

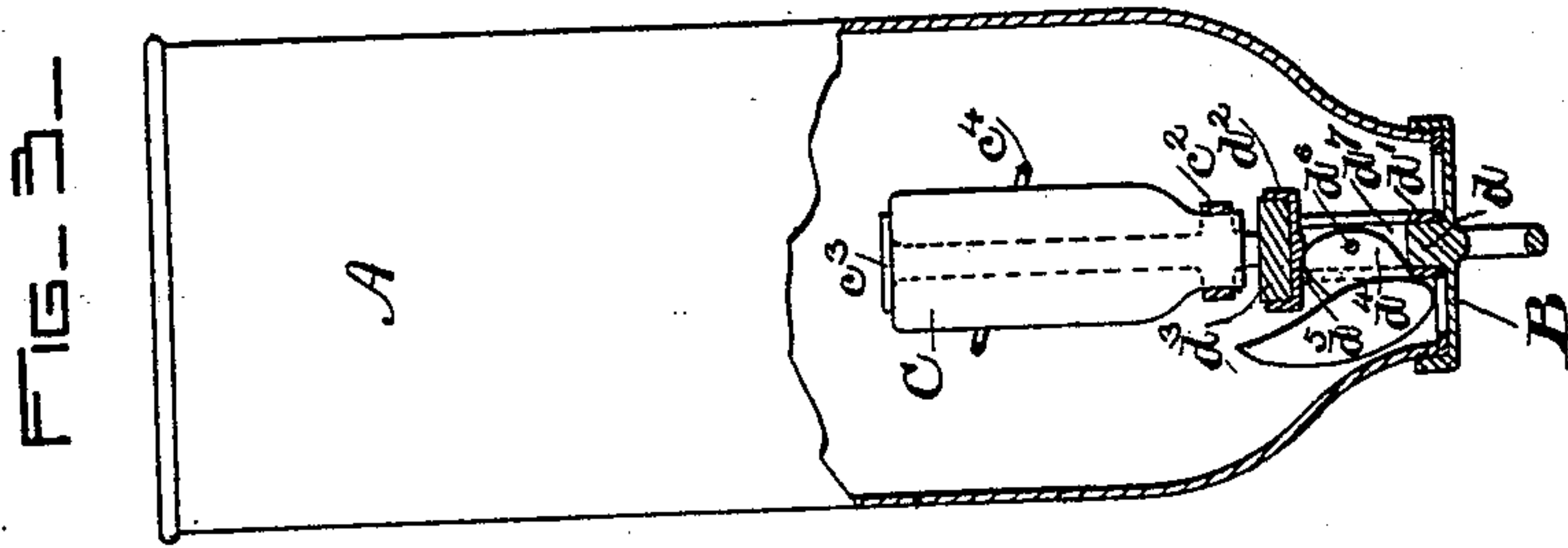
