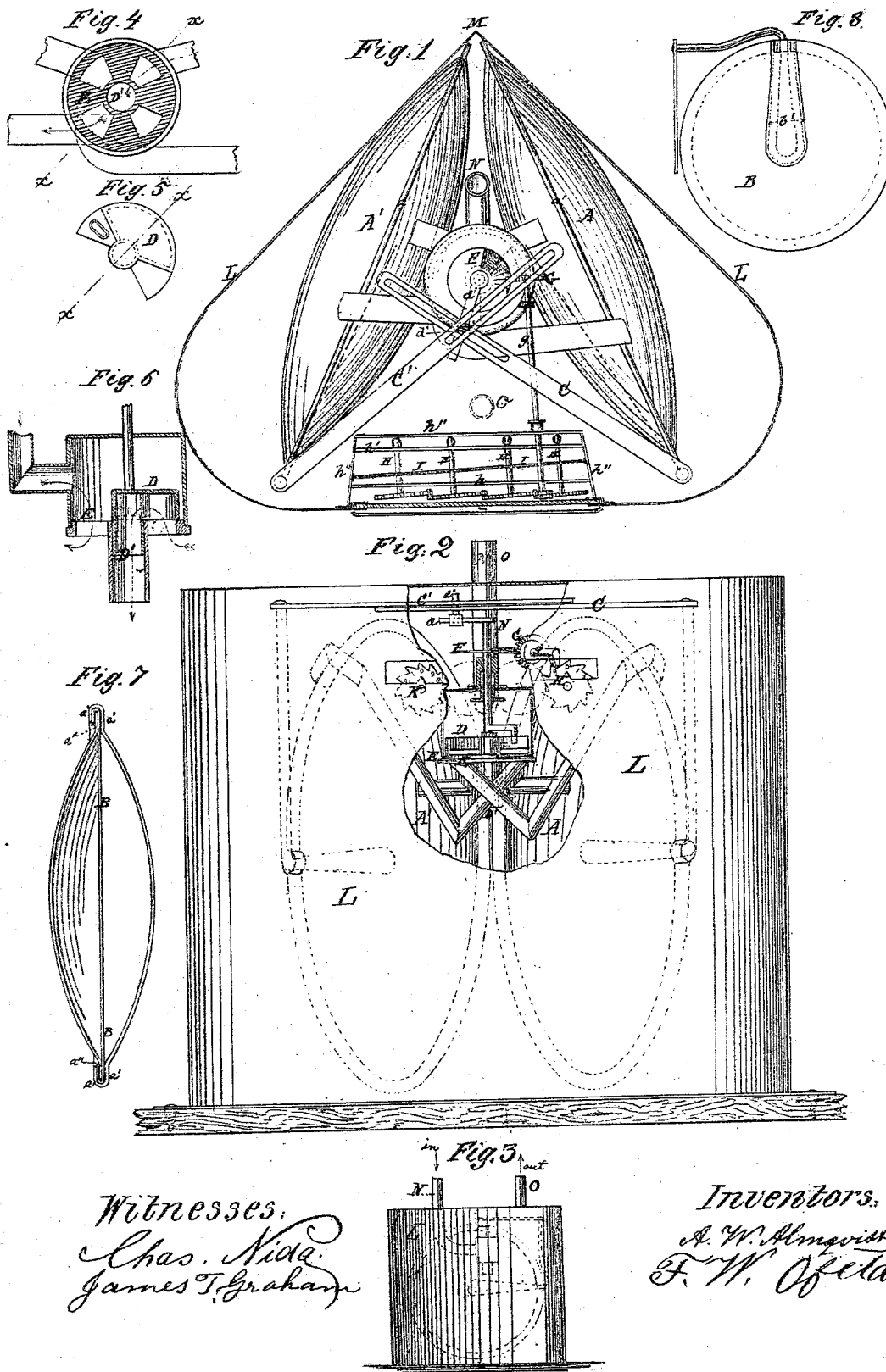


A. W. ALMGVIST & F. OFELDT.

Improvement in Dry Gas-Meters.

No. 115,557.

Patented June 6, 1871.



Witnesses.
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UNITED STATES PATENT OFFICE.

AUGUST W. ALMQVIST AND FRANS W. OFELDT, OF NEW YORK, N. Y.

IMPROVEMENT IN DRY GAS-METERS.

Specification forming part of Letters Patent No. 115,557, dated June 6, 1871; antedated May 29, 1871.

To all whom it may concern:

Be it known that we, AUGUST W. ALMQVIST and FRANS W. OFELDT, of the city, county, and State of New York, have invented a new and Improved Gas-Meter; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 represents a top view of our improved gas-meter, the outer casing being shown in section. Fig. 2 is a front view of the same, the casing being partly broken out. Fig. 3 is a diminished side view of the same; Fig. 4, face view of the valve-seat; Fig. 5, top view of valve proper; Fig. 6, section of valve-chest and valve taken through the line *xx* of Figs. 4 and 5; Fig. 7, cross-section of one of the diaphragm-chambers; Fig. 8, face view of a diaphragm with rock-shaft attached.

Similar letters of reference indicate like parts.

This invention has for its object to furnish a durable gas-meter, which can be constructed at a less cost than those at present in use, and which will produce a maximum of effect while occupying a minimum of space; and it consists in the construction, combination, and arrangement of the various parts, as will be hereinafter described.

