

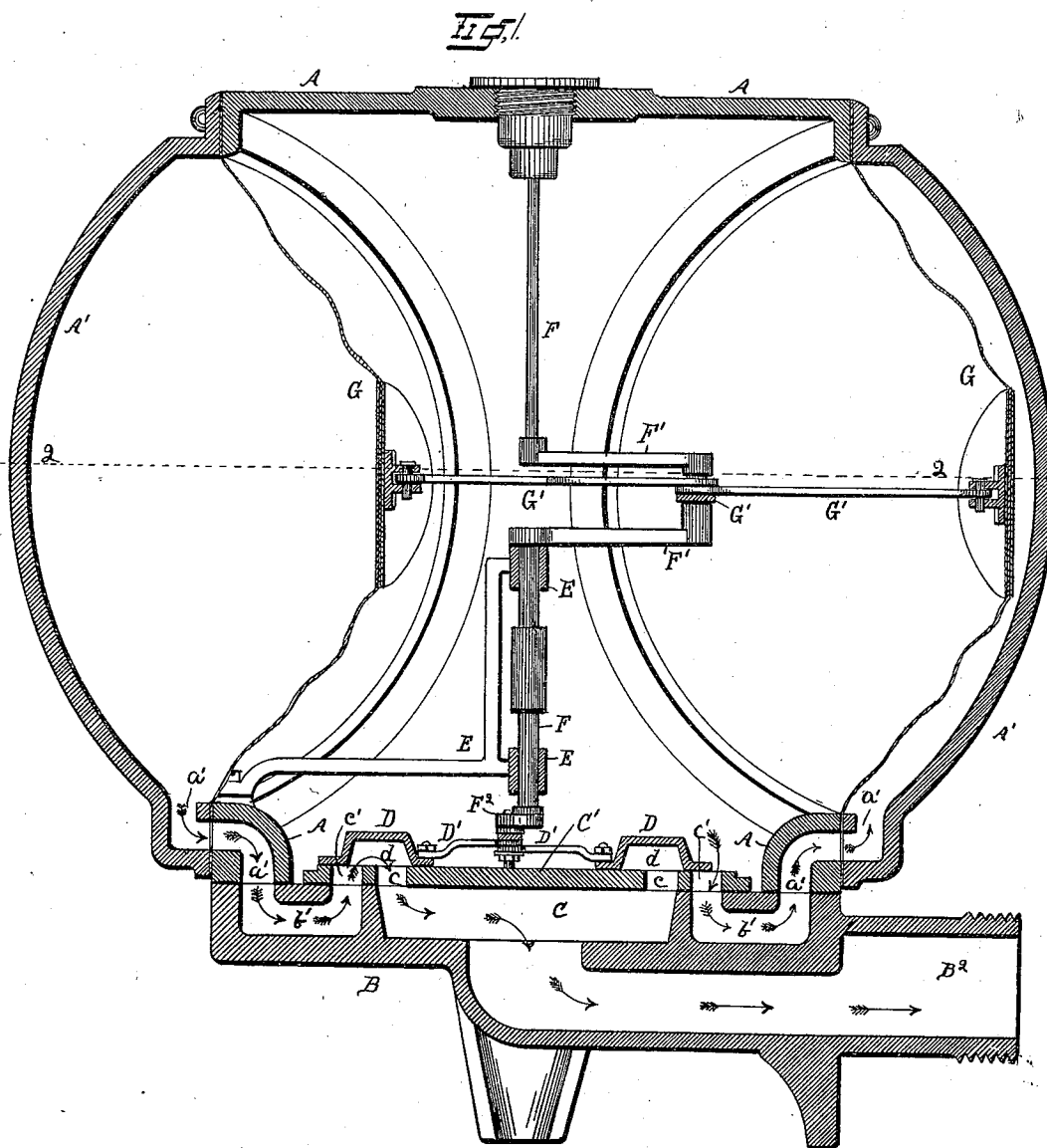
(No Model.)

4 Sheets—Sheet 1.

J. B. WALLACE.
DIAPHRAGM GAS METER.

No. 512,135.