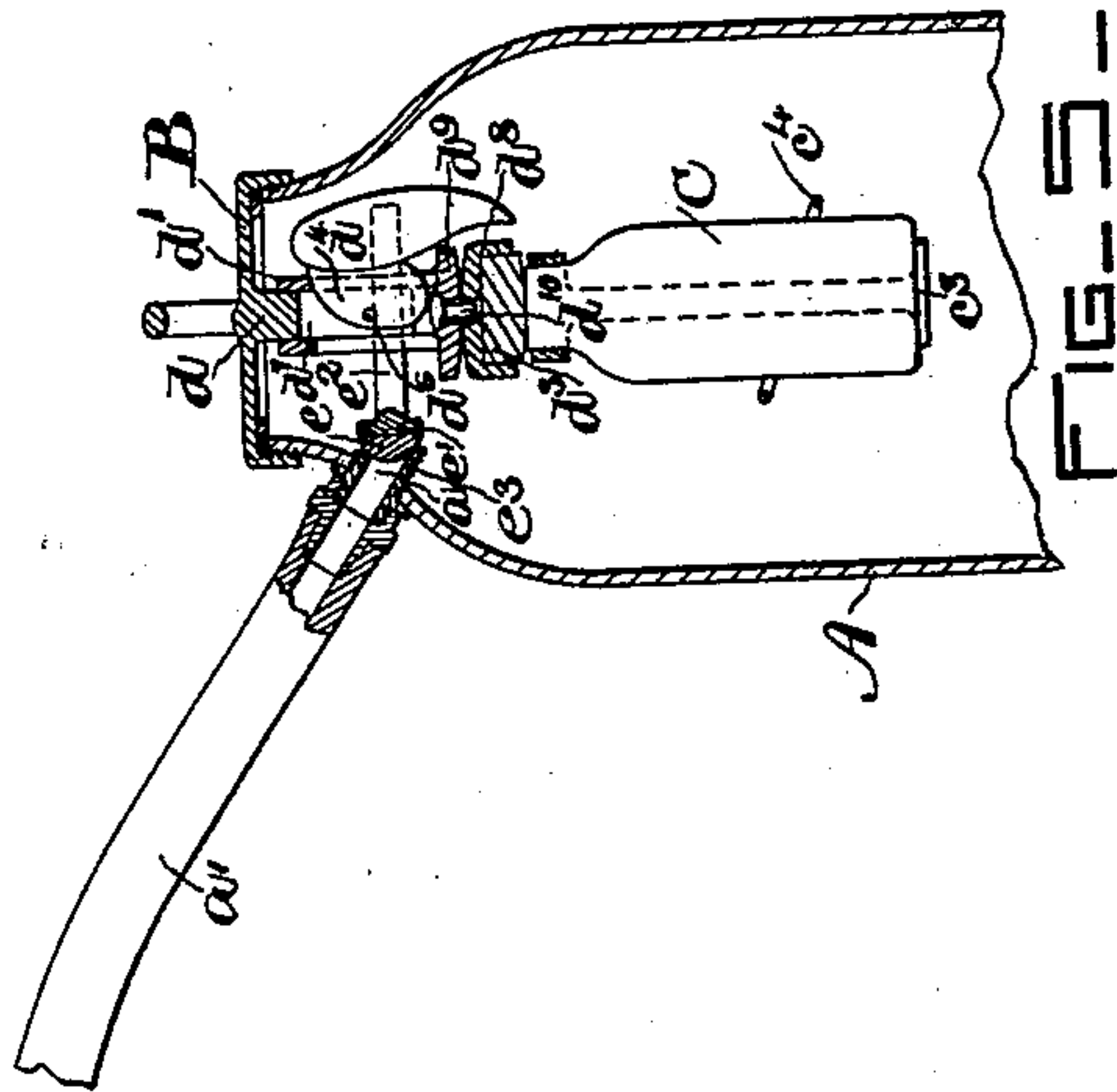
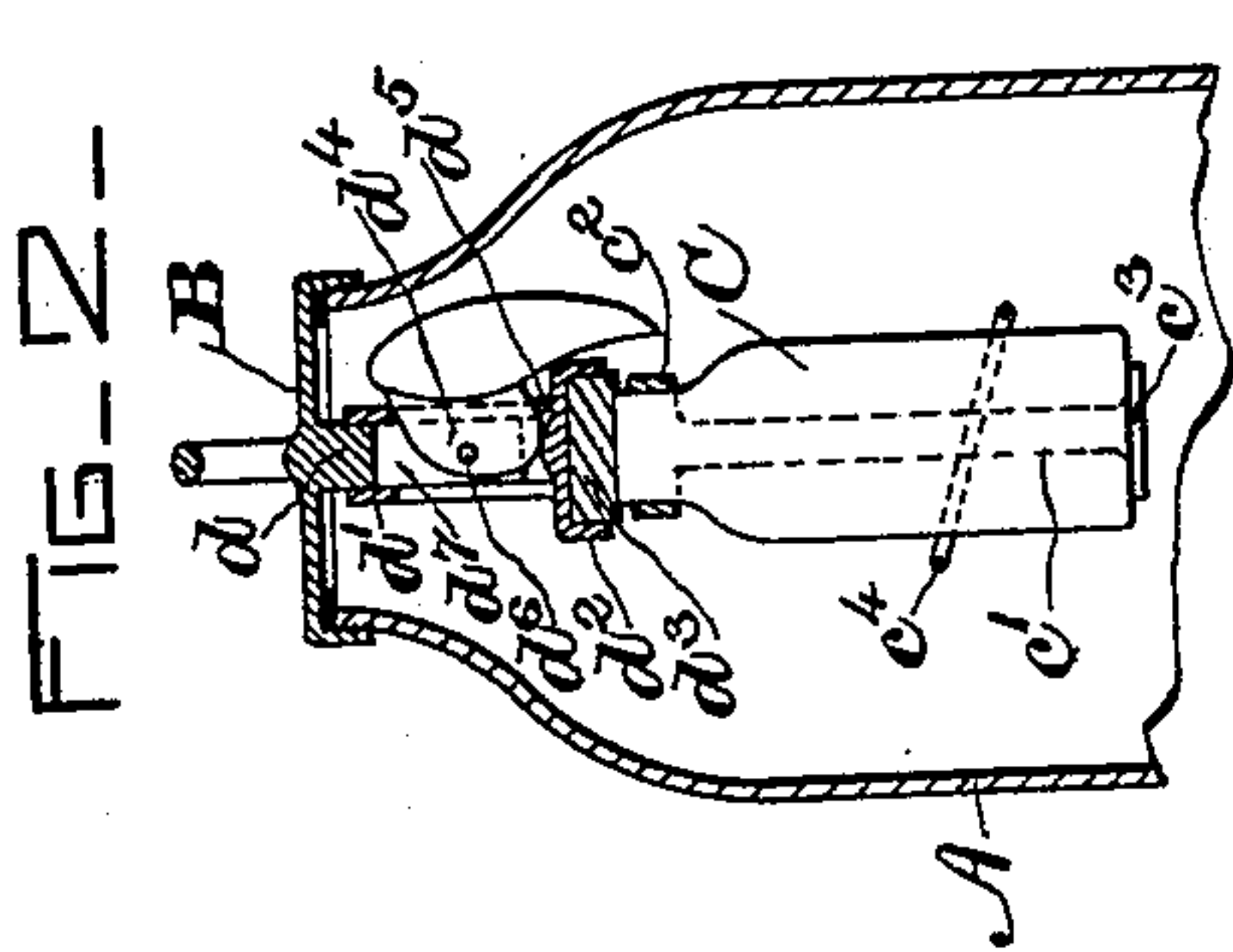
