

T. WHALEY.
Gas-Regulator.

No. 214,218.

Patented April 8, 1879.

Fig. 1.

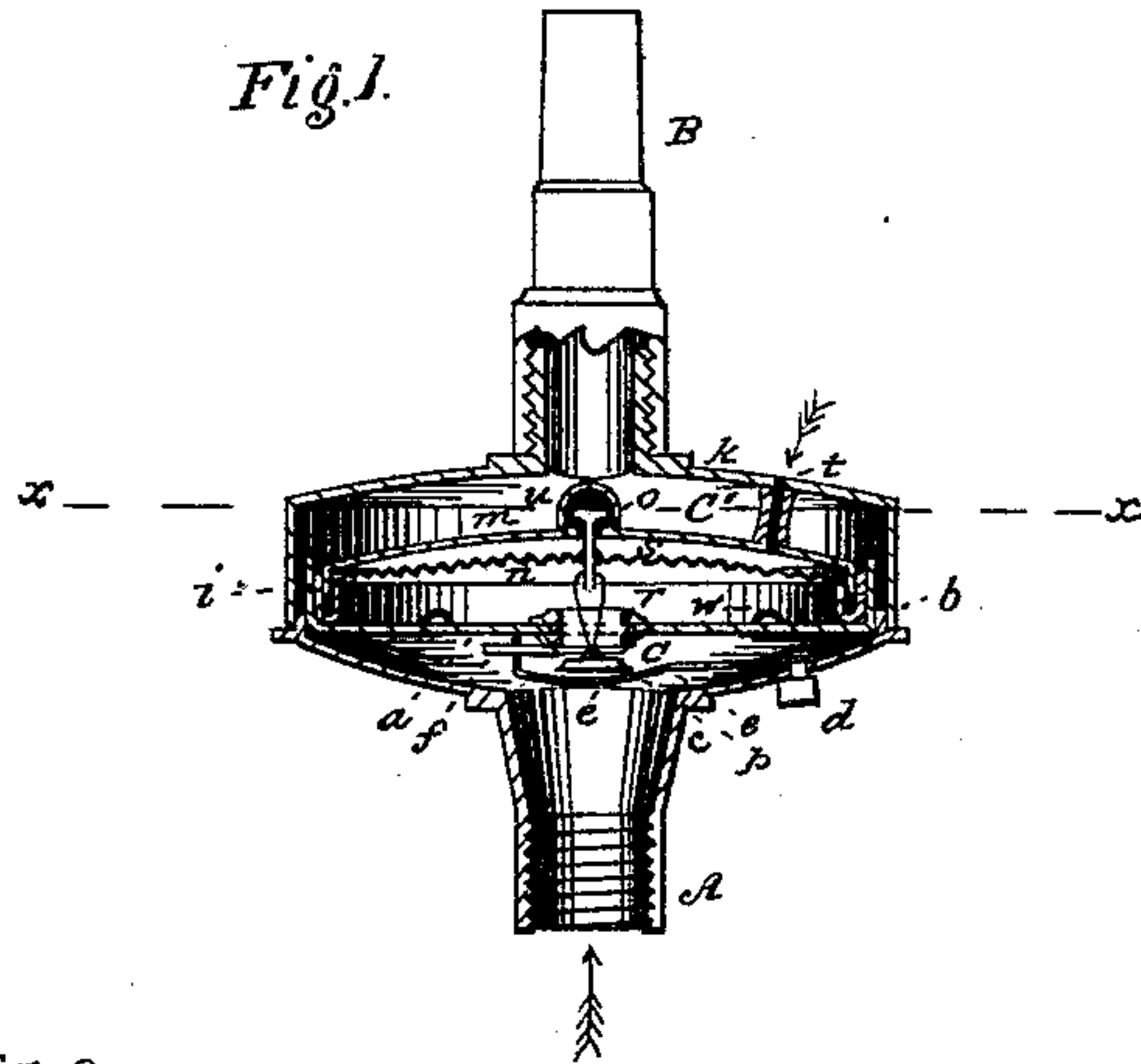


Fig. 2.

