No. 699,621. Patented May 6, 1902.

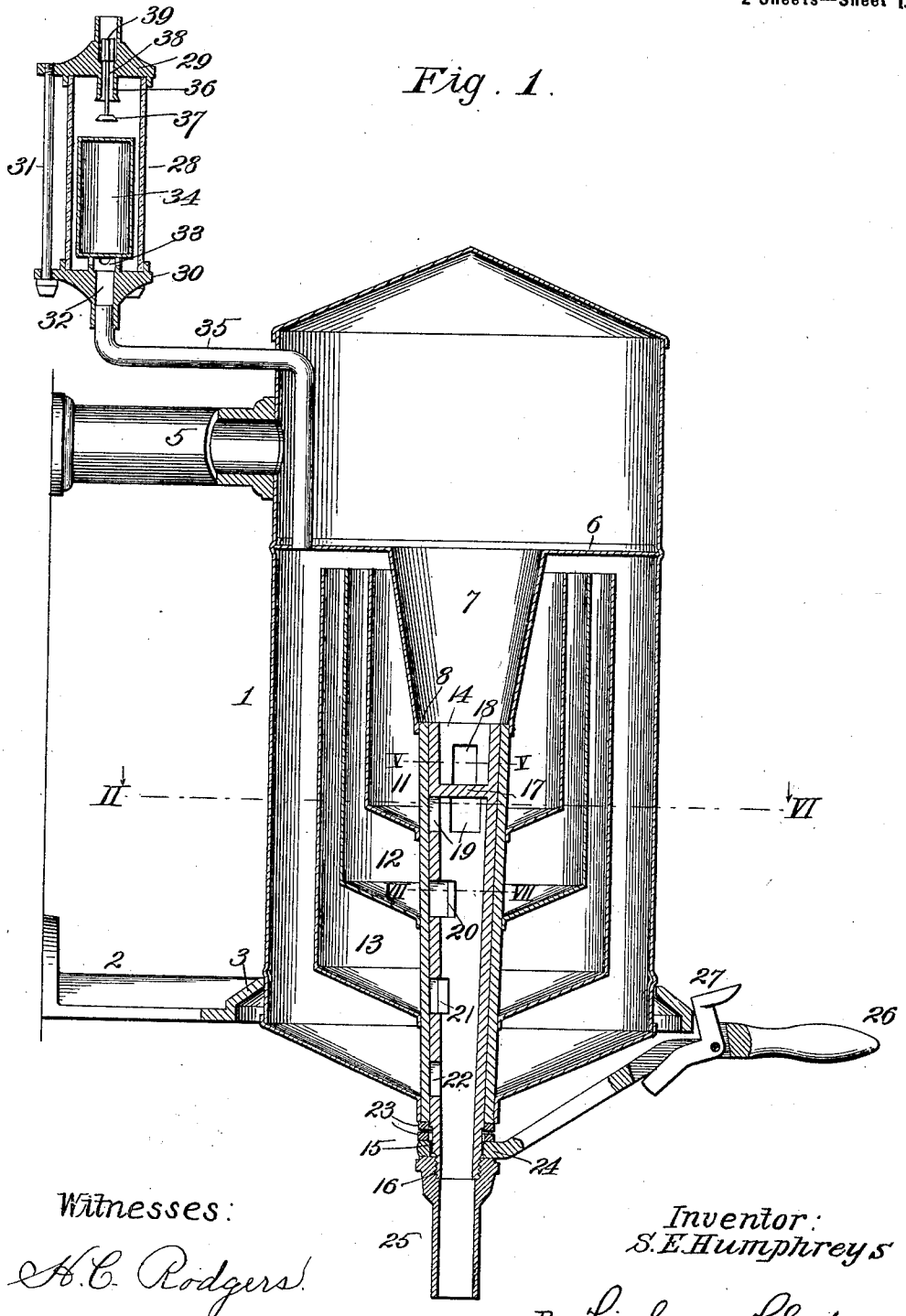
S. E. HUMPHREYS.

LIQUID MEASURING DEVICE.

(Application filed June 29, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



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Fig. 2.

