

April 16, 1957

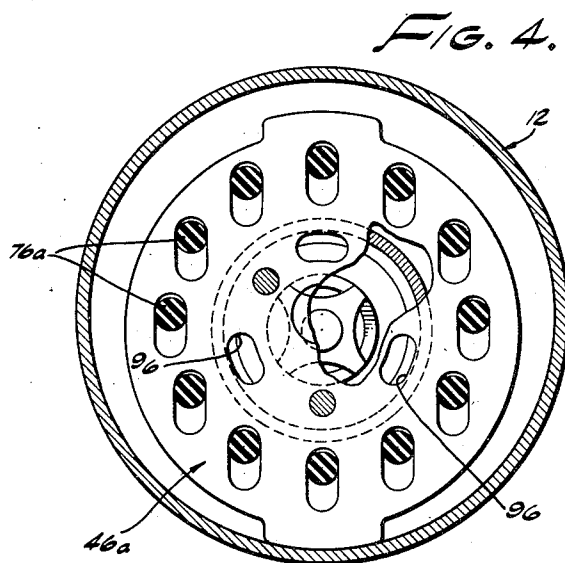
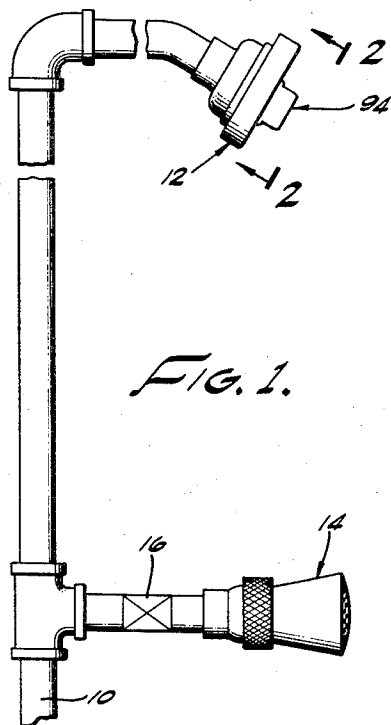
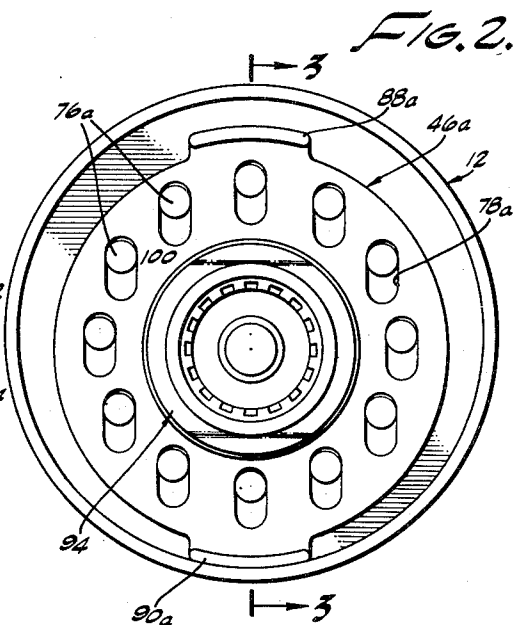
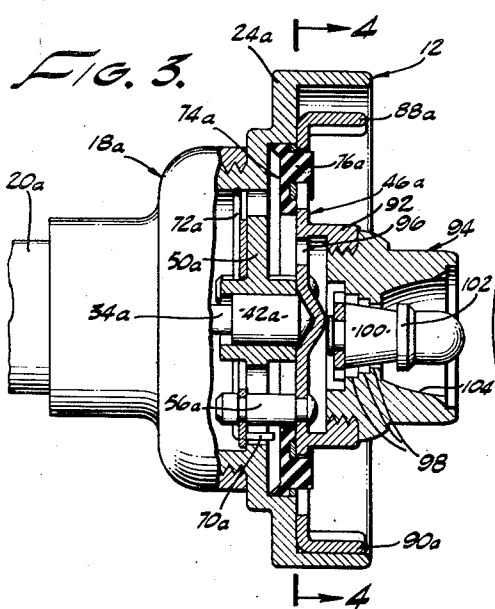
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2,789,013

SELF CLOSING VALVE

Filed Sept. 14, 1953

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 5.

