H. J. Hyams.

Sheet 1-2 Sheets.

Gas Meter,

No. 16,922. Patented Mar. 31, 1857.

Fig 2.

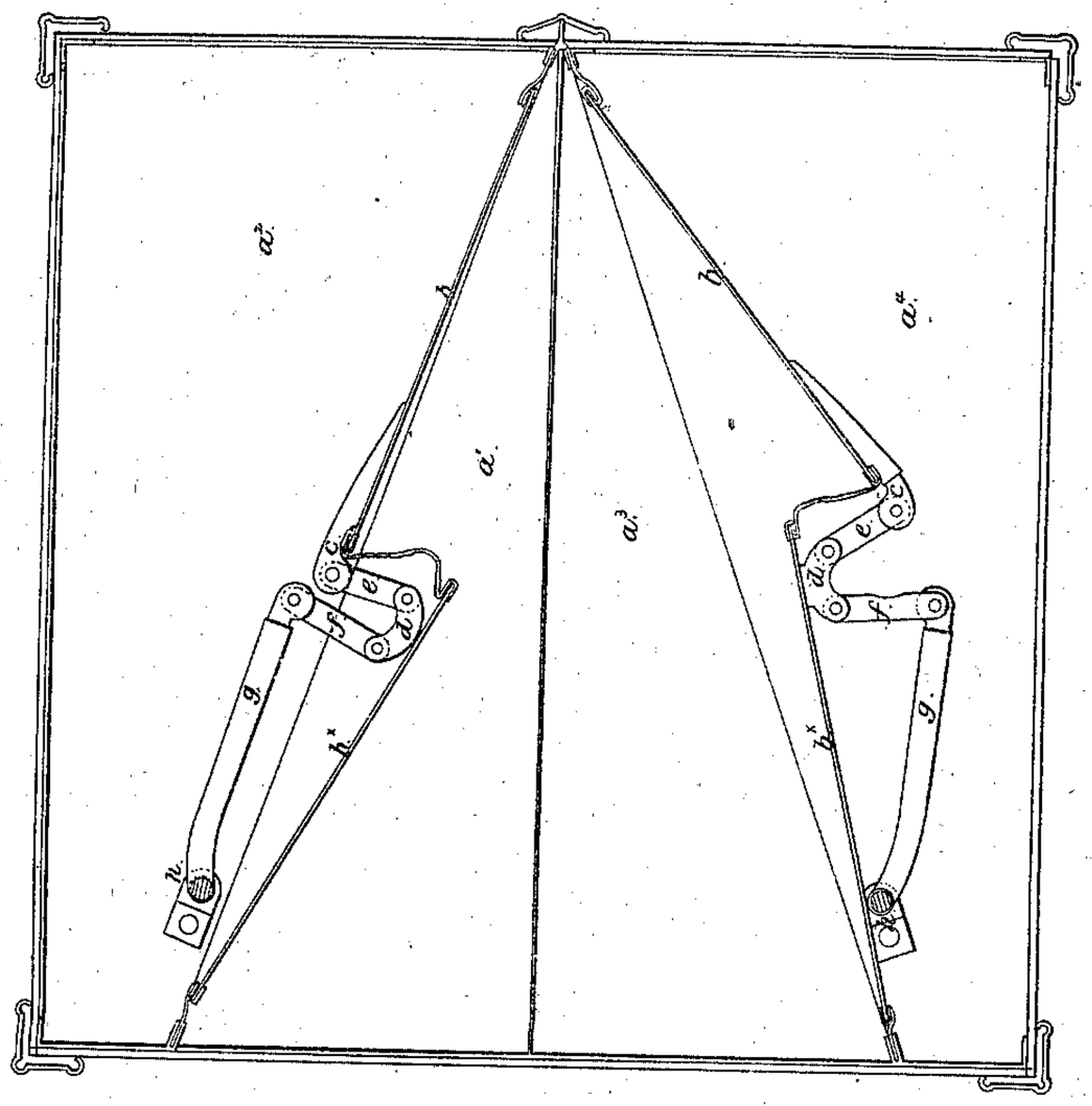
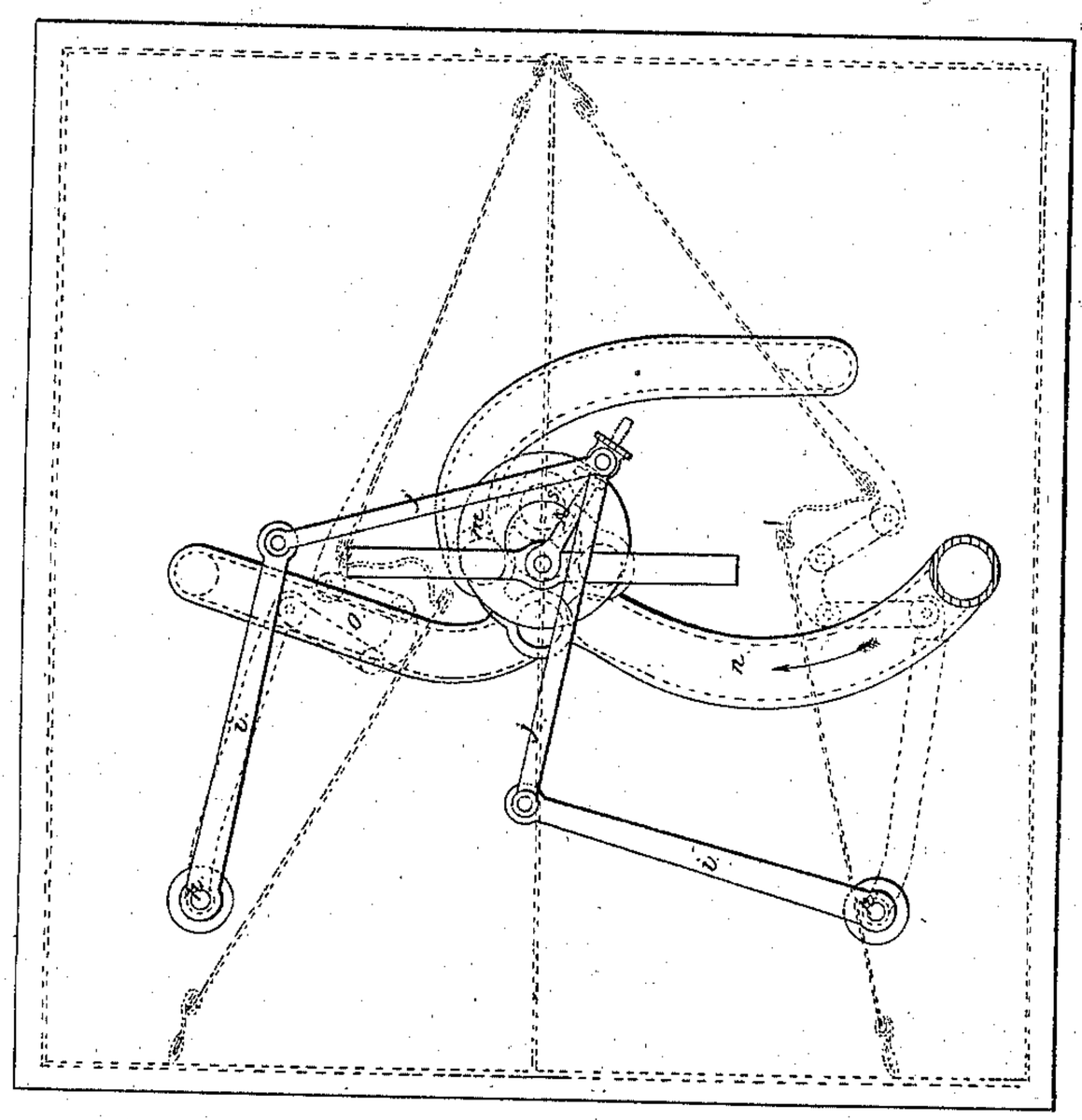


Fig 1.



