

Feb. 5, 1935.

B. BOHNENBLUST

1,990,423

VALVE

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Fig. 1.

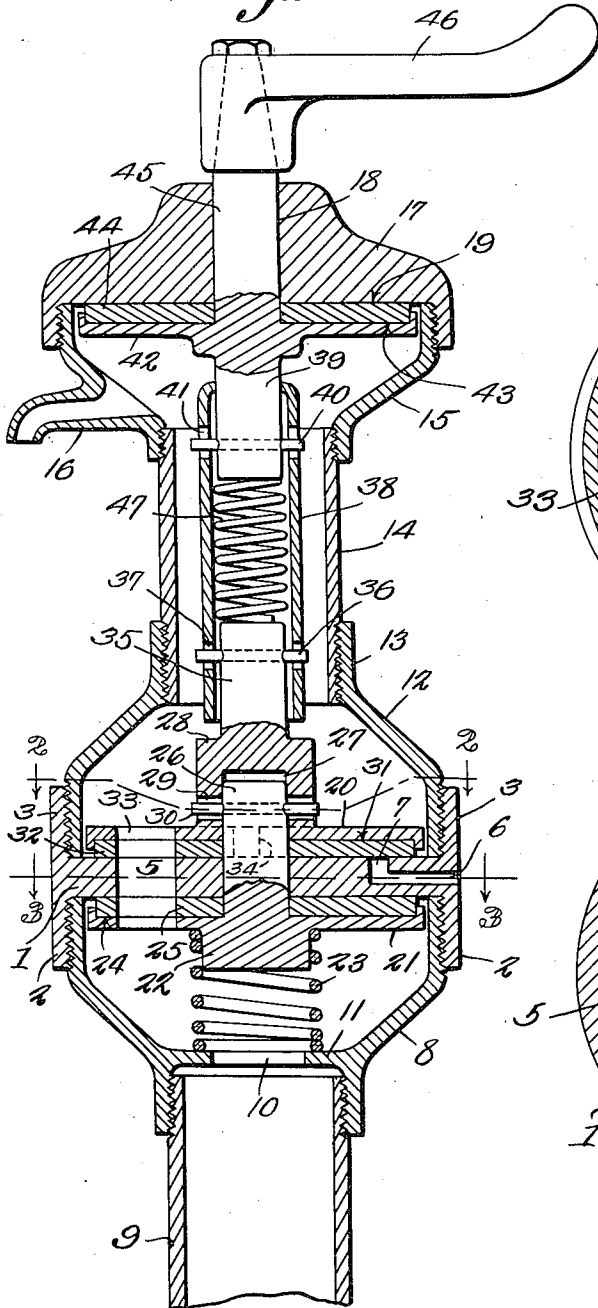


Fig. 2.

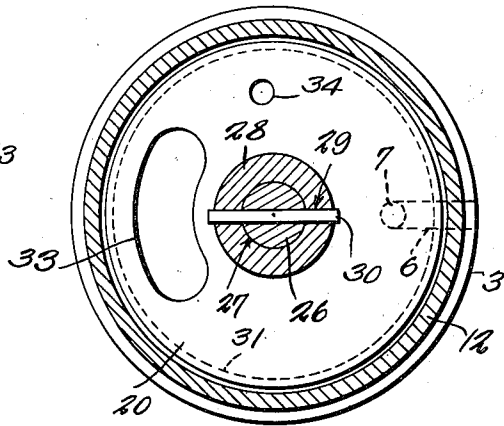
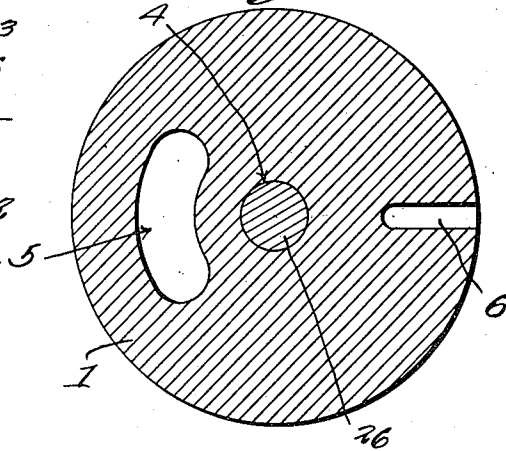


Fig. 3.



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UNITED STATES PATENT OFFICE

1,990,423.

VALVE

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Application August 26, 1933, Serial No. 686,971

1 Claim. (Cl. 251—89)

This invention relates to a valve for use in shutting off steam, water, or other fluid under pressure, one of the objects being to provide a simple and efficient valve which does not require the use of packing and will remain tight under all pressures.

Another object is to provide a valve the working parts of which will compensate automatically for wear.

A still further object is to provide a structure which does not require the use of screws or threads on the working parts, will not stick or corrode from lack of use and can be easily operated.

Another object is to provide a valve which will drain when closed and which can be used on hydrants, or other water outlets, on steam and hot water systems, and wherever a tight and efficient valve is desired to afford a positive cut-off.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claim, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

In the accompanying drawing the preferred form of the invention has been shown.

In said drawing:

Figure 1 is a vertical section through the valve.

Figure 2 is a section on line 2—2, Figure 1.

Figure 3 is a section on line 3—3, Figure 1.