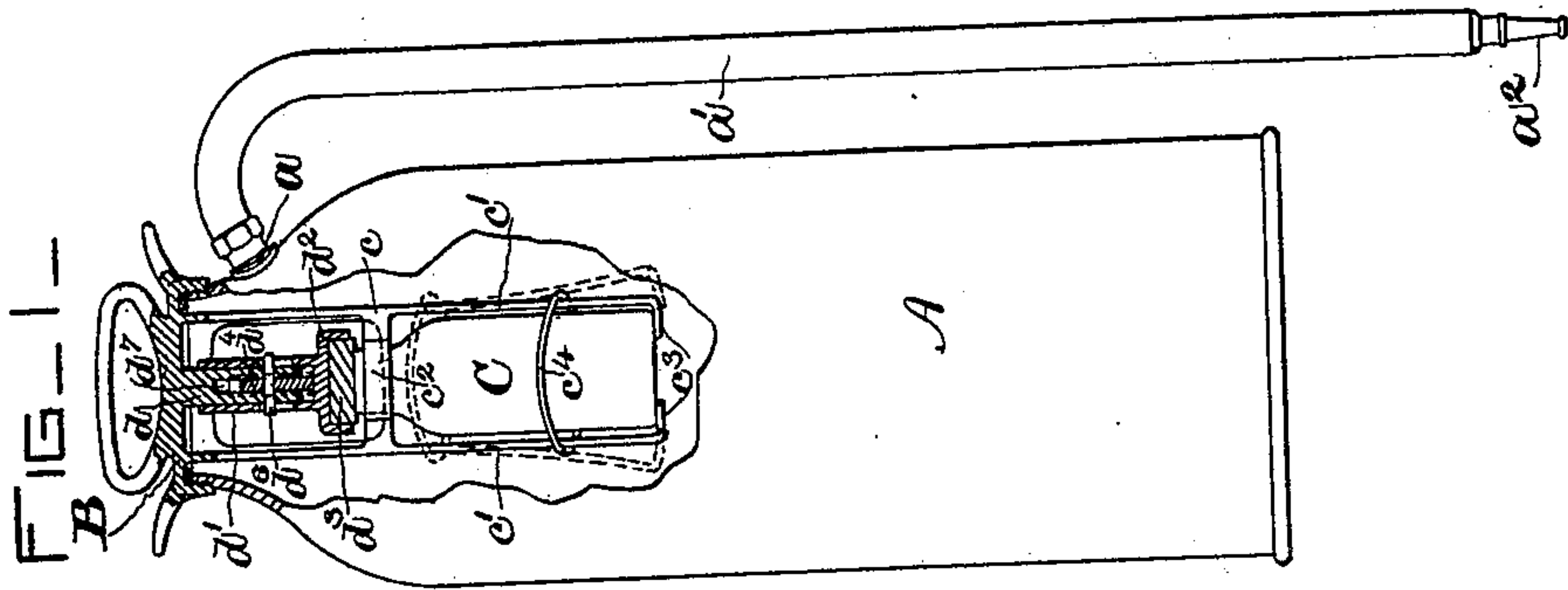
No. 626,683.

