Jan. 12, 1937. H. GIKOW 2,067,266

TIME AUTOMATIC SHUT-OFF FOR GAS RANGES AND THE LIKE

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Fig. 1.

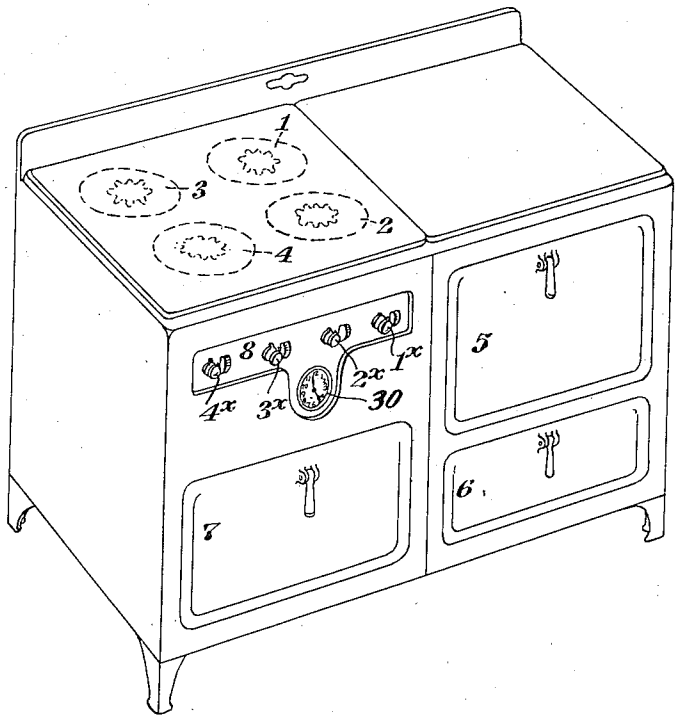
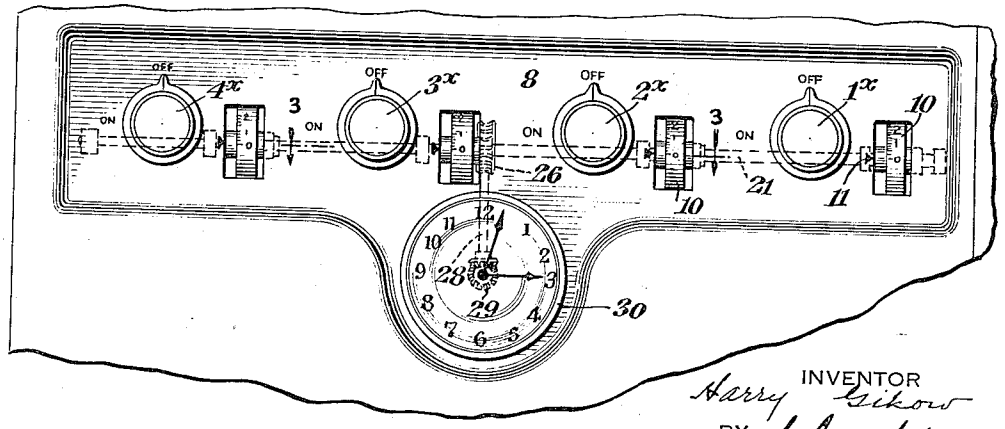


Fig. 2.



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Fig. 3.

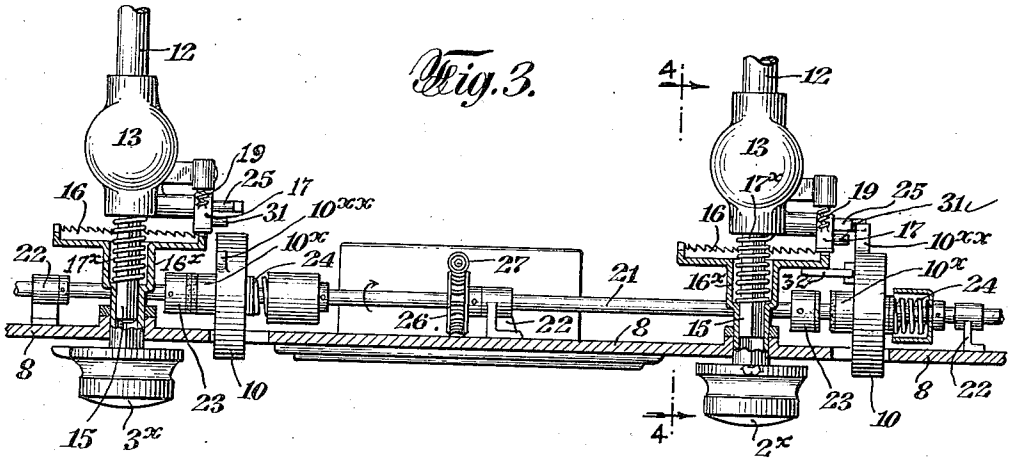


Fig. 4.

