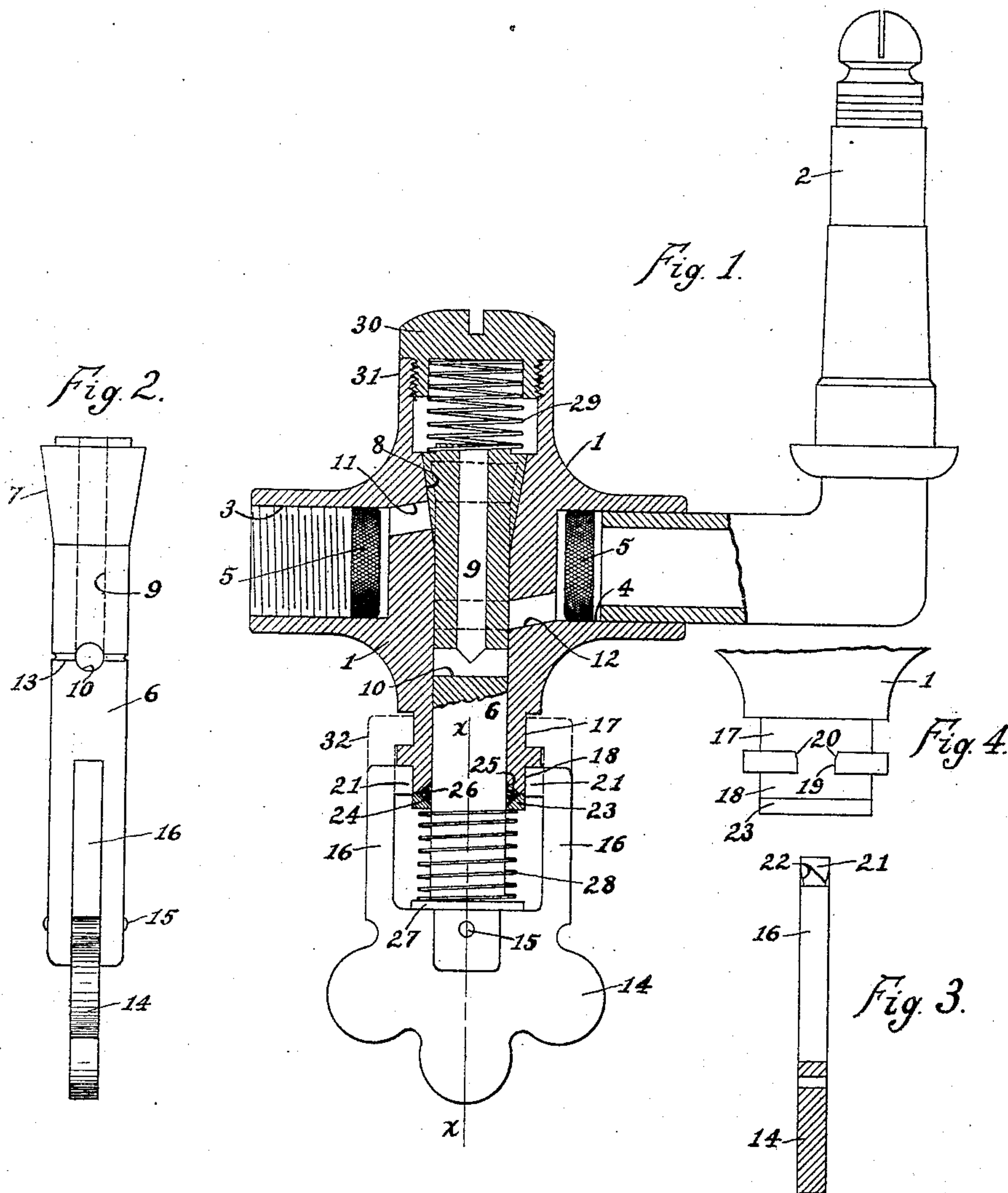


O. R. HASTY.
SAFETY GAS COCK.
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WITNESSES:
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SAFETY GAS-COCK.