Patented June 13, 1899.

W. E. FORSTER.  
FIRE EXTINGUISHER.

(Application filed Feb 10, 1898.)

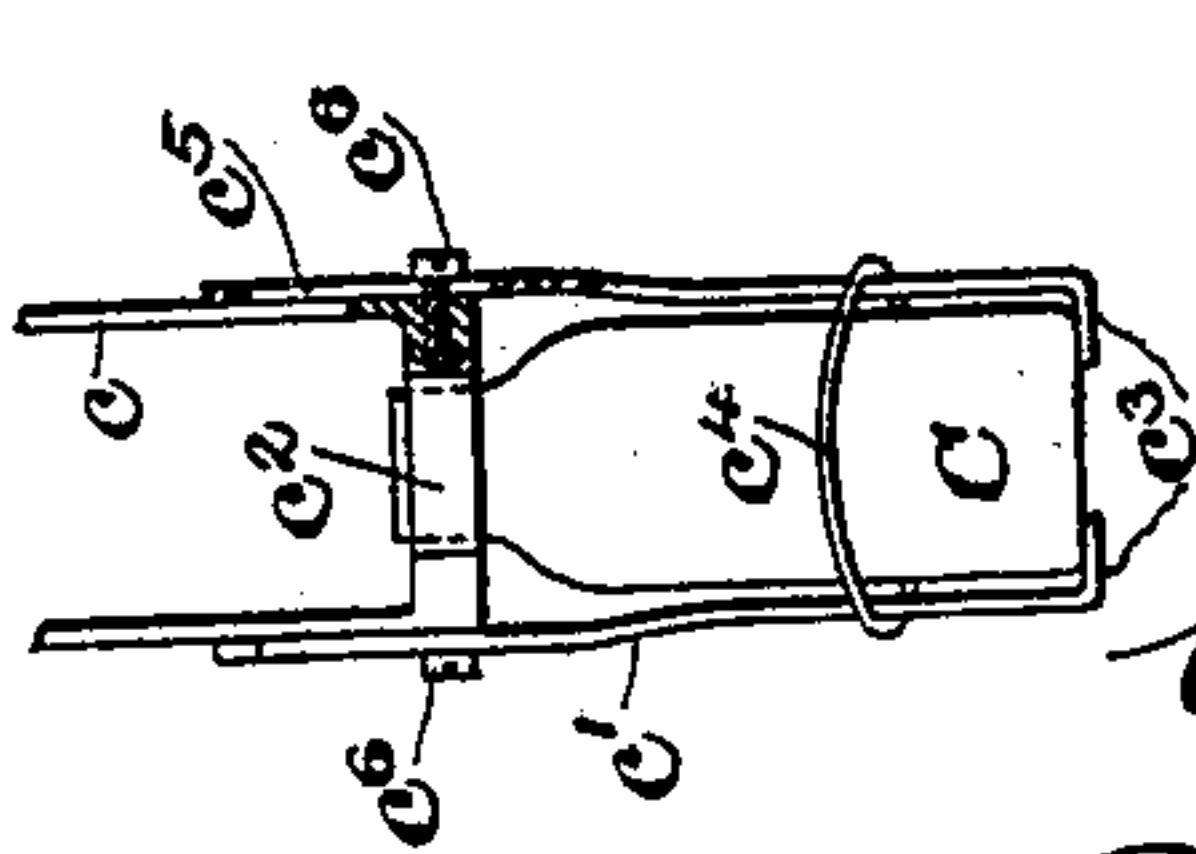
(No Model.)