Sheet 2 - 2 Sheets

H. J. Hyams.

Gas Meter.

No. 16,922. Patented Mar. 31, 1857.

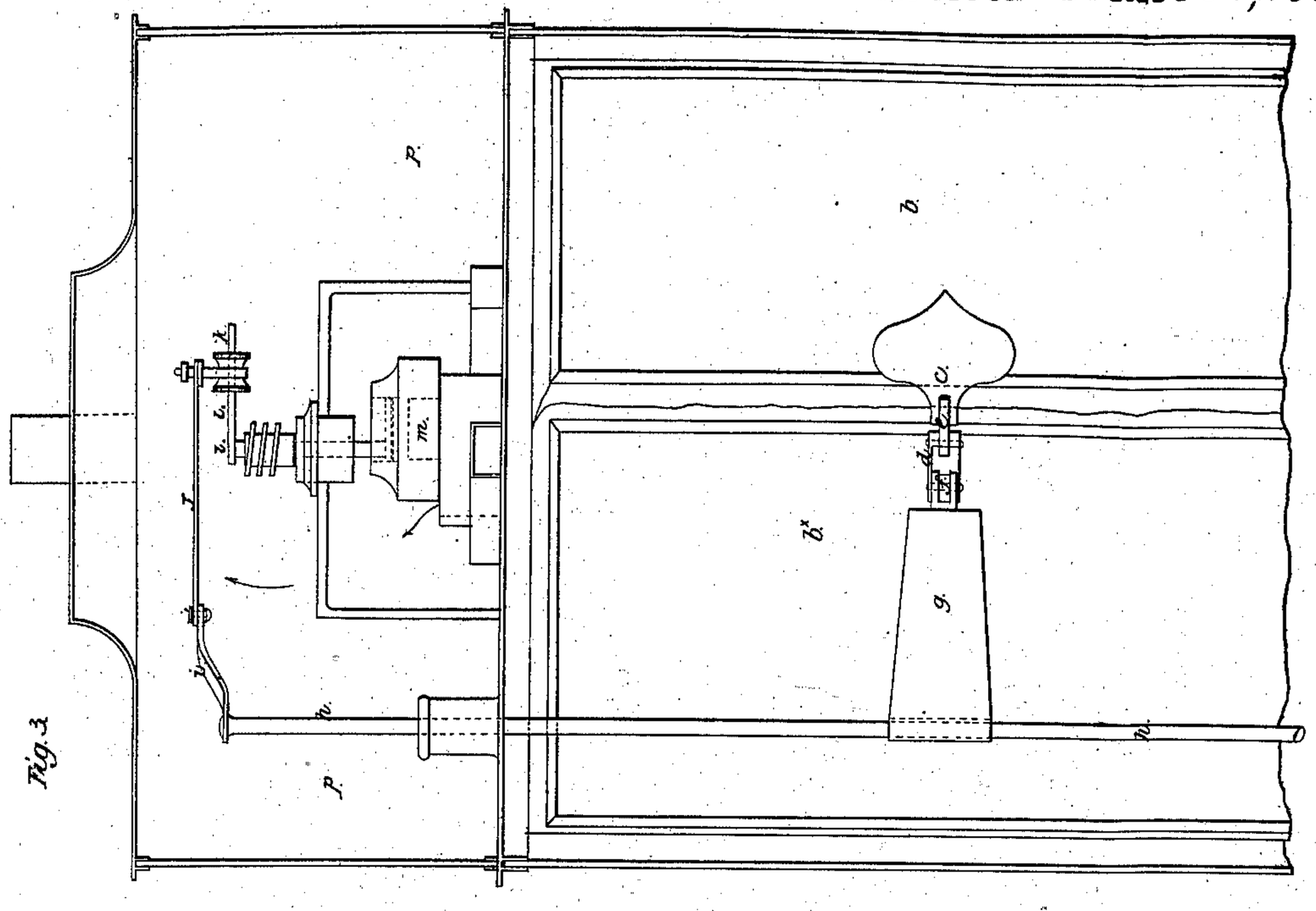


Fig. 3.

