

Dec. 9, 1952

V. S. KUCKI

2,620,947

LIQUID MEASURING DEVICE

Filed Aug. 28, 1946

2 SHEETS—SHEET 1

Fig. 1.

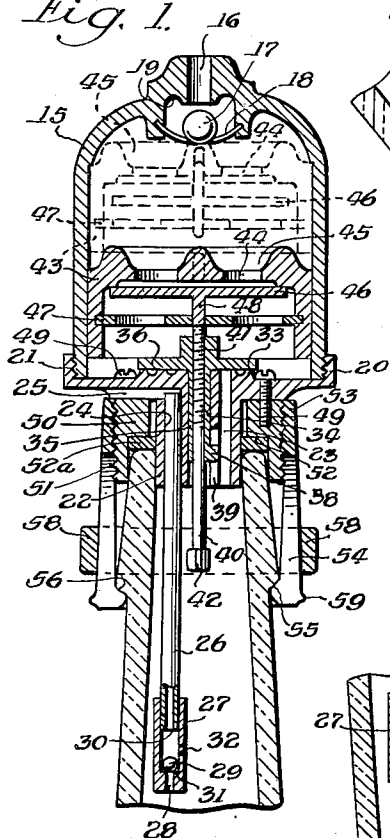


Fig. 2.

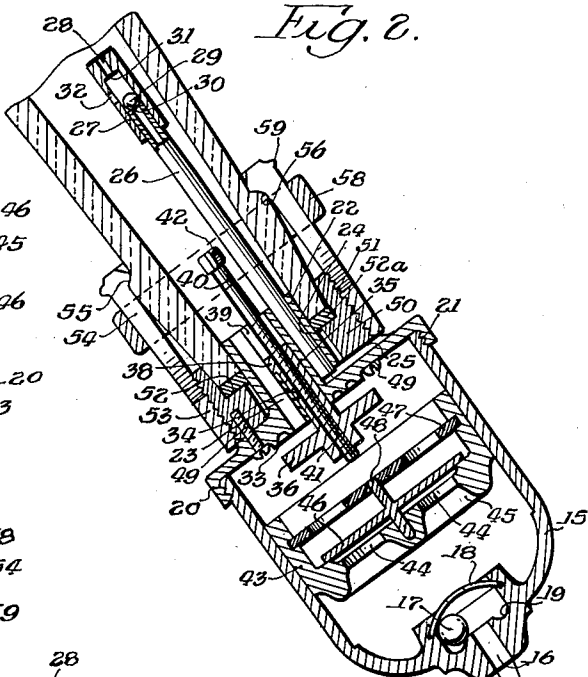
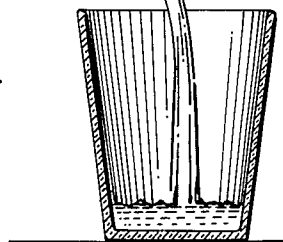
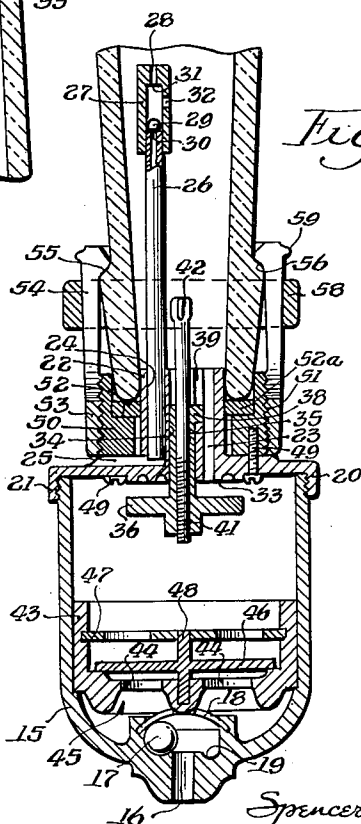


Fig. 3.



