATORS, LIMITED, OF SAME PLACE.

MEANS FOR EFFECTING AERATION OF LIQUIDS IN BOTTLES.

SPECIFICATION forming part of Letters Patent No. 629,752, dated July 25, 1899.

Application filed May 9, 1899. Serial No. 716,122. (No model.)

To all whom it may concern:

Be it known that I, KENNETH SUTHERLAND MURRAY, engineer, a subject of the Queen of Great Britain and Ireland, and a resident of 17 Bedford Court Mansions, London, England, have invented certain new and useful improvements in means for use in effecting the aeration of liquids in bottles or like receptacles and for retaining the said liquids in and discharging them from the said bottles or receptacles, (for which I have, in conjunction with Aerators, Limited, of Broad Street avenue, in the city of London, England, applied for a British patent, No. 7,519, dated April 10, 1899,) of which the following is a specification.

This invention relates to the class of bottles or receptacles for aerated liquids commonly known as "siphon-bottles" or "seltzogenes," from which the aerated liquid is forced, in quantity as required, by the pressure of the gas in the bottle or receptacle; and the said invention has for its principal object to provide improved means whereby the aeration of liquids in such bottles or receptacles can be effected by liberating gas from a capsule or container in which it is confined under pressure, the said capsule or container being with great facility placed in and removed from a holder carried by the siphon-head. The draw-off valve and the holder for the capsule or container of compressed gas (including in that term liquefied gas) and also the means by which it is pierced or opened are carried by a part capable of sliding vertically in the siphon-head and pressed downward by a spring, so that the draw-off valve is normally pressed to its seat, but acts as a safety-valve to relieve excessive pressure in the bottle or receptacle. The liquid is aerated by piercing or opening the capsule or container of compressed gas placed in the holder carried by the said sliding part, the gas passing through passages (and also through a non-return valve, if desired) in the said sliding part and down a tube carried by the siphon-head and descending, as usual, to near the bottom of the bottle or receptacle, but preferably having the opening at its lower end provided with a ball or other valve, which

closes the said opening when the gas passes from the capsule or container and down the said tube, so that the said gas is caused to issue through a small opening or openings in the said tube above the valve in such direction as to facilitate its absorption by the liquid in the bottle or receptacle, while when the liquid is withdrawn it lifts the valve and passes freely up the tube and through the draw-off valve and out at the nozzle. After the liquid has been aerated a handle or device can be operated to move the said sliding part upward in the siphon-head and open the draw-off valve, so that aerated liquid is discharged at the nozzle.

In the accompanying drawings are illustrated arrangements according to this invention.

Figure 1 is a vertical section, and Fig. 2 is a side elevation, of an arrangement according to this invention wherein the capsule or container of compressed gas can be placed in position and removed without removing any part of the apparatus for the purpose. Fig. 3 is a vertical section of a modification of the arrangement; and Fig. 4 shows an arrangement in which the capsule or container of compressed gas is introduced into a chamber above the draw-off handle. Figs. 5 and 6 show an arrangement wherein the capsule holder and perforator can be removed after aeration, and Fig. 5 shows also a filling arrangement.

In Figs. 1, 2, 4, and 5 the capsule or container is presumed to require to be perforated to liberate the gas, and in Fig. 3 the capsule or container is presumed to be provided with a valve requiring to be pushed inward to liberate the gas. The siphon-head can be secured to the top of the bottle or receptacle in the ordinary or any suitable way which will form a good joint.

Referring first to Figs. 1 and 2, a web a is formed across the lower part of the interior of the siphon-head, and in this web is a hole a^2 , around the upper edge of which a valve-seating is formed. Above this web is a cylindrical chamber a^3 , from the lower part of which is carried the spout a^4 , through which the aerated liquid is discharged. Above the

chamber a^3 a continuation a^5 is formed, closed at the top by the cover a^6 and with a gap at one side or opposite sides sufficient to allow of the passage of the capsule or container B of compressed gas.

C is a sliding part, the lower portion of which comprises a piston c , fitting into the cylindrical chamber a^3 , and with its lower end reduced and having secured to it the draw-off valve D, containing elastic material d , to press against the valve-seat around the opening a^2 . Inside the piston c is a web c^2 with an opening c^3 through it, and into the space above this is inserted a small block e , carrying the steel pin E, by means of which the capsule or container B is pierced. The block e is pierced vertically by holes e^2 , which communicate with a horizontal passage e^3 , which communicates with the hole c^3 , so that the gas discharged from the capsule or container B passes therethrough and through the space below the web c^2 and through the opening d^2 in the valve D into the tube A and thence into the liquid in the bottle.