WITNESSES

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# UNITED STATES PATENT OFFICE.

WILLIAM E. FORSTER, OF LYNN, MASSACHUSETTS.

## FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 626,683, dated June 13, 1899.

Application filed February 10, 1898. Serial No. 669,809. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM E. FORSTER, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Fire-Extinguishers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in fire-extinguishers and of that type of fire-extinguishers generally known as "chemical apparatus," and which comprises a tank or vessel containing water and bicarbonate of soda and a small vessel inclosed in said tank containing a suitable acid, and which when discharged into the water and soda will generate carbon dioxide. As the most common forms of such apparatus have been heretofore constructed the smaller acid-containing vessel has been arranged to be broken or tipped, so as to discharge the contents into the soda and water, by means such as rods or levers which pass through the cap or other part of the larger inclosing tank or vessel, and because of the fact that it has been almost impossible to secure a close packing or stuffing around the rod or other actuating device, where it extends through the cap or other part of such inclosing vessel, the liquid therein will evaporate to a certain extent and form a crust or sediment around such rod and the aperture through which it extends, causing corrosion of the metal and the rod to stick and bind therein, rendering it almost impossible to operate the apparatus quickly when desired.

The object of the present invention is to overcome the difficulty above noted and to produce a fire-extinguisher in which the outer tank or receptacle shall be hermetically sealed when not in use, thus effectually preventing all evaporation of its contents.

A further object of the invention is to produce a fire-extinguisher provided with an automatic sealing and releasing mechanism for the acid-containing vessel so arranged that it shall be free of all projecting rods or levers and arranged to automatically unseal said vessel when the apparatus shall be placed upon

its side or turned upside down in order to discharge the acid into the water and soda of the outer vessel, and which when the vessel is standing upon its base or suspended upright will effectually hold the acid-containing vessel sealed.

A further object of the invention is to do away with the usual cock or valve with which the nozzle of the hose of fire-extinguishers are usually provided and provide an automatic sealing device for the hose-opening of the outer tank or vessel, which device will act to automatically close and seal such hose-opening when the apparatus is in an upright position and which will automatically uncover such opening when the apparatus is displaced relatively to such upright position.

To the above end the present invention consists of the devices and combination of devices, as will be hereinafter described and claimed.

