This invention relates to a valve for controlling gas for a double gas burner.

Double gas burners are frequently employed in the top burner system in gas ranges. The burner usually has a center small burner section for providing low and simmer flames and a larger section surrounding the center section. A desired cycle of operation is that wherein the valve is turned from a full on position, with flames at both burner sections, toward off position and to a simmer position where gas is supplied only to the center section for simmering purposes and then in continuing the turning of the valve toward off position, a lower volume of gas is supplied to the center section for warming purposes. Of course, the final increment of movement is to off position.

Now in reversing this cycle, when the valve is turned from off position to on position, the first opening is the low warming position. But there is not enough gas flowing to the center section at this time to initiate ignition although there is sufficient gas to maintain the flame once ignited. The invention aims to provide a valve construction embodying a position indicator wherein the indicator skips the warming position as the valve is turned from off position toward on position and makes its first indication at the simmer position, at which time there is sufficient gas supplied to the burner to initiate ignition. However, in turning the valve from on position back toward off position, the indicating mechanism does indicate the warming position. This is accomplished by a simple mechanism involving a minimum number of parts and indicating all positions and yet skips the indication of the warming position as the valve is turned from off position toward on position. A valve structure made in accordance with the invention is shown in the accompanying drawings:

Fig. 1 is a cross sectional view of a double outlet valve illustrating ports and passages in the body and rotatable valve member.

Fig. 2 is a view of the valve member.

Fig. 3 is a view illustrating the limit and clicking washer.

Fig. 4 is an end elevational view of the valve showing it in off position.

Fig. 5 is a sectional view taken through the valve showing the position of ports in the off position.

Fig. 6 is an end view with parts shown in dotted lines illustrating the low or warming position.

Fig. 7 is a sectional view corresponding to Fig. 6.

Fig. 8 is an end view showing the position of parts in the simmer position.

Fig. 9 is a cross sectional view showing position of ports in the simmer position.

Fig. 10 is a view illustrating the position of parts in full on position.

Fig. 11 is a cross sectional view showing position of ports in full on position.

Fig. 12 is an enlarged sectional view taken substan-

tially on line 12—12 of Fig. 6, showing the cap construction.

Fig. 13 is a developed view of the cap for cooperation with the clicking washer.

The valve body 1 is formed with a tapered valve chamber 2 for receiving a tapered valve member 3 turnable therein, the valve body has an extension 4 with an inlet port 5 and it has two outlet passages 7 and 8. The chamber is connected with the outlet passage 7 by a port 9 and to the outlet passage 8 by two ports 10 and 11. The outlet passage 7 is formed in an extension with a hood 13 having a discharge orifice 15. The outlet passage 8 is formed in an extension with a hood 14 and a discharge orifice 16. The outlet passage 7 is for the main section of the burner and the outlet passage 8 is for the smaller or simmer section.

The valve member 3 has a main passage 20 and two main ports 21 and 22 positioned in a radial plane, the same as the inlet port 5 and the outlet port 9. The valve body has two other ports 23 and 24 positioned to register with the port 10 of the body.

The peripheral surface of the valve member is formed with a circumferentially extending groove 26 communicating into this groove is a port 27. This port extends inwardly toward the axis. The valve member has a hollow stem 30 and positioned between the hollow of the stem and the passage 20 is a secondary passage 31. The port 27 communicates into the secondary passage 31 (Fig. 5). A control and throttling member 33 is screw threaded in the stem and it has a D-shaped extension 34 for controlling the port 27. As the control member is turned on its threads, the D-shape part 34 may be caused to properly restrict the inner end of the port at 27 as will be appreciated by reference to Fig. 5.

The stem 30 extends through a cap 40 which may be secured to the valve body by screws 41 and mounted within the cap and on the stem to rotate therewith is a click washer 42. The stem may be flattened on one side with the aperture in the washer similarly fashioned to provide the driving connection. The washer has two bumps or teeth 43 and a projecting finger 44. The cap has an inturnd stop element 45 and another inturnd stop element 46. The projection 44 operates between the two limit stops 45 and 46.

