(Model.) 3 Sheets—Sheet 1.

H. M. BARTLETT.

PISTON METER FOR FLUIDS.

No. 333,099. Patented Dec. 29, 1885.

Fig. 2.

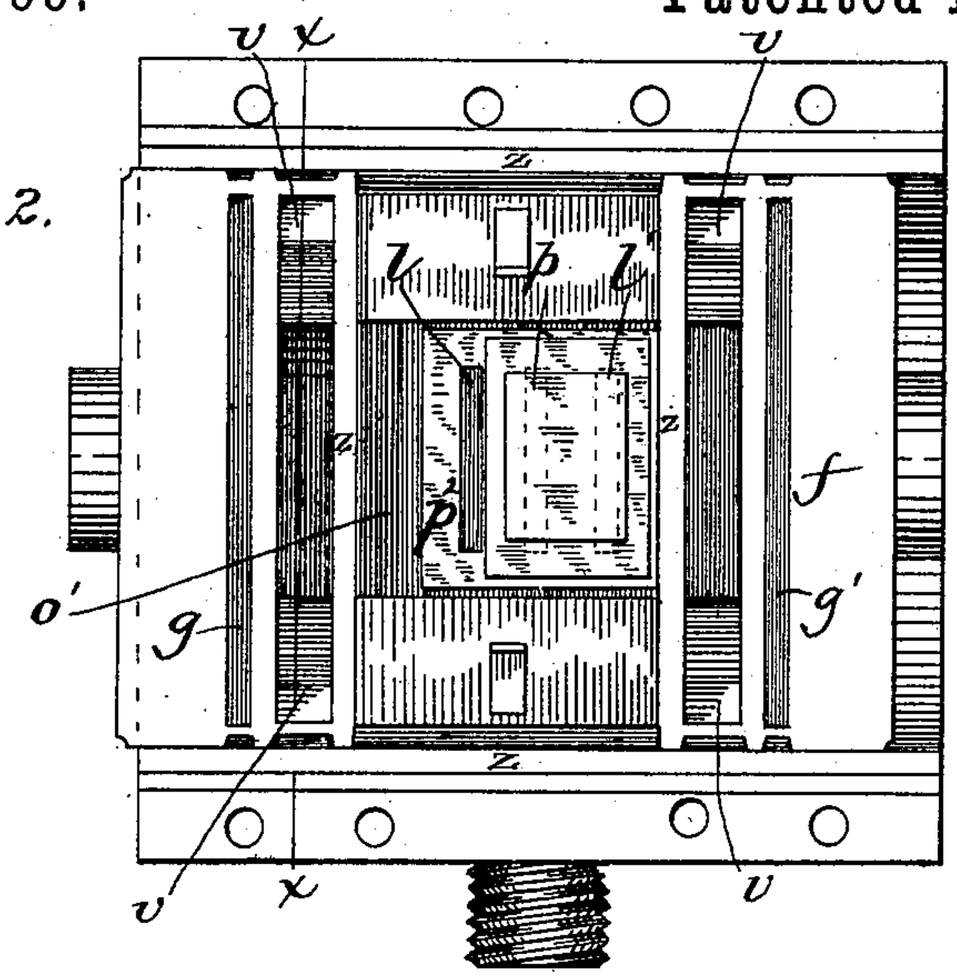
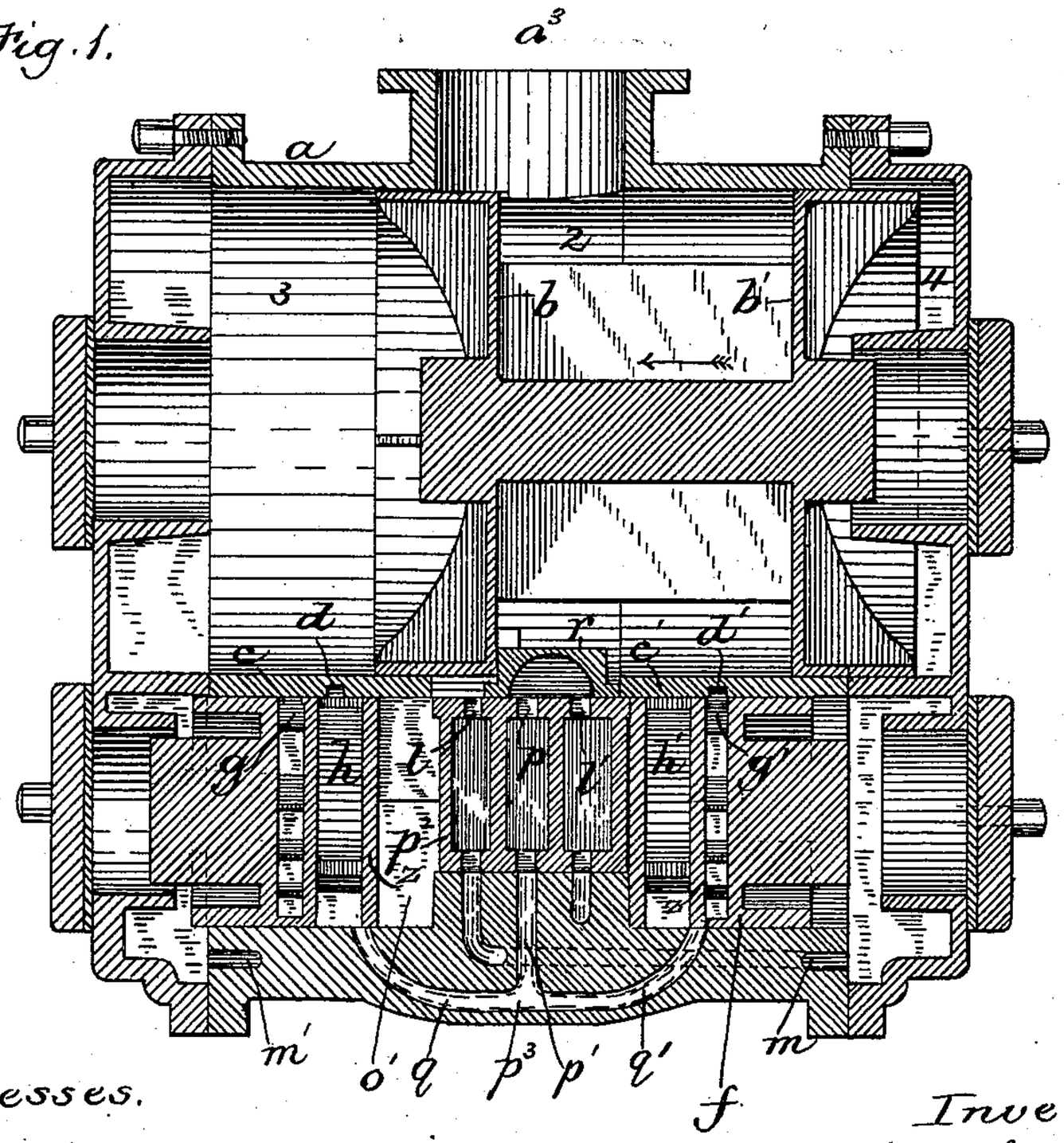


