W. R. BILLINGS.

MEASURING FAUCET.

APPLICATION FILED DEC. 22, 1917.

1,271,840.

Patented July 9, 1918.

2 SHEETS—SHEET 1.

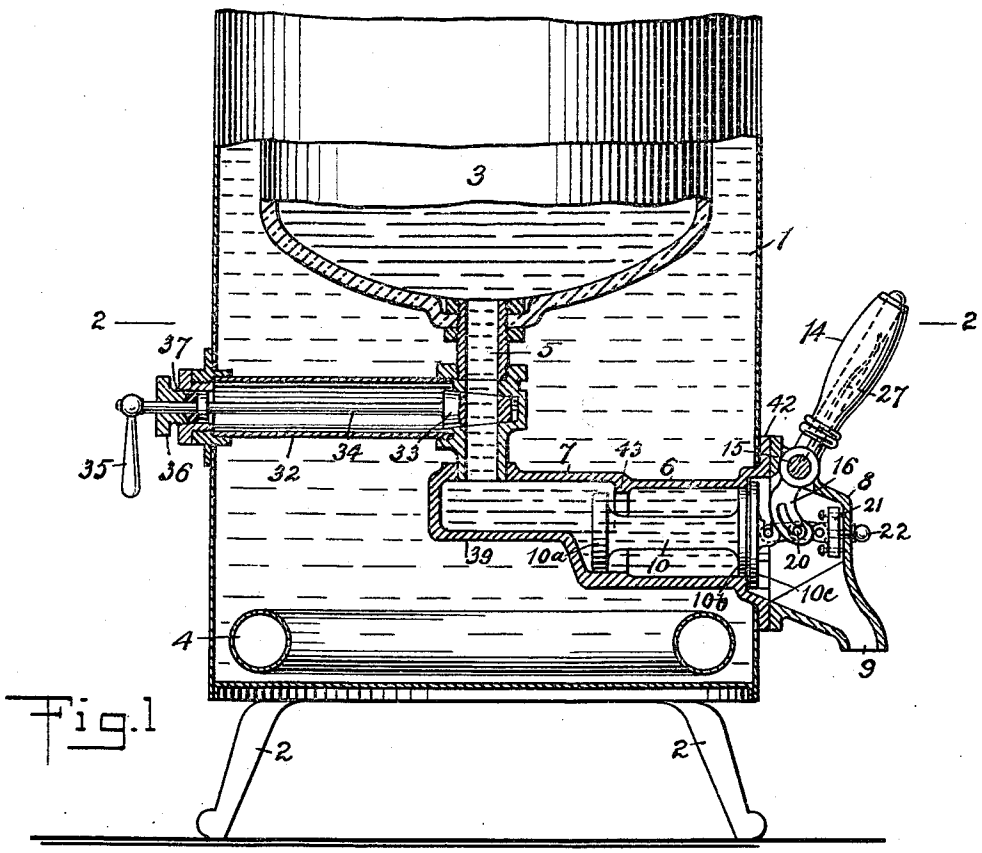


Fig. 1

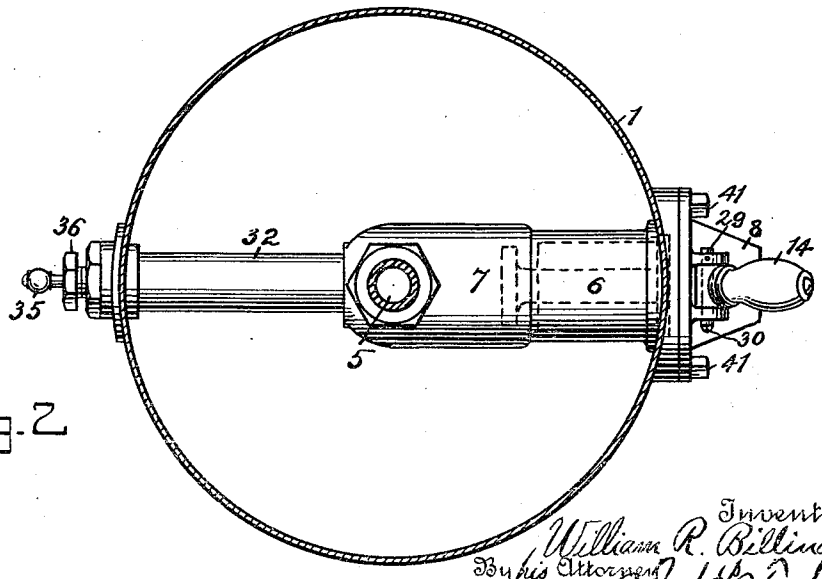


Fig. 2

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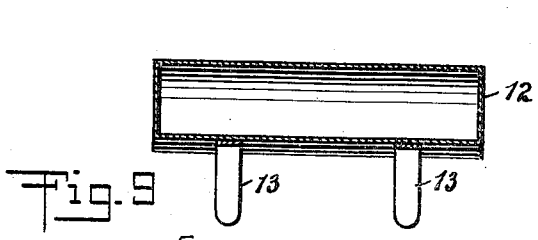


Fig. 9

Fig. 3

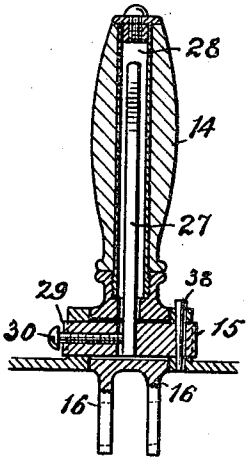


Fig. 8

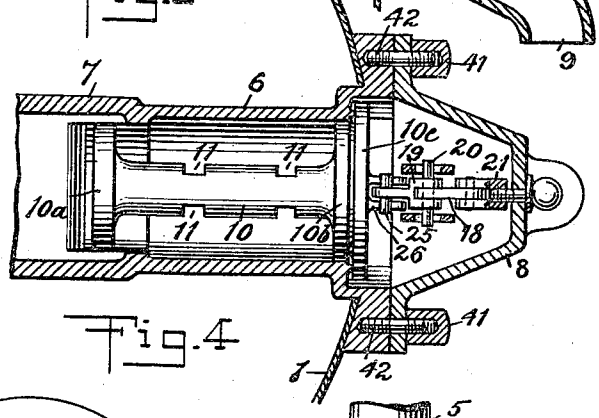


Fig. 4

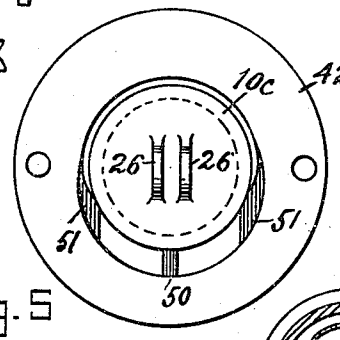


Fig. 5

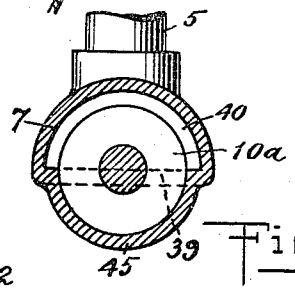


Fig. 6

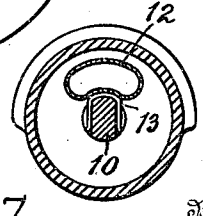


Fig. 7

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UNITED STATES PATENT OFFICE.

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MEASURING-FAUCET.

1,271,840. Specification of Letters Patent. Patented July 9, 1918.

Application filed December 22, 1917. Serial No. 208,418.

To all whom it may concern:

Be it known that I, WILLIAM R. BILLINGS, a citizen of the United States, and resident of the borough of Brooklyn, in the county of Kings, city and State of New York, have invented certain new and useful Improvements in Measuring-Faucets, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention refers to an improvement in measuring faucets for dispensing beverages, liquids or fluids in predetermined quantities, so as to prevent waste and inconvenience. The object of my present improvement is to simplify the combination of mechanical features and thus economize in material and also provide for the more complete emptying of certain of the chambers and other parts, so as to prevent, for one thing, the existence of pockets or corners wherein the liquid being dispensed might become stale and useless from non-circulation or stagnation; and the invention also comprises numerous details and peculiarities in the construction, arrangement and combination of the various parts substantially as will be hereinafter described and then more fully pointed out in the appended clauses of claim.

