

(No Model.)

A. McLENNAN.
GAS REGULATING VALVE.

No. 315,050.

Patented Apr. 7, 1885.

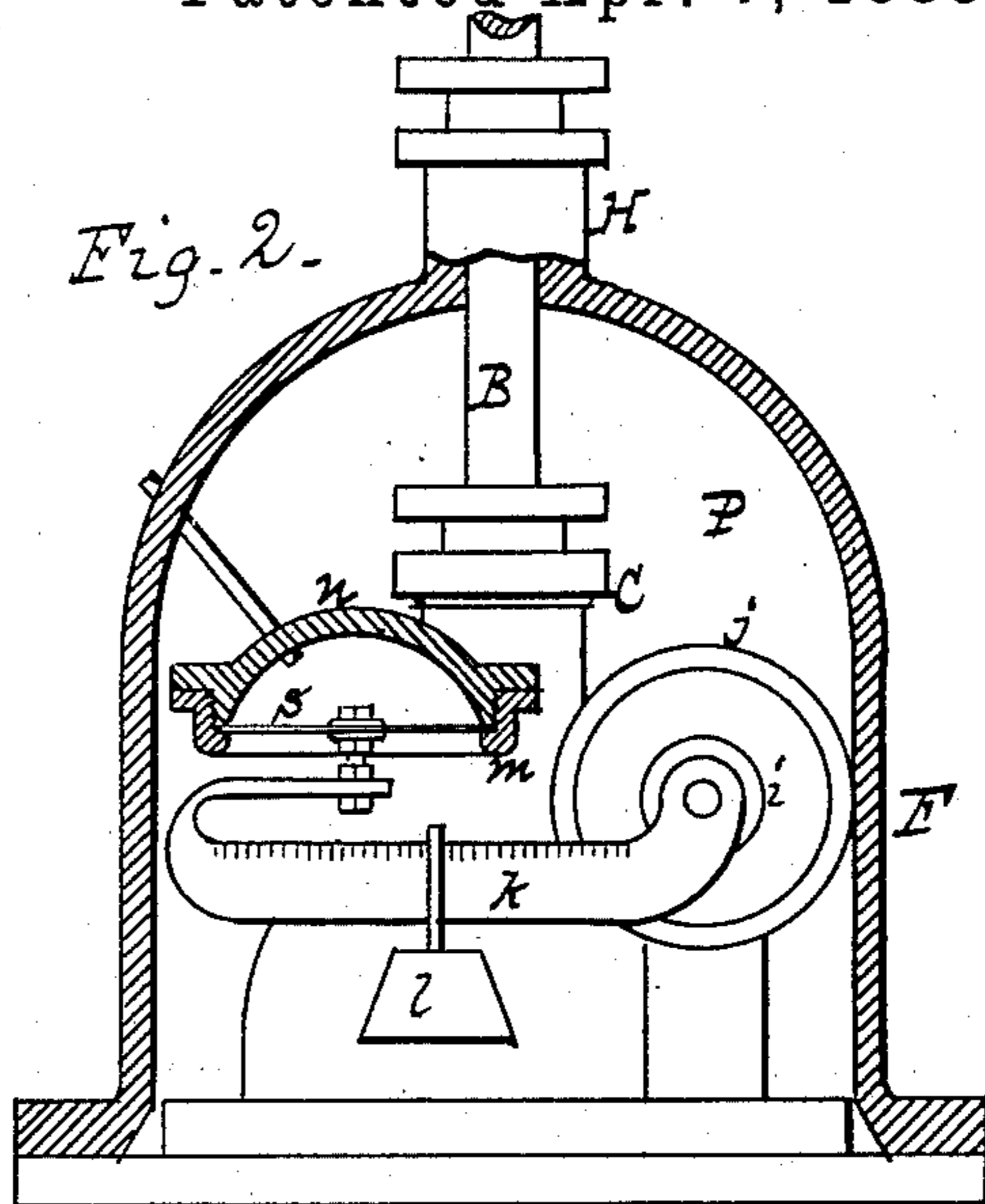
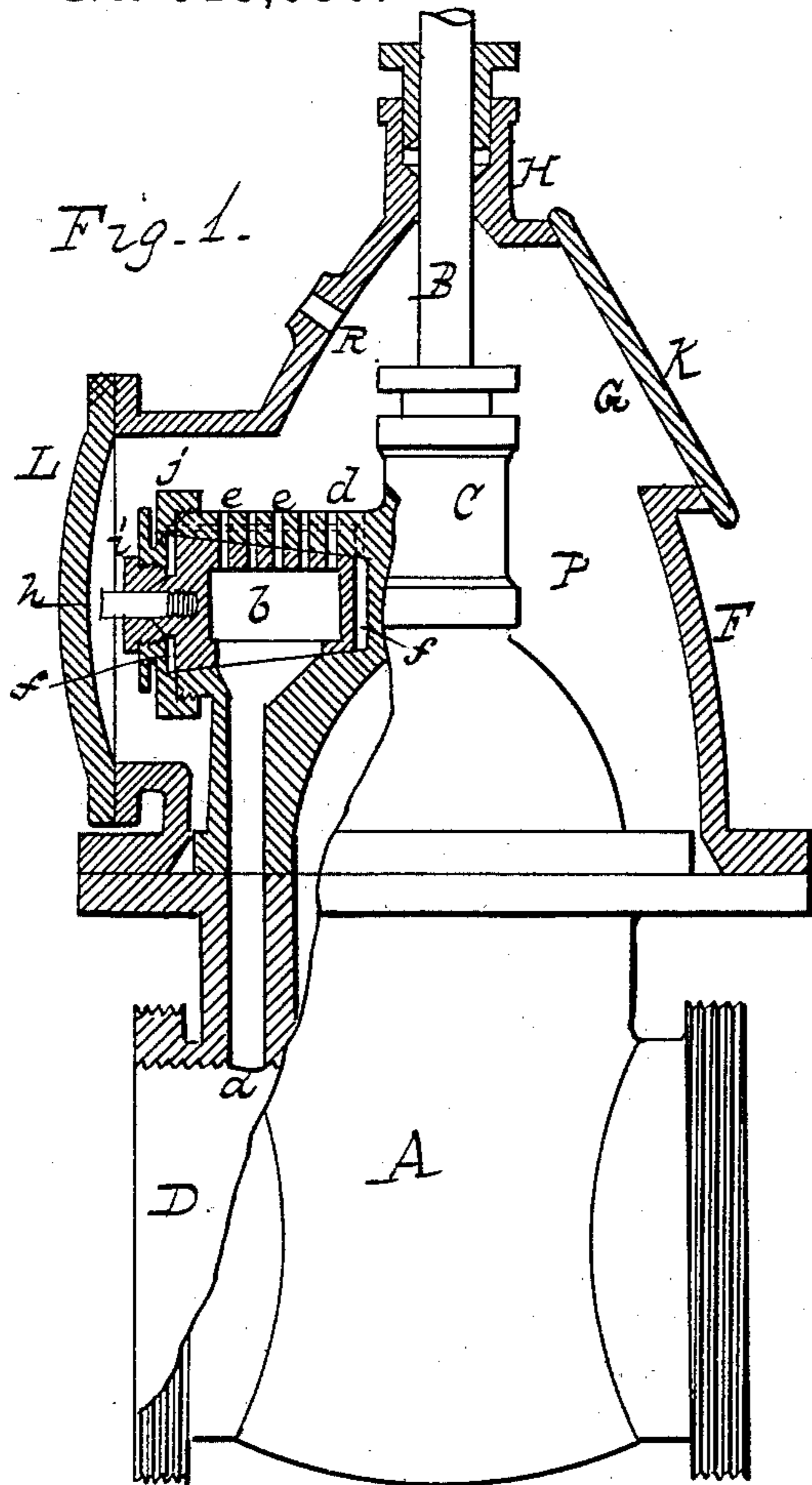
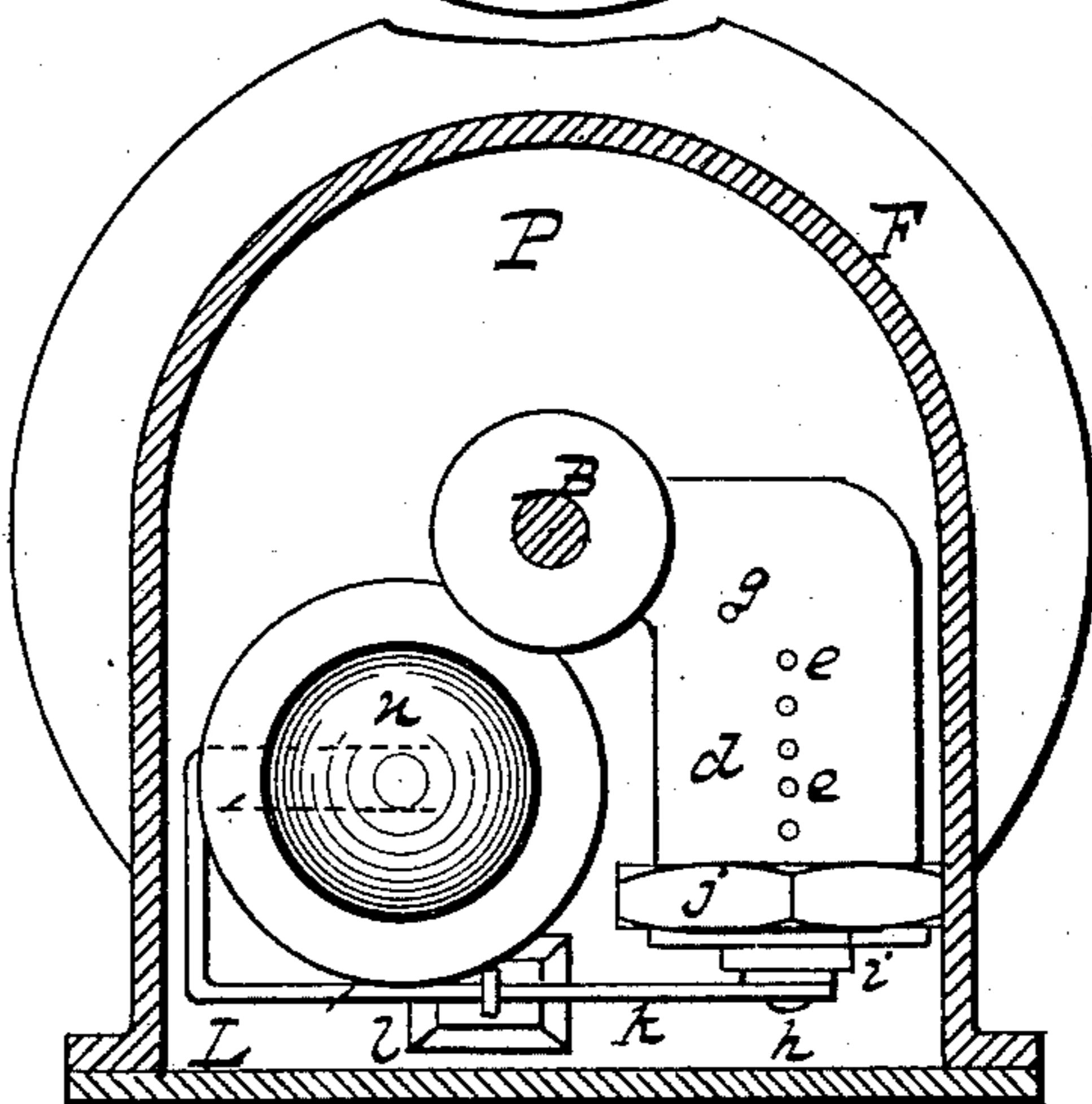


