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A. R. BURGESS
PROPORTIONAL FLOW VALVE

2,535,835

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2 Sheets-Sheet 2

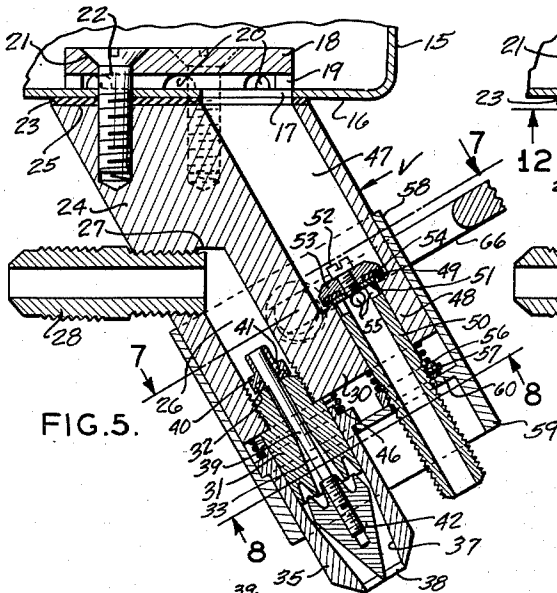


FIG. 5.

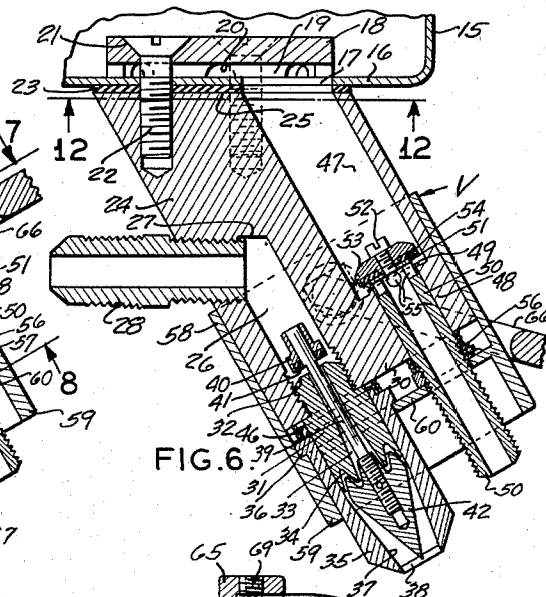


FIG. 6.

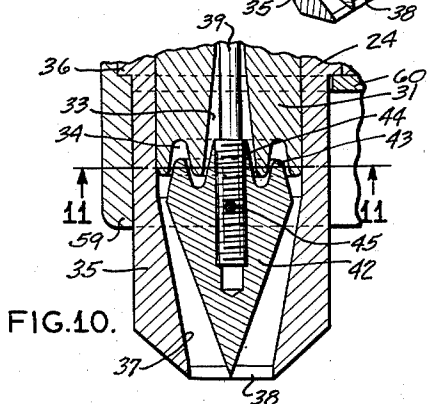


FIG. 10.

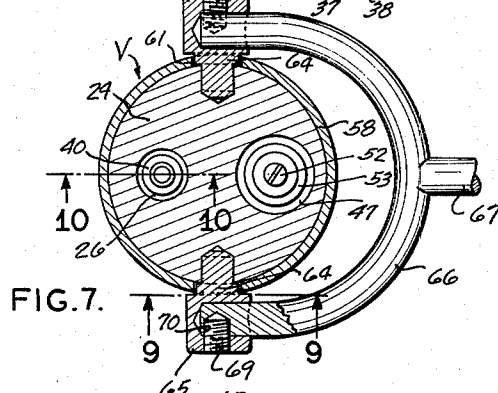


FIG. 7.

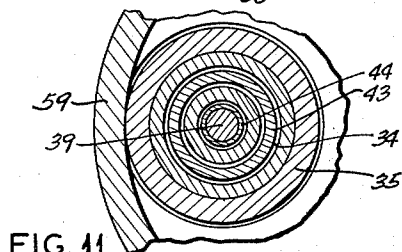


FIG. 11.

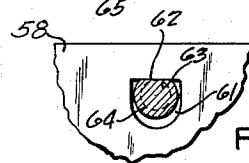


FIG. 9.