No. 931,197.

Specification of Letters Patent.

Patented Aug. 17, 1909.

Application filed June 29, 1908. Serial No. 441,000.

To all whom it may concern:

Be it known that I, OTIS RIDGEWAY HASTY, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Safety Gas-Cock, of which the following is a specification, reference being had to the accompanying drawings, illustrating same.

My invention relates to gas cocks or valves, my principal objects being to provide a safety gas cock which cannot be accidentally turned on after the gas has been turned off; to provide an improved construction in such a gas cock or valve whereby the latter is absolutely tight either when the gas is turned off or on, thereby doing away with any leakage of gas which is so common in ordinary gas cocks; to provide improved means for protecting the valve from dirt or foreign particles, thereby increasing the life of the valve and also its serviceability and efficiency; and to provide such a valve which is positive in action, simple in construction and very efficient.

Other objects will be apparent from the following specification.

It is well known that ordinary gas cocks can be accidentally turned on in various ways when the gas is supposedly shut off, as by something striking or rubbing against the thumb leaf. Such gas cocks are very dangerous.

The gas cock of my present invention is constructed so that it cannot be accidentally turned on after being turned off, by anything striking or rubbing against the thumb leaf, it being necessary to give the thumb leaf an upward movement, or a longitudinal movement, before it can be turned so as to turn the gas on. In the safety position or the shut-off position the thumb leaf may be turned as much as desired without turning on the gas in the least. The advantages of such a gas cock will be readily seen.

In the accompanying drawings illustrating the preferred form of my invention, Figure 1 is a side view of the gas cock or valve of the invention, with portions shown in cross-section to show the interior construction of the valve; Fig. 2 is an edge elevation of the valve plunger and thumb leaf shown in Fig. 1; Fig. 3 is a cross-sectional view of the thumb leaf, taken on line *x x* of Fig. 1, showing the taper on one of the upper arms

of the thumb leaf; and Fig. 4 is a side elevation of the lower portion of the gas cock casing, showing the annular recesses around the lower portion of said casing in which recesses the upper arms of the thumb leaf work, and also showing the tapered passages connecting the said annular recesses.

Like characters refer to like parts in the several figures.

In the drawings, 1 is the valve casing, 2 is the gas jet connected with the valve casing preferably as shown, and 3 is the inlet passage for the valve. In the inlet passage 3 and the outlet passage 4 of the valve casing are placed wire gauze cup-shaped portions 5 5, preferably as shown, to prevent dust, dirt or foreign particles from entering the interior portion of the valve, either from the inlet 3 or from the outlet 4. These wire gauze portions 5 5 are very advantageous in keeping the valve clean and thereby doing away with the ordinary wearing or cutting of the valve. In valves that are out of use for a long time, and in valves that are disconnected from the pipe and kept in a store room for some time, the wire gauze portions 5 5 are very desirable.

Extending transversely through the valve casing 1 is a plunger 6 having its upper end ground with a taper 7 adapted to tightly fit in a ground plunger seat 8 in the valve casing when the valve is shut off. In the top end of the plunger 6 is drilled a hole 9, preferably as shown, to meet a transverse hole 10 in the plunger as shown in Fig. 1. From the inlet passage 3 of the valve casing 1 is drilled a hole 11 to the ground tapered surface 8 of the casing 1. From the outlet passage 4 of the valve casing 1 is drilled a hole 12 to the opening for the plunger 6. When the plunger 6 is seated in the valve casing so as to shut off the gas, the ground tapered surface 7 of the plunger tightly closes the hole 11, and the cylindrical surface of the portion of the plunger below the tapered portion 7 closes the hole 12. When the plunger 6 is raised from its seat to the position shown in dotted lines in Fig. 1, the hole 11 is opened and the hole 10 is moved to the horizontal plane of the hole 12. Now if the thumb leaf is turned lengthwise of the gas pipe to which the valve is connected, the hole 10 in the plunger will register with the hole 12 in the casing

so as to establish an open passage through the valve from the inlet 3 through hole 11, up between the tapered portions 7 and 8 which are now separated, down through the hole 9 in the plunger, through one end of the hole 10, and through the hole 12 to the outlet passage 4. Thus a passage for the gas is provided through the valve to supply the jet 2 with gas when it is desired to burn same.

