

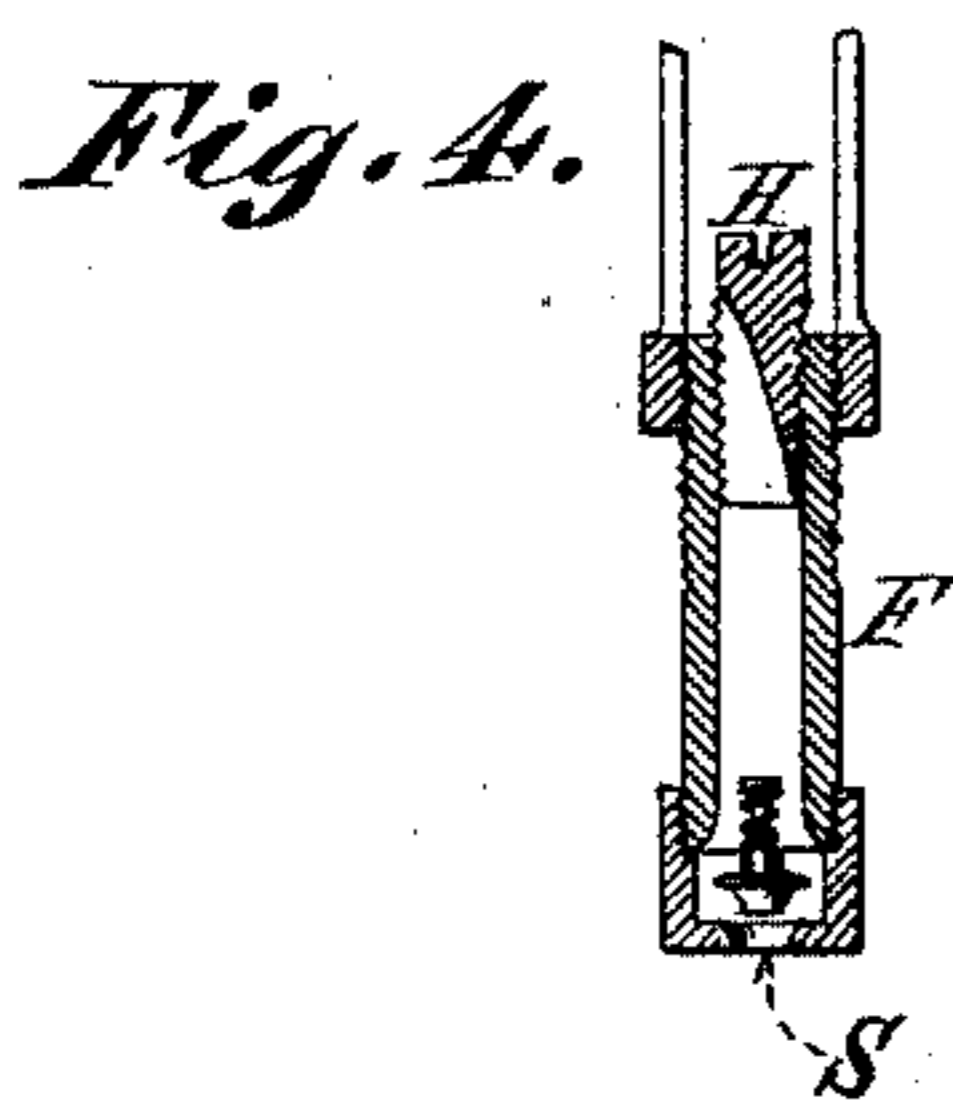