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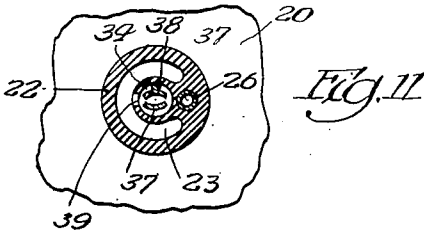
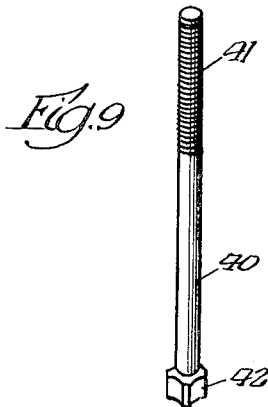
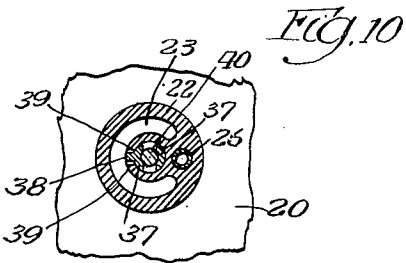
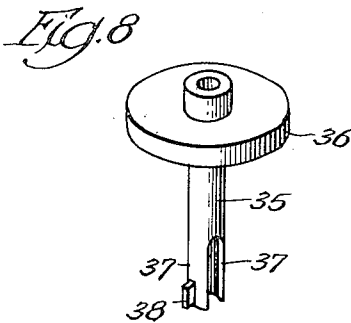
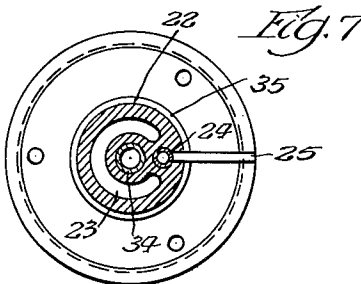
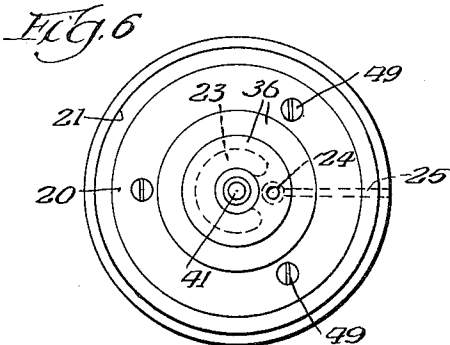
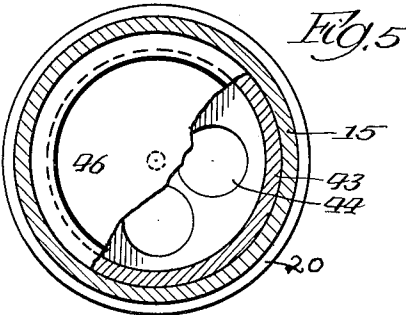
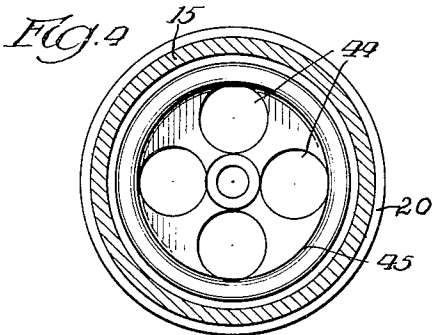
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LIQUID MEASURING DEVICE

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2 SHEETS—SHEET 2



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UNITED STATES PATENT OFFICE

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LIQUID MEASURING DEVICE

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4 Claims. (Cl. 222—335)

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This invention is an improvement of the device described and claimed in my prior Patent 2,317,068, issued April 20, 1943, and one of the objects of the present invention is to improve and simplify the construction of such a device, and enable the same to be more easily manufactured.

A further object is to provide improved means for controlling the air inlet tube, whereby air will be admitted into the container to permit the liquid to be discharged therefrom, and also to prevent the liquid from being delivered or from leaking through the air inlet.

A still further object is to provide improved means for attaching or securing the measuring device to a bottle or container from which the liquid is dispensed.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts, hereinafter more fully described and claimed, and shown in the accompanying drawings illustrating this invention, in which

Fig. 1 is a longitudinal sectional view of a device of this character, constructed in accordance with the principles of this invention, showing the same applied to a bottle, and in an upright position, a portion of the neck of the bottle being shown in section.

Fig. 2 is a sectional view of the device upon being tilted to pouring position from the rest or non-pouring position shown in Fig. 1.

Fig. 3 is a similar sectional view showing the device in pouring position at the end of a pouring operation and prior to being restored to the non-pouring or rest position shown in Fig. 1.

Fig. 4 is a detail sectional view on line 4—4, Fig. 1, with parts omitted.

Fig. 5 is a sectional view on line 5—5, Fig. 1, with parts omitted.

Fig. 6 is a sectional view on line 6—6, Fig. 1, with parts omitted.