The present invention is illustrated in the accompanying drawings, in which—

Figure 1 shows the apparatus in side elevation, the outer vessel being partially broken away to show interior construction and parts being in section. Fig. 2 shows the upper portion of the apparatus in section, turned around a quarter-turn with relation to the illustration of Fig. 1, the weighted cam and other parts being in side elevation. Fig. 3 shows a view similar to Fig. 2 with the apparatus inverted, showing the operation of the sealing device for the acid-containing vessel. Fig. 4 shows a modified form of the supporting-frame for the acid-containing vessel. Fig. 5 shows further modifications to be hereinafter referred to.

Similar letters of reference represent corresponding parts throughout the several views.

In the drawings, A represents the outer or inclosing receptacle or tank, which contains the solution of water and bicarbonate of soda, and B represents the imperforate cap or cover, which is secured in position to close the tank A by means of complementary screw-threads formed on said tank and the cover, all as is usual in these devices. The tank A has the usual hose port or opening *a*, to which is secured a short section of hose *a'*, carrying any suitable form of nozzle *a''*; but unlike the noz-



zle usually employed in these devices the nozzle  $a^2$  may be formed without the usual cock or valve.

C represents the acid-containing vessel, 5 which may be formed of glass or any other preferred material and which in the illustrated embodiment of the present invention is shown as supported by a holder which is secured to the under side of the cap B, but 10 which in practice may be supported at any convenient position in the tank A. The holder for the vessel C consists of a frame  $c$ , which comprises two downwardly-extending arms  $c'$ , which at their upper ends are con- 15 nected to the under side of the cap B and which at a point intermediate their upper and lower ends support a ring or collar  $c^2$ , arranged to embrace the neck of the acid-containing vessel C.

20 The arms  $c'$  below the collar  $c^2$  are arranged to normally spring outward away from the sides of the vessel C and at their lower ends are provided with inturned flanges or feet  $c^3$ , which when the neck of the vessel C is in- 25 serted in the ring or collar  $c^2$  are arranged to be positioned beneath the lower end of said vessel and afford a support for the same.

Any suitable means may be provided to cause the arms  $c'$  to remain in the position 30 shown in the drawings, with the feet  $c^3$  beneath the vessel C; but in the practice I have provided a ring  $c^4$ , which is arranged to embrace the arms  $c'$  and slide along the same in order to draw them toward each other to 35 throw the feet  $c^3$  beneath the vessel C.

When it is desired to remove the vessel C, the ring  $c^4$  is moved toward the cap B, when as it reaches the collar  $c^2$  the lower portions 40 of the arms  $c'$  will spring away from each other, thus removing the feet  $c^3$  from beneath the vessel C and permitting its removal.

In order to adjust the holder of the vessel C to adapt it to support vessels of varying 45 length, the arms  $c'$  may be formed in upper and lower sections, as shown clearly in Fig. 4, wherein the lower sections are shown as provided with slots  $c^5$  in their upper ends, 50 through which pass set-screws  $c^6$ , which are tapped into threaded bearings in the ring  $c^2$ , whereby the lower portions of the arms may be adjustably secured to the upper portions, thus adjusting the feet  $c^3$  toward and from the ring or collar  $c^2$ , as the length of any given vessel C may require.

55 In the present invention the sealing device of the acid-containing vessel C is arranged to automatically close and lock the vessel when the apparatus is in an upright position, as when standing upon its base or when sus- 60 pended, and to automatically unlock and unseal the vessel C when the apparatus shall be turned upon its side or inverted, and in the illustrated embodiment of the invention this result is accomplished by the following mech- 65 anism: Depending from the cap B is a short post  $d$ , upon which is arranged to slide a short tubular sleeve  $d'$ , which at its lower end car-

ries a socketed head  $d^2$ , which receives a block 70 of rubber or cork  $d^3$ , which is designed to be forced in contact with the open end of the vessel C to close the same. For the purpose of moving the head  $d^2$  toward and from the 75 end of the vessel C, I provide a weighted cam  $d^4$ , which passes through a slot  $d^5$  in the sleeve  $d'$  and is fulcrumed at  $d^6$  in a slot  $d^7$  of the post  $d$ , the lower end of the cam  $d^4$  arranged to engage and have a moving contact with a 80 rounded projection on the head  $d^2$  and the upper portion of the cam arranged to engage the upper end of the slot  $d^5$  of the sleeve  $d'$ .