G is a flexible seating into which the neck end of the capsule or container B fits to prevent the upward escape of gas when the said capsule or container is pierced. A check-valve F (pressed upward by a spring f) can be placed within the space below the web c^2 to prevent the gas or aerated liquid from passing upward through the hole c^3 if the capsule or container be removed after aeration or if it does not make a tight joint. The upper portion c^4 of the part C slides in the part a^5 of the siphon-head, the said part c^4 having an opening at one side or at opposite sides to allow of the capsule or container B being placed in position and removed sidewise.

The part C can be moved up and down in the siphon-head, but is prevented from turning therein, which can be effected by making the parts a^5 and c^4 of square or equivalent form. A joint may be formed between the lower part of the unreduced part of the piston and the upper part of the valve D by inserting an elastic ring in the space between them, as shown at h .

A spring C^2 presses upon the top of the sliding part C to keep the draw-off valve D normally to its seat, but yet to allow the said draw-off valve to act as a safety-valve by rising from its seat to allow of escape of gas by the spout a^4 on any undue rise of pressure in the bottle or receptacle. Through a plain opening in the cover a^6 a spindle I is passed, the bottom portion of which is screwed through an internal screw in the head of the part c^4 . The upper end of the spindle I has a lever-handle i centered to it by a pin i^2 .

At the bottom end of the tube A is secured a small valve-chamber J with an opening j at bottom, over which a ball or other retention-valve j^2 seats itself. j^3 are small holes directed upward. The valve j^2 closes the opening j when the pressure is downward and causes the gas to pass upward through the small

holes j^3 , so that the gas is ejected very efficiently into the liquid. The valve j^2 rises to allow the liquid being withdrawn to pass freely into the tube A.

The action of the apparatus is as follows: Liquid having been introduced into the bottle or receptacle to the requisite level and the siphon-head secured firmly in place, a capsule or container B of compressed carbonic acid or other gas is inserted sidewise into place above the piercing-pin E, as shown in Fig. 1, the valve D being held down upon its seating by the pressure of the spring C^2 . The spindle I is then rotated, and thus screwed down in the head of the part c^4 , so as to press the capsule or container B onto the pin E, which pierces the said capsule or container, and on turning the spindle I slightly back the gas is discharged therefrom and passes through the passages e^2 , e^3 , c^3 , d^2 , and a^2 into the tube A and thence by the holes j^3 into the liquid in the bottle or receptacle. The downward movement of the spindle I brings the lever-handle i against the bead a^7 on the cover a^6 , and when it is desired to withdraw aerated liquid from the bottle or receptacle the outer end of the said lever-handle i is pressed down, (the bead a^7 acting as a fulcrum therefor,) and the sliding part C is thus raised and the valve D lifted from its seat and aerated liquid is forced up the tube A and escapes past the valve D and through the spout a^4 , being prevented by the retention-valve F from escaping through the passage c^3 if the capsule or container B has been removed after aeration or if it does not make a tight joint.

Fig. 3 represents a modification wherein a cylindrical capsule or container B is used, which is provided with a valve to be opened by pressure instead of by piercing, and the pin E is therefore without a pointed end. The parts which correspond with those shown in Figs. 1 and 2 are marked with the same letters of reference and the foregoing description applies to them also, except that the spindle I instead of passing through a cover a^6 is screwed directly into the top of the part c^4 and is removed for the insertion of the capsule B, and the spring C^2 acts between a flange-plate secured between the portions of the part a^5 and a flange. The upper portions of the parts c^4 and a^5 are made of hexagonal or other non-circular shape to prevent the sliding part C turning in the siphon-head.

In Fig. 4 is shown a modification in which also the parts which correspond with those shown in the preceding figures are marked with the same letters of reference, the foregoing description of Figs. 1 and 2 applying to them also. In this arrangement, however, the sliding part C is continued up through the cover a^6 , and the receptacle for the capsule or container of compressed gas is at top, and a cap K is screwed down onto the top of the said part C to effect the piercing, the pin E being in the upper portion of the sliding part C and the opening c^3 being continued

through the prolongation of the said sliding part C between the said pin and the retention-valve F. The draw-off lever-handle *i* is forked, so that the prongs of the fork (one of which is shown at *i*³) lie on each side of the sliding part C and when the outer end of the said lever is depressed lift it by bearing on the flanged part *l* above them, the rounded projections *i*⁴, engaging in recesses in the cover *a*⁶, acting as fulcrum. The elastic joint G has a metal thimble *g* in it, containing elastic material to make a tight joint when pressed up by the gas.

