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P. C. FOLWELL.

AUTOMATIC CUT-OFF FOR GAS BURNERS.

(Application filed Oct. 9, 1897.)

(No Model.)

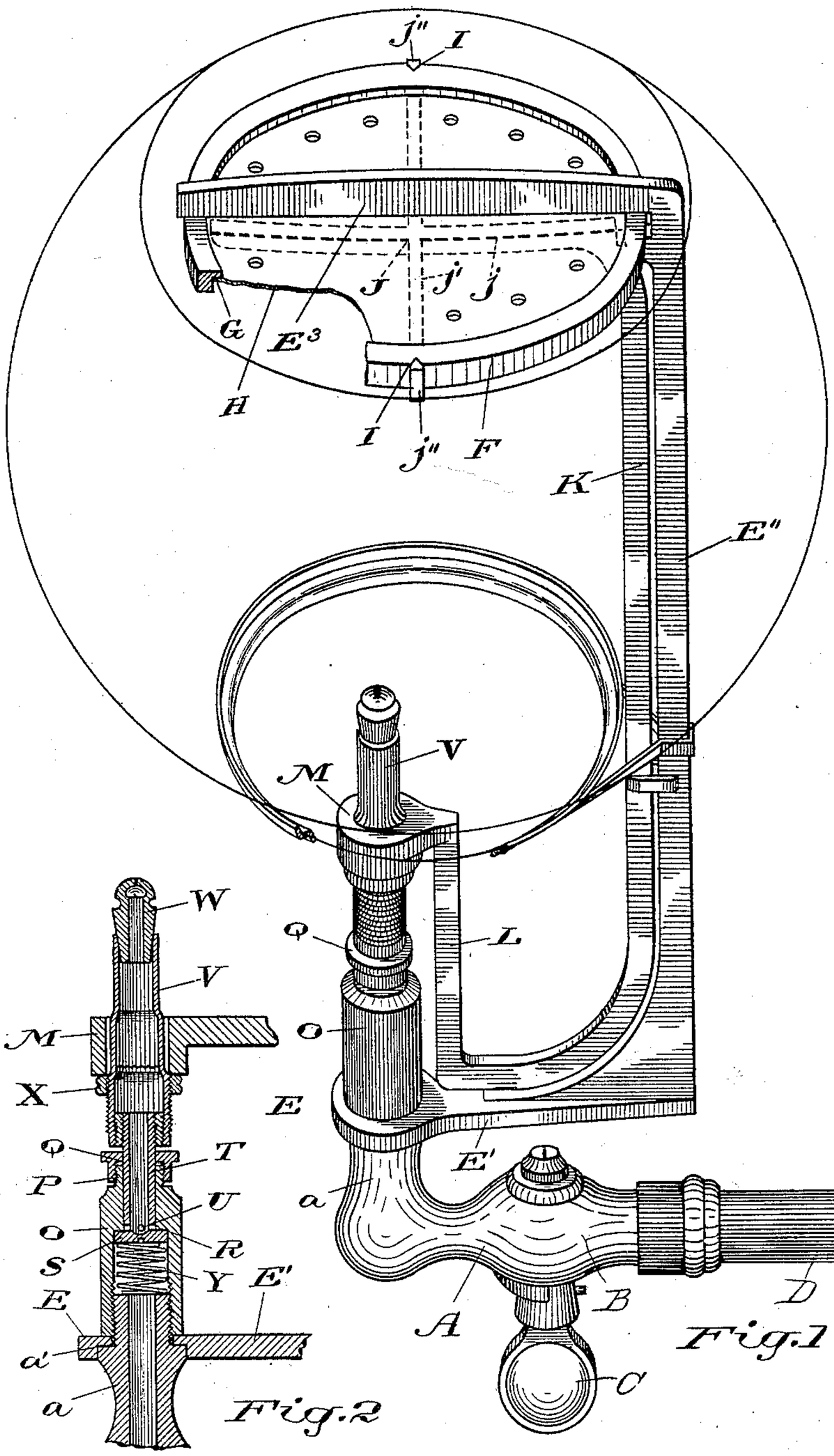

Fig. 1

Fig. 2

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UNITED STATES PATENT OFFICE.

