

(No Model.)

C. C. WRIGHT.
FLUID PRESSURE REGULATOR.

No. 579,551.

Patented Mar. 23, 1897.

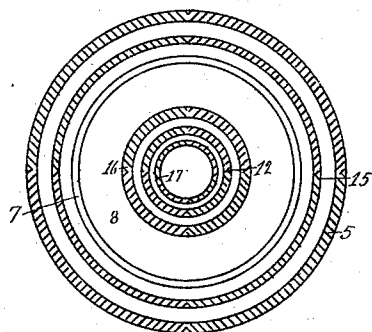
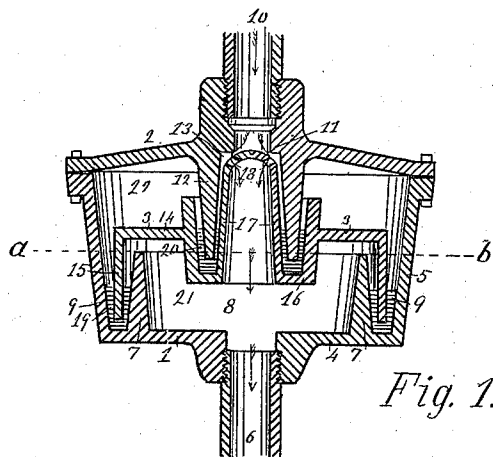


Fig. 2.

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CORNELIUS C. WRIGHT, OF TITUSVILLE, PENNSYLVANIA.

FLUID-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 579,551, dated March 23, 1897.

Application filed November 11, 1896. Serial No. 611,747. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS C. WRIGHT, a citizen of the United States, and a resident of Titusville, in the county of Crawford and State of Pennsylvania, have invented a new and useful Improvement in Gas - Pressure Regulators, of which the following is a specification.

My invention relates to those governors or regulators placed on the entering gas-pipes in a building to regulate and maintain an even pressure in the service-pipes as the consumption is increased or diminished as the different burners are lighted or turned off, my object being to construct one easy, quick, and certain in operation, working without friction, and cheap in construction.

My device is illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical section through the center, and Fig. 2 a horizontal section on line *a b* in Fig. 1.

In the two figures the same numbers indicate the same parts.

The governor is constructed in three separate parts or pieces, 1 representing the body or case; 2, the cover; 3, the float or diaphragm. The case is cylindrical and cup-shaped, as shown, with the bottom 4 and sides 5 adapted at the top to receive the cover 2. In the bottom, preferably at or near the center, is an opening to receive and connecting with the outflow-pipe 6. Near the outer side is the upwardly-projecting ring 7, forming the central cup-shaped space 8 and the surrounding annular cup-shaped ring 9. The cover 2, formed as shown and fitted to be secured to the top of the sides 5, has the center opening to receive the inflow-pipe 10, and on the under side the opening is fitted as a valve-seat 11. Projecting downward from the cover is the annular ring 12, surrounding the opening and forming the central upwardly-tapering cup-shaped space 13. The lower edge of the annular ring 12 is preferably to be a little below the level of the top of the upwardly-projecting ring 7 on the bottom of the case 1.

The diaphragm or float 3 is formed of the web 14 with the outer edge turned downward, forming the rim 15, adapted to come inside the annular ring 9, formed between the side 5 and the ring 7 of the base, without having

frictional contact with either the side or the ring. The depth of the rim 15 should preferably be of about the height of the ring 7. Centrally in the web 14 is formed the partially-depressed cup 16, having its outer wall adapted to surround the ring 12 on the cover without frictional contact therewith. From the bottom of the cup 16 is the upwardly-projecting cone or cylinder 17, adapted to pass freely within the ring 12 and with its top forming a valve adapted to seat itself on the seat 11 on the under side of the inflow-opening 10. Below the point of contact with the valve-seat and near thereto the cone 17 is perforated, as at 18. The bottom of the cup 16 is open on the inside of the cone or cylinder 17.

When the parts are placed in position, a mercurial seal is placed in the space around the rim 15 and around the ring 12, as shown at 19 and 20.

It will be seen that when the parts are placed in position and the mercurial seals applied the governor is divided into two entirely separate chambers 21 and 22, being separated by the float or diaphragm 3, no gas or air in any event passing from the chamber 21 to the chamber 22. Therefore it is desirable, or, perhaps, absolutely necessary, that there should be a connection from the chamber 22 to the outside air, so that the atmospheric pressure should be approximately maintained in the chamber. This may be done by perforations in the cover or by not packing the joint between the cover and case. I prefer, however, that those openings be small, so that the air in the chamber be to some extent a cushion against the motion of the diaphragm.