Fig. 7 is a sectional view on line 7—7, Fig. 1, with parts omitted.

Fig. 8 is a detail perspective view of one of the valves.

Fig. 9 is a detail perspective view of a stop device for one of the valve mechanisms, and valve retaining device.

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Fig. 10 is a detail sectional view on line 10—10, Fig. 1, with parts omitted.

Fig. 11 is a view similar to Fig. 10, with one of the parts in a different position.

Referring more particularly to the drawings, the numeral 15 designates a casing, which may be of any suitable size and configuration, and constructed of any suitable material, either transparent or opaque, and which is adapted to be removably secured to a liquid supply holder or container, such as a bottle or the like.

The casing is provided with a discharge outlet 16. A ball valve 17 co-operates with a valve seat 18, to form a closure for the casing when the same is held erect, to close the casing, and, when the casing is tilted, the valve 17 will enter a channel or raceway 19, to prevent closing the outlet 16, so as to allow the liquid to be discharged from the casing. The casing proper is detachably secured to a base 20, preferably by means of screw threads 21, to permit the parts to be separated, whereby entrance may be had to the interior of the casing.

Depending from the base 20 is an extension 22, having a passage 23 therethrough for liquid, and forming an entrance opening to the casing 15. This extension is provided with a second passage 24, which opens through the side of the extension, as at 25, for the admission of air. One end of a tube 26 is inserted into the passage 24, and the tube extends any desired or suitable distance beyond the end of the extension 22. At the other end of the tube is a preferably cylindrical valve housing 27 containing a ball valve 29 substantially filling but free to roll within the bore of the housing between the opposite ends thereof.

One end of the tube 26 forms a valve seat 30, within an end of the housing 27, the other end 28 of the housing being partially or completely closed to form a seat 31 for retaining the ball valve within the housing. These valve seats 30 and 31 are spaced from each other a substantial distance, so that when the casing 15 is erect, the ball will engage the seat 31, but, when tilted, it will engage the ball retaining seat 30. The housing is also provided with an opening 32 through its wall, midway between the valve seats 30 and 31, for a purpose to be described, and in a position that it will not be closed by the valve 29.

The passage 23 may be of any desired size and

shape, and encompassing the upper end of the passage is a valve seat 33. A bearing opening 34 extends through the extension 22 and the base 20. This opening is preferably located centrally of the extension, and receives the stem 35 of a floating valve 36 (see particularly Fig. 8). The stem is tubular, and, at its lower end, is split or shaped to form resilient portions or fingers 37, and projecting laterally from the periphery of one of said portions or fingers is a lug or extension 38.

The extension 22 is provided with a recess 39 (shown more clearly in Figs. 10 and 11) in its wall, at the lower end thereof, for the reception of the lug 38, when the valve and stem are in position, and the recess is of a length greater than the lug, to permit of a relative longitudinal movement of the stem in its bearing, to unseat and seat the valve 36. The recess is also of a width to prevent the valve 36 and the stem from rotating.

A rod or member 40 having a threaded end 41 and a head 42, is adapted to be inserted into the tubular stem 35 from the resilient end thereof, and has threaded engagement with the valve 36. The member 40 is of a diameter that when the lug 38 is seated in the recess 39, it will maintain the lug therein; but the valve 36, together with the member 40, will be free to reciprocate in the opening 34 of the extension 22, thereby allowing the valve to have free movement by the tilting or inverting action of the casing 15. When, however, the member 40 is removed, the valve 36 and stem 35 may be removed by rotating the valve with respect to the extension 22. This will cause the lug 38 to ride out of the recess 39, as the resilient ends 37 of the stem will be contracted.

The end of the member 40 is adapted to be projected through the valve 36, as shown in Figs. 1 and 2, by rotation of the member through the medium of the head 42, so as to form an adjustable stop device, as will be described, to vary the amount of liquid delivered into the casing 15 when the container is tilted to deliver the liquid into the casing.