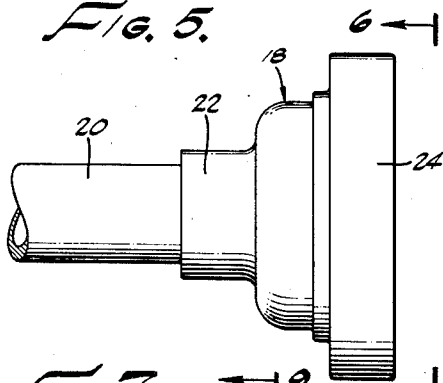


FIG. 6.

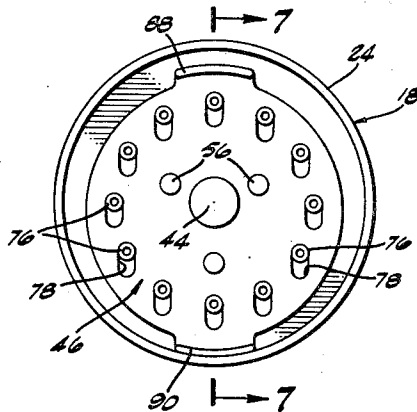


FIG. 7.

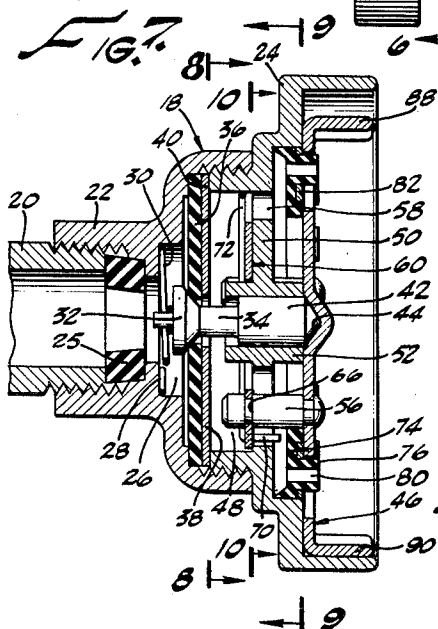


FIG. 8.

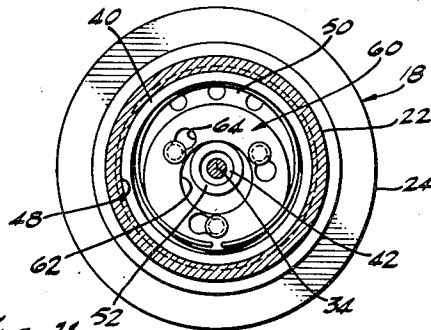


FIG. 11.



FIG. 12.

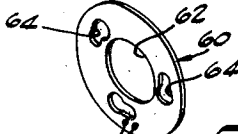


FIG. 10.

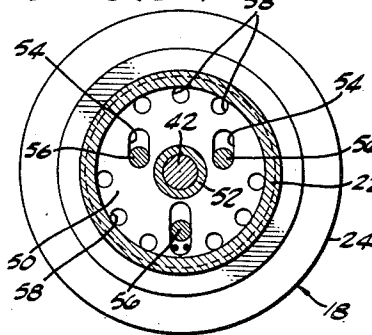


FIG. 13.

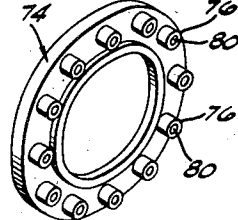
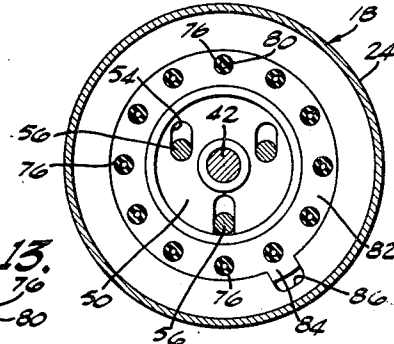


FIG. 9.



