

Dec. 28, 1948.

T. M. COSTAKOS

2,457,531

MEASURING VALVE

Filed Aug. 8, 1947

2 Sheets-Sheet 1

FIG. 1

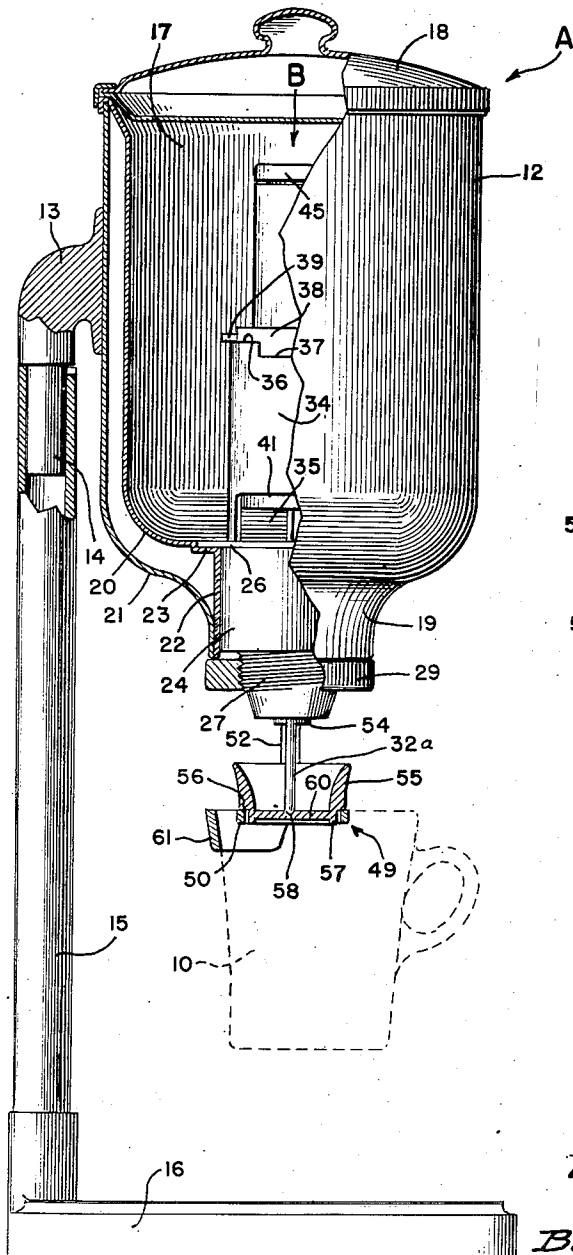
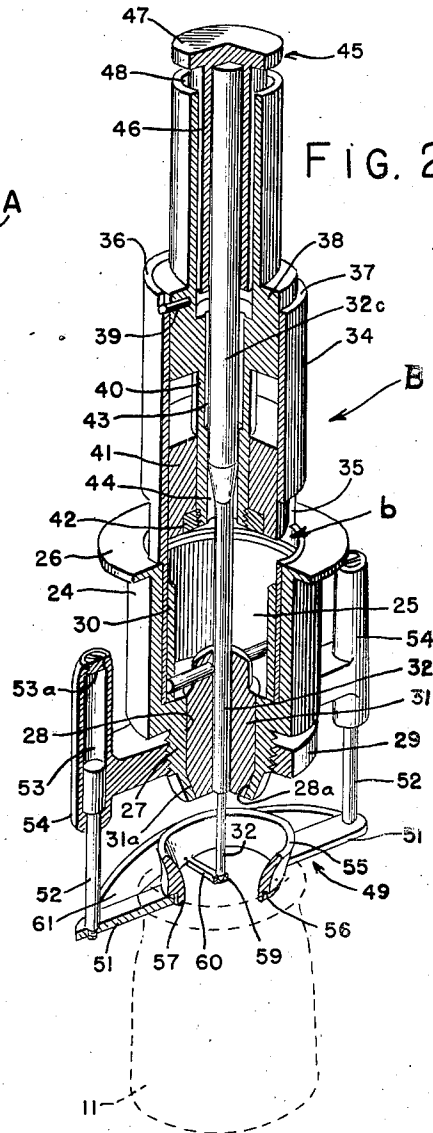