In the accompanying drawing illustrating my invention:

Figure 1 is a vertical section of my improved dispensing apparatus.

Fig. 2 is a horizontal sectional plan of the same on the line 2, 2 of Fig. 1.

Fig. 3 is an enlarged vertical detail section of my improved device shown apart from the urn and hot water tank with which it is commonly used.

Fig. 4 is a horizontal sectional plan of some of the parts shown in Fig. 3.

Fig. 5 is a view of the measuring chamber and valve mechanism therein with the outside discharge chamber removed.

Fig. 6 is a cross-section on the line 6, 6 of Fig. 3.

Fig. 7 is a cross-section on the line 7, 7 of Fig. 3.

Fig. 8 is a detail longitudinal section of the operating handle and shows the method of supporting the same and the spring applied thereto.

Fig. 9 is a sectional detail view of a space filling device, block or cartridge for occupying a portion of the measuring chamber to change the working capacity of said chamber.

Similar characters of reference designate corresponding parts throughout the different figures of the drawing.

1 designates a hot water tank having suitable feet or supports 2. In said tank and kept hot by the hot water in the tank is an urn or beverage container 3 for containing coffee, tea, milk, cocoa or the like. A central passage 5 leads downwardly from the container 3 to the submerged receiving and measuring chambers 7 and 6 through which the beverage or fluid is drawn off into the outer discharge chamber 8, the latter having a spout 9 which delivers the beverage into a cup or glass in exactly the proper premeasured quantity. In the lower portion of the water tank 1 is a steam or hot water coil 4 for heating the contents of tank 1. All these various features so far as their shape, size and general arrangement are concerned may vary within wide limits, and what I have given here is simply by way of illustration. The passage 5 from the container 3 to the receiving chamber 7 is controlled by a cock 33 preferably operated by a handle 35 located outside the tank 1 as shown in Fig. 1. The measuring chamber or measure 6 contains valve mechanism for controlling the passage of the fluid into the measure and also its flow out therefrom, said valve mechanism being operated by a handle 14 mounted upon the discharge chamber 8, in a manner which I shall presently specify.

The measuring chamber 6 and the receiving chamber 7 in the present example of my invention, are preferably formed in a single casting having an outside flange 42 which is secured in any desired manner to the wall of the tank 1. See Figs. 4 and 5. The said combined measuring and receiving chambers are carried in a horizontal position, with the measure nearest the outer wall of the tank 1 and the receiving chamber innermost in position, the end portion of said chamber being entered by the pipe 5 already mentioned which leads from the container 3. I do not wish, however to be confined to making the measure 6 and the receiving chamber 7 in a single piece, as they may obviously be made in separate castings or chambers and secured together in any desired manner. Further, although I give a

single measuring chamber in my explanation, I am not limited thereto.

The measuring chamber 6 is generally of a cylindrical form with a circular opening or seat 43 at its inner end adapted to receive the circular piston valve 10^a, while at the other end of chamber 6 is a circular opening adapted to receive the circular piston valve 10^b, said valves 10^a and 10^b being carried rigidly on a common central stem 10. The valve 10^b is provided with a flange or cover 10^c which fits over the outside of the end of chamber 6. When the valve 10^b is in its closed position fitting into the end of said chamber 6, the flange or valve cover 10^c will assist therefore in making a tight joint at that end of chamber 6. It will be noted that the valves 10^a and 10^b are so spaced from each other that when the valve 10^a is out of and away from its seat in the end of the chamber 6, the valve 10^b will be within the other end of chamber 6 filling and closing the same; and when the valve 10^a is in its seat filling and closing the end of chamber 6, the valve 10^b will be removed beyond the end of cylinder 6 so as to be outside and away therefrom, so as to allow a discharge of fluid to take place at the outer end of chamber 6, that is to say, when the valve 10^a is open and liquid is flowing into chamber 6, valve 10^b will be closed and no outlet will be permitted at that point; while on the other hand, when the inlet valve 10^a closes against the further admission of liquid the valve 10^b will be open so as to allow a discharge of the contents of the measure 6. Again, the valves 10^a and 10^b are so distanced from each other that the inlet valve 10^a begins to close before the outlet valve 10^b begins to open and thus a continuous flow through the measuring chamber cannot be obtained.

