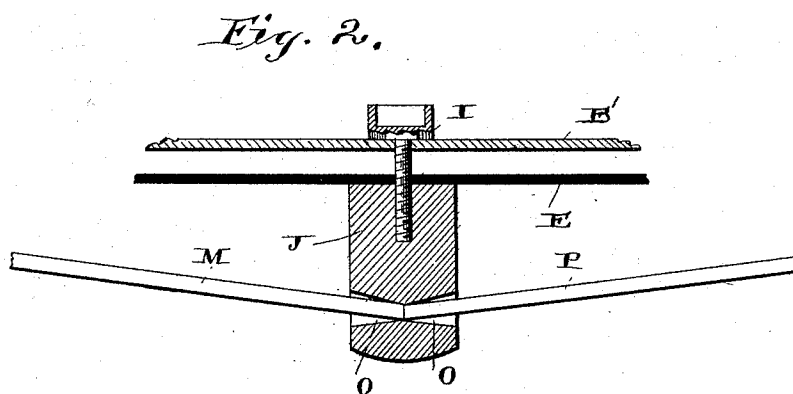
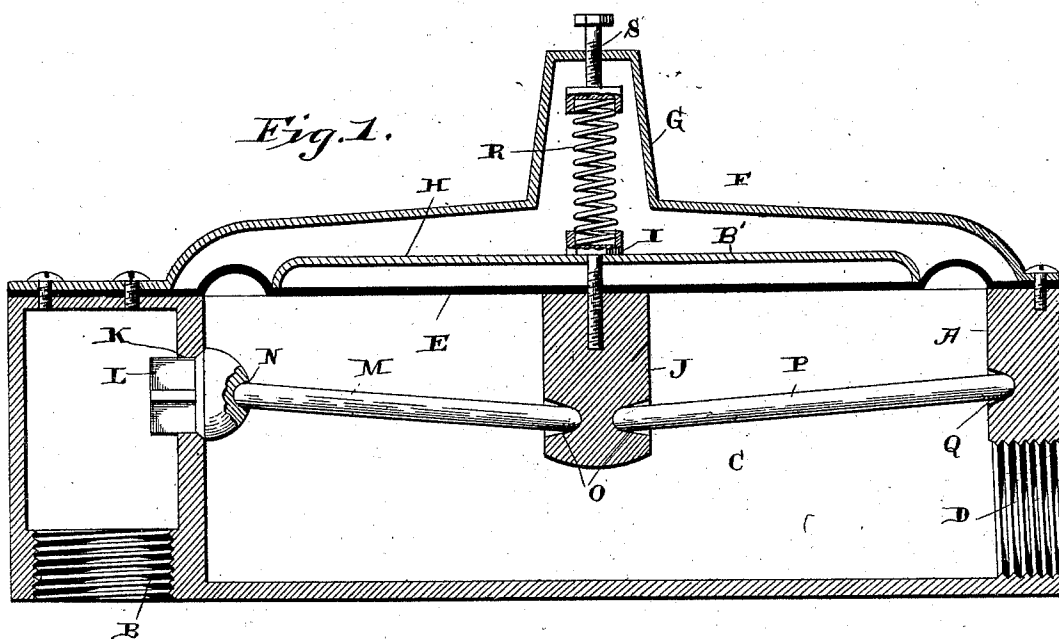


(No Model.)

M. G. REYNOLDS.
GAS REGULATOR.

No. 498,861.

Patented June 6, 1893.



WITNESSES—

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UNITED STATES PATENT OFFICE.

MIRON G. REYNOLDS, OF ELWOOD, INDIANA.

GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 498,861, dated June 6, 1893.

Application filed August 15, 1892. Serial No. 443,133. (No model.)

To all whom it may concern:

Be it known that I, MIRON G. REYNOLDS, a citizen of the United States, residing at Elwood, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Gas-Regulators; and I do 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 the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in gas regulators; and it consists in the particular arrangement and construction of parts which will be fully described hereinafter and particularly referred to in the claims.

The object of my invention is to produce a gas regulator of the particular construction hereinafter shown and described, whereby all side or lateral pressure upon the diaphragm in the act of closing the valve is avoided, which makes the regulator more durable and more accurate in its operation.

In the accompanying drawings:—Figure 1 is a vertical sectional view of a gas regulator which embodies my invention complete. Fig. 2 is a detached view of the inner ends of the levers, showing a modified form of connecting them to the diaphragm weight.

A indicates a casing of any suitable size and shape, and which is provided with an inlet port B, from the gas main to the diaphragm chamber C, and with an outlet port D from the said diaphragm chamber to the point of consumption.

Secured to the upper portion of face of the casing A is a diaphragm E, which is of the ordinary construction, and made of a suitable material, such as rubber or leather.

