J. G. KING.

STOP OR WASTE COCK.

APPLICATION FILED SEPT. 27, 1920.

1,398,329.

Patented Nov. 29, 1921.

Fig. 1.

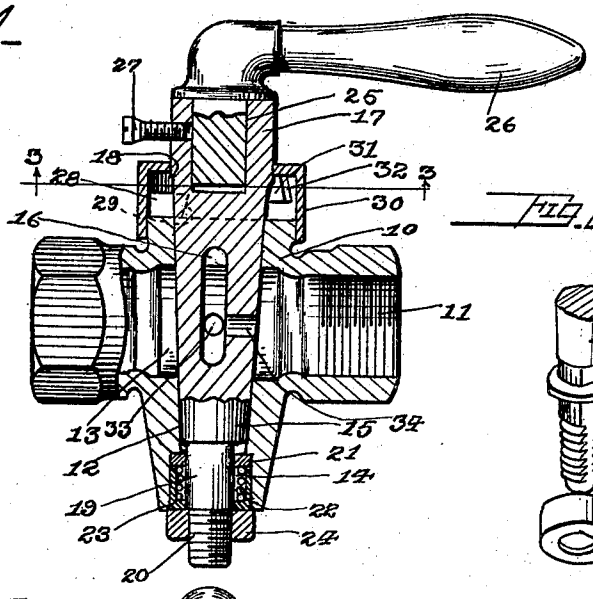


Fig. 7.

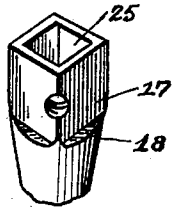


Fig. 8.

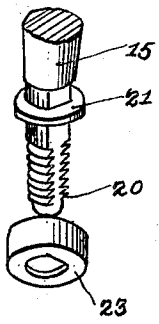


Fig. 2.

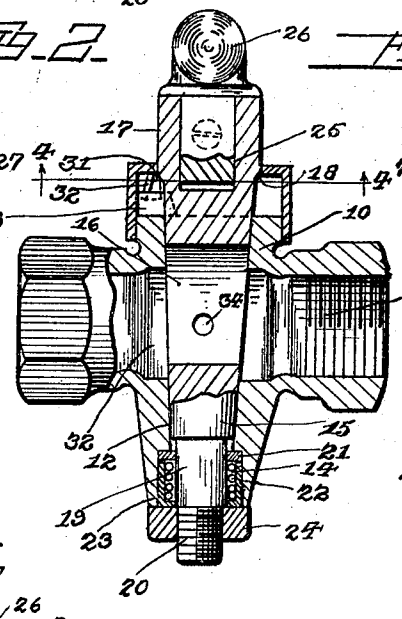


Fig. 3.

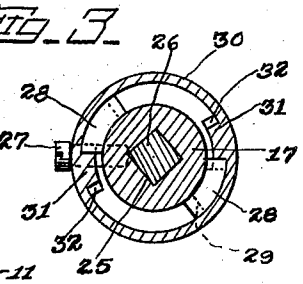


Fig. 6.

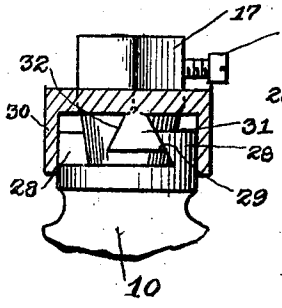


Fig. 5.

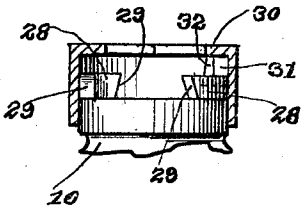
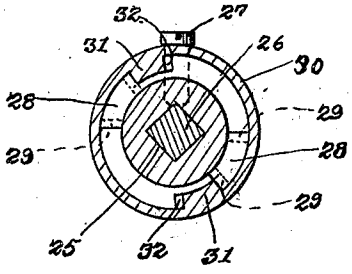


Fig. 4.



Inventor

J. G. King.

By Watson E. Coleman

Attorney

UNITED STATES PATENT OFFICE.

JOHN GRANVILLE KING, OF PINE BLUFF, ARKANSAS.

STOP OR WASTE COCK.

1,398,329. Specification of Letters Patent. Patented Nov. 29, 1921.

Application filed September 27, 1920. Serial No. 413,004.

To all whom it may concern:

Be it known that I, JOHN GRANVILLE KING, a citizen of the United States, residing at Pine Bluff, in the county of Jefferson and State of Arkansas, have invented certain new and useful Improvements in Stop or Waste Cocks, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to rotatable valves such as are used in stop cocks, waste cocks, faucets, and under other circumstances and for other purposes, and particularly to that form of valve wherein a valve pin or core constituting the valve proper passes through the valve casing and is rotatable through a quarter of a circle to permit the flow of liquid through the casing or cut it off.