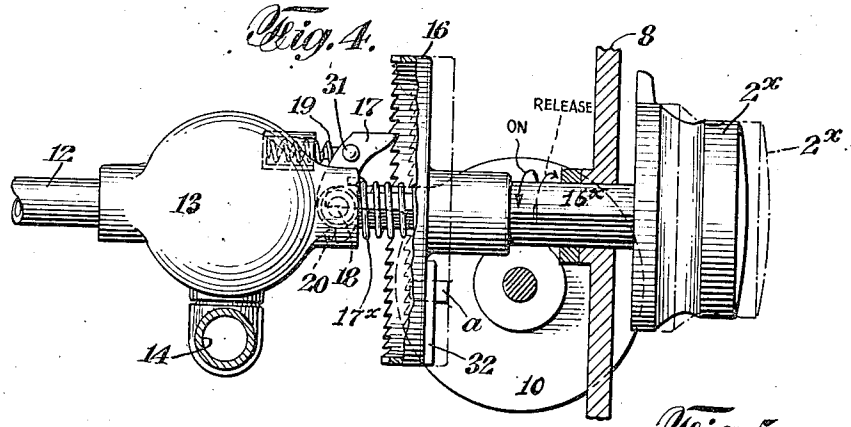


Fig. 5.

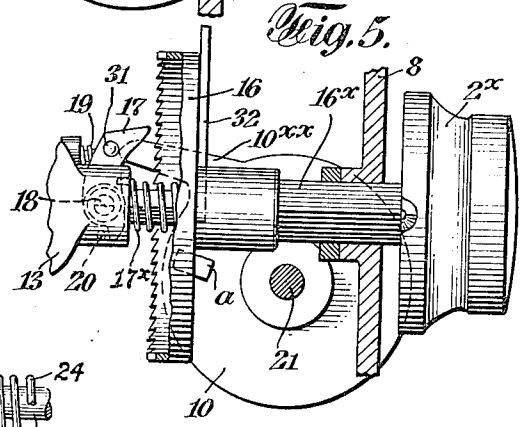
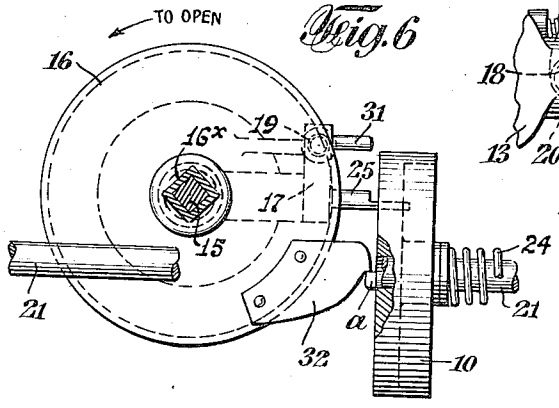


Fig. 6



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TIME AUTOMATIC SHUT-OFF FOR GAS RANGES AND THE LIKE

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Application April 2, 1935, Serial No. 14,250

6 Claims. (Cl. 161—9)

The object of the present invention is to provide means for individually controlling the valves of gas ranges and the like in such manner that a plurality of burners may be shut off at relatively different times in accordance with individual setting of the valve mechanism.

A further object is to provide unitary operating means for all of the burner valves in conjunction with selective means for timing control of the individual burners so that when a plurality of burners are in operation they may be automatically shut off at different time intervals.

A further object of the invention is to provide valve operating means driven from a single clock mechanism which may be continuously operated without affecting the valve throwing elements per se unless the timing control for any valve is set for operation at a predetermined time interval.

A further object of the invention is to provide mechanism of the type in which the valves may be opened and closed in the usual manner independently of the automatic control.

Further objects of the invention will hereinafter appear.

The invention will be described with reference to the accompanying drawings, in which:—

Fig. 1 is a perspective view of a gas range equipped with the invention.

Fig. 2 is an enlarged view in elevation of the control panel of the range showing elements of the invention, certain parts being shown in dotted lines.

Fig. 3 is an enlarged sectional plan view of two of the valves and associated controls, the section being taken generally on the line 3—3, Fig. 2.

Fig. 4 is a side elevation, partly in section, the section being taken generally on the line 4—4, Fig. 3, the control parts being in position for time control of the burner.

Fig. 5 is a view similar to Fig. 4, showing the position of the parts immediately preceding closing of the burner.

Fig. 6 is a fragmentary elevation, partly in section, showing the front face of a control ratchet to the worm shaft, and the timing wheel appropriate to the said control ratchet.

