(No Model.)

S. H. KELLOGG.

FLUID PRESSURE REGULATOR.

No. 584,759. Patented June 15, 1897.

Fig. 1

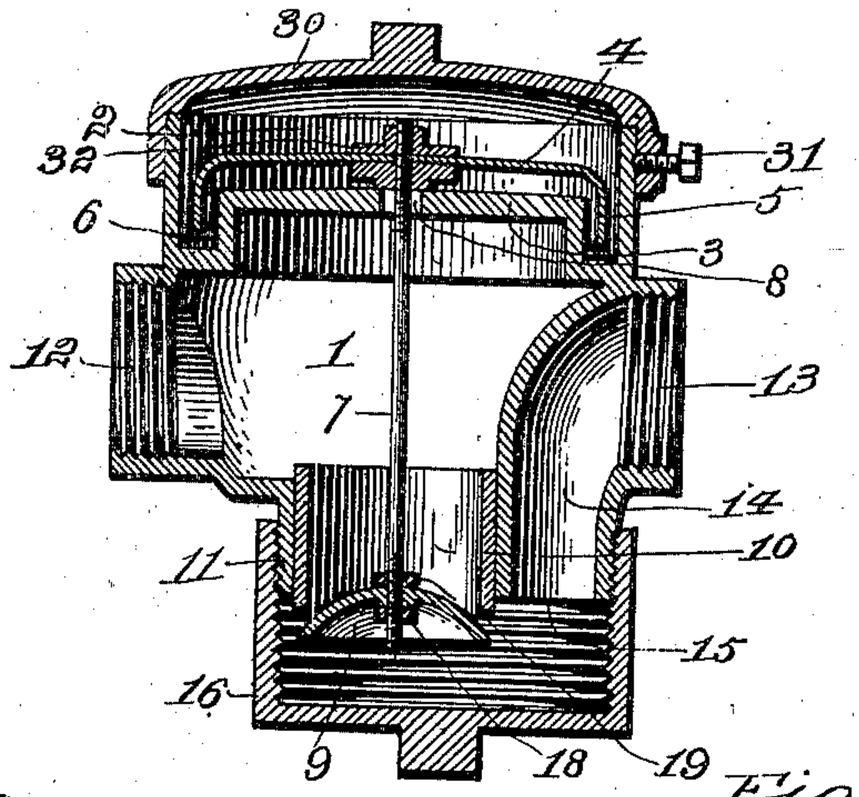


Fig. 3.

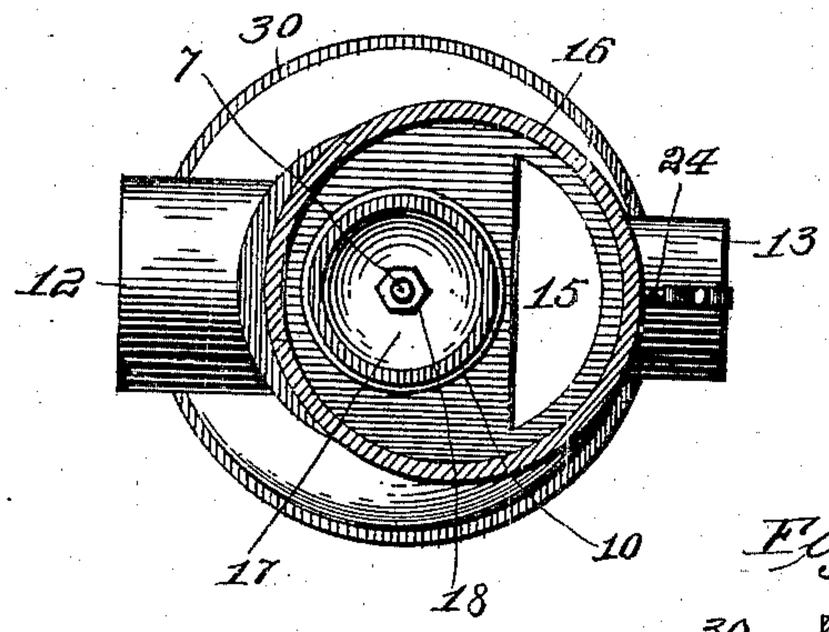


Fig. 2.