With this construction, the valve may be turned to off position wherein the inlet flow 5 is closed to this position, the projection 44 engages limit stop 45. If the valve be turned counter-clockwise, to the position shown in Figs. 6 and 7, it is in low position. This position supplies a low volume of gas to the outlet passage 8. In this position, as shown in Fig. 7, port 21 opens the inlet port 5 and gas flows into the passage 20. From here the gas flows into the secondary passage 31 through port 27 into the circumferential groove 26 which, in this position, registers with the port 11 for supplying the low volume of gas. This can be adjusted by the member 33.

When the valve is turned further counter-clockwise to the position shown in Figs. 8 and 9, the port 21 is still registered with the inlet 5 so gas continues to flow into the passage 20. In this position, the port 23 is in registry with port 10 so that a larger supply of gas is furnished to the outlet passage 8. The circumferential groove has considerable length as shown in Figs. 2 and 7 and it is preferred that in the simmer position, shown in Figs. 8 and 9, that the groove registers with the port 11 so that actually gas may flow not only into the outlet passage 8 through port 23 but may also flow into the passage 9 through the port 11. The result of this is that when the valve is turned back and forth between the Fig. 7 and Fig. 9 positions, the flow passage through the groove 26 is...
not closed or interfered with so that there will be no possible cessation of flow of gas. If the valve be turned further clockwise to the Fig. 10 position, it is in full on position, and the projection 44 abuts the limit stop 46. In this position, the port 22 registers with the inlet port 5 while the port 21 registers with the outlet port 9. Therefore, a full supply of gas is supplied to the main burner section 5. Also in this position the port 24 registers with the port 10 and therefore, gas is supplied to the outlet passage 8 for the smaller section of the burner. In turning the valve toward off position from that shown in Fig. 11, it first reaches the simmer position shown in Fig. 9. A full supply of gas for simmering purposes is thus supplied through the port 23 to the outlet passage 8. As the valve is turned further clockwise from the Fig. 9 position, to the Fig. 7 position, the only connection outlet for the gas is through secondary passage 31, port 27, groove 26, port 11, and outlet passage 8, and this can be controlled by the member 33 to provide a very low volume of gas flow for a low flame at the small burner section for warming purposes. Continued turning of the valve member clockwise results in closing the inlet port 5 and finally the projection 44 strikes the limit stop 45. Now as stated above, the condition of the parts in Fig. 7 does not supply sufficient gas to the small section of the burner for initiating ignition; yet this is the first position of the valve as it moves from off position. Accordingly, indicating means are provided which effectively and in a simple manner make the first indication at the simmer position shown in Fig. 9 when the valve is being turned on. With the parts positioned as shown in Fig. 9, sufficient gas passes through the valve to initiate ignition. However, on the return movement of the valve, that is, from the full on position shown in Fig. 11, the indicator indicates the simmer position of Fig. 9 and also indicates the low position of Fig. 7.

The indication is of an audible nature. The washer 42 is held against the cap by a spring 50 which also seats the valve member in its chamber. The cap is formed with depressions into which the teats are adapted to snap under the action of the spring. In the vicinity of the areas 52 of the cap, the metal of the cap may be counterbored as being in the normal plane of the cap. When the valve is in off position as shown in Fig. 4, the teats 43 lie against the cap in the areas 52. Progressing counterclockwise along the cap as Fig. 4 is viewed the metal of the cap is gradually depressed as at b. Then at c the cap provides a relatively abrupt shoulder e which leads to a part which might be called a bridge 43. Each portion f merges into the opposite portion a; in fact, the portion f adjacent the recess e for one teat is a continuation of the portion a for the opposite teat.

