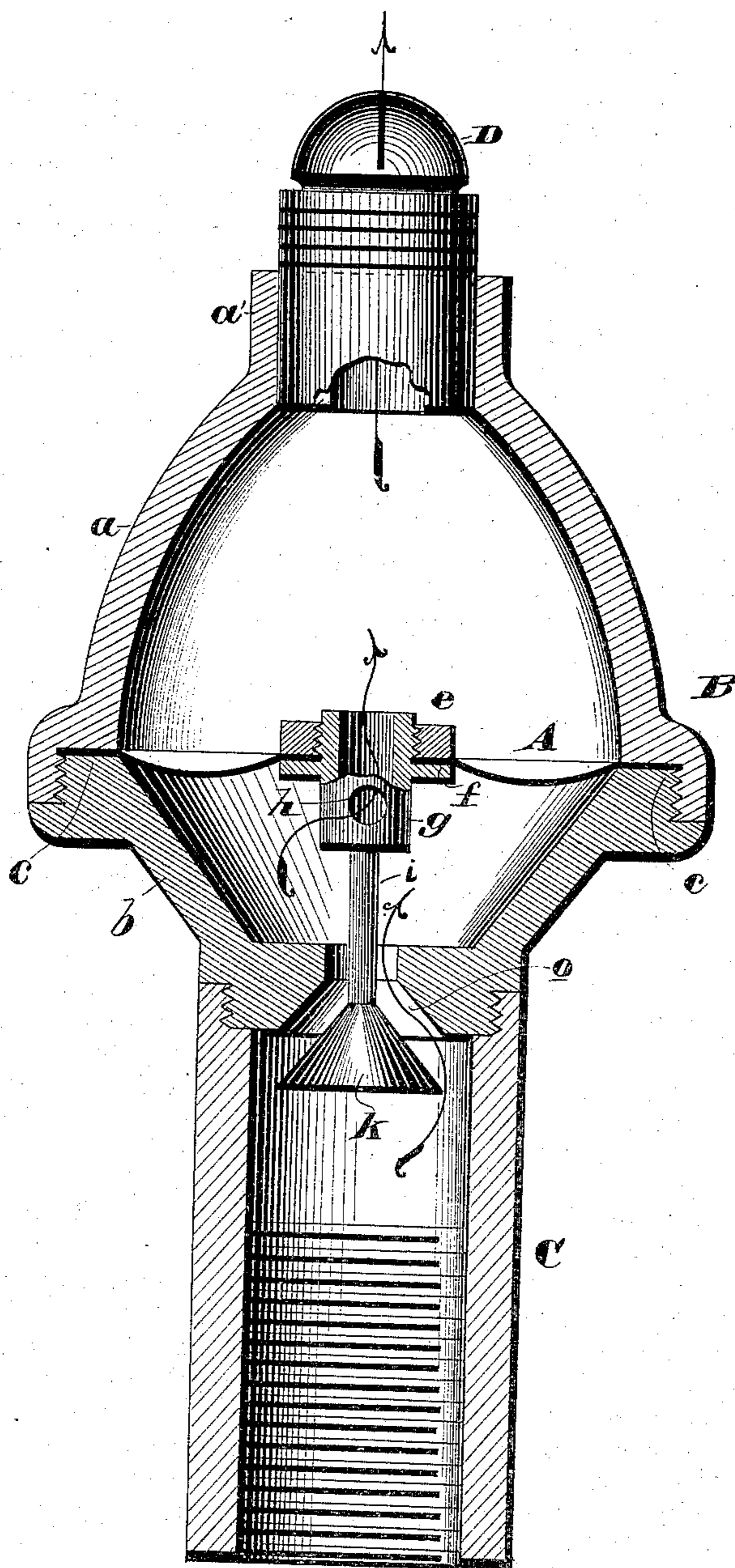


(No Model.)

W. M. JACKSON.
GAS REGULATING BURNER.

No. 316,626.

Patented Apr. 28, 1885.



WITNESSES

W. M. Jackson,
Geo. F. Downing.

INVENTOR

W. M. Jackson.
Geo. F. Downing.
Attorney

UNITED STATES PATENT OFFICE.

WALTER MARSH JACKSON, OF PROVIDENCE, RHODE ISLAND.

GAS-REGULATING BURNER.

SPECIFICATION forming part of Letters Patent No. 316,626, dated April 28, 1885.

Application filed March 27, 1884. (No model.)

To all whom it may concern:

Be it known that I, WALTER M. JACKSON, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Gas-Regulating Burners; and I do hereby 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.

My invention relates to an improvement in gas-burners, the object being to provide simple, cheap, and convenient means for automatically regulating the pressure of gas between the point of combustion and the ordinary stop-cock by which the gas is turned on or off for lighting or extinguishing; and with these ends in view my invention consists in certain novel features of construction and combinations of parts, as will be hereinafter fully described, and pointed out in the claim.

