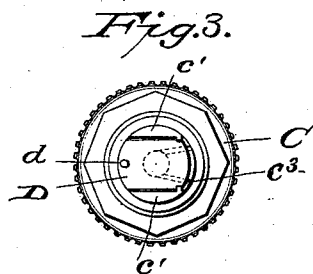
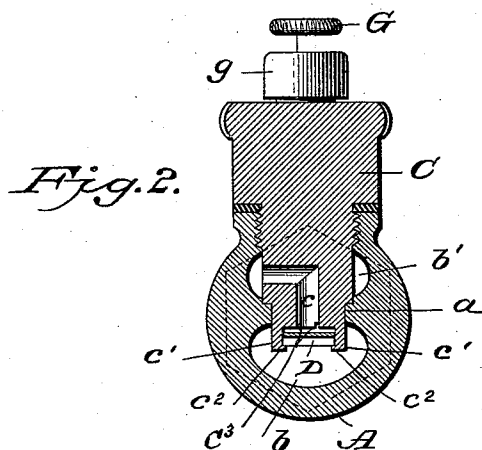
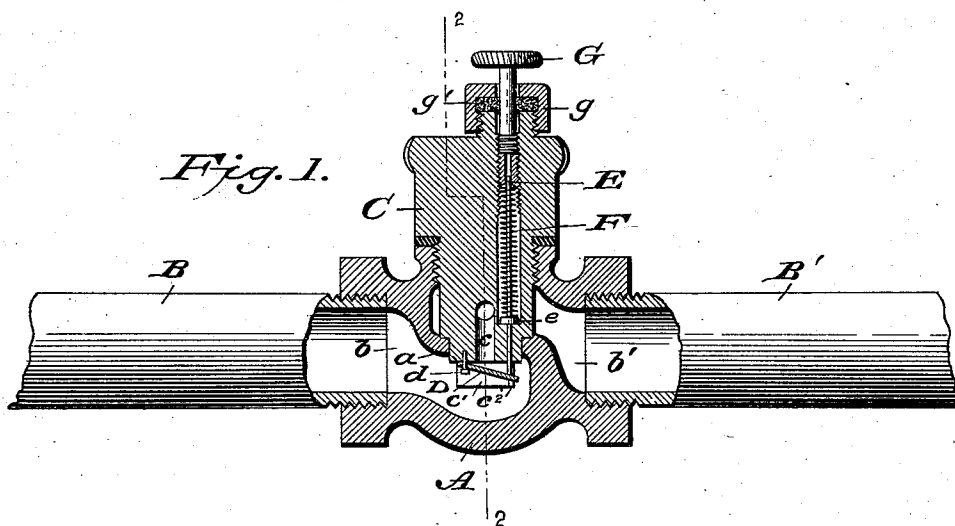


(No Model.)

I. W. WOODS.
FLUID PRESSURE REGULATOR.

No. 572,464.

Patented Dec. 1, 1896.



WITNESSES

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UNITED STATES PATENT OFFICE.

ISAIAH W. WOODS, OF HARRISVILLE, WEST VIRGINIA.

FLUID-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 572,464, dated December 1, 1896.

Application filed August 27, 1896. Serial No. 604,112. (No model.)

To all whom it may concern:

Be it known that I, ISAIAH W. WOODS, a citizen of the United States of America, residing at Harrisville, in the county of Ritchie and State of West Virginia, have invented certain new and useful Improvements in Fluid-Pressure Regulators; and I 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.

In the consumption of gas, particularly natural gas, a very serious objection is often encountered owing to the varying pressure in the main and distributing pipes and consequent irregularity of the flame at the burner, which requires constant watching—especially when the gas is used for fuel—to prevent the excess of flame catching to an inflammable part of the building. To obviate this objectionable feature in utilizing natural gas, I have devised an automatic regulator which is placed at any convenient point in the distributing-pipe to effect a steady flame at the burner irrespective of the pressure in the main, the regulator being adjustable to give any maximum flow past the same.

With the above ends in view my invention consists in providing a swinging valve or gate which is moved toward its seat by the pressure of gas against the same, to thereby reduce the size of the feed-opening, a rod under tension bearing against the valve or gate to regulate the pressure required to move the latter.

The invention further consists in the particular construction and combination of the parts hereinafter fully set forth and claimed.

In the accompanying drawings, forming part of this specification, Figure 1 is a vertical sectional view through a fluid-pressure regulator constructed in accordance with my invention. Fig. 2 is a transverse sectional view on the line 2 2 of Fig. 1. Fig. 3 is an inverted plan view of the plug removed.

I have shown my invention applied to an ordinary valve, the plug being constructed to receive my improvements.

A designates the valve-casing, which is of

the form to present a lower chamber *b* and an upper chamber *b'*, which are separated by a horizontal partition *a*, having an opening 55 and an annular seat to receive the lower end of a plug C. The distributing-pipe from the main communicates with the lower chamber *b* of the valve-casing, while the chamber *b'* connects with the pipe that leads to the burner 60 or burners, and it will be noted that the said chamber *b'* completely surrounds the plug C, for the purpose hereinafter explained.

