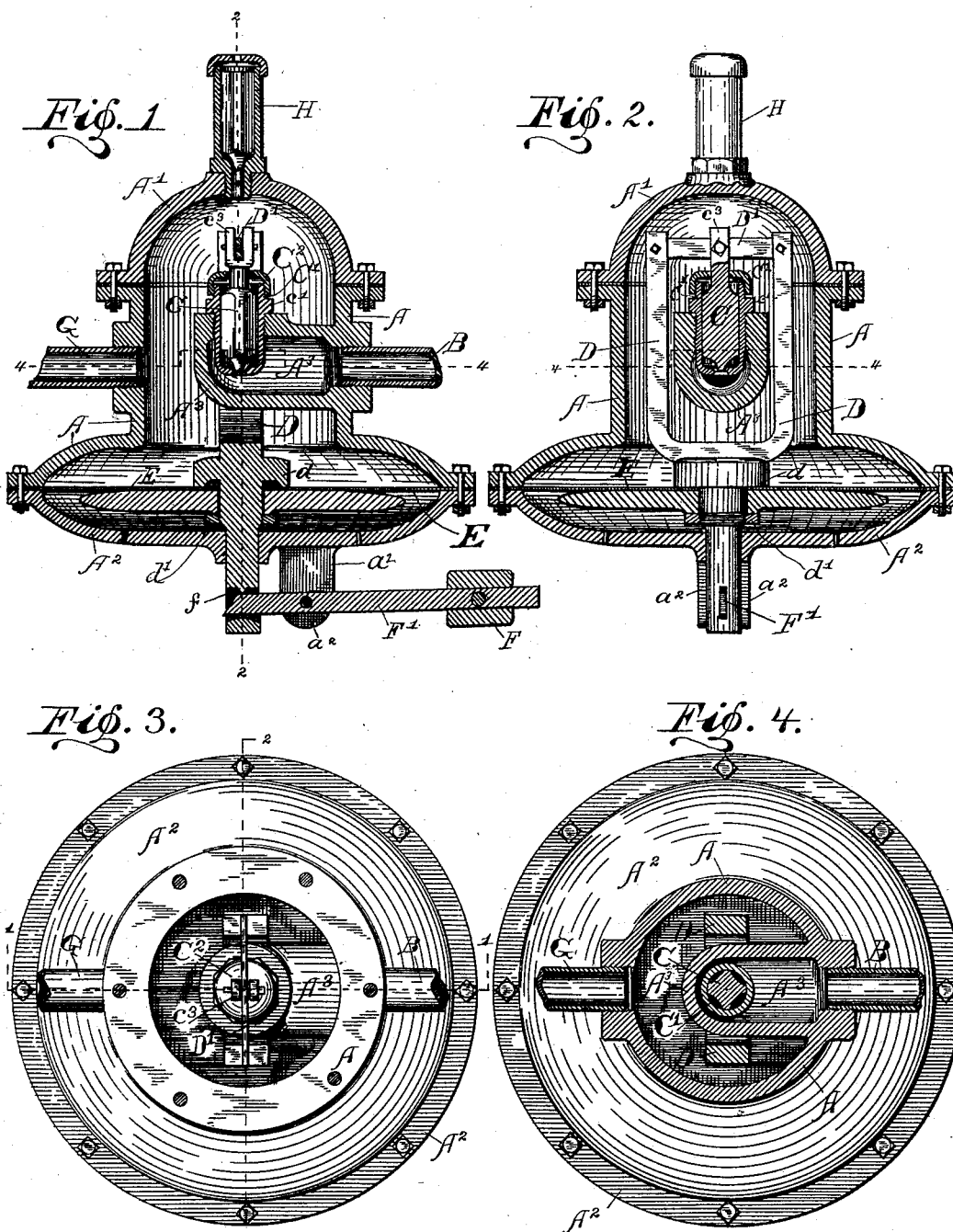


(No Model.)

G. W. WRIGHT.  
GAS REGULATOR.

No. 422,483.

