No. 891,670. PATENTED JUNE 23, 1908.

R. H. COOKE.

AUTOMATIC CUT-OFF FOR GAS BURNERS.

APPLICATION FILED MAR. 23, 1907.

Fig. 1.

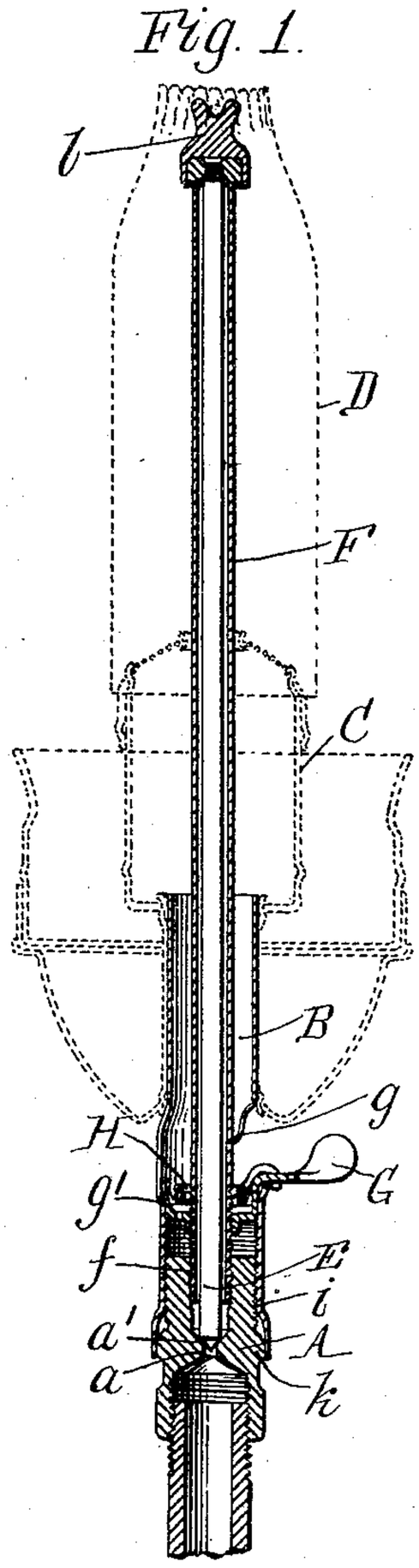


Fig. 2.

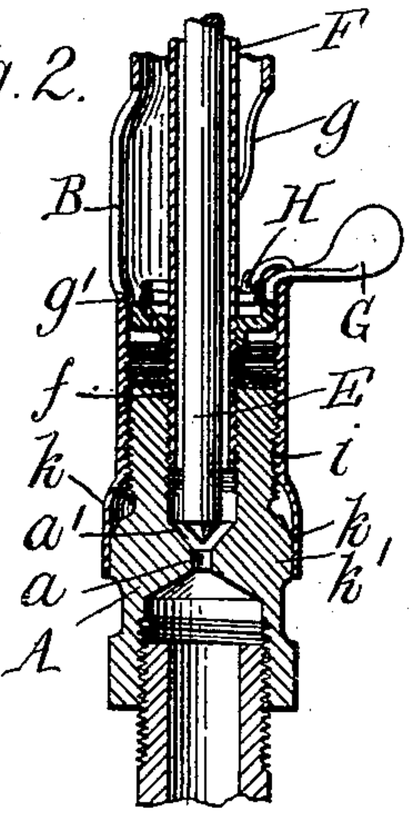


Fig. 3.

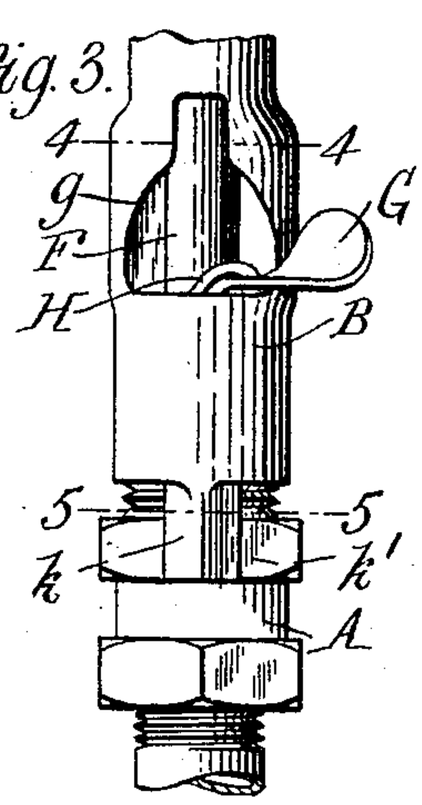


Fig. 4.

