Sept. 5, 1961 I. A. WARD 2,998,824

ANTISIPHON TRANSFER VALVE

Filed Dec. 17, 1956

FIG. 1.

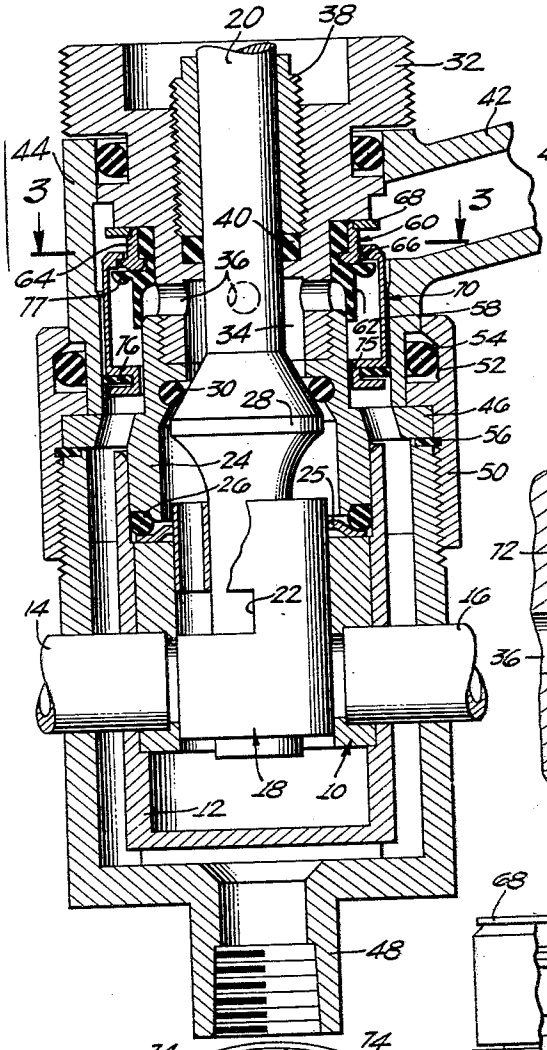


FIG. 2.

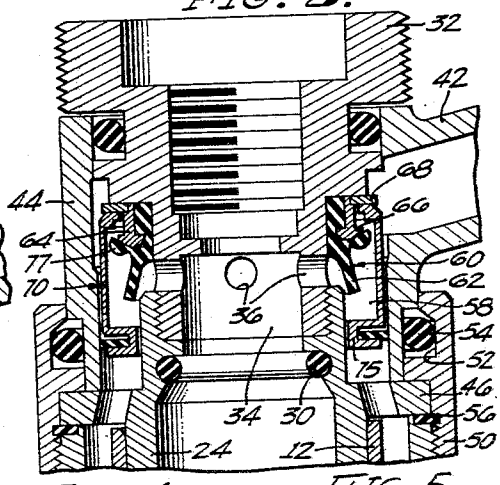


FIG. 4.

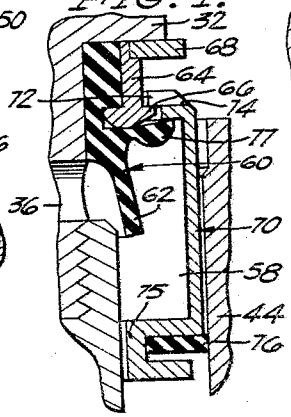


FIG. 5.

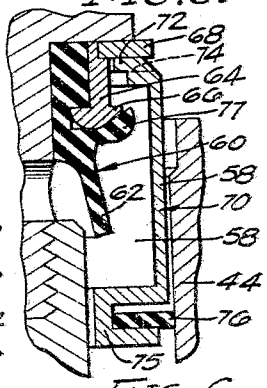


FIG. 6.

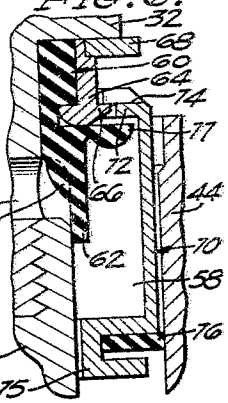


FIG. 7.

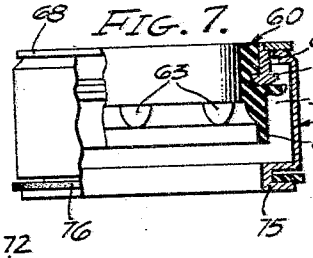
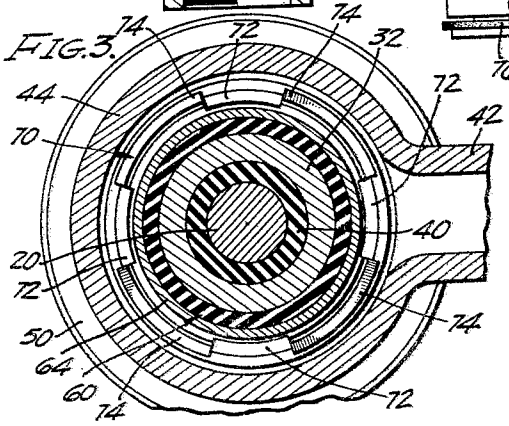


FIG. 3.