10 Around the exterior cylindrical surface of the plunger 6 is provided a small groove 13 in the plane of the longitudinal axis of the hole 12, so that when the plunger 6 is in its raised position there will always be a small

15 passage from the hole 10 to the hole 12 in whatever position the plunger 6 may be turned. Thus this small passage or groove 13 always provides an escape for the gas from the valve to the jet 2 when the plunger 6 is in raised position, to keep the gas from being entirely turned out in whatever position the plunger 6 may be turned.

On the bottom end of the plunger 6 is provided a thumb leaf 14 preferably secured to the slotted end of the plunger 6 by a pin 15 as shown. This thumb leaf 14 is provided with two upwardly extending arms 16 16 adapted to fit in the annular recesses 17 or 18 on the lower portion of the valve casing 1 and to be turned around in these recesses 17 and 18 to any desired position. On each side of the lower portion of the valve casing 1 is provided a passage 19 connecting the annular recesses 17 and 18, as shown in Fig. 4, the upper corner portions of these passages 19 being beveled as at 20 and the lower corners of the inwardly extending portions 21 21 of the arms 16 16 being beveled as at 22 so that the end portions 21 21 of the arms 16 16 will readily pass from the annular recess 17 to the annular recess 18.

Around the plunger 6 at the lower end of the valve casing 1 is placed a ring 23 having its upper interior portion beveled as at 24 to register with a beveled portion 25 around the interior portion of the lower end of valve casing 1, to form an annular V-shaped passage for packing 26, preferably an asbestos string. Between the ring 23 and a washer 27 carried by the lower end of the plunger 6 and suitably held in place by the thumb leaf 14 as shown, is placed a coil spring 28 encircling the plunger. This spring 28 is for the purpose of keeping the ring 23 tight against the lower end of the valve casing 1 to press the packing 26 tightly around the plunger 6 and thereby prevent any escape of gas from the lower portion of the gas cock, and also for the purpose of holding the plunger 6 down in the valve seat so that the ground tapered surfaces 7 and 8 tightly fit each other when the inwardly extending portions 21 21 of the

65 arms 16 16 are in the lower annular recess

18 of the valve casing. On the upper end of the plunger 6 is placed another coil spring 29 which is suitably held in place by a cap screw 30 screwed down tightly on the upper portion 31 of the valve casing 1 as shown. This spring 29 also acts on the plunger 6 to force the latter down into the valve seat when the inwardly extending portions 21 21 of the arms 16 16 are turned so that they may be forced through the passages 19 19 in the valve casing from the upper annular recess 17 to the lower annular recess 18.

When the gas cock is turned off, that is, when the gas is completely turned off, the portions 21 21 of the thumb leaf 14 are in the annular recess 18, being held in this position by coil springs 28 and 29. In this position the thumb leaf 14 may be turned around as much as desired without turning on the gas in the least, because the ground tapered portion 7 tightly closes the hole 11 so as to prevent any escape of gas therefrom. When it is desired to turn the gas on, that is, to open the gas cock, the thumb leaf 14 is turned crosswise of the gas pipe so that the portions 21 21 are positioned directly under the passages 19 19, and then the thumb leaf 14 is forced upwardly so that the portions 21 21 pass through the passages 19 19 into the annular recess 17, as shown in dotted lines at 32 in Fig. 1. In this position the gas may be lighted at the jet 2 because an escape for the gas is provided through the valve to the jet 2 by the ground surfaces 7 and 8 being now separated and the annular groove 13 registering with the hole 12, due to the plunger 6 being now in its raised position or in the position shown in dotted lines in Fig. 1. Now if it is desired to turn the gas on full the thumb leaf 14 is turned lengthwise of the gas pipe or to the position shown in dotted lines 32 of Fig. 1, whereupon the hole 10 in the plunger 6 registers with the hole 12 in the valve casing 1 so as to completely open the gas passage through the valve from the inlet 3 to the jet 2.