Fig. 1.



Witnesses.
H. Brown
R. J. Powers

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by Wright & Brown
Attys.

(Model.)

3 Sheets—Sheet 2.

H. M. BARTLETT.

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Fig. 3.

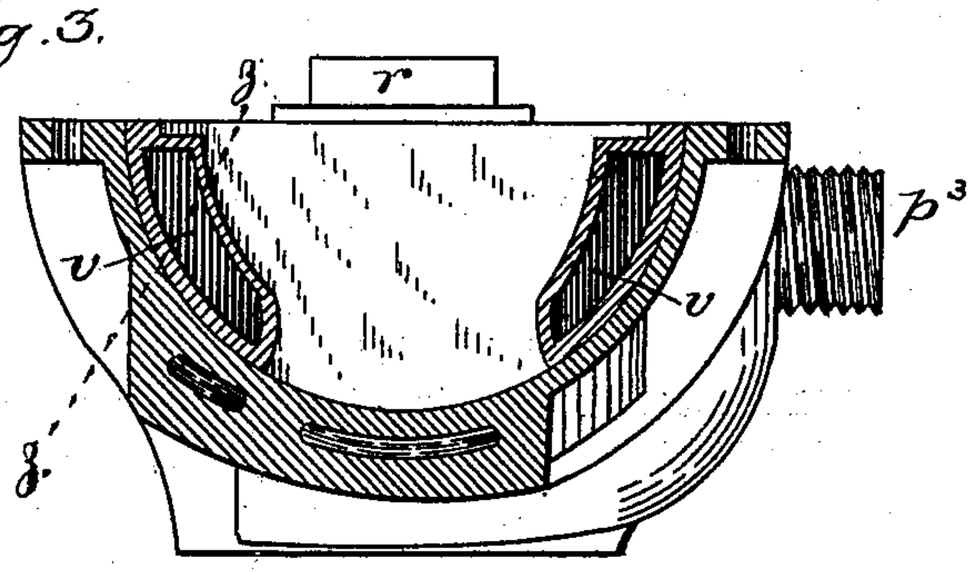
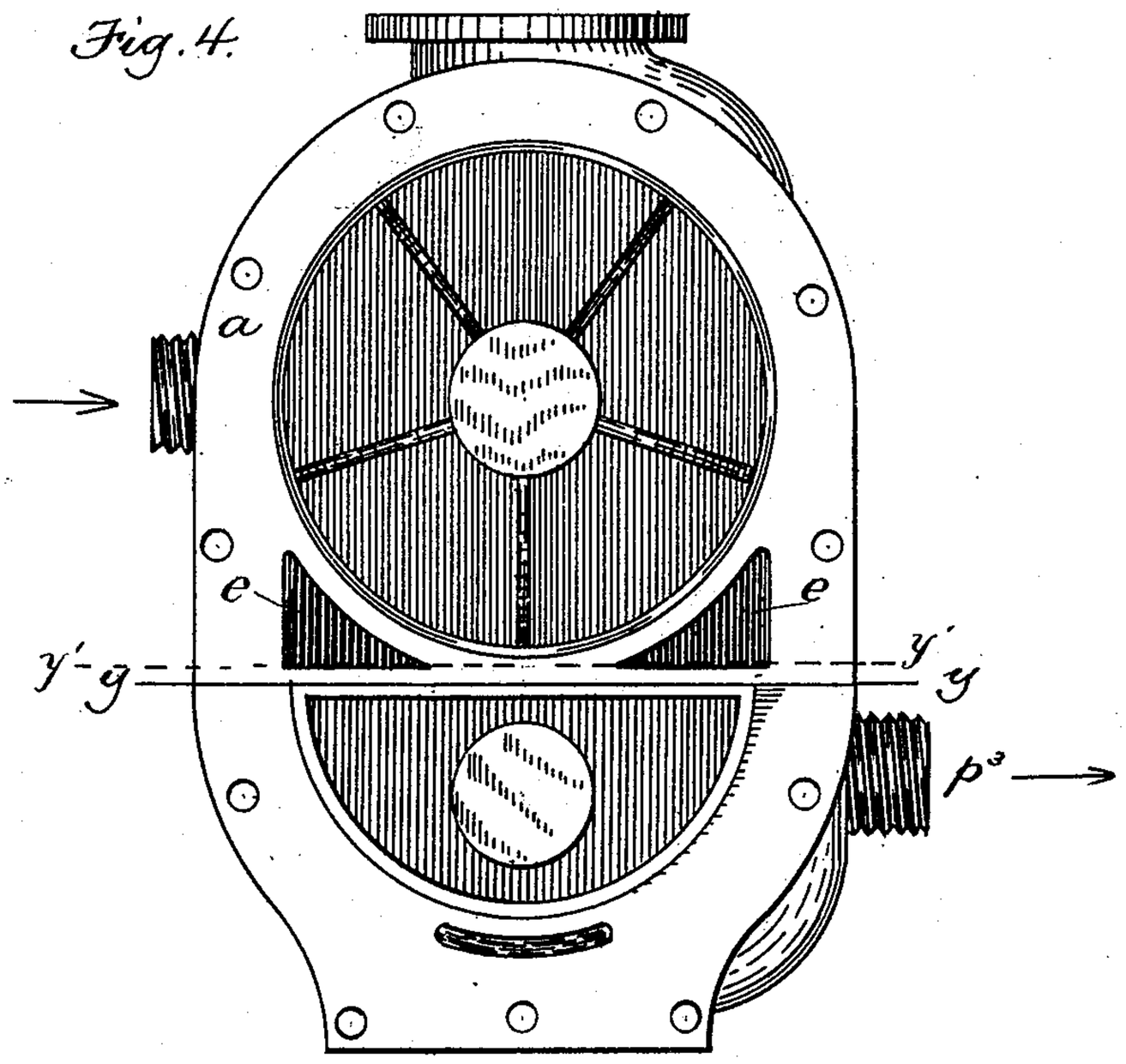


Fig. 4.