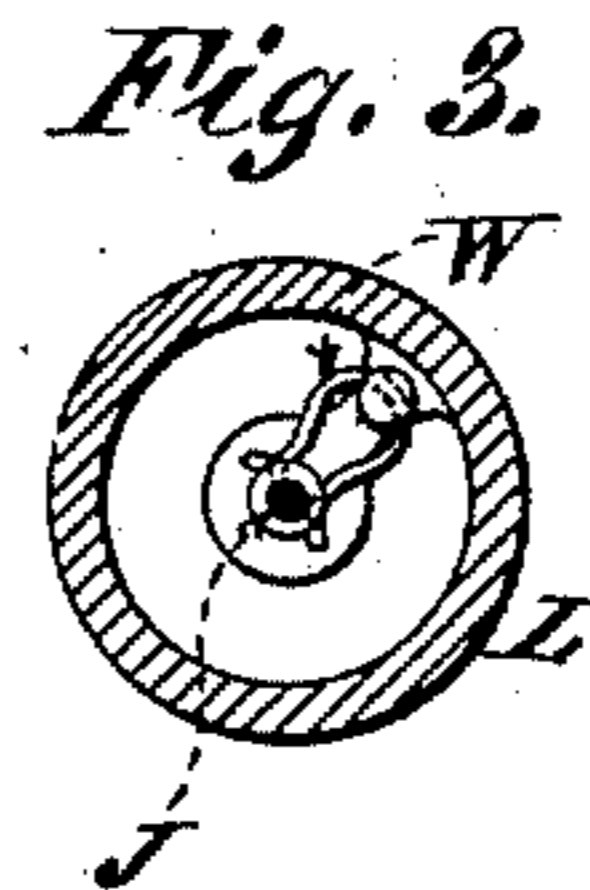
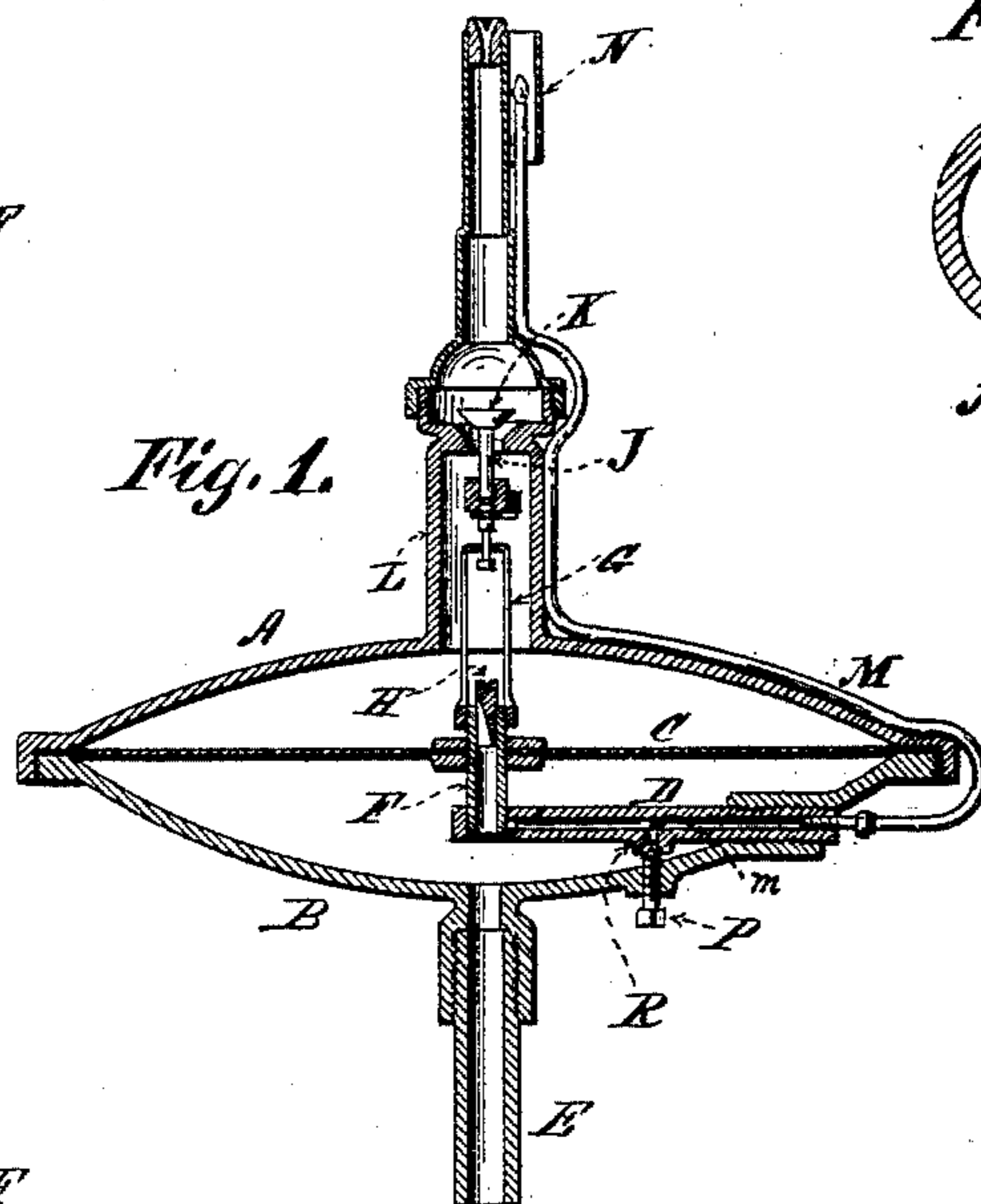