It will be understood that as the thumb leaf 14 is gradually turned lengthwise of the gas pipe the gas will be gradually turned on, due to the fact that the hole 10 in the plunger 6 gradually comes into alignment with the hole 12 in the casing 1. If it is desired to turn the gas partially off, the thumb leaf 14 is turned in either direction a slight amount, less than 45 degrees, which moves the hole 10 in the plunger 6 partially out of alignment with the hole 12 in the casing 1 and thereby partially closes the gas passage through the valve. If a force is exerted upwardly on the thumb leaf 14 the latter may be turned around as much as desired while the portions 21 21 are in the annular recess 17, without entirely shut-

ting off the gas, due to the annular groove 13 around the plunger 6 which always supplies a small amount of gas through the hole 12 to the jet 2 when the plunger 6 is in its raised position. If it is desired to shut the gas off entirely the thumb leaf 14 is turned crosswise of the gas pipe until the inwardly projecting portions 21 21 are positioned above the passages 19 19 in the valve casing 1, whereupon the coil springs 28 and 29 force the plunger 6 down into the valve seat and the portions 21 21 through the passages 19 19 into the lower annular recess 18 in which position the ground tapered surfaces 7 and 8 tightly fit each other and thereby completely shut off the gas as hereinbefore described. In this latter position, if anything accidentally strikes or rubs against the thumb leaf 14 and turns same it will not turn on the gas in the least because the plunger 6 is not raised by such turning so as to open the valve. The only way the gas can be turned on is to turn the thumb leaf so that the inwardly projecting portions 21 21 may be forced up through the passages 19 19 into the annular recess 17 of the valve casing, and then force said portions 21 21 up into the annular recess 17. It will readily be seen that it would be a hard matter to accidentally move the thumb leaf in this manner so as to accidentally turn on the gas. When the gas is fully turned off the person turning the gas off will be positive that it is completely turned off as soon as the thumb leaf 14 drops down to its lower position, that is, to the position in which the inwardly projecting portions 21 21 rest in the lower annular recess 18, the shut-off action of the valve being very positive. With the ordinary gas cocks the thumb leaf may be turned crosswise of the gas pipe and the gas may be supposedly turned out, but on letting loose of the thumb leaf 14 the gas may be easily turned on, especially if the thumb leaf 14 has a rather free action. This is not the case with the gas cock of this present invention.

With the ordinary gas cocks, leakages are very common, and if the parts are tightened up so as to prevent the leakage they soon wear and become loose, or else the turning on and off of the gas loosens the parts and thus produces leakage. In the gas cock shown in the present invention such leakages are entirely eliminated, there being no chance of a leakage at the top of the valve when the latter is open, if the cap 30 is properly screwed down, or at the bottom of the valve if the packing 26 at the lower portion of the valve is in proper shape. The uniform spring pressure on the plunger prevents the tapered portion 7 thereof from wearing in the valve seat and thus becoming loose, as it would if tightened up by the ordinary screw. This uniform spring pres-

sure consequently lengthens the life of the valve, because it does not cut, gives a tightly closed valve when the plunger 6 is down in the valve seat, and provides a valve which always requires practically the same force to operate the thumb leaf.

I do not wish to limit this invention to all of the exact details of construction herein shown, as many modifications may be made in same without departing from the scope of the appended claims.