Fig. 3.



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ALEXANDER McLENNAN, OF PITTSBURG, PENNSYLVANIA.

GAS-REGULATING VALVE.

SPECIFICATION forming part of Letters Patent No. 315,050, dated April 7, 1885.

Application filed September 11, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER McLENNAN, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Gas-Regulating Valve for Gas and other Aeriform Elastic Bodies or Vapors under Pressure, which invention will be readily understood from the following description, taken in connection with the accompanying drawings, wherein—

Figure 1 represents a side elevation of my improved regulating-valve, a portion of its shell having been removed the better to show its interior operative parts; Fig. 2, a transverse vertical section of so much of said valve as is deemed necessary for a full explanation thereof; Fig. 3, a transverse horizontal section or plan of the same.

The object of my invention is to provide a mechanical means whereby expansive gases confined under pressure in one chamber or pipe may be transferred or delivered automatically to another chamber or pipe requiring a less degree of pressure, and in such a manner as that an accumulation of gas beyond a given pressure in the receiving and distributing chamber shall close the valve, and for the time prevent further increase of the gas therein, and keep the same closed until the gas in said chamber becomes exhausted or falls below a certain pressure, when the valve will open for the admission of an additional supply of gas, so controlling and regulating the flow as to make it perfectly safe and available for various domestic and manufacturing purposes.