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(Model.)

3 Sheets—Sheet 3.

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PISTON METER FOR FLUIDS.

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Fig. 7.

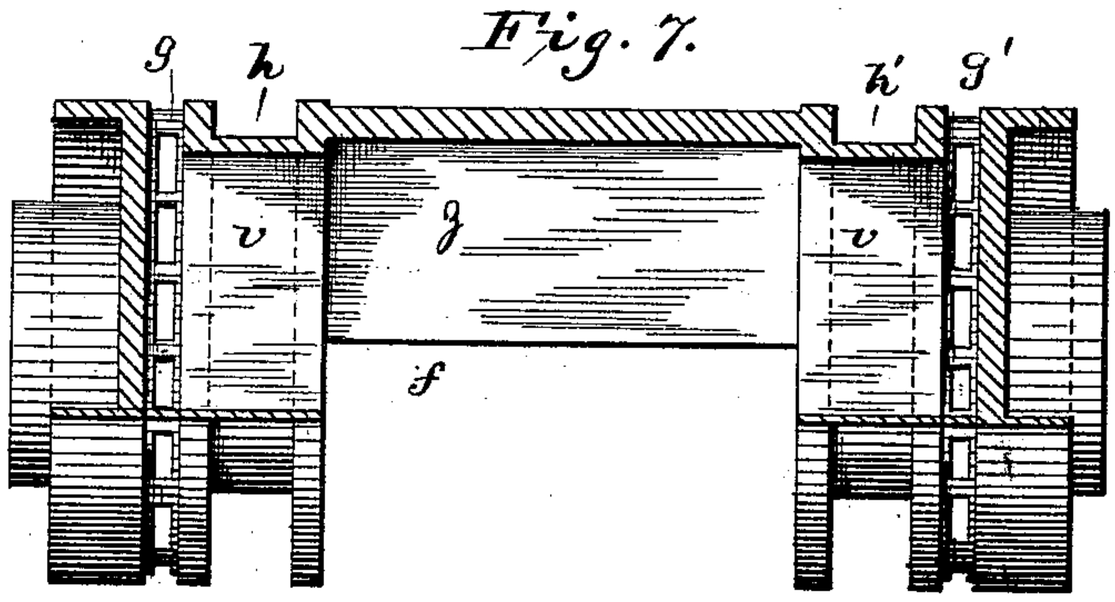


Fig. 5

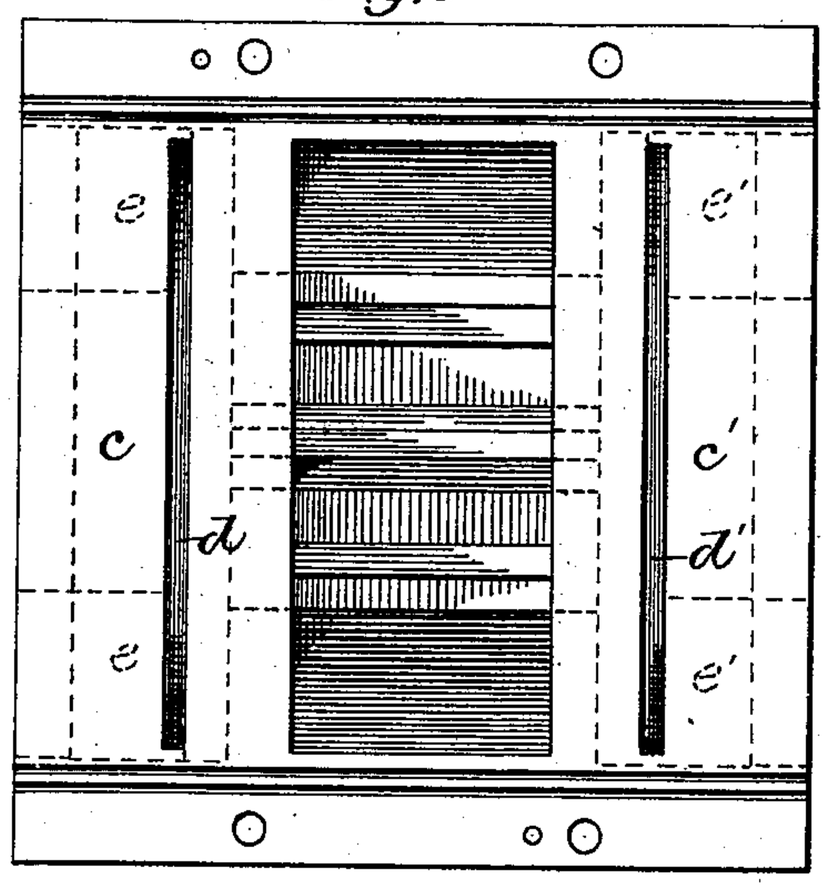
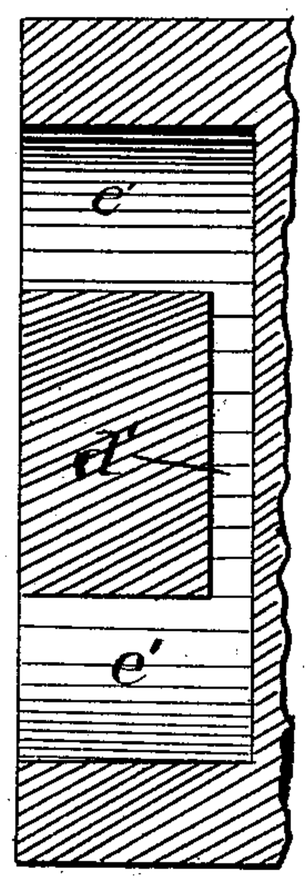


Fig. 6.



Witnesses.
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Chas. S. Goodwin.

Inventor
H. M. Bartlett
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UNITED STATES PATENT OFFICE.

HENRY M. BARTLETT, OF SOMERVILLE, MASSACHUSETTS.

PISTON-METER FOR FLUIDS.

SPECIFICATION forming part of Letters Patent No. 333,099, dated December 29, 1885.

Application filed February 14, 1885. Serial No. 155,939. (Model.)

To all whom it may concern:

Be it known that I, HENRY M. BARTLETT, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Fluid-Meters, of which the following is a specification.

This invention has for its object to provide a simple, accurate, and easily-operated fluid-meter; and it consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a longitudinal vertical central section of a meter embodying my invention. Fig. 2 represents a top view of a piston-reversing valve and the portion of casing on which it moves. Fig. 3 represents a section on line *x x*, Fig. 2. Fig. 4 represents an end elevation of the meter with one of the ends or head removed. Fig. 5 represents a section on line *y y*, Fig. 4, looking upwardly. Fig. 6 represents a section on line *y' y'*, Fig. 4. Fig. 7 represents a section of the piston-reversing valve, taken on the line *z z*, Fig. 3.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents the casing, having the central receiving or induction chamber 2 and the cylindrical or piston chamber 3 4, in which the connected pistons *b b'* work. Below the ends 3 4 are valve-seats *c c'*, having ports *d d'*, one of which, *d*, communicates through passages *e e* with the piston-chamber 3, while the other, *d'*, communicates through passages *e' e'* with the piston-chamber 4.