In the example of the invention given in the drawings, the receiving chamber 7 is of a comparatively small size, it being unnecessary that it should have any considerable size, as it is really only a part of the channel between the container and the measuring chamber, being as it were an enlargement of said channel to facilitate the operation of the inlet valve. I have shown the receiving chamber 7 as arranged endwise of the measure, or, as it may otherwise be described, disposed axially in reference thereto and in a sense eccentric to the measure, the axes of the two parts being parallel to each other and not coincident. Said chamber 7 also has a flat bottom 39, (see Fig. 3 and the dotted line in Fig. 6), and the upper wall above the horizontal bottom 39 is curved or semi-circular, which said semi-circular wall merges into the adjacent wall of the chamber 6 near the inlet valve seat 42, it being observed by referring to Fig. 9 that the semi-circular part of the wall of the receiving chamber 7 is concentric with the inlet valve 10^a, but its radius is longer than the radius of said inlet valve and longer than the radius of seat 43, in order to provide an arcual or semi-circular passage 40 above the valve 10^a when the latter is open as shown in Fig. 6, so that fluid may pass freely from the receiving chamber 7 through said semi-circular opening 40 into the end 43 of chamber 6, and thus into the chamber 6. It will also be seen that the horizontal flat bottom 39 of the receiving chamber 7 drops down abruptly with an inclined end 31 and merges with the adjacent wall of the measuring chamber 6. The bottom of the receiving chamber 7 at the lower end of the incline 31 and close to the measure 6 is curved or semi-circular at 45, see Figs. 6 and 9, to receive the lower edge of the inlet valve 10^a when the latter is open and away from its seat. Thus it will be clear that a part of valve 10^a when it leaves its seat 43 for the purpose of opening communication between the receiving chamber and the measuring chamber will pass into the concentric semi-circular bottom portion 45 of the receiving chamber, with which it is in close contact, but will so move in relation to the upper semi-circular portion of the chamber 7 as to leave the inlet opening 40 through which the fluid will flow. When the inlet valve 10^a opens it will pass close to or will actually strike the inclined portion 31 of the bottom of the receiving chamber, which incline may be of a greater or less angle and will thus cause any fluid or liquid that may have been trapped in the small pocket or recess 46 between the incline 31 and the inlet valve 10^a to be thrown up into the main interior of the receiving chamber 7 and not allowed to remain in a condition of stagnation or non-circulation; that is to say the pocket 46 is so small and the fluid is kept moving therein so constantly during the action of the inlet valve, that there will be no opportunity for it to become stale by non-distribution, but will be thoroughly mixed with the remainder of the contents of the receiving chamber during the back and forth movement of the valve 10^a, and will be, therefore, removed as a part of the contents of the chamber 7 which are caused to pass from time to time over the upper end portion of the valve 10^a.

The diameter of the measuring chamber 6 at the outer end 44 is somewhat larger than at the inlet opening 43, as this is a preferable construction, and this diameter 44 which is that of the main bore in the chamber 6 continues from one end near the inlet 43 to the other end of the chamber, so that the valve 10^b fits into an opening of the same diameter as that of the bore of the chamber. Thus it will be seen that the inlet valve 10^a is of a smaller diameter than the outlet valve 10^b. This is found to be a very important and advantageous form of making these valves, because it allows the valve 10^a when the

parts are being disassembled to be drawn away from its seat 43 and then carried out of the opposite end of the chamber 6 without any such trouble as there might be if the circular opening in the outlet end of the chamber 6 were of the same size as that of the inlet opening 43. Immediately beyond the outlet opening, the diameter of the measuring chamber casting is enlarged just before it spreads into the flange-like form 42, and in this part of enlarged diameter the flange 10^c of the outlet valve 10^b performs its function, the principal part of which is to fit tightly down upon a bead or beads at 45 on the outer face of the end of chamber 6, and assist the closing of the outlet valve, immediately contiguous to the outlet opening in said end, all as clearly shown in Fig. 3.

