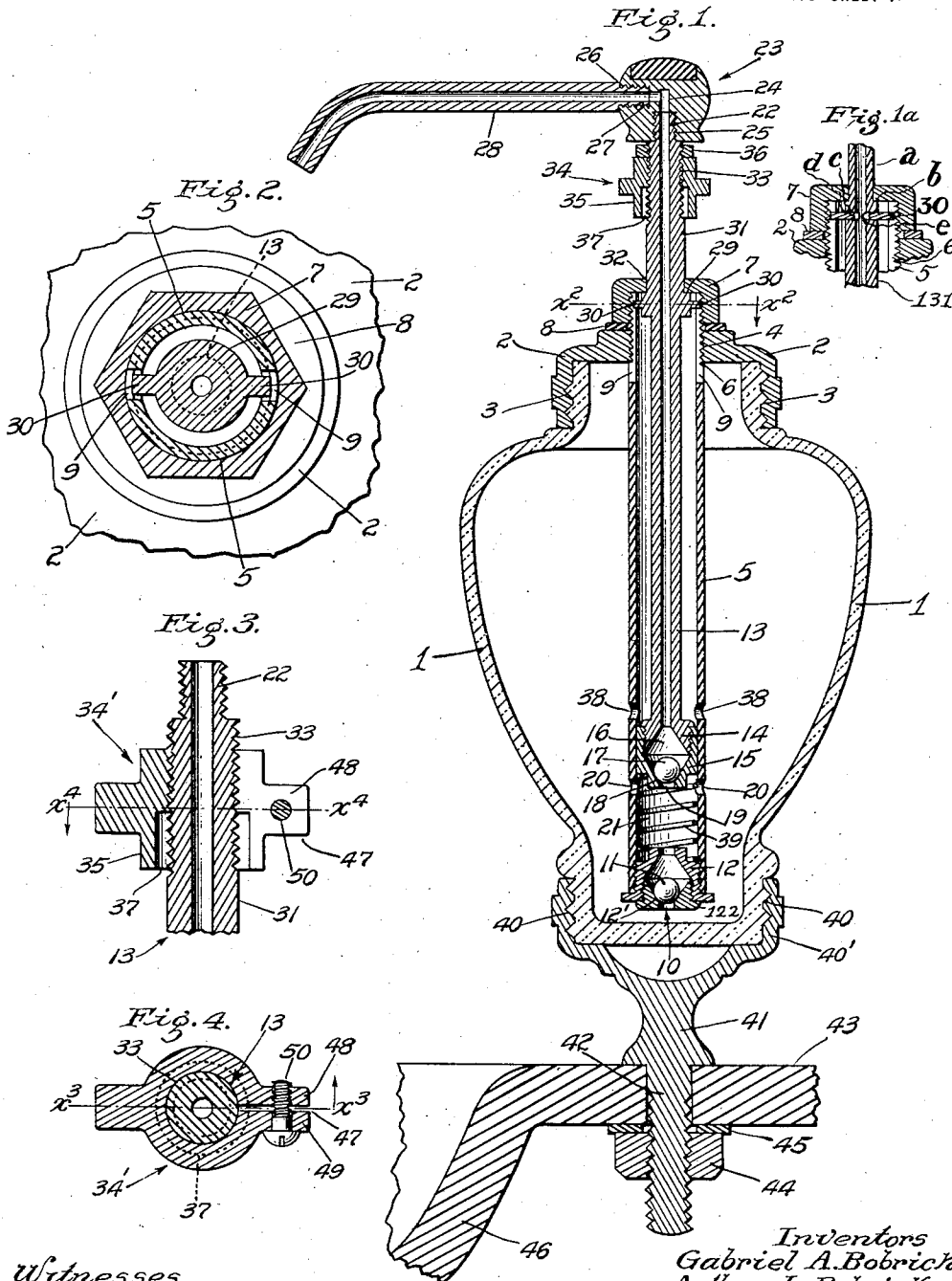


G. A. AND A. L. BOBRICK.
LIQUID DISPENSER.
APPLICATION FILED MAR. 16, 1915.

Patented Dec. 14, 1920.

2 SHEETS—SHEET 1.

1,362,077.