f represents the semi-cylindrical valve which reciprocates in the casing below the valve-seats *c c'*, and has two ports, *g g'*, near its opposite ends, and two ports, *h h'*, between the ports *g g'*. Between the ports *g h* and the ports *g' h'* the valve is cut away, forming a large central opening, *o'*, inclosed by walls *z z z z*, Fig. 2. Into this opening extends a projection, p^2, affixed to the bottom of the casing, and having a flat upper surface constituting a valve-seat, in which are three ports, *l*, *l'*, and *p*. The port *l* communicates through a passage, *m*, with one end of the lower portion of the casing *a*, while the port *l'* communicates through a passage, *m'*, with the opposite end of the casing. The port *p* communicates through a passage, *p'*, with the eduction or outlet passage p^3. In the bottom of the casing are two ports, *q q'*, at opposite sides of the projection p^2, said ports communicating with the outlet-passage p^3. The port *q* is alternately connected with the outlet-port *h* and covered by the bottom of the valve, while the port *q'* is alternately connected with the outlet-port *h'* and covered by the bottom of the valve.

r represents a D-valve, which slides on the upper surface of the projection and alternately connects the ports *l* and *l'* with the outlet-port *p*, the port other than the one thus connected with the outlet-port being uncovered and connected with the induction-chamber 2. The valve *r* is reciprocated by the pistons *b b'*, each striking the valve in turn when it nearly reaches the inner end of its stroke.