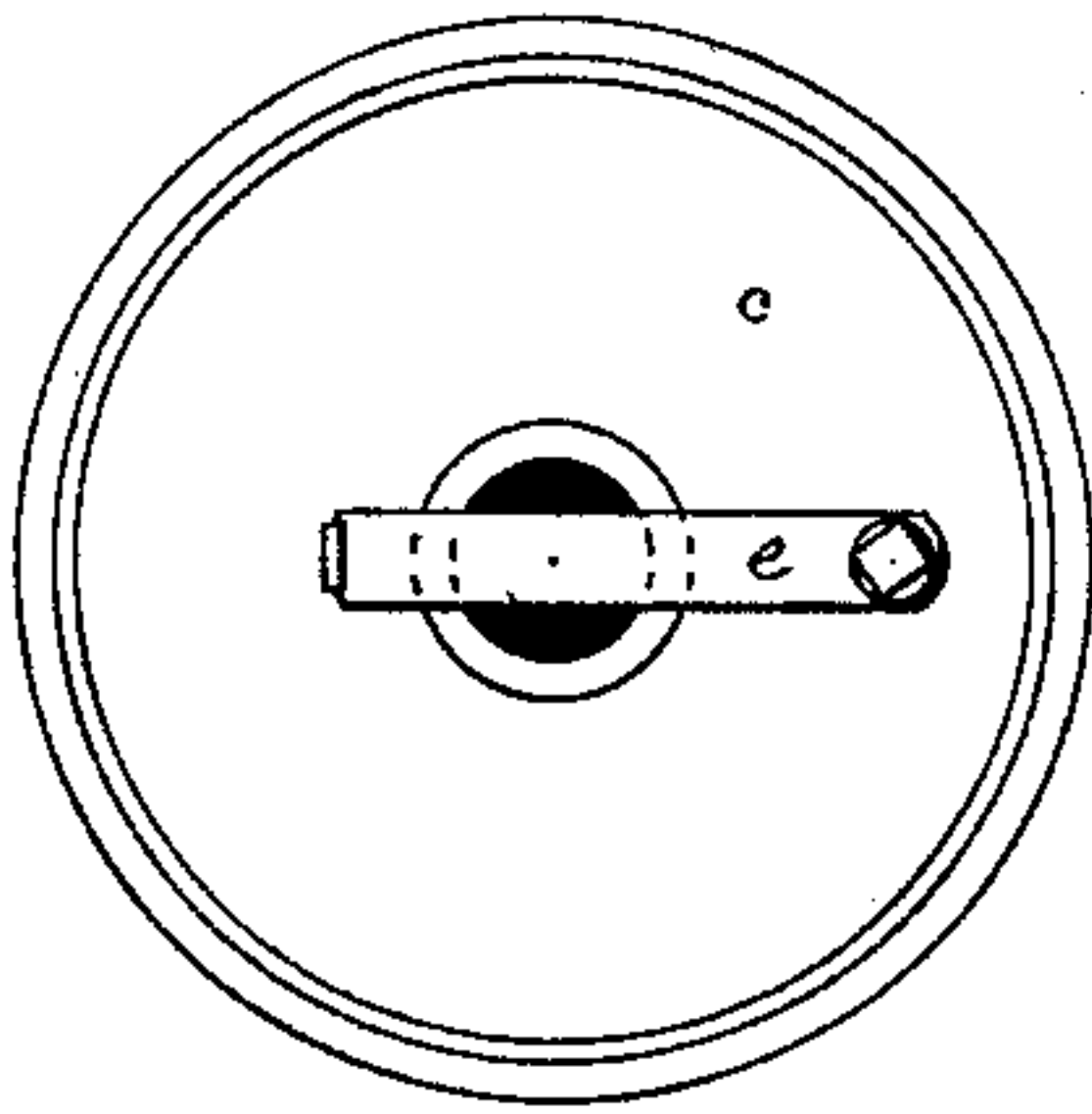


Fig. 3.