In Fig. 1 of the drawings, I have shown a conventional type of range having burners 1, 2, 3 and 4, oven and broiler doors being shown respectively at 5 and 6 and warming compartment at 7. At 8 I have shown a control panel and at 30 a clock.

On control panel 8 I have shown the usual thumb wheels 1x, 2x, 3x and 4x for the burners. There will be, in the commercial construction, a similar control valve or valves for the oven 5 and broiler 6, although for simplicity of illustration, they have not been shown in the drawings.

Adjacent each valve thumb wheel is a timing dial-wheel, the periphery of which will bear numbers corresponding to minutes, the dial-wheels being indicated at 10, and each wheel being rotatable to bring the numbers opposite a pointer 11, Fig. 2, on the panel. The operation of the device is such that each of the burner valves is individually controlled, as will now be explained.

Referring to Figs. 3 to 6 inclusive, it will be noted that each burner receives gas from pipe 12 leading to valve casing 13, the valve casings being fed by means of pipe 14, Fig. 4. Within the valve casing will be a valve-head (not shown) adapted to open and close communication between pipes 12 and 14. The valve head will be operated in each case by a shaft 15 having a squared end. A control ratchet 16 having a sleeve-like hub 16x with a squared interior formation will surround shaft 15. To the outer end of the ratchet wheel hub will be fixed the appropriate valve thumb wheel. Thus, when the thumb wheel is rotated, a corresponding rotation will be imparted to valve shaft 15 to open the valve. This opening movement of the valve shaft 15 will be against the tension of a spiral spring 17x, one end of the spring being fixed to the valve casing 13 and the opposite end to the shaft as by being passed into a hole formed in the shaft transversely thereof. The spring will have sufficient tension to insure the closing of the valve when the thumb wheel is released.

To open any one of the series of gas valves in the ordinary manner, it is only necessary to turn the appropriate thumb wheel to the left. To close the valve, it is only necessary to move the thumb wheel outwardly until the teeth of the ratchet 16 are carried beyond a holding pawl 17, spring 17x returning the shaft and valve head to closed position. Each of the pawls 17 is pivotally mounted upon its appropriate valve casing in the manner illustrated in Figs. 4 and 5, that is to say, by means of a pivot stud 18, a light spring 19 holding the pawl forwardly in such position that the lower end thereof engages a stop pin, indicated at 20. The stop pin holds the pawl in position as the ratchet wheel is retracted therefrom by moving the thumb wheel outwardly in order to close the valve.

Throughout the above described operation of the burners in the usual manner, the automatic control mechanism will be unaffected and each

dial-wheel will indicate opposite the point a neutral position, as, for example, by the cipher 0.

When it is desired, in the case of any burner, to secure automatic closing thereof in a given number of minutes or parts of minutes, the adjacent dial-wheel is rotated to bring the appropriate number on the face thereof opposite the pointer.

The inactive position of the dial-wheel in any case is shown at the right hand end of Fig. 3, and it will be noted that the wheel is mounted upon a light shaft 21 supported by suitable bearing members on panel member 8, as, for example, the bearing brackets 22, the shaft having secured thereto friction clutch disks 23, one for each of the dial-wheels 10. The hub 10*x* of each dial-wheel is formed as a clutch member to co-act with one of the clutch disks 23 under the pressure of a light spring 24.

When the dial-wheel is turned to expose a numeral indicating a timing interval, as, for example 5, meaning five minutes, the wheel will be turned from its position shown at the right hand side of Fig. 3 and a stop finger 10*xx* will be carried away from the shoulder of a fixed stop shaft 25 projecting from valve casing 13, and spring 24 will move the dial-wheel to the left clutching it to the appropriate clutch member 23. The dial-wheel will now be positively rotated due to the fact that light shaft 21 has fixed thereto a worm wheel 26 in mesh with a worm 27 on a light shaft 28 (Fig. 2) having pinioned connection with a drive gear 29 of clock 30. Clock 30 may be driven by a spring or its mechanism may be electrically driven, as desired. Generally, the clock 30 will be an ordinary electric clock having a driven shaft connected in suitable manner to rotate shaft 28 and hence shaft 21 continuously. The structure is such that these shafts have very little load and hence they may be driven continuously with insignificant current consumption when the clock-magnets, motor, or other driving means are in operation.

The setting of the dial-wheel by the required rotation thereof as aforesaid, will not only cause a lateral movement of the dial-wheel due to the action of spring 24, but will cause finger 10*xx* to move in line with a pawl release pin 31 carried by pawl 17, the parts assuming the position shown at the left hand side of Fig. 3. The distance between finger 10*xx* and pawl release pin 31 will be proportionate to the degree of timing, a greater distance indicating a greater length of time. The shaft 21 will be rotated in the direction of the arrow, Fig. 3, the rotation being very slow due to the ratio between the teeth of worm 27 and worm wheel 26. At the end of the time for which the wheel is set, finger 10*xx* will strike the pawl release pin and will disengage the pawl from the teeth of ratchet wheel 16, whereupon spring 17*x* will rotate the valve shaft and close the valve.

