

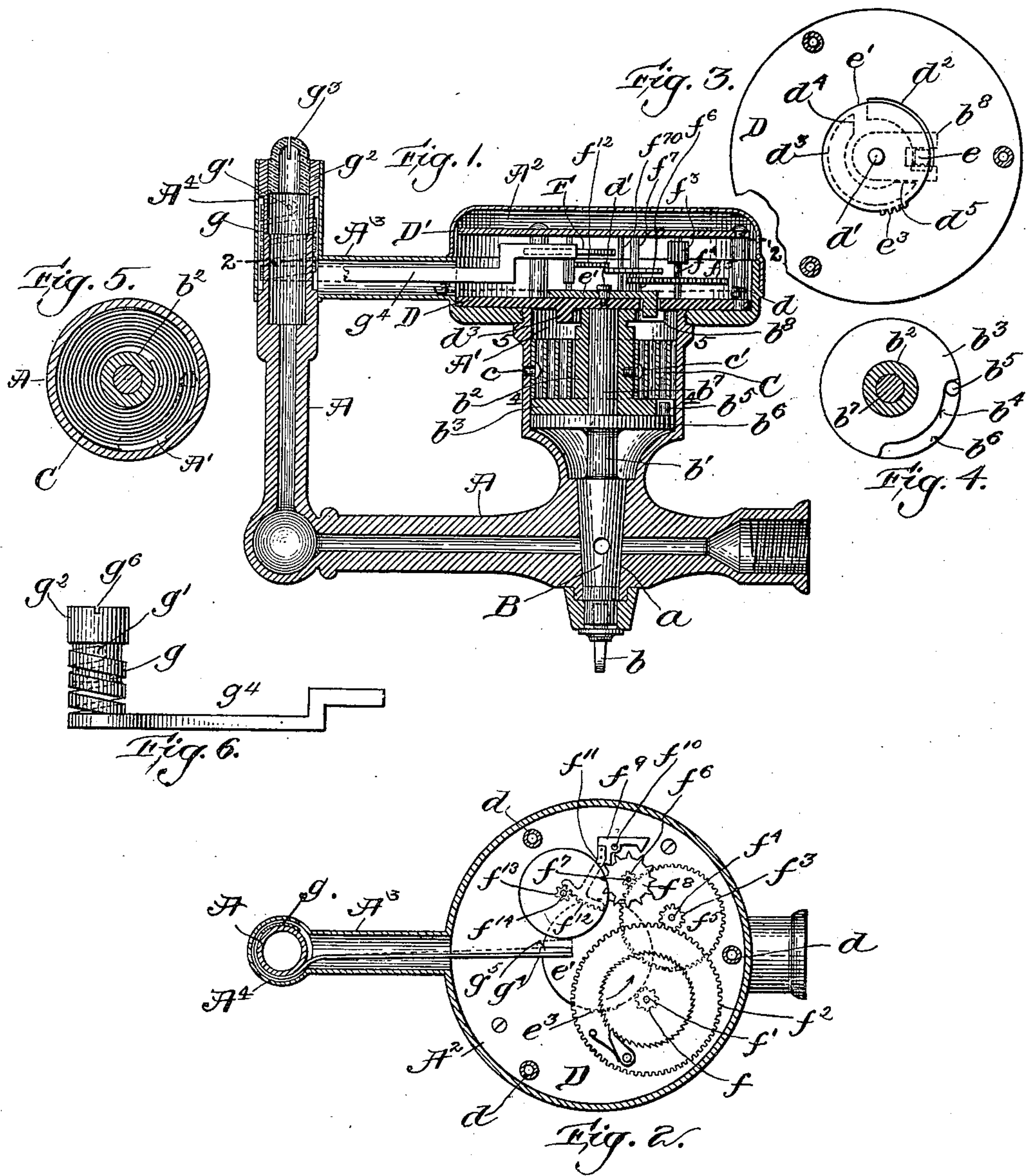
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J. C. HEALD.
AUTOMATIC GAS CUT-OFF.