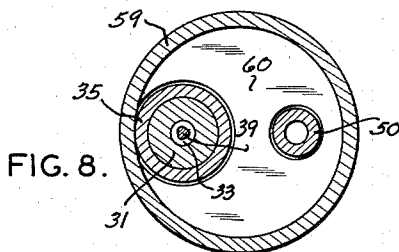


FIG. 8.

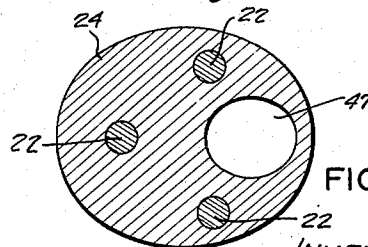


FIG. 12.

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PROPORTIONAL FLOW VALVE

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4 Claims. (Cl. 225—21)

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This invention relates in general to certain new and useful improvements in beverage dispensing equipment and, more particularly, to a so-called "under-bar" dispenser, that is to say, a dispenser adapted to be mounted directly upon the under side of a bar, shelf, or soda fountain counter.

It is the primary object of the present invention to provide an under-bar dispenser which is extremely compact in relation to its capacity and is relatively flat and shallow in the vertical direction so that it can be easily mounted in restricted spaces and will not occupy very much space when so mounted.

It is a further object of the present invention to provide an under-bar beverage dispenser which can be readily refilled with the syrup from which the beverage is made, and which can be readily dismantled for complete cleansing.

It is an additional object of the present invention to provide an under-bar dispensing valve capable of dispensing syrup and carbonated water simultaneously and in proper proportions to make a carbonated drink of proper strength and flavor.

It is also an object of the present invention to provide an under-bar dispenser and dispensing valve therefor, which are simple and economical in construction and are long-wearing and durable.

And with the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawings:

Figure 1 is a perspective view of an under-bar dispenser constructed in accordance with and embodying the present invention installed beneath a bar-counter, the latter being broken away for purposes of simplicity in illustration;

Figure 2 is a bottom plan view of the under-bar dispenser;

Figures 3 and 4 are, respectively, longitudinal and transverse sectional views taken along lines 3—3 and 4—4 of Figure 2; and

Figure 5 is an enlarged sectional view of the dispensing valve of the present invention taken along line 5—5 of Figure 2 showing the valve in closed position;

Figure 6 is a sectional view of the dispensing valve in open position;

Figures 7 and 8 are transverse sectional views of the dispensing valve taken, respectively, along lines 7—7 and 8—8 of Figure 5;

Figures 9 and 10 are detail sectional views of the dispensing valve taken, respectively, along lines 9—9 and 10—10 of Figure 7;

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Figure 11 is a detail sectional view taken along line 11—11 of Figure 10; and

Figure 12 is a detail sectional view taken along line 12—12 of Figure 6.

Referring now in more detail and by reference characters to the drawings, which illustrate a preferred embodiment of the present invention, A designates an under-bar dispenser comprising a cover-plate 1 fabricated preferably from stainless steel and integrally including a flat rectangular top section 2 rounded off along its front margin, as at 3, and smoothly curving into a short vertical front wall or apron 4, the top section 2 and apron 4 being corner-wise reinforced along their outer margins by triangular corner-plates 5 marginally welded thereto. Along the rearward portion of its longitudinal margins the top section 2 is provided with a plurality of spaced apertures 6 for receiving screws 7 by which the cover-plate 1 is secured to the under side, and with a portion a of its area projecting freely outwardly beyond the rear or service-side edge b of the bar-counter B. Centrally of the exposed area a the top section 2 is provided with a filling aperture 8 which is covered by a removable closure element or lid 9 formed preferably of Bakelite or other polymerized plastic material, all as best seen in Figure 1.