The action of spring 17*x* in rotating its appropriate valve shaft 15 to closed position will throw the appropriate dial-wheel back to declutch position. This follows because each ratchet wheel 16 carries a cam plate 32 which, when the valve is closed, lies in the position of Fig. 6 and the edge of the cam bears upon a lug *a* carried by the dial-wheel. In explanation of this action, reference may be made to Fig. 6. It will be noted that the manual opening of the valve by the thumb wheel will cause rotation of ratchet 16 in the direction of the arrow, carrying cam 32 upwardly and permitting spring 24 to move the dial-wheel 10 to clutching relation with shaft 21, provided, of course, dial-wheel 10 has been moved into active timing relation, thereby moving finger 10*xx* away from shouldered shaft 25 (Fig. 3).

In the rotational movement of ratchet wheel 16 to open position, its teeth will move idly with respect to pawl 17. When the valve has been opened to the desired extent, it will be held in such position by the action of pawl 17. In such position, cam 32 will be up out of interference with the dial-wheel and the latter may be rotated to the desired position irrespective thereof. The lateral movement of the dial-wheel into clutching position will be merely a small fraction of an inch and thus its release movement by the action of the cam will be correspondingly short.

It will be noted that in the releasing action, the entire power throw is by spring 17*x*. There is a very minor load upon shaft 21 inasmuch as the only action required by that shaft is to depress pawl 17 against the very light tension of spring 19.

It will be understood that various modifications may be made in the form and arrangement of the embodiment illustrated in the drawings without departing from the spirit of the invention. What I claim and desire to secure by Letters Patent, being as follows:—

1. Automatic gas shut-off mechanism for operating a gas valve embodying a valve shaft, comprising a manual turning member on said shaft, a control ratchet carried by said turning member, latching means engaging said ratchet, a spring adapted to hold the shaft in valve closed position, the turning member being movable on said valve shaft longitudinally thereof to release the control ratchet from said latching means, a timing dial wheel carrying a release finger adapted to engage and release said latching means, a shaft upon which the timing dial wheel is mounted, means for rotating the shaft, and means for clutching the dial wheel to the shaft and for permitting rotation of the wheel relatively to the shaft.

2. Automatic gas shut-off mechanism for operating a gas valve embodying a valve shaft, comprising a manual turning member on said shaft, a control ratchet carried by said turning member, a fixed support, latching means on said support engaging said ratchet, a spring adapted to hold the shaft in valve closed position, the turning member being movable on said valve shaft longitudinally thereof to release the control ratchet from said latching means, a timing dial wheel carrying a release finger adapted to engage and release said latching means, a shaft upon which the timing dial wheel is mounted, means for rotating the shaft, means for clutching the dial wheel to the shaft and for permitting rotation of the wheel relatively to the shaft, and means thrown into action by the release of said latching means for declutching the dial wheel from the shaft.

3. Automatic gas shut-off mechanism for a gas valve embodying a valve shaft, comprising a manual turning member for said shaft, a ratchet wheel carried by said turning member, a pawl engaging the ratchet wheel, a spring tending to turn the shaft toward valve closed position, the turning member being movable in a direction longitudinally of the shaft to release the ratchet from said pawl, a timing dial wheel having a ratchet release finger, a shaft upon which the timing dial wheel is engaged, means for rotating the shaft, and means effecting disengagement between the shaft and the dial wheel, acting automatically upon the release of said pawl by the ratchet release finger.

4. Automatic gas shut-off mechanism con-

structed in accordance with claim 1, in combination with a cam member carried by the valve shaft turning member, said cam being adapted to throw the clutch to open position upon release of the latching mechanism by the dial wheel.

5. Automatic gas shut-off mechanism for operating a plurality of gas valves, each embodying a valve shaft, comprising a manual turning member for each valve shaft, a spring tending to hold the shaft in valve closed position, a ratchet member connected to the shaft and a pawl therefor adapted to hold the shaft in adjusted position in opposition to said spring, a member movably supporting the pawl, a timing dial wheel for each of said pawl members and carrying pawl release means, a shaft upon which all the timing dial wheels are mounted, means for rotating the shaft, and shaft clutches, one intermediate each dial wheel and the shaft, in combination with clutching release means for each clutch adapted to be thrown into action by the release of the respective pawl through the spring rotation of the corresponding valve shaft to closed position.

6. Automatic gas shut-off mechanism constructed in accordance with claim 5, in combination with spring throw-in means for each clutch, and latching means holding said spring means in inactive position under tension preliminary to a rotational movement of its appropriate dial wheel in the setting thereof preliminary to timing action of the dial wheel.

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