

May 9, 1933.

A. E. ENGLAND

1,907,763

DRAW-OFF ATTACHMENT FOR LIQUID CONTAINERS

Filed Feb. 17, 1931

2 Sheets-Sheet 1

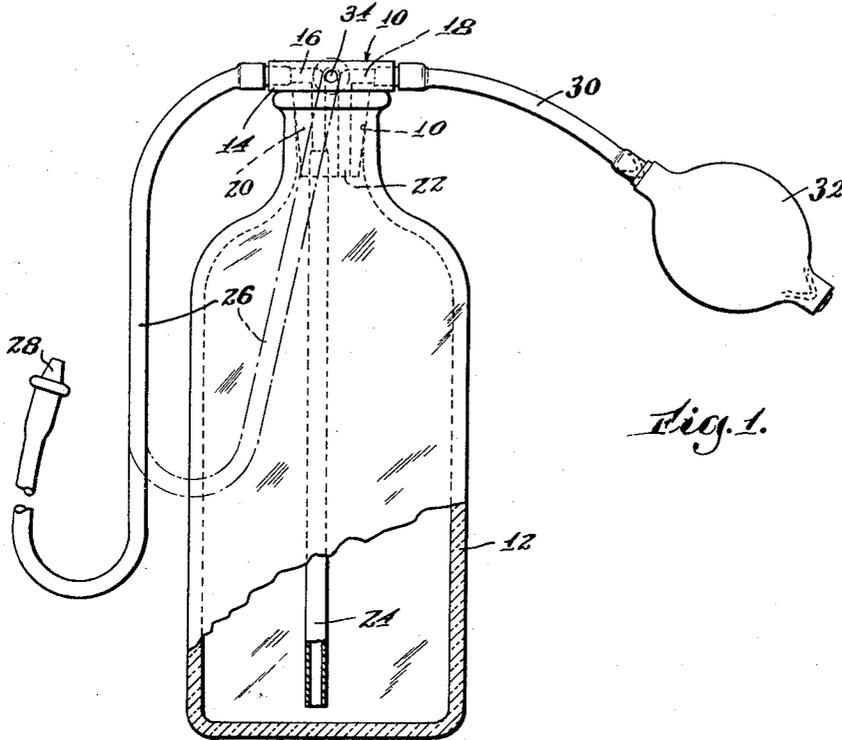


Fig. 1.

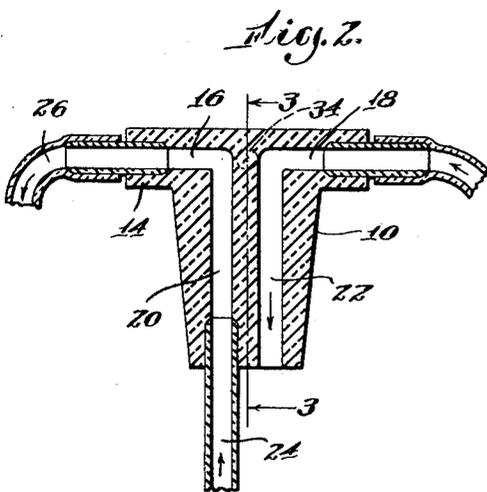


Fig. 2.

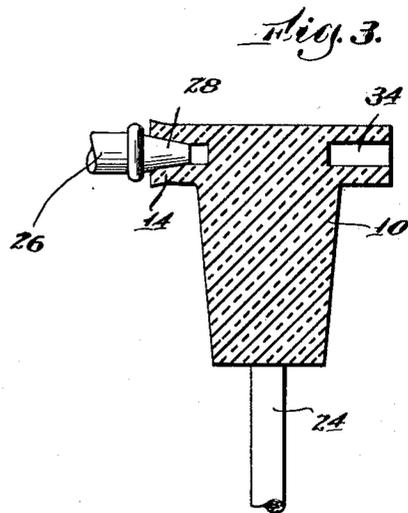


Fig. 3.