FIG. 2



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2 Sheets-Sheet 2

FIG. 3

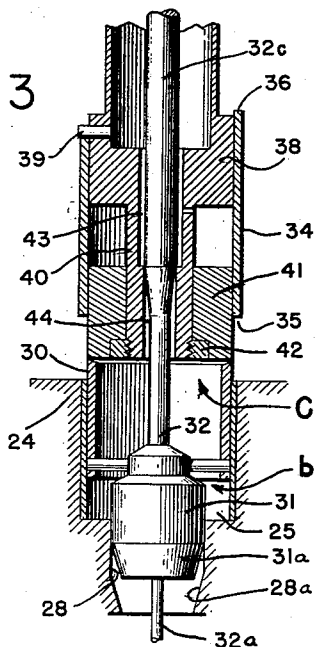


FIG. 5

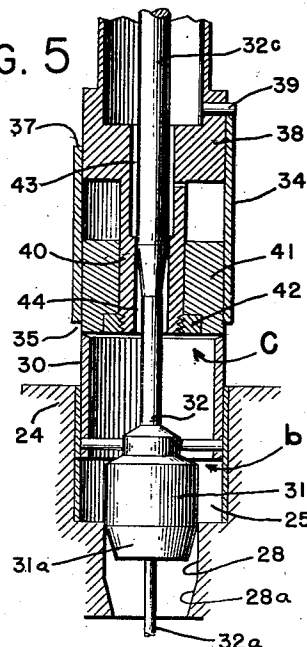


FIG. 4

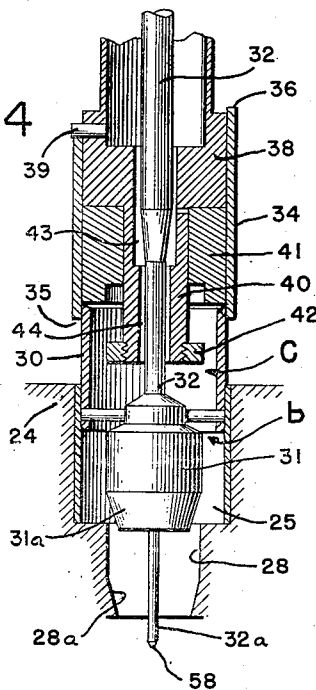
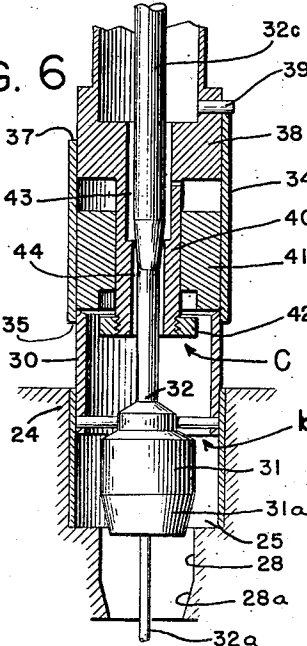


FIG. 6



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UNITED STATES PATENT OFFICE

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MEASURING VALVE

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17 Claims. (Cl. 222-453)

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My invention relates to improvements in dispensers, an object thereof being to provide a simple, durable, sanitary and relatively inexpensive device for dispensing liquids, particularly cream, in measured amounts selectively variable in quantity.

More specifically it is an object of my invention to provide a dispenser having a container for a supply of cream or other liquid and a valve mechanism in association therewith adapted to be operated by and to deliver a charge of the liquid into a cup or other liquid receiving receptacle.

Another object of the invention is to supply a dispenser of the present nature in which the valve mechanism is quickly and easily disassembled to enable the parts thereof to be readily cleansed, and in which such parts are quickly and easily reassembled for further use.

A further object of the invention is to provide a dispenser with valve mechanism, as above, the parts of which are capable of being assembled in manners selectively establishing different adjustments of said mechanism, each of which upon each operation of the device, results in the delivery of a charge of liquid in predetermined quantity peculiar in amount to the particular adjustment selected.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawing, Fig. 1 is a side elevational view of a cream dispenser constructed in accordance with my invention, a portion of the container for the supply of cream being broken away and showing in elevation a portion of the valve mechanism employed in delivering measured charges of cream from said container; Fig. 2 is a perspective view in detail of the valve mechanism shown in Fig. 1, said view being broken away to reveal the internal construction of said mechanism; Fig. 3 is a sectional view diagrammatically illustrating certain parts of said valve mechanism in their relative disposition at one stage in an operation of said mechanism under one of its adjustments; Fig. 4 is a view similar to Fig. 3 with the valve mechanism under the same adjustment but with the parts differently relatively disposed at a subsequent stage in said operation of said mechanism; Figs. 5 and 6 are diagrammatical views similar to Figs. 3 and 4, respectively, but with the valve mechanism under an adjustment differing from said first adjustment to deliver charges of cream of relatively greater quantity.