The general object of my invention is to improve upon valves of this character by the provision of a spring urging the tapered valve core downward against its seat, and the provision of means whereby when the valve is fully turned over to its off or its on position, the valve is held positively to its seat.

A further object is to provide a construction of this character wherein the spring which urges the valve core to its seat is inclosed within a recess or shield through which the core passes, this spring inclosing chamber or recess being closed by a cap fitting over the spring and working inside the shield, thus preventing the accumulation of dirt within the spring chamber and further acting to eliminate all friction on the spring when the valve is operated.

A further object is to provide a valve of this construction which has a $\frac{1}{8}''$ "draw" and which is so constructed as to permit the core to move downward $\frac{1}{8}''$ to compensate for wear in the main body of the valve.

And a further object is to provide means engaged with the valve core and adapted to engage with the valve casing or body which, when the valve is turned fully off or fully on, will wedge the valve downward against its seat, holding the valve rigidly against knocks or jars when under pressure.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a vertical sectional view through a stop cock constructed in accordance with my invention showing the valve closed;

Fig. 2 is a like view to Fig. 1 showing the valve open;

Figs. 3 and 4 are sections on the lines 3—3 and 4—4 of Figs. 1 and 2 showing the valve closed and opened respectively.

Fig. 5 is a fragmentary elevation partly in section of the upper end of the valve and cap;

Fig. 6 is a sectional view of the upper end of the valve and cap showing the coacting lugs;

Fig. 7 is a fragmentary perspective view of the upper end of the core; and

Fig. 8 is a fragmentary perspective view of the lower end of the core and the washer and cap.

Referring to these drawings, it will be seen that I have illustrated my invention as applied to a combined stop and waste cock, and in these drawings 10 designates the body or casing of the stop cock or waste cock or the body or casing of the valve, which is formed to provide two alined interiorly screw-threaded portions 11, the tapering bore 12 intersecting the valve body and the vertically elongated ports 13 leading from this bore into the alined portions 11. The bore at its lower end is enlarged, as at 14, to form a spring chamber, as will be later stated.

The valve core 15 is tapering for the greater portion of its length and is provided with the usual diametrically extending slot 16 adapted in one position of the valve to register with the ports 13. The upper end of the core of the valve proper is formed with a square head 17, the sides of which are less in width than the diameter of the core so as to leave shoulders 18 at the junction of the squared portion 17 with the body of the valve core.

The lower end of the valve core below the tapering portion has a preferably uniform diameter for a distance, as at 19, and below this has a reduced screw-threaded portion 20. The portion 19, which forms the stem of the core, extends down into the chamber 14 and, of course, is smaller in diameter than the interior diameter of this chamber so that a washer 21 may be disposed at the inner end of the chamber, a coiled compression spring 22 disposed within the chamber and bearing against said washer,

and so that a cap 23 may be disposed over the screw-threaded portion of the valve stem and extend into the chamber and bear against said spring.

The stem portion 19 is flattened on one side, and the washer fits this flattened portion so as to rotate with the stem. Exteriorly of this cap, a nut 24 is engaged with the screw-threaded portion 20 of the core, so as to force this cap inward. The spring, of course, bears against the cap and this, through the nut 24, causes a pull to be exerted on the valve core, drawing it against the tapered seat. This cap 22 has an aperture through it, having a flat side which fits the flat side of the stem portion 19 so that the cap also rotates with the stem portion 19. This construction causes the washer, the spring and the cap to rotate together when the stem rotates. When the valve is new, the nut 24 preferably abuts the lower end of the casing and combines therewith to close the chamber and prevent the entrance of dirt and dust to the same.

The squared head 17 of the core is preferably hollow or formed with a socket 25 in which fits a handle 26 held in place by a set screw 27. I do not wish to be limited to this, however. The upper end of the valve body 10 above the portions 11 is formed with two diametrically opposite lugs 28. Each of these lugs on its opposite face is downwardly and inwardly beveled or inclined, as at 29. Fitting over the squared head 17 of the valve core and extending downward over these upwardly projecting lugs 28 is a cap 30 having a square opening in its upper end which fits the square head 17 and having on its inside face the two diametrically disposed lugs 31 which, as illustrated in Fig. 6, are also formed with inclined faces 32 which are complementary to the inclined faces 29 of the lugs 28. When the valve core is in its middle position, that is neither fully closed nor fully open, these lugs 31 are disposed between the lugs 28, but when the valve core is turned to fully close the ports 13 or fully open these ports, the beveled faces of the lugs 32 will engage the reversely beveled faces of the lugs 28. The action on these bevel faced lugs 28 and 31 is to exert a downward pull upon the cap 30 when the valve core has been turned to either a fully opened or fully closed position and the cap 30, bearing against the shoulders 18, forces the valve core 15 downward as much as is permitted by the taper of the seat, thus relaxing the tension on the spring 22 and at the same time stopping the further movement of the valve and further locking the valve in its turned rotated position and holding the valve core rigidly against knocks or jars.