To this end I provide a valve-chest, A, and fit the same with a valve or gate of any suitable construction, the stem B of which passes through a stuffing-box, C, inclosing proper packing; and with this chest provision is made for the attachment thereto of a pipe for the conveyance or transmission of gas. From the cylindrical portion D of this chest A and on the receiving side of the gate a channel, a, extends upwardly to and communicates with the interior of a hollow conical key, b, that is surrounded by a suitable case, d, in which it is made to snugly fit and turn. Through the upper side of the key b and its case d are a number of small holes, e e, that coincide with each other and form a series of separate open

passage-ways to the hollow interior of the key when arranged in suitable position, and close when the key is given a sufficient turn on its axis. The conical key b is made somewhat shorter than the interior of its case d, whereby there is left at each end a small chamber, f, of corresponding area or capacity, and provided with minute openings g, that lead to the outside of the shell, which openings are shown in dotted lines. The conical key b has affixed to its largest end a suitable stem, h, that extends outwardly therefrom through a packing-ring, i, and circumferential screw-cap j, whereby close intervening joints may be had and the key properly secured in place. To the outer end of this stem h is rigidly affixed a long lever or graduated scale-beam, k, provided with a movable weight, l; and the opposite recurving end of this scale-beam is brought under and pivoted to the center of a flexible diaphragm, S, clamped between a stationary ring, m, and the edge of a hemispherical cap, n, screwed therein.

This entire contrivance is inclosed in a metallic gas-tight shield, F, of suitable shape, strength, and dimensions, the upper part of which is provided with a neck, H, containing such means as will constitute a gas-tight packing, through which the stem B of the gate-valve extends; and it is also constructed with a hand-hole, G, closed by a detachable cover, K, which enables the interior packing of the gate-stem B to be reached for renewal or otherwise. On the opposite side is a similar covered opening, L, through which any adjustment of the weight l on the scale-beam may be made. The interior of this shield F is intended to form a perfectly-tight chamber, P, from which a supply of gas under low pressure may be had for delivery through such pipes as shall be put in communication therewith through one or more openings, R, leading thereinto.

The several parts of my improved regulating-valve having been described, the operation of the same is as follows: Gas under a high degree of pressure having been admitted to the interior of the valve-shell D, a portion thereof, with a corresponding force, will pass upward through the vertical channel a into the hollow of the key b, which, if in proper position, will allow the gas to continue onward

through the several small openings or holes, *e*, into the interior of the shield or large chamber *P*. When the gas in this chamber *P* has accumulated until its pressure against the flexible diaphragm *S* is such as to force it upward into its hemispherical cap, it will, by reason of its connection with the weighted scale-beam *k*, lift the same to the extent of turning the key *b* on its axis sufficiently to close the several small holes *e* therein and shut off for the time any additional or further flow of gas in that direction until the gas in said chamber becomes exhausted by use or otherwise, and therefore is unable to sustain the weighted lever. Then the key will resume its former position for the admission of more gas to the chamber, and so the operation of charging and discharging the gas at a diminished pressure through pipes is automatically carried on as long as the supply is continued and its consumption unabated.

Having thus described my regulating-valve and its mode of operation, I claim—

1. A new and improved gas-regulating valve, consisting of a shell containing a movable gate provided with a stuffing-box and stem for operating the same, a means for attaching the same to suitable pipes, in combination with a narrow channel-way leading from the gas-passage in said shell into a hollow key provided with one or more small holes through which the gas is allowed to enter a surrounding chamber, a weighted lever attached to said key, and a flexible diaphragm in connection therewith, whereby said key shall be turned on its axis to open or close these several passages therein by the increase or decrease of gas-pressure within the receiving and distributing chamber.

2. The combination of a valve-shell containing a general gas-passage, a vertical channel-way closed at its top by a hollow key provided with a surrounding case, and one or more openings through both, a weighted lever attached to said key, and a flexible diaphragm whereby said key may be turned on its axis by a pressure of gas within a close chamber provided with an opening for the adjustment of said weight, and an opening for the application of an exhaust or general-delivery pipe.

3. The combination, with a valve-chest, of the shell having a vertical passage extending therefrom, a hollow key having a stem, and provided with openings in its side, a surrounding case therefor provided with similar openings, the weighted graduated lever connected at one end to the sleeve-stem, and the flexible diaphragm pivoted to the other end of said lever, the same being clamped between a stationary ring and a hemispherical cap secured therein, substantially as described.

4. The combination, with the chest and the shell having the vertical passage extending therefrom, of the conical hollow key communicating with the upper end of said passage and formed in its side with openings, and a surrounding sleeve having like openings which coincide with those of the key, said key connecting with the diaphragm and being somewhat smaller than the interior of its case, whereby minute openings are formed that lead to the outside of the shell, substantially as described, and for the purposes set forth.

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Witnesses:

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