An intermediate portion of the plug C is threaded to engage a threaded opening in the 65 valve-casing, and the upper part is octagonal to receive a nut-wrench, while the extreme upper end is rounded and milled to provide for operating the plug manually. The lower end of the plug is shaped to project a slight 70 distance into the chamber *b* of the valve-casing and is provided with a passage *c*, leading from the chamber *b* into the chamber *b'* out of one side of the plug, as shown in Fig. 2. The end of the plug is cut away trans- 75 versely to present depending wings or guides *c'* *c'* for the swinging valve or gate D, which is hinged or pivoted at one end to the plug, the free end of said valve or gate being limited in its downward movement by lugs *c''*, 80 projecting inward from the wings or guides *c'*. As shown, the valve or gate D is pivoted to the plug by a headed pin *d*, passing through a vertical aperture therein. This is the preferred form of construction, though a hinge 85 connection may be employed if desired.

With so much of the device hereinbefore described the gas entering the chamber *b* from the pipe B will pass around the free end of the valve or gate D over the same into the 90 passage *c* to the chamber *b'* and from there into the pipe B', which leads to the burners. Should the pressure in the main become strong from any cause, the gas entering the chamber *b* above the normal pressure would raise 95 the free end of the valve or gate D and reduce the size of the opening above the same leading to the passage-way *c*, and thereby regulate the flow into the pipe B'; but to prevent the valve entirely closing the passage *c* 100 I have provided channels *c''* in the lower end of the plug leading thereto, as shown in the drawings.

In order to regulate the amount of pres-

sure required to operate the valve D, a tension device is employed consisting of a plunger-rod E, positioned in a vertical opening in the plug C to bear upon the free end of the valve, the rod having a collar *e* and an encircling helical spring F interposed between said collar and a thumb-screw G let into the upper end of the vertical opening in the plug and engaging threads therein. The thumb-screw has a central bore to receive the end of the rod and permit the screw to move down upon the helical spring, as well as to permit the upward movement of the rod against the action of the spring. The upper end of the thumb-screw is embraced by a nut *g* and packing *g'* to prevent the escape of gas at this point. The vertical opening through the plug is reduced at its lower end, as shown, so that the rod will fit snugly therein.

From the foregoing description, in connection with the accompanying drawings, the operation of the device will be apparent, for any excess of pressure in the chamber *b* will tend to reduce the feed-opening above the valve or gate D by forcing the latter toward its seat, and the amount of pressure required to operate said valve can be regulated by adjusting the nut G to increase or diminish the tension on the spring F. Thus the mechanism can be set to provide for a certain maximum of pressure with relation to the burner.

My improved construction presents a simple and compact arrangement by which the parts can be readily separated for cleaning or examination.

I am aware that a fluid-pressure regulator has been constructed to embody a swinging valve or gate connected to weighted arms which regulate the movement of said valve toward its seat, and I therefore lay no broad claim to cover such construction; but

What I do claim as new, and desire to secure by Letters Patent, is—

1. The combination in a fluid-pressure regulator, of a valve-casing having two chambers separated by a partition with an opening through the same; a plug located in the valve-casing and provided with a passage-way connecting the chambers therein; a swinging valve or gate adapted to move toward the inlet end of the passage-way; together with a tension device consisting of a spring-actuated plunger bearing against the swinging valve and an adjusting-screw for regulating the spring-pressure upon said valve, substantially as shown and for the purpose set forth.

2. The combination in a fluid-pressure regulator, of a valve-casing having two chambers separated by a partition with an opening through the same; a plug located within the

valve-casing and provided with a passage-way connecting the chambers; a swinging valve located in the inlet-chamber and adapted to move toward the inlet end of the passage-way of the plug; a rod positioned in the plug and bearing against the free end of the valve; a spring bearing upon the rod, and a thumb-screw for adjusting the tension of the spring to increase or diminish the pressure upon the swinging valve, substantially as shown and for the purpose set forth.

3. The combination in a fluid-pressure regulator, of a valve-casing having chambers connected to induction and eduction pipes; a plug located within the valve-casing and provided with a passage-way connecting the chambers and with depending wings or guides on opposite sides of the inlet end of said passage-way; a swinging valve or gate located between the wings or guides; together with a tension device consisting of a rod positioned in a vertical opening through the plug and bearing upon the free end of the swinging valve, said rod having a collar rigidly secured thereto, a helical spring encircling the rod and in engagement with the collar, and a hollow thumb-screw bearing upon the upper end of the spring to increase or diminish the pressure of the rod upon the swinging valve, substantially as shown and for the purpose set forth.

4. The combination in a fluid-pressure regulator, of a valve-casing having chambers connected to induction and eduction pipes; a plug located within the valve-casing and provided with a passage-way connecting the chambers and with depending wings or guides on opposite sides of the inlet end of said passage-way; a swinging valve or gate located between the wings or guides so that the free end thereof will be adjoining the end wall of the chamber opposite the inlet end thereof; together with a tension device consisting of a rod positioned in a vertical opening through the plug and bearing upon the free end of the swinging valve or gate, said rod having a rigid collar, a helical spring mounted upon the rod to bear upon the collar, a thumb-screw bearing upon the upper end of the spring to increase or diminish the pressure of the rod upon the valve, and a nut and washer encircling the upper part of the thumb-screw, substantially as shown and for the purpose set forth.

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

ISAIAM W. WOODS.

Witnesses:

E. J. HALL,

H. B. WOODS.