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2,789,013

SELF CLOSING VALVE

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15 Claims. (Cl. 299—144)

This invention relates to a self closing valve particularly adapted for use as a self closing showerhead or shampoo valve.

It is an object of this invention to provide a showerhead or shampoo valve to be connected in series with a faucet or the like which when opened will remain opened under pressure of flowing water and which will close upon interruption of water flow.

It is a further object of this invention to provide self closing valve means for installation in a combination fixture having multiple outlets to insure that water when first delivered to the same outlet until a subsequent outlet is opened to avoid, for example in a tub and shower installation, having water discharged unexpectedly through the shower outlet.

Other objects and advantages will be apparent from the following description.

In the drawings:

Figure 1 is a side elevation of a combination fixture having a showerhead embodying this invention.

Figure 2 is a view taken along line 2—2 of Figure 1.

Figure 3 is a section taken along line 3—3 of Figure 2.

Figure 4 is a section taken along line 4—4 of Figure 3.

Figure 5 is a side elevation of a shampoo valve embodying this invention.

Figure 6 is a view taken along line 6—6 of Figure 5.

Figure 7 is a section taken along line 7—7 of Figure 6.

Figure 8 is a section taken along line 8—8 of Figure 7.

Figure 9 is a section taken along line 9—9 of Figure 7.

Figure 10 is a section taken along line 10—10 of Figure 7.

Figure 11 is a perspective view of the spring means.

Figure 12 is a perspective view of the locking plate.

Figure 13 is a perspective view of the valve open mechanism control means.

Referring first to Figure 1, there is shown by way of example a multiple outlet fixture having water supplied through pipe 10 either to the showerhead 12 or to a foot spray 14. A diverter 16 may be utilized to divert all the water out the showerhead when it is opened. The showerhead utilized in this fixture, illustrated in Figures 2, 3 and 4, is moved to the open position permitting flow of water therefrom where the showerhead is held open by water pressure. When water flow is terminated the showerhead closes. If water flow is again commenced through pipe 10 it is diverted through foot spray 14 and cannot discharge through showerhead 12 until same is again opened.

It is apparent that a self closing valve of this type has many applications such as for example, in a shampoo valve as illustrated in Figures 5 through 13. This shampoo valve is normally attached upon a flexible hose and connected with a wash basin to a common water supply.

Describing first the shampoo valve, water is delivered to the valve 18 through tube 20 which is screwed into the bonnet 22 which in turn threadably receives spray body 24. A packing member 25 may be provided to prevent

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leakage. Water flow then enters the valve chamber 26, which chamber is provided with an internal shoulder 28 forming a base for spring 30, which spring bears against valve head 32, urging same and valve stem 34 towards the closed position. The valve seat is formed in an annular washer 36, which is of a suitable resilient material and which is secured against movement with valve head 32 by a metal washer 38, which fits into chamber 26 and bears against an internal shoulder 40 formed by the extremity of spray body 24.

At the other extremity of valve stem 34 a cam head 42 is formed, which fits into a depression 44 formed in cam plate 46. As seen in Figure 7 the shower valve is in the closed position, however, if the cam plate is raised in Figure 7 the cam head 42 will be raised out of depression 44 against spring 30 opening the valve and permitting flow from chamber 26 into chamber 48 in advance of the valve seat.

The spray body 24 has a web 50 formed therein with a central guide 52 for cam head 42 and three elongated slots 54 for receiving the studs 56 of cam plate 46. This web also has a plurality of holes such as 58 to insure unobstructed water flow therethrough.

In advance of web 50 a locking plate 60 is provided having a central aperture 62 receiving guide 52 and three elongated openings 64 for forming a bayonet lock with annular slots such as 66 formed in studs 56.