Adhesively secured upon the under face of the top section 2 is a rectangular gasket 10 flanked along the outer edges of each of its longitudinal sides by a series of suitably spaced depending bolts 11 welded at their upper ends to the under face of the top section 2 for receiving wing-nuts 12. Suitably apertured and held up upon each series of bolts 11 by the wing-nuts 12, are U-shaped channel members 13, one rail of which projects under a broad flat rolled rim or flange 14 formed peripherally around the upper margin of a shallow rectangular syrup pan 15, such rim being forced up by tightening of the wing-nuts 12, into tightly sealed engagement with the gasket 10. In its bottom wall 16, the syrup pan 15 is provided with a circular syrup-discharge aperture 17 preferably located in concentric vertical alignment with the filling aperture 8 and interiorly covered by a circular gated-plate 18 having a depending marginal flange 19 provided with a plurality of slots or gates 20 through which syrup may run to the aperture 17. The plate 18 is also provided with three equally spaced counter-sunk apertures 21 for receiving flat-headed attachment screws 22 which extend therethrough and through both the bottom wall 16 and a circular gasket 23 upon

the under face of the bottom wall 16 for threaded engagement in the upper end of the stainless steel cylindrical body 24 of a dispensing valve V having an angular end face 25 for seated engagement against the gasket 23 and so arranged that the valve V will extend forwardly and downwardly from the forward end of the pan 15, projecting, at its lower or discharge end, beyond the plane of the apron 4 "in the clear" so to speak, all as best seen in Figures 1 and 3.

Extending lengthwise upwardly into the valve body 24 is a bore 26 terminating in a lateral off-take 27 which is internally threaded to receive a nipple 28 for disengageable connection by means of a fitting 29 to a carbonated water line *l*. At its lower end the bore 26 opens upon the lower end face 30 of the valve body 24 and is internally threaded to receive a stationary, stainless steel nozzle-quill 31 which is conically faced-off at its upper end in the provision of a valve seat-forming face 32 and is internally flared for about the lower half of its length to provide a discharge passage 33 having gradually increasing cross-sectional area. Finally, upon its lower end-face, the nozzle-quill 31 is provided with a concentric deep groove 34 which is rounded at its top and bottom edges, as shown in Figure 10. Suitably fitted upon, and projecting downwardly from the nozzle-quill 31 is a shiftable nozzle 35 integrally provided at its upper end with a diametrically enlarged collar 36 and being, at its lower end, interiorly tapered, as at 37, to a somewhat reduced inside diameter in the formation of a constricted discharge opening 38. Loosely and shiftable mounted within the nozzle-quill 31 is a valve stem 39 provided at its upper end with fixed washer-ring 40 and an annular downwardly presented washer 41 for seated engagement against the seating face 32. It should be noted that the valve stem is provided with a plurality of axially extending "flats," so to speak, to provide ample annular clearance for the flow of liquid through the passage 33, as best seen in Figure 8. At its other end the valve stem 39 is threadably secured in a downwardly pointed concentric cone 42 formed preferably of Lucite and having greater angularity than the converging interior side walls of the nozzle 35 and being provided, at its upper end, with upwardly extending concentric rings 43, 44, for complementary disposition, respectively, within the groove 34 and tapered passage 33 of the quill 31, as best seen in Figure 10. The cone is finally pinned to the nozzle 35 by a diametral pin 45 so that the nozzle 35, cone 42, stem 39, and washer 41 move together, and the entire assembly is normally held in downwardly shifted or "closed" position by a compression spring 46 disposed annularly around the quill 31 and the upper end of the nozzle 35 in endwise abutment on one end against the upper face of the collar 36 and on its other end against the lower end face 30 of the valve body 24.

Extending lengthwise into the valve body 24 in spaced parallel relation to the bore 26 is a second bore 47 opening at its upper end upon the upper end face in registration with the syrup-drainage aperture 17. About midway of the body-portion, the bore 47 is reduced in diametrical size in the provision of a shoulder 48 having a raised annular valve-seat 49. Snugly fitted within the lower or reduced-size end of the bore 47 for lengthwise shiftable but leakproof movement therein is a syrup-discharging spout 50 which is closed at its upper end by an end wall

51 centrally bored and tapped for receiving a screw 52 adapted to secure in place a diametrically enlarged disk 53 and washer 54, the latter being disposed within the enlarged upper end of the bore 47 for seated engagement against the valve-seat 49. Just below its closed end, the spout 50 is provided with a plurality of radially drilled orifices 55 through which syrup may flow for ultimate discharge from the lower or open end of the spout 50, and at its lower or discharge end the spout 50 is externally threaded for receiving an internally threaded set-collar 56 having a locking set screw 57. The spout 50 is normally held in downwardly shifted or "closed" position, with its associated washer 54 in seated engagement against the valve-seat 49, by a compression spring disposed annularly therearound and abuttingly engaged at one end against the upper face of the set-collar 56, and at its other end against the lower end face 30 of the valve-body 24.