This structure operates as follows: When the valve is in off position, the two teats 43 lie against their respective portions a. When the valve member is turned counterclockwise the teats a ride down the elongated inclined surfaces b, the spring 50, of course, urging the washer backwardly from the valve member 3, and the teats come into engagement with the shoulder c. There is an almost imperceptible resistance to this movement provided by the shoulder c considering the manual forces that an operator applies for the turning of such a valve and considering the resistance offered to turning by the valve member in its seat. This resistance is inconsequential. Therefore, when an operator turns the valve from off position, the teats ride down the elongated inclines b, ride up over the shoulder c, traverse the bridge d and then the teats snap into the recesses e. The washer is sufficiently loose on the stem to permit of this snapping action; the snapping action requires a rotating component as the spring snaps the washer against the face of the cap. At this audible indication, the valve has moved beyond the low positions of Figs. 6 and 7 and has arrived at the simmer position of Figs. 8 and 9. This is the first audible indication and sufficient gas is supplied to initiate ignition. If the valve member is turned further to full on position, the teats ride out of the recesses e and the projection 44 engages the limit stop 46. Now in the return movement the teats ride along the surface f and again snap into the recesses e. This effects an audible indication in the nature of a click and the valve is again in the simmer positions shown in Figs. 8 and 9. Further turning of the valve member clockwise as Fig. 4 is viewed, causes the teats 43 to ride out of the recesses e and then they snap over the shoulder c thus giving another audible indication and the valve is now in the low position shown in Figs. 6 and 7. This supplies a very low volume of gas for low flame but the flame remains ignited. Of course, from this point the valve may be turned further clockwise to off position with the teats riding up the inclined surfaces b and coming to rest on the surfaces a.

The valve may be manipulated back and forth between the simmer position and the low position and an audible indication is given for each. When the valve is shifted clockwise from the simmer position of Figs. 8 and 9, the teats ride out of the recesses 3, traverse the bridge d and snap over the shoulder c. If the valve is turned counter-clockwise from the low position of Figs. 6 and 7 to the simmer positions of 8 and 9 the teats ride over the shoulder c, traverse the bridge d, and snap into the recesses e.

Thus it will be seen that with the simple expedient of a snap washer and the inclined surfaces in conjunction with the shoulder c and the grooves e that when the valve is turned from off position the low position is skipped and the first audible indication received is when the valve is in simmer position where ignition may be initiated. Yet when the valve is turned from on position towards off position, it moves from full on position to a simmer position where there is an audible click, then to a low position where there is an audible click.

I claim:

1. A double outlet valve for controlling the flow of gas to a double section gas burner comprising, a valve body having a valve chamber therein, an inlet port and two outlet ports, one for each burner section, a valve member turnably seated in the chamber and having ports therein, the ports in the valve body and in the valve member being relatively arranged so that, (1st) in off position the inlet port is closed (2nd) when the valve member is turned in one direction from off position ports are registered for passing a low volume of gas to one outlet port for a low flame but insufficient to satisfactorily initiate ignition, (3rd) when the valve is turned further in the same direction, ports are registered for passing an intermediate volume of gas to said one outlet port for effecting a simmering flame and which is sufficient in volume to initiate ignition, and (4th) when the valve is turned further in the same direction, ports are registered for passing gas into said one outlet port and for passing a high volume of gas to the other outlet port for supporting a full flame, a cap on the valve body, a washer mounted on a valve member to turn therewith and being axially shiftable relative thereto, a spring for urging the washer as set up by the shoulder c on the washer for engaging the cap, the cap having an area engaged by the protrusion when the valve is in (1st) position, an elongated inclined surface on the cap extending from said area and terminating in a shoulder, said shoulder being in (2nd) position, the cap having a recess beyond the shoulder and in (3rd) position, said protrusion adapted to slide down the elongated inclined surface and over the shoulder silently as the valve is turned from (1st) position, and to snap
into the recess to give an audible indication when the valve is in (3rd) position, said protrusion, when the valve member is turned toward off position, snapping over said shoulder to give an audible indication of the (2nd) position.

