

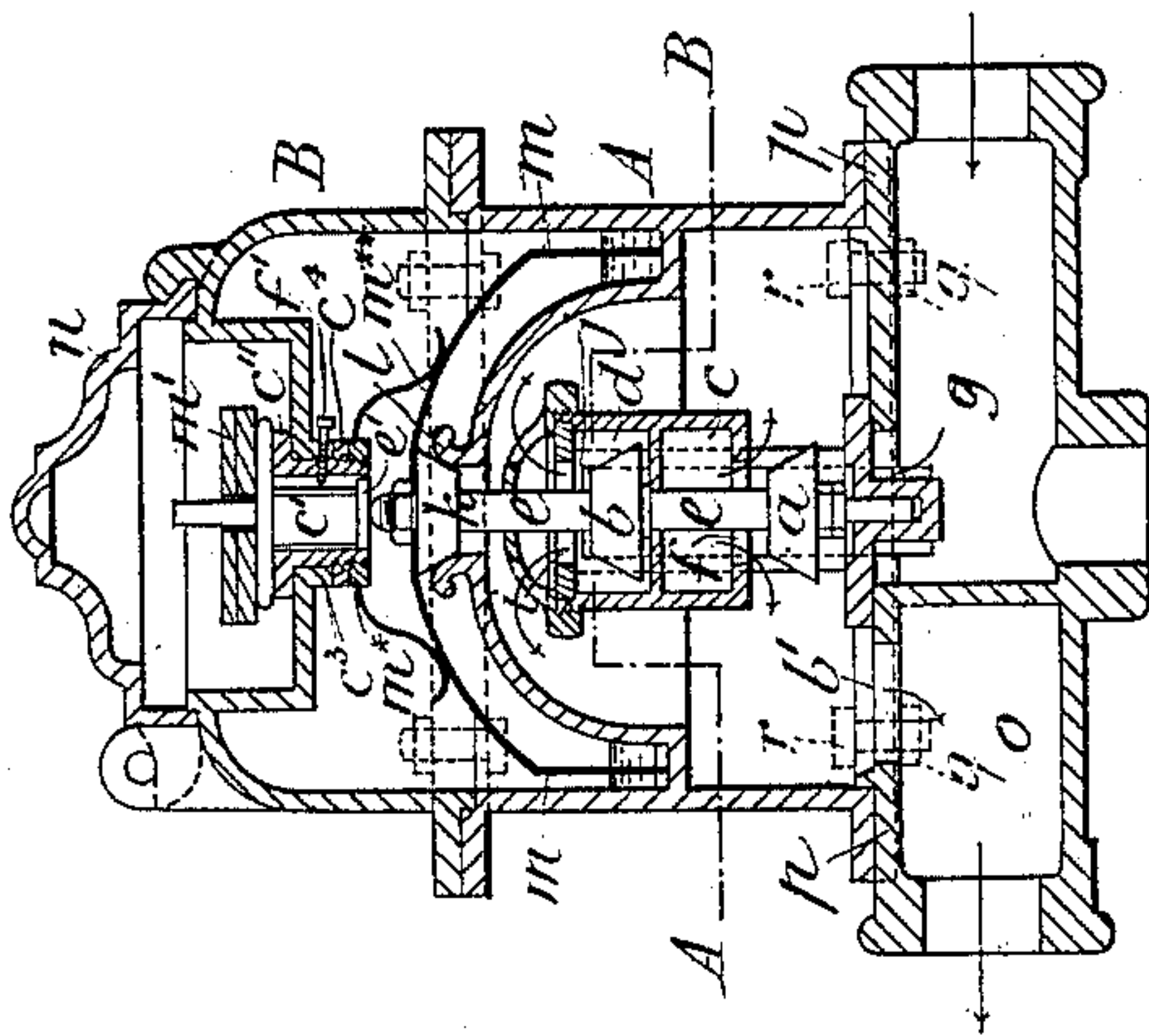
