

Sept. 29, 1959

J. FRASER ET AL

2,906,293

TRANSFER VALVE

Filed Sept. 12, 1955

FIG. 1.

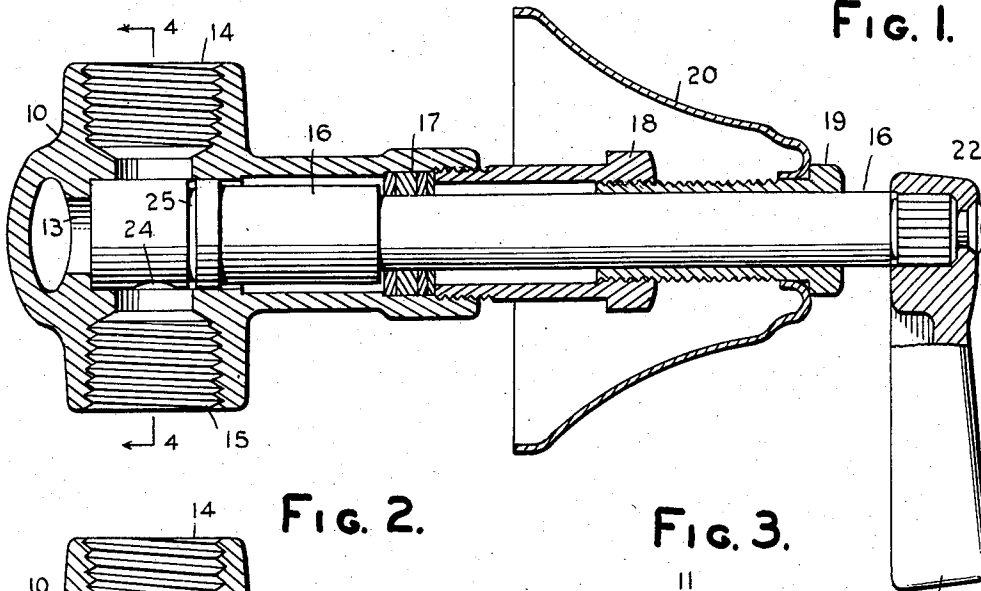


FIG. 2.

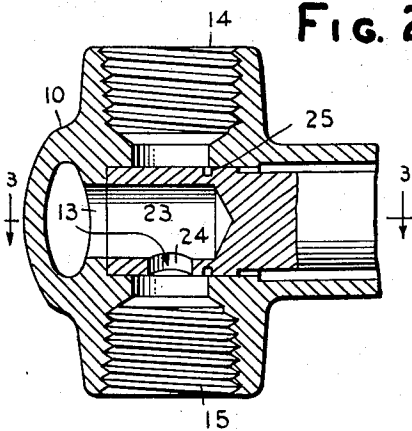


FIG. 3.

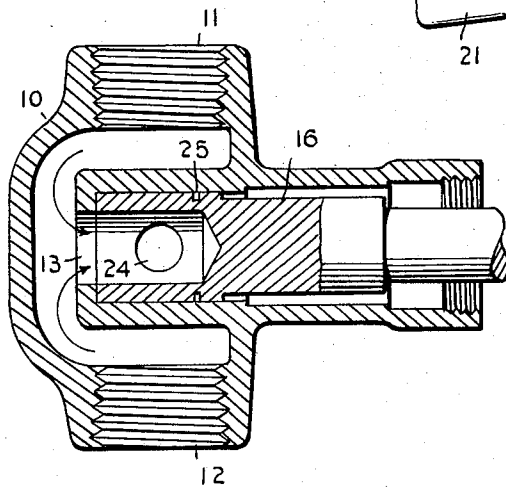
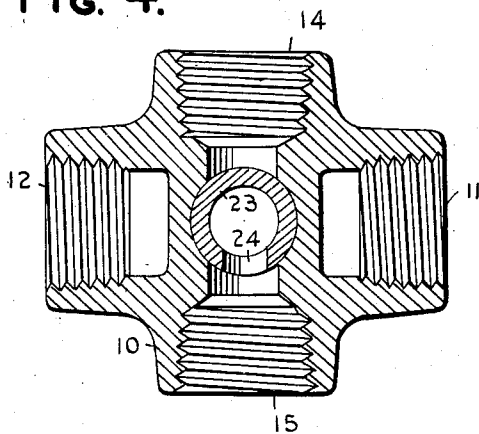


FIG. 4.