What I claim as my invention is:

1. A valve of the character described, having an inlet passage and an outlet passage, a plunger forming an obstruction between the said passages to disconnect same from each other, a passage through a portion of the plunger, means whereby longitudinal movement may be given to the plunger to connect the inlet passage with the passage in the plunger, and whereby the plunger may be then turned to connect the passage therein with the outlet passage.

2. In a valve of the character described, an inlet passage and an outlet passage, a plunger normally closing the said passages, a passage through a portion of the plunger normally disconnected from the said inlet and outlet passages, means for giving the plunger longitudinal movement to connect the said inlet passage and the said outlet passage together through the passage in the plunger, and means whereby now turning the plunger regulates the size of the opening through the valve.

3. A valve of the character described, having a transverse opening therethrough, a portion of which is tapered to form a valve seat, an inlet passage from one end of the valve to the valve seat, an outlet passage from the other end of the valve to the said transverse opening in the valve, a plunger extending through the transverse opening in the valve and having one end thereof tapered to snugly fit the valve seat and thereby close the said inlet passage, the said plunger having a passage therethrough entering the tapered end thereof and extending out of the side thereof, an annular groove around the plunger intersecting the said side opening in same, means for moving the plunger endwise to raise the tapered portion thereof out of the valve seat and connect the said inlet passage through the passage in the plunger and the annular groove around the plunger with the said outlet passage, whereby a small passage is formed through the valve, and means for now turning the plunger to cause the said side opening therein to gradually come into alinement with the said outlet passage whereby the passage through the valve is gradually increased, for purposes substantially as described.

4. A valve of the character described, comprising a valve casing having an inlet

passage and an outlet passage therein, a plunger for connecting the inlet passage with the outlet passage as desired, a pair of annular recesses around the lower portion
 5 of the valve casing and passages connecting the said recesses, a thumb leaf connected with the said plunger and having arms adapted to fit in either of the said annular recesses and to be moved from one of the
 10 said recesses to the other through the said passages connecting the said recesses, whereby the said plunger may be either raised or lowered and turned around in either position, means whereby the plunger must be
 15 raised and then turned in order to open the valve, the said arms of the thumb leaf being then in the said upper annular recess of the valve casing, and a spring member acting on the plunger to automatically lower same
 20 when the thumb leaf is turned so that the arms thereof are permitted to pass through the said passages connecting the said annular recesses of the valve casing, for purposes substantially as described.

25 5. A valve of the character described, having a plunger for opening or closing a passage through the valve as desired, a thumb piece associated with the lower portion of the plunger for operating same, a packing
 30 box around the lower portion of the plunger for preventing any leakage therearound, a coil spring encircling the lower end of the plunger and acting between the thumb piece and the packing box to keep the latter properly
 35 adjusted and to act downwardly on the thumb piece, and another coil spring acting on the top end of the plunger in conjunction with the first mentioned coil spring to automatically lower the plunger when the valve
 40 is closed, substantially as described.

6. A valve having a plug, means for giving the plug a longitudinal and a rotary
 45 movement to open the valve, said means being free to be turned clear around when the valve is closed without tending to open same.

7. A valve having a plunger fitted in a valve seat, mechanism whereby the plunger must be raised out of the seat and then
 50 turned to fully open the valve, and means for giving the plunger such movement, the said means being free to be turned clear around when the valve is closed, without opening same.

8. A valve having a plunger fitted in a
 55 valve seat, a thumb piece attached to the plunger for raising same out of the valve seat and for rotating the plunger, and mechanism whereby the said thumb piece may be freely turned whether the plunger is raised
 60 from the valve seat or seated in the valve seat, for purposes substantially as described.

9. A valve having a plunger, said plunger having an opening therethrough from
 65 one end thereof to the side thereof, means for giving the plunger a longitudinal move-

ment to bring only the opening in the end of the plunger into the valve passage, and means for giving the plunger a separate rotary movement to bring the opening in the
 70 side of the plunger into the valve passage, for purposes substantially as described.

