Nov. 12, 1935. G. HERBSTER 2,020,414

GAS COCK

Filed May 10, 1933

Fig. 1A.

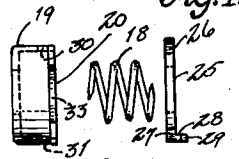


Fig. 1B.

Fig. 1C.

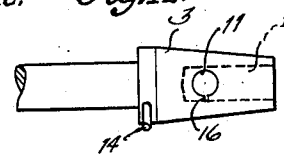


Fig. 1D.

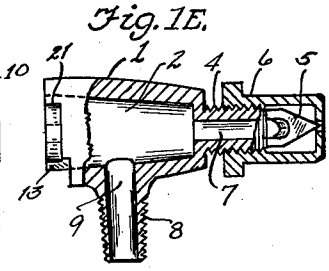


Fig. 1E.

Fig. 2A.

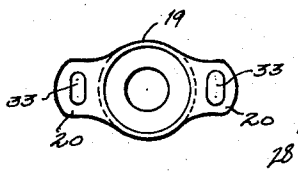


Fig. 2C.

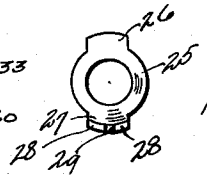


Fig. 2D.

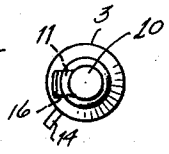
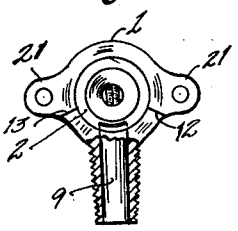


Fig. 2E.



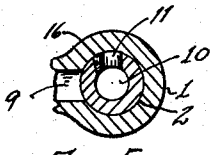
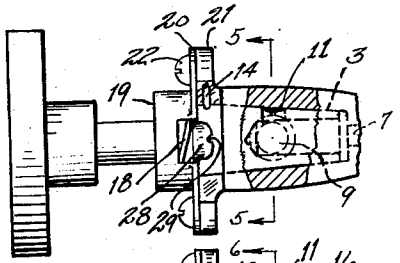


Fig. 5.

Fig 3.



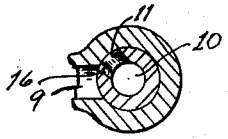
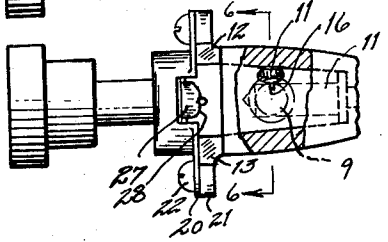


Fig. 6.

Fig. 4



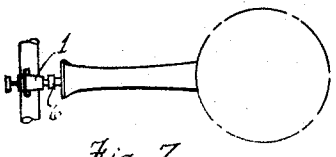


Fig. 7.

Inventor

George Herbster,

Searle & Howard.

By

his Attorneys.

Patented Nov. 12, 1935

2,020,414

UNITED STATES PATENT OFFICE

2,020,414

GAS COCK

George Herbster, Cleveland, Ohio

Application May 10, 1933, Serial No. 670,379

5 Claims. (Cl. 251—163)

This invention relates to gas cocks such as are commonly used for controlling the flow of gas to the service burners of gas ranges and the like and particularly to gas cocks in which a snap action is provided for informing the operator when the plug has been rotated to the proper position for maintaining a simmering flame.

The principal object of the present invention is to provide a gas cock having a simple and economical snap indicating means.

Another object is to provide a gas cock by which the flow of gas to the burner may be varied more gradually and constantly when low flames are maintained at the burner.

Still another object is to provide a snap indicating means for arresting the rotation of the plug in the desired position for maintaining such flame.

Another object is to provide means for adjusting the position of the snap indicating means without dismantling any part of the stop-cock mechanism whereby the indicating means may be set readily to operate for various desired flame intensities.

Other objects and advantages will become apparent from the following specification wherein reference is made to the drawing.

