June 6, 1961 J. E. SHERLOCK 2,987,257

THERMOSTATIC DEVICES

Filed Sept. 3, 1958 2 Sheets-Sheet 1

FIG. 1.

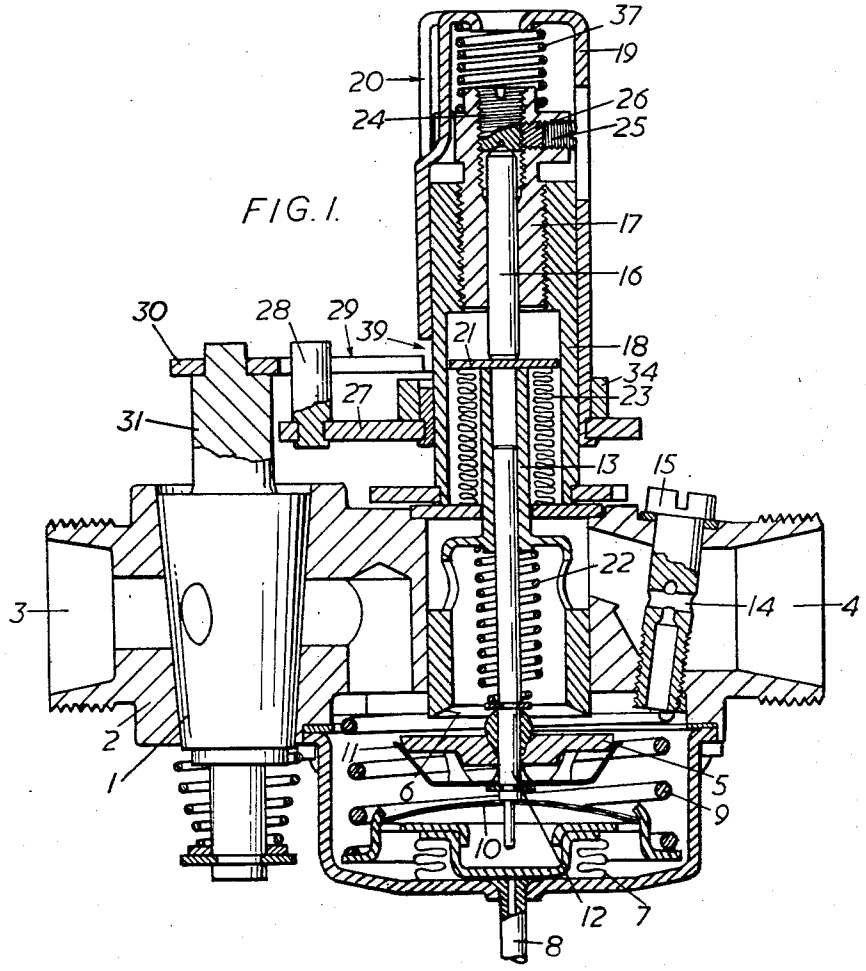
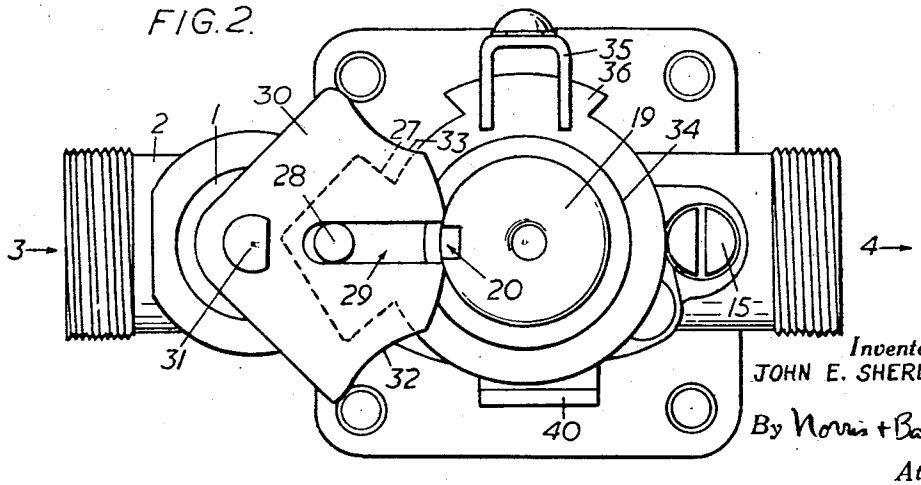


FIG. 2.