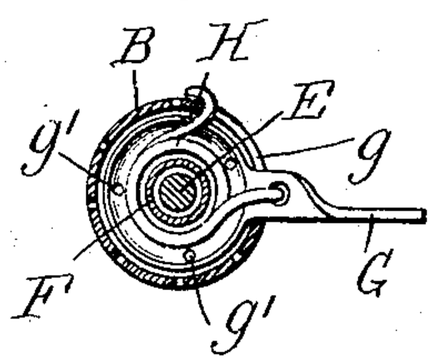


Fig. 5.

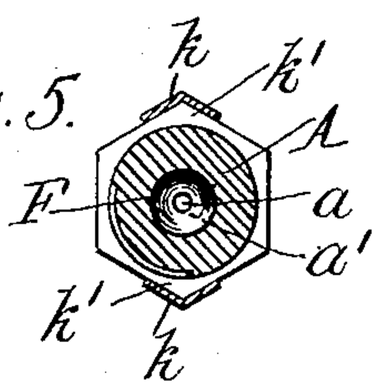


Fig. 6

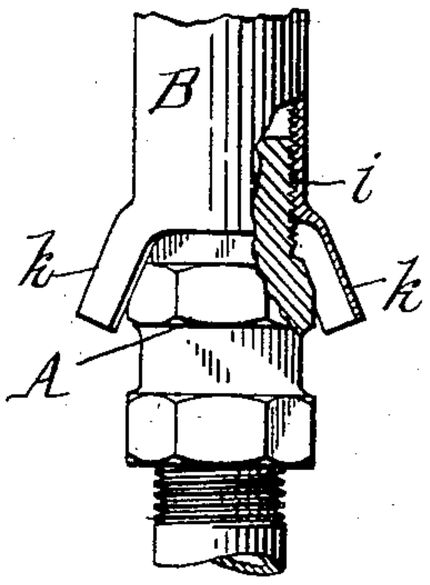
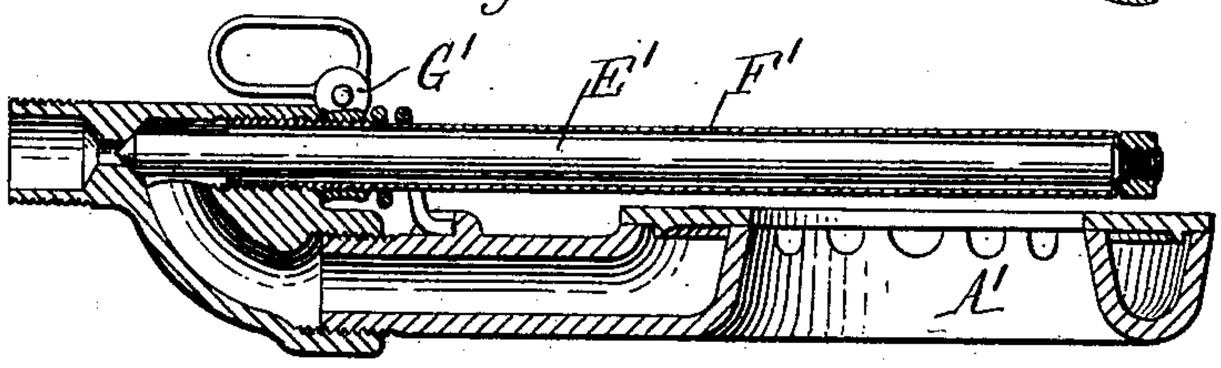


Fig. 7



Witnesses:
A. G. Dimond.
E. A. Yoek.

Inventor.
Richard H. Cooke.
By Wilhelm, Parker & Hard,
Attorneys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

RICHARD H. COOKE, OF BUFFALO, NEW YORK.

AUTOMATIC CUT-OFF FOR GAS-BURNERS.