Patented Jan. 2, 1894.



Witnesses
W. Marley
H. C. Lord

Inventor
Jacob. B. Wallace.
By Attorney
Hallock & Hallock

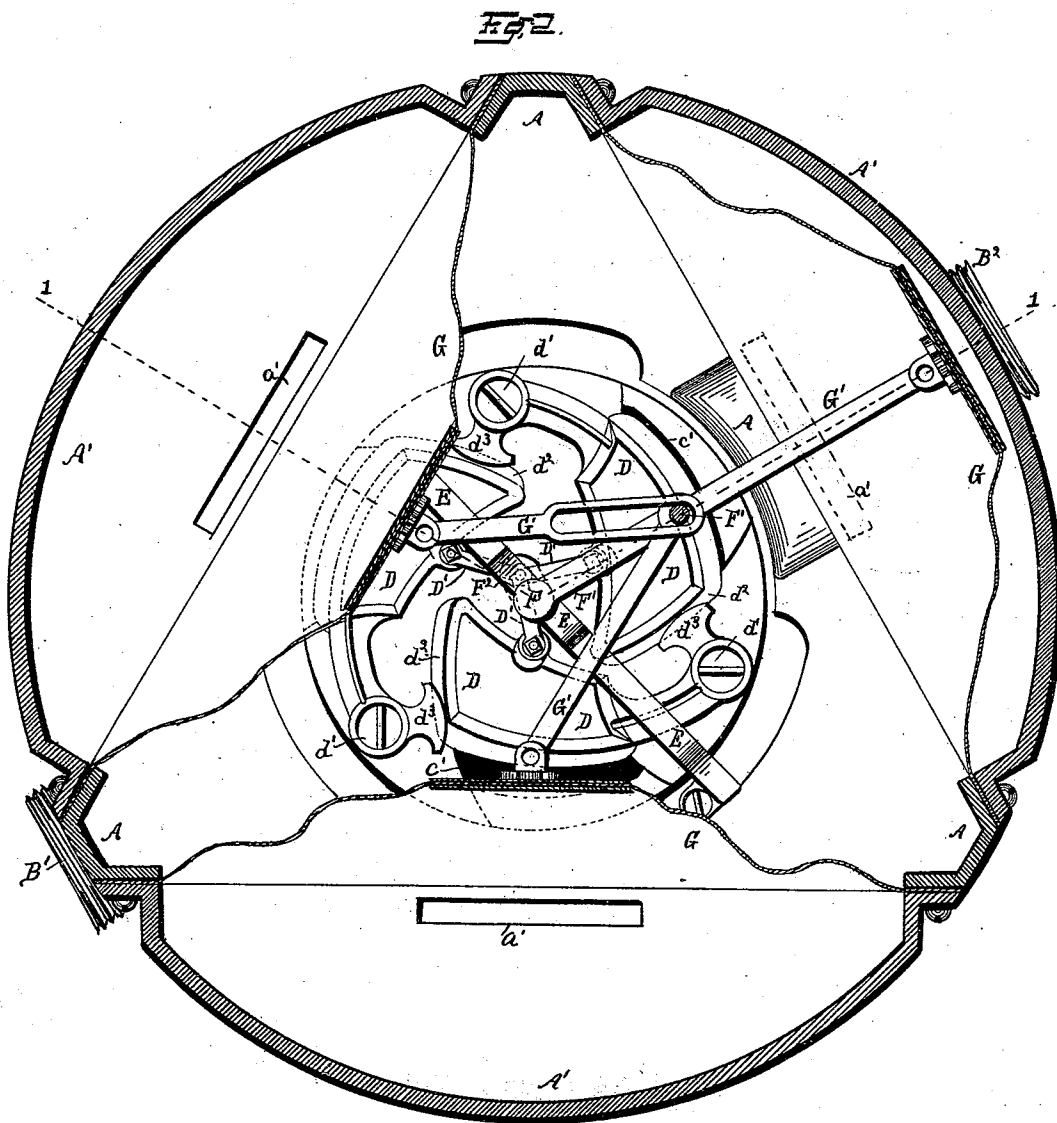
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Witnesses
W. M. Carter
H. C. Long