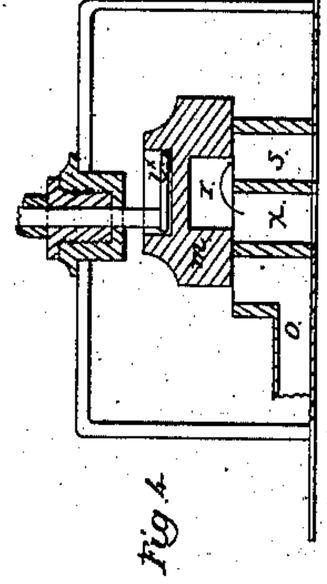


Fig. 5.

Fig. 4.

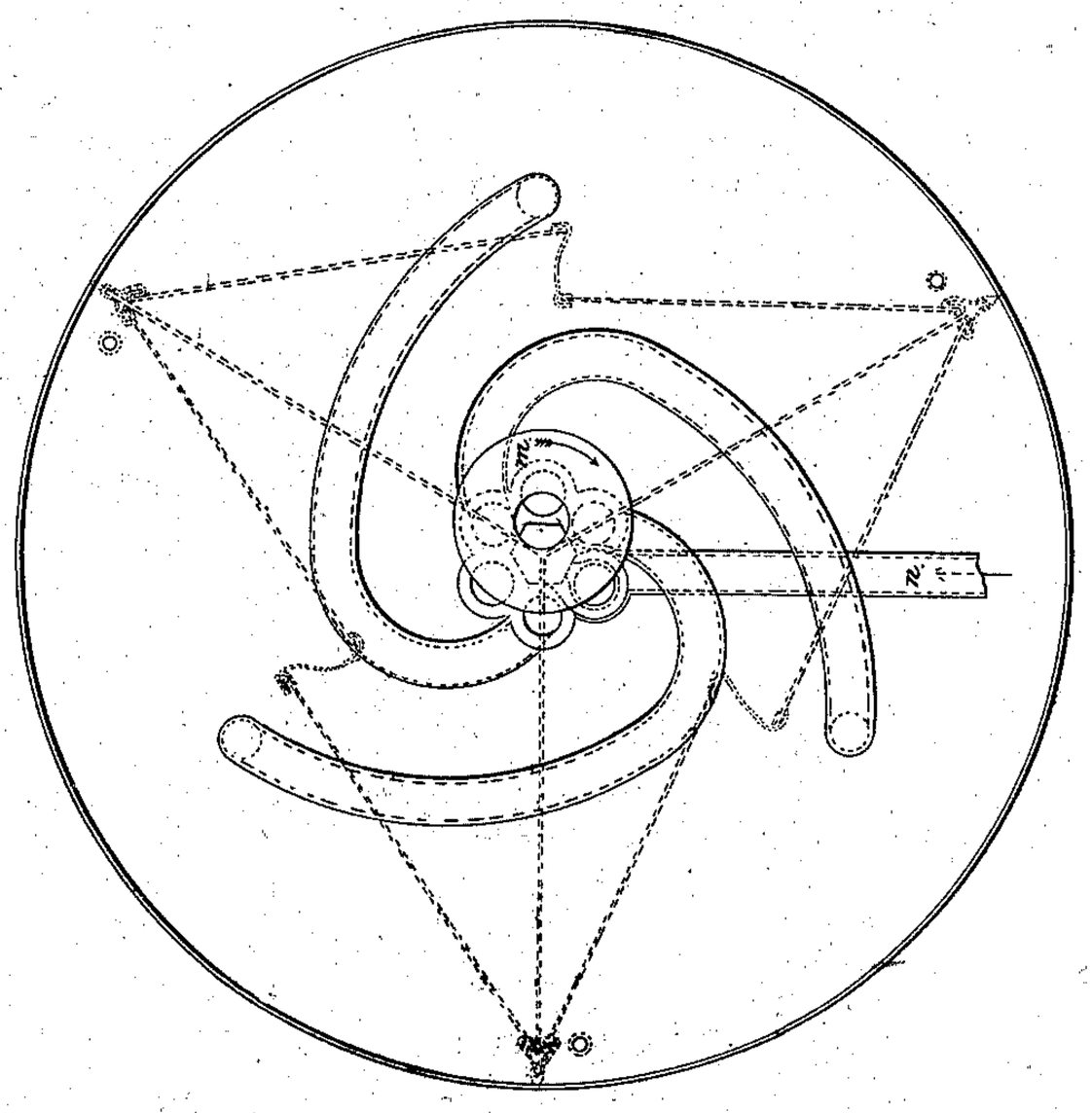


Fig. 6.

UNITED STATES PATENT OFFICE.

HYAM JACOB HYAMS, OF HAMPSTEAD ROAD, COUNTY OF MIDDLESEX, ENGLAND.

IMPROVEMENT IN DRY GAS-METERS.

Specification forming part of Letters Patent No. **16,922**, dated March 31, 1857.

To all whom it may concern:

Be it known that I, HYAM JACOB HYAMS, of Stanhope Street, Hampstead Road, in the county of Middlesex, England, gas-meter maker, have invented Improvements in the Construction of Gas-Meters; and I do hereby declare that the following is a full and exact description of my said invention.

My invention of improvements in the construction of gas meters relates to that description of gas-meter commonly called "dry gas-meters," and in which one side of the measuring-compartments is formed by means of a movable or flexible diaphragm.

The first part of my improvements consists in connecting together the rigid parts of the movable diaphram, so that they may be made to act together—that is, when one is moved by the pressure of the gas entering the meter it will, by being connected to the other one by means of a rigid rod or bar, move the other one also and assist in delivering the gas from the meter.

My second improvement relates to an improved mode of constructing the valve, which is of that description of valve known as the "rotary valve;" and it consists in attaching the circular rotating plate of the valve to a crank, whereby it is moved eccentrically or in a similar manner to that of the eccentric of a steam-engine. By this means the several apertures whereby the gas passes through the valve from one part of the meter to another are uncovered in rotation.

In the accompanying drawings I have given various representations of portions of a gas-meter with my improvements applied thereto.

Figure 1 is a plan of a dry gas-meter with the outer casing removed, so as to show more clearly the position of the entrance and exit passages for the gas and the mode of operating the circular valve. Fig. 2 is a section of the meter, taken through the diaphragms and showing my improved mode of connecting the rigid parts of the said diaphragms together. Fig. 3 is another section of the meter, showing the diaphragms in elevation.