Patented Mar. 4, 1890.



WITNESSES.

Edmund Rhodes.  
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# UNITED STATES PATENT OFFICE.

GEORGE W. WRIGHT, OF LAPEL, INDIANA.

## GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 422,483, dated March 4, 1890.

Application filed November 25, 1889. Serial No. 331,503. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. WRIGHT, a citizen of the United States, residing at Lapel, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Gas-Regulators, of which the following is a specification.

My invention relates to that class of regulators by which the pressure of gas is reduced in the pipes, and it is designed particularly for reducing such pressure between the pipes which come from the wells and the pipes which lead to the places where the gas is to be consumed in natural-gas fitting, it being interposed between what are commonly known as "high-pressure" and "low-pressure" pipes. My said invention will first be fully described, and then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof and on which similar letters of reference indicate similar parts, Figure 1 is a central vertical section of a regulator and fragments of pipe attached thereto, embodying my said invention, on the dotted line 1 1 in Fig. 2; Fig. 2, a similar view on the dotted line 2 2 in Fig. 1; Fig. 3, a top or plan view of the regulator with the upper portion or cap removed, and Fig. 4 a horizontal sectional view on the dotted line 4 4 in Fig. 1.

In said drawings the portions marked A, A', and A<sup>2</sup> represent the walls or casing of my improved regulator; B, the incoming or high-pressure gas-pipe; C, the valve; D, a yoke through which, by means of a weight and a diaphragm, said valve is operated; E, said diaphragm; F, said weight; G, the outgoing or low-pressure pipe, and H a blow-off or escape-valve.

The central or main portion A of the body of my improved regulator has a hollow arm A<sup>3</sup>, which projects inwardly to the center thereof and the outer or open end of which is connected to the incoming or high-pressure gas-pipe B, as shown. In one side thereof is a hole, the center of which is preferably coincident with the center of the entire structure in which the valve is seated. The entire space surrounding this inwardly-projecting hollow arm forms a chamber communicating with the outgoing or low-pressure

gas-pipe. This chamber is inclosed at the top by the roof-like portion or covering-flange A', and a somewhat similar portion A<sup>2</sup> incloses and protects the diaphragm at the other end. This latter portion, however, is for purposes of protection only so far as the diaphragm is concerned, as there are holes formed therein which permit the air to enter from the outside to the space between it and the diaphragm. It contains a central hole which forms a bearing for the stem of the yoke D, and has downwardly-projecting ears a<sup>2</sup>, in which the lever carrying the weight is pivoted. The pipe B, and also the pipe G, are simply ordinary gas-pipes connected with the regulator, as shown, and need no special description.

The valve C is a double valve. A cylindrical casing C' is provided therefor, which is seated in the hole in the upper side of the inwardly-projecting arm A<sup>3</sup>, which hole is generally screw-threaded, and this cylinder has corresponding screw-threads upon its exterior by which it is secured therein. Said cylinder C' has a flange c' just above said arm A<sup>3</sup>, which is preferably hexagonal or octagonal in shape, and thus serves as a nut by which said cylinder can be screwed in place. The lower end of said cylinder is contracted, leaving an orifice of only the size desired, the upper side of which orifice is tapered somewhat and forms a valve-seat on which the valve C rests when the valve is closed. Upon the upper end of this cylinder C' is a cap C<sup>2</sup>, which is preferably secured thereto by being interiorly screw-threaded, as shown, and in the center of which is an opening through which the gas escapes to the chamber, and which also forms a valve-seat for the other end of the valve. When said valve is forced to position against this valve-seat, the passage of gas is completely cut off. The valve C, as before stated, rests in this cylinder C' and is tapered at or near each end to fit into the two valve-seats, respectively. Its central portion is considerably larger than the portions which fit against the valve-seats, and the sides of this central portion are cut away to permit the passage of gas when the valve is open. This is illustrated best in Fig. 4. A central stem c<sup>3</sup> extends from this valve up to above the top of

the cap C<sup>2</sup>, and is there connected to the yoke D, as will be presently described.