Slidably mounted upon, and fitting annularly around, the lower end of the valve-body 24 is an actuator sleeve 58 having a skirt 59 projecting beyond the end of the valve-body 24 and being interiorly provided with an integral partition or transverse wall 60 suitably bored for fitting loosely around the nozzle 35 and spout 50, simultaneously bearing, upon its upper face against the under faces of the nozzle-collar 36 and set-collar 56. Adjacent its upper end, the sleeve 58 is provided with two diametrically opposite U-shaped apertures 61 having transverse flat camming faces 62 for operative engagement with camming faces 63 of actuating studs 64 which are rotatably mounted in, and project radially from, the valve-body 24 through the apertures 61 and terminate in enlarged heads 65 which are, in turn, radially bored for snugly receiving the ends of a handle-clevis 66 centrally provided with an outwardly projecting handle 67 having a conventional knob 68 threaded upon its outer or free end. The stud-heads 65 are, furthermore, axially bored and tapped to receive set screws 69 which project retentively into registering drill holes 70 in the retained ends of the handle-clevis 66.

In operation, the syrup pan 15 may be filled through the filling aperture 8 with a suitable flavoring syrup, such as, for example, "Coca-Cola" syrup, and as the handle 67 is swung either up or down the camming faces 62, 63 will co-act to drive the sleeve 58 upwardly whereupon the partition or wall 60 thereof, abutting against the collars 36, 56, will shift the valve-stem 39 and spout 50, and the associated washers 41, 54, from the "closed" position shown in Figure 5 to the "open" position shown in Figure 6. When the valve V is in open position, syrup and carbonated water will flow simultaneously into the glass or other receptacle which is held therebeneath and a uniformly mixed beverage will thus be made. It should be noted that by reason of the shallow nature of the syrup pan 15 there will be relatively small variation in the hydrostatic head of the syrup therein and thus, for all practical purposes, the syrup will flow from the opened spout 50 at a fairly constant rate. Furthermore, the carbonated water supplied through the water line *l* will flow under substantially constant pressure from any conventional source (not shown). The orifices 55 are of such size and position that the amount of syrup dispensed during any given time interval can be controlled by proper fitting of the collar 56. If,

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for instance, the collar 56 is threaded down so that it is relatively closer to the discharge end of the spout 50, the lifting action of the partition 60 will, in effect, raise the orifices 55 completely above the valve seat 49. If, on the other hand, the collar is threaded upwardly to a point somewhat further from the discharge end of the spout 50, the lifting effect of the partition 60 will be reduced and the orifices 55 will be lifted only part-way above the valve seat 49, thereby reducing the area exposed for admitting the flow of syrup and consequently reducing the amount of syrup delivered in a given time interval. By this means, the rate of flow of syrup can be proportioned in any desired manner to the rate of flow of carbonated water, thus forming a beverage of desired flavor strength. When desired, the nipple 28 and fitting 29 can be disconnected and the wing-nuts 12 loosened to permit complete removal of the pan 15 and its associated valve V for quick and convenient cleansing.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the beverage dispensing equipment may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

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

1. A valve for controlling the flow of fluids comprising a valve-body having a first passage extending longitudinally therethrough and being constricted intermediate its ends in the provision of a valve seat, a tubular spout slidably mounted in and projecting from one end of said first passage and being provided on its inner end with a closure element for valve-forming co-operation with the valve seat, spring means for normally urging the spout outwardly with respect to the valve-body and bringing the closure element into seated engagement with the valve seat, said valve-body having a second passage extending therethrough, a tubular member mounted in and projecting from one end of said second passage and being provided at its inner end with a valve seat, a stem mounted in and extending through said tubular member, a valve poppet fixed upon the upper end of said stem for co-operation with the valve seat, a discharge nozzle slidably mounted on and projecting downwardly from the tubular member and being connected to the stem for movement therewith, an abutment on the spout, an abutment on the discharge nozzle, and means engageable with the abutments for simultaneously lifting the spout, stem, and the associated closure element and poppet for opening both of said passages and permitting the flow of fluids therethrough.