It will be seen from Fig. 1 that the valve core is so formed that it has a certain amount of "draw" at the lower end, that is that it may move downward a certain amount, as for instance $\frac{1}{8}''$, while the cap 30 is also so made as to allow the core to move downward $\frac{1}{8}''$ and still remain tight against the sloping lugs 31. Obviously, therefore, the more the valve wears, the tighter it locks when on or off, and obviously the opening 16 has sufficient length as to permit this $\frac{1}{8}''$ movement of the valve for wear. When this valve is turned half way off or half way on, the cap 30 is loose, but when it is turned all the way off or all the way on, the cap locks against the lugs 31 and is rigid.

I have illustrated my improvement as applied to a waste cock, that is the valve body 10 is formed with an aperture 33 which, when the valve is turned fully off, communicates with a port 34 in the valve core. This aperture 33 may be closed by a plug under normal circumstances, and this plug opened to drain the pipe line to which the valve is connected in front of the valve. It will be understood, of course, that the aperture 34 extends to the hollow interior of the valve core. It is, therefore, obvious that my improvement is applicable to stop and waste cocks or to stop cocks not provided with the drainage opening disclosed.

In actual use, a cock constructed in accordance with my invention has been found to wear about $\frac{1}{32}''$ in something over a year, but due to the provision of the lugs above described and the spring, there was no seeping or leakage during this period. The average cock or valve of this type without my improvements thereon lasts about twelve weeks in constant use and then will start to seeping or leaking.

While I have shown this device as particularly applied to a stop and waste cock, it will be understood that it may be also applied to rotary valves not of this exact class.

I claim:—

1. A valve of the character described comprising a valve casing having a tapering valve seat, a tapering valve core fitting said seat, a spring operatively engaging the lower end of the core and urging the valve core downward in the seat, the upper end of the valve casing being formed with an upwardly projecting lug having an undercut beveled end face, and a cap engaging over the valve core and rotating therewith, the valve core being provided with a shoulder upon which the cap rests, said cap inclosing the lugs on the valve casing and being provided with an inwardly projecting lug having one end beveled to engage with and wedge beneath the undercut beveled face of the lug on the valve casing whereby to urge the valve core downward in the valve casing when the valve is turned to one position and the lugs engaged.

2. A valve of the character described comprising a valve casing having a tapering

valve seat, a tapering valve core fitting said seat, a spring operatively engaging the lower end of the core and urging the valve downward in the seat, the upper end of the valve casing being formed with diametrically disposed, upwardly extending lugs, the opposite face of each lug being undercut and beveled, and a cap fitting over the upper end of the valve core and over said lugs, the valve core being provided with a shoulder upon which the cap rests, said cap on its inner face being provided with diametrically disposed, downwardly projecting lugs, the end edges of which are beveled to have wedging engagement with the beveled faces of the lugs on the valve casing to thereby urge the valve core downward when it is turned to either its fully open or fully closed position.

3. A valve of the character described comprising a valve body having diametrically disposed ports and a tapering valve seat, a tapering rotatable valve disposed in the valve seat, a spring operatively engaging the lower end of the valve and urging it downward against the valve seat, the upper end of the valve being formed with a many-sided, upwardly projecting portion and with shoulders at the junction of this many-sided portion with the valve core, the upper end of the valve casing being provided with diametrically disposed, upwardly projecting lugs, the opposite faces of each lug being undercut and beveled, a cap having a many-sided opening fitting over and having engagement with the many-sided portion of the valve core, the inside of the cap being formed with diametrically disposed projections adapted to have wedging engagement with the undercut beveled faces of the lugs when the valve is fully turned in one direction or the other, and a screw entering the many-sided portion of the valve core and holding the cap against upward movement.

4. In a valve, a valve casing having a tapering valve seat, the lower portion of said valve seat being diametrically enlarged to form a chamber, a tapering valve resting on the valve seat, the lower end of the valve core being reduced and extending to said chamber, the extremity of the valve core being screw-threaded, a washer disposed within the chamber and surrounding the reduced stem of the valve, a coiled spring disposed against the washer and within said chamber, a cap fitting loosely within the chamber and against which the coiled spring bears, and a nut on the screw-threaded portion of the stem engaging said cap.