(Application filed Aug. 7, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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AUTOMATIC GAS CUT-OFF.

SPECIFICATION forming part of Letters Patent No. 667,656, dated February 5, 1901.

Application filed August 7, 1899. Serial No. 726,434. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. HEALD, of Newfield, in the county of York and State of Maine, have invented certain new and useful
5 Improvements in Automatic Gas Cut-Offs, of which the following is a description sufficiently full, clear, and exact to enable those skilled in the art to which it appertains or with which it is most nearly connected to make
10 and use the same.

It is the principal object of this invention to equip a gas-burner with mechanism which will be wound up or set by the simple turning on of the gas to light the same and which
15 mechanism, if the gas should not be lighted or should be extinguished without being turned off by hand, will operate to turn the valve or cock to shut it off, and if the gas should be lighted, to operate thermostatically
20 through a medium to brake or stop the said mechanism so that it may not be operative in controlling the gas in any way, the valve or cock being free at all times to be manipulated to turn on the gas to any degree within the
25 scope of its purpose, turn it low, or shut it off completely, the same as though the said mechanism were not present.

To these ends the invention consists in certain novel features of construction and combinations of parts, the essential elements of which are recited in the appended claims and a preferred form of embodiment of which is specifically described hereinafter and illustrated in the accompanying drawings.

Reference is to be had to the annexed drawings, and to the letters of reference marked thereon, forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they
40 occur.

Of the drawings, Figure 1 is a central longitudinal section of one form of my improved gas-burner. Fig. 2 is a section on line 2 2 of Fig. 1. Figs. 3, 4, and 5 are sections taken
45 on lines 3 3, 4 4, and 5 5 of Fig. 1. Fig. 6 is an elevation of the thermostat and its supporting-thimble detached.

In the drawings, A represents the body of my improved gas-burner, which body is

formed with a socket *a* to receive a valve or
50 cock B. The valve B has secured to it at its lower end outside of the body a thumb-piece *b*, by which the valve may be operated by hand. The stem of the valve B is made in two parts, comprising a part *b'*, which is in-
55 tegral with the valve B, and a part *b²*, which is formed with a flange *b³*, which is cut away on its periphery, as at *b⁴*, into which cut-away part a pin *b⁵* extends, said pin being secured in a flange *b⁶*, formed on the part *b'*. The part
60 *b²* is preferably of a hollow cylindrical form and is mounted upon an extension *b⁷* of part *b'*.

The body A is formed with a chamber A', in which the part *b²* of the valve-stem is located, and said chamber also receives within
65 it a spring C, one end of which is secured at *c* to the body A and the other end of which is secured at *c'* to the part *b²* of the valve-stem.

The valve B is moved into its open position
70 to turn on the gas by hand and in opposition to stress of the spring, which serves in case of necessity, as hereinafter described, to return the valve B to its closed position.

The upper end of part *b²* of the valve-stem
75 is formed or provided with an arm *b⁸*, which is slotted and engages a lug *e*, which projects downwardly from a disk *e'*.

Above the chamber A' the inclosing casing for the mechanism forms another chamber A²,
80 in which is secured a frame comprising two plates D D', connected by posts or bars *d d'*, and the disk *e'* is mounted to turn on a stud *d'* on plate D. The plate D is formed with a slot *d²*, through which the lug *e* projects and
85 in which said lug moves when the disk *e'* is moved on stud *d'*. The movement of arm *b⁸* is limited in both directions by a segmental lug *d³* on the under side of plate D, and the ends *d⁴* *d⁵* of lug *d³* engage the arm *b⁸* and pre-
90 vent the latter from moving more than one-quarter of a complete revolution.

