No. 875,183. PATENTED DEC. 31, 1907.

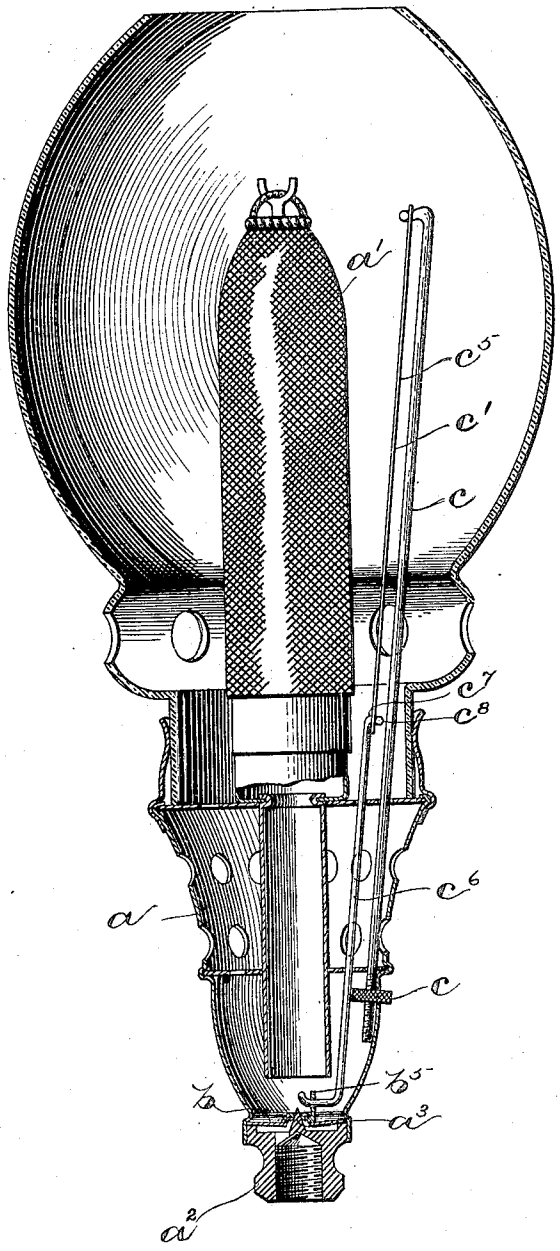
D. H. KENT.

AUTOMATIC GAS REGULATOR.

APPLICATION FILED OCT. 22, 1906.

2 SHEETS—SHEET 1.

Fig. 1



Inventor
Don Henry Kent,

Witnesses
J. Llewellyn Walker
Chas. F. Wilch

By Staley & Burman
His Attorneys

No. 875,183. PATENTED DEC. 31, 1907.

D. H. KENT.

AUTOMATIC GAS REGULATOR.

APPLICATION FILED OCT. 22, 1906.