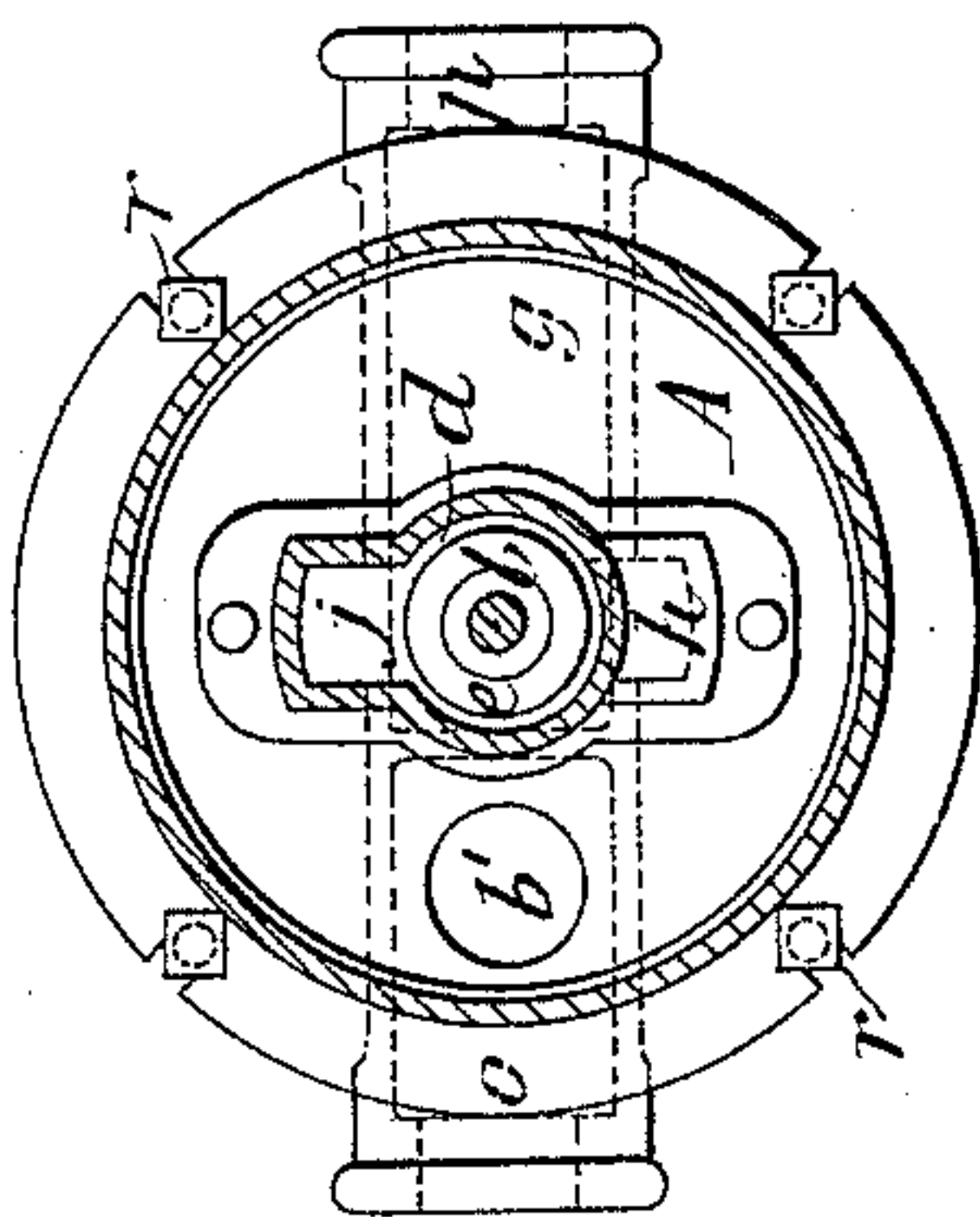