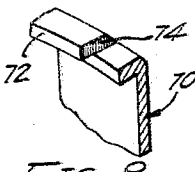


FIG. 8.

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ANTISIPHON TRANSFER VALVE

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6 Claims. (Cl. 137—119)

This invention relates to an improved transfer valve and more particularly a valve adapted to be placed between a water inlet and a pair of outlets which will direct flow normally through one of said outlets until the other outlet is opened at which time all discharge is through the latter mentioned outlet.

It is an object of this invention to provide a transfer valve which will accommodate a stem passing therethrough such as a stem of a single lever faucet.

It is still a further object of this invention to provide a transfer valve of this type which is antisiphon in character.

It is still a further object of this invention to provide such a device which is easily and rapidly assembled and inexpensive to manufacture without detracting from its dependability and longevity.

Other objects and advantages will be readily apparent from the following description:

In the drawings:

FIGURE 1 is a side elevation in section of a device embodying this invention in the shutoff position.

FIGURE 2 is a fragmentary view similar to FIGURE 1 illustrating flow to the spout outlet.

FIGURE 3 is a view taken along line 3—3 of FIGURE 1.

FIGURE 4 is an enlarged fragmentary section illustrating flow to the spray outlet.

FIGURE 5 is a view similar to FIGURE 4 illustrating flow to the spout outlet.

FIGURE 6 is a view similar to FIGURE 4 illustrating the reinforcing of the valve element.

FIGURE 7 is side elevation partially in section of the valve mechanism.

FIGURE 8 is a fragmentary view of the cage.

A valve body **10** is supported in a casing **12** and pipes **14** and **16** convey hot and cold water through the casing into the valve body. A rotary plug valve **18** is supported upon stem **20** and has a slot **22** therein adapted upon rotation of stem **20** to register with one or more of the pipes **14** and **16** to admit water which flows upwardly towards the open top of casing **12**.

The upper extremity of casing **12** telescopically receives the lower extremity of the transfer valve body support member **24**. The upper extremity of valve body **10** forms a shoulder upon which washer **25** is seated and the under edge of support member **24** is notched to receive O-ring **26** forming a watertight seal at this union.

The stem **20** has an enlarged head **28** thereon while the support member **24** has a tapered restriction adjacent the head. An O-ring **30** is seated in this restriction adapted to engage head **28** and thereby shut off flow upwardly through member **24** when the valve stem is raised. Thus raising and lowering valve stem **20** by an appropriate handle varies the volume of water while rotation of same varies the mixture of hot and cold water.

A cap **32** screws into the upper extremity of support member **24** and has a chamber **34** formed therein having a plurality of transversely extending discharge ports **36**. Stem **20** projects through chamber **34** and carries a plug **38** which screws into cap **32** while packing **40** forms a watertight seal at the top of chamber **34**.

Surrounding the chamber **34** is the spout outlet formed of a spout **42** and an annulus **44** which slips partially

down over the support member **24** resting on ported web **46** on the support member. The hand spray outlet **48** has an enlarged extremity which permits passage of pipes **14** and **16** therethrough and further encompasses the plug valve body **10**. Its upper extremity bears against web **46** and a retaining member **50** screws thereon which has an annular slot **52** formed therein to receive O-ring **54**, providing a watertight seal between spout annulus **44** and web **46**. A packing element **56** forms a seal between the enlarged extremity of the spray outlet and retaining member **50**.

Thus, a single water inlet is provided from chamber **34** to chamber **58** surrounding same while a pair of outlets either to spout or spray are provided for chamber **58**. This invention is particularly directed to the mechanism for controlling flow to one or the other of the outlets.

Surrounding the lower extremity of cap **32** is a resilient check valve element **60** which has a thin flexible flap **62** depending therefrom which covers ports **36** preventing back siphonage therethrough. The inner surface of flap **62** has a plurality of beads **63** thereon which reinforces same.

When water flows through either outlet the flap flexes to permit flow through ports **36** into chamber **58**. Surrounding the upper portion of valve element is a metallic washer **64** having a shoulder **66** formed thereon and a metal ring **68** supported by washer **64** at its uppermost extremity forming a second shoulder spaced from shoulder **66**. The spaced shoulders form limits for movement of a cage-like member **70**. Member **70** has at its upper extremity an inturned flange **72** which falls between shoulder **66** and ring **68**. The flange **72** has a plurality of notches **74** cut therein so that flow will not be terminated upon engagement of flange **72** and ring **68**.