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TRANSFER VALVE

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Application September 12, 1955, Serial No. 533,547

2 Claims. (Cl. 137—625.42)

The general object of this invention is to provide a new transfer or distributing valve to be used with alternate outlets, such a valve being so constructed as to provide positive drainage of all outlets other than the one momentarily in use.

Heretofore such two-way and multiple outlet valves as have been used for alternate outlet valve systems have suffered from the defect that a small leakage passing the valve into the outlet or outlets not being used causes troublesome dripping or overflow. My improved valve overcomes this difficulty by supplying for the first time a positive drainage for the outlets not in use when another outlet is being used.

Distribution systems employing a common supply of liquid under pressure and several outlets to which the liquid may be distributed successively either at will or automatically, come within the ambit of the invention, and my improved valve is well adapted for such use. As an illustration, a transfer valve of the above mentioned type finds a common field of use in supplying a hot-cold water mixture alternatively to shower heads or bath tubs in hotels and residences at a temperature controlled by valve adjustments made by the user. As is well known, when the transfer valve is set to fill the tub a slight leakage past the valve into the outlet to the shower causes the shower head to drip in a most annoying manner, and an important aim or object of the present invention is to provide an improved arrangement and construction of a transfer valve so as to drain the shower supply line when the tub supply line is being used.

More specifically the object of the invention is to provide a jet operated venturi-effect suction line on the shower system when the flow of water is adjusted into the tub supply system.

The various features and novelties which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, and its advantages and specific objects obtained with its use, reference is made to the accompanying drawings and descriptive matter in which is illustrated and described a preferred embodiment of the invention.

The drawings illustrate a manually operated transfer or distributing valve for a combined tub and shower fixture, wherein—

Figure 1 is a horizontal view partially in section;

Figure 2 is a horizontal view also in section showing the details of Figure 1;

Figure 3 is a sectional view on the line 3—3 of Figure 2; and

Figure 4 is a sectional view on line 4—4 of Figure 1, all of the views being drawn to the same scale.

The transfer valve structure shown in the drawings comprises a chambered valve housing or body 10 having two inlets 11 and 12 (shown in Figure 3) disposed at diametrically opposite points and leading to a common inlet port 13. The valve housing 10 also has two outlet connections 14, 15 (shown in Figures 1 and 2) disposed

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at right angles to the inlets in the same transverse plane therewith. A rotatable valve 16, having its axis at right angles to plane of the inlets and outlets, fits within a central bore in the valve housing 10 and is held in place by the packing 17 and the screw threaded gland 18 (shown in Figure 1) with its stem projecting through the adjustable bushing 19 which screws into the gland 18 and supports the hood 20, as is well understood in the art. Attached to the end of the valve stem is a handle 21, removably held in place by means of the screw 22. By removing this handle and the hood 20 access may be had to the gland 18 for adjustment or renewal of the packing.

The valve system as illustrated has a liquid passage 23 leading to a discharge port 24, shown aligned with the inlet port 13, but which may be rotated to align with any one of the outlet ports 14 and 15. The discharge through the outlet port 24 from the liquid passage 23, as shown in Figure 2, allows the incoming liquid entering under considerable pressure through the openings 11 and 12 and the common passage, as shown by the arrows in Fig. 3, to pass through the port 13 into the liquid passage 23 and out of outlet port 24 into the outlet 15. The port 24 is smaller than the inlet connections 11 and 12 and outlet connections 14 and 15 so that the velocity or flow through the port is sufficient to form a jet. The liquid flows freely from these outlet connections, and due to the fact that the stream is smaller than the outlet, a partial vacuum is produced by the jet. A circumferential drainage passage 25 around the valve 16 and connecting the outlet 15 to the outlet 14, allows this vacuum to draw any liquid remaining in the outlet 14 into the outlet 15, thereby producing a positive drainage.