In this meter there are four chambers, $a' a^2 a^3 a^4$. The movable diaphragms are composed of two rigid parts, b b and b^* b^*, hinged together by some flexible material, as shown in Figs. 2 and 3. The parts b^* b^* of these diaphragms are furnished with lugs d d and the parts b b with lugs c c. The lugs c and d are connected together by means of a link, e, whereby a regular distance is always preserved between the two parts b and b^* of each diaphragm, and also causing them to act properly together. The lug d is connected by a link, f, to an arm, g, projecting from the vertical spindle h, Figs. 2 and 3. This spindle h carries at its upper end an arm, i, (see Fig. 3,) connected by a rod, j, to another arm, k, of the vertical spindle l, which is provided at its lower end with a crank or eccentric, l^*, for working the rotary circular valve m. (See the detached sectional view, Figs. 4 and 5.) The valve m, as before mentioned, is circular, and by preference is made of glass; but it may be made of any suitable material. The valve is placed loosely on its seat over the gas-passages and simply rests thereon by its own gravity, which has been found sufficient to prevent the escape of gas from between the lower surface thereof and its seat. By constructing and arranging the several parts in this manner the valve has a double motion communicated to it—that is to say, it is moved by the crank or eccentric over the passages, so as to change alternately the direction of the currents of gas through the different passages, and during this rotation round the center of the crank it likewise turns round upon its own axis, or that of the disk of the eccentric by which it is moved, which latter motion enables the valve more readily to free itself from any extraneous matter that might tend to produce friction between its face and the seat whereon it works.

The operation of the meter is as follows: The gas is admitted to the cavity r in the valve m through the inlet-pipe n and center space, x, as shown by the arrows in Fig. 1, and passes down through the passage s into the chamber a' of the meter, (see Fig. 2,) forcing outward the diaphragms b $b^\times$ toward the chamber a^2, thus expelling the gas from the latter through the passage o into the space p above the valve, from whence it passes to the supply-pipe of the burners. As the diaphragms b $b^\times$ b $b^\times$ are alternately moved to and fro by the gas acting upon their different surfaces, they by means of the connections f and g cause the spindles h h

to turn, which by the connections *i*, *j*, *k*, and *l* communicate a circular eccentric motion to the valve *m*, thereby opening and closing successively the different passages for the ingress and egress of the gas to and from the several chambers of the meter. At Fig. 6 I have shown a meter having six chambers instead of four, as in the one above described; but as the construction and mode of operation of the several parts would in this case be similar to that first alluded to, no detailed description of the several parts will be necessary, a simple inspection of the drawings only being required to explain the operation of the working parts.

If it should be considered advisable to regulate the pressure of the gas in the meter and maintain it at a uniform pressure, I cause it to pass through a small regulating apparatus before entering the measuring-chambers. This object I propose to effect by causing the gas to enter a chamber fixed inside the meter and act upon a diaphragm or movable partition in this chamber. To the back of the diaphragm is adapted a spring, which is so adjusted as to yield when subjected to any increased pressure from the gas, and thereby cut off the supply until the pressure is removed.

When the pressure of the incoming gas acts on the diaphragm, it will move it back, and the latter being connected with a slide or other contrivance for stopping the valve, and which works near or in the exit-valve, will of course partially or wholly close or cover up the same until the pressure is removed, when the spring will by its pressure force back the diaphragm, and by that means draw away the slide or other stopper from the valve and allow more gas to enter. I consider it advisable to cause the gas to pass through a regulator or governor of some kind before entering the measuring-chambers; but I do not intend to confine myself to any particular form of apparatus for this purpose, but the apparatus above described is the one I prefer to use for this purpose. I do not, however, intend to claim it as part of the present invention, and I would observe that any other governor or regulator that will answer the purpose may be employed, if preferred.

Having now described my invention of improvements in the construction of gas-meters and the manner of carrying the same into effect, I wish it to be understood that I do not intend to confine myself to the exact form and arrangement of parts herein shown and described, as they may be varied without departing from the nature and object of my invention; nor do I intend to claim all the parts herein shown as of my invention; but that which I claim under the above in part recited Letters Patent is—

1. Connecting together the rigid parts of the movable diaphragms in order, substantially as specified, that they may act together, as above described.

2. The construction and arrangement of the rotating circular valve, as shown.

In witness whereof I, the said HYAM JACOB HYAMS, have hereunto set my hand and seal the 2d day of October, in the year of our Lord 1856.

HYAM JACOB HYAMS. [L. S.]

Witnesses:
FRED WALKDEN,
C. J. WINTERSGILL,
Clerks to Newton & Son, 66 Chancery Lane, London.