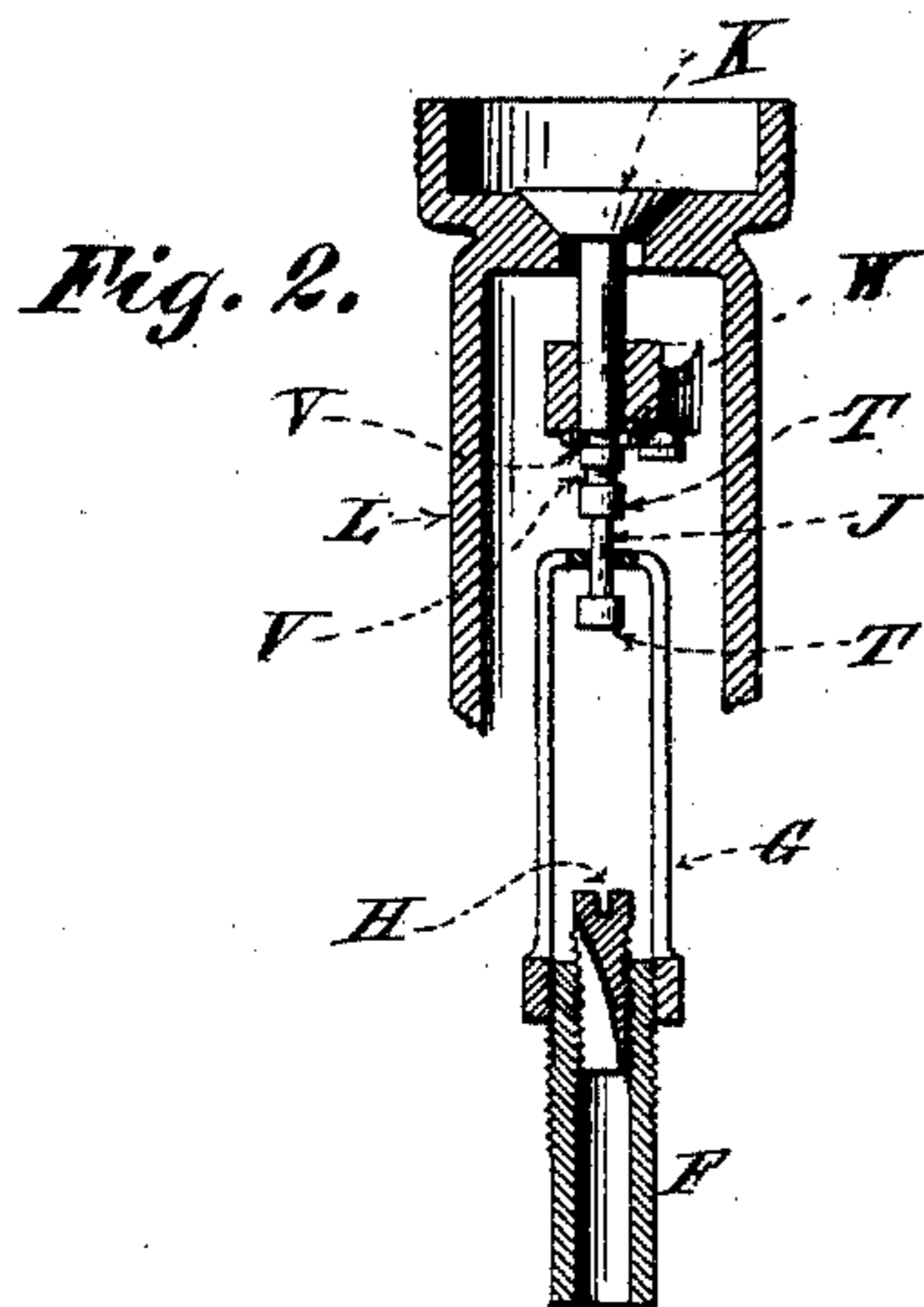
(No Model.)