Inventor
Jacob B. Wallace
By Attorneys
Hallcock & Hallcock

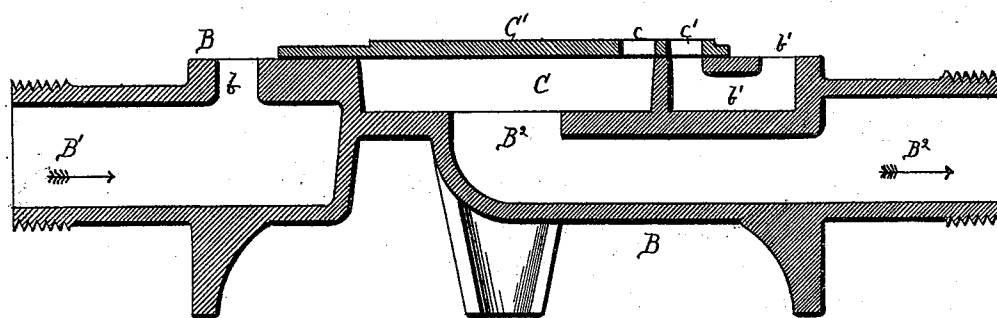
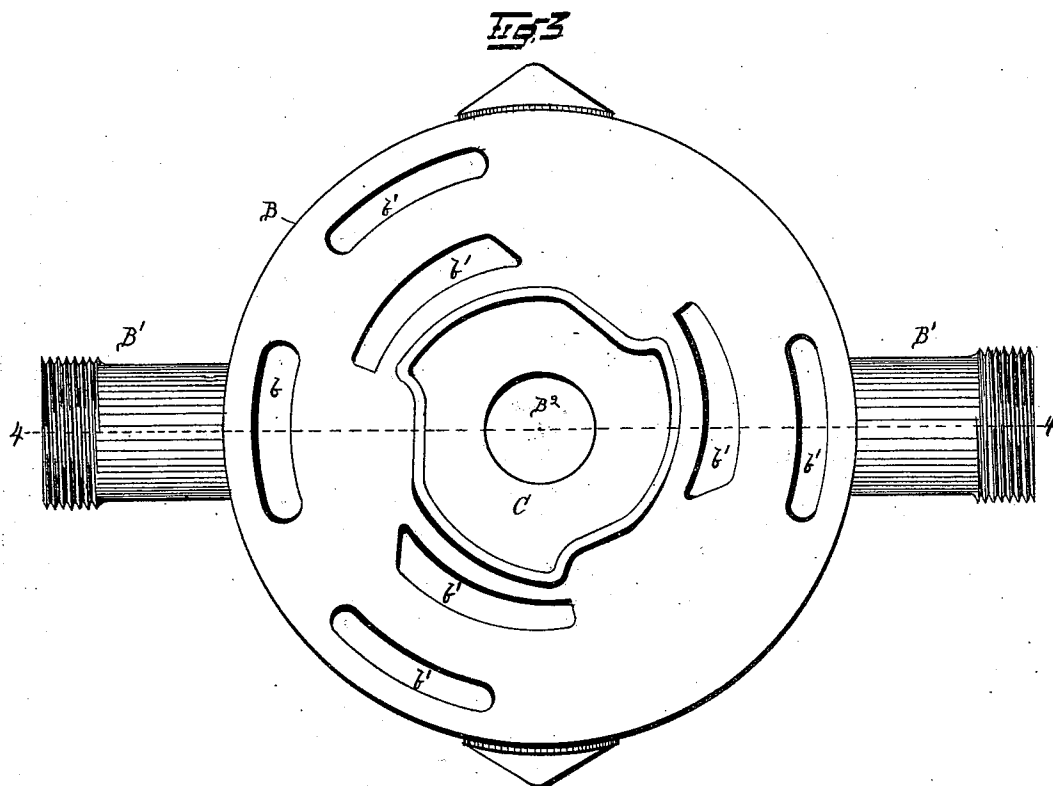
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J. B. WALLACE.
DIAPHRAGM GAS METER.