No. 891,670. Specification of Letters Patent. Patented June 23, 1908.

Application filed March 23, 1907. Serial No. 364,041.

To all whom it may concern:

Be it known that I, RICHARD H. COOKE, a subject of the King of Great Britain, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Automatic Cut-Offs for Gas-Burners, of which the following is a specification.

This invention relates more particularly to improvements in gas burners of that type having a cut-off valve controlled by a thermostat which is influenced by the heat of the burning gas and acts to hold the valve open to allow the flow of gas so long as the gas is burning, but seats the valve and prevents the escape of gas in the event that the flame is extinguished from any cause.

The objects of the invention are to produce an automatic cut-off for gas burners which is quickly and easily operated to light the gas and is reliable in its automatic action, but is nevertheless so simple in construction that it adds but little to the cost of the burner; also to adapt the cut-off device especially to the well known incandescent mantle burners; also to provide simple means for adjusting the cut-off valve; also to locate and construct the thermostat so that it provides a support for the incandescent mantle.

To these ends the device comprises a burner having a valve to control the flow of gas, a thermostat, influenced by the heat of the burning gas, which is connected to said valve and has a screw or analogous connection with the burner whereby it can be turned to open and close the valve manually, and which is expanded by the heat of the flame and holds the valve open so long as the gas is burning, but contracts and closes the valve upon the flame being extinguished. The thermostat in an incandescent mantle burner extends up through the mixing tube of the burner and constitutes a support for the mantle, and the mixing tube is adjustable for regulating the action of the cut-off valve. The invention is applicable also to other forms of illuminating burners and to heating burners.

In the accompanying drawings: Figure 1 is a sectional elevation of an incandescent mantle gas burner embodying the invention, the valve being closed. Fig. 2 is a fragmentary similar view, on an enlarged scale, showing the valve open. Fig. 3 is an elevation of the parts shown in Fig. 2. Figs. 4 and 5 are cross sections thereof in lines 4—4 and 5—5, respectively, Fig. 3. Fig. 6 is a fragmentary elevation thereof, partly in section, on an enlarged scale, showing the holding lugs of the mixing tube released for adjusting the tube. Fig. 7 is a sectional elevation of a stove burner embodying the invention.

Like letters of reference refer to like parts in the several figures.

Referring particularly to Figs. 1–6, A represents the body, and B the air and gas mixing tube of an incandescent mantle gas burner, the burner cap and mantle being indicated by broken lines at C and D, respectively. The burner body, which may be of any suitable form, has a gas passage *a* therethrough in which is provided a valve seat *a'* preferably conical in shape.

E represents a valve, consisting preferably of a rod extending longitudinally through the burner cap and mixing tube into the burner body and having a conical inner end to cooperate with the valve seat *a'* for controlling the flow of gas. This valve rod is attached in any convenient manner at its outer end to an expansible element or thermostat F which has a screw connection *f* at its inner end with the burner body. The thermostat preferably consists of a tube surrounding the valve rod and having a screw-threaded inner end screwed into an internal thread in the gas passage of the burner body. This tube is made of any suitable metal having a higher coefficient of expansion than the valve rod. If a steel valve rod is used, for example, a brass or copper tube will operate properly. Suitable means are provided for turning the tube in its threaded connection for seating and unseating the valve rod. In the construction shown in the drawings, a lever G is screwed on the thermostat tube or otherwise fixed thereto and extends out through a hole *g* in the mixing tube so that it can be reached and turned. The hub of the lever, which practically fills the mixing tube B, has one or more perforations *g'* for the passage of the gas. A spring H is coiled about the thermostat tube with its opposite ends attached respectively to the mixing tube and to the lever. By turning the lever G in one direction (to the left in Fig. 4) the thermostat tube will be raised, by reason of its screw connection with the burner body, and lift the valve rod off of its seat. The gas will then flow through the burner and can be ignited. The

heat of the flame will soon expand the thermostat tube and thereby lift the valve rod still farther from its seat. When the lever is released the spring H will return it and the thermostat tube to the initial position, but owing to the elongation of the tube the valve will be held off of its seat so that the gas will continue to flow and maintain the flame. If the flame should be accidentally extinguished from any cause, such, for example, as a reduction in the gas pressure or the blowing out of the flame, the thermostat tube will contract to its initial length and thus seat the valve and cut off the gas, thereby preventing the escape of gas into the apartment. The burner pipe is provided with an ordinary turn plug or valve (not shown) for turning the gas on and off at will.