The lower portion of member **70** projects into chamber **58** and the lower extremity is bent to form a piston **75** at the lower edge of the cage. The piston is of slightly smaller diameter than chamber **58** to move in response to the pressure in the chamber but not to cut off flow therethrough. Also the piston is slotted to receive packing element **76**, providing a watertight seal between the piston and the outer wall of chamber **58**.

The check valve element **60** has a flange or bead **77** formed thereon which projects into chamber **58** and flexes in accordance with flow through said chamber, and its outer diameter is sufficiently large to cover notches **74** in flange **72** of member **70** as shown in FIG. 4.

In operation, the normal position of the elements is shown in FIGURES 1 and 6 where the flow of water is shut off, flap **62** covering ports **36** preventing back siphon to the water supply. When the plug valve **18** has been rotated and lowered to admit water, the parts assume the position illustrated in FIGURES 2 and 5 when the spray outlet is closed and discharge is through the spout outlet **42**. The flap **62** is flexed admitting water to chamber **58**. Since the spray outlet is closed, water pressure on flange **72** raises the member **70** until same engages ring **68** with water flowing through notches **74** and out the spout.

When the spray outlet is opened and water flows therethrough, there is a reduced pressure below piston **75** causing member **70** to be lowered until flange **72** engages shoulder **66**. This condition is seen in FIGURE 4. The flange or head **77** flexes to cover the space between shoulder **66** and flange **72** blocking flow through notches **74** thereby preventing any discharge through spout **42** while the spray outlet is open preventing drip from the spout or a siphon through the spray.

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 included within the scope of the appended claims.

I claim:

1. A transfer valve comprising: fixed means forming an annular chamber having two outlets and one inlet, a resilient check valve surrounding said inlet, said check valve closing said inlet in its relaxed state and being resiliently opened by flow from said inlet, a cage-like member movable in said chamber, an annular piston on said member movable in response to pressure in said chamber, and a flexible element on said check valve adapted to flex and close off flow to one of said outlets upon movement of said member in said chamber in response to flow through the other of said outlets.

2. A transfer valve comprising: fixed means forming an annular chamber having two outlets, means forming a second chamber within said annular chamber, ports intercommunicating said chambers, a resilient check valve in said first mentioned chamber covering said ports in its relaxed state and being resiliently opened by flow from said ports, a cage-like member movable in said first mentioned chamber, an annular piston on said member movable in response to pressure in said first mentioned chamber, and a flexible element on said check valve adapted to flex and close off flow to one of said outlets in said first mentioned chamber upon movement of said member in said chamber in response to flow through the other of said outlets in said first mentioned chamber.

3. A transfer valve comprising: fixed means forming an annular chamber, means forming a ported inlet for said chamber, a pair of outlets from said chamber, a valve element supported on said inlet forming means, a flexible flap on said valve element covering said ported inlet, said flap closing said ported inlet in its relaxed state and being opened by flow therefrom, a cage-like member in said chamber, a piston on said member movable in response to pressure in said chamber, and a pair of opposed shoulders formed on said valve element, a portion of said member projecting between said shoulders and limiting movement of said member in said chamber.

4. A transfer valve comprising: fixed means forming an annular chamber, means forming a ported inlet for said chamber, a pair of outlets from said chamber, a valve element supported on said inlet forming means, a flexible flap on said valve element covering said ported inlet, said flap closing said ported inlet in its relaxed state and being

opened by flow therefrom, a cage-like member in said chamber, a piston on said member movable in response to pressure in said chamber, a pair of opposed shoulders formed on said valve element, a flange on said member fitting between said shoulders limiting movement of said member in said chamber and notches in said flange permitting flow therethrough when contacting said shoulders.

5. A transfer valve comprising: fixed means forming an annular chamber, means forming a ported inlet for said chamber, a pair of outlets from said chamber, a valve element supported on said inlet forming means, a flexible flap on said valve element covering said ported inlet, said flap closing said ported inlet in its relaxed state and being opened by flow therefrom, a cage-like member in said chamber, a piston on said member movable in response to pressure in said chamber, a pair of opposed shoulders formed on said valve element, a portion of said member projecting between said shoulders and limiting movement of said member in said chamber, and a flexible portion on said valve element blocking flow between said shoulders and said member by flexing in response to flow through one of said outlets.

6. A transfer valve comprising: fixed means forming an annular chamber, means forming a ported inlet for said chamber, a pair of outlets from said chamber, a valve element supported on said inlet forming means, a flexible flap on said valve element covering said ported inlet, said flap closing said ported inlet in its relaxed state and being opened by flow therefrom, a cage-like member in said chamber, a piston on said member movable in response to pressure in said chamber, a pair of opposed shoulders formed on said valve element, a flange on said member fitting between said shoulders limiting movement of said member in said chamber, notches in said flange permitting flow therethrough when contacting said shoulders and a flexible portion on said valve element blocking flow through said notches in response to flow through one of said outlets.

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