Witnesses
H. N. Kirby
Estella Hill

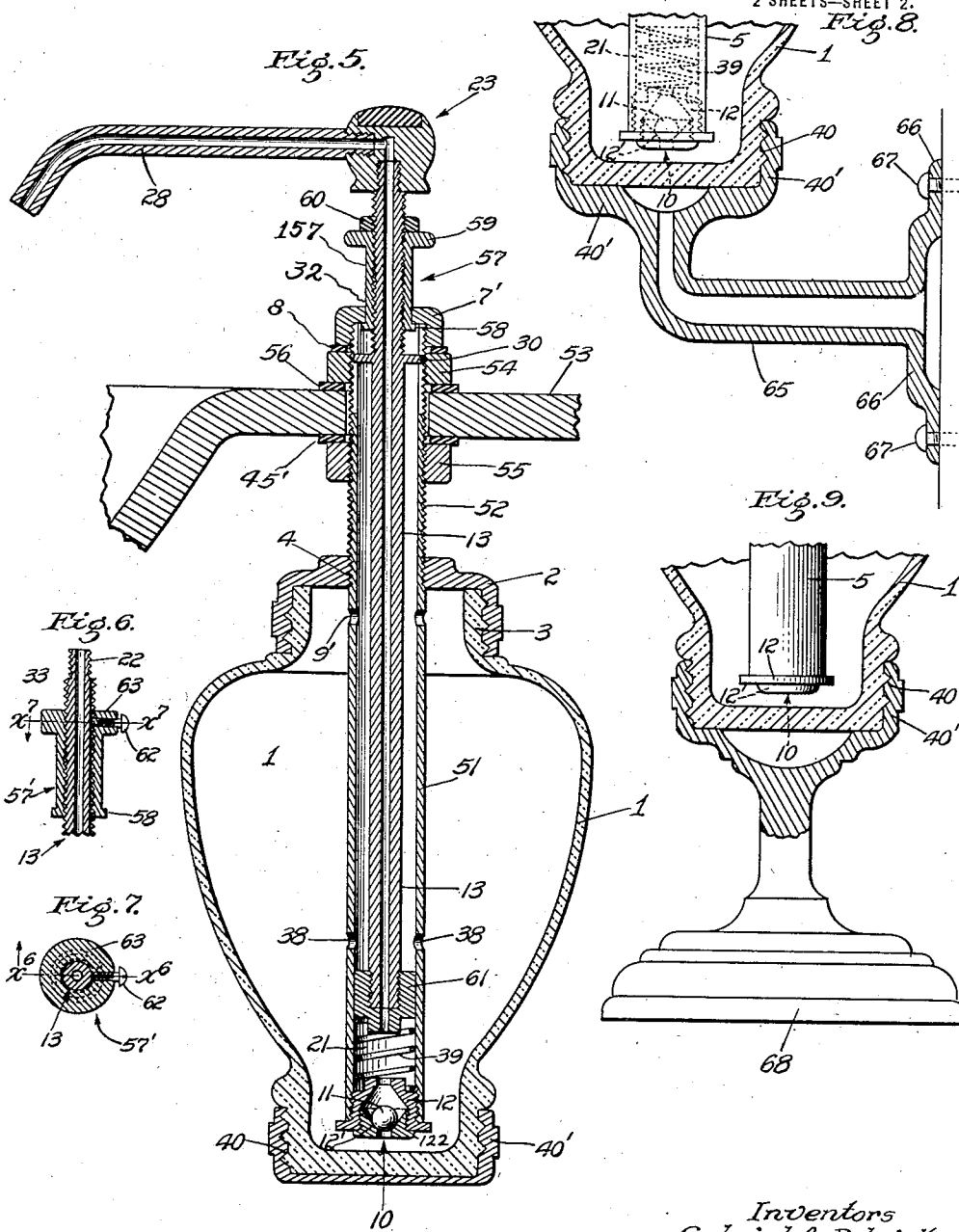
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Gabriel A. Bobrick
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James R. Thompson
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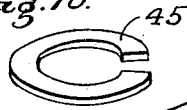
Patented Dec. 14, 1920.

2 SHEETS—SHEET 2.



Witnesses
 W. N. Turley
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Fig. 10.



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UNITED STATES PATENT OFFICE.

GABRIEL A. BOBRICK AND ARTHUR L. BOBRICK, OF LOS ANGELES, CALIFORNIA.

LIQUID-DISPENSER.

1,362,077.