E. N. DICKERSON, Jr.

APPARATUS FOR TURNING ON AND OFF AND LIGHTING GAS.

No. 468,131.

Patented Feb. 2, 1892.



Witnesses:  
Wm. A. Pollock  
Anthony Jones

Inventor:

E. N. Dickerson, Jr.

# UNITED STATES PATENT OFFICE.

EDWARD N. DICKERSON, JR., OF NEW YORK, N. Y.

## APPARATUS FOR TURNING ON AND OFF AND LIGHTING GAS.

SPECIFICATION forming part of Letters Patent No. 468,131, dated February 2, 1892.

Application filed October 18, 1888. Serial No. 288,452. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD N. DICKERSON, Jr., of the city, county, and State of New York, have invented a new and useful Improvement in Apparatus for Turning On and Off and Lighting Gas, of which the following is a full, true, and exact description, reference being had to the accompanying drawings.

This invention relates to an improvement in apparatus for lighting and extinguishing gas by means of the pressure of gas supplied to the burner. By means of this apparatus a pressure of any degree can be carried in the supply-pipes without affecting the burner, provided such pressure be increased or diminished gradually; but by a sudden variation in pressure the lights will be lighted or extinguished, as the case may be. In the apparatus, as shown, the lighting is done from the small supplemental jet; but other sources of lighting—as, for instance, electricity—could be employed.

My invention will be readily understood from the accompanying drawings, in which—  
Figure 1 represents my apparatus generally in section; Fig. 2, a larger view of part of Fig. 1; Fig. 3, a detail, in section, of the valve-locking spring; and Fig. 4 shows an addition in which a check-valve is employed to prevent the return of the gas from the upper chamber.

My apparatus consists, generally, of a diaphragm affected by the pressure of gas. For this diaphragm any well-known equivalent could be substituted; but I prefer the diaphragm for ordinary purposes. This diaphragm may be made of india-rubber or thin elastic metal. I prefer, however, to have thin corrugated metal. The diaphragm C is shown as held in the diaphragm-casing A B, the part B being supported upon the gas-pipe E. The diaphragm supports the tube F, the lower end of which serves as a valve passing through an orifice in the pipe D, which is horizontally screwed into the casing B. Obviously this tube could be arranged in many different ways and accomplish the same result. This tube connects with the tube M, supplying the supplemental burner in the casing N, as shown. Whenever the diaphragm is raised, the tube F is raised, uncovering the inner aperture in the tube D and allowing the gas to flow freely