The lower end of the mixing tube B is preferably threaded at *i*, see Figs. 2 and 6, and is screwed on an externally threaded portion of the burner body. By turning the mixing tube on this thread on the burner body, the thermostat tube will also be turned through the lever G and the initial position of the valve rod can thus be adjusted to insure the proper seating of the valve. The mixing tube is provided with depending lugs *k* adapted to bear against a hexagonal or polygonal portion *k'* of the burner body, as shown in Figs. 2 and 3, to hold the mixing tube from turning in the position to which it is adjusted. When it is desired to turn the mixing tube for adjusting the valve, the lugs *k* are bent outwardly away from the burner body, as shown in Fig. 6. The mixing tube can then be turned. After adjustment the lugs are again bent back into engagement with the part *k'* of the burner body to hold the mixing tube. Any other means for holding the mixing tube in adjusted positions can be used.

The thermostat tube can, if desired, be utilized for supporting the incandescent mantle D by providing a fork or seat *l* on the upper end of the tube to receive the usual suspension loop of the mantle.

The thermostatic cut-off device described is not restricted in application to a burner of the type shown in Figs. 1–6, but can be used with gas burners generally. Fig. 7 shows the same in connection with a stove burner, in which A' is the burner, E' the valve rod arranged to coöperate with a seat in the gas passage of the burner, F' the thermostat tube and G' the spring-operated lever for actuating the same. The thermostat tube is arranged to be heated by the flame of the burner and has a screw connection with the burner as in the first construction. The operation of this device is similar to that of the other device described in detail.

I claim as my invention:

1. The combination of a burner, a valve controlling the flow of fuel to the same, a thermostat independent of the burner tube which is rotatably mounted and influenced by the heat of the burning gas and by its expansion and contraction operates said valve, means acting when said thermostat is turned manually to actuate said valve, and means for returning said thermostat to the initial position when released, substantially as set forth.

2. The combination of a burner, a valve controlling the flow of fuel to the same, a thermostat which is influenced by the heat of the burning gas and by its expansion and contraction operates said valve, a screw connection for said thermostat whereby it is adapted to be turned and said valve is actuated by turning said thermostat, and means for returning said thermostat to the initial position when released, substantially as set forth.

3. The combination of a burner, a valve rod controlling the flow of fuel to the same, a thermostat tube surrounding and connected to said valve rod and having a screw connection with said burner, said thermostat tube being adapted to be turned on said screw connection for operating said valve, and means for returning said thermostat tube to the initial position when released, substantially as set forth.

4. The combination of a burner, a valve controlling the flow of fuel to said burner, a rotatable thermostat member connected to said valve rod, means acting when said thermostat member is turned to shift the same axially to unseat said valve, and means for returning said thermostat member to the initial position when released, said thermostat acting automatically by expansion to hold said valve off of its seat and by contraction to seat said valve, substantially as set forth.

5. The combination of a burner, a valve rod controlling the flow of gas through the same, a thermostat tube surrounding and connected to said valve rod and having a screw connection with said burner, a lever for turning said thermostat tube to open said valve, and a spring for returning said thermostat tube to initial position, substantially as set forth.

6. In an incandescent mantle gas burner, the combination of a valve controlling the flow of gas, and a thermostat for actuating said valve which extends from said burner and constitutes a support for the mantle, substantially as set forth.

7. In a gas burner having an air and gas mixing tube, the combination of a cut-off valve, and a thermostat connected to said valve and having a screw connection with the burner, said mixing tube being adjustable on the burner and connected to said thermostat for adjusting said valve, substantially as set forth.

8. The combination of a burner body, a cut-off valve, a thermostat connected to said

valve and having a screw connection with said burner body, an air and gas mixing tube having a screw connection with said burner body, means for holding said mixing tube stationary, and a lever connected to said thermostat and projecting through a hole in said mixing tube, substantially as set forth.

Witness my hand, this 21st day of February, 1907.

RICHARD H. COOKE.

Witnesses:
C. W. PARKER,
E. C. HARD.