

(No Model.)

J. E. HOGAN.
AUTOMATIC CUT-OFF FOR GAS BURNERS.

No. 467,287.

Patented Jan. 19, 1892.

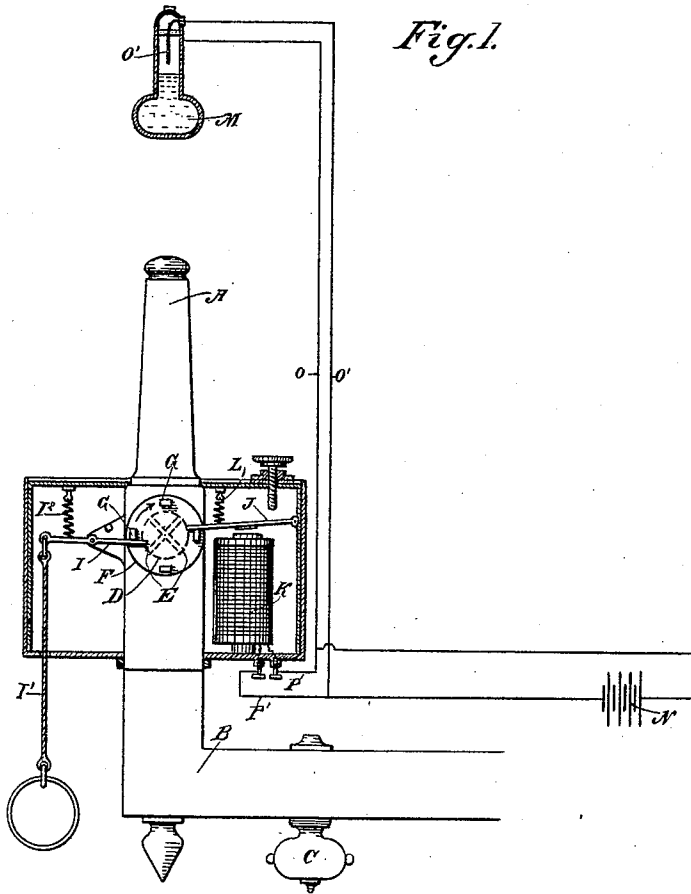


Fig. 2.

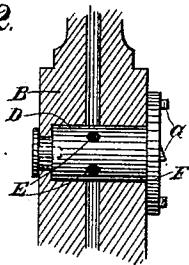
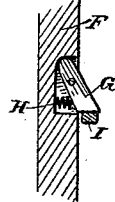


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES E. HOGAN, OF OAKLAND, CALIFORNIA.

AUTOMATIC CUT-OFF FOR GAS-BURNERS.

SPECIFICATION forming part of Letters Patent No. 467,287, dated January 19, 1892.

Application filed April 20, 1891. Serial No. 389,684. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. HOGAN, a citizen of the United States, residing at Oakland, Alameda county, State of California, have invented an Improvement in Electric Safety Attachments for Gas-Burners; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a device which I call an "electric safety attachment for gas-burners;" and it consists of the constructions and combinations of devices which I shall hereinafter fully describe and claim.

Its object is to provide a supplemental means for cutting off the flow of gas in case the usual key is accidentally turned or left open after the light has been extinguished.

Figure 1 is a side elevation of my apparatus. Fig. 2 is a vertical section through the gas-pipe in the line of the axis of the plug. Fig. 3 is an enlarged detail view of one of the stops.

A is the burner-tip, B the pipe through which the gas is supplied thereto, and C the key or cock, which is turned to allow gas to flow to the burner.

D is a supplemental rotary plug-cock, which is properly fitted at some point in the pipe between the cock C and the burner-tip A. This plug is perforated in two directions at right angles with each other by the holes E, and when either of the holes is in line with the passage to the burner-tip gas will be allowed to flow, but when they stand diagonally with the passage to the burner-tip the supply will be cut off. The plug is turned in one direction by intermittent movements, so as to first open the passage for gas, then cut it off, and continue thus alternately. This rotation is effected as follows: Upon the outer end or shaft of the plug D is fixed a disk F. This disk has the four spring-actuated stops G fulcrumed in depressions in the face of the disk, as shown in enlarged view, Fig. 3, and by means of a spring H the points of these lugs are forced outward, so as to be engaged by the operating arms or levers acting in one direction; but when these arms are moved backward or returned over the inclined faces of the lugs the latter will be depressed by the yielding of the spring beneath them, so as to allow the arms to pass the lugs,

being immediately forced out again to the proper position to be engaged by the lever in its next movement.

