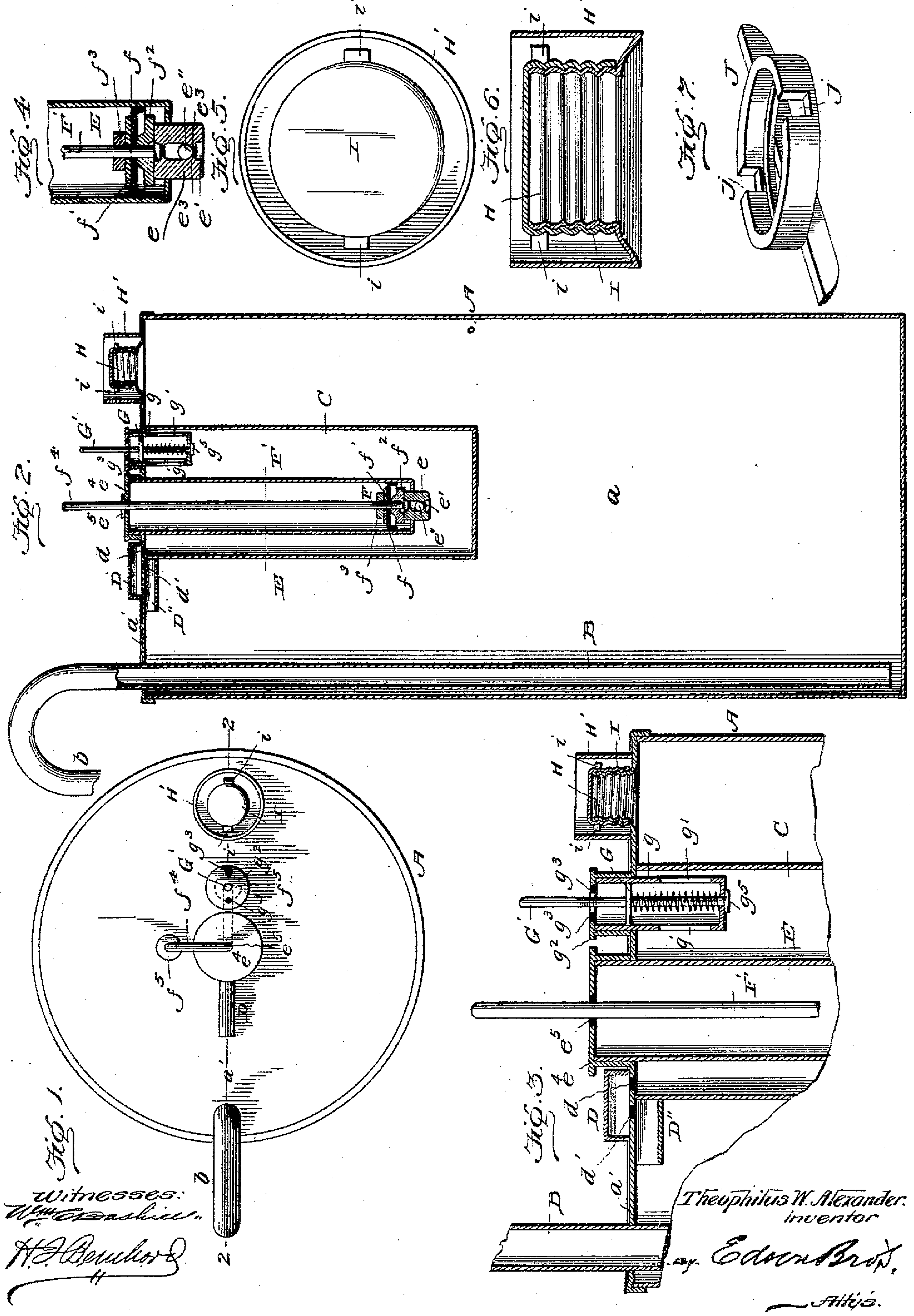
(No Model.)

T. W. ALEXANDER.

OIL OR GASOLENE CAN.

No. 566,723. Patented Aug. 25, 1896.



Witnesses:
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Theophilus W. Alexander.
Inventor
by Edson Bros.
Att'ys.

UNITED STATES PATENT OFFICE.

THEOPHILUS W. ALEXANDER, OF BURLINGTON, IOWA.

OIL OR GASOLENE CAN.

SPECIFICATION forming part of Letters Patent No. 566,723, dated August 25, 1896.

Application filed April 6, 1896. Serial No. 586,357. (No model.)

To all whom it may concern:

Be it known that I, THEOPHILUS W. ALEXANDER, a citizen of the United States, residing at Burlington, in the county of Des Moines and State of Iowa, have invented certain new and useful Improvements in Oil or Gasolene Cans; 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.