The face of flange or cover 10^c of the outlet valve is provided with a pair of hooks 26 that loosely receive a horizontal pin 25 carried by a link 19. The link 19 is pivoted by means of a pivot 20 to another link 18 which in turn is pivoted by means of a pin 24 to a block 21 having adjusting screws 23 which bear against the inner wall of the discharge chamber 8, while another adjusting screw 22 passes through the wall of the discharge chamber 8 and engages an opening in the block 21, the outer end of said screw device 22 having a knob or otherwise made so that it can be easily manipulated for the purpose of tightening up the block 21 after it has been adjusted in its position by means of the screws 23. All these parts except the handle of screw 22 lie within the discharge chamber 8 as seen in Fig. 3. The links 18 and 19 are generally in line with each other, but the pivot 20 by means of which said links are pivoted to each other is slightly above a line drawn joining the centers of the pivots 24 and 25 when the flange or cover 10^c is closed tightly against the bead or beads 45, this arrangement, therefore, being a toggle device which allows the locking of the flange 10^c tightly in position by the closure of the outlet valve, all of which is accomplished by the action of the handle 14 upon the toggle links 18 and 19.

Handle 14 is pivoted in the upper portion of the discharge chamber 8 and has on its lower end inside of chamber 8 a pair of jaws 16 slotted at 17, through which slotted jaws passes the pin 20 by means of which the toggle links 18 and 19 are interpivoted. The slots 17 are curved with a flat end and when the jaws 16 lift upon the pin 20 by pushing the handle up toward the urn and said pin is in the lower end of slots 17, it will be evident that the interpivoted ends of links 18 and 19 will be lifted, and this will draw the outlet valve 10^b forward from the end of the measuring chamber 6 and simultaneously release the flange 10^c from its seat 45, thus opening the outlet valve, and at the same time closing the inlet valve, but at the reverse movement of the jaws 16, when they are moved downwardly by the return of the handle to the position shown in Fig. 3, the pin 20 will be depressed and the links 18 and 19 straightened out again so as to lie in the same general direction, thus closing the outlet valve and pressing the cover flange 10^c against its seat 45, and locking the links 18 and 19 together by this pressure upon the pivot 20, which will be in the flat end of slots 17 while at the same time the inlet valve is opened. The handle 14 is supported in the upper portion of the discharge chamber 8 by means of a stationary pivot pin 15 which is held stationary by means of the pin 38 engaging the wall of chamber 8. Through one end 29 of pin 15 passes a clamping screw 30 which bears against the end of the spring 27 that enters an opening in pin 15 and projects through a cylindrical tube 28 in the interior of the handle 14, said spring 27 being bent as shown in Fig. 3 to bear against one side of the tube 28, and thus having the function of holding the handle 14 in the position shown in Fig. 3 where the outlet valve is closed; for with this arrangement the pin 15 is stationary with the handle 14 rotatable thereon. When the handle is lifted the spring 27, having its lower end held stationary since it is attached to the pin 15, it will put the spring 27 under pressure, and when the handle is released the spring will carry the handle back down into its closed position. Thus, when the outlet valve is opened by lifting upon the handle 14, the contents of the chamber 6 will be discharged and then by releasing the handle 14 the spring will carry the handle back into its closed position again, as shown in Fig. 3.