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Referring to the accompanying drawings, it will be seen that the embodiment of my invention illustrated therein includes a container A as for a supply of cream to be dispensed in measured quantities into receptacles such as a coffee cup 10 shown in dotted lines in Fig. 1, or such as an individual cream pitcher 11 shown in dotted lines in Fig. 2. This container A consists of a double-walled cylindrical body 12 having a bracket 13 secured to one side thereof and formed with a depending stud 14 removably socketed in the upper end of a tubular leg 15 standing on a base member 16. Supported by the leg 15, the body 12 of said container A is held axially upright in a position elevated to accommodate the placement of a receptacle beneath the same. The container 12 has a filler opening at the top thereof. This filler opening admits the introduction of liquid into the supply chamber 17 within the container and it provides access to the interior of said container. A double-walled cover 18 normally closes said filler opening in said container. At its lower end, the container body 12 has a neck 19 axially disposed vertically, the same being formed by incorporating between the container walls 20, 21 an upright nipple 22 having an outwardly extending flange 23 at its upper end to provide an annular seat.

Associated with the container A is a valve mechanism B having a valve body 24 of cup-like formation which fits into the nipple 22 from the top thereof, the upwardly opening cavity in the cupped valve body 24 providing a sump chamber 25 for the supply chamber 17 in the container A. An outwardly extending annular flange 26 formed at the lip of the valve body 24 rests on the seat flange 23 at the upper end of the neck-nipple 22. Depending axially from the valve body 24 is an externally threaded boss 27 which has an axial discharge bore 28 therein leading downwardly from the sump chamber 25. A wing-nut 29, threaded on said boss 27 and turned against the rim of the neck 19, secures the valve body 24 in place within said neck with the flange 26 on said valve body firmly held against the seat flange 23.

A lift valve 30 fitted to the valve body 24 comprises an axially upright valve sleeve 30 slidable vertically in the sump chamber 25, an axially upright valve plug 31 slidable downwardly into and upwardly out of the discharge bore 27, and a valve stem 32 co-axially fixed relative to the valve plug 31. Radial arms 33 fast at their outer ends to the valve sleeve 30 and fast at their inner ends to the valve plug 31 connect said valve sleeve 30 and valve plug 31 together leaving an annular space

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intervening therebetween. Said valve stem 32 has a lower and relatively slender section 32^a extending downwardly from said valve plug 31 and has a head section extending upwardly from said valve plug 31 in axial coincidence with the sump chamber 25 and the valve sleeve 30 therein.

The lift valve *b* is self-movable downwardly by gravity to effect the retraction of the valve sleeve 30 into the sump chamber 25 along with the lowering of the valve plug 31 into the discharge bore 28, said lift valve *b* being lifted, as will later appear, to effect the upward projection of said valve sleeve 30 from the sump chamber 25 along with the upward withdrawal of said valve plug 31 from said discharge bore 28.

Removably socketed for its footing in the sump chamber 25 of the valve body 24 is a stand 34 of tubular formation, the socketed portion of said stand serving as a liner for said sump chamber 25 within which said valve sleeve 30 slides. This tubular stand 34 has apertures 35, therein immediately thereof bringing the interior of the container proper into communication with the sump chamber 25, and the upper edge of said stand 34 is notched to form a number of stepped shoulders. A high shoulder 36 and a lower shoulder 37 are shown in the drawing, it being understood, that intervening shoulders may be additionally employed, if desired. Removably applied to the upper end of the stand 34 is a tubular mounting 38 having a lug 39 intermediately thereof extending radially therefrom, said lug being in the form of a pin or of other suitable form.