My invention relates to improvements in cans designed to contain oil, gasolene, and other fluids which are required to be stored in a sealed or tight receptacle for the purpose of preventing evaporation or explosions; and the objects that I have in view are, first, to provide a simple construction in which the liquid contents of the can or receptacle may be expelled by an increase of the atmospheric pressure in the storage-compartment of the can; secondly, to so construct and arrange the air-forcing appliances that oil or other liquid in the receptacle may not have access to the working parts of the air-forcing mechanism, thus preventing the liquid from interfering with the free and proper action of the air-forcing appliances; thirdly, in a novel form of vent designed to reduce the air-pressure in the receptacle or can when it is desired to arrest the flow of liquid when the lamp or other receiver is filled or nearly filled, and thus prevent the lamp or receiver from overflowing, and to provide a novel form of filling-nozzle cap which cannot easily be removed except by the application and manipulation of a proper key which can be advantageously used to tightly close the cap and thereby secure a tight joint between the filling-nozzle and its cap to prevent leakage of air.

With these ends in view my invention consists in the novel combination of devices and in the construction and arrangement of parts which will be hereinafter fully described and claimed.

To enable others to understand my invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a plan view of a can or receptacle constructed in accordance with my invention. Fig. 2 is a vertical sectional view on the plane indicated by the dotted line 2 2 of Fig. 1. Fig. 3 is an enlarged detail sectional view showing the construction by which the air-pressure cylinder communicates with the storage-compartment in a manner to prevent liquid from the latter passing into said pressure-cylinder. Fig. 4 is an enlarged detail sectional view through the lower portion of the piston-cylinder, illustrating the piston therein to show the construction of the piston-head more clearly. Figs. 5 and 6 are detail views of the filling-nozzle cap, and Fig. 7 is a perspective view of the key for manipulating said cap.

Like letters of reference denote corresponding parts in all the figures of the drawings.

A designates a storage can or receptacle of any suitable construction, form, and size. Within the storage chamber or compartment *a* of the can or receptacle are arranged the eduction-pipe B and the air-pressure cylinder C. The eduction-pipe B is arranged in a vertical position close up to one side of the can A, with its lower end a suitable distance above the bottom of the can and with its upper end passing through the head *a'* of the can, said pipe or tube being secured to the head by a hermetically-sealed joint, as, for example, a solder-joint, to prevent leakage of air. This eduction-pipe has a "gooseneck" discharge-nozzle *b*, which may be permanently attached or detachably connected to the tube or pipe B, and this form of nozzle enables the can to be advantageously used in filling lamps or other receivers, because the end of the nozzle *b* can be thrust easily into the filling-opening of the vessel.

The air-pressure cylinder C is preferably arranged centrally within the storage-chamber of the receptacle, and it is secured to the head *a'* by a hermetically-sealed joint. This pressure-cylinder is tightly closed all around, so that it does not have direct communicarion with the storage-chamber *a;* but said pressure-cylinder does not have indirect connection with the storage-chamber by the construction illustrated more clearly in Fig. 3 of the drawings. In the head *a'* of the receptacle is pierced two air-openings *d d'*, which are spaced and arranged to lie on opposite

sides of the wall of the air-pressure cylinder, one of said openings or ports d being in connection with the chamber of the pressure-cylinder C and the other opening or port d' being in connection with the storage-chamber a of the receptacle A. Over these two ports d d' is arranged a hood D, which is suitably attached to the head a' in an air-tight manner, and by which the air under pressure from the pressure-cylinder C and the port d is directed, through the port d', into the storage-chamber a. It will be seen that the pressure-cylinder C has an indirect connection with the storage-chamber a, through the sealed hood D and the spaced ports d d', so that the air under pressure from the cylinder C will pass to the chamber a to press on the liquid in said storage-chamber and force the liquid out through the pipe B when the air-pressure is sufficient to overcome the inertia of the liquid; but while the air is free to pass from the cylinder C to chamber a the liquid cannot, under ordinary usage of the structure, pass through the ports d d' and the cylinder C to accumulate in the latter in sufficient quantity to have access to the working parts of the air-forcing mechanism and the vent-valve, so that the liquid will not injuriously affect the operative parts of the can or receptacle.

To the under side of the head a' is securely attached a baffle-plate or open hood D'', which is arranged below the port d', so as to prevent the liquid from having direct access to the port d', but one or both ends of this baffle plate or hood are open for the free passage of the air from the closed hood D and the port d' into the storage-chamber a of the receptacle.