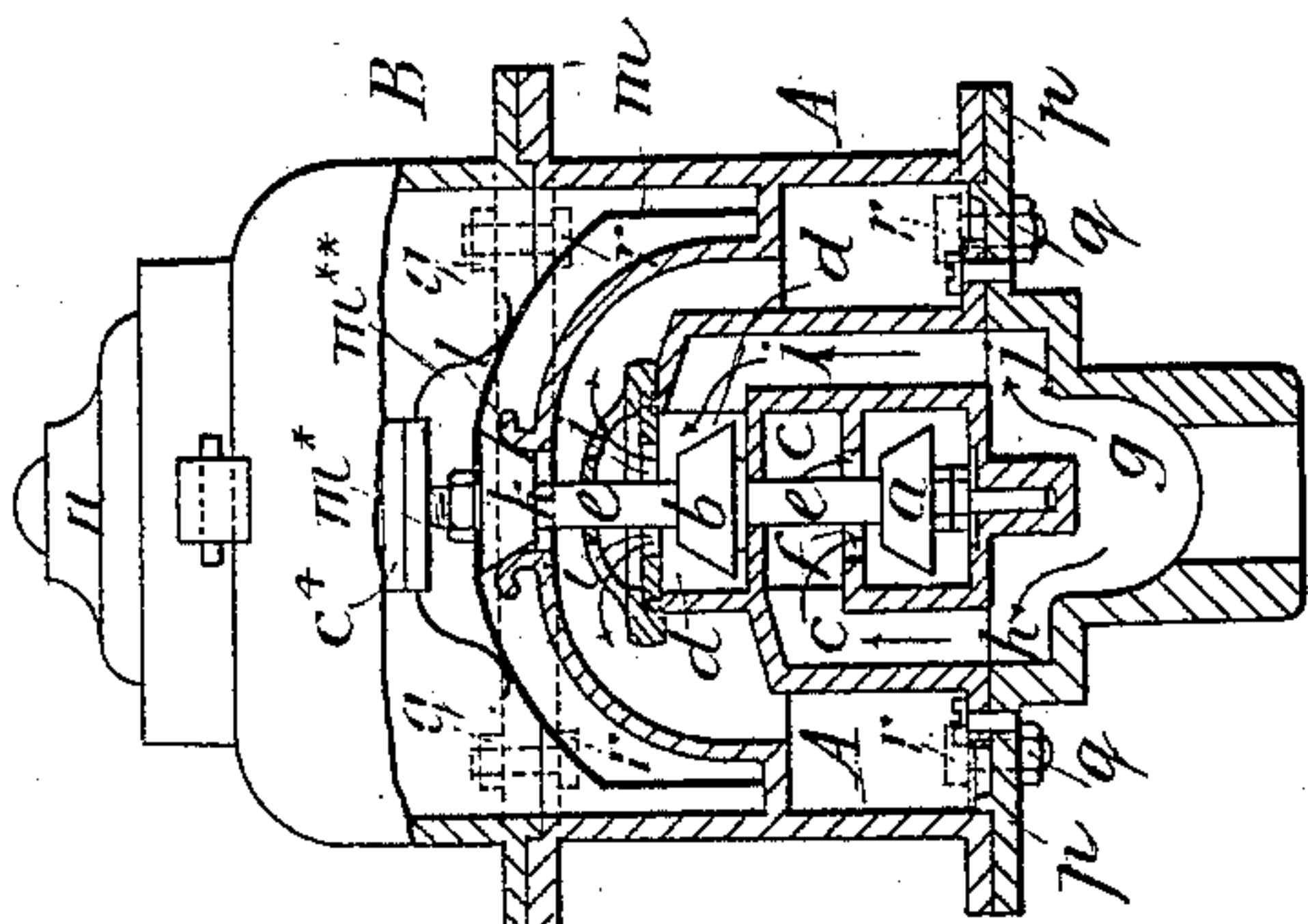
(No Model.)