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June 6, 1961 J. E. SHERLOCK 2,987,257

THERMOSTATIC DEVICES

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2 Sheets-Sheet 2

FIG. 3.

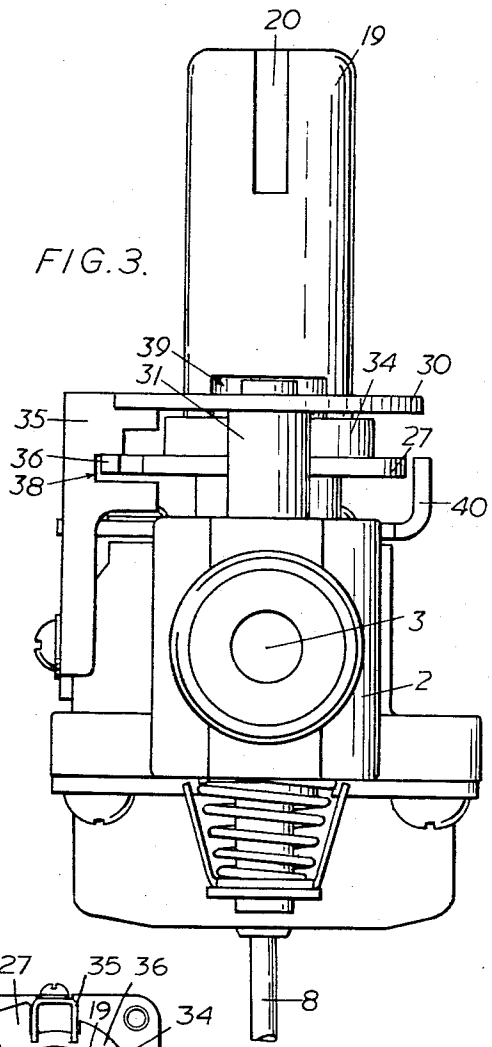
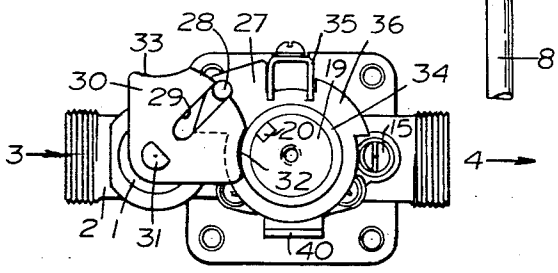


FIG. 2A



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2,987,257

THERMOSTATIC DEVICES

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Claims priority, application Great Britain Sept. 3, 1957
11 Claims. (Cl. 236—99)

This invention relates to thermostatically controlled gas valves for application to cooking ovens and the like and is an improvement in or modification of the gas valve assembly described and claimed in British patent specification No. 773,593.

In the aforesaid specification there is claimed a gas valve assembly for the purpose mentioned provided with latching means to lock a rotary plug valve member or cock in its closed and fully open positions and a common hand-operated member for turning the cock between said positions but capable of disengagement in the fully open position from the latching means for independent operation to vary the temperature at which a thermostatically controlled valve will reduce or cut off the gas supply to the burners; and the particular latching means therein disclosed comprises a forked arm fast with the cock and engaged by a crank pin fixed to the hand-operated member whose axis is parallel to and spaced from the axis of said cock, and a non-rotatable, spring-loaded lock plate having projections or abutments which co-operate with the forked arm to retain the cock in each of its two limit positions, movement of the hand-operated member beyond the fully open position of the cock being permitted by the disengagement of the crank pin from the forked arm whilst freeing of the cock for movement to the other limit position is effected by displacement of the lock plate against its spring.

The object of the present invention is to provide an improved and simplified form of latching means which facilitates manufacture and assembly.

According to the invention the latching means comprises a forked arm which is so shaped that its movement in both directions is limited by abutment with the hand-operated member.