therethrough. A constant supply of gas is maintained in the tube M through the opening *m* therein, closed by the regulating screw-plug P, so that a very small jet of light is constantly burning within the casing N. When, however, the diaphragm is raised, an increased pressure of gas flowing through the tube D causes the flame of M to flash up, thereby lighting the burner. The passage of gas through the tube F is regulated by the screw H, which has an angular slot cut in one side of it. By turning this screw H the amount of gas passing through the tube F can be exactly determined. This opening should be so adjusted as to supply only the requisite amount of gas to the burner. The tube F may be provided with a check-valve S, as shown in Fig. 4, though in most cases this is not requisite. Upon the upper part of the tube F is screwed the yoke-frame G, which surrounds the valve-stem J. This valve-stem J has two collars T T upon it, with which the upper part of the yoke-frame G engages for the purpose of opening and closing the valve K, the collars T T being arranged on the stem a short distance apart and forming a sliding joint with the yoke to allow lost motion of the yoke-frame when moved under pressure of the diaphragm, so that the diaphragm can move upward or downward within certain limits without affecting the valve; but when it moves in either direction the extent of the lost motion the valve will be operated. The valve-stem J has likewise two annular slots V V, with which the spring W, suitably supported in a bracket in the exterior pipe L, engages. The valve K is capable of two positions, in one of which the gas is shut off, as shown in Fig. 2, and in the other of which the gas is permitted to flow to the burner, as shown in Fig. 1, and the spring W holds the valve in either position in which it may be left until it is changed by the action of the diaphragm.

The operation can now be readily understood. Under normal conditions when the gas is burning the apparatus will be in the position shown in Fig. 1. If now a sudden decrease in the pressure occurs, the gas in the chamber above the diaphragm will cause the diaphragm to move downward suddenly, thereby closing the valve K, which will re-

main closed, being locked by the spring W. If now it is desired to light the gas, the small supplemental jet being lighted, a sudden increase in the gas-pressure will cause the diaphragm C to rise, thereby opening the valve K and simultaneously opening the tube D, allowing an increased pressure of gas to flow through the tube M and causing the jet in the casing N to flash up and light the gas. The sudden variation in the pressure of the gas in either direction will soon, however, equalize itself upon both sides of the diaphragm, which will then assume the intermediate position again; leaving the gas either turned on or off, as the case may have been. Thus in order to accomplish the results of lighting or extinguishing the gas but a temporary variation in pressure is requisite, while the pressure can otherwise be maintained at any desired point without affecting the burner.

It is obvious that many modifications of this structure would suggest themselves to a mechanic. For instance, the opening between the upper and lower chambers of the diaphragm need not be in the diaphragm itself but may be external thereto—as, for instance, the pipe M may be caused to communicate with the upper chamber as well as with the lower chamber; but I prefer the arrangement shown.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in an apparatus for lighting and extinguishing gas, of a burner, a valve controlling the supply of said burner, a diaphragm controlling said valve, a connection between the valve and the diaphragm for moving the valve positively in either direction; and a sliding joint in said connection to permit of lost motion between the diaphragm and the valve, substantially as described.

2. The combination of the diaphragm C, valve K, connection having sliding joint therein between the diaphragm and valve for operating the valve, spring for retaining the valve in open or closed position, and the adjustable opening through the diaphragm, substantially as described.

3. The combination of the diaphragm C, valve K, having a stem provided with collars T T, and yoke-frame G, connected to the diaphragm and operating upon collars T T, permitting lost motion between said collars, substantially as described.

4. The combination of the diaphragm C, pipe F, having regulating-screw H, yoke-frame G, valve K, the casings above and below the diaphragm, and the burner mounted upon the upper casing, substantially as described.

5. The combination, with the diaphragm and upper and lower chambers, of the supply-pipe entering the lower chamber, the burner communicating with the upper chamber, a valve controlling the supply to said burner and connected to the diaphragm, the supplemental burner, an independent supply-pipe therefor communicating with the lower chamber, the passage between the chambers, and a second valve connected with the diaphragm for controlling the flow of gas through said supply-pipe leading to the supplemental burner, substantially as described.

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

E. N. DICKERSON, JR.

Witnesses:

ANTHONY GREF,  
WM. A. POLLOCK.