No. 512,135.

Patented Jan. 2, 1894.



Witnesses
Wm. Marley Jr.
H. Hedberg

Inventor
Jacob B. Wallace
By Attorneys
Hallok & Hallok

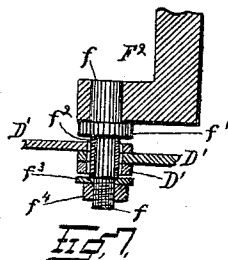
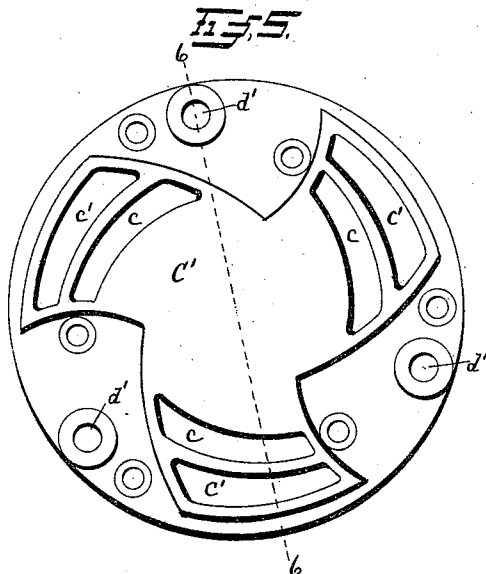
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J. B. WALLACE.
DIAPHRAGM GAS METER.

No. 512,135.

Patented Jan. 2, 1894.



Witnesses
W. M. ...
H. ...

Inventor
Jacob B. Wallace
By Attorney
Hallock & Halleck

UNITED STATES PATENT OFFICE.

JACOB B. WALLACE, OF ERIE, PENNSYLVANIA, ASSIGNOR TO THE METRIC METAL COMPANY, OF SAME PLACE.

DIAPHRAGM GAS-METER.

SPECIFICATION forming part of Letters Patent No. 512,135, dated January 2, 1894.

Application filed March 6, 1893. Serial No. 464,646. (No model.)

To all whom it may concern:

Be it known that I, JACOB B. WALLACE, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Gas-Meters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to gas meters, and consists in certain improvements therein, as will be hereinafter fully set forth and pointed out in the claims.

The particular form or type of gas meters to which my invention is applicable, is that wherein there are three or more bellows arranged around and connected with a common crank shaft from which the valves and the registering mechanism are operated.

My invention relates chiefly to the construction of the valves, their method of operation and the arrangement and construction of the parts.

My invention is illustrated in the accompanying drawings, as follows:

Figure 1 is a vertical section, taken on the deflected line 1—1 in Fig. 2. Fig. 2 is a horizontal section, taken on the line 2—2 in Fig. 1, the direction of view being downward upon the valves and their actuating mechanism. Fig. 3 is a top or plan view of the base-piece of the meter with all the superimposed parts removed. Fig. 4 is a transverse vertical section of the part shown in Fig. 3 with the port plate, C', added; the line 4—4 in Fig. 3 being the line of section. Fig. 5 is a top or plan view of the port plate, C'. Fig. 6 is a section of the port plate, C', the line 6—6 in Fig. 5, being the line of section. Fig. 7 is a vertical section through the lower crank, F², of the crank shaft, which is the valve actuating crank. The valve connecting rods, D', are also shown in section and broken off.

The meter shown in the drawings has three bellows and is globular in general outline. It consists of a base, B; a frame, A, having the three uprights and the top plate formed in one piece, and side caps, A', which form the bellows chambers. In the base piece there is an inlet passage, B', with a port, b,

into the inner chamber of the meter, an outlet passage, B², and a central discharge chamber, C, which connects with the outlet passage, B², directly and with the bellows chamber through the passages b'—a', and the ports, c c', in the port plate, C', which covers the chamber C. While the port plate, C', is here shown as a separate plate attached to the base piece, such a construction is not necessary and is employed for convenience in molding, and for the purpose, when desired, of using a more frictionless metal, as it is upon this plate the valves act, as will be seen as we progress.

