March 29, 1949. F. SONNTAG 2,465,404

VALVE AND SCREEN

Filed Feb. 20, 1947

Fig 1

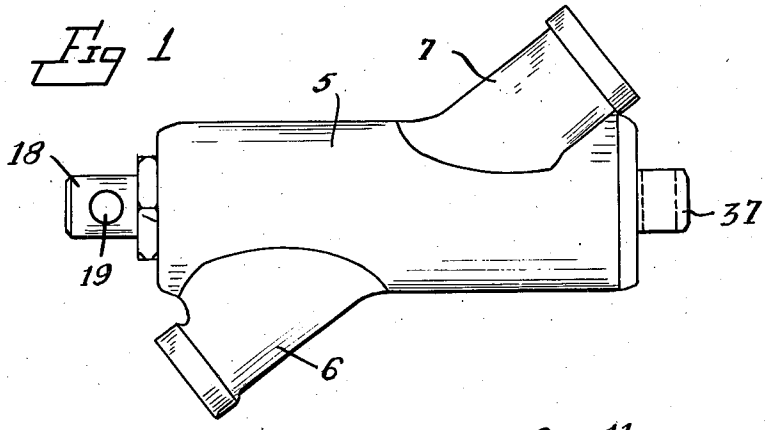


Fig 2

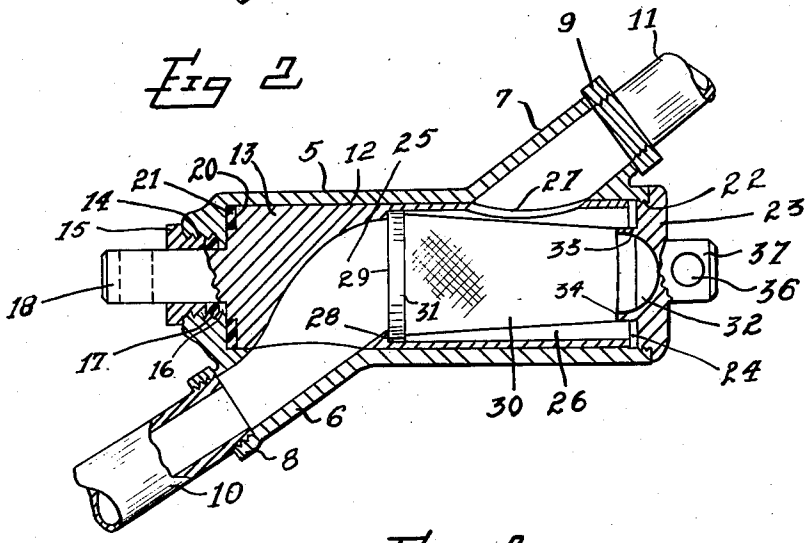
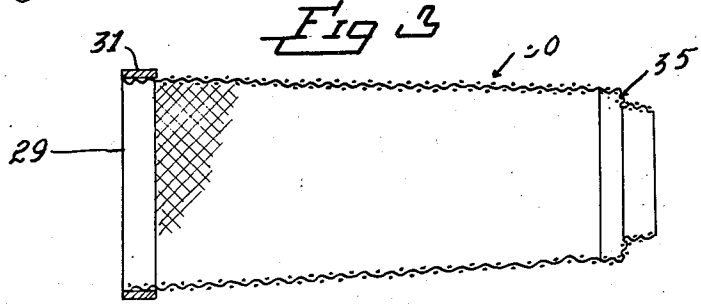


Fig 3



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VALVE AND SCREEN

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2 Claims. (Cl. 210—166)

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My present invention relates to improvements in a valve and screen.

The invention is particularly applicable to sprinkler systems such as are used in irrigation where water is pumped from a suitable source through distributing pipes to a series of sprinkler heads. In such devices the water may contain considerable material that, if allowed to flow to the sprinkler heads, would clog or wear them unduly. It is essential, therefore, to have some sort of screen in the liquid distribution system by which the flow of water can be strained to remove the damaging particles. The screen necessarily has to be relatively fine mesh in order to remove fine particles of sand and the like and must, therefore, have a substantial surface exposed to the flow of water in order not to retard the flow unduly. It is also essential to have the screens so mounted that they can readily be removed and cleaned or replaced without delay. In the valves where the sprinkling is done, one screen may serve a number of sprinklers and difficulty would arise if there were any outer leakage in the screen mounting when the screen is removed for cleaning and replacement.

According to my invention I provide a combination valve and screen which is so arranged as to offer a minimum impedance to the flow of water through the pipes. This valve and screen unit is so constructed that the inlet and outlet ports of the valve are both shut off easily to eliminate any flow of liquid while the screen is being cleaned and replaced.

It is also a purpose of my invention to provide a novel valve and screen combination wherein the valve body is closed at one end by a cap which carries the screen and holds it in operating position. The construction is such that the valve itself and the screen both are removable through one end of the valve body.

The novel features that I consider characteristic of my invention are set forth with particularity in the claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will be understood from the following description of a preferred form of the invention which is also illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a view in side elevation of my improved valve and screen;

Figure 2 is a longitudinal sectional view through the valve and screen illustrating the interior construction thereof;

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Figure 3 is a detailed view of the screen showing how it is constructed for mounting on the valve cap.