The mounting 38 slipped into and out of the upper end of the tubular stand 34 and turns therein to enable said mounting 38 to be vertically adjusted relative to the stand 34 to bring the lug 39 to rest on one or the other of the shoulders 36, 37, thereby holding the mounting 38 at a higher or lower elevation relative to the stand as may be selected. The lower portion of the mounting 38 is externally reduced in diameter to provide a guide 40. Slidably mounted on this guide 40 is a closure cap 41 for the valve sleeve 30, said closure cap 41 being of cylindrical formation having an axial bore receiving said guide portion 40 of said mounting 38. Limiting the gravitating descent of the closure cap 41 on the guide portion 40 of the mounting 38 is a stop nut 42, the same being screwed on the lower threaded end of said guide portion 40 beneath said closure cap 41. The upper portion of said mounting 38, extends above the extreme high level of the liquid introduced into the supply chamber 17 of the container A.

In either of the high or low adjustments of the mounting 38 on the stand 34, the closure cap 41 is engaged by the upper edge of the valve sleeve 30 and lifted by said sleeve during the lifting of the lift valve *b*, such engagement of said valve sleeve 30 with said closure cap 41 occurring before the upward withdrawal of the valve plug 31 from the discharge bore 28 in the valve body 24. Thus, all of the liquid contained in the sump chamber 25 and in the valve sleeve 30 upwardly projected therefrom to point of contact with the closure cap 41 becomes a trapped charge of liquid in quantity of accurate measurement ready to flow out of the discharge bore 28 as soon as said bore is cleared by the valve plug 31. Stated otherwise, the sump chamber 25 and the upwardly projected valve sleeve 30 together with the closure cap 41 engaged by said valve sleeve provide a measuring chamber C trapping a definite quantity of liquid for delivery from the de-

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vice upon the clearing of the discharge bore 28 by the valve plug 31. For a charge of liquid of minimum quantity, the lug 39 of the mounting 38 will be placed to bear upon the lower shoulder 37 of the stand 34, and for a charge of liquid of maximum quantity the said lug 39 will be set to bear upon the upper shoulder 36 of said stand 34.

The head section of the valve stem 32 is formed with an upper enlarged stopper portion 32^c which plays up and down in the bore 43 of the mounting 38, and said bore 43 has a lower restricted portion 44 into and out of which said stopper portion 32^c slides to obstruct and to clear said bore 43. The obstruction of said restricted portion 44 of said mounting-bore 43 by said stopper portion 32^c of the valve stem 32 takes place during those stages of operation of the lift valve *b*, wherein the valve sleeve 30 is out of engagement with the closure cap 41. Thus, at such times, said mounting-bore 43 is obstructed by said stopper portion 32^c against the ascent of liquid in said bore, which if permitted to rise therein would add more or less to the amount of liquid measured out in the measuring compartment C. The clearing of the restricted portion 44 of the mounting-bore 43 by the stopper portion 32^c of the valve stem 32 takes place during those stages of operation of the lift valve *b*, wherein the valve sleeve 30 is in engagement with the closure cap 41. Hence, at such times, said mounting-bore 43 serves as an air passageway leading downwardly from above the level of liquid in the container A to the measuring compartment C to vent said compartment and facilitate the emptying therefrom of the charge of liquid trapped therein. Fig. 3 of the drawing shows the mounting 38 in its low adjustment on the stand 34 to effect the trapping of a charge of liquid of minimum quantity in the measuring compartment C, and Fig. 5 shows said mounting 38 in its high adjustment on said stand 34 to effect the trapping of a charge of liquid of maximum quantity in the measuring compartment C. In both instances, the valve sleeve 30 is illustrated as just having ascended into engagement with the closure cap 41. From these views of the drawing, it will be understood that the restricted portion 44 of the mounting-bore 43 is obstructed by the stopper portion 32^c of the valve stem 32 at all times until the valve sleeve 30 comes into engagement with the closure cap 41. Fig. 4 illustrates the mounting 38 in its said low adjustment and Fig. 6 illustrates said mounting 38 in its said high adjustment. And, in both instances, it is seen that the bore 43 of the mounting 38 is cleared by the stopper portion 32^c of the valve stem 32 after the valve sleeve 30 engages the closure cap 41 and proceeds to lift the same upwardly on the guide portion 40 of said mounting 38. Thus, under each adjustment of the mounting 38 on the stand 34 a venting of the measuring compartment C occurs after the trapping of a charge of liquid in said compartment is completed and before the valve plug 31 ascends from the discharge bore 28 to free the trapped charge of the liquid therefrom.