The plate 60 is also provided with a pair of holes 68 for receiving the bent ends 70 of circular spring 72. The spring 72 bears against the wall of chamber 48 urging the locking plate and hence cam plate 46 to the down position in Figure 7 where recess 44 receives cam head 42 permitting spring 30 to urge valve head 32 to the closed position shutting off water flow.

To maintain the cam plate 46 in the raised or valve opening position a resilient washer 74 is provided. This washer has a plurality of tubular projections 76 which project into suitable slots 78 in cam plate 46. Each projection in this embodiment has an aperture 80 therethrough, through which water is discharged. Positioned between this resilient washer 74 and cam plate 46 is a metal washer 82, which has a plurality of holes receiving projections 76 and a tab 84 which projects into a suitable recess 86 formed in web 50 preventing rotation of washers 82 and 74. The metal to metal contact of washer 82 and cam plate 46 permit movement of the cam plate with respect to resilient washer 74 by means of tabs 88 and 90. When for example the cam plate is moved so as to move valve head 32 and permit water flow through the shampoo valve water pressure upon the resilient washer forces metal washer 82 against the cam plate 46 holding same in the open position against the urging of spring 72. When however, the water is shut off and the pressure on resilient washer 74 released, the spring 72 urges the cam plate to the valve closing position. Consequently, the shampoo valve thus constructed will return to the closed position upon termination of water flow and will remain in whatever position it is manually adjusted to as long as water flow continues.

The showerhead illustrated in Figures 2 through 4, is much the same as the shampoo valve and like parts are given the same numerical designation plus the exponent "a". It is readily apparent that the difference between the showerhead and the shampoo valve lies in the discharge means. In the showerhead the projections 76a on the resilient washer 74a are solid, so that no water is discharged through them. The cam plate 46 has a threaded extension 92 into which a showerhead 94 is screwed. A plurality of ports 96 are provided permitting flow of water through cam plate 46 into the showerhead 94. The showerhead has a stepped restricted throat 98

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therein with a deflecting member 100 supported in the throat. The deflecting member has a shoulder 102 formed thereon so that water flowing through the shower-head strikes shoulder 102 and is deflected against skirt 104 and discharged in a suitable conical shower.

While what hereinbefore has been described is the preferred embodiment of this invention, it is readily apparent that alterations and modifications can be resorted to without departing from the scope of this invention and such alterations and modifications are intended to be within the scope of the appended claims.

We claim:

1. A self closing valve comprising: a water inlet, a water discharge means, a valve member disposed in said inlet, manually operable valve opening mechanism in said discharge means, and pressure responsive frictional means between said inlet and said discharge for maintaining said valve in the open position during flow through said valve.

2. A self closing valve comprising: a water inlet, a water discharge, a valve member disposed in said inlet, manually operable valve actuating means to move said valve member to a valve open or valve closed position, spring means urging said actuating means to the valve closed position, and water pressure actuated frictional means for maintaining said valve member in the open position when moved to the open position during flow through said valve.

3. A self closing valve comprising: a housing having a water inlet and a water outlet, a valve member disposed adjacent said inlet, a cam head attached to said valve member, a cam plate in said outlet contacting said cam head movable from a position wherein said valve is closed to a position wherein said valve is opened, spring means urging said cam plate to the position wherein said valve is closed, and pressure actuated means holding said cam plate in the open position during flow of water through said outlet.

4. A self closing valve comprising: a housing having a water inlet and a water outlet, a valve seat in said inlet, a valve head, a cam head adjacent said outlet and secured to said valve head, a cam plate in said outlet contacting said cam head, movement of which urges said cam head from a position wherein said valve head engages said valve seat preventing flow through said valve to a position where said valve head is unseated from said valve seat permitting flow through said valve, and water pressure actuated means maintaining said cam plate in the valve opening position during flow through said valve.