Secured over the casing A and inclosing and securing the diaphragm in place is a dome F, having a central vertical spring chamber G.

Placed upon the top of the diaphragm E, is a cup-shaped metal plate B', which is smaller than the diaphragm in diameter as illustrated, and passing through the center of this cup-shaped plate and the diaphragm E, is a screw-bolt I. The lower end of this screw bolt I, passes into a depending combined lever sup-

port and weight J which depends from the lower face of the diaphragm, which is supported by the said screw bolt and the cup-shaped plate.

Made in the inner wall of the inlet port B, and communicating with the diaphragm chamber C, is a valve opening K, which receives a valve L.

Made in opposite sides of the depending diaphragm weight J are the recesses O, which receive the inner ends of the rods P, and M, forming a toggle joint. The outer end of the lever M rests in a recess made in the inner end of the valve L, and the outer end of the lever P rests in a recess Q made in the inner surface of the casing A.

Placed in the spring chamber G is a coil spring R which has its lower end resting upon the upper end or head of the screw-bolt I, and its upper end resting against the inner end of an adjusting bolt S which projects through the upper end of the said chamber G. By means of this adjusting bolt S, the pressure or tension of the spring against the diaphragm is regulated, as will be readily understood.

The operation of my invention is as follows:—Gas flows in from the main through the inlet port B, and through the valve opening K, owing to the fact that the diaphragm E is normally down when gas is not flowing through the regulator, which allows the inner ends of the levers M and P to drop, and the valve L to fall or move inward. The gas filling the diaphragm chamber causes a pressure therein which raises the diaphragm, and moves the valve outward through the medium of the levers, as will be readily conceived. Before the valve will close however, the pressure in the chamber C must be sufficient to overcome the diaphragm weight, and the tension of the regulating spring R. As soon as the pressure is sufficient to overcome both the tension of the spring, and the weight of the diaphragm, the valve L will close and cut off the flow of gas, until the pressure in the chamber C is decreased or lowered, at which time the valve L will again open to allow gas to flow through. The valve L however will open only just far enough to allow the gas to flow through sufficient to maintain the pressure in the chamber C, which is regulated by the tension of the regulating spring R. That is to

say, the pressure of the gas flowing to the burner or place of consumption can be regulated by means of the screw bolt S.

Owing to the use of two levers as here shown, the one M to operate the valve L, and the one P to prevent the weight J, being pushed to one side when the valve is closed, all lateral strain upon the diaphragm is avoided, as will be readily understood, and the weight J, which operates the valve through the medium of the lever M, held perfectly perpendicular in its movement. This will make the diaphragm more durable, and make the regulator more accurate in its workings, than if a lateral strain was caused upon the diaphragm when closing the valve L. Again it makes the closing of the valve firm and rigid. Where a lever P is not used, the valve would be held closed by a yielding connection of the weight or depending portion J, with the diaphragm, which would allow the valve to vibrate, thus causing a fluttering, which is especially to be avoided in gas regulators.

In Fig. 2 a slight modification is shown, which accomplishes the same end, that is to say, lateral strain upon the diaphragm is prevented, and a firm closing of the valve secured. In this instance an opening O is made in the weight J, and the levers M and P made to extend through the opening until they are in contact as shown. In this instance the weight merely serves to support the inner ends of the levers. The operation and effect however is the same in either instance. It will be seen that this construction, makes a toggle movement, which is powerful, and avoids all pivotal points and positive connections which are liable to get stiff, and out of order, as the levers merely have their opposite ends to loosely rest in recesses made for

them. This cheapens the construction of the regulator as will be readily understood, besides reducing friction, and the liability to get out of order, which is the case where pivotal points are used.

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

1. A gas regulator comprising a chamber having an inlet and an outlet, a diaphragm therein carrying a laterally extending rod support having a recess at each side, a valve in the inlet opening having a recess, the wall of said chamber having a recess substantially opposite the inlet opening, each recess having a lower rod supporting wall and rods having their respective ends unconnected with and loosely resting in the recesses of the depending rod support, the valve and the said chamber, whereby a toggle joint is formed, as shown and described.

2. A gas regulator comprising a chamber having an inlet and outlet, a diaphragm therein carrying a laterally extending rod support having a transverse opening from side to side, a valve in said inlet, a rod having one end engaging the said valve and the opposite end resting in said transverse opening of the rod support, and a rod having one end engaging the wall of the chamber substantially opposite the said inlet and its opposite end resting in said transverse opening of the rod support and engaging the adjacent end of the other said rod, substantially as and for the purpose described.

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

MIRON G. REYNOLDS.

Witnesses:

H. D. BAYLESS,
DICK SHICK.