2 SHEETS—SHEET 2.

Fig. 2

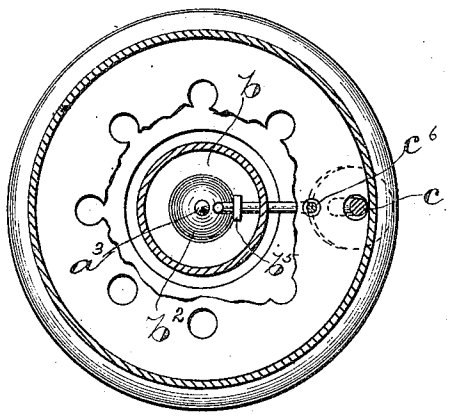


Fig. 3

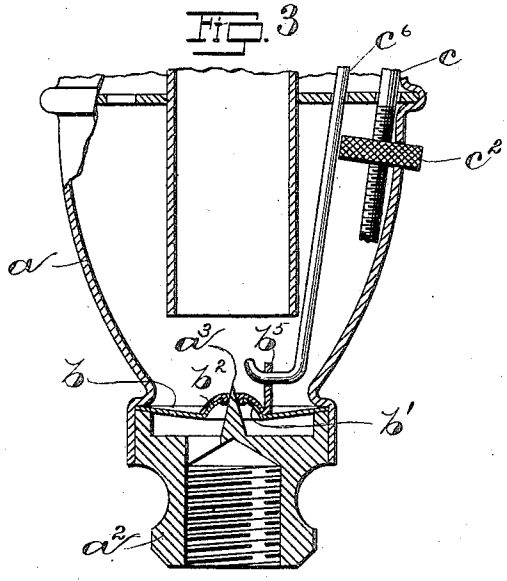


Fig. 5

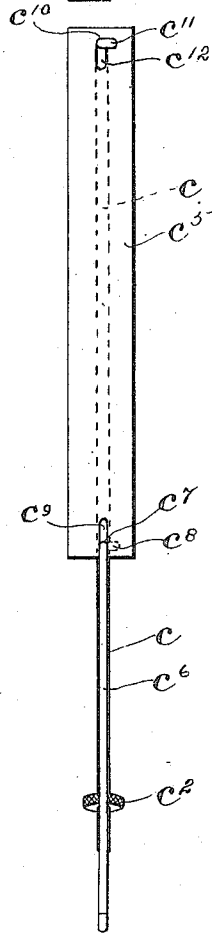


Fig. 6

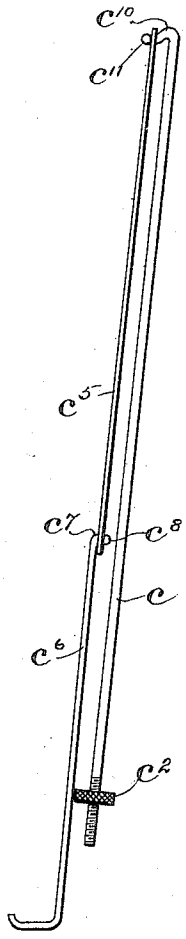
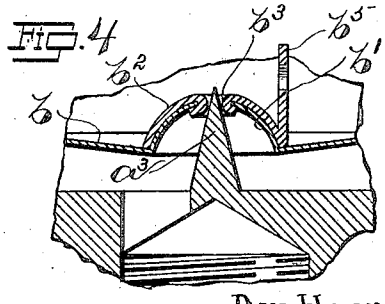


Fig. 4



Inventor

Don Henry Kent,

Witnesses

J. Llewellyn Walker

Chas. F. Wirth

By Staley & Burman

His Attorneys.

UNITED STATES PATENT OFFICE.

DON HENRY KENT, OF URBANA, OHIO, ASSIGNOR TO THE AMERICAN AUTOMATIC LIGHT COMPANY, OF URBANA, OHIO, A CORPORATION OF OHIO.

AUTOMATIC GAS-REGULATOR.

No. 875,183. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed October 22, 1906. Serial No. 339,940.

To all whom it may concern:

Be it known that I, DON HENRY KENT, a citizen of the United States, residing at Urbana, in the county of Champaign and State of Ohio, have invented certain new and useful Improvements in Automatic Gas-Regulators, of which the following is a specification.

My invention relates to improvements in automatic gas regulators and more particularly relates to regulators for incandescent burners.

The object of the invention is to improve upon the constructions set forth in my prior Patents Nos. 806,473 and 806,474, dated December 5th, 1905.

The invention consists in the construction and combination of parts hereinafter described and set forth in the claims.

In the accompanying drawings which form a part of this specification, Figure 1 is a side elevation of a gas burner embodying my invention. Fig. 2 is a transverse sectional view looking toward the bottom of the device. Fig. 3 is a vertical sectional view of a portion of the same. Fig. 4 is an enlarged detail view partly in section of the regulating valve. Figs. 5 and 6 are detail views, respectively, of the thermostat and its support.

Like parts are represented by similar characters of reference in the several views.

The invention is shown in connection with an incandescent burner, but the construction described may be employed with other types of burners, as will be obvious. In the said drawings, a represents a Bunsen burner of the usual type and a' an incandescent mantle supported on the burner in the usual way.

a^2 is the gas inlet, screwthreaded in the usual way, for attachment to the gas supply. Suitably secured at the inner end of this gas supply connection is a flexible diaphragm, b, of sheet metal or other elastic material. The central part of the diaphragm is formed with an upwardly-extending dome-shaped portion, b', having an open center and provided with an encircling reinforcing cap, b^2, of sheet metal. This cap, b^2, is also provided with an opening at its center which has its edges, b^3, flanged in so as to clamp the edges of the opening in the diaphragm. Or the respective openings in the cap and diaphragm may be made of the same diameter, with an eyelet clamping the parts together at this point. The cap is further provided with an upwardly-extending perforated ear, b^5, to provide a connection for the thermostatic rod hereinafter described.