5. A self closing valve comprising: a housing having a water inlet and a water outlet, a valve seat in said inlet, a valve head, a cam head adjacent said outlet and secured to said valve head, a cam plate in said outlet contacting said cam head, movement of which urges said cam head from a position wherein said valve head engages said valve seat preventing flow through said valve to a position where said valve head is unseated from said valve seat permitting flow through said valve, spring means urging said cam plate to the valve closing position, and water pressure actuating means maintaining said cam plate in the valve opening position during flow through said valve.

6. A self closing valve comprising: a housing having a water inlet and a water outlet, a valve seat in said inlet, a valve head, a cam head adjacent said outlet and secured to said valve head, a cam plate in said outlet contacting said cam head, movement of which urges said cam head from a position wherein said valve head engages said valve seat preventing flow through said valve to a position where said valve head is unseated from said valve seat permitting flow through said valve, spring means urging said cam plate to the valve closing position, and a resilient washer disposed between said inlet and outlet forced by water pressure against said cam plate during flow through

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said valve maintaining said cam plate in the valve opening position.

7. A self closing valve comprising: a housing having a water inlet and a water outlet, a valve seat in said inlet, a valve head, a cam head adjacent said outlet and secured to said valve head, a cam plate in said outlet contacting said cam head, movement of which urges said cam head from a position wherein said valve head engages said valve seat preventing flow through said valve to a position where said valve head is unseated from said valve seat permitting flow through said valve, a plurality of slots formed in said cam plate, spring means urging said cam plate to the valve closing position, a resilient washer disposed between said inlet and outlet forced by water pressure against said cam plate during flow through said valve maintaining said cam plate in the valve opening position, and a plurality of projections on said resilient washer projecting through said slots in said cam plate.

8. A self closing valve comprising: a housing having a water inlet and a water outlet, a valve seat in said inlet, a valve head, a cam head adjacent said outlet and secured to said valve head, a cam plate in said outlet contacting said cam head, movement of which urges said cam head from a position wherein said valve head engages said valve seat preventing flow through said valve to a position where said valve head is unseated from said valve seat permitting flow through said valve, a plurality of slots formed in said cam plate, spring means urging said cam plate to the valve closing position, a resilient washer disposed between said inlet and outlet forced by water pressure against said cam plate during flow through said valve maintaining said cam plate in the valve opening position, a plurality of projections on said resilient washer projecting through said slots in said cam plate, and a second washer positioned between said resilient washer and said cam plate.

9. A self closing valve comprising: a housing having a water inlet and a water outlet, a valve seat in said inlet, a valve head, a cam head adjacent said outlet and secured to said valve head, a cam plate in said outlet contacting said cam head, movement of which urges said cam head from a position wherein said valve head engages said valve seat preventing flow through said valve to a position where said valve head is unseated from said valve seat permitting flow through said valve, a plurality of slots formed in said cam plate, spring means urging said cam plate to the valve closing position, a resilient washer disposed between said inlet and outlet forced by water pressure against said cam plate during flow through said valve maintaining said cam plate in the valve opening position, a plurality of projections on said resilient washer projecting through said slots in said cam plate a second washer positioned between said resilient washer and said cam plate, and means on said second washer engaging said housing preventing rotation of said resilient washer.

10. A self closing valve comprising: a housing having a water inlet and a water outlet, a valve seat in said inlet, a valve head, a cam head adjacent said outlet and secured to said valve head, a cam plate in said outlet contacting said cam head, movement of which urges said cam head from a position wherein said valve head engages said valve seat preventing flow through said valve to a position where said valve head is unseated from said valve seat permitting flow through said valve, a plurality of slots formed in said cam plate, spring means urging said cam plate to the valve closing position, a resilient washer disposed between said inlet and outlet forced by water pressure against said cam plate during flow through said valve maintaining said cam plate in the valve opening position, and a plurality of projections on said resilient washer projecting through said slots in said cam plate, said projections in said resilient washer having an aperture therethrough discharging water flow through said valve.