A wheel F is operatively connected through a train of gearing presently to be described with the part *b²* of the valve-stem and is ac-
95 tuated by the spring C in the manner hereinafter described, and the movement of said wheel is controlled by a thermostat, herein

shown as made up of a strip of sheet metal bent to form a coil g , with one secured at g' to a thimble g^2 , which surrounds the burner-tip g^3 , and with its other end g^4 free and extending into the chamber A^2 to a point adjacent to wheel F , where it is equipped with a brake-shoe g^5 , as shown in Fig. 2. An extension A^3 of the casing incloses the arm g^4 , and a tube A^4 , compounded with said casing extension, surrounds the thimble g^2 , the coil g , and part of the body A .

The disk e' constitutes a mutilated gear, being formed with a segment of gear-teeth e^3 on its periphery, and when the valve B is moved into its open position to turn on the gas the said gear-teeth move in the direction of the arrow in Fig. 2 and intermesh with a pinion f , fast on a shaft f' , journaled in plates $D D'$. The shaft f' also carries a gear f^2 , which is connected with said shaft by a ratchet-and-pawl mechanism, as shown in Fig. 2, or it may be a suitable clutch device of other form, so that as the disk e' is moved in the direction of the arrow in Fig. 2 when the valve B is being moved by hand into its open position pinion f may be turned independently of the gear f^2 , and when the spring C operates to turn the said disk, pinion, and shaft f' in the opposite direction to move the valve B into its closed position the clutch mechanism operates to connect the shaft f' with and to turn gear f^2 . The gear f^2 is in mesh with a pinion f^3 , fast on a shaft f^4 , journaled in plates $D D'$, on which shaft is also fixed a gear f^5 , which meshes with a pinion f^6 . The pinion f^6 is fast on a shaft f^7 , journaled in plates $D D'$, and said shaft also carries an escapement f^8 , which engages and operates an escapement-lever f^9 . The latter is fast on a shaft f^{10} , journaled in plates $D D'$, and is provided with an arm f^{11} , the extremity of which is a segmental gear f^{12} , which is in engagement with and turns a pinion f^{13} on the shaft f^{14} of the wheel F , which constitutes an oscillatory balance-wheel.

When the valve is moved by hand into its open position and then released, the spring C tends to return the valve to its closed position and through the medium of the mechanism just described serves to actuate the wheel F , and the latter through the medium of the escapement and the gears and pinions acts as a governor to regulate the speed at which the spring moves part b^2 .

When the valve B is moved into its open position and the gas is ignited at the tip g^3 , the thimble g^2 and thermostat are heated and the latter operated. The free end g^4 of the thermostat being moved from the position shown by full lines in Fig. 2 to the position shown by dotted lines has its brake-shoe g^5 brought against the periphery of wheel F , which is thereby locked and prevents the spring from operating and moving the part b^2 .

When the flame is extinguished at the tip g^3 , the thermostat g operates to release wheel F , and the spring C is then free to move disk

e' in the opposite direction to the arrow in Fig. 2, and when the spring C has turned the disk e' sufficiently to carry the segmental gear e^3 past and out of engagement with pinion f the said disk and part b^2 are disconnected from wheel F and intermediate mechanism, and the spring being then uncontrolled operates to move parts b^2 and b' and valve B to their normal or closed position by a quick movement.

In some instances it may be desirable to construct the valve-stem of one piece; but the advantage obtained by making it in two pieces connected by a pin and slot, as heretofore described, is that after the valve has been turned by hand into its open position and part b^2 partly rotated and after the thermostat has operated to lock the wheel F , and thereby prevent part b^2 from being turned by spring C to close the valve, the said valve may be moved back into its closed position or partly-closed position by hand, the pin b^5 being moved from one end of the slot b^4 to the opposite end independently of part b^2 .

The thimble g^2 fits into the tubular casing A^4 tightly and is held in place by friction between it and said casing; but as it is necessary to adjust the thermostat very nicely with relation to wheel F for different temperatures the thimble g^2 is movable in said casing and is slotted, as at g^6 , so that a tool may be inserted in the said slot and the thimble g^2 turned in the casing and the free end of the thermostat adjusted with relation to wheel F .