The gas enters through the passage, B', and the opening, b, into the inner chamber of the meter, and then passes through the ports, c', and passages, b'—a', into the bellows chambers and is exhausted from the bellows chambers through the passages, a'—b', ports c', the valve passages, d, and the ports, c, into the discharge chamber, C, and thence out through the passage B².

The bellows, G, are of ordinary construction and are connected by connecting rods, G', with the crank, F', of the crank shaft, F, and the action of the bellows rotates the said shaft, which is journaled in a bridge tree, E. On the lower end of the shaft, F, is a crank, F², which is connected by rods, D', with the valves, D. The valves, D, are preferably formed in general outline and they are pivoted at one end, at d', and swing on said pivot from and toward the central axis of the meter by the action of the rods, D', and crank, F². Each valve has the ordinary D-space, d, on its lower side for the passage of the gas through it from port to port. On its swinging or distal end it has a flange, d², and at its pivoted end it has an arm, d³, extending at right angles from it, that overlaps the flange, d², of the adjoining valve. The object of the overlapping arm, d³, is to act as a guide to hold the outer ends of the valves down upon their seats. It will be noted that the ports, c c', upon which the valves, D, operate, are specially formed to correspond with the form and movement of the valves, and that said ports are opened and closed by a movement of the valves in a line at substantially right angles to said ports, in effect the

same as an ordinary reciprocating valve, and hence the ports will be opened and closed in the shortest possible time relative to the speed of the shaft, F.

5 In the limited space which a meter of the type here shown affords for the valves and their actuating gearing, I prefer the construction of valves and ports as shown and just described, as they are more desirable than
10 would be direct radially acting valves.

The crank, F^2 , and the manner of connecting the rods, D' , thereto is shown clearly in Fig. 7. A crank pin, f , is inserted in an eye in the crank arm, and is provided with a shoulder, f' . Below this shoulder on the wrist, is a sleeve, f^2 . Below the sleeve is a washer, f^3 ; and then follows a nut, f^4 , that screws onto the extreme end of the pin. The connecting rods, D' , embrace the sleeve, f^2 , and the lower one of the three rests on the washer. The
20 sleeve is somewhat loose on the wrist and within the eyes of the rods, D' , and acts to lessen the friction of the action of the parts, and the washer serves to prevent the rotary
25 action of the parts from unscrewing the nut, f^4 .

What I claim as new is—

1. In a gas meter of the type herein shown, the combination with a series of bellows that operate toward and from a common center
30 and upon a common crank shaft, of a like series of valves which are pivoted at one end so as to swing from and toward said common center and are moved from said common crank shaft.

35 2. In a gas meter of the type herein shown, the combination with a series of bellows that operate from and toward a common center and upon a common crank shaft, of a like series of valves which are arc-formed, are piv-

40 oted at one end so as to swing from and toward said common center and are moved from said common crank shaft.

3. In a gas meter of the type herein shown, the combination with a series of bellows that operate from and toward a common center
45 and upon a common crank shaft, of a like series of valves which are moved from and toward said common center by said common crank shaft, a port plate, C' , forming a seat for said valves and having a like series of
50 double ports, $c\ c'$, a base piece supporting said port plate having a like series of passages, b' , leading from the bellows chambers to the ports, c' , in said port plate, a central discharge chamber, C, under said port plate
55 and accessible through said port, c , an inlet passage, $B'-b$, into the central chamber of said meter, and an outlet passage, B^2 , from said discharge chamber, C.

4. In a gas meter of the type herein shown, the combination with a series of bellows that operate from and toward a common center and upon a common crank shaft, of a like series of valves which are pivoted at one end so as to swing from and toward said common center
65 and are moved from said common crank shaft, flanges, d^2 , on the free ends of said valves and arms, d^3 , on the pivoted ends of said valves that overlap said flanges, d^2 , on the next contiguous valve and thereby hold the free ends
70 of said valves upon their seats.

In testimony whereof I affix my signature in presence of two witnesses.

JACOB B. WALLACE.

Witnesses:

WM. P. HAYES,
H. C. LORD.