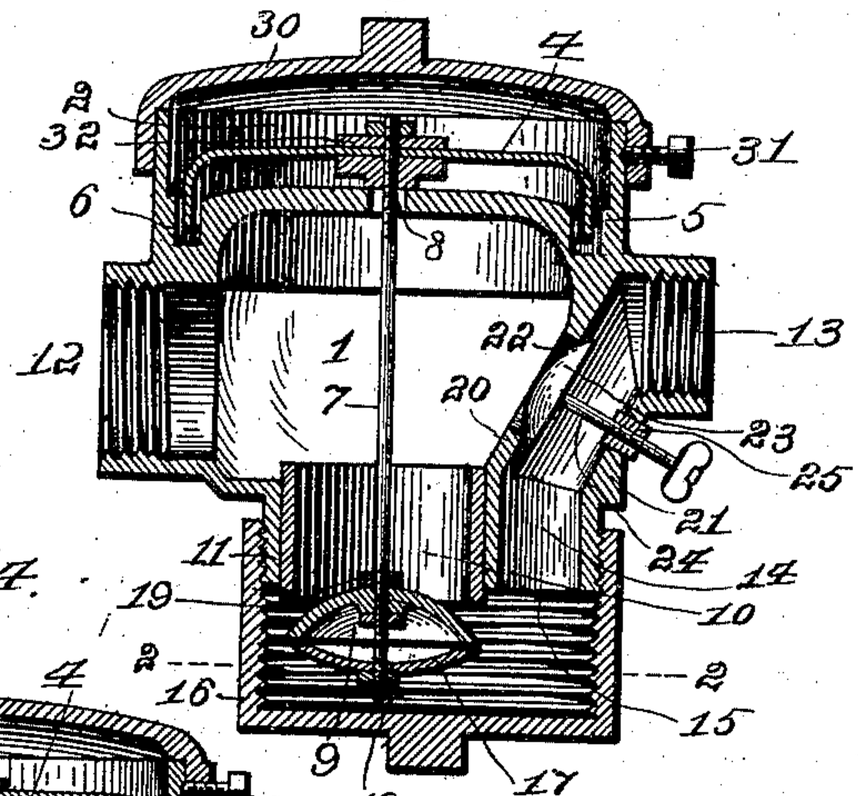
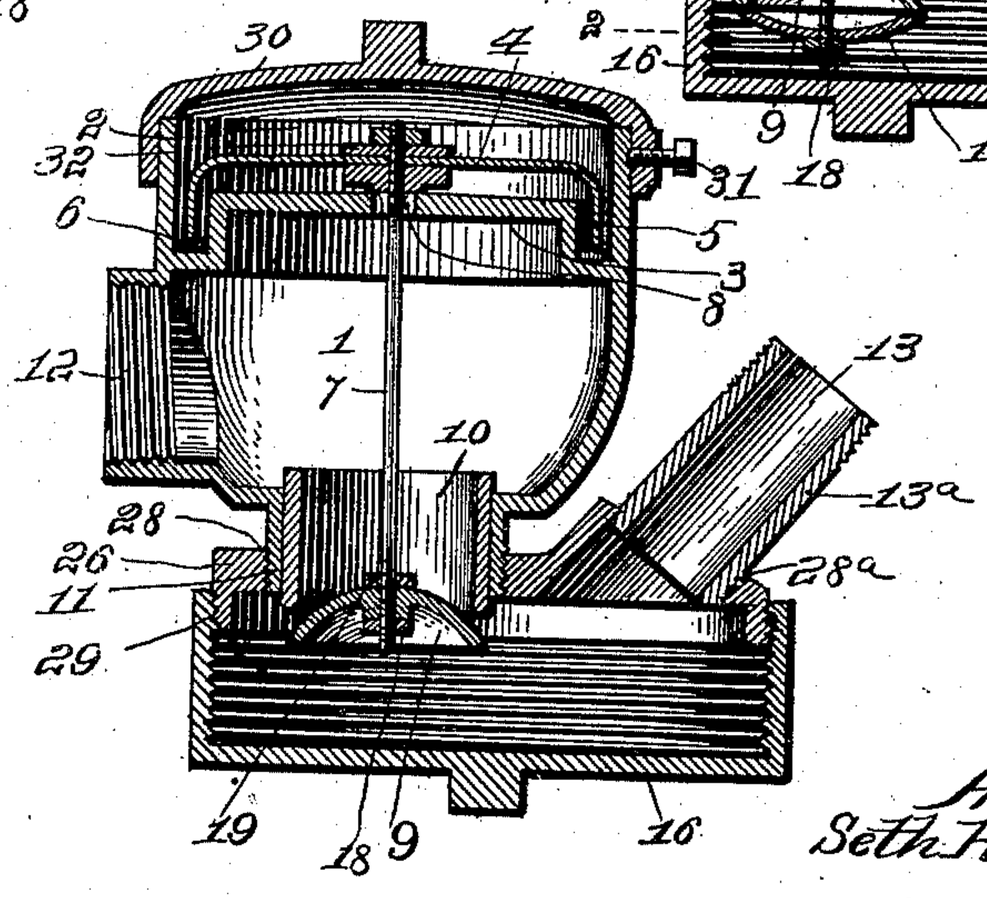