An embodiment of the invention will now be described with reference to the accompanying drawings of which:

FIG. 1 is a sectional elevation of the gas valve,

FIG. 2 is a plan view,

FIGURE 2A is a plan view similar to FIGURE 2 but showing the valve in closed position, and

FIG. 3 is an end elevation looking from the left of FIG. 1.

Referring to FIG. 1 of the drawings, a gas supply cock **1** of the rotary plug type is mounted in a casing **2** having an inlet passage **3** adapted to be connected to a main gas supply and an outlet passage **4** adapted to be connected to the gas burners in an oven. Communication between the inlet and outlet passages is controlled by a valve member **5** movable toward or away from a normally fixed but adjustable seating **6** by the operation of a flexible metallic bellows device **7** connected in known manner by a capillary tube **8** to a thermally sensitive phial (not shown) disposed within or near the oven. The bellows, tube and phial form a closed system charged with a substance whose expansion under heat causes the bellows **7** to expand and move the valve member **5** towards its seating **6**.

The bellows **7** is loaded by a spring **9** and acts on the valve member **5** via an ambient temperature compensating bi-metallic disc **10** and an overload spring **11** both of which register with a push rod **12**. The latter is guided at its upper end in a sleeve **13** integral with

the valve seat **6**. The spring **11** is adapted to yield by splaying its extremities out beyond the periphery of the valve member **5** if the bellows continues to expand after the valve is closed.

A by-pass passage **14** in an adjustable member **15** permits a little gas to escape after the valve **5** has been seated in order to prevent the burner flames from being extinguished when the valve is closed.

In order to adjust the position of the seating **6** to vary the temperature range of the instrument, there is provided a push rod **16** carried in a sleeve **17** threaded into what is virtually an upward extension **18** of the casing **2**. The sleeve **17** may be rotated by a hand-operated member in the form of a hollow spindle **19** slotted at **20** to engage with a control knob not shown. Such rotation causes the push rod to be moved axially by virtue of the screw action. A bellows plate **21** rests upon the sleeve **13** and is caused to follow the movement of the push rod **16** by a spring **22** so as to vary the position of the seat **6** in accordance with the position of the knob on the spindle **19**. A bellows **23** provides a seal between the fixed and movable parts. The initial position of the rod **16** relative to the sleeve **17** can be varied by means of a trimming screw **24** which is afterwards locked in position by a grub screw **25** acting on a lead pellet **26**.

The rotation of the cock **1** into the on and off position is performed by the knob on the hollow spindle **19**, that is to say the same knob as that which adjusts the position of the valve seat **6**. For this purpose, the spindle **19** is provided with a latch plate **27** carrying a pin **28** sliding in a slot **29** in a forked arm **30** fixed to the spindle **31** of the cock **1**. The forked arm **30** has a "Geneva cross" configuration, the two fingers defining the slot **29** having arcuate outer edges **32** and **33** of the same radius as the enlarged portion **34** of the spindle **19**.

When the cock **1** is in the closed position, the innermost curved edge **32** bears closely against the periphery of the portion **34** so that the forked arm **30** and the cock are held against movement. Further clockwise (as seen in FIG. 2) movement of the spindle **19** (which would disengage the pin **28** from the slot **29**) is prevented in this position by the upper (in FIG. 2) edge of the latch plate **27** coming into contact with the left hand edge of a latch **35**. Anticlockwise movement of the spindle **19** is prevented by the left hand edge of a projection **36** coming up against the right hand side of the latch **35**.

Before the spindle **19** can be turned to open the cock **1**, it has to be pushed in (that is to say, downwards in FIGS. 1 and 3) against a spring **37**. Such movement of the portion **34** unlocks the forked arm **30** while the corresponding movement of the projection **36** brings it into the plane of a clearance slot **38** in the latch **35**. This slot is sufficiently deep radially to allow the passage of the projection **36** but not of the latch plate **27**. Consequently, anticlockwise rotation of the spindle **19** (as seen in FIG. 2) is now possible, clockwise rotation is still prevented.

As the spindle **19** is rotated, it opens the cock **1**, a slot **39** in the spindle **19** permitting the extremity of the forked arm **30** to pass through the mid position shown in the drawings. Once the projection **36** has entered the slot **38** the spindle **19** is prevented from axial movement under the influence of spring **37** until the cock **1** has been fully opened and the pin **28** is at the end of the slot **29** in the forked arm **30**. At this point the projection **36** leaves the latch **35** and the spindle **19** moves outwards (upwards in FIG. 1). This traps the edge **33** of the forked arm **30** against the portion **34** so locking the cock in the open position.

