H. J. Hyams,

Gas Meter.

No. 107,380. Patented Sept. 13. 1870.

Fig. 1.

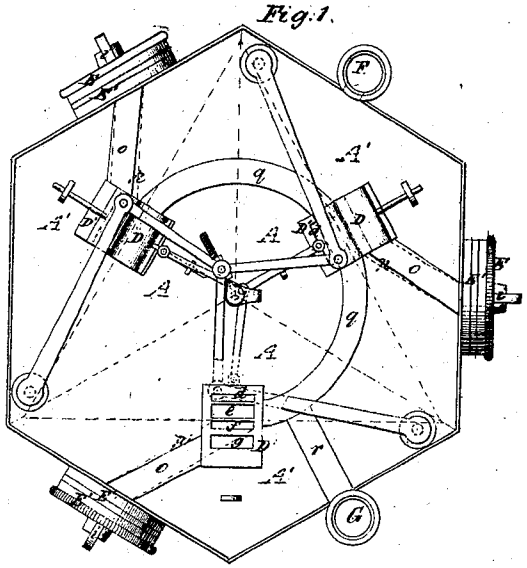


Fig. 2

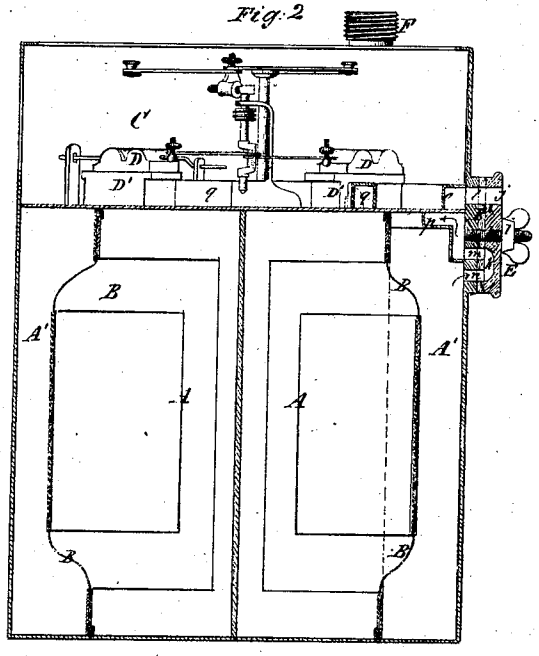
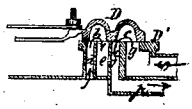


Fig. 3.



Witnesses.
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HYAM J. HYAMS, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 107,380, *dated September* 13, 1870.

IMPROVEMENT IN GAS-METERS.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, HYAM J. HYAMS, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gas-Meters; 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—

Figure 1 is a plan of a dry gas-meter, with its top and one of the slide-valves removed, constructed in accordance with my invention;

Figure 2 is a vertical central section of the same, corresponding with fig. 1; and

Figure 3 is a sectional view of one of the slide-valves and its seat.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to dry gas-meters where the gas is mixed with air or other gases; and

It firstly consists in a meter constructed with three or more diaphragms, which are arranged within a corresponding number of compartments, whereby there are formed, on opposite sides of each diaphragm, two chambers, one of which is exclusively used for gas, while the outer is used for air or the mixing gases.

It secondly consists in regulating or change-valves in the sides of the meter, for regulating the quantity of air or other gases to be mixed.

It thirdly consists in providing an extra port in the valve-seats of the slide-valves for the admittance of air or mixing gases.

To enable others to construct gas-meters in accordance with my invention, I will proceed to describe the same with reference to the drawing.

A A′ are compartments or measuring-chambers formed inside of the case of the meter.

These chambers are separated from each other by the fixed partitions *a a*, and the movable diaphragms B B.

The inner chambers A are exclusively used for gas, while the outer chambers A′ are used for air or mixing gases.

The drawing shows a meter with three diaphragms, in which case the chambers are made of triangular form.

The movable diaphragms B B are so arranged as to form the partition between the inner and outer chambers A A′.

C is a compartment formed on top of the measuring-chambers A A′, within the case of the meter, to contain the sliding valves D D, and the operating mechanism whereby said valves and the register are worked.

The valves D D are each provided in their face with two cavities, *b c*, and work on seats D′, made with four ports, *d e f g*.

E E are regulating or change-valves, arranged to the outside of the meter, so that its upper portion may communicate with the compartment C, while its lower portion is in communication with the outer chamber A′.

They are fastened tightly to their seats E E′, but allowed to turn thereon by means of a central screw-pivot, *h*, which is fast in said seats, and by a nut, *i*.

An opening, *j*, and cavity *k*, on the face of these valves, are made to communicate respectively with the ports *l m n*, provided to the seats E E′, and thereby with the chambers A′, and, by means of the channels *o p*, with the ports *f g* in the seats D′ D′.

F is the induction-pipe connected with the main pipe, and opens into the compartment C.

G is the eduction-pipe, which communicates with the ports of the valve-seats D′ D′, by means of the troughs *q r*.

The operation of this meter is as follows:

The gas which enters the compartment C through the pipe F is allowed to pass alternately through one of the ports, *d*, as they are uncovered by the valves D D, into one of the inner chambers, A′, whereby the diaphragm is moved outward, thus forcing the air contained in the outer chamber A′ through the port *n*, cavity *k*, port *m*, channel *p*, port *f*, cavity *b*, port *e*, into the trough *q*, where it mixes with the gas to pass off through the trough *r* to the eduction-pipe G.

When the valve D closes the port *d* the diaphragm moves back again toward the inner chamber, and the cavities *b c* allow the gas contained in the latter to pass out of it, through the ports *d e*, into the trough *q*, and at the same time allow the air to fill up the outer chamber, through the opening *j*, port *l*, channel *o*, ports *g f*, channel *p*, port *m*, cavity *k*, and port *n*, as clearly shown in fig. 3, the flow of the gas and air being indicated by arrows.

The diaphragms, being linked together and also connected with the sliding valves, as shown in the drawing, enable the valves D to alternately close and open the ports *d*, to the compartment C, and have a corresponding communication established between the several ports in the valve-seats D′.

To change the quantity of air to be mixed with the gas, one or two of the regulating-valves E are turned half round, whereby the ports *l m* are closed up, while the port *n* is open to the atmosphere, and the air passing into the chambers A′ is expelled again to the outside of the meter. Thus, greater facility for mixing gas and regulating the proportion of the mixture is obtained than by mixing-meters at present adopted.

A very important feature of this invention, viz., the additional port *g*, provided in the valve-seat for the admission of air, is capable of modification to suit various valves, according to the form and nature of the movement of such valves.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The arrangement of three or more diaphragms, and corresponding double system of measuring-chambers A A′, substantially as and for the purpose herein described.

2. The additional port *g* provided in the valve-seat for the admission of air, substantially as herein described.

3. The regulating-valves E E, and their seats E′ E′, constructed substantially as and for the purpose herein set forth.

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