Fig. 4.



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UNITED STATES PATENT OFFICE.

SETH H. KELLOGG, OF WASHINGTON, DISTRICT OF COLUMBIA.

FLUID-PRESSURE REGULATOR.

SPECIFICATION forming part of Letters Patent No. 584,759, dated June 15, 1897.

Application filed April 14, 1897. Serial No. 632,144. (No model.)

To all whom it may concern:

Be it known that I, SETH H. KELLOGG, a citizen of the United States, and a resident of Washington, in the District of Columbia, have invented certain new and useful Improvements in Automatic Gas-Regulators, of which the following is a full, clear, and exact specification.

My invention relates to a device which may be introduced in the service-pipe of a building or any other place where gas is consumed and which will automatically cut down the service-pressure to any prearranged point and automatically retain that pressure at each burner or other point of consumption, regardless of whether the gas is released for consumption at one or many of said burners or points of consumption, the constancy of pressure being wholly independent of when the different burners, &c., are opened or closed. Mechanism of this kind should be so constructed as to require little attention to keep it in order and must remain effective and accurate in use for a long time without necessity for replacing parts. For these reasons simplicity of construction is a primary essential, and this constitutes one object of my present invention.

As gas-regulators are now constructed it is a difficult matter to secure proper adjustment of the valve or to change the adjustment when found necessary. Unless the area of the valve-opening is approximately the same as the section of the passage there will be fluttering of the lights caused by lack of steadiness in the flow of gas. To properly adjust the valve, it is essential that it be exposed to lateral view in order that its position relative to the valve-seat may be easily observed. To permit of this, it is necessary to have the valve-seat in the lower end of the neck of the governor and to have everything surrounding said valve and which is below the lower end of the neck removable, so as not to obstruct the view across the ends of the neck and between the valve and its seat. A further requirement arises from the fact that gas is often ladened with impurities, which are precipitated upon mechanism through which the gas passes, and often so loads up working parts as to impede the proper performance of their functions. For this reason it is essential that such mechanism should be so constructed that the parts subject to interference from the gas precipitate may be readily and conveniently exposed for cleaning.