10. A valve having a plunger fitted in a valve seat, an opening through the plunger from one end thereof to the side thereof,
 75 means for raising the plunger out of the seat to connect the inlet passage of the valve with the passage in the plunger at the end of the plunger, and means for now turning the plunger to connect the outlet passage of the valve with the passage in the plunger at
 80 the side of the plunger, whereby the valve is opened.

11. A valve having a plunger fitted in a valve seat, a passage through the plunger from one end thereof to the side thereof,
 85 means for raising the plunger out of the seat to connect the inlet passage of the valve with the passage in the plunger at the end of the plunger, means for now turning the plunger to connect the outlet passage of the
 90 valve with the passage in the plunger at the side of the plunger, whereby the valve is opened, and means for automatically seating the plunger when same is turned to close the valve, for purposes substantially as de-
 95 scribed.

12. A valve having a plunger fitted in a seat, said plunger having a passage there-
 100 through from one end thereof to the side thereof, means for raising the plunger out of its seat and then turning same to open the valve through the passage in the plunger, said means being free to be turned whether the plunger is raised from or lowered into the seat.
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13. A valve having a plunger fitted in a seat, a passage through the plunger from one end thereof to the side thereof, means
 110 for raising the plunger from the seat and for then turning same to open the valve through the passage in the plunger, the said means being free to be turned whether the plunger is raised from or lowered into the seat, and means for automatically lowering the plunger into the seat when it is turned
 115 while in raised position, for purposes substantially as described.

14. A valve having a plunger, means for giving the plunger a longitudinal and a rotary movement for opening the valve, a
 120 packing ring around the plunger and a spring acting thereon to hold same in place, and a second spring acting on the plunger in conjunction with the first mentioned spring whereby the plunger is given a lon-
 125 gitudinal movement when turned to close the valve, for purposes substantially as described.

15. A valve having a plunger fitted in a valve seat, a thumb leaf by means of which
 130

the plunger may be raised out of the seat and turned to open the valve, a packing box near one end of the plunger, a coil spring encircling the plunger and acting between the packing box and the thumb leaf to hold the packing in place, and a second coil spring acting at the opposite end of the plunger to act on same in conjunction with the first mentioned spring whereby the plunger is automatically seated when turned to close the valve, for purposes substantially as described.

16. A valve of the character described having an inlet passage and an outlet passage, a plunger forming an obstruction between the said passages, said plunger having a passage therethrough from one end thereof out opposite sides thereof, means for giving the plunger a longitudinal movement to bring only the opening in the end of the plunger into the valve passage, and means for giving the plunger a separate rotary movement to bring one of the openings in the side of the plunger into the valve passage, for purposes substantially as described.

17. A valve casing having a plunger therein projecting from the casing, annular recesses in the casing around the plunger, a thumb piece connected with the plunger for giving same a longitudinal or a rotary movement, and portions on the thumb piece adapted to extend into the said recesses and to be turned around in one or the other in whatever position the plunger may be placed, for purposes substantially as described.

18. A valve casing having a plunger therein projecting from the casing, a pair of annular recesses in the casing surrounding the plunger, passages in the casing connecting the said recesses, a thumb leaf associated with the plunger for giving same a longitudinal or a rotary movement, said thumb leaf having arms adapted to extend into the said recesses and to pass from one recess to the other through the said passages, the said arms being free to be turned around in either of the said recesses, and means for automatically throwing the said arms from one of the said recesses to the other through the said passages when the thumb leaf is turned to close the valve, for purposes substantially as described.

19. A valve of the character described having a plunger suitably fitted in a seat, means for giving the plunger a longitudinal and a rotary movement for opening the valve, the said plunger being adapted to be turned when seated without tending to open the valve, for purposes substantially as described.

20. A valve having a plug, operating means therefor for giving the plug a longitudinal and a rotary movement to open the valve, and means for automatically giving

the plug a longitudinal movement when the valve is being closed, to place the said operating means in safety position, the latter being free to be turned when the valve is closed without tending to open same.