Referring now to the drawings, my invention is embodied in a valve 5, which comprises an elongated cylindrical body with an inlet nipple 6 and outlet nipple 7 formed integrally with the body and directed at an acute angle with respect to the axis of the body. The nipples 6 and 7 are threaded as indicated at 8 and 9 for connection to pipes 10 and 11. The valve body preferably is made of a suitable casting such as, for example, brass.

The body 5 is machined on its interior to provide a chamber 12 in which the valve 13 is fitted. At one end of the body a threaded aperture 14 is provided to receive a packing gland 15. The body 5 has a seat at 16 for a packing ring 17 of the gland. A valve stem 18 extends through the gland and is provided with a transverse aperture 19. An offset portion 20 of the valve 13 also provides space for mounting a second packing ring 21.

The valve body 5 is threaded as illustrated at 22 at the end opposite the stem 18 to receive a cap 23. The valve 13 extends substantially to the cap 23 leaving a small space 24 between the valve and the cap 23.

The valve 13 has a passage 25 formed therein and adapted when the valve is properly positioned to align with the inlet nipple 6. Beyond passage 25 toward the cap 23 the valve has a cylindrical chamber 26. The valve wall is cut away at 27 to form an outlet from the chamber 26 to the nipple 7. A shoulder 28 is formed within the valve at the junction of the passage 25 and the chamber 26. This shoulder forms a stop for the open end 29 of an elongated screen cup 30. This screen cup has a band 31 of metal at its open end. The other end of the screen is fitted into a depression 32 of the cap 23. This depression is substantially semi-spherical, a flange 33 being formed on the cap to receive the screen and to provide a shoulder at 34 where the inturned screen wall 35 rests. The screen is attached to the cap 23 by soldering it in place or by some other suitable mounting.

It will be noted that the screen 30 tapers from the open end 29 to the cap 23 and that it is spaced throughout its length from the wall of the chamber 26 so that water flowing through the screen will have ample space to pass around the screen to the outlet nipple 7. When the cap 23 is put in place it holds the screen 30 in the chamber 26 and against the shoulder 28 and permits

the valve 13 to be turned to bring the passage 25 and the outlet 27 into or out of alignment with the nipples 6 and 7, respectively. The relative positions of the passage 25 and the outlet 27 are such as to offer minimum impedance to the flow of water through the valve. The screen will, of course, collect the foreign matter in the water and the foreign matter may be washed toward the depression 32 so as to interfere as little as possible with the direct flow of water through the screen. When it is necessary to remove the screen for cleaning or replacement the cap 23 is unscrewed by inserting a suitable rod in an opening 36 which is provided in a stem 37 found on the cap.

The operator, before removing the screens will give the valve 13 a one-half turn so as to move the passage 25 into position where its inlet end faces, and is sealed by, the wall of the shell 5 diametrically opposite the nipple 6 and the outlet 27 into position to face and be sealed by the wall of the shell 5 diametrically opposite the nipples 6 and 7, respectively. This effectively seals both nipples so that liquid will be shut off and cannot escape through the valve from either of the pipes 10 or 11. This also permits complete cleaning of the interior of the valve 13 so that when the screen 30 is returned to position there will be no escape of foreign matter to the pipes 11.

The construction just described provides a simple effective valve and screen combination for use in irrigation sprinklers. The operator of the sprinkling system can check the screens and clean them at any time without having a quantity of water flow out from the discharge or supply pipes. He need not turn off the supply of water to the valve body and as soon as the screen is cleaned and replaced the flow of water is restored by returning the valve 13 to its operation position. It is believed that the nature and advantages of my invention will be clearly understood from the foregoing description.

Having thus described my invention, I claim:

1. A combination valve and screen adapted for use in irrigation sprinkler systems and the like, comprising an elongated tubular valve body having oppositely disposed inlet and outlet nipples thereon, said nipples being spaced apart longitudinally of the body and directed at an acute angle with respect to the axis of the valve body, one end of said valve body being open, the other end thereof being provided with a valve stem opening and a packing gland around said opening, a valve rotatable in said body and having a stem extending through said opening and gland, said valve having an inlet passage the inlet end of which is at the surface of the valve and in registration with the inlet nipple opening through the valve body, said valve having a cylindrical chamber into which said passage opens, the chamber being open toward the open end of the valve body and the valve having an outlet opening from the chamber registering with the outlet nipple opening, the valve being rotatable in the body to shut off both the inlet and the outlet nipple openings of the body, a closure for the open end of the valve body, and a tubular screen having an open end seated in the bottom of said chamber and surrounding the discharge end of said passage, the other end of said screen being seated on said closure.

2. A combination valve and screen adapted for use in irrigation sprinkler systems and the like, comprising an elongated tubular valve body having oppositely disposed inlet and outlet nipples thereon, said nipples being spaced apart longitudinally of the body, one end of said valve body being open, the other end thereof being provided with a valve stem opening, a valve rotatable in said body and having a stem extending through said stem opening, said valve having an inlet passage the inlet end of which is at the surface of the valve and in registration with the inlet nipple opening through the valve body, said valve having a cylindrical chamber into which said passage opens, the chamber being open toward the open end of the valve body and the valve having an outlet opening from the chamber registering with the outlet nipple opening of the valve body when the inlet passage registers with the inlet nipple opening, the valve being rotatable in the body to shut off both the inlet and the outlet nipple openings of the body, said valve having an annular shoulder at the inner end of said chamber around the discharge end of said passage, a tubular screen having an open end seated on the shoulder, and a cap threaded to the open end of said body and engaging the other end of the screen to hold it against the shoulder.

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