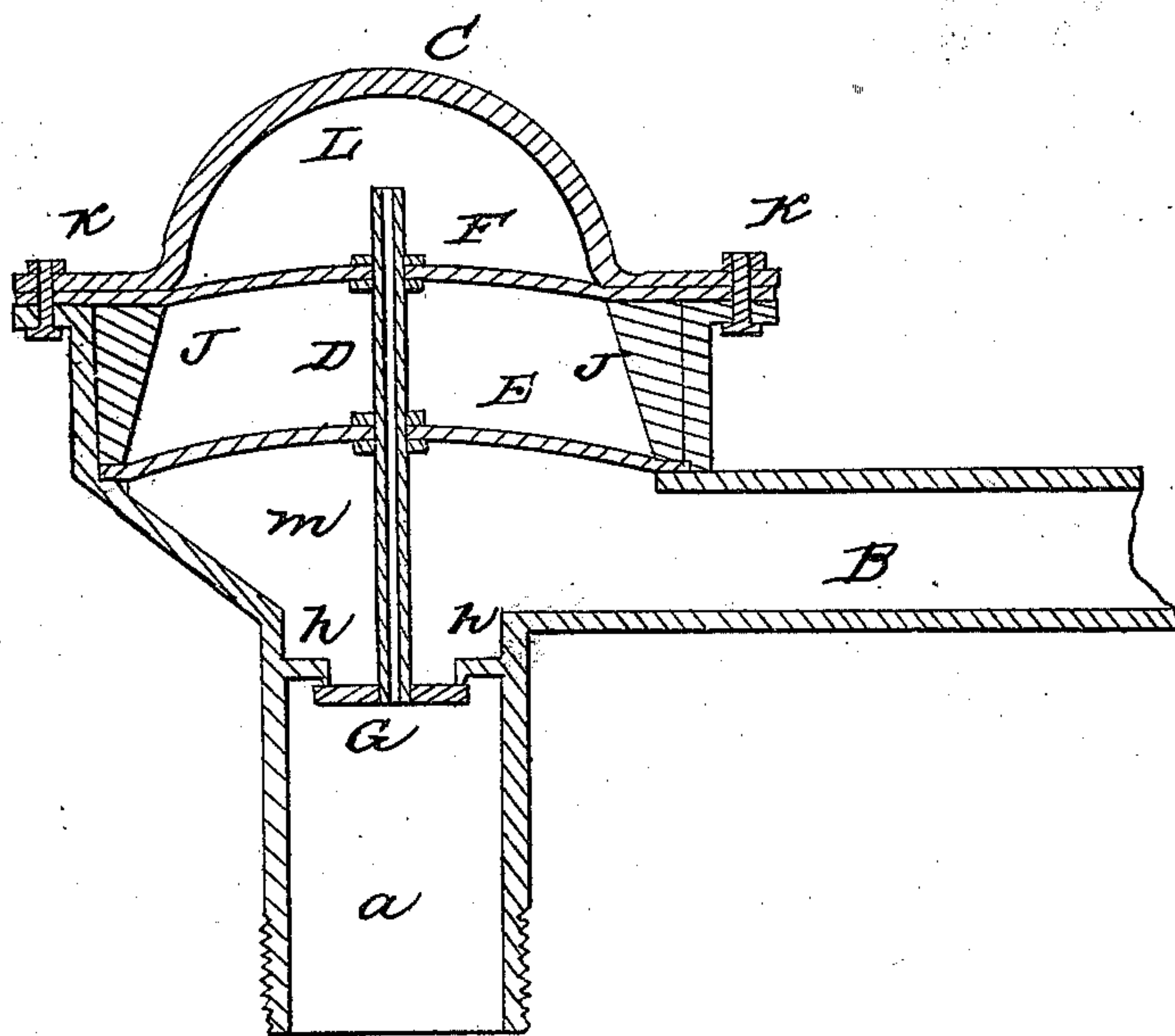


J. E. BOYLE.

Gas Regulator.

No. 42,430.

Patented April 19, 1864.



Witnesses  
Geo. Maxwell  
J. W. Stevenson.

Inventor  
James E. Boyle

# UNITED STATES PATENT OFFICE.

JAMES E. BOYLE, OF BROOKLYN, ASSIGNOR TO HIMSELF, DUDLEY KAVANAGH, AND GEORGE STEVENSON, OF NEW YORK, N. Y.

## IMPROVED GAS-REGULATOR.

Specification forming part of Letters Patent No. 42,430, dated April 19, 1864.

*To all whom it may concern:*

Be it known that I, JAMES E. BOYLE, of the city of Brooklyn, Kings county, and State of New York, have invented a new and Improved Gas-Regulator; and I do declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference thereon.

The body of the regulator is made of iron or other suitable material.

*d* is the induction-pipe, and fitted with a thread, so as to be readily screwed to the top of the meter.

*B* is the eduction-pipe leading to the burners.

*C* is the cap of the regulator, made oval to admit of space between it and the top of the hollow valve-stem.

*D* is a hollow valve-stem, at the lower end of which is the valve *G*, the valve and stem being all one piece.

*h h* is the valve seat, on the under side of which and near its edge is a sharp-edged projection which meets the valve *G* when the valve is closed.

*E* is a flexible diaphragm, made of parchment, bladder-skin, or any suitable material, its edges resting on a seat made in the body of the regulator and just above the upper edge of the eduction-pipe *B*.

*J* is a ring of iron or other suitable material, made to fit the diameter or bore of the body of the regulator, with its upper edge wider than the lower one, and placed within the bore of the regulator and upon the edge of the diaphragm *E*, holding the same firmly to the seat.

*F* is a second flexible diaphragm, of same material as the diaphragm *E*, but of smaller diameter, its edges resting on the top of ring *J* and the shoulder of the body of the regulator, the hollow valve-stem *D* passing through both diaphragms at their center and each diaphragm

is fastened firmly to the valve-stem *D* by nuts or other suitable means. The cap *C* is connected to the body of the regulator by bolts at *K K*, and secures the diaphragm *F*, the rings *J*, and the diaphragm *E* firmly in their respective places.

It will be observed that the gas has free passage at all times from the meter through the hollow valve-stem *D* to the chamber *L*. There is, therefore, a constant pressure downward upon the valve to open it; but it is obvious that when the gas at the burners is turned off and no gas is escaping at them, the diaphragm *E*, presenting a larger surface than the diaphragm *F*, the pressure of the gas upon the diaphragm *E* will overcome the pressure of the gas upon the diaphragm *F* in the chamber *L* and bring the valve *G* to its seat, thus cutting off the supply of gas to the chamber *M*.

When the gas is turned on at the burners and ignited for use, the withdrawal of gas from the chamber *M* lessens the pressure upon the diaphragm *E* sufficiently to admit of a slight opening of the valve, the valve being held open to admit of the escape of sufficient gas to supply the consumption, and no more, by the differential pressure of the gas upon the two diaphragms *E* and *F*.

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

1. The hollow valve-stem and valve and two diaphragms of unequal diameter, combined in a gas-regulator, substantially as and for the purpose specified.

2. The opening and closing of the valve of a gas-regulator by the pressure of the gas upon the surfaces of two diaphragms of unequal diameters, substantially as described.

JAMES E. BOYLE.

Witnesses:

GEO. L. MAXWELL,  
JOHN STEVENSON.