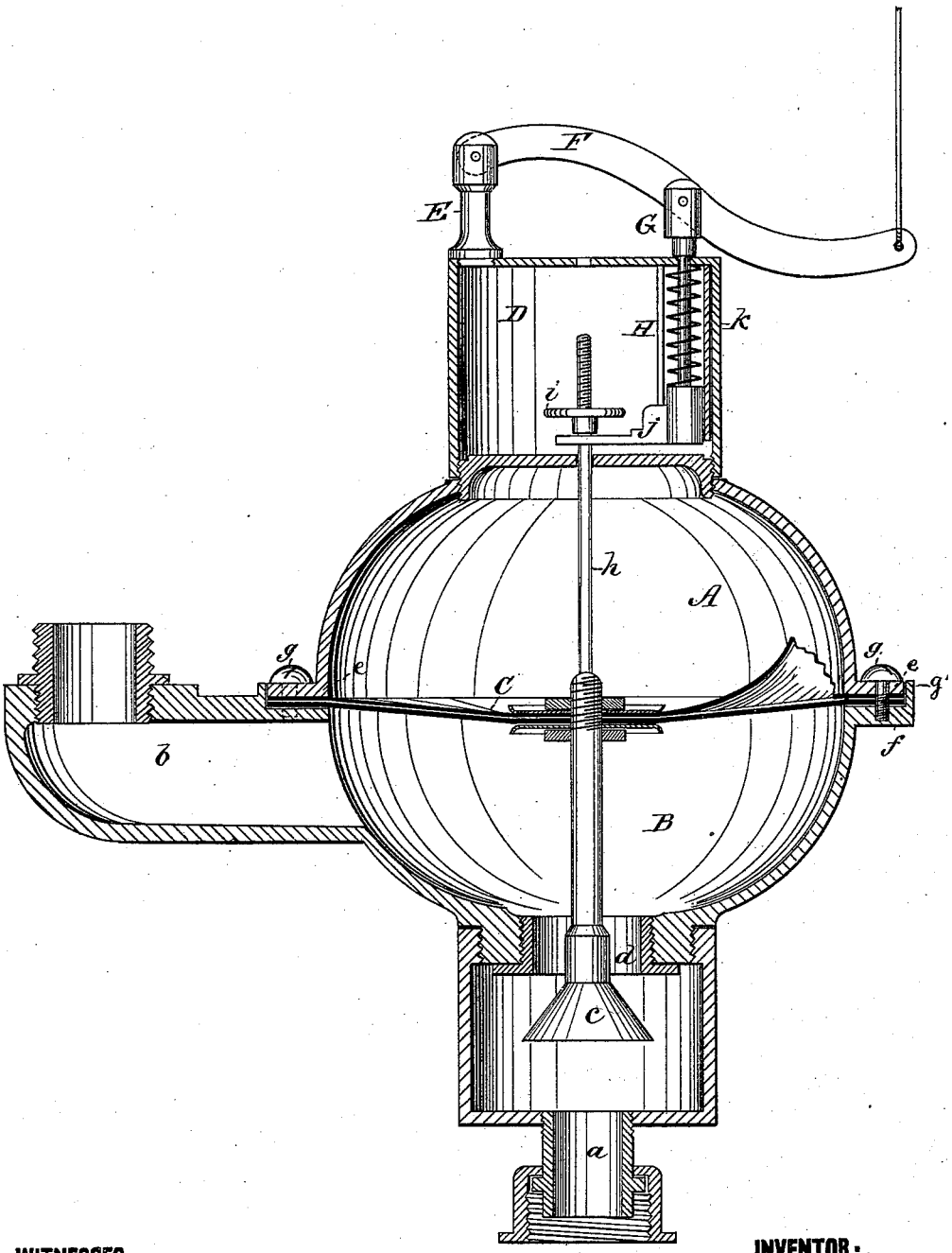
J. ADAMS

Gas Regulator.

No. 208,134. Patented Sept. 17, 1878.



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JOSEPH ADAMS, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN GAS-REGULATORS.

Specification forming part of Letters Patent No. **208,134**, dated September 17, 1878; application filed February 5, 1878.

To all whom it may concern:

Be it known that I, JOSEPH ADAMS, of Washington city, District of Columbia, have invented a new and Improved Gas-Regulator; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which the figure is a vertical central section.

My invention is an improvement in gas-regulators designed to increase, diminish, or entirely cut off the supply of gas in an automatic regulator from any portion of the building, and without descending to the meter or place where the regulator is, and designed also to obviate leakage of gas in the regulator.

The improvements are upon that form of dry regulator in which the automatic valve controlling the supply is attached to and operated by a flexible diaphragm. Said improvements consist, first, in arranging a slide-rod and lever or other lifting device above the diaphragm, so that a pull upon the lever from a wire leading to any part of the house causes the diaphragm to move and the attached valve to wholly or partially shut off the supply.

The invention also further consists in the peculiar construction and arrangement of the joint between the two hemispheres of the case, for preventing leakage, as hereinafter more fully described.

