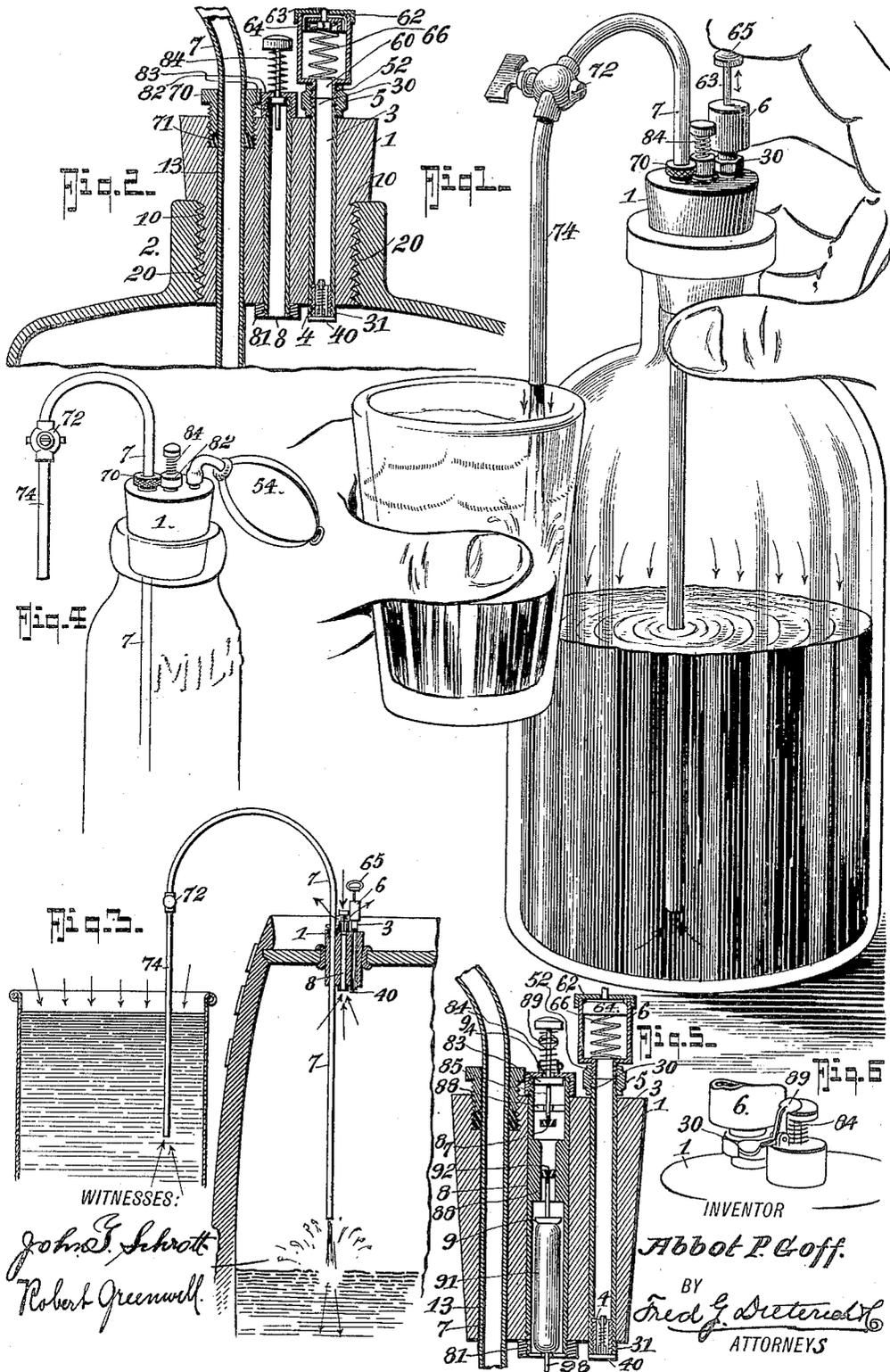


A. P. GOFF.
 AUTOMATIC REACTING SIPHON AIR PUMP AND STOPPER.
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Patented Aug. 11, 1914.



WITNESSES:
John S. Schrott
Robert Greenwall.

INVENTOR
Abbot P. Goff.
 BY *Fred G. Dietrich*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

ABBOT PORTER GOFF, ST. JOSEPH, MISSOURI.

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To all whom it may concern:

Be it known that I, ABBOT PORTER GOFF, residing at St. Joseph, in the county of Buchanan and State of Missouri, have invented a new and Improved Automatic Reacting Siphon Air-Pump and Stopper, of which the following is a specification.