11. A self closing valve comprising: a housing hav-

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ing a water inlet and a water outlet, a valve seat in said inlet, a valve head, a cam head adjacent said outlet and secured to said valve head, a cam plate in said outlet contacting said cam head, movement of which urges said cam head from a position wherein said valve head engages said valve seat preventing flow through said valve to a position where said valve head is unseated from said valve seat permitting flow through said valve, a plurality of slots formed in said cam plate, spring means urging said cam plate to the valve closing position, a resilient washer disposed between said inlet and outlet forced by water pressure against said cam plate during flow through said valve maintaining said cam plate in the valve opening position, a plurality of projections on said resilient washer projecting through said slots in said cam plate, a showerhead secured to said cam plate, and means diverting water flow through said cam plate out said showerhead.

12. A self closing valve comprising: a housing having a water inlet and a water outlet, a valve seat in said inlet, a valve head, a cam head adjacent said outlet and secured to said valve head, a cam plate in said outlet contacting said cam head, movement of which urges said cam head from a position wherein said valve head engages said valve seat preventing flow through said valve to a position where said valve head is unseated from said valve seat permitting flow through said valve, a plurality of slots formed in said cam plate, spring means urging said cam plate to the valve closing position, a resilient washer disposed between said inlet and outlet forced by water pressure against said cam plate during flow through said valve maintaining said cam plate in the valve opening position, a plurality of projections on said resilient washer projecting through said slots in said cam plate, and a second washer positioned between said resilient washer and said cam plate, said projections in said resilient washer having an aperture therethrough discharging water flow through said valve.

13. A self closing valve comprising: a housing having a water inlet and a water outlet, a valve seat in said inlet, a valve head, a cam head adjacent said outlet and secured to said valve head, a cam plate in said outlet contacting said cam head, movement of which urges said cam head from a position wherein said valve head engages said valve seat preventing flow through said valve to a position where said valve head is unseated from said valve seat permitting flow through said valve, a plurality of slots formed in said cam plate, spring means urging said cam plate to the valve closing position, a resilient washer disposed between said inlet and outlet forced by water pressure against said cam plate during flow through said valve maintaining said cam plate in the valve opening position, a plurality of projections on said resilient washer projecting through said slots in said cam plate, a second washer positioned between said resilient washer and said

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cam plate, a showerhead secured to said cam plate, and means diverting water flow through said cam plate out said showerhead.

14. A self closing valve comprising: a housing having a water inlet and a water outlet, a valve seat in said inlet, a valve head, a cam head adjacent said outlet and secured to said valve head, a cam plate in said outlet contacting said cam head, movement of which urges said cam head from a position wherein said valve head engages said valve seat preventing flow through said valve to a position where said valve head is unseated from said valve seat permitting flow through said valve, a plurality of slots formed in said cam plate, spring means urging said cam plate to the valve closing position, a resilient washer disposed between said inlet and outlet forced by water pressure against said cam plate during flow through said valve maintaining said cam plate in the valve opening position, a plurality of projections on said resilient washer projecting through said slots in said cam plate, and means on said second washer engaging said housing preventing rotation of said resilient washer, said projections in said resilient washer having an aperture therethrough discharging water flow through said valve.

15. A self closing valve comprising: a housing having a water inlet and a water outlet, a valve seat in said inlet, a valve head, a cam head adjacent said outlet and secured to said valve head, a cam plate in said outlet contacting said cam head, movement of which urges said cam head from a position wherein said valve head engages said valve seat preventing flow through said valve to a position where said valve head is unseated from said valve seat permitting flow through said valve, a plurality of slots formed in said cam plate, spring means urging said cam plate to the valve closing position, a resilient washer disposed between said inlet and outlet forced by water pressure against said cam plate during flow through said valve maintaining said cam plate in the valve opening position, a plurality of projections on said resilient washer projecting through said slots in said cam plate, and means on said second washer engaging said housing preventing rotation of said resilient washer, a showerhead secured to said cam plate, and means diverting water flow through said cam plate out said showerhead.

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