To limit the gravitating descent of the lift valve *b* and to prevent any dripping of liquid from the discharge bore 28 when said lift valve *b* is in its lowermost position, the lower portion of the valve plug 31 is externally beveled as at 31^a, and said discharge bore 28 is formed with a correspondingly beveled reduction 28^a, the same constituting a seat for said beveled portion 31^a of said valve plug 31.

Insuring the gravitating descent of the lift valve *b* to its lowermost limit and the accompanying seating of the beveled portion 31^a of the valve plug 31 against the beveled reduction 28^a of the discharge bore 28, I employ a weight 45 having a sleeve-like body 46 which is slipped over the upper end of the head section of the valve stem 32, as best seen in Fig. 2. At the upper end of said sleeve-like body 46 is a crown member 47 which overhangs the annular space 48 remaining in the upper portion of the mounting-bore 43 between the mounting 38 and the body 46 of said weight 45, said space 48 being guarded by said crown member 47 against the entry thereof into of liquid as a supply thereof is being poured into the container A through the filler opening at the top thereof.

The lift valve *b* is elevated through the medium of a receptacle into which a charge of liquid is to be dispensed from the discharge bore 28 of the valve body 24. To this end, I provide means associated with the lower end of the lower valve stem section 32^a which is engaged by the rim of a receptacle and lifted to elevate said lift valve *b*. Said means includes a breast member 49, such member, as shown, consisting of a seat-forming annulus 50, Fig. 1, having abutment bars 51 extending horizontally outward therefrom in diametrically opposed relation. Guide stems 52 extending upwardly from the abutment bars 51 are slidably guided at their upper portions in vertical ways 53 formed in the wings 54 of the nut 29. Removably socketed within the annulus 49, is a funnel member 55 having a shoulder 56 which bears upon said annulus 49, said funnel member 55 also has a depending flange 57 which fits loosely within the annulus 50 to enable said funnel member 55 to move slightly in any direction laterally of said annulus 50. Generally, the axis of the funnel member 55 will coincide with the axis of the valve stem section 32^a, the lower terminus of which is pointed conically, as at 58. This conically pointed terminus 58 of the valve stem section 32^a is removably socketed in a conical depression 59 in a web-bar 60 formed on the funnel member 55 diametrically thereof at its lower portion. Bowed rearwardly toward the leg 15 of the device and extending horizontally from one abutment bar 51 to the other is an arcuate stop 61 the lower marginal portion of which hangs beneath the level of the funnel member 55. A user of the dispenser engages with this stop 61 the rim of a receptacle, such as a cup 10 or pitcher 11, to assist in bringing the receptacle directly beneath the funnel member 55. A receptacle thus disposed relative to the funnel member 55 is lifted to bring its rim against the abutment bars 51 and elevate the breast member 49. Such elevation of said breast member 49 results in the elevation of the lift valve *b* and the consequent delivery of a charge of liquid from the measuring chamber C through the discharge bore 28. Issuing from said discharge bore 28, the liquid flows into the funnel member 55 and from said funnel member into the receptacle by which the breast member 49 is lifted. It will be noted that the lower section 32^a of the valve stem 32 and the web-bar 60 in the funnel member 55 are of relatively small cross-sectional area. This provision minimizes accumulations of the discharged liquid and the consequent dripping thereof from said stem portion and web-bar between dispensing operations. The limited lateral play of the funnel member 55 in the annulus 50 provides tolerance between

parts avoiding the binding thereof which otherwise might occur. The upper ends 53^a of the ways 53 provide stops for the upper ends of the guide stems 52 limiting the upward thrust of the lift valve *b* by said breast member 49.

In preparing the dispenser for use, the mounting 38 will be adjusted on the stand 34 from the inside of the container A to accord with the particular quantity of liquid desired to be discharged each time the lift valve *b* is elevated. In making this adjustment, the lug 39 on said mounting 38 will be brought to bear upon one or the other of the shoulders 36, 37 on said stand 34. Thereafter, the supply of liquid to be dispensed will be introduced into the container A and the cover 18 put in place thereon.