From the foregoing description of the construction, relation and arrangement of the different parts, it will be clearly understood how the device is operated without requiring any additional description of the operation. The measure or measuring chamber 6 may have any desired capacity and I do not wish to be restricted in respect thereof. Ordinarily, when the main apparatus is a dispensing one for restaurant service or the like, the measure may be of a capacity equal to that of an ordinary tea or coffee cup or such other portion as may be customarily served. When such is the case, it will be evident that by quick manipulation of the handle 14 the device will fill cup after cup with great speed and with no waste, slopping or inconvenience; for each time the inlet valve is opened the measure will be filled, and each time the outlet valve is opened the measure will discharge into the discharge chamber and the contents will flow readily out through the spout 9 into the receptacle placed or held beneath it

to receive the same, and as already explained the quick action of the inlet valve in reference to the adjacent end of the receiving chamber, all constructed in the manner stated, will absolutely prevent any of the liquid from being trapped at any point in a deleterious way.

It may be that it will be desired to change the capacity of the measuring chamber at certain times without providing a new chamber, and this I am able to do by inserting in the chamber a filler or block device which will occupy a portion of the contents of the chamber and thus reduce the quantity of liquid required to fill the latter. Such filler or cartridge is shown at 12 in Fig. 9, the same being provided with spring clips 13 adapted to engage the valve stem 10 by clasping the latter in the grooves 11. This is only one of the many ways for partially filling the measure with something that will occupy a portion of the space otherwise occupied by the liquid, thus reducing the quantity of liquid and enabling the measure to function as of a different capacity. If desired the stem 10 may vary in size so as to vary the capacity of the chamber 6.

As above stated the passage 5 leading to the receiver 7 from the container 3 is controlled by a cock 33, which may be an ordinary three way cock or any other valve device. In order to enable the plug of the cock to be withdrawn in cleaning, I employ a tube 32 which extends from the pipe 5 to the outer wall of the tank 1 and through this tube. The valve stem 34 runs through tube 32 and is packed near the outer end of the packing gland 36, which is adjusted down upon the collar 37 on the rod 34. The end of the rod 34 which projects through the gland 36 is provided with an operating handle 35. The removal of the gland 36 allows the device to be withdrawn without disturbing the hot water in tank 1, which surrounds the pipe 32.

It is of the greatest importance that the valves 10^a and 10^c should be properly alined with reference to each other and should keep this position while they are moving in and out of the ends of the measuring chamber, and thus performing their functions for the admission and outlet of fluid. I have already referred to the fact that the lower half of the valve 10^a slides tightly on the semi-circular portion 45 of the receiving chamber 7, which semi-circular portion merges into the wall of the measure 6. Said semi-circular part 45 forms a portion of the seat 43 for the valve 10^a, but is obviously wider than the upper portion of said seat. Hence, while the valve 10^a is in its closed position in seat 43 and also while it is traveling into its open position as shown in Fig. 3, it will be guided surely and accurately by its close contact with this curved bottom portion 45. While this is true of the inlet valve 10^a it is also true of the outlet valve 10^b that some means must be provided to keep said valve in proper alinement with its seat when it is removed from said seat or otherwise there would be a dislocation in the relative positions of the valves 10^a and 10^b and consequently, binding and difficulties in the operation. Such means I provide in the shape of a middle rib 50 and side ribs 51, see Figs. 3 and 8, which occupy the position in the outer wider portion of the casting which forms the measuring chamber close to where said casting spreads into the flange 42, said ribs providing edges that are parallel to the axis of the valve 10^b and on which the flange 10^c of said valve 10^b will slide back and forth during the reciprocation of the valve 10^b—all as clearly shown in Fig. 3. Though I have shown three of these ribs, one of which is at the bottom while the other two are on the side, it will be evident that I am not restricted to any particular number, but can have as many as is necessary. It will generally be found that a few edges in the lower portion of the casting on which the flange 10^c can slide will be sufficient. Moreover, it will be noted that immediately below the ribs 50 and 51 the bottom portion 8^a of the discharge chamber slopes off or declines rapidly toward the spout 9 and it will be evident that the contents of the measure in discharging will run swiftly down between the ribs 50 and 51 and down the steep decline of the bottom 8^a to the spout 9, so that the discharge chamber will be quickly emptied.

