No. 690,573. Patented Jan. 7, 1902.

C. A. HAAS.

AUTOMATIC GAS BURNER PRESSURE REGULATOR.

(Application filed Mar. 28, 1901.)

(No Model.)

Fig. 1

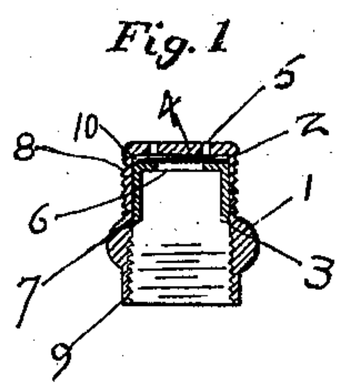

Fig. 1a

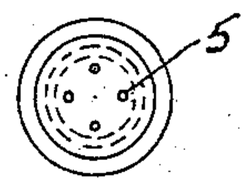

Fig 3

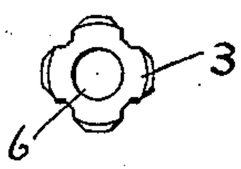

Fig. 3a

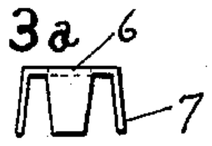

Fig. 2

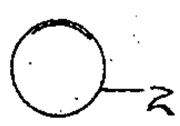

Fig. 2a

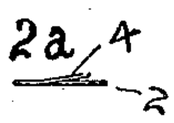

Fig. 4

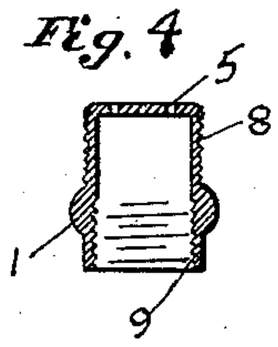

Fig. 4a

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CYRUS A. HAAS, OF ST. LOUIS, MISSOURI.

AUTOMATIC GAS-BURNER PRESSURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 690,573, dated January 7, 1902.

Application filed March 28, 1901. Serial No. 53,375. (No model.)

To all whom it may concern:

Be it known that I, CYRUS A. HAAS, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Automatic Gas-Burner Pressure-Regulators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in gas-pressure regulators secured directly to the burner; and it consists in the novel construction of regulator more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a middle vertical section taken through the device. Fig. 1ª is a top plan thereof. Fig. 2 is a top plan of the valve disk or plate detached. Fig. 2ª is an edge view thereof. Fig. 3 is a top plan of the valve-retaining spider. Fig. 3ª is a side elevation thereof. Fig. 4 is a vertical middle section taken through the outer casing, and Fig. 4ª is a top plan thereof.

The object of my invention is to construct a gas-pressure regulator to be secured directly to the upper section of the burner with a view of regulating the flow of gas to the latter and insuring a uniform feed thereto, thereby producing a constant flame under all circumstances.

The advantages of the present construction will be better apparent from a detailed description of the invention, which is as follows:

Referring to the drawings, 1 represents a valve-casing closed at the top and provided with perforations 5, said casing having outer peripheral screw-threads 8, by which it may be screwed directly to the burner, (not shown,) and having interior screw-threads 9 at the opposite end, by which it may be screwed to the gas-pipe. (Not shown.) Located within the casing is a spider 3, having resilient guide-arms 7, the base of the spider being provided with an opening 6 for the free and uninterrupted flow of the gas therethrough. Interposed between the base of the spider 3 and the closed end of the casing is a valve disk or plate 2, which while shown circular may be polygonal in contour. Cut from the outer edge of the said plate 2 is a resilient tongue 4, by which the distance between the valve and perforated end of the casing is regulated. Under a normal and constant flow of the gas the valve remains as seen in section in Fig. 1, the gas passing through the orifice 6 past the notch, resulting from the severing of the tongue 4 from the body of the valve, finally escaping through the openings 5. Should the pressure rise, the immediate effect would be a slight compression of the tongue 4 and a slight raising of the end of the valve farthest from said tongue, this action closing one or more of the openings 5. Upon a further increase of the pressure a further compression of the tongue would result and a greater number of openings would close, the volume of gas delivered to the burner remaining approximately the same under all circumstances, and thus insuring a constancy in the flame and uniformity in the light produced thereby. The flexibility of the plate or valve 2 and the yielding character thereof insure the results herein enumerated, and while I am aware that it has been the practice to control a single opening by a spring-valve and also a series of openings simultaneously by a spring-actuated valve I am not aware that a series of openings have been controlled in succession according to the pressure of the stream flowing past the valve. The immediate effect of any increase in pressure would be to close the openings farthest from the tongue 4, other openings being successively closed as the pressure increases. With a decrease in the pressure of course the openings last closed would be the first to be uncovered and those first closed would be the last uncovered.