The parts of my dispenser required to be cleansed for sanitary purposes may be readily treated. Ordinarily the valve body 24 and the wing nut 29 therefor will be left on the container A, and the breast member 49 will be left in place on said nut 29. However, all of the remaining parts of the valve mechanism B will be removed from the container A. The weight 45 may be taken first by lifting it from the valve stem 32. Then, the mounting 38 may be lifted from the stand 34 together with the closure cap 41 on said mounting. Then, the stand 34 will be lifted from the valve body 24 and, thereafter, the valve stem 32 with its attached valve sleeve 30 and valve plug 31 will be removed. From the outside of the container A, the funnel member 55 will be removed from its supporting annulus 50. With these various parts disassembled, as indicated, they may be easily and thoroughly cleaned in convenient manner, and may be reassembled in operative relationship with the same ease with which they are disassembled.

Changes in the specific form of my invention, as herein described, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a dispenser, a container having an opening in the bottom thereof providing a chamber for a supply liquid to be dispensed, valve mechanism adapted to dispense from the container successive charges of liquid in measured quantities, said valve mechanism comprising a cupped valve body received in said opening in the bottom of the container and providing a sump chamber therefor, said valve body being formed with a discharge bore therein opening downwardly from said sump chamber, a lift valve movable downwardly by gravity and including an axially upright valve sleeve slidable in the sump chamber for downward retraction thereinto and for upward projection therefrom, and a valve stem connected with said valve sleeve and extending downwardly through said discharge bore, means associated with the valve stem beneath the container for elevating the lift valve, said lift valve further including a valve plug on said valve stem downwardly movable into said bore to obstruct the same upon the descent of the lift valve and upwardly movable out of said bore to clear the same upon the elevation of the lift valve, a closure cap for the upper end of the valve sleeve, supporting means guiding the closure cap for vertical movement and limiting its gravitating descent to a level spaced above the retracted valve sleeve, said closure cap being engaged and lifted by the valve sleeve during the elevation of the lift valve, said sump chamber together with the

valve sleeve and closure cap constituting a compartment which, upon engagement of said valve sleeve with said closure cap, traps therein a measured charge of liquid from the container, the clearing of said discharge bore by said plug following the engagement of said valve sleeve with said closure cap to release from the dispenser the charge of liquid trapped in said measuring compartment.

2. A dispenser, as defined in claim 1, including means associated with the lift valve for admitting venting air into the measuring compartment upon completion of the trapping of a charge of liquid therein.

3. A dispenser, as defined in claim 1, in which said supporting means consists of a stand within the container, an upright tubular mounting thereon for said closure cap, the bore in said mounting providing a vent for the measuring compartment, said bore having a restricted portion, said valve stem including a head section extending into the venting bore end having an enlarged stopper portion to obstruct said restricted portion of said bore and prevent the rising of liquid in said bore, said stopper portion of said stem being adapted to clear said restricted portion of said venting bore after the trapping of a charge of liquid in the measuring compartment.

4. A dispenser, as defined in claim 1, in which the said container has a filler opening therein, and in which said supporting means consists of a stand within the container, an upright tubular mounting on the stand for said closure cap, said stand and mounting being removable from the container through said filler opening and said mounting being removable from said stand, the bore in said mounting providing a vent for the measuring compartment, said bore having a restricted portion, said valve stem including a head section extending into the venting bore and having an enlarged stopper portion to obstruct said restricted portion of said bore and prevent the rising of liquid in said bore, said stopper portion of said stem being adapted to clear said restricted portion of said venting bore after the trapping of a charge of liquid in the measuring compartment.

5. A dispenser, as defined in claim 1, in which the means for elevating the lift valve consists of a breast member carried by the valve body for vertical movement, a funnel member on said breast member to receive the liquid flowing from said discharge bore, said funnel member having a web member formed with a socket therein for the lower end of the valve stem, said breast member being adapted to be engaged and lifted by a receptacle disposed to receive from the funnel member the liquid discharged thereinto from the discharge bore.

6. A dispenser, as defined in claim 1, in which the means for elevating the lift valve consists of a vertically movable breast member, a funnel member mounted for limited lateral play on said breast member to receive the liquid flowing from said discharge bore, the lower end of said valve stem being pointed conically, said funnel member having a web member formed with a conical socket therein for said pointed end of said valve stem, said breast member being adapted to be engaged and lifted by a receptacle disposed to receive from the funnel member the liquid discharged thereinto.

7. A dispenser, as defined in claim 1, having a nut threaded on the valve body and bearing

against the bottom of the container, said means for elevating the lift valve consisting of a breast member slidably mounted on said nut for vertical movement, said breast member providing a rest for the valve stem and adapted to be engaged and lifted by a receptacle disposed to receive a charge of liquid from said discharge bore.