2. A valve for controlling the flow of fluids comprising a valve-body having a first passage extending longitudinally therethrough and being constricted intermediate its ends in the provision of a valve seat, a tubular spout slidably mounted in and projecting from one end of said first passage and being provided on its inner end with a closure element for valve-forming co-operation with the valve seat, spring means for normally urging the spout outwardly with respect to the valve-body and bringing the closure element into seated engagement with the valve seat, said valve-body having a second passage extending therethrough, a tubular member mounted in and projecting from one end of said second passage and being provided at its inner

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end with a valve seat, a stem mounted in and extending through said tubular member, a valve poppet fixed upon the upper end of said stem for co-operation with the valve seat, a discharge nozzle slidably mounted on and projecting downwardly from the tubular member and being connected to the stem for movement therewith, an abutment on the spout, an abutment on the discharge nozzle, a tubular sleeve slidably mounted upon the lower end face of the valve-body, a transverse partition rigidly mounted in the sleeve and apertured for loosely clearing the spout and nozzle and engaging the abutments, and handle means for shifting the sleeve upwardly in relation to the valve-body for simultaneously lifting the spout, stem, and the associated closure element and poppet for opening both of said passages and permitting the flow of fluids therethrough.

3. A valve for controlling the flow of fluids comprising a valve-body having upper and lower end faces and a longitudinally extending first passage opening at its opposite ends upon said upper and lower end faces, said passage being constricted intermediate its ends in the provision of a valve seat, a tubular spout slidably mounted in, and projecting from, one end of said first passage, said spout being provided on its inner end with a closure element for valve-forming co-operation with the valve seat, spring means for normally urging the spout outwardly with respect to the valve-body and bringing the closure element into seated engagement with the valve seat, said valve-body having a second passage opening at its lower end upon the lower face of the valve-body and at its upper end upon a side face of the valve-body, a tubular member mounted in and projecting from the lower end of said second passage and being provided at its upper end with a valve seat forming end face, a stem loosely and shiftably mounted in and extending through said tubular member, a valve poppet fixed upon the upper end of said stem for cooperation with the seat forming end face, a discharge nozzle slidably mounted on and projecting downwardly from the tubular member and being connected to the stem for movement therewith, an abutment collar on the spout, an abutment collar on the discharge nozzle, and means operably mounted on the valve-body for engagement with the abutment collars for simultaneously lifting the spout, stem, and the associated closure element and poppet for opening both of said passages and permitting the flow of fluids therethrough.

4. A valve for controlling the flow of fluids comprising a cylindrical valve-body having upper and lower end faces and a longitudinally extending first passage opening at its opposite ends upon said upper and lower end faces, said passage being constricted intermediate its ends in the provision of a valve seat, a tubular spout slidably mounted in one end of said first passage and projecting inwardly therein beyond the constriction, said spout being provided on such inwardly projecting end with a closure element for valve-forming co-operation with the valve seat, spring means for normally urging the spout outwardly with respect to the valve-body and bringing the closure element into seated engagement with the valve seat, said valve-body having a second passage opening at its lower end upon the lower face of the valve-body and at its upper end upon a side face of the valve-body, a tubular member mounted in and projecting from

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the lower end of said second passage and being provided at its upper end with a valve seat forming end face, a stem loosely and shiftably mounted in and extending through said tubular member, a valve poppet fixed upon the upper end of said stem for co-operation with the seat forming end face, a discharge nozzle slidably mounted on and projecting downwardly from the tubular member and being connected to the stem for movement therewith, an abutment collar on the spout, an abutment collar on the discharge nozzle, a tubular sleeve slidably mounted upon the lower end of and projecting beyond the lower end face of the valve-body, a transverse partition rigidly mounted in the sleeve and apertured for loosely clearing the spout and nozzle and engaging the abutment means thereon, and handle means for shifting the sleeve upwardly in relation to the valve-body for simultaneously

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lifting the spout, stem, and the associated closure element and poppet for opening both of said passages and permitting the flow of fluids there-through.

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