Within the casing 15 is a freely reciprocable piston or plunger 43, which is hollow and is provided with openings 44 through the bottom thereof, a recess 45 being provided in the top surface thereof, so as not to interfere with the valve and valve seat 17-18. Within the piston 43 is a floating valve 46, which is preferably weighted, and is heavier than the piston, and controls the openings 44. This valve is preferably supported by a spider 47, and guided by a stem 48 that passes freely through the spider. This support or spider 47 is spaced a substantial distance from the inner face of the bottom of the plunger or piston 43, so that the valve will be free to gravitate in one direction or the other, with respect to the piston, according to the position into which the casing 15 is moved. The end of the stem 48 is positioned to engage the end of the member 40. It will therefore be seen that as the member 40 is adjustably supported by the valve 36, it can be projected any desired distance beyond the valve 36, and will be engaged by the end of the stem 48 of the valve 46. This will control or regulate the amount of liquid that will be allowed to pass through the openings 44 to the other side of the piston or plunger 43.

Secured to the bottom 20 of the casing 15, such as by means of screws 49, or other suitable fastening means, is a sleeve 50, which encom-

passes the extension 22, and is provided with peripheral screw threads 51. The sleeve is provided with an open recess 52, in which a gasket 52^a may be arranged, so that when the device is attached to a bottle, the mouth of the bottle will extend into the recess and the gasket will abut the end of the neck. A clamp is provided to secure the device in position, with the extension 22 projecting into the bottle. This clamp embodies an internally threaded body portion 53, and a plurality of spaced springs or resilient fingers 54, having inwardly projecting lips or shoulders 55 at the extremities thereof. These lips are adapted to engage under the usual circumferential shoulder 56 on the neck 57 of a bottle, and when the lips are engaged under such shoulder, a collar 58 is forced over the fingers to hold them firmly in engagement with the shoulder 56. Stops 59 may be provided on the fingers to prevent the collar 58 from becoming disengaged from the clamp device.

By the provision of the threaded or adjustable connection between the clamp 53 and the collar 50, the clamp may be adjusted with respect to the base 20 of the casing 15, to adapt the device for attachment to bottles of varying sizes and to bottles having the shoulder 56 located at different distances from the end of the neck. The clamping device also insures a liquid tight joint between the bottle and the measuring device, as it is possible, when the parts are assembled, to adjust the clamping device with respect to the casing 15, to force the gasket 52^a against the end of the bottle neck.

It is thought that the operation of this device will be clearly understood from the foregoing, but, briefly stated, it is as follows:

Before the device is attached to a bottle, the member 40 is adjusted to project the end thereof the required distance beyond the valve 36, according to the amount of liquid it is desired that the device will dispense. The device is then placed in position on the bottle, with the clamping fingers engaging under the shoulder 56 of the bottle neck, after which the casing and clamp are relatively rotated to force the gasket 52^a against the end of the bottle neck. The bottle and casing are then tilted a sufficient distance to unseat the valve 36, to permit liquid to flow into the casing 15, beneath the piston 43. The piston 43 and the valve 46 will move towards the discharge outlet 16 of the casing 15, and the space between the bottom 20 of the casing and the piston 43 and valve 46, will be filled with the liquid. During this operation the ball valve 29 will move into engagement with the seat 30, to prevent liquid from flowing out of the air inlet tube 26. The bottle and the casing 15 are then arighted, which will cause the valve 36 to close and the ball valve 29 to move into engagement with the seat 31, to permit air to enter the bottle through the tube and outlet 32. In this arighted position, the piston 43 will gravitate, as will also the valve 46, but as the valve is weighted and is heavier than the piston, it will, as shown in dotted lines in Fig. 1, move in advance of the piston, and the liquid beneath the piston will flow through the openings 44 to the other side of the piston.

When the parts reach the rest position shown in solid lines in Fig. 1, a measured quantity of liquid will be trapped in the casing 15 above the valve 46 and the piston 43, so that upon the next tilting of the bottle and container, this measured amount of liquid will be dispensed, while, at the same time, a new supply is flowing into the dis-

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penser behind the piston and valve 46, to be dispensed when the bottle is subsequently tilted.

The liquid above the piston, when the casing is erect, will be protected by the valve 17 engaging its seat 18, but by reason of the channel or run-
way 19 for this ball valve, the discharge outlet 16 will not be closed thereby, upon tilting or inverting the bottle and casing 15.