G. PORTER.

GAS REGULATOR OR GOVERNOR.

No. 387,181.

Patented July 31, 1888.



Witnesses:

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Inventor.

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UNITED STATES PATENT OFFICE.

GEORGE PORTER, OF LONDON, ENGLAND.

GAS REGULATOR OR GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 387,181, dated July 31, 1888.

Application filed October 14, 1887. Serial No. 252,326. (No model.) Patented in England December 31, 1885, No. 16,093.

To all whom it may concern:

Be it known that I, GEORGE PORTER, a subject of the Queen of Great Britain, residing at London, England, have invented new and useful Improvements in Gas Regulators or Governors, (for which I have obtained Letters Patent in Great Britain, No. 16,093, dated December 31, 1885,) of which the following is a specification.

My invention relates to improvements in mercurial gas regulators or governors, and has for its object to prevent the oscillation of the lights common with other regulators; to produce a more perfect equilibrium action of the valves, and consequently greater accuracy and sensitiveness thereof, than heretofore, thereby dispensing to a great extent with counterbalance-weights, the valves acting with such precision that not only is a saving effected under a high pressure, but under a low pressure also; to prevent the escape of gas by means of an extra valve, which shuts off automatically in case of loss of mercury from any cause or accident to the governor, and controls the meter so as not to allow more gas to pass than each burner when alight actually requires, and to construct the shell or body of the governor in several parts, mount the valves on a separate base in order that the other parts may be easily removed by any ordinary person, so as to leave the valves entirely exposed for cleansing, adjustment, or other necessary purpose, such provision not being generally made in other governors.

According to my invention, the valves in the lower part of the regulator are of the equilibrium form; but instead of the two valves being mounted in a single chamber, as heretofore, I mount them in a double chamber, each of the said chambers being fitted with a separate inlet, which equalizes the pressure and thus insures perfect equilibrium action, the gas acting with equal force upon the lower and upper valves, instead of rushing with greater force out of the upper one, and in this latter case causing the valves to oscillate under certain pressures, and thereby imparting unsteadiness to the lights.

An additional valve is fitted to the upper part of the same spindle, and this additional valve works in a seating provided for it in a dome-shaped partition which forms the roof

of the lower portion of the governor, the object of this being that should there be a loss of mercury from any cause the diaphragm would cease to float, and the upper valve would thereby fall into its seating, and thus shut off the gas, which would otherwise escape into the house. The body or outer shell is constructed in several pieces, the base, with the inlet and outlet pipes attached, being in one separate piece and having mounted upon it the equilibrium-valve. The body and upper part are also in separate pieces, the whole being placed together and secured by clips, bolts, or screws.

In order to enable my invention to be fully understood, I will proceed to describe the same by reference to the accompanying drawings, in which—

Figure 1 represents a vertical section of a gas regulator or governor constructed according to my invention. Fig. 2 is a vertical section of the same, partly in elevation, the section being taken transversely to Fig. 1; and Fig. 3 is a horizontal section taken on the line A B of Fig. 1.

Similar letters in all the figures represent similar parts.

a and *b* are the two valves of the equilibrium form in the lower part of the regulator.

c d represent the double chamber, the said valves being mounted in the said chamber on a spindle, *e*, which bears at its upper end against a sliding rod, *e'*.

f is the opening controlled by the valve *a*, through which the gas entering the chamber *c* from the inlet-pipe *g* through the inlet *h* passes into the lower part A of the regulator.

i is the opening controlled by the valve *b*, through which the gas entering the chamber *d* from the said pipe *g* through the separate inlet *j* passes into the said part A of the regulator, this arrangement serving to equalize the pressure and causing a perfect equilibrium action in the manner hereinbefore explained.

The valves *a* and *b* are mounted upon a spindle, *e*, and guides are provided for said spindle—one in the partition between the chamber *c* and *d* and another in a curved plate extending above the chamber *d*. I prefer, also, to provide a guide for the lower end of the spindle, as shown in the drawings, so that said spindle is supported in three guides and held from any lateral movement, thereby insuring

a perfect and accurate working of the valves. The guides for the spindle are preferably within the shell A.

k is the additional valve fitted to the upper end of the spindle e , and l is the seating of the said valve, provided in the roof of the part A of the regulator forming the lower valve-chamber, the edges of the said seating being turned over in the manner shown in the drawings in order to prevent the mercury from entering the lower part, A, of the regulator in the event of the apparatus becoming inverted during transit or otherwise.

m is a diaphragm fixed to the valve k and floating in mercury placed in the lower portion, A, of the regulator, as shown, the valve serving, in the manner hereinbefore explained, to shut off the gas from the diaphragm m in case of the latter ceasing to float through a loss of mercury from any cause. The rod c' is adapted to slide in a bush, c'' , secured in a socket, c^3 , formed in the top wall of the portion B of the apparatus. The said bush is screw-threaded at its lower end, so that it can be secured in the socket by means of a nut, c^4 .