It may be further noticed that the handle jaws 16 to which I above alluded as having curved slots 17 terminate at their lower ends in flat portions, there being an abrupt angle between the flat portions and the remainder of the curved slots, said slots being for the purpose of enabling the toggle mechanism to be locked when the valve 10^b is on its seat and the cover flange 10^c against the bead 45. But the toggle is also an adjustable toggle as well as one that can be locked, as is evident from the foregoing description. When the handle 14 is pushed up toward the urn the pin 20 will be forced out of the flat portion of the slots 17 and caused to enter the curved portion of the slots 17, while the jaws 16 are lifting on the pin 20. When the spring 27 returns the handle to its normal position as shown in Fig. 3, the pin will drop back down through the slots 17 past the abrupt angle in said slots and enter the flat end portions of the slots. Any pressure that may be on the other side of the outlet valve within the measure, will not be able to force the toggle in such a way as to lift the pin 20 out of the flat ends of the slots 17 and past the abrupt angle in said slots. Such change

in the position of the parts can only be made by hand whenever the handle is pushed up for the purpose of emptying the measure.

Many changes in the precise details and peculiarities of the different parts and their relation to each other for the purpose of combining the same may be made without departing from my invention, and I reserve the liberty, therefore, of making such changes as may be required in practice within the scope of the appended claims.

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

1. In a measuring faucet, the combination of a measure, a receiver axially-disposed with relation thereto, the receiver having a flat bottom of higher level than the bottom of the measure and having its upper part concentric with and of larger diameter than the measure, and inlet and outlet valves for the measure.

2. In a measuring faucet, the combination of a measure, a receiver axially-disposed with relation thereto and having its bottom of a higher level than the bottom of the measure, said bottom having an abrupt end adjacent to the measure, and said receiver having also a curved top of greater diameter than the measure, together with inlet and outlet valves in said measure.

3. In a measuring faucet, the combination of a measuring chamber, a receiver disposed endwise thereof and axially-eccentric thereto, so that the wall of the receiver may be out of line with the wall of the measure so as to provide a channel for the passage of liquid into the measuring chamber when the inlet valve is open, and inlet and outlet valves for the said measure, together with a discharge chamber.

4. In a measuring faucet, the combination of a measuring chamber, a receiver disposed endwise thereof and axially-eccentric thereto, so that the wall of the receiver may be out of line with the wall of the measure so as to provide a channel for the passage of liquid into the measuring chamber when the inlet valve is open, said channel being of a curved form, and inlet and outlet valves for the said measure, together with a discharge chamber.

5. In a measuring faucet, the combination of a measuring chamber, a receiving chamber disposed at the end thereof and axially-eccentric so that the wall may be out of line with the wall of the measuring chamber to provide a channel for the inflow of liquid to the measure, said channel being of arcual form when the inlet valve is open, inlet and outlet valves for the measure, a discharge chamber, and means for operating said valves.

6. In a measuring faucet, the combination of a measure, of a receiver axially-disposed with relation thereto, and having a flat bottom of higher level than the bottom of the measure, inlet and outlet valves for the measure, the inlet valve being the smaller, and the outlet valve having a flange, said outlet valve fitting into the bore of the measure and said flange engaging the outer end of the measure, together with means for moving the said valves jointly.

7. In a measuring faucet, the combination of a measure, a receiver placed axially-eccentric thereto, with its bottom of higher level than the bottom of the measure, said bottom having an abrupt end terminating in a curved portion which merges into the measure, while the top wall of the receiver is curved and of a greater diameter than the measure so as to leave a curved opening when the inlet valve is open through which liquid may flow from the receiver into the measure, together with inlet and outlet valves in said measure.

8. In a measuring faucet, the combination of a measure, a receiver adapted to discharge into the said measure and axially-disposed with relation thereto and having its bottom of a higher level than the bottom of the measure, said bottom having an abrupt end adjacent to the measure, which end terminates in a curved portion on which the inlet valve slides in opening and closing so as to preserve its axial position in the measure, inlet and outlet valves moving jointly, supporting means for insuring the axial position of the outlet valve when it is out of its seat, and mechanism for operating said valves.

In testimony whereof I hereunto affix my signature.

WILLIAM R. BILLINGS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."