The operation is as follows: When the governor is placed in proper connection with the inflow and outflow gas-pipes and gas is admitted through the pipe 10, the outflow-pipe 6 in all its connections being entirely closed, the downward pressure on the diaphragm is confined to the area of the inflow-pipe at the valve-seat. On the other hand, as the pressure accumulates in the chamber 21, under the diaphragm, the upward pressure upon the diaphragm, being upon a much greater area, lifts the diaphragm (assisted by the buoyancy of the mercury in the seal 19) until the inflow

of gas is stopped by the closing of the valve at the inlet. The valve remains closed until the outflow is opened, when the pressure is reduced in the chamber 21, causing the diaphragm to lower and open the valve to admit gas sufficient to maintain the equal pressure. The relative pressure in the inlet and the outlet pipes can be regulated in the relative areas of the valve-seat in the inlet-pipe and the web of the diaphragm assisted by the quantity and relative buoyancy of the mercury in the seal 19.

In the construction herein described and illustrated it will be seen that the float or diaphragm does not necessarily have any frictional contact with either the case or cover, or with any of the parts of either, except in the mere closing of the valve, while the escape of gas is entirely cut off by the two mercurial seals. There is therefore absolutely nothing to prevent the free and easy movement of the diaphragm, consequently maintaining an absolutely even pressure in the outflowing-pipe, whether one or any number of burners are in use. As the burners are successively lighted the opening of the valve increases just sufficient to maintain the requisite pressure.

If desired, the top of the cone 17 can be inverted and attached to the inflowing-pipe to operate against a seat on the remainder of the cone 17; or, if desired, a downwardly-opening valve can be placed in the outflow-pipe and operated by a stem from the diaphragm and reversing the direction of the flow of gas, producing the same result.

I claim as my invention—

1. In a gas-pressure regulator; the float or diaphragm, constructed as described and shown, with the outer depressed rim inserted in a mercurial seal in the core, and carrying the second mercurial seal between two raised rims near the center, and with an opening through the center of the diaphragm admitting a direct flow of gas from the inlet to the outlet pipe; substantially as shown and described.

2. In a gas-pressure regulator; the float or diaphragm, constructed as shown, with the outer depressed rim inserted in a mercurial seal in the case, and carrying the second mercurial seal between two raised rims near the center; the center rim being extended upward and forming a valve adapted to close the inlet from the inlet gas-pipe; and with

opening through the shell of the inner rim below the valve-seat to admit gas to the interior of the cone; in combination with a depressed ring on the cover of the regulator the lower edge of which is inserted in the second mercurial seal; substantially as shown and described.

3. In a gas-pressure regulator; the float or diaphragm, constructed as shown, with the outer depressed rim inserted in a mercurial seal in the case, and having in the said diaphragm the central depressed cylindrical cup; in combination with the annular ring 12, attached to and forming a part of the cover, the lower edge of said ring 12 being in a mercurial seal in said cylindrical cup; the central wall of said cylindrical cup being extended up and forming a valve fitted to close the opening in the inlet-pipe 10, the wall of the same being perforated below the valve-seat to admit gas into the interior of the cone; and with an opening through the web of the diaphragm, thus allowing of a direct passage for the gas from the inlet to the outlet pipe; substantially as shown and described.

4. A gas-pressure regulator; consisting of the cup-shaped case 1, with an upward-projecting ring 7, near the outer side, and with an opening in or near the center for the outflowing-gas pipe; a cover 2, upon said case with a central opening to receive the inflowing gas, said opening being surrounded by the dependent ring 12; a float or diaphragm, consisting of a web the outer rim of which is dependent and passing loosely between the ring 7, and the wall of the case, the web having in center the partially-depressed cup 16, the outer wall of which loosely surrounds the dependent ring 12, and the inwardly upward-projecting cone or cylinder passes loosely inside the depressed ring 12, the upper end of the cone forming a valve for closing the port of the inflowing-gas pipe, the walls of the cone being perforated below the valve-seat, the bottom of the cup being removed inside the cone 17; and with mercurial seals in the depressed ring between the outer wall of the cup 16, and the cone 17, and between the ring 7, and the wall of the case; all the parts working in combination substantially as shown and for the purpose herein set forth.

CORNELIUS C. WRIGHT.

In presence of—

JOS. T. CHASE,
GEO. A. CHASE.