Operation: The parts being in the position shown in Fig. 1, the port *g'* coinciding with the port *d'*, and the port *d* with the outlet-port *h*, water passes from the induction chamber into the large central opening, *o'*, between the ends of the valve *f*, and from thence through the passages *v v* in the valve to the port *g'*, and through the latter, the port *d'*, and passages *e' e'* into the chamber 4 of the casing, pressing against the piston *b'* and forcing both pistons in the direction indicated by the arrow in Fig. 1. The piston *b* is thus caused to force the water from the chamber 3 of the casing through the passages *e e*, port *d*, the outlet-port *h* of the valve, and the outlet-port *q* of the casing. When the pistons nearly reach the end of their stroke in the direction indicated, the piston *b'* strikes the valve *r* and moves it until it connects the ports *l* and *p* and uncovers the port *l'*. Water is thus admitted to the casing at the left-hand end of the valve *f* through the port *l'* and passage *m'*, and is permitted to escape from the opposite end of the casing through the passage *m*, port *l*, valve *r*, and port *p* to the outlet-passage. The water thus admitted to the left-hand end of the casing forces the valve *f* to the right, thus connecting the outlet-port *h'* of the valve with the port *d'* of the casing, and the inlet-port *g* of the valve with the port *d* of the casing. The entering water now passes from the induction-chamber to the piston-chamber 3 and reverses the

movement of the pistons, causing the piston b' to expel the water from the end 4. When the piston b reaches the valve r, it moves it back to the position shown in Fig. 1, causing it to connect the ports p and l' and uncover the port l. Water now enters the right-hand end of the casing through the port l and passage m, and moves the valve so as to again admit water to the chamber 4 and reverse the movement of the piston.

This meter, in its mode of operation, is like that described in my pending application, Serial No. 159,938, the only differences of construction being the fixed projection p^2, having the ports l, l', and p, the passages m m', and the eduction-ports q q' formed in the casing, and the large central opening, o', formed in the valve f for the projection p^2.

In the meter shown in my other application the upper surface of the valve f is continued from end to end, and the ports l, l', and p, and passages m m' are formed in the valve, so that the valve is heavier and its movement is attended with more friction than the valve shown in this application.

The ends of the casing are provided with yielding buffers for the pistons and for the valve f, as shown in my other application. An opening, a^3, is provided in the upper portion of the casing, through which passes that portion of the indicating mechanism which is acted on by the pistons to indicate the quantity of water.

Any of the well-known forms of indicating mechanism adapted to be operated by the reciprocating pistons may be employed, and as I have not devised anything novel in said mechanism, I have not thought it necessary to illustrate it in the drawings.

I claim—

1. The combination of the piston-reversing valve having the large central opening and the inlet and outlet ports arranged in pairs at opposite sides of said opening, the casing having the induction and piston chambers, the fixed projection and its ports located in the central opening of the valve, and ports arranged substantially as described, whereby water may be conducted to either piston-chamber from the inlet and from the other piston-chamber to the outlet, the D-valve arranged on the fixed projection, and the pistons arranged to reciprocate said valve, as set forth.

2. The combination of the casing having the induction-chamber and piston-chambers, the ports d d', communicating with the outer ends of the piston-chambers, the eduction-ports q q' in the lower portion of the casing, the fixed projection having the ports l l', communicating with the ends of the casing, and the port p, communicating with the outlet, the D-valve resting on said projection, the connected pistons arranged to reciprocate said valve, and the piston-reversing valve having a central opening for the projection p^2, and the ports g h g' h' at opposite sides of said central opening, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 6th day of February, 1885.

HENRY M. BARTLETT.

Witnesses:
C. F. BROWN,
H. BROWN.