It is apparent that I may depart slightly from the details herein set forth without affecting the spirit or nature of the invention.

The tongue, which is deflected at right angles to the disk and which serves as the spring, has its fixed end secured to the disk valve, the opposite end being free to ride over the inner surface of the perforated end of the casing.

It may be added that by closing the perforations 5 of the casing in succession there will result a flame characterized by a stiffness absolutely essential in the class of burners to which this invention is applied—viz., incandescent or mantle burners. This stiffness results from the joint efflux of the

streams of gas through the openings remaining uncovered at any time, such efflux inducing always the necessary admixture of oxygen from the surrounding atmosphere, insuring perfect combustion and uniform results.

Having described my invention, what I claim is—

1. In a gas-pressure regulator, a casing having a perforated end, a regulating device located in said casing against which the gas is first to impinge, and means for retaining said regulating device in contact with the inner adjacent surface of said perforated end, substantially as set forth.

2. In a gas-pressure regulator, a casing having a perforated end, a disk located in the casing against which the gas is first to impinge, a resilient tongue for actuating the disk in one direction, and means for retaining said disk in contact with the inner adjacent surface of said perforated end, substantially as set forth.

3. In a gas-pressure regulator, a disk, a resilient tongue carried by the disk, the tongue having a fixed end and a free end, the fixed end being carried by the disk, and means for retaining the disk in coöperative relation with the free end of the regulator, substantially as set forth.

4. In a gas-pressure regulator, a casing having a perforated end, a disk within the casing, a resilient tongue disposed along, and forming an integral continuation of the outer edge of the disk, said tongue being normally deflected in a plane at right angles to the plane of the disk, means for supporting the disk and retaining the same in coöperative relation with the inner face of the perforated end of the casing, substantially as set forth.

5. In a gas-pressure regulator, a disk, a casing therefor having a perforated end against whose inner face the disk is free to engage, a tongue severed from the adjacent portion of the body of the disk disposed along the outer edge of the latter, the tongue being deflected at an angle to the disk, permitting the latter to control the perforations successively according to the pressure of gas against the disk, and means for supporting the disk in position within the casing, substantially as set forth.

6. In a gas-pressure regulator, a disk, a resilient tongue disposed along the outer edge of the same and deflected therefrom in a plane at right angles to the plane of the disk, one end of the tongue being free, a casing for the disk, one end of the casing being closed, but perforated for the escape of gas, a spider for maintaining the disk within the casing, said disk being interposed between said spider and said perforated end of the casing, the parts operating substantially as and for the purpose set forth.

7. In a gas-pressure regulator, a disk or valve composed of suitable flexible yielding material, a spring connected thereto, a casing having a perforated end, means for retaining the disk in coöperative relation with said perforated end, the disk being adapted to yield under excessive pressure and close the perforations in succession from the series farthest from the spring, to those in near proximity thereto, substantially as set forth.

8. In a gas-pressure regulator, a casing having a series of perforations, means for coupling the casing to a suitable source of gas-supply, and regulating devices located within the casing for automatically closing or opening the perforations aforesaid in succession, according to the pressure of gas within the casing.

9. In a gas-pressure regulator, a casing having an open and a closed end respectively, the closed end being provided with one or more perforations for the escape of gas, and the open end adapted to be secured to a suitable source of gas-supply, suitable devices located in the casing in the path of the gas passing therethrough for automatically regulating the discharge of the gas from the perforations, and means for retaining said devices in contact with the inner adjacent surface of the wall containing said perforations, substantially as set forth.

10. In a gas-pressure regulator, a casing having a perforated end, a regulating device located in said casing against which the gas is first to impinge, and means for retaining said regulating device in contact with the inner adjacent surface of said end and in coöperative relation with the perforations, substantially as set forth.

11. In a gas-pressure regulator, a casing having a perforated end, a regulating device located in said casing, means for retaining said regulating device in contact with the inner face of said end and in coöperative relation with the perforations, the regulating device being adapted to control said perforations successively according to the pressure of gas in the casing, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CYRUS A. HAAS.

Witnesses:

JAY NOBLE,

H. T. AUDE.