I is a lever, fulcrumed at one side of the disk F, so that one end of it extends inwardly beyond the circle of travel of the lugs G, and when this lever is moved in one direction by pulling the cord I' it will engage one of the lugs, thus partially rotating the disk F and bringing it and the plug D, which it carries, into such position that one of the openings through the plug will be in line with the passage to the gas-burner, thus allowing the gas to flow freely whenever the cock C is turned. When the cord is released, the lever is returned by the spring I², and is thus ready to engage the next lug G when the rotation of the disk brings it to the proper point. Upon the opposite side of the disk F is a second lever J, the end of which extends beyond the circle of travel of the lugs upon that side, and this lever carries an armature which is acted upon by the electro-magnet K when a current passes through this magnet. Above the lever J is a spring L, which acts to draw the lever upward whenever the electrical current is cut off from the magnet. Above the burner, or in such position as to be acted upon by the flame when the gas is lighted, is a bulb or chamber M, containing mercury.

N represents the battery, and O and O' are the wires leading from the battery to the upper part of the bulb M. This bulb may be made of copper or other suitable metal, and the wire O forms a contact with one side of the bulb and through it with the mercury. The other wire O' passes into the upper part of the bulb, from which it is insulated, and the point of the wire is so arranged within the bulb and above the surface of the mercury that when the latter is heated it will rise and form a contact with the point of O', thus completing the circuit. Two other wires P and P' connect directly with the electro-magnet K, as shown. It will be manifest that when the gas is burning the wires O and O' will short-circuit the current, so that it will pass through the bulb M, as before described, and the electro-magnet having no action upon the armature the spring L will raise the lever J until its point stands just above one of the lugs G on the disk F.

As long as the gas remains lighted this will be the position of the parts, the disk F standing in such position, as before described, that a clear opening is left for the gas to flow through the plug D to the burner. If the supply of gas is cut off either temporarily or permanently, so that the flame is extinguished, the mercury in the bulb immediately commences to cool, and when it is contracted so as to break the contact between the point of the wire O' and itself the short-circuit current through the wires O and O' ceases, and the current then flows through the wires P and P' and the electro-magnet K, thus causing it to attract its armature on the lever J with sufficient force to overcome the tension of the spring L, and this lever, acting upon the lug G, will rotate the disk F and the plug D sufficiently to turn the latter, so as to cut off communication through it with the burner. If then by accident the key or cock C should have been turned sufficiently to cut off the flow of gas and afterward should be again turned on, so that the gas would flow through the burner, so as to endanger the occupant of the room, it will be seen that this supplemental plug D will be operated by the electro-magnet and turned so as to cut off the supply of gas. This being the normal position, it will be manifest that when it is again desired to light the gas it will be necessary to rotate the plug D to again open communication, and this is done by pulling upon the chain I', which actuates the lever I sufficiently to overcome the tension of the spring I², when the inner end of the lever I, acting upon one of the lugs G, with which it is in contact, will again turn the disk F and the plug D, so as to bring one of the passages through the plug in line with the burner. The key or cock C being turned will then allow gas to flow and it may be lighted, when the operation of short-circuiting will again take place. The lever J, being released from the magnet, will be drawn upward by the spring L until its end is above one of the lugs G, and it is again in position to close the supplemental valve D after the gas has been extinguished.

I have here described mercury contained in a bulb as the most convenient form of expansible conducting medium; but it will be manifest that a solid metal may be used, the expansion of which will complete the circuit.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A safety attachment for gas-burners consisting of a supplemental cock or valve, whereby the supply of gas may be cut off

from a burner, a means whereby said cock may be turned, so as to allow the flow of gas through it to the burner, an expansible conducting material supported above the burner-tip, a battery having wires, one of which is connected directly with the expansible conductor and the other is insulated and supported in such position that the circuit is completed by the expansion of the conductor, an electro-magnet connected with the same circuit, a lever carrying an armature which is acted upon by said electro-magnet when the circuit through the magnet is completed, and lugs or attachments connected with the supplemental cock or valve, whereby the latter is turned to cut off the flow of gas when the electrical current is caused to pass through the magnet by the cooling of the expansible conductor and a cutting off of the short circuit thereby, substantially as herein described.

2. A safety attachment for gas-burners, consisting of a rotary supplemental cock or valve by which passage may be opened or closed to the burner, a disk fixed to said cock and having the spring-actuated lugs G in its face, a lever I, adapted to engage one of these lugs, a means for moving said lever and rotating the cock, so as to open a passage to the burner, a second lever J, adapted to engage one of the lugs from the opposite side of the disk, a spring L, by which said lever is normally raised and in position to engage one of the lugs, an armature fixed to said lever, an electro-magnet whereby said armature and lever are drawn down by the completion of an electric circuit through the magnet and the cock is rotated to close communication with the burner, and an expansible conductor suspended above the burner and having short circuit-wires connected therewith and interposed between the electro-magnet and the battery or source of electrical supply, said wires being so arranged with relation to the expansible conductor that the electric circuit will be completed through them and the electro-magnet thrown out of the circuit by the heating and expansion of the conductor, and the current interrupted through these wires and directed through the magnet by the cooling and contraction of the conductor, substantially as herein described.

In witness whereof I have hereunto set my hand.

JAS. E. HOGAN.

Witnesses:

S. H. NOURSE,
H. F. ASCHECK.