Specification of Letters Patent. Patented Dec. 14, 1920.

Application filed March 16, 1915. Serial No. 14,822.

To all whom it may concern:

Be it known that we, GABRIEL A. BOBRICK and ARTHUR L. BOBRICK, citizens of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Liquid-Dispenser, of which the following is a specification.

This invention relates to the piston type of apparatus for dispensing liquids of various kinds and for various purposes, but is particularly intended for use as a liquid soap dispenser.

The requirements of different establishments, such as private residences, offices, schools, hotels, clubs, factories, stores, etc., vary as to quantity of liquid soap to be delivered per stroke of piston.

An object of the invention is to provide a positively non-leaking, non-dripping and economical liquid soap dispenser which will meet such requirements as nearly as practicable.

It has been found in practice that the great variety in styles and forms of wash-basins, and in the materials of which they are made, require different methods and devices for securing the dispenser to the wash-basin or to the adjacent wall; and with this fact in view we have devised means whereby the dispenser may be secured to the wash-basin with the container above or below the top of the basin, or may be secured to the wall adjacent to the wash-basin, or may be secured to a portable base.

To make a liquid soap dispenser positively non-leaking and non-dripping, it is necessary:—first, that the mouth of the container shall be above the level of the liquid, so as to get rid of the necessity of packings and cements for securing the container to the dispensing apparatus, because such packings are likely to become loose, making the dispenser leak at the base. and, second, it is necessary that the dispensing apparatus should deliver the charge of soap through a nozzle located above the level of the soap in the container; so as to prevent possible leakage through worn parts.

The discharge of the soap from the nozzle should be caused by the pressure of the hand effecting the down stroke of the piston, and should stop the very moment the piston stops exerting pressure on the soap entrapped in the charge chamber. The pis-

ton is returned by a spring; and it is important that, on its upstroke the action of the piston should so sufficiently withdraw the soap from the channel of the delivery nozzle as to free the tip of such channel from soap, so as to prevent dripping and to prevent clogging the nozzle with dried soap at its tip.

To make the dispenser economical and adaptable for the different establishments, it is necessary to provide means for regulating the quantity of soap to be delivered per stroke of piston; such means must be easily accessible and provided with a locking device to prevent readjustment of piston stroke without a special tool. This is especially true when the dispensers are installed in public wash rooms.

Other objects and advantages may appear from the following specification.

The accompanying drawings illustrate the invention.

Figure 1 is a vertical axial section of a liquid soap dispenser constructed in accordance with this invention, and illustrating the method of securing the dispenser to a wash-stand, with the container above the top of the wash-stand plate, a fragment of which is shown. Fig. 1^a is a sectional detail of a modified form of piston rod in place.

Fig. 2 is an enlarged horizontal section on line x^2 , Fig. 1.

Fig. 3 is a fragmental vertical axial section on line x^3 , Fig. 4, illustrating a modified form of means for adjusting the piston stroke, and locking same in adjusted position.

Fig. 4 is a horizontal cross-section on line x^4 , Fig. 3.

Fig. 5 is a vertical axial section of a liquid soap dispenser illustrating a modified form of pumping mechanism and piston stroke adjusting device. This figure also illustrates the method of securing the dispenser to a wash-stand, with the container under the top of the wash-stand, a fragment of which is shown. The principles of the invention are common to both Fig. 5 and Fig. 1.

Fig. 6 is a fragmental vertical axial section on line x^6 , Fig. 7, showing another form of piston stroke-adjusting device.

Fig. 7 is a horizontal cross-section on line x^7 , Fig. 6.

Fig. 8 is a vertical section of the lower part of a dispenser illustrating the method

of fastening the dispenser to the wall adjacent to the wash-stand. The inside tube is shown in elevation, and hidden parts are dotted in.

5 Fig. 9 is a view analogous to Fig. 8, showing the dispenser mounted on a portable base.

Fig. 10 is a detached perspective view of the lock nut washer used in securing the dispenser to the wash stand.

Referring to the form of dispenser shown in Fig. 1, the container 1 which may be of any suitable size, form or material, has an externally-threaded neck 3, open at its top, and adapted to receive an internally-threaded cap 2, which may be either removably or permanently secured to the neck of the container. Said cap 2 has a central threaded aperture 4, through which a tube 5, having a threaded portion 6, at its upper end, is screwed, from the inner or under side thereof, so as to project above the outer or upper side of said cap.