2. A double outlet valve for controlling the flow of gas to a double section gas burner comprising, a valve body having a valve chamber therein, an inlet port and two outlet ports, one for each burner section, a valve member turnably seated in the chamber and having ports therein, the ports in the valve body and in the valve member being relatively arranged so that, (1st) in off position the inlet port is closed (2d) when the valve member is turned in one direction from off position ports are registered for passing a low volume of gas to one outlet port for a low flame but insufficient to satisfactorily initiate ignition, (3d) when the valve is turned further in the same direction, ports are registered for the passing of an intermediate volume of gas to said one outlet port for effecting a simmering flame and which is sufficient in volume to initiate ignition, and (4th) when the valve is turned further in the same direction, ports are registered for passing a high volume of gas to said one outlet port for a full flame but insufficient to satisfactorily initiate ignition, (3d) when the valve is turned further in the same direction, ports are registered for supplying a full volume of gas to an outlet port for a full flame, a cap on the valve body, a washer mounted on a valve member to turn therewith and being axially shiftable relative thereto, a spring for urging the washer against the cap, a pair of axially extending protrusions on the valve member for engaging the cap, the cap having areas engaged by the protrusions when the valve member is in (1st) position, two elongated inclined surfaces extending from the areas and each terminating in a shoulder, which shoulders are located in the (2d) position, over which the protrusions ride silently as the valve is turned from (1st) position to "on" position, two recesses in the cap positioned beyond the shoulders and located in (3rd) position and into which the protrusions snap to give an audible indication of the (3rd) position, said protrusions when the valve member is turned in the opposite direction, snapping over the shoulders to give an audible indication of the (2nd) position.

3. A double outlet valve for controlling the flow of gas to a double section gas burner comprising, a valve body having a valve chamber therein, an inlet port and two outlet ports, one for each burner section, a valve member turnably seated in the chamber and having ports therein, the ports in the valve body and in the valve member being relatively arranged so that, (1st) in off position the inlet port is closed (2d) when the valve member is turned in one direction from off position ports are registered for passing a low volume of gas to one outlet port for a low flame but insufficient to satisfactorily initiate ignition, (3d) when the valve is turned further in the same direction, ports are registered for the passing of an intermediate volume of gas to said one outlet port for effecting a simmering flame and which is sufficient in volume to initiate ignition and (4th) when the valve is turned further in the same direction, ports are registered for passing a high volume of gas to the other outlet ports for supporting a full flame, a member fixed relative to the valve body, a second member mounted on the valve member to turn therewith, said members being axially shiftable relative to each other, a spring means for urging the members into engagement with each other, a protrusion on one member for engaging the other member, said other member having an area engaged by the protrusion when the valve is in the (1st) position, said other member having an elongated inclined surface extending from said area and terminating at the base of a shoulder, with the shoulder located at the (2nd) position, the protrusion riding along the elongated inclined surface and over the shoulder silently as the valve is turned from (1st) toward "on" position, said other member having a recess positioned beyond the shoulder into which the protrusion snaps when the valve is in (3rd) position to give an audible indication thereof, said protrusion, when the valve member is turned in the opposite direction, snapping over said shoulder to strike the surface at the base thereof to give an audible indication of the (2nd) position.

4. A valve for controlling the flow of gas to a gas burner comprising, a valve body having a valve chamber therein and inlet and outlet ports, a valve member turnably seated in the chamber and having ports therein, the ports in the valve body and the valve member being relatively arranged so that, (1st) in off position the inlet port is closed, (2d) when the valve member is turned in one direction from off position, ports are registered for passing low volume of gas to an outlet port for a low flame and which is insufficient to satisfactorily initiate ignition, (3d) when the valve member is turned further in the same direction, ports are registered for intermediate flow of gas to an outlet port for supporting a simmering flame and sufficient to initiate ignition, and (4th) when the valve member is turned further in the same direction, ports are registered for supplying a full volume of gas to an outlet port to support a full flame, a cap on the valve body, a washer mounted on a valve member to turn therewith and being axially shiftable relative thereto, a spring for urging the washer against the cap, an axially extending protrusion on the washer for engaging the cap, the cap having an area engaged by the protrusion when the valve is in (1st) position, an elongated inclined surface on the cap extending from said area and terminating when the valve is in (2d) position, the cap having a recess beyond the shoulder and the recess being in (3rd) position, said protrusion adapted to slide down the elongated inclined surface and over the shoulder silently as the valve is turned from (1st) position, and to snap into the recess to give an audible indication when the valve is in (3rd) position, said protrusion, when the valve member is turned toward off position, snapping over the shoulder to give an audible indication of the (2nd) position.