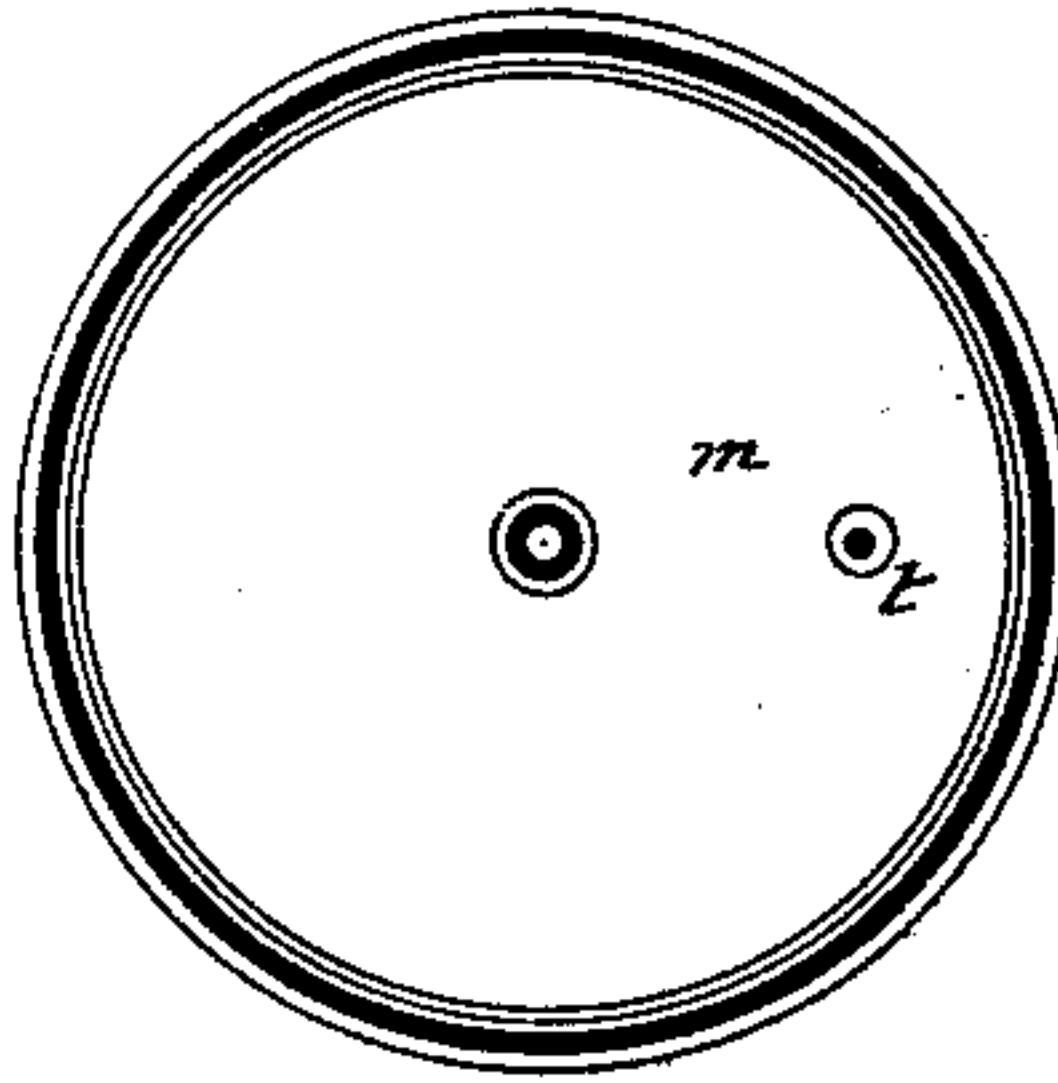


Fig. 4.