A and A' are the diaphragm-chambers, (the general exterior appearance and mode of operation of the diaphragms of which are shown and described in our patent for an oscillating diaphragm-meter of only one chamber, operating with a cut-off-valve gear and oscillating rotary valve, numbered 100,964, and dated March 22, 1870,) which in this case are formed of metallic sheet plates struck up by dies into the shape of spheric segments of small altitude, the edges being left flat for the purpose of forming flanges *a'* and *a''* of different widths, so that in putting them together the broader, *a'*, will overlap *a''*, between which flanges the diaphragm B is inserted and clamped by being bent, together with the flange *a'*, over the flange *a''* and pressed tight. Thus the halves of each chamber are fastened together securely without screws or solder, cheaply, and without danger of destroying the diaphragm by

the heat necessary in applying solder for fastening. The diaphragm B in each chamber is made single, and secured to the oscillating arm of the rock-shaft by means of a piece, *b'*, Fig. 8, sewed on, between which and B the rock-shaft arm is inserted and pivoted to the inside of a short tube clamped between the flanges *a'* and *a''* to allow of the free oscillation of the arm and rock-shaft. To the rock-shaft are attached the slotted arms C and C', which are placed at such angles to the oscillating arms that one diaphragm will always be at the middle of its stroke, while the other passes its "dead-center," thus reversing the motion of the other diaphragm without the aid of a cut-off-valve gear, while at the same time the valve always rotates uninterruptedly in the same direction. The arms C and C' act upon the crank-pin *d'*, adjustable on the crank *d* of the valve D, which has two ports acting alternately as inlets and outlets for each chamber, and one common exhaust in the center of the valve-seat E. The valve D is so constructed that during its revolution the whole area of one of the four ports is always in communication with the exhaust D', whereby a constant flow of the fluid is effected as if it were discharged through an open pipe, each chamber being twice emptied and filled for each revolution, or four times the volume of one chamber discharged for each revolution of the valve. Each revolution, and consequently the measurement, is transmitted, by means of the screw F on the valve-stem, to the toothed wheel G on the shaft *g*, which communicates its motion to the index-wheels. These wheels are constructed as in our former patent, (for water-meters;) but in this case we have made a cheaper arrangement for producing the necessary friction to prevent the wheels from turning in undue time, and of making and placing the indexes. The shafts H of the register-wheels work in bearings in the frames *h* and *h'*, secured in the register-box *h''*, (which is gas-tight,) and a straight spring-wire, I, is put over and under every alternate shaft H, and secured at its ends to the box *h''*, so that by more or less "setting" the wire I the friction between it and the shafts H is decreased or increased to any degree of nicety required. The indexes K being stationary, (while the figures stamped on the wheels move around

the point of the index,) we make and place them at proper distances apart by simply cutting or stamping them out of the outer casing L, making them a part thereof, as shown in Fig. 2.

In order to occupy as little as possible of available space in a room, it is desirable that a gas-meter be so constructed that, when placed in an angle of a room, it will present no angles or corners, but only a smooth front toward the interior of the room. In a gas-meter which must work with extremely low pressure and with very even motion, it is also of utmost importance that the valve be placed far enough from the centers of oscillation of the diaphragm-arms to enable the application of a sufficiently large crank, and thereby secure an easy movement of the valve. To effect this necessity and at the same time maintain the small compass desired, the chambers A A' are placed at such an angle to each other, Fig. 1, that the two sides of the casing L, tangential to the outer curves of the chambers, meet at a right angle in the point M, fitting in the angle of a room, while the third side of the casing L presents the face of the dial to the interior of the room, the general exterior shape of the gas-meter being that of a three-sided prism with two corners rounded off. By this arrangement space enough is gained to place the valve at the desired distance from the point of oscillation of the diaphragm-arms—that is to say, at a point where the arms C and C' make a large enough stroke to admit of the required length of crank.

The gas, after entering the meter through the pipe N and passing through the chambers A and A', the valve D, and exhaust D', passes into the casing L, which acts as a reservoir or drum for the free expansion of the gas, equalizing its pressure in the discharge-pipe o, from which it passes through the service-pipe to the burners.

This meter may be used with equal advantage for water or other liquids, in which case, however, we dispense with the reservoir and attach the service-pipe directly to the exhaust in the valve; and also, for compactness and neatness of appearance, place the chambers parallel to each other and the valve across their edges, making it cylindrical, and arranging the four ports in the periphery of the valve-seat E in pairs opposite each other, and the common exhaust in the center of its length instead of its diameter.

Claims.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination of the two chambers A and A' (each formed of two spheric or nearly spheric segments) with each other and with a rotary valve, of the construction described and shown, substantially as herein set forth.

2. The arrangement of the chambers A A' herein shown and described at such an angle to each other that the two sides of the casing L, tangential to the outer curves of the said chambers between their centers and rearedges, may meet at a right angle in the point M to obtain sufficient space for the play of a crank of such length as to secure an easy movement of the valve while maintaining the meter within a small and convenient compass, giving to it the desired prismatic form adapted to fit in an angle of a room, substantially as hereinbefore set forth.

The above specification of our invention signed by us this 22d day of January, 1870.

AUGUST W. ALMQVIST.
FRANS W. OFELDT.

Witnesses:

WILLIAM F. MCNAMARA,
ALEX. F. ROBERTS.