5. A valve of the character described comprising a valve casing having a tapering seat and diametrically disposed ports, the lower end of the valve casing being interiorly enlarged to form a chamber, the upper end of the valve casing being formed with diametrically disposed, upwardly projecting lugs, the opposite end faces of the lugs being undercut and beveled, a tapering valve core disposed within the valve seat and having a diametrically extending port longer than the ports in the valve casing, said valve core being reduced at its lower end to form a stem, the extremity of the stem being screw-threaded, a spring disposed within said chamber and surrounding the stem, a cap disposed within the lower end of the chamber and bearing against the stem, a nut on the screw-threaded end of the stem and bearing against the cap, the valve core being provided at its upper end with a many-sided, upwardly projecting portion, a cap having a many-sided aperture engaging the many-sided portion of the valve core and extending downward over the upper end of the valve casing, the inner face of the cap being provided with diametrically disposed lugs formed with beveled end faces adapted to have wedging engagement with the lugs on the valve casing, the core being formed with a portion upon which the cap rests whereby a downward movement of the cap due to a wedging engagement of its lugs with the lugs on the casing will urge the valve core downward, detachable means for preventing the upward movement of the cap relative to the valve core, and a handle on the valve core.

6. In a valve of the character described, a valve casing having a tapered seat, the small end of the valve casing being interiorly enlarged to form a chamber, a tapered valve inserted in the valve casing and resting against said seat and having a stem extending therefrom through said chamber, the stem being flat on one side, a washer disposed within said chamber and fitting the flattened portion of the stem, a spring disposed within the chamber and bearing against the washer, a cap fitting within the chamber and bearing against the spring, the cap having an aperture flattened on one side to engage the flattened face of the stem, and a nut on the lower end of the stem bearing against said cap.

7. In a valve of the character described, a valve casing, a valve therein formed at its extremity with a reduced stem, the lower end of the valve casing formed to provide a chamber surrounding the stem, a washer disposed within said chamber, a spring disposed within the chamber and surrounding the stem, a cap surrounding the stem and fitting in the open end of the chamber, and a nut engaging the stem and bearing against the cap, the cap and washer being rotatably engaged with the stem.

8. A valve of the character described comprising a valve casing having a tapering valve seat, a tapering rotatable valve disposed on the valve seat, a spring urging the valve downward against the valve seat, and

coacting means mounted on the valve casing and on the valve core acting when the valve is turned in one direction to its fully off position or in the opposite direction to its fully on position to wedge the valve downward against the seat.

9. A valve of the character described comprising a valve casing having a tapering valve seat, a tapering valve core fitting said seat, a spring operatively engaging the valve core and urging the valve downward against its seat, and coacting members mounted on the valve core and on the casing respectively, said members having inclined faces adapted to abut against each other when the valve is turned fully off or fully on and to wedge the valve downward against this seat.

10. A valve of the character described comprising a valve casing having a tapering valve seat, a tapering valve core fitting said seat, a spring operatively engaging the core and urging the valve core downward in the seat, the valve casing being formed with an upwardly extending lug having an undercut beveled end face, the valve core being provided with a member engaging beneath said lug when the valve is turned to a predetermined position, the engagement of said member with the undercut face of the lug acting to urge the valve core downward.

11. A valve of the character described comprising a valve casing having a tapering valve seat, a rotatable valve core fitting said seat, a spring operatively engaging the core and urging the core downward against the seat, the valve casing and core being formed, one with a lug having an undercut beveled face and the other with a lug engageable against said beveled face when the valve is turned to a predetermined position, said engagement causing the valve core to move against its seat.

12. A valve of the character described comprising a valve casing having a tapering valve seat, a tapering valve core fitting said seat, a spring operatively engaging the core and urging the valve core toward its seat, the valve casing and core being formed, one with a pair of undercut beveled lugs and the other with members adapted to engage the beveled faces of said lugs when the valve is turned either to its fully on or its fully off positions to thereby cause the valve to be forced downward against its seat.

13. A valve of the character described comprising a valve casing having a tapering valve seat, a tapering valve core fitting said seat, a spring operatively engaging the core and urging the valve core against the seat, the upper end of the valve casing being formed with an upwardly projecting lug having an undercut beveled end face, the valve core being provided with a downwardly projecting lug having a beveled undercut end to engage with and wedge beneath the undercut beveled face of the lug on the valve casing whereby to urge the valve core downward in the valve casing when the valve is turned to one position and the lug is engaged.

In testimony whereof I hereunto affix my signature.

JOHN GRANVILLE KING