The above arrangement is such that when 85 the apparatus is in an upright position the cam  $d^4$  under the influence of its weight will engage the head  $d^2$  and force the plug of rubber or cork  $d^3$  in close contact with the open 90 end of the vessel C; but and by reason of the fact that when the cam  $d^4$  is in this position it becomes a strut between the fulcrum  $d^6$  and the plug or cork  $b^3$  the plug or cork is locked closed. When the apparatus is turned 95 over or inverted, the weighted cam will by its upper edge engage the slot  $d^5$  in the sleeve  $d'$  and cause said sleeve to move along the post  $d$ , thus removing the plug from contact with the end of the vessel C and permit the 100 acid therein contained to flow out and mingle with the solution of water and soda in the tank A, thus producing carbon dioxide, as usual in these devices.

The device as so far described produces an 105 efficient apparatus, wherein the nozzle  $a^2$  of the hose is provided with the usual stop-cock or valve; but I prefer to omit such stop-cock or valve and provide the apparatus with a self-acting sealing device for the tank A, 110 which will hermetically close the hose-opening, and thus at all times when the apparatus is not in use the tank A will be tightly closed, preventing any evaporation of its contents.

The automatic sealing device for the hose- 115 opening is arranged like the sealing device of the vessel C to close said opening when the apparatus is in an upright position and to uncover said opening when the apparatus shall be inverted, and said automatic closing 120 device may be conveniently placed upon the interior of the tank A and also conveniently actuated by the same cam which actuates the sealing mechanism of the vessel C, as shown in Fig. 5 of the drawings; but I do not in any 125 sense consider the present invention as limited to the illustrated embodiment thereof.

As shown in the drawings, the sealing de- 130 vice for the hose-opening  $a$  of the tank A comprises a suitable elastic or yielding stopper  $e$ , which is carried by a head  $e'$ , secured to the end of arms  $e^2$ , which are carried by the weighted cam  $d^4$ , said arms being arranged so that they will extend each side of the sleeve  $d'$ , so as not to interfere with the 135 sealing mechanism of the vessel C. The stopper  $e$  is arranged to be forced into contact with the inner end of the usual bushing  $e^3$ , which forms the hose-opening by the weight-



ed cam  $d^4$ , when the apparatus is in an upright position and to be removed from contact with the bushing  $e^3$  when the apparatus is inverted or otherwise displaced relative to its normal position, all as will be clear from the illustration.

In Fig. 5 is shown a modified form of sealing device for the vessel C, in which the plug  $d^3$  is carried by a socket  $d^8$ , having a rounded upper surface and movably connected to a head  $d^9$ , formed on the sleeve  $d'$ , also having a rounded under surface, the socket and head being connected by a rivet  $d^{10}$  or other suitable means, whereby the socket  $d^8$  may rock upon the head  $d^9$  in order to permit the plug  $d^3$  to conform to the open end of the vessel C.

In use the tank A is filled with the ordinary solution of water and bicarbonate of soda and the vessel C with a suitable acid, when the cap B is screwed onto the open upper end of the tank A, and said tank supported or suspended in an upright position, when the weighted cam will hold the plug  $d^3$  in close contact with the end of the vessel C, and at the same time if the automatic hose-opening sealing device be employed thrust the plug  $e$  in position to close said opening.

When it is desired to use the apparatus, by simply inverting the same or displacing it with relation to its upright position the weighted cam  $d^4$  will immediately cause the sleeve  $d'$  to move along the post  $d$  to remove the plug  $d^3$  from contact with the acid-containing vessel C and permit the acid to mingle with the solution in the tank A, thus generating carbon dioxide, as usual in such apparatus, the weighted cam at the same time removing the plug  $e$  from the hose-opening, permitting the solution to flow from the hose.