Referring to the figures by characters of reference 1 designates the disk-like valve seat having flat opposed faces and provided with oppositely extending annular flanges 2 and 3 which are internally screw-threaded. This seat is provided with an opening 4 at its center and with an arcuate slot 5. A short bore 6 extends radially into the seat at a point diametrically opposite the center of the slot 5 and this bore communicates with a small port 7 opening through the top surface of the seat. The port and bore constitute a drain for the valve.

Secured to the threaded lower flange 2 is the lower casing section 8 which engages a supply pipe 9 and has an entrance port 10 surrounded by a seat 11.

Secured to the threaded flange 3 is the upper section 12 of the valve casing. This section has a tubular extension 13 connected by a tubular housing 14 to the bottom portion of an outlet

casing 15. This outlet casing is provided with a discharge member which can be in the form of a spout 16 or the like, and the top of the casing 15 is closed by screw cap 17. A central opening 18 extends through this cap and the bottom of the cap presents a smooth flat surface indicated at 19.

The valve per se includes an upper member 20 located above seat 1 and a lower member 21 located below the seat. The lower member has a central depending boss 22 projecting into one end of a coiled spring 23 the other end of which engages the seat 11. A shallow recess 24 is provided in the member 21 and fitted snugly in this recess is a valve disk 25 of hard fiber or any other suitable substance adapted to fit snugly against the adjacent smooth flat surface of the seat 1.

A stud 26 is extended from the center of member 21 through disk 25 and opening 4. This stud has its upper end located in a socket 27 extending upwardly through the center of the member 20 and into a hub 28 made integral with said member 20. Radial slots 29 are provided in the wall of the hub and receive a coupling pin 30 which extends through stud 26. Sufficient play is allowed between the pin and the ends of the slots, and between stud 26 and the end of socket 27 to permit limited relative longitudinal movement of the stud 26 and hub 28. Member 20 has a shallow recess in one face as shown at 31 and in this recess is snugly seated a disk 32 of hard fiber or the like adapted to fit tightly upon the flat top surface of seat 1. Obviously stud 26, pin 30 and hub 28 constitute a coupling whereby independent rotation of the valve members 20 and 21 is prevented. Both valve members have arcuate slots 33 adapted to register with slot 5 when the valve is open, it being understood that these slots also extend through the fiber disks. A drain port 34 is provided within member 20 and its disk and is adapted to register with port 7 when the slots are out of register.

A stud 35 is extended upwardly from hub 28 and has a coupling pin 36 extending diametrically therethrough into slots 37 formed within the lower portion of a coupling sleeve 38. Stud 35 extends into the lower end of this coupling sleeve. Another stud 39 extends downwardly into the upper end of the sleeve and has a coupling pin 40 extending therethrough into opposed slots 41 within the sleeve. This stud is carried by and depends from the center of a sealing disk 42. A recess 43 is provided in the disk and snugly seated therein is a disk 44 of fiber or the like adapted to fit tightly against the surface 19 of cap 17.

A stem 45 projects upwardly from the center of disk 42 and is rotatable in the opening 18. To the outer end of this stem is secured a suitable handle 46 by means of which the valve can be manipulated.

The pressure of disk 44 against surface 19 and of disk 32 against seat 1 is maintained by a coiled spring 47 located in sleeve 38 and exerting a constant pressure against the respective studs 35 and 39.

When the valve is open the parts are positioned as illustrated in Figure 1 and steam, air, water or other fluid thus can flow freely from pipe 9 through the casing to the outlet 16. By giving the valve a quarter turn so as to move slots 33 out of register with slot 5, port 34 will be brought into register with port 7. Thus fluid entering the casing from pipe 9 will be shut off from the outlet and any fluid contained in the upper portion of the casing will be free to drain therefrom.

While the valve is closed spring 23 holds disk 25 tightly against its seat and spring 47 holds disk 32 tightly against its seat. Thus leakage of fluid through slot 5 will be prevented. It might be stated that the pressure exerted by spring 23 will be augmented by the pressure of the restrained fluid against member 21. While the valve is open leakage of fluid through cap 17 by way of opening 18 will be prevented by disk 44 which is not only pressed against its seat by spring 47 but also by the force of the fluid within the upper portion of the casing.

As the valve members 20 and 21 and the disk 42 are shiftable relative to each other while coupled together, they will automatically compensate for

wear upon the disks 25, 32, and 44. As the several parts of the casing can be detached readily, the said disks if worn, can be replaced easily with new ones.

What is claimed is:

A valve including a casing, a multifaced seat extending thereacross provided with separate ports, upper and lower disks constituting valve members, means upon the disks for engaging the respective faces of the seat to prevent leakage between the disks and seat, a stem projecting from one of the disks and slidable and rotatable within the seat and the other disk, a spring for holding the disk of the stem pressed yieldingly toward the seat, a hub on the other disk housing and slidably engaged by the stem, detachable means extending through the stem and hub for holding them against relative rotation without interfering with their relative sliding movement, a stud on the hub, a second stem rotatable in one end of the casing, means for rotating the second stem, a spring interposed between said second stem and stud, a sealing disk rotatable with said second stem and bearing against the casing to seal the bearing within which the second stem is mounted, said spring constituting means for holding said sealing disk and the hub carrying disk yieldingly in sealing positions, a sleeve extending around and slidably engaging said second stem and the stud and housing the spring therebetween, and detachable means extending through said second stem and stud for holding them and the sleeve against relative rotation without interfering with their relative sliding movement.

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