In the drawing:

Figs. 1A and 1D inclusive are respectively side elevations of the cap, spring, locking washer, and plug of a valve embodying the principles of the present invention. Fig. 1E is a side elevation of the valve body, part thereof being shown in section for clearness in illustration. Figs. 2A, and 2C to 2E inclusive are end elevations respectively of the cap, lock washer, plug and valve body illustrated in Figs. 1A to 1E.

Fig. 3 is a bottom plan view of the assembled gas cock showing the plug in cut-off position, part thereof being shown in section for clearness in illustration.

Fig. 4 is a similar view of the gas cock illustrated in Fig. 3 showing the plug in simmering position.

Figs. 5 and 6 are sectional views taken on planes indicated on the lines 5—5 and 6—6 respectively of Figs. 3 and 4.

Fig. 7 is a diagrammatic illustration of the cock in operative position relative to a service burner.

The gas cock comprises a hollow body 1 provided with a tapered axial bore 2 adapted to receive and seat a suitable control plug 3. The body 1 is provided with the usual threaded extension 4 having at its outer end a needle 5, a suitable cap 6, threaded for engagement with the threaded extension 4, being provided and cooperating with the needle 5 for regulating the amount of gas discharged from the body. The extension 4 has an axial bore 7 communicating with the bore 2 and with the interior of the cap 6. The body is also provided with the usual lateral connection 8, threaded for engagement with a gas supply conduit, and having a bore 9 extending laterally from and communicating with the bore 2.

In the form illustrated, the plug 3 has an axial bore 10, and a transverse bore 11, the bore 10 being continuously in communication with the bore 7 and the bore 11 being positioned longitudinally of the plug to pass into communication with the bore 9 in certain rotated positions of the plug. A portion of the body 1 is cut back from the larger diameter end to provide shoulders 12 and 13 and a pin 14 is rigidly secured in the plug 3 and is adapted to abut the shoulders 12 and 13 to limit the rotation of the plug. When the plug 3 is rotated in the bore 2 to move the bore 11 into communication with the bore 9, it is apparent that due to the bores 9 and 11 being circular, the proportion of the bore 11 placed in communication with the bore 9 initially would increase very rapidly upon very slight rotation of the plug toward open position. Consequently, if limiting of the rotation of the plug 3 were relied on for controlling the amount of gas passing to the burner for maintaining a simmering flame, a very delicate adjustment or setting of the plug would be necessary to prevent a substantial variance in the simmering flame each time the plug was moved to this simmering position. Such a delicate adjustment would prove ineffective after slight wear of the plug. In order to overcome this objection and eliminate the need for such adjustment a radial slot 16 is provided in one wall of the bore 11 in position to pass into communication with the bore 9 before the bore 11 has moved directly into communication therewith as the plug is rotated from closed toward open position. The slot 16 is of sufficient size to maintain a substantial simmering flame when it alone is in alignment with the bore 9. Consequently, a slight difference in the rotation of the plug in either direction from the position in which the slot 16 is communicated will change the amount of fuel introduced for maintaining a simmering flame very gradually and constantly in proportion to the amount of rotation.

Referring particularly to Figs. 4 and 6, the position of the plug for maintaining a simmering

flame is illustrated, the bore 9 being designated in Fig. 4 by a dot-dash line.

In substantially all gas cocks, whether discharging axially or laterally, the plug is held seated by a spring which, at one end, bears on the larger diameter end of the plug and is compressed by engagement of its opposite end with a suitable cap. The cap, in turn, is rigidly secured to the body. In the valve herein illustrated, such a spring is indicated at 18 and a cap at 19. The cap 19 is provided with suitable ears 20 and complementary ears 21 are provided on the body, the cap being held in place by screws 22 passing through openings in the ears 20 and into threaded engagement with the ears 21.

