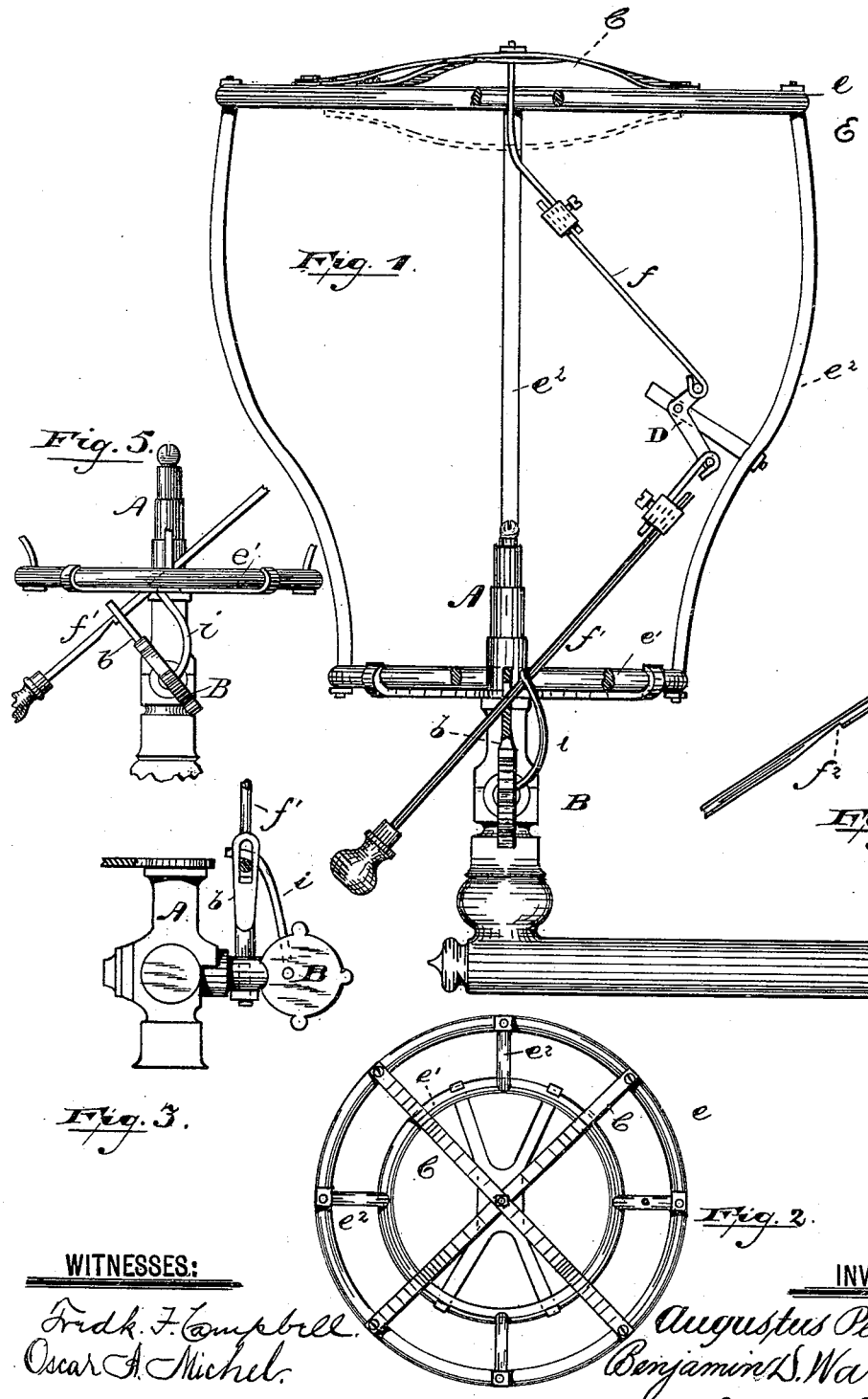
(No Model.)

B. D. WARNER & A. PELISSE.

AUTOMATIC CUT-OFF FOR GAS BURNERS.

No. 344,510. Patented June 29, 1886.



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AUTOMATIC CUT-OFF FOR GAS-BURNERS.

SPECIFICATION forming part of Letters Patent No. 344,510, dated June 29, 1886.

Application filed December 29, 1885. Serial No. 187,050. (No model.)

To all whom it may concern:

Be it known that we, BENJAMIN D. WARNER and AUGUSTUS PELISSE, citizens of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Automatic Cut-Off Mechanism for Gas-Burners; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object for which this invention is designed is to automatically cut off the flow of gas from a burner when the light is extinguished without turning the stop-cock or valve, leaving the gas to escape into the room or apartment. To accomplish this result, the expansion and contraction of metals is employed, and by means of properly-arranged levers the movement of the expanding and contracting metal is communicated to the stop-cock, which is thereby closed.