In the drawing, A represents the upper and B the lower hemisphere of an ordinary form of gas-regulator, having an inlet at *a* and an outlet at *b*. C is the diaphragm, from which is suspended the valve-stem and conical valve *c*, which latter plays upon the valve-seat *d*. This diaphragm, instead of being made of a single thickness of leather, as is usual, is made of two thicknesses. These two thicknesses of leather make a much more flexible and sensitive diaphragm than one piece equaling the thickness of both, and at the same time the double character of said diaphragm allows the inner adjacent faces of the same to be coated with plumbago or other gas-resisting medium, which coating, being thus placed out of direct contact with the gas, remains unaffected, and consequently preserves the impervious character of the diaphragm for a greater length of time.

In securing the outer edges of the diaphragm, the edges of the two hemispheres are provided with flanges *e* and *f* and united by screws *g*, which clamp the flanges upon the edges of the diaphragm. In order to prevent any leakage of gas at the joint, however, the lower flange is provided with an upwardly-projecting rim, *g'*, within which the upper flange fits and is flush with its upper edge. The screw-holes in the lower flange also, instead of being made entirely through, only extend partially through, so that when the said joint is "leaded" no gas can escape. With respect to this feature, I am aware that the lower hemisphere has been heretofore formed with a raised rim upon its outer edge, with an upper hemisphere or a ring screwed into the same by a circumferential screw-thread. This form of screw-thread is, however, difficult to cut and adjust, and when corroded from the action of the gas is troublesome to disengage for the inspection of the apparatus or substitution of a new diaphragm. My devices are cheaper and easier of adjustment to permit the separation of the parts, and at the same time form a gas-tight joint, the raised rim stopping the escape of gas between the hemispheres, the heads of the screws stopping escape through the crevices of the upper screw-holes, and the closed screw-holes below absolutely preventing escape at that point.

In combining the cut-off with the diaphragm a stem, *h*, rises above the diaphragm and passes through a hole in the top hemisphere of the case, so as to play freely therethrough and be guided thereby, thus causing the subjacent valve to properly seat itself, and upon the stem above the top hemisphere is located a flange, tappet, or nut, *i*. D is a supplemental case, arranged to be screwed upon the upper portion of the top hemisphere, and provided with a standard, E, to which is pivoted a lever-arm, F. Said lever-arm is, in turn, pivoted near its middle to a vertically-sliding rod, G, which at its lower end carries a horizontally-projecting and forked foot, *j*. This sliding rod is arranged in a tube, H, and about the rod and inside of the tube is arranged a spiral spring, *k*, which always presses the rod and its attached foot down. The said foot extends through a slot in the side of the tube H

to a position where its fork loosely embraces the stem *h* beneath the nut *i*, so that as the slide-rod and foot are raised the foot strikes against the nut or projection *i* on the said stem, and by lifting the latter raises also the diaphragm and valve, and by seating the latter either cuts off the flow of gas entirely or diminishes the flow according to the degree of movement of the foot.

In operating the foot I prefer to use the device just described, motion being imparted to the same by a wire connected with the free end of the lever and passing through tubes and over bell-cranks to any point about the house desired, at which latter end of the wire a lever with a graduated dial may be employed to indicate to what extent the supply is turned off and when it is turned off entirely.

I am aware of the fact that attempts have been made to operate a gas-cock through wires leading to different parts of the house, but the flexibility of a long wire connection makes the turning of a stiff valve or cock impracticable.

This connection of the valve of an automatic gas-governor with devices for operating it from any part of the house renders the turning of the gas off or on at a distance practicable, for the reason that it takes advantage of the exceedingly delicate and sensitive character of the automatic regulator-valve, and hence requires the exertion of but little force.

Although I prefer the means just described for operating the valve, I do not confine myself to the same, as various modified means may be employed—as, for instance, the lever may be dispensed with, and the wire attached directly to the slide-rod carrying the foot, or the tube containing the slide-rod may be dispensed with and the lever retained. When the lever alone is used its pivots prevent the rod from turning axially and hold the foot to its proper place, and when the tube is used without the lever the slot in the same, through which the foot projects, prevents this axial movement. The fork of the foot should in any case embrace the stem *h* loosely, so as to permit free motion of the same without friction, and without interfering with the sensitive automatic action of the diaphragm.

Having thus described my invention, what I claim as new is—

1. In an automatic gas-regulator, the combination, with the valve poised and sustained in sensitive equilibrium, of a device constructed substantially as described, adapted to connect with said valve and be operated by a wire to move said valve at will and with a positive and defined action, as and for the purpose described.

2. The combination, with the diaphragm having an upwardly-projecting stem, *h*, and tappet or projection *i*, of a slide-rod carrying a forked foot arranged to embrace the stem, and a spiral spring for holding said foot normally down, for the purpose described.

3. The combination, with the diaphragm having the stem *h* and projection *i*, of the slide-rod G, having foot *j*, the slotted tube H, the spiral spring *k*, and the lever-arm F, substantially as and for the purpose described.

4. The combination, with the diaphragm and the hemisphere A, having plain flange *e*, provided with screw-holes extending through the same, screws *g* fitting therein, of the lower hemisphere, B, having a flange with an upwardly-projecting rim, *g'*, and screw-holes extending only partially through, as described.

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Witnesses:
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