Fig. 5 shows the invention as applied to a siphon-head in which provision is made for introducing the liquid without removing any part of the said head except a cap covering the inlet for liquid. The parts which correspond with those shown in the preceding figures are marked with the same letters of reference. The valve F is shown in a chamber above the lever-handle *i* instead of in a lower chamber, and instead of the part carrying the spout *a*⁴ being secured directly to the bottle or receptacle it is secured to a shell or casing M, which is secured to the bottle or receptacle, there being sufficient space between the part carrying the spout *a*⁴ and the shell or casing M to allow of liquid introduced by the inlet-opening *m* passing into the bottle or receptacle. The opening at *m* is covered by a screw-cap *m*², with a leather or other joint to give a tight closure. In full lines the inlet *m* is shown directed upward for filling while the bottle or receptacle is standing on its base; but in order to insure that the bottle or receptacle shall only be filled to the requisite level the said inlet *m* may be directed out horizontally, as indicated by dotted lines, so that the bottle or receptacle is placed on its side to be filled, and the liquid will overflow at the inlet when the requisite quantity has been introduced. The said arrangements for filling can be applied to either of the arrangements shown. Fig. 5 also shows an arrangement wherein the part, Fig. 6, which carries the capsule or container B and the perforating device E is made separable, so that on being removed it can be used for charging any number of bottles or receptacles. The part for carrying the capsule or container B and the perforating device E, Fig. 6, when the liquid in the bottle or receptacle is to be charged with gas, is screwed on in place of the dust-cap *n*, Fig. 5, which is removed for the purpose. When charging has been effected, the part shown in Fig. 6 is removed and the dust-cap *n* is screwed in place. In order to prevent the necessity for turning back the handle *i* or its equivalent to allow the gas to pass out of the capsule or container, the pin E may have a perforation through it.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I declare that what I claim is—

1. The combination with a siphon-head, of a sliding part which comprises or carries the draw-off valve and forms a holder for a capsule or container of compressed gas, a device acting to release the gas from the capsule or container, said device being also carried by the sliding part, and a passage from the sliding part for the escape of the released gas into the liquid to be aerated, substantially as described.

2. The combination with a siphon-head of a sliding part which comprises or carries, the draw-off valve; a holder for the capsule, or container, of compressed gas; and a device for releasing the gas therefrom and a passage for the escape of the released gas into the liquid to be aerated; and a retention-valve to prevent return of gas or liquid, by the said passage; substantially as hereinbefore described.

3. The combination with a siphon-head of a sliding part which comprises, or carries the draw-off valve; a holder open at the side for the insertion of a capsule, or container of compressed gas; and a device for releasing the gas therefrom; and a passage for the escape of the released gas into the liquid; and a lever-handle so arranged that after the gas has been liberated from the said capsule or container the said sliding part can be moved upward by the said handle to open the draw-off valve; substantially as hereinbefore described.

4. The combination with a siphon-head of a sliding part which comprises, or carries, the draw-off valve; a holder for the capsule, or container, of compressed gas; a perforating or opening device therefor; and a passage for the escape of the liberated gas into the liquid; and a spring pressing down the said sliding part, and consequently pressing the draw-off valve down onto its seat, so that the said draw-off valve also acts as a safety-valve; substantially as hereinbefore described.

5. The combination with a siphon-head of a tube descending into the liquid to be aerated, the said tube being provided with an opening at bottom, controlled by a valve, and with an opening, or openings above the first-named opening so that when gas passes down the tube, the valve closes the bottom opening, and the gas passes through the opening or openings, above, into the liquid, the said valve opening to admit of the outflow of liquid in drawing off; substantially as hereinbefore described.

6. The combination with a siphon-head and draw-off valve and means for operating the same, a holder for the capsule or container of compressed gas, a device for releasing the compressed gas from said capsule, means for moving the capsule in its holder to bring said device into operation, and a passage through the movable part for conducting the liberated gas into the bottle or receptacle containing the liquid to be aerated.

7. The combination of a siphon-head, of a

movable part slidably mounted in said head and forming a holder for a capsule or container of compressed gas, a device fixed in said sliding part acting to release the gas from the capsule, means also carried by the sliding part for moving the capsule into contact with the gas-releasing device whereby the latter comes into operation, a passage through the sliding part for conducting the liberated gas into the liquid to be aerated, and the draw-off valve and means for operating the same.

8. The combination with a siphon-head, of a movable part slidably mounted in said head, comprising a draw-off valve and forming a holder for the capsule or container of compressed gas, a device for releasing the gas from the capsule fixed in said movable part, means for moving the capsule into contact with said gas-releasing device, a passage through the movable part for conducting the released gas into the liquid to be aerated, and means for sliding the movable part in the

siphon-head for opening and closing the draw-off valve.

9. The combination with a siphon-head, of a movable part slidably mounted therein and forming a holder for a capsule or container of compressed gas, a yielding support against which the capsule rests at one end, a device adapted to release the compressed gas contained in the capsule, means for moving the capsule against its yielding support and into contact with the gas-releasing device, a passage through the movable part for conducting the released gas into the liquid to be aerated, and a draw-off valve and means for operating the same.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

K. S. MURRAY.

Witnesses:

JOHN EDWARD NEWTON,
WILLIAM FREDERICK UPTON.