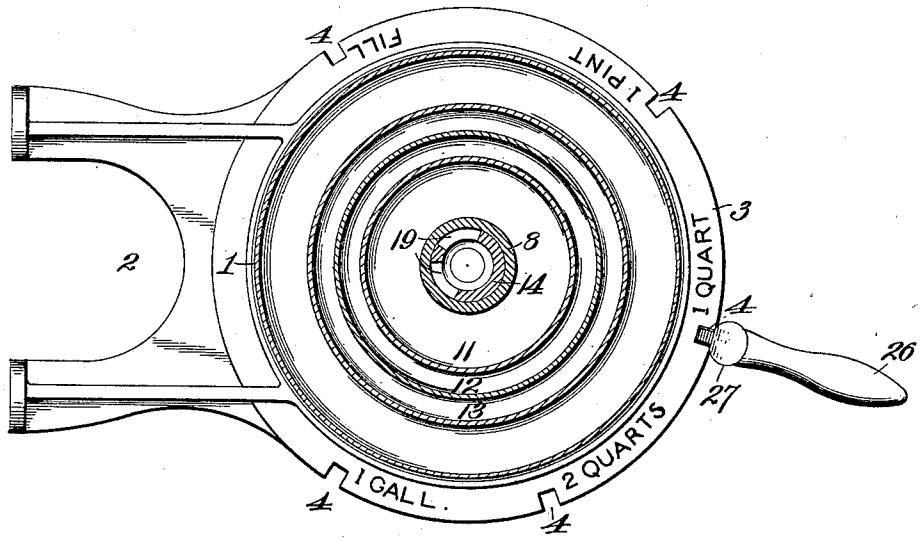


Fig. 3.

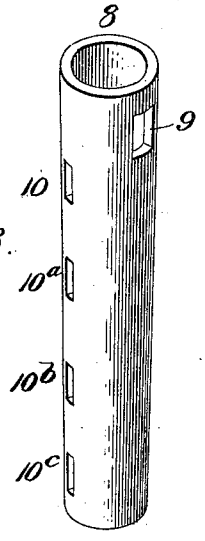


Fig. 4.

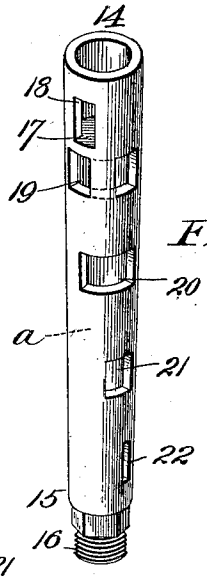


Fig. 6.

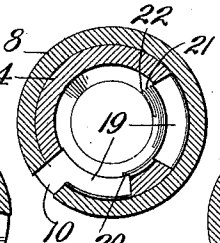


Fig. 5.

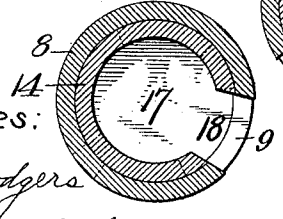
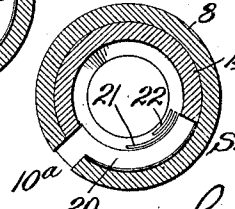


Fig. 7.



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UNITED STATES PATENT OFFICE.

SYLVESTER E. HUMPHREYS, OF KANSAS CITY, MISSOURI, ASSIGNOR TO EDGAR J. HUMPHREYS, INDIVIDUALLY AND AS TRUSTEE, OF FAIRMOUNT, KANSAS.

LIQUID-MEASURING DEVICE.

SPECIFICATION forming part of Letters Patent No. 699,621, dated May 6, 1902.

Application filed June 29, 1901. Serial No. 66,608. (No model.)

To all whom it may concern:

Be it known that I, SYLVESTER E. HUMPHREYS, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Liquid-Measuring Devices, of which the following is a specification.

My invention relates to liquid-measuring devices; and my object is to produce a device of this character of that class which delivers a predetermined quantity or quantities accordingly as its valve is turned a greater or less distance, my particular object in this connection being to provide an attachment for indicating when the device is charged or empty and for facilitating the discharge at the proper time; also, to provide a measuring device which is positive and reliable in action and of simple, durable, cheap, compact, and ornamental appearance.

With these general objects in view the invention consists in certain novel and peculiar features of construction and combinations of parts as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 is a central vertical section of a measuring device embodying my invention. Fig. 2 is a horizontal section taken on the line II VI of Fig. 1. Fig. 3 is a detail perspective view of the valve-casing. Fig. 4 is a detail perspective view of the valve. Fig. 5 is a horizontal vertical section on line V V of Fig. 1. Fig. 6 is a horizontal section on line II VI of Fig. 1, showing the valve and casing, with the valve occupying a different position from that shown in Fig. 2. Fig. 7 is a section on the line VII VII of Fig. 1, Figs. 5, 6, and 7 being drawn to a greater scale than the remaining figures.

Referring to the drawings in detail, 1 designates a cylindrical casing having its upper and lower ends preferably tapered to a point.

2 designates a bracket secured horizontally to the wall or to the object from which the supply of liquid comes, said bracket being formed with a circular ring or band 3, provided at suitable intervals with notches 4 in its periphery, said notches representing in this case the filling-point—one pint, one quart, two quarts, and a gallon.