A threaded tube cap 7, having a central aperture 32, suitable for the passage of a smooth portion 31 of the tubular piston rod 13, is screwed onto said tube 5 above the cap 2. A washer 8 is interposed between the caps 2 and 7. The tube 5 may be soldered or otherwise permanently secured to said container cap 2.

The upper end of the tube 5 is also provided with orifices, in the form of slots 9, the lower ends of which extend below the container cap 2 for purposes hereinafter set forth.

The lower end of the tube 5 is provided with a foot valve, which, in the form shown, consists of a bushing 12, screwed into or otherwise secured to said tube. The inner upper end of said bushing 12 is hollowed, similar in form to a frustum of a cone, having an opening into the tube 5; the inner lower end is threaded to receive a plug 122. The inner upper end of said plug is also hollowed similar in form to a frustum of an inverted cone, the lower end of which is perforated to form an inlet 10.

The hollowed portion of the plug, at its bottom, is shaped to form a suitable seat for a valve, which, in the form shown is preferably a ball 11, seated by gravity, and lifting inwardly to open inlet 10 to admit liquid from the container into the tube on the upstroke of the piston. The bushing 12 and the plug 122, when secured together, form the body of the foot valve, and the inner hollowed portions form the chamber or inclosure for the valve 11.

Inside the tube 5 is located a piston, which, in the form shown, is provided with a delivery valve, consisting of the piston body 15, provided at its lower end with a perforation or inlet 19. The inner lower portion of the piston body above the per-

foration is hollowed similar in form to the hollowed portion of the plug 122, and is shaped to form a seat for the valve 17, which is, preferably, also a ball seated by gravity and lifting inwardly to open the inlet 19 on the downstroke of the piston. The inner upper end of the piston body is suitably secured to the tubular piston rod 13, being shown threaded to receive the enlarged externally threaded portion 14 of said tubular piston rod, which is also hollowed out, similar in form to the hollowed portion of the bushing 12.

The tube 5 is provided, at some distance above its bottom, with one or more free vent ports 20, the purpose of which will hereinafter be described. The space in the tube between the bottom of the port or ports 20 and the top of the foot valve body 12 forms the piston or charge-chamber 21, in which the piston on its downward stroke, upon passing the ports 20, entraps a predetermined quantity of soap, and forces it out through the delivery valve and the continuous channel of the piston rod and nozzle.

The ports 20 serve the purpose of venting any air which may pass into the charge-chamber 21 on the upward stroke of the piston, through the continuous channel of the piston rod and nozzle, because of possible leakage of the delivery valve, should any sediment accumulate on the seat or valve, or when liquid in container is too low. Another purpose of the ports 20 is to permit a long stroke of the piston and free movement of the hand for a comparatively small discharge of soap. Otherwise, and if the soap is reasonably free from unsaponified matter and sediments the ports 20 may be omitted.

At about the level of the upper end of the piston, when the piston is at rest, at its maximum height, ports 38 are provided in the tube 5 to drain the liquid from the tube 5 above the piston. The ports 38 also serve the purpose of permitting the convenient filling of the container with soap, especially if the ports 20 are omitted and the cap 2 is firmly cemented onto the neck of the container.

With the form shown in Fig. 1, it is desirable that the cap 2 of dispensers installed in public wash rooms should be firmly cemented onto the neck of the container.

To fill the container, the tube cap 7 is unscrewed, the piston rod and piston withdrawn from the tube 5, a funnel, not shown, is inserted into the tube above the cap 2, and liquid soap poured into the funnel; the liquid descends into the tube and enters the container through the ports 38; the air from the container escapes into the atmosphere through the slots which extend into the container, as shown at 9, Fig. 1, or through the ports 9', as shown in Fig. 5.

The ports 20 and 38 may be connected to form slots similar to the slots 9.

A knob or push button 23, having an angular channel 24, is screwed or otherwise permanently secured onto the top of the tubular piston rod, and a tubular nozzle or spout 28 is screwed or otherwise secured in the vertical end of the angular channel 24, thus establishing communication between the charge chamber and the outside, when the piston on its downward stroke forces the liquid, not shown, entrapped in the charge chamber, to open the delivery valve and to flow out. The end of the nozzle or spout is bent downward so as to conveniently discharge the liquid soap, forced out from the piston chamber 21, into the palm of the hand of the user of the dispenser.