Inventor
Arthur E. England
by Mitchell, Chadwick Kent
Attorneys

May 9, 1933.

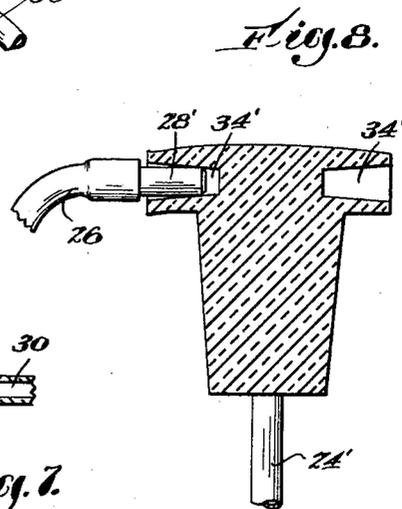
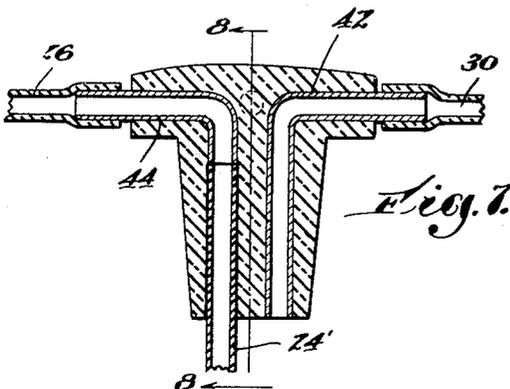
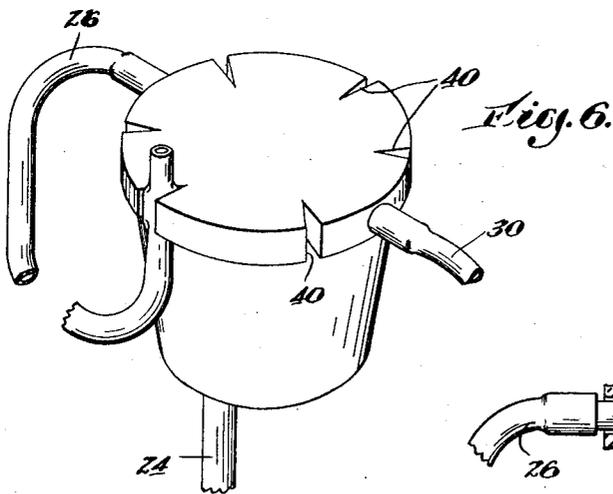
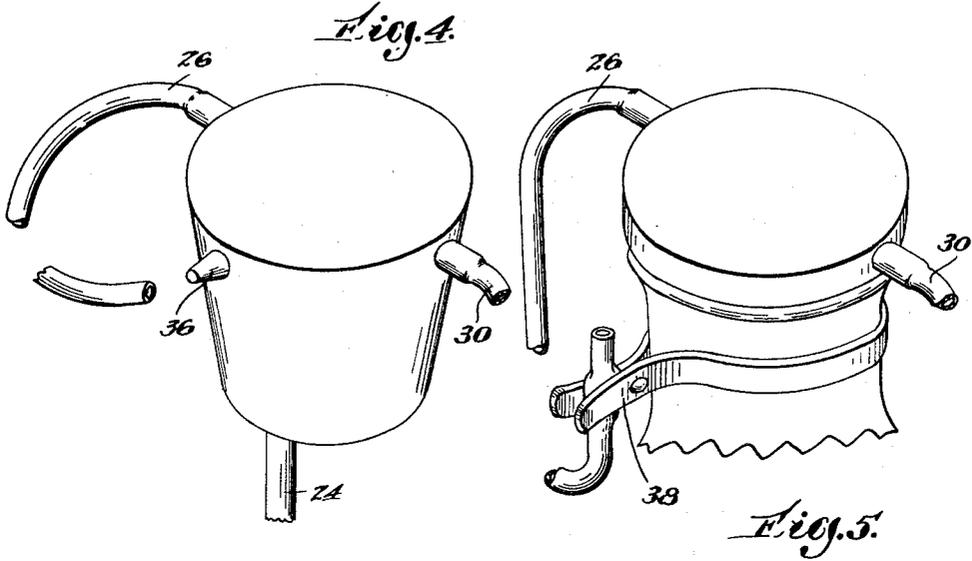
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2 Sheets-Sheet 2