5 designates a pipe leading from the supply and arranged to discharge into the upper end of casing 1 above the horizontal partition 6, which partition is provided centrally with a depending funnel 7, snugly embracing the upper end of the downwardly-tapering valve-casing 8, fitted with a liquid-tight joint in the lower end of casing 1. Said valve-casing is provided in its upper end with an opening 9 and at an angle of about ninety degrees thereto with the vertically-alined openings $10\ 10^a\ 10^b\ 10^c$, for a purpose which hereinafter appears.

Embracing casing 8 in about the plane of the lower margin of opening 10 thereof and concentrically surrounding funnel 7 is a pint-cup 11, this pint-cup fitting concentrically within a quart-cup 12, embracing the casing with a liquid-tight joint coincident with the lower margin of opening 10^a, which quart-cup in turn is concentrically surrounded by a half-gallon cup 13, also secured upon the valve-casing coincidental with the lower margin of opening 10^b, the arrangement and relative proportion of the parts being such that their upper ends occupy the same horizontal plane in order that the liquid may overflow from the pint into the quart, from the quart into the half-gallon, and from the half-gallon into the casing proper. The joint capacity of the pint and quart cups is one quart. The joint capacity of the pint, quart, and half-gallon cups is one-half gallon, and the joint capacity of the pint, quart, one-half-gallon cups, and the casing equals one gallon.

14 designates a tubular valve fitting within and having a ground joint with the valve-casing to prevent the liquid passing between the same and provided at its lower end with a hexagonal portion 15 and a threaded portion 16. Near its upper end it is provided with a horizontal partition 17 and above the same with an opening 18, adapted to register with opening 9 of the casing only when the filling operation is in progress. Below said partition it is provided with a pair of openings 19, one about vertically under opening

18, or in lieu of said pair of openings a single long opening, as indicated by dotted lines, may be employed, with one end underlying opening 18, this opening being adapted to register with opening 10 whenever liquid is being drawn from the device.

Vertically below that opening or end 19 most remote from opening 18 and in the same horizontal plane as opening 10^a is an opening 20, and below the corresponding end of the latter is an opening 21, adapted to register with opening 10^b, and below opening 21 is an opening 22, adapted to register with opening 10^c. The advanced or front ends of the discharge-openings of the valve—namely, 19 20 21 22—are arranged spirally, as indicated by the dotted line *a*, Fig. 4, in order that they shall successively register with openings 10, 10^a, 10^b, and 10^c, respectively. As the front end of opening 19 registers with opening 10 it will be apparent that the contents of only the pint-cup are permitted to escape. When the front end of opening 20 registers with opening 10^a, it will be apparent that the discharge from the quart-cup is effected, and it will also be apparent by reason of the length of opening 19 or of the fact that the front end of opening 20 overlaps the front opening 19 (where two are shown as in full lines) that the discharge from the quart-cup is accompanied by discharge from the pint-cup, the joint capacity of said cups being a quart, as hereinbefore stated. It will also be understood that when opening 21 registers with opening 10^b so as to effect the discharge from the half-gallon cup 13, that openings 19 and 20 still register with openings 10 and 10^a, respectively, and that in consequence the joint discharge from the pint, quart, and half-gallon cups is effected, and it will also be observed that when opening 22 registers with opening 10^c openings 19, 20, and 21 simultaneously register with openings 10, 10^a, and 10^b, so that the discharge from the can is accompanied by the discharge from each of said cups. It will thus be seen that the operator can draw off a pint, quart, half-gallon, or gallon, as he wills.

23 designates a split spring-washer of the usual or any preferred type upon the lower end of the valve and interposed between the lower end of casing 8, a lever or wrench 24 fitting non-rotatably on the hexagonal portion of the valve, said lever being held up in proper relation to said spring-washer and the valve by means of the threaded discharge-pipe 25, screwed upon the threaded portion 16 of the valve.

The lever or wrench terminates in a handle 26 and carries a gravity-dog 27 to play against the face of the ring 3 and automatically engage one of the notches 4, with which it may register, so that when the handle registers with the pint-notch it is only necessary after effecting the disengagement of the dog therewith to swing it to the left, when the dog will automatically register with the quart-notch. If instead of the quart a half-gallon is desired, the operator in the manipulation of the lever holds the dog back until the quart-notch is passed.

Referring now to the means for indicating whether the casing is charged or emptied and for facilitating the discharge, 28 designates a transparent or glass cylinder, closed at its upper end by a flanged cap 29 and at its lower end by a cap 30, said caps being bolted reliably together, as at 31. Cap 30 is provided with a central passage 32 and with a notched flange 33, surrounding the upper end of the same and supporting ordinarily a float 34. The lower end of passage 32 is connected by tube 35 with the interior of the casing below partition 6. The upper cap 29 is provided with a vertical passage 36, adapted to be closed at its lower end by a reciprocatory valve 37, the stem 38 of the latter terminating in a spider guide or support 39.