My invention, which in its general nature, relates to means for evacuating and refilling bottles, jars or other vessels, is more particularly designed to provide a simple and inexpensive means that serves as a stopper for the bottle, jar or other vessel, and which includes simple and easily manipulated pumping mechanism readily adjustable for quickly and conveniently filling the bottle or other vessel or for forcing out from the said bottle or other vessel the amount of liquid desired.

My invention has for its object also to provide a vessel filling and evacuating means of the general character noted in which the body portion, which may be of cork, rubber, wood, metal, or any other material capable of being readily formed into a stopper shape with or without external threads, for holding it air-tight within the neck of the bottle or other vessel and in which the several parts are so arranged whereby a few strokes of the pump piston will suffice for ejecting the amount desired to be discharged from the bottle and a slight pressure on a vent valve serves to create a siphonic action for refilling the bottle or vessel.

With other objects in view that will hereinafter appear, my invention consists in certain details of construction and peculiar combination of parts, all of which will be hereinafter explained, specifically pointed out in the appended claims, and illustrated in the accompanying drawings, in which:—

Figure 1 is a perspective view of my invention showing the same as applied to an ordinary bottle. Fig. 2 is a section of my combined stopper and pumping means, the body of the stopper being of metal and shown as applied to the threaded neck of a metallic can, the action of ejecting the contents into a holder being indicated by the position of the pump piston. Fig. 3 is a similar view that shows my invention as applied to a barrel, the parts being shown adjusted for creating a siphonic action for filling the barrel. Fig. 4 is a detail perspective view of a bottle with my invention

applied, a slightly modified form of the pumping devices being shown. Fig. 5 is a sectional view of a modified form of my invention hereinafter referred to. Fig. 6 is a detail perspective of the vent valve catch.

In the practical application of my invention, the same embodies a main or body portion 1 which I hereinafter term a stopper, since the said body portion performs the functions of the ordinary stopper, and the said stopper, which may be of any material, suitable for the special kind of vessel with which it may be used, is preferably formed with an external screw 10 particularly when made of glass or metal, whereby to fit the internal threads 20 of the neck 2 of the bottle or other vessel, as shown.

At one side, the body or stopper 1 has a vertical bore in which fits a tube 3, the upper and lower ends of which are threaded, as at 30—31, the end 31 projecting slightly below the stopper bottom to receive a cage 4 that carries a back check valve 40.

5 designates a coupling that fits onto the upper end 30 of the tube 3, one threaded portion 52 of which receives an air pump which may be an ordinary siphon bulb 54, as shown in Fig. 4, but preferably is a cylinder 6 having a threaded nozzle 60 for engaging the coupling 5 and a cap 62 in practice held air-tight on the cylinder 6, the said cap having a central aperture for the piston rod 63 having the piston 64 at one end and an actuating handle or head 65 at the other end.

66 designates a spring within the cylinder 6 for returning the piston after being manually forced down.

The body of stopper 1 has a passage 13 through it in which is adjustably held a siphon tube 7, the latter also passing through a packing 71 and nut 70 that engages the gland or packing 71 by which means the tube 7 may be held to any adjustment through the tightening of the nut 70 and consequent compression of the gland material against the tube. Siphon tube 7 includes a nozzle 74 provided with a finger valve 72.

8 designates a third tube that passes down through the body 1 and its lower end is threaded to receive a clamp nut 81, its upper end being also threaded to receive a valve casing 82 in which is mounted a finger pressed valve 83 opened under finger pressure to relieve the air pressure in the bottle or vessel or in the contents thereof and

closed by a spring 84, as shown, or by the ordinary back or air pressure within the vessel.

From the foregoing taken in connection with the drawing, the complete arrangement of and the advantages of my invention will be readily apparent.

By reason of the simplicity of construction and the convenience in applying it to jars, bottles and other vessels, it is more advantageous for filling a bottle and other vessels than filling them by means of a funnel.

In my construction, to fill a vessel from a vessel to which the pump is attached, it is only necessary to give the air pump a few piston movements to force compressed air on top of the liquid in the vessel to which the pump is attached, after which, by opening the valve in the siphon nozzle, the liquid will rise up said nozzle and discharge therefrom into a glass or other receiver. But if, in thus pouring the liquid, a quantity more than desired flows into the receiver, the liquid thus withdrawn, or any part of it, can be instantly returned again into the vessel to which the pump is attached by inserting the nozzle into the liquid before withdrawn and then simply pressing down on the vent valve 83 to exhaust the air in the vessel to which the pump is attached, it being understood that during the aforesaid action the surface of the liquid in the vessel to which the liquid is returned is lower than that of the other vessel.