Inventor
Arthur E. England
by *Witchell, Chadwick & Kent*
Attorneys

UNITED STATES PATENT OFFICE

ARTHUR E. ENGLAND, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO PETRICK BROTHERS, INC., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

DRAW-OFF ATTACHMENT FOR LIQUID CONTAINERS

Application filed February 17, 1931. Serial No. 516,327.

This invention relates to improvements in draw-off attachments for liquid containers.

More especially it provides a stopper for a top opening in a container, as for example in a gallon bottle, which stopper is designed and equipped for the feeding of liquid from the container. It may have a variety of uses. One for which it is particularly suited is for conveniently replenishing distilled water in the cells of storage batteries, and when thus used it may be called a "battery filler."

It is an object of the invention to provide so that liquid from a standard type of container, having a single opening at its top, as a bottle or jug, may be directed in a stream into a battery cell, or other desired place, without inverting the container, and may be interrupted at will, by a siphon method, without need for priming the siphon each time a discharge of water is wanted. When desired liquid may be propelled to a substantially higher level than the liquid level in the container. One object is to provide so that the delivery tube may be sealed tightly when not in use. It is moreover, an important feature that the invention is simple in construction, low in cost to produce, and readily may be associated with and dissociated from a container.

In attaining these objects and results in the preferred way a closure plug or stopper device is provided which embodies a manually operated pump, a flexible tube which may be a siphon, and a dead-end socket to receive, close and hold the tube. All these may cooperate in the generation of flow-pressure of liquid from the container.

The pump may be an ordinary hand operated rubber bulb with valves, for applying air pressure to the surface of liquid in the container. This can eject liquid from the container into the tube, for priming the siphon, after which liquid can flow through the delivery tube by siphonic action to any point which is below the level of liquid in the container. A dead-ended socket is provided in the side of the stopper, of suitable size to receive and grip the discharge end of the tube. When the tube is not in use its end or nozzle may be thrust into this socket,

which acts as a closure for the nozzle to maintain the device primed and ready for instant siphonic delivery of liquid as needed, and which acts as a grip to hold the tube-end securely and neatly in a stand-by position, with the tube as a whole so positioned that the whole apparatus can conveniently be carried about with one hand, and if desired held with one hand in position for action while the other hand manipulates the tube.

For delivery to points above the liquid level in the container, a manual squeezing of the bulb generates the necessary propulsive force to carry the liquid to sufficient height above the container.

It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty exist in the invention disclosed.

In the accompanying drawings:

Figure 1 is an elevation of my invention applied to a bottle;

Figure 2 is an enlarged elevation of details in medial section, with tubular extensions broken away;

Figure 3 is a section of 3—3 of Figure 2;

Figure 4 is a perspective of a modified form of bottle stopper, embodying features of the invention;

Figure 5 is a perspective showing a clamp on a bottle neck, adapted to pinch and hold the nozzle-end of delivery tube;

Figure 6 is a perspective of a bottle stopper with grooves in its flange, for pinching and holding the end of the delivery tube;

Figure 7 is an elevation, in medial section, showing tubes moulded in a stopper body, to provide the interior passages, and

Figure 8 is an elevation, in section on 8—8 of Figure 7.