In order to provide a snap indicator, a latch washer 25, having a lug 26, preferably extending radially therefrom at one side, and a similar lug 27 also extending radially therefrom and preferably at the opposite side from the lug 26 is provided. The outer end of the lug 27 is formed at an angle to the plane of the washer to provide a lip 28 which, when the cock is assembled, overhangs the outer end of the plug. The lip 28 has formed therein a notch 29, adapted to snugly receive the pin 14 radially when the plug is rotated to bring the pin into alignment therewith and is beveled back from the notched portion toward its edges. The side walls of the cap 19 are provided with slots 30 and 31 adapted to receive the lugs 26 and 27 snugly so that the latch washer 25 is held in fixed position circumferentially of the cap, with some play, if desired, as better shown in Fig. 4, but free to move inwardly and outwardly thereof toward and away from the plug 3. The elements shown are assembled in the order illustrated in Fig. 2, the washer 25 slipping over the plug stem and lying against the end of the plug with the lip 28 overhanging the end of the plug and lying in the path of the pin 14. The spring 18 seats the plug and urges the latch washer thereagainst. Consequently upon rotation of the plug from either off or on position toward a simmering position the pin engages one or the other beveled edges of the lip 28 and forces the washer toward the cap 19. The resistance to rotation of the plug resulting from the yielding engagement of the pin with either edge of the lip 28 informs the operator that the plug is rotated almost to the position to be indicated by the notch 29. Having been thus informed, the operator approaches this latter position more cautiously and the possibility that the operator will overrun the position indicated by the engagement of the pin and notch is greatly reduced until the pin passes into alignment with the notch 29. In this position the latch washer snaps down into latching position and engages the pin sufficiently firmly enough to inform the operator that such position is reached.

Since different parties desire different heights of simmering flame, an effective adjustment of the simmering position is provided by making the openings in the cap 19 slightly elongated as indicated at 33 in Fig. 2A. In order to adjust the position of the snap latch relative to the plug so that a different latching position of the plug relative to the bore 9 is provided, it is only necessary to loosen the screws 22 a slight amount and rotate the cap 19 to the new position desired and then again tighten the screws 22. Thus without removing any part of the cock mechanism or removing the cock, as a whole, from the stove, or from its position relative to the burner, an effective adjustment can be made.

While I have described my invention as embodied in a gas cock in which the plug seating spring engages the larger end of the plug, it is apparent from the description that the same snap action indicator can as easily be embodied in well known types of gas cocks.

Having thus described my invention,

I claim:

1. A gas cock comprising a body having a plug receiving bore and an inlet passage and an outlet passage, a rotatable plug in said bore, said plug having a passage communicating and discommunicating said body passages consequent upon rotation of the plug to predetermined positions, a stem on said plug rotatable and coaxial therewith, a washer slidable along said stem and rotatable relative thereto, said washer having a shoulder, a complementary shoulder rigid with the plug engageable with the washer shoulder and operable to move the washer axially of the stem consequent upon rotation of the plug to a position effecting engagement of said shoulders, a cap fixed relative to said body outwardly of the stem past the latch washer and in overhanging relation to the washer, means on the cap engaging the washer for retaining the washer in fixed circumferential position relative to the body, a spring intermediate the cap and washer urging the washer against the plug and maintaining the plug seated in said bore, and means on said body engaging said plug shoulder consequent upon rotation of the plug past the positions engaging the washer shoulder for limiting the relative rotation of the plug in said body.

2. A gas cock comprising a body having a plug receiving bore and an inlet passage and an outlet passage, a rotatable plug having a passage communicating and uncommunicating said body passages consequent upon rotation of the plug to predetermined positions, a stem coaxial with the plug for rotating the same, a washer slidable along the stem, a cap fixed relative to the body outwardly of the stem past the washer and overhanging the washer, a spring intermediate the cap and washer urging the washer toward the plug, said washer having a latching shoulder and a notch in said shoulder, a complementary shoulder on the plug receivable in the notch in a predetermined rotated position of the plug for yieldably resisting continued rotation of the plug and being operative to move the washer axially and thereby be released from the notch consequent upon continued rotation of the plug, said latch shoulder having a portion disposed in the path of travel of the plug shoulder for engaging and yieldably resisting rotation of the plug toward the notch engaging position and being operated by the plug shoulder to move the washer axially and release the plug shoulder from the latching shoulder of the washer upon continued rotation of the plug toward the said notch engaging position, whereby upon rotation of the plug toward the notch engaging position an indication is given that the notch engaging position is almost reached.

