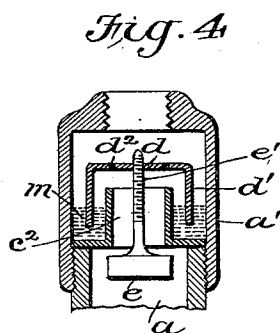
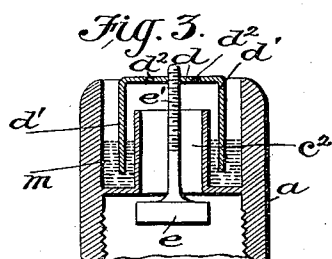
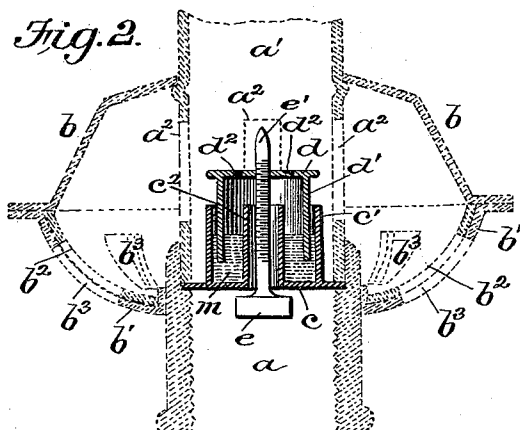
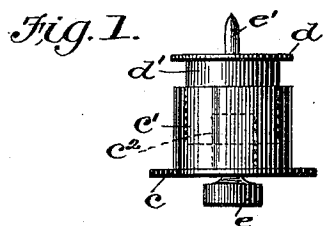


(No Model.)

O. R. CLINE.
GAS REGULATOR FOR WELSBACH BURNERS.

No. 578,212.

Patented Mar. 2, 1897.



WITNESSES:

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UNITED STATES PATENT OFFICE.

OREN R. CLINE, OF EL DORADO, KANSAS.

GAS-REGULATOR FOR WELSBACH BURNERS.

SPECIFICATION forming part of Letters Patent No. 578,212, dated March 2, 1897.

Application filed June 9, 1896. Serial No. 594,819. (No model.)

To all whom it may concern:

Be it known that I, OREN R. CLINE, of El Dorado, in the county of Butler and State of Kansas, have invented a new and useful Improvement in Gas-Regulators for Welsbach Burners, of which the following is a specification.

My invention is in the nature of an improved automatic regulating device for Welsbach and other burners of this class mixing air and gas or using an incandescent mantle; and its object is to render the gas-pressure so uniform that its variations shall not injuriously affect the fragile mantle, but will insure a uniform and brilliant light.

It consists in the peculiar construction of an automatic regulating-valve in combination with the burner-tube and the encompassing air-chamber, as will be hereinafter fully described.

Figure 1 is an enlarged side elevation of the regulating-valve. Fig. 2 is a vertical section of the same shown applied to the tubular stem of a Welsbach burner, which latter is shown in dotted lines; and Figs. 3 and 4 are sectional views of modifications.

In the drawings, *a* represents the screw-nipple, and *a'* the upward extension of the tubular stem of a Welsbach burner. The nipple *a* is to be screwed upon the gas-pipe, and the stem *a'* has openings *a²* in its side that receive air from a surrounding air-chamber *b b'*. The lower portion *b'* of this air-chamber has a sliding draft-regulator *b²*, with holes *b³* registering with or capable of being turned partly or wholly away from corresponding holes in the part *b'*, so as to regulate the quantity of air to be admitted through holes *a²* to the interior of the tube *a'*. This is the ordinary construction of the air-supply of a Welsbach burner.

Between the abutting ends of the nipple *a* and tubular stem *a'* is ordinarily placed a perforated disk, known as the "gas-check." This is entirely replaced by my invention, which consists of a flanged cup *c c'*, having a central tube *c²* opening through it and its bottom flange caught and held between the abutting ends of the nipple *a* and tube *a'*. Within the annular chamber of the cap *c* is placed a liquid seal of mercury *m*, in which is inverted

another cup *d d'*, whose walls *d'* dip into the mercury and centrally to which cup *d d'* is adjustably attached a screw-threaded stem *e'* of a valve *e*, this valve being below the cup *c* and its stem extending up through the central tube *c²*. In the top *d* of the inverted cup are several small holes *d²*, through which the gas escapes into the tube *a'* to become mixed with the air therein.

The normal position of valve *e* is down and open, and the gas passes up around its stem *e'* through the central tube *c²* and passing through the small holes *d²* in the inverted cup mingles with the air in the burner-tube to produce the perfect combustion and intense heat required by the Welsbach burner.

If the gas-pressure in the pipes be increased, the inverted cup *d d'* is lifted slightly in the mercury seal, and the valve *e* rising cuts off a corresponding proportion of the flow, while if the gas-pressure in the pipes be diminished the cup *d d'* drops down and opens valve *e* wider, thus increasing the flow and keeping a constant relation between pressure and flow, increasing the latter as the former diminishes, and vice versa, so as to make a uniform delivery and proper admixture of gas with air at the burner. In this way if a portion of the lights of a burner be turned on or off this effects no change in the feed of gas to this burner, and thus preserves always a proper action and uniform light.

As a modification of my invention I may use the burner-tube to form the outer wall of the mercury-cup, as shown in Figs. 3 and 4.

I am aware that it is not broadly new to incorporate in a burner-tube a mercury seal with an inverted cup and valve having a rising-and-falling motion, in which case the working power is the difference between the initial gas-pressure below the valve and the gas-pressure above it, which difference is so slight as to give little or no effectiveness. In my invention the working power is the entire or initial pressure of the gas on the one hand, working against the atmospheric pressure only, by reason of the fact that air is freely admitted into the burner above the valve from the encompassing air-chamber of the Welsbach burner, which gives a very efficient action.

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

1. In a burner mixing air and gas, the combination with the burner-tube and its surrounding air-chamber, with regulating air-inlets; of a regulating-valve placed in the burner between the initial gas-pressure and the air-chamber, said valve consisting of an annular liquid-seal chamber with a central opening, an inverted cup with perforated top, the perforations of which lead into the mixing-chamber above, and a valve and valve-stem, the latter attached to the inverted cup and descending through the annular seal and attached at its lower end to the valve substantially as and for the purpose described.
2. In a burner mixing air and gas, the combination with the burner-tube made in upper

and lower sections *a* and *a'* with openings *a*² in the upper section, and an air-chamber with regulating-inlets surrounding the same, an annular liquid-seal chamber having a marginal flange at its lower edge retained between the abutting ends of the two burner-tube sections and separating the initial gas-pressure from the air-pressure, an inverted cup with perforated top, the perforations of which lead into the mixing-chamber above, and a valve and valve-stem the latter connected to the inverted cup and extending through the liquid-seal chamber and connected to the valve below the same substantially as and for the purpose described.

OREN R. CLINE.

Witnesses:

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C. L. HARRIS.