Projecting into the opening formed in the diaphragm is an upwardly-extending cone-shaped valve, a^3, preferably formed integrally with the gas-supply connection, a^2.

Mounted upon a supporting rod, c, and adapted to extend along adjacent to the flame of the burner is a thermostatic rod, c', this rod being loosely hung at its upper end to said support, c, and having its lower end formed in the nature of a hook and extended through the perforation in the ear, b^5, to form a loose connection with the diaphragm. The thermostatic rod is preferably formed in two parts, the upper part, c^5, being in the nature of a flattened strip or plate, considerably wider than the supporting rod, so as to form a shield for said supporting rod. The part, c^5, is loosely connected to the lower portion, c^6, by a loose connection, preferably made by bending the end of the portion, c^6, which is a thin wire or rod, at right angles to the main portion, as shown at c^7, and forming on the end of the bent portion, c^7, a lateral extension, c^8. By turning the portion, c^6, at right angles to the portion, c^5, this bent end, c^7, and its lateral extension, c^8, may be inserted through a slotted opening, c^9, in the flattened portion, c^5, whereupon by swinging the portion, c^6, down to its normal position parallel with the portion, c^5, the parts become locked together. The connection between the broadened part, c^6, and its support, c, is similarly made; the said support being bent at right angles at its upper end, as shown at c^{10}, which has a laterally-extending projection, c^{11}, the portion, c^5, being provided with a slotted opening, c^{12}, to receive the same in the same manner as before described.

By constructing the diaphragm with the central dome having the reinforcing cap, as described, the diaphragm will be caused to move uniformly so that the valve will always stand centrally in the supply opening, thus permitting the gas to pass through the opening in a uniform manner and produce a better mixture. The rounded dome also deflects the air to cause it to mingle with the gas in a more efficient manner.

The operation of the device is as follows: In the normal position of the diaphragm it stands in the position shown in Fig. 4 to

close the gas supply opening. By means of the adjusting nut, c^2, on the supporting rod, c, the position of the diaphragm may be adjusted to permit a normal supply of gas to pass through the supply opening, b^4; the usual valve in the gas supply pipe having been opened to its full extent. As the pressure of the gas increases the thermostatic rod will expand by the action of the increased heat, permitting the flexible diaphragm to return toward its normal position by reason of its elasticity, thus reducing or entirely closing the supply opening, b^4. Should the pressure of the gas decrease, the decreased heat will permit the thermostatic rod to contract and carry the flexible diaphragm away from the stationary cone-shaped valve and increase the size of the opening, b^4, to permit an increased supply of gas.

Having thus described my invention, I claim:

1. In a gas supply regulator, a flexible diaphragm, a gas supply opening therein, a thermostat connected with said diaphragm, and means for regulating the size of said opening by the movement of said diaphragm, substantially as specified.

2. In a gas supply regulator, a flexible diaphragm, a gas supply opening therein, a thermostat connected with said diaphragm, means for regulating the size of said opening by the movement of said diaphragm, and means for adjusting said thermostat, substantially as specified.

3. In a gas supply regulator, a flexible diaphragm, a gas supply opening therein, a fixed projection extending into said opening, and a thermostat connected with said diaphragm, substantially as specified.

4. In a gas burner, a gas supply conduit, a flexible diaphragm, having a central opening, in said conduit, a fixed cone-shaped valve in said conduit extending into the opening in said diaphragm, and a thermostatic rod supported adjacent to the flame of the burner having a connection to said diaphragm, substantially as specified.

5. In a gas burner, a gas supply conduit, a flexible diaphragm in said conduit having a central opening, a reinforcing cap about said opening having a projecting perforated ear, a thermostatic rod supported adjacent to the gas flame and having a connection to said perforated ear, substantially as and for the purpose specified.

6. In a gas burner, a gas supply conduit, a flexible diaphragm in said conduit having a central upwardly-extending dome provided with an opening at its center, a reinforcing cap for said dome, and a thermostatic rod supported adjacent to the gas flame and having a connection to said cap, substantially as specified.

In testimony whereof, I have hereunto set my hand this 12th day of October A. D. 1906.

DON HENRY KENT.

Witnesses:
CHAS. I. WELCH,
CLARA GALLAGHER.