In the accompanying drawing, which represents a view in section of my improvement, B represents a shell made in two sections, *a b*, adapted to be clamped, screwed, or otherwise securely held together gas-tight, the said shell presenting a globular appearance. Each section of the shell is provided with a shoulder, *c*, between which, when the sections are secured together, is tightly held a diaphragm, A, made of any suitable material, but preferably of cloth rendered gas-tight by coating it with thin rubber and immersing it in a solution of glycerine and gelatine. This diaphragm is centrally provided with a small hole or perforation adapted to receive a small pipe, *g*, which is closed at its lower end, provided at its upper end with the external screw-thread, below which thread is formed a shoulder or flange, *f*. Upon the upper end of this pipe fits a nut, *e*, and when screwed down securely holds the diaphragm between itself and the shoulder *f*; or, if desired, the thread may be dispensed with and a sliding nut employed. The pipe or tube *g* below the diaphragm is provided with a small hole, *h*, and to its lower end is secured the vertical rod *i*, adapted to pass freely through the opening *o* in the lower end of the section *b* of the shell. To the lower end of this rod, I secure a valve, *k*, hanging below said opening *o*, and preferably formed in the shape of a cone, the sides of the opening

o being inclined in accordance therewith, and forming a valve-seat. The lower end of the section *b* is provided with a male screw-thread which meshes with a female screw-thread formed in the upper end of a suitable shank, C, which latter is adapted to secure the device to any ordinary fixture, the upper end of the section *a* being provided with a neck, *a'*, for the reception of any ordinary gas-tip, D. If desired, this neck may be threaded for the purpose of attaching an Argand or other burner.

Having set forth the construction and relative arrangement of the several parts of my improvement, I will now describe its operation. When the stop-cock is opened, the gas rushes up past the valve *k* into the space or chamber below the diaphragm, through the small hole *h* in the pipe *g*, out into the chamber above the diaphragm, to emerge at the burner, where it may be lighted. The outlet of said burner being of larger caliber than the hole *h* in the tube *g* a difference in pressure on either side of the diaphragm is always assured. Again, the hole *h* in the tube *g* is of such size as to allow a sufficient quantity of gas to pass through it under the lowest pressure at which it is deemed advisable to burn gas in order to obtain the greatest illuminating power from a given quantity. When thus constructed, the diaphragm is inactive and the burner emits its normal quantity of gas; but if the pressure be increased the diaphragm will be forced upwardly, the tube *g*, nut *e*, spindle *i*, valve *k*, and the back-pressure of the gas in the chamber above the diaphragm counteracting a part of this upward pressure. Now, as the pressure below the diaphragm vibrates between the standard of low pressure and any degree of high pressure, the diaphragm, actuated by the difference between the pressures in the chambers above and below it, rises and falls, thus closing or opening the valve in the lower end of the section *b* and automatically checking or opening the supply of the gas to the section *b*, and automatically checking or opening the supply of the gas to the burner. Since the back-pressure above the diaphragm is less than the pressure below when the main gas-pressure is higher than the lowest standard, it follows that the diaphragm must always be actuated to perform its func-

tion, and by making the hole h of a desired size to allow of the passage of a given quantity of gas under a certain pressure, and by forming the aperture in the burner of larger capacity than the hole in the tube, there is under higher pressure always a force to actuate the diaphragm and automatically supply a uniform quantity of gas to the burner.

It will be seen from the foregoing description that although the valve may constantly rise and fall, varying the flow of gas into the shell, said valve cannot come into actual contact with the seat, and therefore is not liable to adhere and close the hole entirely or to fasten itself and refuse to operate when the gas is turned on.

My invention is exceedingly simple in construction, is durable and efficient in use, and can be applied to any ordinary gas-fixture at a small initial cost.

I am aware that it has been proposed in a prior patent to construct a gas-regulator with a shell divided into two compartments by a flexible diaphragm having a regulating-valve connected therewith, a gas-opening being provided through the valve-stem for the flow of gas from one chamber or compartment to the other; and hence I make no broad claim to such construction and arrangement of parts. In my improvement the opening in the valve-stem for the passage of gas from the lower chamber to the upper chamber is of less capacity than the gas-opening in the burner-tip, and yet of the proper capacity to allow the gas at its normal pressure to flow freely from the lower chamber into the upper chamber and out

through the burner tip without actuating the regulating-valve. By providing the valve-stem with a gas passage or conduit of less capacity than that through the burner-tip the pressure on the under side of the diaphragm will exceed that exerted on its upper side and thus force the diaphragm upwardly and retain it under a tension sufficient to prevent the regulating-valve being actuated by slight variations in the pressure of the gas, which would result in a flickering flame of the burner, and insure a constant and practically uniform flow of gas at the burner-tip.

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

In a gas-burning regulator, the combination, with a shell provided with a gas-tip, of a flexible diaphragm dividing the shell into upper and lower gas-chambers, a valve connected with the diaphragm and adapted to regulate the passage of gas into the lower gas-chamber, the valve-stem connection being provided with an opening or openings of less capacity than the gas-exit opening in the tip of the burner for regulating the position of the valve by the differential pressures of gas in the two gas-chambers, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WALTER MARSH JACKSON.

Witnesses:

STEPHEN F. PECKHAM,
CHAS. H. JACKSON.