8. A dispenser, as defined in claim 1, in which the means for elevating the lift valve consists of a vertically movable breast member providing a rest for the valve stem and adapted to be engaged and lifted by a receptacle disposed to receive a charge of liquid from said discharge bore.

9. A dispenser, as defined in claim 8, including a stop member on said breast member adapted to be engaged by a receptacle to aid in locating it for the reception of liquid discharged from said bore.

10. In a dispenser, a container providing a chamber for a supply of liquid to be dispensed, valve mechanism adapted to dispense from the container successive charges of liquid in selectively variable quantities, said valve mechanism comprising a cupped valve body incorporated in the bottom of the container to provide a sump chamber therefor, said valve body being formed with a discharge bore therein opening downwardly from said sump chamber, a lift valve movable downwardly by gravity and including an axially upright valve sleeve slidable in the sump chamber for downward retraction thereinto and for upward projection therefrom, and a valve stem connected with said valve sleeve and extending downwardly through said discharge bore, means associated with the valve stem beneath the container for elevating the lift valve, said lift valve further including a valve plug on said valve stem downwardly movable into said bore to obstruct the same upon the descent of the lift valve and upwardly movable out of said bore to clear the same upon the elevation of said lift valve, a closure cap for the upper end of the valve sleeve, supporting means guiding the closure cap for vertical movement and variably limiting its gravitating descent to selected levels spaced above the retracted valve sleeve, said closure cap being engaged and lifted by the valve sleeve during the elevation of the lift valve, said sump chamber together with the valve sleeve and closure cap constituting a compartment which, upon the engagement of said sleeve with said closure cap, traps therein a measured charge of liquid from the container in quantity determined by the selected limit of descent of said closure cap, the clearing of said discharge bore by said plug following the engagement of said valve sleeve with said closure cap to release from the dispenser the charge of liquid trapped in said measuring compartment.

11. A dispenser, as defined in claim 10, in which, said supporting means consists of a stand within the container, a mounting slidably supporting the closure cap, a limit stop for the closure cap on said mounting beneath said cap, said mounting being vertically adjustable on said stand.

12. A dispenser, as defined in claim 10, in which, said supporting means consists of a stand within the container having stepped shoulders thereon, a mounting slidably supporting said closure cap, a limit stop for the closure cap on said mounting beneath said cap, a lug on said mounting engageable selectively with the shoulders on said stand to dispose said mounting vertically within the container.

13. A dispenser, as defined in claim 10, in which,

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said supporting means consists of a tubular stand removably fitted at its lower end in the sump chamber and providing a lining therefor, the upper end of said stand having stepped shoulders thereon, an upright mounting slidably supporting said closure cap, a limit stop for the closure cap on said mounting beneath said cap, said mounting being removably slidably fitted in said stand and angularly shiftable therein, a lug on the mounting adapted in different angular positions of said mounting to rest on different shoulders of said stand, thereby selectively to dispose said mounting at different elevations within the container.

14. A dispenser, as defined in claim 10, including means associated with the lift valve for admitting venting air to the measuring compartment upon completion of the trapping of a charge of liquid therein.

15. A dispenser, as defined in claim 10, in which said supporting means consists of a stand within the container, an upright tubular mounting vertically adjustable on said stand, said mounting slidably supporting said closure cap, a limit stop for said closure cap on said mounting beneath said cap, the bore in said mounting providing a vent for the measuring compartment, said bore

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having a lower restricted portion, said valve stem including a head section extending into the venting bore and having an enlarged stopper portion adapted to obstruct said restricted portion of said bore and preventing the rising of liquid therein, said stopper portion of said stem being adapted to clear said restricted portion of said venting bore after the trapping of a charge of liquid in the measuring compartment.

16. A dispenser, as defined in claim 15, including a weight removably mounted on the upper end of the head section of the valve stem within the venting bore in said mounting and spaced from the wall of said bore.

17. A dispenser, as defined in claim 15, in which the container has a filler opening in the upper portion thereof, and in which a weight is removably mounted on the upper end of the head section of the valve stem within the venting bore in said mounting in spaced relation relative to the wall of said bore, said weight having a crown member shielding said bore against the entry thereinto of liquid introduced into the container through said filler opening therein.

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No references cited.