With this improved clamping means, the device may be readily removed and applied to another bottle or container and, being adjustable, can be readily adjusted to fit bottles of various constructions.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction, and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:

1. A device for dispensing measured quantities of liquid from a supply container having an outlet orifice through which liquid may be discharged, comprising a casing having an inlet opening and an outlet opening at opposite ends thereof, said casing being formed for attachment on the container with said inlet opening of the casing in communication with the outlet orifice of said container, a one-way valve at said inlet opening allowing liquid flow therethrough into said casing, a piston valve freely movable in said casing and adapted to gravitate toward said outlet opening when the container and casing are tilted in pouring position, to thereby discharge liquid in front of said piston valve from said casing and simultaneously to draw liquid, into the casing behind the piston valve, through said one-way valve, said piston valve being adapted to gravitate away from said outlet opening, when the container and casing are in non-pouring position, to pass a measured quantity of liquid through and into dispensing position in front of said piston valve, an air inlet comprising a tube supported on said casing in position to extend into the container, through said outlet orifice, when the casing is in mounted position on the container, said tube having open communication with the atmosphere outwardly of said casing, the casing remote end of the tube forming a valve seat, a ball valve adapted to seat by gravity upon said seat to close said tube, when the casing is in pouring position, and to uncover the end of the tube, when the casing is in non-pouring position, a cylindrical sleeve sealed at one end on said casing remote end of the tube in position exposing said end, and the seat formed thereby, within said sleeve, said sleeve being sized to snugly receive said ball valve for rolling movement therein toward and away from said seat, said sleeve being formed with a lateral perforation intermediate its ends, and the seat remote end of the sleeve having an inwardly turned portion defining a central opening whereby to retain the ball valve in said sleeve and permit fluid flow through said central opening.

2. A device for dispensing liquid from a supply container having an outlet orifice, comprising a casing adapted for attachment on said container in communication with said orifice, one-way valve mechanism in said casing through which liquid to be dispensed may be poured from the container when the same and the attached casing are tilted in pouring position, an air inlet comprising a tube supported on said casing in position to extend into

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the container, through said outlet orifice, when the casing is in mounted position on the container, said tube having open communication with the atmosphere outwardly of said casing, the casing remote end of the tube forming a valve seat, a ball valve adapted to seat by gravity upon said seat to close said tube, when the casing is in pouring position, and to uncover the end of the tube, when the casing is in non-pouring position, a cylindrical sleeve sealed at one end on said casing remote end of the tube in position exposing said end, and the seat formed thereby, within said sleeve, said sleeve being sized to snugly receive said ball valve for rolling movement therein toward and away from said seat, said sleeve being formed with a lateral perforation intermediate its ends, and the seat remote end of the sleeve having an inwardly turned portion defining a central opening whereby to retain the ball valve in said sleeve and permit fluid flow through said central opening.

3. A device for dispensing liquid from a supply container having an outlet orifice, comprising a casing adapted for attachment on said container in communication with said orifice, one-way valve mechanism in said casing through which liquid to be dispensed may be poured from the container when the same and the attached casing are tilted in pouring position, an air inlet comprising a tube supported on said casing in position to extend into the container, through said outlet orifice, when the casing is in mounted position on the container, said tube having open communication with the atmosphere outwardly of said casing, said casing remote end of the tube forming a valve seat, a ball valve adapted to seat by gravity upon said seat and close said casing remote end of said tube, when said casing is in pouring position, and to uncover said end of the tube when the casing is in non-pouring position, and a cage on said tube for retaining said ball valve in operative position at the end of the tube, said cage being laterally perforated whereby the end of the tube may have open communication with the interior of the container when said ball valve is in open position, the seat remote end of the cage being formed with inwardly extending portions defining a central opening allowing free liquid flow into and out of the cage through said central opening.

4. A device for dispensing liquid from a supply container having an outlet orifice, comprising a casing adapted for attachment on said container in communication with said orifice, one-way valve mechanism in said casing through which liquid to be dispensed may be poured from the container when the same and the attached casing are tilted in pouring position, an air inlet comprising a tube supported on said casing in position to extend into the container, through said outlet orifice, when the casing is in mounted position on the container, said tube having open communication with the atmosphere outwardly of said casing, said casing remote end of the tube forming a valve seat, a ball valve adapted to seat by gravity upon said seat and close said casing remote end of said tube, when said casing is in pouring position, and to uncover said end of the tube when the casing is in non-pouring position, and a cylindrical sleeve sealed on the end of the tube and sized to closely retain the ball valve for free rolling movement therein toward and away from the valve seat, and intumed means formed on the sleeve to limit movement of the ball valve therein away from said seat, said intumed means be-

ing formed with a central opening allowing free liquid flow into and out of the sleeve at its seat remote end, said sleeve having a lateral opening therethrough, adjacent said valve seat, to maintain open communication of said tube with the interior of the container when said ball valve is in valve open position in said sleeve.

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