m^* is a collar which is screwed onto the said bush below the nut c^4 , and is provided with spring-arms m^{**} , adapted to bear upon the top of the diaphragm. These spring-arms are preferably of such strength that they will equilibrate the pressure of the gas beneath the diaphragm when such pressure does not exceed, say, nine-tenths of an inch. These spring-arms also serve to further preclude the possibility of oscillation of the lights. In case, however, that the regulator is required to work with a higher pressure of gas, I provide weights $m' m'$, which can be placed on the rod c' , as shown in Fig. 1. The rod c' is preferably of triangular shape in cross-section, and with a plate, e' , at its lower end, so that the latter can at all times work freely in the bush c'' . A set-screw, f' , is provided, which, by entering between the angles of the rod c' , will prevent the latter from falling out of the apparatus if it be inverted. The upper end of the spindle e bears upon the plate e' when the valve k is raised.

By forming the rod c' separate from the spindle, in the manner hereinbefore described, I prevent the weights from throwing the spindle carrying the valves out of the perpendicular, and the valves are consequently caused to work accurately in their seatings.

n is a cover, by removing which access is obtained to the said weights. o represents the outlet for the gas to the burners after having passed through the regulator or governor, the gas entering the outlet through an opening, b' , in the base p , hereinafter referred to.

The shell or body of the governor consists of the inner shell, in which the equilibrium-valves are mounted, and outer shell, A, the said outer shell being provided with a cap or cover, B. The inner shell is detachably mounted upon the base, which contains the in-

let and outlet pipes g and o . The shell A is also detachably mounted upon the base and secured by bolts or clips or other desired means. This shell is provided with the seat for valve k , and also with an outwardly-projecting flange at its upper edge. This flange supports the part B, the top of which is formed by the lid or cover n . When this cover is raised, access may be had to the weights m' . By removing the part B of the body of the regulator the diaphragm will be exposed, and by removing the diaphragm and valve at the upper end of the spindle e and the nuts by which the shell A is secured to the base this shell may be removed intact and access had to the valves for cleansing or other purposes.

The course of the gas through the regulator or governor is indicated by the arrows in Figs. 1 and 2. As the gas enters the separate chambers c and d from the inlet g and passes out therefrom into the lower part, A, of the shell or body of the regulator, the pressure of the gas upon the diaphragm m will always keep open the valve k . If the burners be turned off the pressure of the gas will raise the diaphragm m to such an extent as to close the valves a and b , the gas in this manner being prevented from entering the lower part, A, of the regulator. If, however, the burners, or some of them, be turned on, the pressure upon the diaphragm m will be proportionately reduced and sufficient gas will be allowed to pass to supply the number of burners lighted. For every burner which is turned off or on, or on any increase or decrease of the pressure in the street-mains, a corresponding closing or opening of the valves a and b takes place. This action of the governor, which is entirely automatic, produces a uniform pressure at the point of incandescence, so that a great saving is effected in the consumption of gas.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. A gas regulator or governor consisting of a base having inlet and outlet pipes, an inner shell detachably secured to said base, containing one or more valves, and an outer shell consisting of two parts detachably secured together, the lower of which is provided with a dome-shaped partition, the whole of said outer shell being detachably secured to said base, substantially as described.

2. In a gas regulator or governor, the combination, with a base provided with inlet and outlet pipes, of an inner shell provided with two valve-seats and two guides secured to said base, an outer shell secured to said base, and a rod mounted in the guides in said inner shell and carrying two valves, substantially as described.

3. In a gas regulator or governor, the combination, with a base provided with inlet and outlet pipes, of an inner shell secured to said base and provided with two valve seats and

two or more valve-rod guides, an outer shell provided with a valve-seat and secured to said base, and a valve-rod mounted in the guides in said inner shell and having valves for engaging the valve-seat in the inner shell and a valve for engaging the valve-seat in the outer shell, substantially as described.

4. In a gas regulator or governor, the combination, with a base provided with inlet and outlet pipes, of an inner shell secured to said base and having valve-rod guides, an outer shell attached to said base and having a dome-

shaped partition provided with a valve-seat, a portion of the said outer shell above said partition being removably secured to the lower portion, a valve-rod mounted in the guides in the inner shell, and a diaphragm and valve attached to said rod above the partition of the outer shell, substantially as described.

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Witnesses:

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