The upper portion of the tubular piston rod 13, at some distance below its top, is provided with a shoulder which in Fig. 1 is shown as a hub 29 which abuts against the under face of the cap 7, and holds the piston rod and piston in normal position, limiting the stroke of the piston and preventing withdrawal of the piston rod through the aperture of the cap 7.

The piston rod is provided at or near the shoulder with lugs 30 which project into the slots 9, thus preventing the nozzle 28 from being turned laterally and changed from its set position over the wash bowl.

The upper end of the piston rod 13 between the knob or push button 23, and the hub 29, is partly smooth and partly threaded. The smooth portion 31 is the portion that moves up and down through the orifice of the tube cap 7; the threaded portion 33, and what we term the regulator 34 adjustable thereon, form the means for adjusting the stroke of the piston.

The regulator 34 has an upper internally-threaded portion to fit the thread 33 of the piston rod, and has a bore 37 in the lower portion, which bore is slightly larger in diameter than the piston rod, permitting said lower portion to move freely over and around the threaded and non-threaded portions 33 and 31, said lower portion serving as a protection for the thread 33, also as a stop for the piston rod and piston, when the lower portion of the regulator 34 reaches the top of the cap 7 on the down stroke. The check nut 36, when screwed tightly against the regulator 34, prevents the latter from turning or changing its position on the piston rod.

In the dispenser shown in Fig. 1, the adjusting mechanism is set at its maximum height, permitting a maximum stroke of piston and a maximum delivery of liquid through the nozzle. The lowering of the regulator 34 will reduce the stroke of the piston, thereby reducing the delivery charge. Particular attention is called to the fact

that the slightest turn of the regulator in either direction on the piston rod will increase or decrease the amount of the discharge at a full stroke of the piston, hence the different establishments installing the device, can adjust the piston stroke to a nicety to deliver any quantity of soap desired. The regulating device being above the container and easily accessible, the person in charge can adjust the delivery accurately by turning the regulator one way or another until the quantity of the discharge per full stroke of the piston is determined by measure or otherwise.

In the piston stroke adjusting mechanism shown in Figs. 3 and 4, the regulator 34' is similar to that shown at 34, of Fig. 1, except that it is provided with two projections, one of which is split vertically, as shown at 47, to form two transversely perforated limbs 48 and 49. The perforations in one of the limbs is smooth, the other is threaded. A clamp screw 50 is inserted through the perforation of one limb and screwed into the thread of the other. By tightening the screw 50, the limbs will be tightened thereby tightly clamping the regulator 34' around the threaded part 33 of the piston rod 13. The clamp acts as a locking device for the regulator on the piston rod, and the check nut 36, shown in Fig. 1, is dispensed with. The other details of the adjusting device 34' are the same as at 34, of Fig. 1.

It may be readily seen that it is desirable that a portion of the regulator 34 be unthreaded. Any extension of the thread in the regulator downward or to its full depth would require an extension of the thread on the unthreaded portion 31, and this extended threaded portion of the piston rod would not only be liable to damage when passing through the orifice 32 of the cap 7, but it might also make the operation of the dispenser noisy.

A spiral spring 39 bearing with its lower end against the top of the foot valve body 12, and with its upper end against the piston 15 is placed in the charge chamber 21 to return the piston to its normal position after its downward stroke, and to yieldingly support it in that position, with the shoulder 29 abutting against the under part of the cap 7.

The container 1 is preferably made of glass; the lower portion is preferably threaded externally, as shown at 40, to engage a seat 40'. The seat 40' may be constructed in various forms to meet the requirements of different establishments. In Fig. 1 the seat 40' has a downward extension 41, adapted to rest on the top of the wash basin 43, and is further provided with a threaded portion 42, which passes through the top of the wash-basin, to which it is se-

cured by the nut 44 and split washer 45, commonly known as a lock nut washer.

In Fig. 5, the seat 40' serves merely as a protector for the threaded portion 40.

In Fig. 8 the seat 40' has a downward vertical extension curved to form the horizontal extension 65 terminating in the flange 66 adapted for securing the dispenser to the wall adjacent to the wash basin, by means of screws 67.

In Fig. 9, the seat 40' is similar in construction to that in Fig. 1, with the threaded part 42 screwed into or otherwise secured to a portable base 68.