The invention consists in the combination, with a gas-burner, of metallic pieces so disposed as to receive the full heat of the flame from the burner, and arranged in a curved line directly above the burner, and levers connected with the said metallic pieces and the stop-cock, so arranged as to transmit the movement of the metallic pieces in cooling to the stop-cock.

One arrangement and construction of the said invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the automatically-acting cut-off mechanism attached to a burner. Fig. 2 is a top view of the frame of the device shown in Fig. 1. Fig. 3 is a detail view of the stop-cock and the parts attached thereto. Fig. 4 is a view of the notched rod; and Fig. 5 is an elevation of the gas-burner and a portion of the surrounding parts, as shown in Fig. 4, illustrating the relation of the several adjacent parts when the stop-cock is turned to prevent the escape of the gas.

Similar letters of reference indicate like parts in each of the said views.

A in said drawings indicates the burner, and B the stop-cock thereof. Above the burner, at a suitable distance, are arranged the metallic strips C, which, by their expansion and subsequent contraction in cooling, cause the closing of the stop-cock through the lever D and the rods connected thereto.

The strips C are supported above the burner by a frame, E, of any suitable construction, that shown in the drawings consisting of rings *e e'* and connecting-rods e^2, which may be made so as to be adjusted longitudinally, the said strips being secured at their ends to the ring *e*, and extend diametrically across the said ring in a curved line, curving upward away from the burner, as indicated in Fig. 1, or downward toward the burner, as shown by the dotted lines in the same figure.

The object of curving the metallic strips is to produce a movement thereof away from the burners under the expanding power of the heat from the flame, and toward the said burner when the light is extinguished, caused by the contracting of the strips in cooling. The movement of the strips in cooling is utilized in turning the stop-cock through the lever D and the longitudinally-adjustable rods *f f'*, one of which, *f*, is pivotally attached to the short arm of the lever and to the metallic strips at their point of intersection.

The second adjustable rod, *f'*, is pivotally attached by one end to the long arm of the lever D, and at the opposite end is so constructed as to engage with and turn the stop-cock or an arm, *b*, secured to and turning with said stop-cock. A stop is provided on the rod *f'* or a cut or notch, f^2, as shown in Fig. 4, which engages with the arm *b*, that is preferably slotted to receive the rod, and as the rods and lever move under the downward movement of the contracting-strips causes the said slotted arm and stop-cock to turn until the flow of the gas ceases.

When the strips are curved downward, as shown by the dotted lines on Fig. 1, the movement of the strips in cooling is upward; hence the connecting-rods, lever, &c., must be reversed to transmit the movement of the strip, or the arm *b* may project below instead of above the stop-cock, in which position the drawing motion of the operating parts acts to

turn off the gas. The degree of movement of the rod *f'* depends upon the relative length of the arms of the lever D, and which may be varied as necessary, as will be understood.

When a simple cut is made in the rod to engage with the slotted arm, a rod, *i*, or equivalent device, attached to and moving with the stop-cock, may be used to hold the said notch or cut in holding contact with the said arm.

In Fig. 1 the notch in the rod *f'* has, under the downward movement of the expanded strips, entered into engagement with the arm *b*, and is about to turn the stop-cock, the bent end of the rod *i* being a little above the rod to permit the rod to have sufficient play. The said rod *i* may be employed to serve another purpose—viz., to cause the notch in the rod *f'* to lift from its engagement with the slotted arm after it has turned toward the left, sufficiently to cut off the flow of the gas. When operating in this manner, the bent free end of the said rod *i* engages with the under side of the rod *f'*, as shown in Fig. 5, instead of projecting over and bearing against the upper side of the said rod, as Figs. 1 and 2 indicate.

The operation of the device is substantially as follows: When the gas is turned on, the stop-cock and arm *b* assume a vertical position, as shown in Fig. 1, the notch in the rod *f'* being at the left of the stop-cock. Under the heat of the flame the expansion of the curved strips, which move in a direction at right angles to their length, acting through the rod *f* and lever D, causes an upward movement of the notched rod through the slotted arm until the notched portion thereof has passed through and to the right of the slotted arm. When the gas is extinguished, the reverse of this operation takes place, the contraction of the curved strips causing a downward movement of the notched rod until the notch engages with the bottom of the slot in the arm, as indicated in Fig. 1. The downward movement of the notched rod continuing causes the said arm and the stop-cock to turn toward the left until the flow of the gas is stopped. When the rod has reached this point, the rod *i* strikes the under side of the notched rod and lifts it from its catching engagement with the arm, so that any further downward movement does not affect the stop-cock.

It will be seen that the notch in the rod *f* is made so as to catch in the arm during its downward movement only.

The number of the metallic strips, if desirable, may be increased to four, or any suitable number, according to the power necessary to operate the stop-cock.