In the structure shown in the drawings this drainage passage 25 consists of a groove cut in the peripheral surface of the valve 16 in such a manner as to partially overlap the discharge port openings so that it provides a channel for passage of fluid from one discharge port to the other. It obviously is within the scope of this invention to provide other types of passages from one port to the other.

In use hot and cold water in controlled volumes are admitted from any suitable source through inlets 11 and 12 and manually adjusted to the desired temperature by valves not shown. The handle 21 is then turned up or down to allow the water to flow either into the shower or the tub. If to the tub, the water flows from the inlets to the common passage and port 13. It enters the liquid passage 23 in the end of the valve and is discharged through the outlet port 24 from which it flows freely through the outlet connection 15 into the tub. This creates a partial vacuum at the top of the outlet connection 15 which is connected by means of the drainage passage 25 cut in the valve stem 16 to the upper outlet 14 connected with the shower head. Due to this partial vacuum any water remaining in the outlet passage 14 is drawn through the passage 25 into the outlet 15 and thereby produces positive and continuous drainage of the outlet passage not in use.

The general form and arrangement of the valve mechanism shown in the drawing is practical, and advantageous because of the simplicity and compactness of the transfer valve structure and because all of the ports may be formed by simple boring, turning and reaming operations. In some cases it may be practical and desirable to have the passage 25 of a controlled nature and to have it independent of the valve stem 16, in which case it will be necessary to have conduits in the housing 10 to connect these two outlet connections.

While the best form of a preferred embodiment of the invention has been illustrated and described as required by law, it will be apparent to those skilled in the art that it may be applied to other systems of distributing liquids

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and gases, and that changes may be made in the form of the apparatus to suit special conditions within the scope of this invention, as set forth in the appended claims.

What is claimed is:

1. A transfer valve for a combined tub and shower water supply system having hot and cold water supply pipes, said valve having a hollow body the longitudinal axis whereof is coincident with the longitudinal axis of said valve, said valve being provided with opposed inlets at its sides adapted to be connected with said hot and cold water supply pipes, respectively, and having opposed outlets adapted to be connected to the shower head and tub spout, respectively, and a hollow valve member rotatably mounted in said body with its stem projecting from an end thereof and provided with means for turning it through 180°, said hollow valve forming a chamber having an opening at its end remote from the stem in communication with said side inlets and an opening in its side positioned for alignment with one or the other of said outlets when turned 90° from its midposition in either direction, and a circuitous channel, connecting said outlets when said side opening is aligned with either of said outlets, and being not directly in flow communication with said chamber, said channel being substantially smaller than said side opening, said side opening being of substantially smaller size than said outlets to project a jet of water into one or the other of them when aligned therewith, whereby a jet action is produced and water is thereby drained from the closed outlet through said channel into the open outlet.

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2. A transfer valve comprising a hollow housing structure with a fluid inlet and a plurality of spaced apart fluid outlets, said inlet leading to an axial inlet passage, and said outlets having ports leading from said inlet passage, closure means in said passage normally closing one of said outlets and rotatable into position to close the other outlet, said closure means comprising a hollow valve with an axial inlet passage and a connecting discharge passage at right angles thereto, said passage acting to admit fluid from said inlet passage and to discharge fluid into one of said outlet ports, said discharge opening being smaller than said outlet ports, and a circumferential groove substantially smaller than said outlet on the valve overlapping both of said outlet ports, whereby a jet action is produced between said discharge passage and the outlet port which is in communication therewith, and water is thereby drained from the closed outlet through said groove into the open outlet.

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