In charging this device with liquid the latter passes through pipe 5 and down through funnel 7 into the upper end of the tubular valve, the opening 18 of the latter registering at this time with opening 9 of the valve-casing, because the dog 27 is in engagement with the filling-notch 4. The liquid flows through said registering opening into the pint-cup, and, owing to the fact that openings 19, 20, 21, and 22 do not register with openings 10, 10^a, 10^b, and 10^c, respectively, its only way of escape is by rising in said cup and overflowing therefrom into the quart-cup, which in turn overflows to supply the half-gallon cup, overflowing the latter in turn to supply the gallon-chamber. As the volume of liquid increases, the air is forced out of the liquid-chamber up through tube 35 and escapes through passage 36 and the liquid rises in said pipe and in the casing above the partition until eventually its ascent in the latter is checked by the air. It continues to rise through tube 35 until shortly after it causes float 34 to rise and force valve 37 to its seat, when the back pressure of the air will check its further flow. Standing thus in the indicator, the operator knows that the measuring device is charged and after placing a suitable receptacle below the discharge-pipe manipulates the handle from filling-notch 4 to the pint-notch, if he desires only a pint. This action throws opening 18 out of alinement with opening 9, and at the same time the front opening or front end of opening 19 registers with opening 10 of the valve-casing, this relation being instantly followed by a flow of liquid from the pint-cup into the valve. Should a quart be desired, the handle is properly positioned to cause the front end of the valve-opening 20 to register with opening 10^a, and in this connection it will be noticed that opening 19 continues to register with opening 10 to effect a joint discharge from the pint and quart cups, this joint discharge equaling a quart. Should a half-gallon be desired, the proper adjustment of the handle is made, and openings 19, 20, and 21 register with openings 10, 10^a, and

10^b. Should a gallon be required, openings 19, 20, 21, and 22 are caused to simultaneously register with the openings 10, 10^a, 10^b, and 10^c.

The discharge is effected rapidly in each case, because as soon as the valve is properly positioned for this purpose the level of the liquid falls in the indicator and air enters the latter and applies atmospheric pressure on the liquid.

From the above description it will be apparent that I have produced a liquid-measuring device which embodies the features of advantage enumerated as desirable in the statement of invention and which is obviously susceptible of modification in minor particulars without departing from the spirit and scope or sacrificing any of the advantages of the invention.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A measuring device, comprising a cylindrical casing, a partition dividing the same horizontally and provided with a depending funnel, a valve-casing depending from said funnel through the bottom of the casing, having openings, cups of varying capacity arranged one within the other and surrounding the valve-casing, the topmost cup communicating with the two uppermost openings, and the remaining cups and the cylindrical casing each with one of the remaining openings, and a tubular valve fitting snugly in the valve-casing and provided with openings, and an internal partition between the topmost and the remaining openings, the topmost opening being adapted to register with the corresponding opening of the valve-casing non-concurrently with the registration of the remaining valve-openings and valve-casing openings; said remaining openings, beginning at the top, registering successively with the said remaining valve-casing openings, substantially as described.

2. A measuring device, comprising a cylindrical casing, a partition dividing the same horizontally and provided with a depending funnel, a valve-casing depending from said funnel through the bottom of the casing, having openings, cups of varying capacity arranged one within the other and surrounding the valve-casing, the topmost cup communicating with the two uppermost openings, and the remaining cups and the cylindrical casing each with one of the remaining openings, a tubular valve fitting snugly in the valve-casing and provided with openings, and an internal partition between the topmost and the remaining openings, the topmost opening being adapted to register with the corresponding opening of the valve-casing non-concurrently with the registration of the remaining valve-openings and valve-casing openings; said remaining openings, beginning at the top, registering successively with the said remaining valve-casing openings, a wrench or lever secured to operate the valve, a dog carried thereby, and a band or ring provided with notches to receive the dog accordingly as the device is to be filled or varying quantities are to be discharged therefrom, substantially as described.

3. A measuring device, comprising a cylindrical casing having a horizontal partition and provided with cups of varying capacity below said partition, and valve mechanism whereby said cups may be charged or relieved of their charge, a pipe for supplying liquid to the casing above said partition, an indicator, comprising a transparent cylinder, caps secured upon its opposite ends and provided with longitudinal passages, a reciprocatory valve occupying the passage of the upper cap, a tube connecting the passage of the lower cap with the upper end of the lower chamber of the cylindrical casing, a notched flange surrounding the upper end of said lower cap, and a float within the transparent cylinder normally resting upon said notched cap without interfering with the passage of the air, but adapted when liquid enters said cylinder to rise and seat said reciprocatory valve, and adapted as the discharge from the device takes place to descend and permit said valve to open, subtantially as described.

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

SYLVESTER E. HUMPHREYS.

Witnesses:

H. C. RODGERS,

G. Y. THORPE.