A second feature of my invention has this object in view, and consists in locating the feed-opening laterally with relation to the controlling-valve and providing a cap or chamber in which the valve works, said cap being readily removable without unshipping or disconnecting the device and thereby opening up the device immediately at the valve, so as to expose the latter with its seat and leave no obstruction surrounding them. An objection might arise to a device of this nature on the ground that there might be danger of the mercury from the seal getting through the pipe into the meter. My arrangement of passages with removable cap completely prevents possibility of this. A further advantage incident to the use of this cap is that it overcomes a great difficulty which might otherwise result from choking at the valve, which would be a serious objection. The cap affords such ample enlargement as to completely prevent this.

In some localities it might be found desirable to provide the governor with a by-pass which may be opened when required to permit a direct flow of gas without passing the valve. I do not consider this feature indispensable to a successful governor, but such an attachment is convenient at times. My preferred construction enables me to take off the controlling-valve very readily and thus accomplish all the advantages of the by-pass.

My construction also offers good opportunity, however, for the addition of a by-pass with a controlling-gate independent of the valve.

A further feature of my invention therefore consists in combining such a by-pass and gate with my improved construction.

A further feature of my invention relates to a means whereby the governor may be constructed without an integral inlet and downwardly-extending passage, but so connected up as to embody some of the advantages of my preferred construction. That is to say, I may provide a plate which will receive the screw-cap around its periphery and which is provided with threaded openings to receive

the supply-pipe and the neck of the governor in which the valve is located. The cap thus becomes an enlarged chamber for the valve and connects up the supply-pipe with the governor.

A further feature of my invention consists in applying a cone or deflecting-disk to the bottom of the valve in order to decrease the resistance of the latter.

My invention will be fully understood upon reference to the accompanying drawings, in which—

Figure 1 is a vertical axial section through a governor constructed in accordance with the preferred form of my invention. Fig. 3 is a horizontal section on the line 3 3, Fig. 2, looking upward. Fig. 2 is a view similar to Fig. 1, illustrating some modifications. Fig. 4 is a further modification.

Referring to Fig. 1, 1 represents the valve-chamber, and 2 the upper compartment, which is divided from the valve-chamber by means of the diaphragm 3 and contains the float 4, whose flange 5 dips in the mercury seal 6.

7 is the valve-stem which extends from the float through the opening 8 in the diaphragm and carries at its lower end a valve 9.

10 is the valve-seat, preferably in the form of a bushing removably inserted in the neck 11 of the governor. The outlet or house pipe connection is shown at 12, and the inlet or supply connection is substantially at a diametrically opposite point, as shown at 13.

14 is a passage leading downward from the supply-inlet 13, and this extends through and terminates with the neck of the governor, as shown at 15.

16 represents a cap which is threaded on the neck 11 of the governor. This cap performs a number of important functions. In the first place it forms the only covering for the valve and its seat, and being removable it opens up the governor immediately at the valve and permits the valve and its seat to be removed for cleaning or permits the removing of the valve alone when it is desired to take out the resistance which the governor would otherwise offer and test the flow of gas without the governor. It further permits the adjustment of the valve at will when the action of the machine is to be corrected.

A further advantage of the removable cap arises from the fact that it constitutes the chamber in which the valve works and affords ample enlargement to avoid any possibility of choking at the valve. These advantages are of particular importance when it is remembered that the removal or adjustment of the valve and access to it at any time do not involve the unshipping or uncoupling of the governor. If it were necessary to resort to uncoupling of the governor, it would often require the services of two persons, so that any attention to the valve could only be given at considerable expense. With my improved construction the parts are exposed with the greatest facility. Moreover, the inlet and outlet are such that the governor is introduced in the pipe without necessity of bending the latter or deflecting it to make inconvenient or expensive connections.

If in practice it is desired to estimate the price of a governor upon the basis of the amount of gas it saves to the consumer, the valve may be entirely removed with ease or the governor may be loaded down so that the valve may not act. If the latter course is adopted, it might be found that the valve, notwithstanding its open position, might still offer considerable resistance to the free flow of gas and thus show inaccurately the natural flow when the governor is inactive. I have found that this may be overcome by placing a disk 17 of coned or rounded shape, so that the gas will be deflected and the resistance of the valve reduced to a minimum. The disk which thus serves as a deflector is readily secured in place beneath the valve by extending the valve-stem 7 through it and applying the usual jam-nuts 18 and 19.