The spindle **19** can now be rotated further in an anticlockwise direction (FIG. 2) to vary the position of the seating **6** in the manner already described. This causes the pin **28** to leave the slot **29**. It will be appreciated that in order to lock the cock **1** in the open position it is desirable to prevent further inward movement of the spindle **19**. This is achieved by a stop **40** which engages first on the underside of the latch plate **27** and then on the underside of the projection **36**. The gap between these two is less than the width of the stop **40**. Extreme anticlockwise movement of the spindle **19** is limited by the lower (as seen in FIG. 2) edge of the latch plate **27** coming into contact with the right hand side of the latch **35**. In this position the projection **36** is still in contact with the stop **40** so that the cock **1** cannot be unlocked.

I claim:

1. In a gas supply valve having a passage, a rotary valve plug in the passage adapted to be turned between fully open and fully closed positions, a manually rotatable member mounted for axial displacement, means for latching said member against rotatable movement and for locking said plug against rotation when the plug is in fully closed position, means for axially displacing said member to unlatch said member for rotation and at the same time to unlock said plug for rotation, rotation of said member in one direction being effective to turn said plug to fully open position, a thermostatically-controlled valve in said passage having an adjustable part to selectively vary the temperature range during which said thermostatically controlled valve acts to vary gas flow through the passage, and means providing a motion transmitting connection between said member and said part for adjusting said part when said plug is in said fully open position.

2. In the valve defined in claim 1, means for retaining said member in axially displaced position during rotation of said valve plug.

3. In the valve defined in claim 1, means effective when said member is displaced to plug rotating position for blocking rotation of said member in the other direction.

4. In the valve defined in claim 1, resilient means effective when said valve plug has been rotated to fully open position for axially moving said member to the original position it assumed when the valve plug was fully closed and locking the plug against rotation.

5. In the valve defined in claim 1, an eccentric pin on said member slidably engaged with a slotted arm on said plug, and at least one arcuate locking face on said arm coacting with a corresponding locking face on said member.

6. In the valve defined in claim 1, means preventing axial displacement of said member during said adjustment of said part.

7. A gas supply valve for controlling the supply of gas to a burner, comprising a rotary plug valve member having a forked operating arm for turning it into closed and fully open positions, said forked arm having arcuate outer edges, a manually rotatable member having a crank pin mounted eccentrically thereon and engageable with said forked arm to turn said plug valve member between its said positions and disengageable from said forked arm by rotation of said manually rotatable member while said plug valve member is in its fully open position, means mounting said manually operable member for axial reciprocable movement, a thermostatically-controlled valve member operable to reduce or cut off the supply of gas to the burner, means for operably connecting said valve member and said manually rotatable member to adjust said thermostatically-controlled valve member for operation through a range of temperatures, and a spring acting on the manually rotatable member to hold it in a position to lock said forked arm against movement by engagement of one or other of said arcuate outer edges with a similarly curved portion of the manually rotatable member, said forked arm being releasable for plug turning movement only after predetermined axial movement of said manually rotatable member from said position against said spring.

8. A gas supply valve as claimed in claim 7 in which the forked arm is of "Geneva cross" configuration and has two fingers defining a crank pin receiving slot having arcuate outer edges of the same radius as the curved portion of said manually rotatable member against which they abut in the open or closed positions of the plug valve.

9. A gas supply valve as claimed in claim 7 in which latch means is provided for limiting movement of said manually operable member.

10. A gas supply valve as claimed in claim 7 in which stop means is provided to prevent axial displacement of said manually rotatable member during adjustment of said thermostatically-controlled valve member.

11. A gas supply valve as claimed in claim 7 in which the thermostatically-controlled gas member valve is acted on by a bellows assembly through an overload spring in the form of a spider having legs which are adapted to splay out and slide on the valve member if the bellows continues to expand after said thermostatically-controlled valve is closed.

References Cited in the file of this patent

UNITED STATES PATENTS

2,099,171	Matthews	Nov. 16, 1937
2,696,082	Fouron	Dec. 7, 1954