In my construction, to draw all or a part of the contents of a vessel into the vessel to which the pump is attached, it is only necessary to insert the nozzle of the siphon tube into the liquid which is to be drawn into the vessel to which the pump is attached, and then give the air pump a few piston movements to force compressed air into the vessel to which the pump is attached, and then by pressing down on the vent valve 83 to exhaust the air in the vessel to which the pump is attached, and the liquid will thereby be caused to flow into the vessel to which the pump is attached, which can then be filled to any point desired, and the flow of the liquid can be stopped at any time desired by releasing the vent valve to permit it to close or by closing the valve in the siphon nozzle, or by removing the vessel from under the siphon nozzle.

In Fig. 5, I have illustrated a somewhat modified form of my invention which differs from the construction shown in Figs. 1 to 4, particularly in the construction of vent tube. In the modified arrangement the said vent tube includes an upper or finger pressed valve 83, which has a long pendent stem 85 whose purpose is to cooperate with an automatically closing valve 9, which is in

the nature of a long float body 91, that is freely movable up and down the tube 8, and whose upper end has a stem carrying guide and washer 92 for contacting at times with a like washer 87 on the stem 85 of the finger pressed valve, the said washer 92 being movably held in guide bushings 88 within the tube 8.

In the use of the latter form of my stopper when it is desired to draw a liquid from a vessel into another vessel to which my device is attached, it is only necessary to press down the finger valve 83 until it engages a catch 89 (see Fig. 6) so arranged that it will hold the said valve 83 down to thereby open the port 94 to allow the escape of the air from the vessel as it is being filled.

As the vessel, to which my device is attached, fills, the liquid will force the float 91 up into the vent tube to close up against the restricted passage through the bushing and thereby shut off the air through the vent tube and thus stop the flow into the vessel to which my device is attached.

The pendant 93 attached to the lower part of the float or plug valve 91 holds the said valve straight and from getting out of place.

From this description it will readily be apparent that a vessel to which this device is attached, will require no watching to note when the filling is accomplished so that the flow of liquid may be stopped, but is automatic in its action, the flow being cut off when the vessel is filled. When it is desired to restore the valve 91 to its normal position, thus reopening the vent, it is only necessary to press the finger portion of valve 83 the remainder of its length below the position it assumes when in engagement with catch 89 and thereby abutting the head portions 87 and 92 which serves to force valve 91 down.

While I have shown and described my improved stopper as especially adapted for being screwed into the neck of a bottle or other vessel, it is obvious that the said stopper may be provided with threads for engaging external threads upon the neck of a bottle or the vessel to which the stopper is to be attached, or in other words, the stopper may be so formed as to be fitted either within a vessel neck or on a vessel neck.

What I claim is:—

1. A stopper for liquid containers, comprising a body shaped to snugly fit in the mouth of the container, said body having three passages, a siphon tube attached to one of the passages, an air pump attached to another of the said passages, a vent tube that extends through the remaining passage, a valve that normally closes the upper end of the said vent tube and is finger pressed to its open position, a detent for holding the said finger pressed valve at its open posi-

tion, a supplemental air passage in the vent tube, a float valve located in the said vent tube adapted when it is caused to rise by the rising liquid in the container, to close the said supplemental air passage and there-
 5 by the vent tube, said finger pressed valve and the float valve having co-engaging extensions whereby the finger pressed valve is forced down the float valve is moved to its
 10 open position.

2. A means for filling and exhausting liquids from a container, said means including a stopper shaped to fit air tight into the mouth of said container, said stopper
 15 having three passages, a siphon tube projecting through one of said passages, a gland and packing around said siphon tube to prevent leakage through the stopper pas-
 20 sage in which the siphon tube is mounted, one of said passages serving as an air passage, a tube mounted in said air passage

and projecting beyond the ends of the same, a check valve mounted in the lower end of said last named tube, an air pump connected to the upper end of said last named tube, 25 the third of said passages serving as a vent, and a vent tube mounted in said third passage and projecting beyond the ends of the same, nut members on the ends of said vent tube to engage said stopper and there- 30 by prevent leakage around the tube, and a finger operatable valve mounted in the upper end of said vent tube, together with means continuously tending to hold said last named valve closed, all being arranged 35 substantially as shown and for the purposes described.

ABBOT PORTER GOFF.

Witnesses:

MARION O. LAND,
 CLARENCE C. PRINCE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."