Referring to the drawings, the stopper preferably will be of rubber having a fair degree of resilience, and is adapted for insertion in the top opening of a container, such as the bottle 12. A flange 14, having substantial thickness, overlies the top of the container and has, opening out of it at spaced apart locations, horizontal conduits or passages 16, 18, connecting respectively with passages 20, 22 which latter extend through the

body of the stopper and are open at its bottom. The conduit 20, at the bottom of the stopper, has inserted in it the end of a tube 24 of diameter somewhat larger than the diameter of the conduit, thereby stretching the rubber, and of length to extend to a point a little short of the bottom of the container on which the invention is to be applied. Preferably this tube 24 will be stiff and straight, and will be held secure in the stopper by the elasticity of the rubber.

A hose tube 26 is connected to the tube 24, through the passage 20, 16, and may have a nozzle 28 at the hose end to facilitate the directing of a stream flowing out of bottle 12 through the hose 26. Thus a siphon is provided which, once primed, causes flow from the bottle so long as nozzle 28 is below the level of liquid in the bottle.

The nozzle is preferably of hard material, and has a conical exterior, for a reason to be explained.

For priming the siphon, and for propelling liquid to heights above the level in the container, I provide a pump. To this end the passage 22, 18 is connected through tube 30 to a hand bulb 32, having the usual pumping valves (not shown). A squeezing of bulb 32 generates air pressure on the surface of liquid in the container, forcing it through tube 24, conduits 20, 16, hose 26 and thence out at nozzle 28. Once the flow is instituted by the pump, it will continue by siphonic action, so long as the nozzle 28 is below the level of liquid in the container. And by continued manual propulsion the liquid may be delivered from the nozzle at substantial distances above the container.

It is an important feature of my invention that provision is made for maintaining the siphon, when the device is not in use, primed and ready for immediate delivery of liquid to points below the level of liquid in the container, without need for fresh priming or manual propulsion. For this purpose I provide a socket 34 in the flange 14 of the stopper, extending a substantial distance into the flange. The socket will be of diameter somewhat smaller than the hard conical exterior of the nozzle 28, so that the latter may be easily entered in and pressed into, and then will be securely held by the socket, at times of non-use. Because of the elasticity of the rubber of which the flange is formed, the nozzle will be gripped tightly enough to seal its discharge thus holding liquid in the siphon tube 26 ready to flow out as soon as the nozzle is lowered below the liquid level in the container. The tube 26 meanwhile is held conveniently out of the way where it leaks no water, does not drag on the floor in the handling of the bottle, cannot be stepped on, and remains always clean. As the exterior parts are all preferably of soft rubber there are no parts liable to be broken in refilling

or handling the bottle. And no standard for holding the bottle upside down is required, such as characterizes other devices in common use, the bottle is not encumbered, and does not have to be handled so difficultly when in use. The device can be applied to any bottle which the stopper 10 will fit. The nozzle can be omitted, and the bare end of rubber tube used with the same effect, though with less convenience.

In either case the operator controls flow through the tube by pinching or releasing the soft material, while the nozzle is withdrawn from or about to be withdrawn from the socket. The tube end can be placed where water is wanted, and the flow started or stopped instantly, and the tube held primed ready to start flow again, all with great convenience.

Instead of the dead-end socket 34 for holding and closing the discharge end of tube 26, the stopper 10 may be formed as in Figure 4, with a fixed plug 36 for closing and holding the end of the tube, which can conveniently be thrust upon the plug. In such a case a saving of stopper material may be effected by elimination of the flange of Figures 1-3. Or a device in the form of a spring clamp 38 would serve similar purposes by pinching the flexible end of the tube so as to close its passage and to hold the tube as seen in Figure 5. Still another device for holding and closing the tube may consist merely of narrow recesses or slits 40 in the edge of the stopper flange which flange extends out appreciably beyond the bottle top. The flexible tube end may be inserted in the slit to be pinched and held between the elastic walls thereof. If the stopper be designed with a multiplicity of such slits 40, as shown in Figure 6, the flexibility of each will be higher for yielding, and the tube 26 may be inserted on any slit which is nearest to hand.