5. A valve for controlling the flow of gas to a gas burner comprising a valve body having a valve chamber therein and inlet and outlet ports, a valve member turnably seated in the chamber and having ports therein, the ports in the valve body and the valve member being relatively arranged so that, (1st) in off position the inlet port is closed, (2d) when the valve member is turned in one direction from off position ports are registered for passing low volume of gas to an outlet port for a low flame and which is insufficient to satisfactorily initiate ignition, (3d) when the valve member is turned further in the same direction, ports are registered for supplying a full volume of gas to an outlet port to support a full flame, a member fixed relative to the valve body, a second member mounted on the valve member to turn therewith, said members being axially shiftable relative to each other, a spring means for urging the members into engagement with each other, a protrusion on one member for engaging the other member, said other member having an area engaged by the protrusion when the valve is in the (1st) position, said other member having an elongated inclined surface extending from said area and terminating at the base of a shoulder, with the shoulder located at the (2nd) position, the protrusion riding along the elongated inclined surface and over the shoulder silently as the valve is turned from (1st) toward "on" position, said other member having a recess positioned beyond the shoulder into which the protrusion snaps when the valve is in (3rd) position to give an audible indication thereof, said protrusion, when the valve member is turned in the opposite direction, snapping over said shoulder to strike the surface
at the base thereof to give an audible indication of the (2nd) position.

6. A double outlet valve for controlling the flow of gas to a double section burner comprising, a valve body having a valve chamber therein and an inlet port and an outlet port for each burner section, a valve member turnable in the chamber, the body and valve member having ports relatively arranged so that in off position of the valve member the ports are closed and as the valve member is turned in one direction from off position, ports are successively opened at low position for a low rate of flow, at intermediate position for intermediate rate of flow, and at full on position for full rate of flow of the gas, the off position being one extreme position and the full on position being the other extreme position, a first member non-rotatably secured to the body, a second member turnable with the valve member, a spring urging the members into engagement, a protrusion on the second member; the first member having an area engaged by the protrusion when the valve member is in off position, an elongated inclined surface extending from the area and terminating at the base of a shoulder at the low position, a recess beyond the shoulder at the intermediate position and a surface for engagement by the protrusion beyond the recess at full on position; the protrusion adapted to slide down the elongated inclined surface and to move over the shoulder silently as the valve member is turned from off position, and to snap into the recess to give an audible indication at the intermediate position, said protrusion, when the valve member is turned toward the off position, adapted to snap over the shoulder and strike the surface at the base thereof to give an audible indication of the low position.

7. A valve for controlling the flow of gas to a burner comprising, a valve body having a valve chamber therein with inlet and outlet ports, a valve member turnable in the chamber, the body and valve member having ports relatively arranged so that in off position of the valve member the ports are closed and as the valve member is turned in one direction from off position ports are successively opened at low position for a low rate of flow, and at a next position for a higher rate of flow of the gas sufficient to satisfactorily initiate ignition, and at a next position for a higher rate of flow of the gas sufficient to satisfactorily initiate ignition, two members, one non-rotatably secured to the body and the other turnable with the valve member, spring means urging the members into engagement, a protrusion on one member; the other member having an area engaged by the protrusion when the valve member is in off position, an elongated inclined surface extending from the area and terminating at the base of a shoulder at low position, a recess beyond the shoulder at said next position, the protrusion adapted to slide down the elongated inclined surface and to move over the shoulder silently and to snap into the recess to give an audible indication at said next position when the valve member is turned in one direction from off position so that the issuing gas may be ignited, said protrusion, when the valve member is turned in the opposite direction toward off position, adapted to snap over the shoulder to said base thereof to give an audible indication of the low position where the ignited gas remains ignited.

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