3. A gas cock comprising a body member having a plug receiving bore, an inlet passage and an outlet passage communicating therewith, a relatively rotatable plug member in said bore operable to communicate and uncommunicate the inlet and outlet passages consequent upon rotation of the plug member, an indicating means rotatable with the plug member, a cooperating indicating means rotatable with the other member, one of said means being mounted on its asso-

ciated member for movement transversely of its path of relative rotation toward and away from the other means, a spring urging said means relatively toward each other, a shoulder on one of said means, a lip on the other of said means, said shoulder and lip intercepting each other upon predetermined relative rotation of the members for restraining continued rotation thereof in the same direction, and said shoulder and lip being relatively movable away from each other in a direction transversely of their path of rotation, consequent upon continued relative rotation of said members in the same direction for releasing, and said lip having a notch intermediate its edges for receiving said shoulder when the plug member is additionally rotated in the same direction for yieldably resisting continued relative rotation of said members in said direction and for releasing the shoulder upon additional relative rotation of the members in said direction, and said lip having wedge surfaces sloping in each direction from said notch and away from the path of relative rotation of the lip and shoulder at the portions of the lip engageable with said shoulder, whereby the shoulder and lip engage upon relative rotation of the members in either direction preparatory to engagement of the notch and shoulder for informing the operator that the notch engaging position is almost reached.

4. A gas cock comprising a body having a plug receiving bore and an inlet passage and an outlet passage, a rotatable plug in said bore having a passage, said plug communicating and uncommunicating said passages consequent upon rotation of the plug to predetermined positions, a stem coaxial with the plug for rotating said plug, a shoulder on the plug, a latch element movable along the stem toward and away from the plug, means to hold said element in substantially fixed circumferential position relative to the body, a spring urging said element toward the plug, a shoulder on said element having a notch therein for receiving the plug shoulder when the plug is rotated to a position to be indicated and yieldably resisting continued rotation of the plug in the same direction, said element being yieldably movable away from the plug for releasing said shoulder and notch consequent upon rotation of the plug from the notch engaging position, the shoulder of said element being disposed in the path of the plug shoulder in advance of the notch for yieldably engaging the plug shoulder consequent upon predetermined rotation of the plug toward the notch engaging position and for yieldably resisting continued rotation of the plug toward said notch engaging position and cooperating with the plug shoulder for moving said latch element away from the plug against the force of the spring consequent upon continued rotation of the plug toward notch engaging position whereby an indication that the notch engaging position is almost reached is provided.

5. A gas cock comprising a body having a plug receiving bore, and an inlet passage and an outlet passage communicating therewith, a relatively rotatable plug in said bore operable to communicate and uncommunicate the inlet and outlet passage consequent upon rotation of the plug, an operating stem coaxial with the plug, a snap element slidable along the stem and rotatable relative thereto, a cap having a circumferential wall and secured to the body and overhanging the element, a spring interposed between the cap and element urging the element toward the body, a circumferentially extending slot in the circumferential wall of said cap, a radially extending lug on said element projecting through said slot and being engageable with the ends of the slot for retaining the element in substantially fixed circumferential position relative to the body, said lug protruding radially outwardly beyond the cap and adjacent end portion of the plug, a shoulder extending from said protruding end alongside the adjacent end portion of the plug, a radially extending pin on the plug positioned to engage said shoulder upon predetermined rotation of the plug whereby continued rotation of the plug is resisted, said shoulder being operative to move the element axially away from the plug and out of the path of the pin, whereby said pin may pass said shoulder consequent upon continued rotation of the plug in the same direction, and means on the body engaging said pin consequent upon rotation of the plug past the position engaging the shoulder of said element and pin for limiting the rotation of the plug in the body.

GEORGE HERBSTER.