Should it be desired to employ a by-pass independent of the valve-passage, this may be conveniently located in the parallel walls 20 and 21 of the passage 14. 22 represents such a by-pass formed in the inner wall 20 of the passage 14, so as to establish direct communication between the inlet 13 and the governor-chamber 1. In order to close said by-pass, it is simply necessary to provide a gate 23, which may be moved to and from said opening by means of a stem 24, working in a packing 25 in the outer parallel wall 21 of the passage 14. I thus provide with little additional expense a direct by-pass. I would prefer, however, ordinarily to construct the governor without this by-pass, as substantially all the advantages thereof may be obtained by removing the valve 9 from its seat.

It will be observed from the above description that my invention consists primarily in arranging the inlet and valve passage in substantially lateral relation to each other and connecting them up by means of a cap which forms the enlarged valve-chamber and the only covering of the valve, so that when the cap is removed the valve is exposed with the various advantages named. In Fig. 4 I have shown means whereby these advantages may be obtained without forming the inlet 13 and passage 14 integral with the shell, but the shell may be formed with a neck through which the valve-passage is formed and against which the valve seats, and a plate 26 is then provided, which has a threaded opening 28 to receive the neck 11 of the governor and an additional threaded opening 28 to receive a supply-pipe 13^a. The periphery of the plate 26 is threaded as shown at 29, and a cap 16 is applied to the periphery of said plate with the same effect as heretofore explained with reference to said cap.

In each form of my device I employ a cap 30, which covers the shell above the float and which may be secured in place by a set-screw

31 or any other suitable means. In operating the governor it is set to any desired pressure by adding to or taking from a series of counterbalance-rings 32, resting on top of the float.

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

1. A gas-governor provided with a passage terminating in a valve-seat, a supply-passage terminating adjacent to said seat, a valve adjustably mounted beneath the seat and a cup-shaped cap covering said seat and passage so as to form a communication between them, providing a chamber in which the valve works, and removable to expose the valve and seat to lateral view to permit accurate adjustment; substantially as herein explained.

2. A gas-governor formed with a neck and two gas-passages communicating respectively with the pressure-chamber and with a gas-supply inlet and terminating at the lower end of said neck, and provided with a valve below said neck, working against the seat, and a cup-shaped cap screwed to the periphery of, and covering the valve-seat and adjacent port to form a communication between them, and providing a chamber in which the valve works, said cap being removable to expose the valve to lateral view, as explained.

3. A gas-governor being formed with a neck and with a valve-seat, and a gas-supply port in said neck, and provided with a removable valve coöperating with said seat and a cup-shaped cap screwed upon said neck whereby it may be removed to permit lateral inspection of the valve in adjusting or removal of the valve when desired to test the flow without the valve; substantially as and for the purposes set forth.

4. A gas-governor comprising the following elements: a shell formed with a pressure-chamber having a lateral outlet, a supply-passage having a lateral inlet in substantially the same plane with the outlet, and a neck in the bottom of which are formed a valve-seat communicating with the pressure-chamber, and an adjacent port communicating with the supply-passage; an adjustable valve beneath the valve-seat, and a cup-shaped cap covering the port and valve-seat to form a communication between them, forming a chamber in which the valve works, and screw-threaded upon the periphery of the neck, whereby it may be readily removed to give lateral view of the valve.

5. In a gas-governor, the combination of the shell formed with a gas-chamber and with a valve-opening leading into the same, and an outlet therefrom; said shell being also provided with a supply-pipe and with a passage from said supply-pipe arranged laterally to the gas-chamber, and having a by-pass opening directly into the gas-chamber; and a gate for opening and closing said by-pass and having an operating-stem extending through the wall of the shell; substantially as herein explained.

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