Under some circumstances it is necessary to accommodate the strips to the height of the flame, as when the flame is at its greatest height and heat, or when but a small light is burning, so that the strips can be adjusted to the proper distance from the flame to be sufficiently heated. When the said strips are at the proper distance from the flame, the heat therefrom causes the said strips to expand, as will be understood. When the light is extinguished, either accidentally or intentionally, without turning the stop-cock, the strips in cooling contract, and depressing the rods *f* and *f'* cause the stop-cock to turn until the flow of the gas is stopped.

The strip-supporting frame E not only serves to hold the expanding and contracting pieces above and at the proper distance from the flame, but in addition thereto acts to prevent the curtain or other light drapery from coming near to or in contact with the flame.

That many devices have been contrived to effect the result which we desire to accomplish is well known. Consequently it is not our intention to lay broad claim to any element or combination of elements that will secure the desired end, but that combination of parts which is found in our device and all equivalent or modified forms thereof.

In some of the cut-offs hitherto made a helical spring of differing metals has been used, the expansion and contraction of which is utilized to set free another spring which turns the stop-cock. This evidently is very different from the construction and operation of our invention, which is positive and yet very simple in its action. On other devices a rod has been arranged above the burner, one end of the rod being immovably secured to a standard or frame attached to the burner, and the other end of said rod either engaging with or pivoted to a lever which communicates the movement of the rod to the stop-cock; but in this case the expansion of the rod is longitudinal, or in the direction of its length. The expanding pieces or strips in our device move only in the direction of their curvature, and not lengthwise, because any longitudinal movement is prevented by the ends of each strip being fastened immovably to the supporting-frame.

Having thus described our invention, we desire to claim the following:

1. In an automatic gas cut-off, the combination, with a gas-burner, of a supporting-frame attached to said burner, a curved metallic strip or bar secured by each end thereof to said frame in proximity to the gas-burner, and connecting devices attached to said curved strip at about the center thereof and to the stop-cock of said burner, and communicating the movement of the said strip to the stop-cock, substantially as and for the purposes set forth.

2. In an automatic gas cut-off, the combination, with a gas-burner, of a supporting-frame, curved metallic strips secured by each end thereof to said supporting-frame in proximity to the gas-burner and moving in a direction at right angles to their length under the influence of the heat from the gas-flame, a lever or bell-crank pivoted to the supporting-frame, rods connecting said lever with the said curved strips and the stop-cock and communi-

cating the movement of the strips through the lever to the stop-cock, and an arm with which one of said connecting-rods engages secured to and moving with said stop-cock, for the purpose set forth.

3. In an automatic gas cut-off, the combination, with a gas-burner, of a supporting-frame, curved metallic strips secured by each end thereof to said supporting-frame in proximity to the gas-burner and moving at right angles to their length or in the direction of their curvature under the influence of the heat from the flame, a bell-crank or lever pivoted to the said supporting-frame, an adjustable rod, *f*, connecting said bell-crank with the curved strips at about the center thereof, an adjustable rod, *f'*, attached to said bell-crank, and means constructed and operating to permit said rod *f'* to move freely when the gas is lighted, but which engages with said rod and communicates the movement thereof to the stop-cock when the gas or flame is extinguished, substantially as and for the purposes set forth.

4. In an automatic gas cut-off, the combination, with a gas-burner, of a supporting-frame, curved metallic strips secured by each end thereof to said supporting-frame in proximity to the gas-burner and moving in a direction at right angles to their length under the influence of the heat from the gas-flame, a lever or bell-crank pivoted to the supporting-frame, a rod, *f*, connecting one arm of said lever with the curved metallic strips, a notched rod, *f'*, connecting the other arm of said lever with the stop-cock, a slotted arm secured to and turning with the stop-cock, with which the notched arm engages when the flame is extinguished, and a lifting-rod, *i*, connected and moving with the said stop cock, substantially as and for the purposes set forth.

5. In an automatically-acting gas cut-off adapted to be applied to and used in connection with a gas-burner, the combination of a supporting-frame, curved metallic strips secured by each end thereof to said supporting-frame and intersecting each other, a bell-crank pivotally secured to said frame, an adjustable rod, *f*, connecting one arm of said bell-crank with the curved strips at their point of intersection, an adjustable rod, *f'*, attached to the other end of said bell-crank and provided with a notch thereon, and an arm secured to the stop-cock of the burner and provided with a slot therein through which said rod *f'* passes, the notch in the rod engaging with said arm, which is caused to turn as said rod *f'* moves, substantially as and for the purposes set forth.

In testimony that we claim the foregoing we have hereunto set our hands this 23d day of December, 1885.

BENJAMIN D. WARNER.
AUGUSTUS PELISSE.

Witnesses:
CHARLES H. PELL,
FREDK. F. CAMPBELL.