In practice, the form of soap dispenser shown in Fig. 1 is suitably installed, as shown, on a wash-stand, and the nozzle or spout 28 projects above the top of the wash-stand plate 43, and over the wash-bowl 46. The user intermittently presses down the knob 23 allowing the spring to intermittently react, thus reciprocating the piston until the liquid soap, not shown, flows out through the nozzle 28, under which a hand may be held to receive the soap discharged. Usually the bore of the tube and part of the nozzle will remain charged with liquid so that any downward movement of the piston will cause a discharge of liquid through the nozzle.

In the form shown in Fig. 5, the container 1 is placed under the top of the wash-basin with the piston stroke adjusting device above the top, and the nozzle directed over the wash bowl.

The tube 51 has a threaded extension 52 above the container cap 2, of a length sufficient to extend up through the top 53 of the wash-stand, leaving enough of the threaded part below the top 53 to compensate for different thicknesses of the top, also to accommodate the nut 55 and the lock nut washer 45'.

Two nuts 54 and 55, and two washers 56 and 45' are shown. The nut 54 above the top 53, prevents the dispenser from dropping down when the tube cap 7' is unscrewed to remove the piston rod and piston from the tube, whether for mere inspection or for filling the container, if the container cap 2 is firmly cemented onto the neck 3.

The washer 56 is of the standard type and washer 45' is of the split lock nut type, like washer 45 of Fig. 1, separately shown in Fig. 10. The nut 55, when screwed up tightly against the lock nut washer 45' prevents the tube 51, and the whole apparatus from turning.

The piston body 61 differs in construction from that shown at 15, Fig. 1. It is provided with a bore of about the same diameter as the bore of the piston rod and has no delivery valve. The tubular piston

rod is screwed into or otherwise firmly secured to the piston. The charge chamber 21 has no ports below the piston, such as shown at 20, Fig. 1. The ports 38 are the same as in Fig. 1, and the ports 9' take the place of the ports or extended slots 9 shown in Fig. 1. The foot valve in the lower part of the tube 51 is the same as in Fig. 1. The capacity of the charge chamber is greater than the combined capacities of the channels in the piston, piston rod, push button and nozzle, hence on the down stroke of the piston the liquid will first fill up the continuous channel to its full capacity, and then the excess will flow out through the nozzle.

The cap 7' is the same as that shown at 7, in Fig. 1. The piston stroke adjusting mechanism in Fig. 5 is of a modified form. The regulator 57 consists of an internally threaded tube 157 provided with two flanges 58, 59. The flange 58 abuts against the under side of the cap 7' to prevent withdrawal of the regulator through the orifice of the cap. It also limits the piston stroke and prevents the lifting out of the piston rod and piston through the orifice 32. The upper flange 59 of the tube 57 serves as a stop against the top of the cap 7', when the piston rod is pushed down. In the form shown in Fig. 5, the piston is set about midway in the charge chamber. By turning the regulator in one or the other direction the length of the piston stroke will be either increased or reduced, thus discharging through the nozzle 28, a greater or lesser amount of soap per full stroke of piston. The check nut 60, when screwed tightly against the flange 59, holds the piston stroke adjusting mechanism in fixed position.

The internally threaded tube 157 of the regulator 57 is usually made initially with only one flange. Such tube is inserted through the orifice of the cap, and the other flange is then either formed on or screwed onto the tube or is otherwise secured thereto. The piston rod is provided with a knob or push button 23, and spout 28 as heretofore described for Fig. 1.

The piston stroke adjusting mechanism shown in Figs. 6 and 7 differs from that shown in Fig. 5, in that the threaded portion of the piston rod 13 is slotted vertically and a set screw 62 is screwed through the flange 63 to engage the base of the slot in the threaded piston rod. The set screw, when tightened, prevents the regulator 57' from turning, thus maintaining the desired length of stroke. The set screw 62 performs the function of the check nut 60, shown in Fig. 5, and therefore the check nut is there dispensed with.

It may be observed that while the prin-

ciple in all the piston stroke-regulating devices, as shown in Figs. 1, 3, 4, 5, 6, and 7, is the same and their function is the same, the devices shown in Figs. 1 and 3 differ from those shown in Figs. 5 and 6 in details and mode of operation. For instance:—To increase or reduce the delivery charge of liquid to a greater or less quantity with the device shown in Figs. 1 or 3, it is necessary to lower the regulator, the position of the piston remaining the same, while the device shown in Figs 5 or 6 will perform the same function by turning the regulator 57 or 57' in one or the other direction, thus increasing or decreasing the normal height of the piston, and increasing or decreasing the delivery charge.