E is the piston-cylinder, and F is the piston which is operatively fitted in said cylinder. The piston-cylinder E is smaller in size than the air-pressure cylinder, and it is arranged inside of the pressure-cylinder C. The upper end of the piston-cylinder E is tightly secured to the head a' of the receptacle to have one end project through and above the head a', but the lower end of the piston-cylinder terminates a suitable distance above the closed lower end of the pressure-cylinder. Said piston-cylinder has at its lower end a valve box or casing e with an outlet-port e', and in this valve-box is fitted a downwardly-opening ball-shaped check-valve e'', which, on the descent of the piston, is arranged to fit against the little lips e^3 near the bottom of the valve-box, as shown by Fig. 4, which lips do not entirely surround the valve, but leave openings or spaces around the valve when depressed to its open position, so that the air will escape from the pump-cylinder and the valve-box into the pressure-cylinder C when the piston is depressed and the valve is forced to the bottom of the valve-box against the lips e^3. When the piston is on the upstroke, there is no pressure on the check-valve from within the cylinder, and the suction of air through the valve-box created by the upward movement of the piston causes the valve (which is small and light) to seat itself against a seat provided near the upper end of the valve-box, so that the valve is closed to prevent the air from passing back from the pressure-cylinder C into the piston-cylinder E. A cap e^4 is secured to the nipple or upwardly-projecting end of the piston-cylinder E, and in this cap is an orifice e^5, which is somewhat larger than the piston-rod, in order to provide a space around the piston-rod for the ingress of air into the cylinder E above the piston, the orifice e^5 thus forming the air-inlet port to the piston-cylinder.

The piston-rod F' is threaded for a suitable distance at its lower end to receive the two check-nuts f^2 f^3, which are spaced a suitable distance to accommodate the elastic packing-washer f and the stiff metallic plate or washer f', said parts f f' f^2 f^3 constituting the piston F. The nut f^3 is first screwed on the threaded end of the piston-rod. Then the metallic washer f' is placed on the stem to rest against the top check-nut f^3, the elastic washer f is placed against the metallic washer f', and then the check-nut f^2 is screwed up against the parts to bind them securely in place. The metallic washer f' is of less diameter than the elastic washer, and it serves to reinforce the latter. The piston fits in the cylinder E in a manner to prevent the metallic washer from having contact with the walls of the cylinder; but the unconfined or free edges of the elastic washer ride and bear against the walls of the cylinder in a way to make a tight joint when the piston is on its downstroke, so as to expel the air from the cylinder E; but on the upstroke of the piston and on the closing of the check-valve e'' a vacuum is created in the lower end of the cylinder below the piston, and the pressure of the air on the elastic washer and the deflection of the washer causes the air to pass the piston and thus have access to the lower end of the piston-cylinder, ready to be expelled on the next downstroke of the piston. It will be observed that the metallic washer f' is nearly the same in diameter as the elastic washer, but the lower check-nut f^2 is of smaller diameter than either of said washers f f'. On the downstroke (which is the air compressing and forcing stroke of the piston) the edges of the elastic washer are pressed up by frictional contact of the elastic washer with the cylinder E, and this upward play of the washer is arrested by the large metallic washer f'. Hence the elastic washer is caused to secure a tight joint between the cylinder and piston; but on the upstroke of the piston (which creates the vacuum and forms the air-intake stroke) the edges of the elastic washer are depressed by the frictional contact of the washer with the cylinder E, and as there is a partial vacuum in the lower end of the piston-cylinder, and as the atmospheric pressure of the air is exerted on the upper side of the piston, the air will

pass the piston on its upstroke, and thus enter the piston-cylinder below the piston in sufficient quantities, ready to be expelled through the valve-box *e* and into the pressure-cylinder C on the next downstroke of the piston.

The upper protruding end of the piston-rod is provided with a suitable handle, or it may be bent over to form the handle f^4. In case the rod is bent to form the handle, I provide the plate or knob f^5, which is suitably attached to the free bent end of the piston-rod, for the purpose of opening the vent-valve G in case it is desired to reduce the air-pressure in the storage-receptacle.