The yoke D extends up on both sides of the inwardly-projecting arm A<sup>3</sup>, and is connected 5 to the upwardly-projecting stem c<sup>3</sup> on the valve C by a cross-bar D', as shown most plainly in Fig. 2. Its lower end develops into a stem which extends down through the bottom A<sup>2</sup> to the regulator and there engages with the 10 lever F' to the weight F. Inside the chamber this stem is provided with a flange d, against which the diaphragm is forced by a nut d' on said stem at the other side of said diaphragm, as shown. The underside of this 15 flange, which comes in contact with said diaphragm, is turned off and preferably cupped somewhat, as shown, in order to make a perfectly gas-tight joint. The opening through the lower end of the stem of this yoke, which 20 receives the lever to the weight, is preferably tapered to a knife-edge f, which enables the weight to operate better than it otherwise would.

The diaphragm E consists of a sheet of 25 flexible material stretched across the widest portion of the chamber, as is usual, and a plate on the outside thereof which serves to support it, as shown in Figs. 1 and 2. As before stated, it is tightly clamped on the stem 30 of the yoke between the flange d and the nut d'.

The weight F is mounted on a lever F', which in turn is pivoted to the ears a<sup>2</sup> on the lower portion A<sup>2</sup> of the regulator. It is arranged to operate oppositely to the force of 35 the gas in the chamber against the diaphragm, and is made adjustable on its lever, in order that the proper relative adjustment may be obtained.

As before stated, the lever F' rests against 40 a knife-edge formation in the lower end of the stem of the yoke D, and its end which passes through the slot in said stem is beveled, as shown. This enables the weight to automatically lock the lever in position when the 45 valve C has been forced up against its upper seat, (and the supply of gas thus entirely cut off,) as the corner at the upper side of said beveled portion will pass said knife-edge, bringing said edge down upon said beveled 50 end, and thus locking the yoke and the valve after the manner of a pawl. This forms what is generally known as an "automatic cut-off," and, as will be readily understood, is an exceedingly effective device for the purpose, 55 while, because of the peculiar formation of the bearing between the lever and the stem of the yoke, it is impossible for it to be dis-

turbed without first lifting the weight by some force outside the regulator itself.

I have shown my regulator with the valve 60 above and the diaphragm and weight below the gas-pipes. I prefer this arrangement because of its better appearance and because it brings the greater portion of the weight below the point where the regulator is coupled 65 to the pipes. I do not, however, desire to confine myself to this arrangement, as by an obviously easy rearrangement of some of the parts the regulator can be made to work as effectively in a reverse position, as will be 70 readily understood.

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

1. The combination, in a gas-regulator, of 75 the shell thereof, an inwardly-projecting hollow arm, a valve located in said arm, a yoke the arms of which extend up and are connected to said valve above said arm, a diaphragm secured to a stem on said yoke below 80 said arm in an enlarged portion of the regulator, said stem being continued down through the bottom of the regulator, a lever pivoted in ears on the bottom of the regulator and engaging with said stem at its inner end, and 85 an adjustable weight on the outer end of said lever, substantially as set forth.

2. The combination of the cylinder C', the cap C<sup>2</sup> thereon, a valve-seat in each, and a valve C, operating between said valve-seats 90 and adapted to close either, substantially as set forth.

3. The combination of the valve C, the cylinder C', the hollow arm A<sup>3</sup>, in which said cylinder is located, the yoke D, the two arms 95 of which extend up on each side of said arm, and the cross-bar D', by which they are connected to said valve, substantially as set forth.

4. The combination of the valve, the yoke, the weight, and a lever connecting the yoke 100 and the weight, said lever being beveled at its end, as shown, whereby it is adapted to automatically lock said yoke in elevated position whenever said valve reaches its extreme position in that direction, substan- 105 tially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 18th day of November, A. D. 1889.

GEORGE W. WRIGHT. [L. s.]

Witnesses:

C. BRADFORD,  
J. WALSH.