It will be seen, however, by comparing Figs. 1 and 5, that the construction admits of a change from the position of the container above the wash-stand as in Fig. 1 to below the stand as in Fig. 5, by simply substituting a longer tube 51 for tube 5 and adding clamping devices. By providing a cap for the tube 5 or 51 independent of the cap for the container 1, provision for this ready adaptation to different positions is made.

It is understood that while the piston rod in Fig. 1, and the tube 157 in Fig. 5, closely fit the orifices through the caps 7 and 7' respectively, there is sufficient vent space around the piston rod and around the tube to allow air to enter the container 1 to maintain the normal air pressure requisite for the operation of the pumping mechanism located in the container.

It is understood that we do not limit our invention to the details illustrated in the drawings and described in the specifications, nor to any particular piston stroke adjusting device.

In Fig. 1^a the upper end of the tubular piston rod 131 is reduced in diameter at *a* to leave a shoulder *b* to form a stop to abut against the under side of the cap 7, and a transverse pin *c* is inserted through a hole *d* bored through the upper end of the unreduced portion of the tube after which the obstruction thus formed in the bore of the tubular piston rod is removed by boring through the pin *b* as indicated at *e*. The projecting ends of the pin constitute the lugs 30 in this construction, while lugs project into the slots 5 to prevent turning of the nozzle.

By providing the threaded tube as 5 or 51 carrying the inlet valve as at 11, 12, and swerving it into the container cap through which the threaded tube extends for threaded connection with the upper elements of the device the requisite security against leakage is obtained by cheap, simple and easily-assembled means.

We claim:

1. A liquid dispenser comprising a tube externally threaded at its upper end and threaded at its lower end; a valve chamber secured to said lower end; a foot valve in and carried by said valve chamber there being a charge chamber above the valve chamber; ports opening into the charge chamber; a container; a cap for said container screwed onto the top thereof and fixed to the tube, said tube extending upwardly through the cap; a portion of said tube being contained within the container; a tubular piston rod; a piston carried thereby and working in said tube and a cap for the tube forming a guide for a piston rod; the piston being removable by removing the tube cap.

2. A liquid dispenser comprising a container; a tube extending inside the container and carrying an inlet valve and a separate charge chamber having a free port; a piston working in said charge chamber and a tubular piston rod provided with a spout and arranged to operate said piston.

3. A liquid dispenser comprising a container; a tube extending inside the container and carrying an inlet valve and a separate charge chamber having a free port; a piston working in said charge chamber; a spring to move said piston away from the valved inlet and a tubular piston rod provided with a spout to operate said piston and conduct liquid from the chamber.

4. A liquid dispenser comprising a container; a tube extending inside the container and carrying an inlet valve and a separate charge chamber having a free port; a piston head working in said charge chamber; a spring to move said piston head away from the valved inlet; a tubular piston rod provided with a spout to operate said piston and conduct liquid from the chamber, and means to limit the stroke of said piston.

5. A liquid dispenser comprising a container; a tube extending inside the container and carrying an inlet valve and a separate charge chamber having a free port; a piston working in said chamber; a tubular piston rod provided with a spout and arranged to operate said piston; and adjustable means to limit the length of the stroke of said piston rod.

6. A liquid dispenser comprising a container; a tube in the container; said tube being provided with a valved inlet and a charge chamber; and a tubular piston operable in the tube to discharge liquid therefrom; said tube being provided with a free port at the top of the charge chamber and at about the level of the depressed piston.

7. In a liquid dispenser of the character set forth, a container having an open mouth

and a closed bottom; said mouth and said bottom being threaded so that the container is adapted to receive liquid ejecting means for discharging liquid and is adapted to be
5 mounted either below or above the wash-stand top or elsewhere substantially as set forth.

In testimony whereof, we have hereunto

set our hands at Los Angeles, California, this 10th day of March 1915.

GABRIEL A. BOBRICK.
ARTHUR L. BOBRICK.

In presence of—
JAMES R. TOWNSEND,
STELLA HILL.