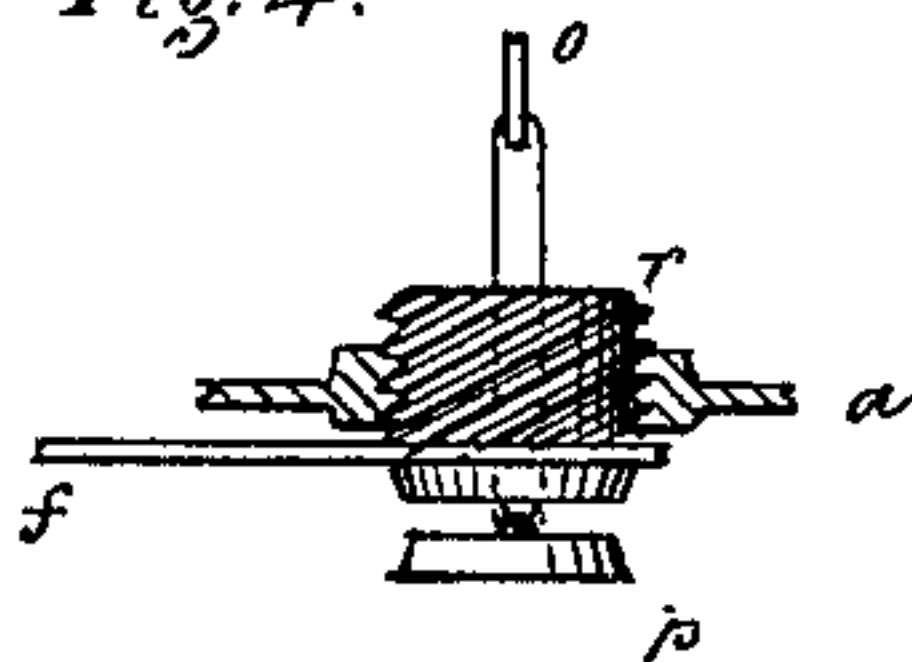
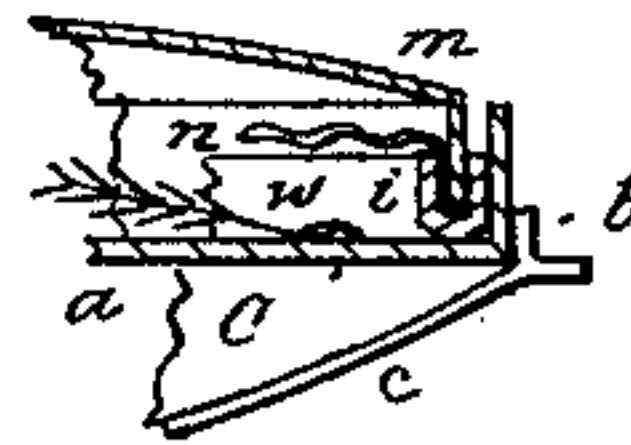


Fig. 5.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN GAS-REGULATORS.

Specification forming part of Letters Patent No. **214,218**, dated April 8, 1879; application filed
November 23, 1878.

To all whom it may concern:

Be it known that I, THOMAS WHALEY, of the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Gas-Regulators; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification.

This invention relates to certain improvements in gas-regulators, to be used at or near the gas-burner for the purpose of regulating the pressure and consumption of the gas; and it is more especially intended as an improvement on a certain gas-regulator invented by George W. Thompson, and patented to him January 1, 1878.

The objects of my invention are to render the apparatus less liable to damage or derangement of its parts, to simplify the construction of the flexible elastic box, so that the parts may be more readily and easily put together, and to dispense with the use of springs or weights for the purpose of adjusting the apparatus.

The invention consists in the combination of an adjustable valve-seat with the flexible and elastic box or diaphragm, a laterally-closed inlet, by which the outer air is freely admitted to act upon the diaphragm in an opposite direction to the pressure of the gas as it enters the instrument, and a valve suspended from the latter, by which means the use of springs or weights for regulating the pressure is avoided; also, in an improved construction of the flexible elastic box, whereby the same is constructed more easily and rendered less liable to become disarranged or injured by rough usage; and also in improved means for adjusting the apparatus from the outside, all of which is hereinafter particularly set forth and described.

In the accompanying drawings, Figure 1 represents a transverse vertical section of my improved gas-regulator; Fig. 2, a plan of the upper surface of the lower case; Fig. 3, a horizontal section on the line *xx* in Fig. 1; Fig. 4, a detached view of the adjustable valve-seat on an enlarged scale; and Fig. 5, a sectional

view of one edge of the elastic box on an enlarged scale.

Similar letters of reference indicate the same parts in all the several figures.

A is a connecting-piece, provided with a screw-thread which fits onto the service-pipe; and B is the stem of the gas-tip, which may be of any of the ordinary forms. The gas-chamber or main body of the apparatus is divided into two compartments, C and C', by a horizontal plate, *a*, which fits inside of a flange, *b*, formed upon the lower case, *c*. At the center of this plate *b* is located an adjustable valve-seat, *r*, made adjustable by a screw-thread or other suitable means, and operated so as to be raised or lowered by a square-headed pin, *d*, on the outside of the instrument, through the medium of a rod or plate, *e*, attached to the said pin, and an arm, *f*, secured to the valve-seat. The arm *f* is slotted to receive the upwardly-extending end of the rod *e*, which latter is secured to and operated by the pin *d*, so that by turning the said pin *d* the valve-seat is partially rotated, and thereby raised and lowered, as may be desired.