The passages 16, 18, 20 and 22 within the stopper conveniently can be cored during the moulding operation, and passages so made are represented in Fig. 2. But they may preferably be provided by moulding the stopper body around small, stiff tubes, which may be of bronze or other suitable material, and which remain in the completed stopper as seen in Fig. 7. Here the tubes 42, 44 have each a horizontal nipple which projects out of the flange to provide a means for connection of the tubes 26, 30. The vertical portion of the tube 42 opens out at the bottom of the stopper, but the vertical portion of tube 44 is relatively short and communicates with a cored passage which latter opens out at the bottom of the stopper. And it is into this cored passage that the long stiff tube 24' is inserted, preferably to the full extent of the passage so that its end abuts against the moulded-in tube 44. With this construction economies in manufacture may be effected due to the elimination of cores except for the single

straight passage which receives the tube 24'; and the latter coring may be eliminated similarly, leaving a projecting nipple (not shown) upon or into which the long and preferably stiff tube 24' may be screwed or otherwise fastened.

In Fig. 8 the sockets 34' are tapered in form, with diminishing cross-section from their mouths inward. This permits use of a conventional straight piece of stiff tube for a nozzle 28' or an ordinary soft rubber pipe end 26; and yet it is effective to seal the device when the nozzle is pressed into such a socket. Also the nozzle will be securely held in a socket by the elastic grip of the socket walls, protected and out of the way.

I claim as my invention:

1. In a discharge device for a bottle or the like, the combination of a stopper; a siphon passing through the stopper having a flexible tube discharge portion; and means for maintaining the siphon primed during periods of non-use, comprising a device carried by the bottle for holding and closing the free end of the tube.

2. In a discharge device for a bottle or the like, the combination of a stopper; a siphon passing through the stopper having a flexible tube discharge portion; a pump and passage for letting air from the pump in the bottle, for priming the siphon; and means for maintaining the siphon primed during periods of non-use, comprising a device carried by the bottle for holding and closing the free end of the tube.

3. In a discharge device for a bottle or the like, the combination of a stopper; a siphon passing through the stopper having a flexible tube discharge portion; and means for maintaining the siphon primed during periods of non-use, comprising a recess in an exposed part of the stopper adapted to receive, to fit and to hold frictionally the end of said tube, the elastic engagement of said tube end with the recess wall serving to prevent escape of liquid.

4. In a discharge device for a bottle or the like, the combination of a stopper; a siphon passing through the stopper, having a flexible tube discharge portion, and a conical nozzle; and means for maintaining the siphon primed during periods of non-use, comprising a dead-end socket in an exposed part of the stopper to fit yieldingly the snout of said conical nozzle, and elastically to engage, seal and hold said nozzle.

5. In a discharge device for a bottle or the like, the combination of a soft elastic stopper pierced by a passage; a tube held by and extending down from said passage toward the bottom of the bottle; a second tube held by the outer part of the passage, with flexible discharge portion extending away therefrom, these two tubes with the passage constituting a siphon; the outer part of the stopper being

arranged for holding and closing the end of said second tube.

6. A discharge device for a bottle or the like, comprising a stopper having an air inlet passage, and a siphon discharge passage with cylindrical nozzle; said stopper having a socket in an exteriorly exposed portion of the stopper, said socket having walls tapering inward and adapted to receive, hold and seal the said nozzle when thrust therinto.

7. In a discharge device for a bottle or the like, the combination of a stopper; a siphon passing through the stopper having a flexible tube discharge portion; and means for maintaining the siphon primed during periods of non-use, comprising a device for closing the tube passage.

Signed at Chicago, Illinois, this 14 day of February, 1931.

ARTHUR E. ENGLAND.

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