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AUTOMATIC CUT-OFF FOR GAS-BURNERS.

SPECIFICATION forming part of Letters Patent No. 610,623, dated September 13, 1898.

Application filed October 9, 1897. Serial No. 654,719. (No model.)

To all whom it may concern:

Be it known that I, PHILLIP C. FOLWELL, of the city of Toronto, in the county of York and Province of Ontario, Canada, have invented certain new and useful Improvements in Automatic Cut-Offs for Gas-Burners; and I hereby declare that the following is a full, clear, and exact description of the same.

The object of this invention is to provide the burner of a gas-jet with a valve which will automatically close the passage through the burner after the light has been extinguished, to provide the valve with a heat-influenced apparatus to control its action, and to so arrange the several parts that they can be readily applied to any gas-jet without requiring the alteration of any of the parts; and the invention consists, essentially, of the device hereinafter more fully set forth, and more particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of a gas-jet, showing the cut-off applied. Fig. 2 is a vertical section through the burner.

Like letters of reference refer to like parts throughout the specification and drawings.

A represents the gas-jet; B, the valve-casing of the jet A; C, the valve working within the valve-casing B; D, the gas-pipe to which the gas-jet A is connected.

The end *a* of the gas-jet A is screw-threaded, and the gas-jet, at the terminus of the screw-threaded part, is provided with a shoulder *a'*. Fitted over the end *a* and resting on the shoulder *a'* is the collar E of the supporting-frame. The supporting-frame consists of a horizontal arm E', extending horizontally from the end *a* of the gas-jet; a standard E'', integrally formed with the arm E', extending above the top of the burner, and a horizontal arm E^3, extending from the top of the standard E'' over the nipple of the burner. The arms E' E^3 are preferably formed integral with the standard.

F represents a ring sustained by the arm E^3. The top of the ring F is provided with an inward flange G.

H represents a diaphragm of thin sheet metal embraced by the ring F and prevented from moving upwardly by the flange G. Formed in the outer face of the ring F are two diametrically-opposed grooves I I.

J represents a frame consisting of two bars *j j'*, respectively crossed at the middle. The ends of the bars *j'* are provided with upward projections *j''*, located in the grooves I I, which act as guides for them. The diaphragm H is made of some metal which is easily or quickly expansible, while the ring F is made of a slowly-expansible metal. The diaphragm H is made to fit snugly but not tightly the inner side of the ring and when not heated normally rests on the frame J. When the gas-jet has been lighted, the diaphragm quickly responds to the action of the heat, expanding against the inner face of the ring, which limits the lateral expansion of the diaphragm and causes it to bulge toward the frame and hold the frame in its downwardly-moved position, as hereinafter specified. The bar *j* is parallel with the under side of the arm E^3 and extends to the edge of the ring F. Suspended from the bar *j* is an arm K, which extends downwardly parallel with the standard E''. The lower end of the arm K is curved to extend over the arm E', to which it is in close proximity. The curved end of the arm K extends to a point near the burner, and extending upwardly from the end of the curved arm K is a vertical arm L, the top of which is provided with a horizontal collar M. Fitted on the screw-threaded end *a* of the gas-jet is a cylinder O, which when screwed into position tightly holds the collar E between itself and the shoulder *a'*, preventing the displacement of the main frame. The top of the cylinder O is provided with a screw-threaded projection P, and fitted on the top of the projection P is a nut Q. The passage through the cylinder O is in communication with the passage through the gas-jet A. The passage through the cylinder O is provided with a valve-seat R at or about the middle of the cylinder. Working within the cylinder is a piston-valve S, which is adapted to be pressed against the seat R and close the passage from the gas-jet A through the cylinder to the burner. Extending upwardly from the piston-valve S is a hollow valve-stem T, and formed through the valve-stem T are perforations U. The top of the valve-stem T is screw-threaded, and fitted on the valve-stem is the burner V, provided with the usual nipple W. The outer face of the burner V is screw-threaded, and fitted on the burner is an ad-

justing-nut X. The collar M embraces the burner V above the nut X. Within the cylinder O is a spring Y, which bears against the under side of the valve S and the top of the end *a* of the jet. The tendency of the spring Y is to force the piston-valve upward to close the passage from the gas-jet to the burner.