By the invention described it will be seen that the gas may be turned on and lighted, turned "low" or "high," or be entirely shut off to extinguish the light precisely as is done with a burner not equipped with the invention, but that in case the gas should be blown out or accidentally extinguished through any cause the valve will be automatically operated soon after such extinguishment by the running down of the spring-motor.

The invention is relatively simple in and economic of construction, which are things, coupled with the foregoing, that add to its importance and value.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, it is declared that what is claimed is—

1. The combination with a gas cock and burner, of a spring-motor operatively connected with said cock so as to be set or wound up by the turning thereof, said motor having an escapement and a balance-wheel; and a thermostatic brake for the latter associated with the burner so as to be applied by the heat generated thereat, substantially as described.

2. The combination with a gas cock and burner, of a spring-motor operatively connected with said cock so as to be set or wound up by the turning thereof, said motor having an escapement and a balance-wheel; and a ther-

mostatic brake for the latter in the form of a metal strip having a coil associated with the burner, substantially as described.

3. The combination with a gas cock and burner, of a spring-motor operatively connected with said cock so as to be set or wound up by the turning thereof, said motor having an escapement and a balance-wheel; a thimble surrounding the burner-tip; and a thermostatic brake in the form of a metal strip having a coil secured to the thimble and an arm extending to the balance-wheel, substantially as and for the purpose described.

4. The combination with a gas cock and burner, of a spring-motor operatively connected with said cock so as to be set or wound up by the turning thereof, said motor having an escapement and a balance-wheel; a casing for the motor having an extension with a portion surrounding the burner; a thimble fitting within said surrounding portion of the casing extension and itself surrounding the burner-tip; and a thermostat in the form of a metal strip having a coil secured to said thimble and an arm extending through the casing extension to the balance-wheel and constituting a brake therefor, substantially as described.

5. The combination with a gas cock and burner, of a spring-motor operatively connected with said cock so as to be set or wound up by the turning thereof, a thimble surrounding the burner; and a thermostat in the form of a metal strip having a coil secured to said thimble and a part constituting a stop for the motor, substantially as described.

6. The combination with a gas cock and burner, of a spring-motor operatively connected with said cock so as to be set or wound up by the turning thereof; a casing for the motor having an extension with a portion surrounding the burner; a thimble fitting within said surrounding portion of the casing extension and itself surrounding the burner-tip; and a thermostat in the form of a metal strip having a coil secured to said thimble and an arm extending through the casing extension to the motor with which it cooperates as a stop, substantially as described.

7. The combination with a gas cock and burner, of a spring-motor operatively connected with said cock so as to be set or wound up by the turning thereof, said motor comprising a member rotatively connected with the cock and with the spring and members normally disconnected from said member which is arranged to be brought into connection therewith by the turning of the cock; and a thermostatic stop device associated with the burner and coacting with the members of the motor normally disconnected from the spring and cock, substantially as described.

8. The combination with a gas cock and burner, of a thermostatic stop device associated with the burner; and a spring-motor with which said stop device coacts and which is operatively connected with the cock so as to be wound up or set by the turning thereof, said motor having a mutilated gear normally out of mesh between its spring and its member which is acted upon by the stop device, and said gear being in the form of a disk or wheel with a limited number of teeth projecting from its periphery.

9. The combination with a gas cock and burner, of a casing, a spring connected therewith and with the cock, a slotted arm in rotative connection with the cock, a gear-supporting frame in the casing comprising plates one of which is slotted and formed with a segmental stop-lug; a disk journaled over said plate and having a pin extending through the slot thereof into engagement with the slotted arm of the cock, said disk having gear-teeth on its periphery; a train of gear- ing supported between the plates and associated with said disk; and a thermostatic stop device associated with the burner and arranged to coact with said train, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 31st day of July, A. D. 1899.

JOSEPH C. HEALD.

Witnesses:

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