21. A valve having a plug, means for giving the plug a longitudinal and a rotary movement to open the valve, and means for automatically giving the plug a longitudinal movement when the valve is being closed, to place the plug in safety position, the latter being free to be turned when the valve is closed without tending to open same.

22. A valve having a plug, operating means therefor for giving the plug a longitudinal and a rotary movement to open the valve, and means for automatically giving the plug a longitudinal movement when the valve is being closed, to place the said plug and said operating means in safety position, the said plug and said operating means being free to be turned when the valve is closed without tending to open same.

23. A valve having a plunger seated in a seat, operating means therefor for raising the plunger from its seat and turning it to open the valve, and means for automatically seating the plunger when the valve is being closed, the said operating means being free to be turned when the plunger is seated in its seat, without unseating the plunger.

24. A valve having a plunger seated in a seat, means for raising the plunger from its seat and turning it to open the valve, and means for automatically seating the plunger when the valve is being closed, the said plunger being free to be turned when seated in its seat, without unseating itself.

25. A valve having a plunger seated in a seat, operating means therefor for raising the plunger from its seat and turning it to open the valve, and means for automatically seating the plunger when the valve is being closed, the said plunger and said operating means being free to be turned when the plunger is seated in its seat, without unseating the plunger.

26. In a safety valve, a plug adapted to be placed in a plurality of positions and to be operated in each of the said positions without moving therefrom, means for holding the plug in each of the said positions, and means for automatically moving the plug from one of the said positions to another when the valve is being closed.

27. In a safety valve, a plug and valve operating means adapted to be placed in a plurality of positions and be operated in each of the said positions without moving therefrom, means for holding the plug and valve operating means in each of the said positions, and means for automatically moving the plug and valve operating means from one of the said positions to another when the valve is being closed.

28. In a safety valve, a valve plug fitted in a seat and adapted to be placed in a plurality of positions and to be turned in each position, means for holding the plug in each
5 of the said positions, and means for automatically throwing the plug from one position to another when the valve is being closed.

29. In a safety valve, a plug and valve operating means adapted to be placed in a plurality of positions and to be turned in each position, means for holding the plug and valve operating means in each of the said positions, and means for automatically throwing the plug and the valve operating means from one position to another
15 when the valve is being closed.

30. A valve having a plunger, said plunger having a passage therethrough opening at different portions of the plunger, means
20 for giving the plunger a longitudinal movement to bring only one of the openings of the plunger into the valve passage, and means for then giving the plunger a rotary movement to bring the other opening of the
25 plunger into the valve passage, for purposes substantially as described.

31. A valve having a casing with a fluid conduit therethrough and with a plurality
30 of annular recesses, said recesses being connected by suitable passages, a valve plug, a thumb piece therefor having arms cooperating with the said recesses, whereby said thumb piece may be held in a plurality of
35 positions, said thumb piece in one of the said

positions being incapable of affecting the flow of fluid through the said conduit and being adapted to move the plug to open the fluid conduit when in another of said positions and being adapted to be turned in each
40 of the said positions, and means for automatically throwing the thumb piece from one of the said positions to another when the valve is being closed.

32. A valve having a casing with a fluid
45 conduit therethrough and with a plurality of annular recesses, said recesses being connected by suitable passages, a valve plug, a thumb piece therefor having arms cooperating with the said recesses, whereby said
50 thumb piece may be held in a plurality of positions, said thumb piece in one of the said positions being incapable of affecting the flow of fluid through the said conduit and being capable of affecting the flow of fluid
55 through the said conduit when in another of said positions, and being adapted to be turned in each of the said positions, and means for automatically throwing the thumb piece from one of the said positions
60 to another when the valve is being closed.

As inventor of the foregoing I hereunto subscribe my name in the presence of two subscribing witnesses this 27th day of June, 1908.

OTIS RIDGEWAY HASTY.

Witnesses:

CHAS. E. HASTY,
FREDERICK R. PARKER.