It is to be noted that by the improved construction described the tank A when not in use is entirely closed, thus preventing the evaporation of the contents, and that the sealing mechanism of the acid-containing vessel is free from all levers or rods, which are liable to corrode and stick in their bearings, and thus become inoperative.

In so far as I am at present advised of the state of the art it has never been proposed to provide in a fire-extinguishing apparatus a closely-sealed outer tank or vessel and a sealing mechanism for the acid-containing vessel, said sealing mechanism being arranged to hold the acid-containing vessel closed and locked when the apparatus is supported in its normal position and to automatically unlock and unseal said vessel when the apparatus is displaced relatively to such normal position, or to provide the outer tank with an automatically-operating hose-opening sealing device adapted to operate when the apparatus is displaced relatively to its normal position, as before described, and I therefore do not consider the present invention as limited to the construction shown and described; but,

Having described one construction and its

mode of operation, I claim as new and desire to protect by Letters Patent of the United States—

1. In a fire-extinguishing apparatus, the combination with the outer inclosing tank, of an acid-containing vessel located within said tank, a sealing and locking mechanism for the acid-containing vessel, said sealing mechanism arranged to automatically close and lock the acid-containing vessel when the apparatus is supported in its normal position, and to automatically unlock and open said vessel when the apparatus shall be displaced with relation to its normal position, substantially as described.

2. In a fire-extinguishing apparatus, the combination with the outer inclosing tank arranged to be hermetically sealed, of an acid-containing vessel located within said tank, and a sealing and locking mechanism for said acid-containing vessel, all parts of which are wholly contained within the outer tank, said sealing mechanism arranged to automatically seal and lock the acid-containing vessel when the apparatus is in an upright or normal position, and to automatically unlock and unseal said vessel when the apparatus shall be inverted or displaced with relation to its upright position, substantially as described.

3. In a fire-extinguishing apparatus, the combination with the outer inclosing tank, of an acid-containing vessel supported in a fixed position within the tank, a sealing and locking plug movable toward and from the open end of the acid-containing vessel, and an actuating-weight for said plug, arranged to lock said plug in contact with the open end of the acid-containing vessel when the apparatus is in an upright position, and to unlock and remove said plug from the open end of the acid-containing vessel when the apparatus shall be inverted or displaced with relation to its upright position, substantially as described.

4. In a fire-extinguishing apparatus, the combination with the outer inclosing tank, of an acid-containing vessel located within said tank, a plug arranged to move toward and from the open end of the acid-containing vessel, and a weighted cam operating to hold said plug in contact with the open end of the acid-containing vessel when the apparatus is in an upright position, and to remove said plug from the open end of the acid-containing vessel when the apparatus shall be inverted or displaced with relation to its upright position, substantially as described.

5. In a fire-extinguishing apparatus, the combination with an outer inclosing tank or vessel, of an acid-containing vessel supported within said outer tank, a closing plug or cap for said acid-containing vessel, a sliding sleeve carrying said plug or cap, and a pivoted weighted cam arranged to move said sliding sleeve toward and from the open end of the acid-containing vessel, substantially as described.

6. In a fire-extinguishing apparatus, the



combination with the outer inclosing tank and  
its cover or cap, of a frame supported by said  
cover or cap, an acid-containing vessel sup-  
ported by said frame, a slotted post support-  
5 ed by the cap, a slotted sleeve carrying a  
plug arranged to move along said post, and  
a pivoted weighted cam engaging the slot in  
the sleeve, said cam arranged to move the  
sleeve and cap toward and from the open end  
10 of the acid-containing vessel, substantially  
as described.

7. In a fire-extinguishing apparatus, the  
combination with an outer tank provided with

a hose-opening, of a sealing device maintained  
in position to seal the hose-opening when the 15  
tank is in its normal position; and means ac-  
tuated by a displacement of the tank from its  
normal position to actuate said sealing device  
to unseal the hose-opening; substantially as  
described. 20

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

WILLIAM E. FORSTER.

Witnesses:

T. HART ANDERSON,

A. E. WHYTE.