To obviate the difficulty of forming an airtight joint at the periphery of the elastic box, arising from the thinness of the metal and the consequent difficulty of working the same, I construct the said box with the parts and in the manner hereinafter described—namely: *i* is a metallic ring, which, at its edges, is U-shaped in cross-section, and which fits tightly within an upwardly-extending flange surrounding the plate *b*, and rests upon the said plate. Within the two edges or flanges of the ring *i* are clamped by a flanged plate, *m*, the edges of a disk, *n*, of thin corrugated sheet metal or other suitable material which is flexible and elastic, and will readily yield to the pressure of the gas on its under side. A pin, *o*, provided with a head at its upper end, passes through the center of the disk *n*, and is rigidly secured thereto, and extends upward through a perforation in the plate *m*, in which it works freely; and from the lower end of the said pin is suspended, by a flexible wire, the valve-plug *p*, which works in connection with the adjustable valve-seat *r*, so that the said valve-plug has a swivel motion, and readily

adjusts itself to the seat. The head of the pin *o* comes against the plate *m* when the pressure is removed from the under side of the disk *n*, thereby supporting the latter, and preventing any liability of its being injured by sudden jars.

An air-chamber, *s*, is formed by the disk *n* and plate *m*, into which the outer air is freely admitted through a passage-way, *t*. This passage-way is most easily formed by first making a perforation in the plate *m*, and another perforation in the upper case, *k*, between which, in putting the parts together, I place a piece of common putty; and after the parts have all been properly connected, I bore through the putty, so as to form a tubular connection between the air-chamber *s* and the outer atmosphere.

A cap, *u*, is soldered or otherwise secured upon the plate *m*, over the head of the pin *o*, for the purpose of preventing any gas from entering the air-chamber.

The gas, as it enters the instrument, passes through the valve and strikes against the under side of the disk *n*, causing the latter to bulge upward in proportion to the degree of pressure, and thereby proportionately raising the valve-plug and diminishing the size of the opening at the valve through which the gas enters. After having acted upon the disk *n*, the gas passes through openings *w* on the lower edge of the ring *i* into the upper compartment, *C'*, of the gas-chamber, and from thence to the burner; and the instrument, having once been set at a predetermined degree of pressure by means of the pin *d*, rod *e*, and arm *f*, will continue to supply the gas at that degree of pressure to the burner for an indefinite length of time.

To prevent the regulator being tampered with so as to alter the adjustment, the pin *d*

is made to fit so tightly that it cannot be turned by the fingers without using a key or wrench.

By means of my improvements the apparatus can be constructed much more cheaply than heretofore, and the use of springs or weights is rendered unnecessary, while at the same time, it is much less liable to be injured and put out of adjustment by sudden jars or concussions or other rough usage; and by reason of the head of the pin *o* coming against the plate *m* when the disk *n* is deflected, the latter is preserved from being injured by being unduly deflected, and is enabled to retain its proper degree of elasticity.

What I claim as my invention is—

1. In a gas-regulator, the combination of an adjustable valve-seat, a flexible and elastic box or diaphragm, a valve suspended from the said diaphragm, and a laterally-closed inlet, by which the air is freely admitted to act upon the diaphragm in an opposite direction to the pressure of the gas as it enters the instrument, substantially as described, for the purpose set forth.

2. The flexible box or chamber composed of the lower perforated and flanged plate, *a*, upper flanged plate, *m*, ring *i*, and metallic disk *n*, constructed and arranged substantially as described, to admit atmospheric air above the diaphragm, and allow the egress of the gas below the same into the chamber *C*, as set forth.

3. The combination of the disk or diaphragm *n* and valve-plug *p* with the adjustable valve-seat *r*, rod or plate *e*, slotted arm *f*, and pin *d*, as and for the purpose specified.

4. The combination of the pin *o*, plate *m*, and disk or diaphragm *n*, as and for the purpose set forth.

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Witnesses:

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