The vent-valve G is situated within the pressure-cylinder C, but it has a protruding valve-stem G′, which is normally lifted by a suitable retractor to close the vent orifice or port. The shell or casing *g* of the vent-valve is fastened to the head *a*′ by a hermetically-sealed joint, and in one side of this shell, near the bottom thereof, is provided the vent ports or orifices *g*′. Within the shell *g* is fitted the disk-like valve G, and it is attached to the vertical stem G′, which plays and is guided in vertically-alined apertures in the bottom and the cap g^2 of said vent-valve. This cap g^2 has one or more vent-openings g^3, in addition to the opening through which the the rod G′ plays, to provide for the free and uninterrupted escape of air when the valve G is depressed to a point below the vent-orifice *g*′. The lower end of the valve-stem G′ has a head or knob g^5, which, when the valve-stem is raised, closes the opening in the lower end of the valve-shell, and the rod and valve are normally raised by a pressure-spring G^2, which bears against the valve G and the bottom of the valve-shell *g*, so as to normally hold the valve G to a position above the vent-orifice *g*′. It will be noted that the vent-valve is held in a securely-closed position to prevent the escape or leakage of air from the pressure-cylinder C, but when the receiver or vessel has been filled with liquid to the desired level, and it is desired to arrest the flow of liquid suddenly in order to prevent the liquid from overflowing, the vent-valve G is opened for the purpose of reducing the pressure in the cylinder C and the storage-chamber *a* of the can or receptacle. The valve may be opened by pressing on the stem G′ by hand or by turning the piston F′ to a position where the head f^5 thereof will bear on the stem G′ and then pushing the piston-rod downward, this downward movement of the piston-rod carrying the valve-stem G′ with it until the valve G passes the vent-orifice *g*′, whereupon the air rushes through the orifice *g*′, the valve-shell *g*, and the orifices in the head of the shell *g*.

The operation may be described, briefly, as follows: When it is desired to fill a lamp or or other receiver with liquid contained in my receptacle, the nozzle *b* is inserted into the receiver and the piston-rod F′ is worked up and down in the piston-cylinder E, said rod being so turned or adjusted that the head f^5 does not abut against the stem of the vent-valve. The air forced into the cylinder C by the pump mechanism passes through the port *d* into the closed hood D, and from the latter, through the port *d*′, into the storage-chamber *a*, in which the compressed air exerts pressure on the liquid sufficient to force the liquid through the pipe B and thence to the receiver or vessel to be filled. The liquid flows in a continuous stream from the eduction-pipe so long as the pressure of the air is sufficient to overcome the inertia of the liquid, but should the flow cease before the receiver has been filled the piston-rod F′ may be operated to keep up the flow. When the receiver is filled, the vent-valve is opened and the air allowed to escape from the pressure-cylinder, thereby reducing the pressure and arresting the escape of liquid to prevent it from overflowing the receiver.

In my improved receptacle I have provided an improved key-operated cap for the filling-nipple, together with a shield or cup to prevent the liquid, as it is poured into the can, from flowing over the head or top thereof. The filling-nipple H is threaded, as is usual, and it is surrounded by an annular shield H′, which is attached to the head *a*′ and rises a suitable distance from the same up to or above the upper end of the nipple. Said shield H′ is arranged to provide or leave an annular space between the nipple or shield for the purpose of receiving the threaded cap I, which is adapted to be screwed on the nipple. When this cap is screwed home to secure an air-tight joint, in order to securely close the can or receptacle, access cannot easily be had thereto for the purpose of operating the cap to remove it, but to overcome this objection I have provided the key J, adapted to be adjusted in a manner to interlock with the cap I. Said cap I is provided with projecting lugs or studs *i*, which extend from the cap at diametrically opposite sides. The key consists of a ring or annulus having the diametrically opposite notches *j* and the transverse finger-bar which extends beyond the annulus for a suitable distance and which affords a secure grasp for the operator's fingers. The ring is fitted over the cap in a way to have the lugs *i* thereon take into the notches of the ring, and the finger-bar can now be grasped to turn the key, whereby the cap may be screwed tightly on the nipple H or it may easily be unscrewed therefrom.

I am aware that changes in the form and proportion of parts and in the details of construction of the devices herein shown and described as the preferred embodiment of my invention may be made by a skilled mechanic without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such modifications and alterations as fairly fall within the scope of my invention.

Having thus fully described my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a can or receptacle, a pump-cylinder, a vent-valve supported by the receptacle at one side of the pump-cylinder and having a projecting stem, and a reciprocating rod and piston fitted in the pump-cylinder, said piston-rod provided with a suitable head and adapted to be turned axially in the cylinder, whereby the piston-rod may be adjusted to operate the piston without influencing the vent-valve or said piston-rod may be turned to cause its head to strike the valve-stem and open the vent-valve, as and for the purposes described.

2. The combination with a can or receptacle, a pump-cylinder, and a piston operating in said cylinder, of the vent-valve adjacent to the pump-cylinder and having its shell provided with the ingress and egress ports and its valve-stem normally lifted by a spring to hold the valve above the ingress-port, and a reciprocating and axially-adjustable piston-rod connected with said piston and provided with a head adapted to depress the stem of the vent-valve, as and for the purposes described.

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

THEOPHILUS W. ALEXANDER.

Witnesses:
JNO. J. SEERLEY,
CHAS. C. CLARK.