The action of the parts is as follows: When it is desired to light the gas, the valve C is opened and the arm L is drawn downward, causing a simultaneous downward movement of the collar M, which carries with it the burner V, valve-stem T, and valve S, opening the passage from the gas-jet to the burner and allowing the free passage of the gas from the gas-pipe D to the nipple X. The arm L when moving downwardly carries with it the frame J, and the diaphragm H, normally resting on the frame, moves with it. When the diaphragm has been influenced by the heat from the flame, it expands against the ring and holds the frame in its downwardly-drawn position, holding down at the same time the piston-valve and keeping open the passage through the cylinder to the burner and nipple. The diaphragm is expanded and held in this position so long as influenced by the heat from the ignited gas. Immediately the gas has been extinguished either by closing the valve C or by blowing it out at the burner the diaphragm rapidly cools, contracts, and allows the upward movement of the frame and the part suspended from it and also the upward movement of the burner, the valve-stem, and piston-valve to close the passage through the cylinder. By this construction the passage from the gas-burner to the nipple is effectually closed immediately after the flame has been extinguished, thus preventing accidents and danger from the escape of gas through the careless extinguishing of light. To guide the arm K in its upward movement, it is provided with two lugs Z, which embrace the sides of the standard E′.

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

1. In an automatic cut-off for gas-jets, a thermostat embracing in its construction a slowly-expansible ring suspended above the burner and provided with an annular flange, a quickly-expansible diaphragm loosely mounted in the ring in combination with a vertically-movable frame suspended below and supporting the diaphragm, and provided with an arm to operate the valve to open the passage when the diaphragm is heat-influenced, substantially as specified.

2. In an automatic cut-off for gas-jets, a thermostat embracing in its construction a slowly-expansible ring provided with an annular flange, a quickly and easily expansible diaphragm, loosely mounted in the ring in combination with a vertically-movable frame suspended below and supporting the diaphragm, and provided with diametrically opposite lugs embracing the sides of the ring, and an arm depending from the frame to operate the valve controlling the passage through the burner, substantially as specified.

3. An automatic cut-off for gas-jets embracing in its construction a cylinder connected to the gas-jet, a piston-valve within the cylinder, a hollow valve-stem connected to the piston-valve and projecting beyond the cylinder and provided with ports in close proximity to the piston-valve, a spring to normally hold the piston-valve against the valve-seat in the cylinder and close the passage from the gas-jet to the burner, a thermostat, an arm controlled by the thermostat when heat-influenced to hold the valve depressed and keep open the passage from the gas-jet to the burner, said thermostat provided with an eye encircling the burner, and an adjusting-nut fitted on the burner to support the eye of the heat-controlled arm and regulate the movement of the hollow valve-stem and burner, substantially as specified.

4. An automatic cut-off for gas-jets embracing in its construction a gas-jet, a supporting-frame consisting of a standard having two horizontal arms, the lower horizontal arm fitted with an eye supported on the shoulder of the gas-jet, the upper horizontal arm holding a ring of slowly-expansible metal, a cylinder fitted on the gas-jet, binding the eye of the supporting-frame against the shoulder, a piston-valve within the cylinder, a spring pressing against the top of the gas-jet and the under side of the piston-valve, a hollow valve-stem connected to the piston-valve and having ports in close proximity thereto, a burner fitted to the top of the valve-stem, a diaphragm of quickly-expansible metal loosely held by the slowly-expansible ring, a vertically-movable frame below the diaphragm, an arm depending from the frame, an eye connected to the arm encircling the burner, and an adjusting-nut fitted on the burner to support the eye, substantially as specified.

Toronto, September 23, A. D. 1897.

P. C. FOLWELL.

In presence of—
M. A. WESTWOOD,
C. H. RICHES.