

I. P. Tice,
Water Meter.

No. 113,366.

Patented Apr. 4, 1871.

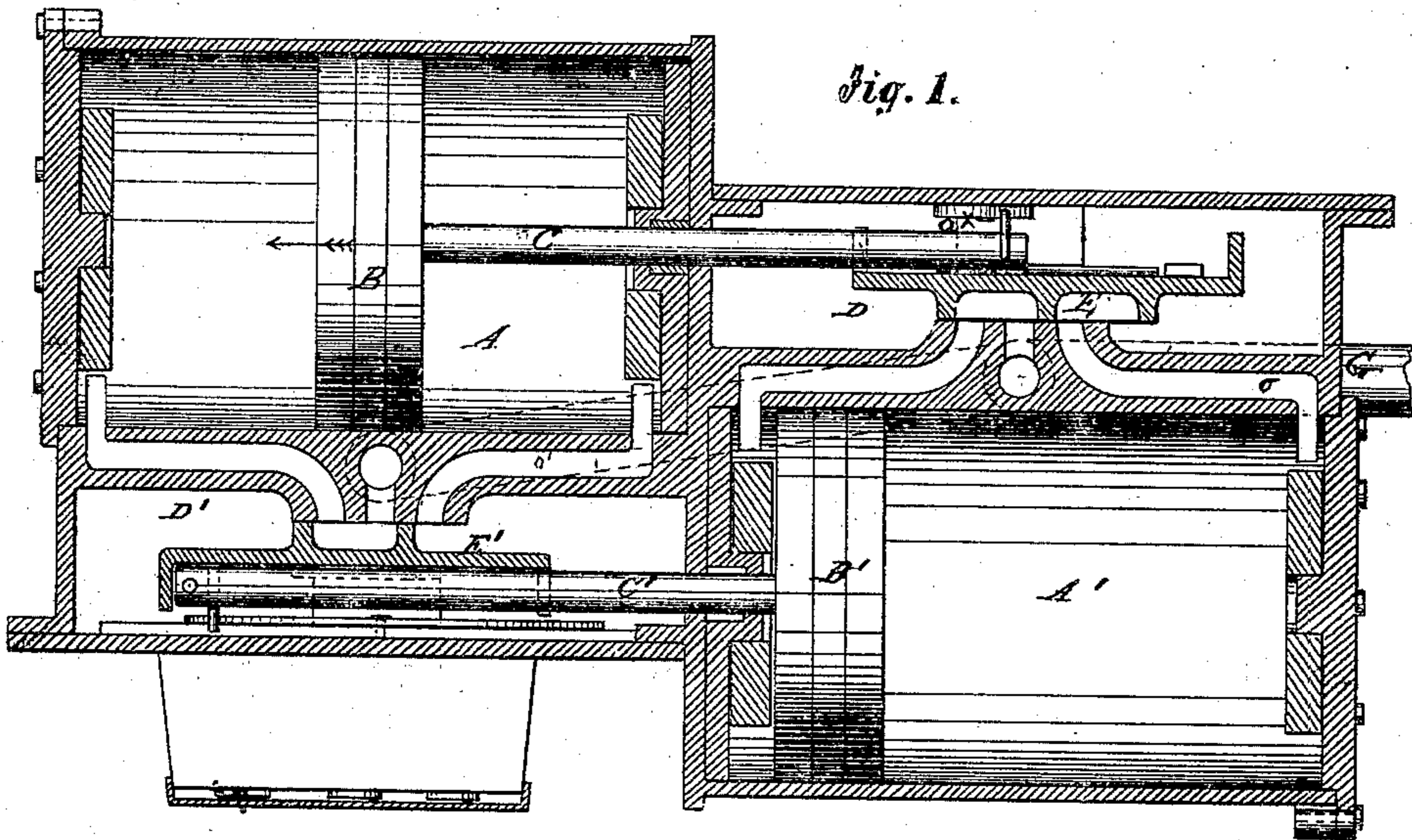


Fig. 2.

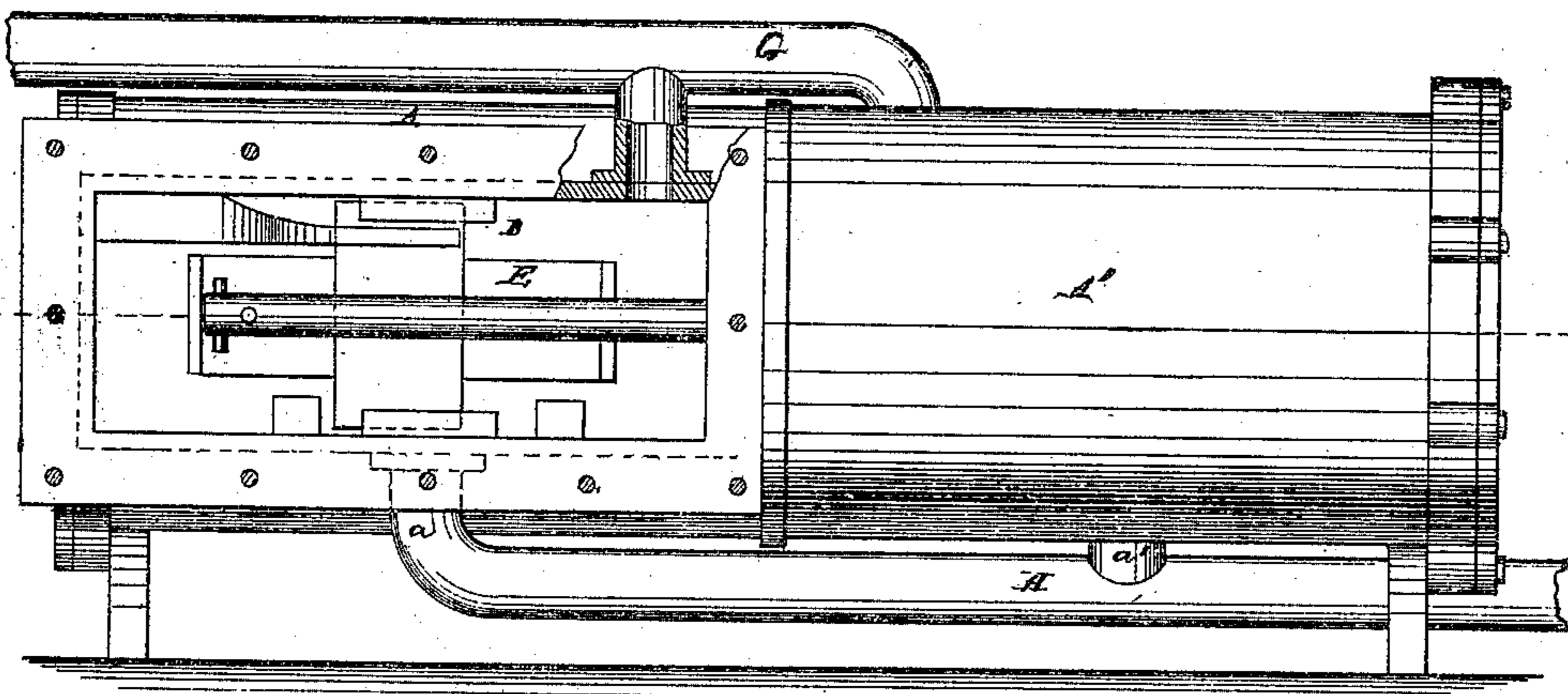


Fig. 3.

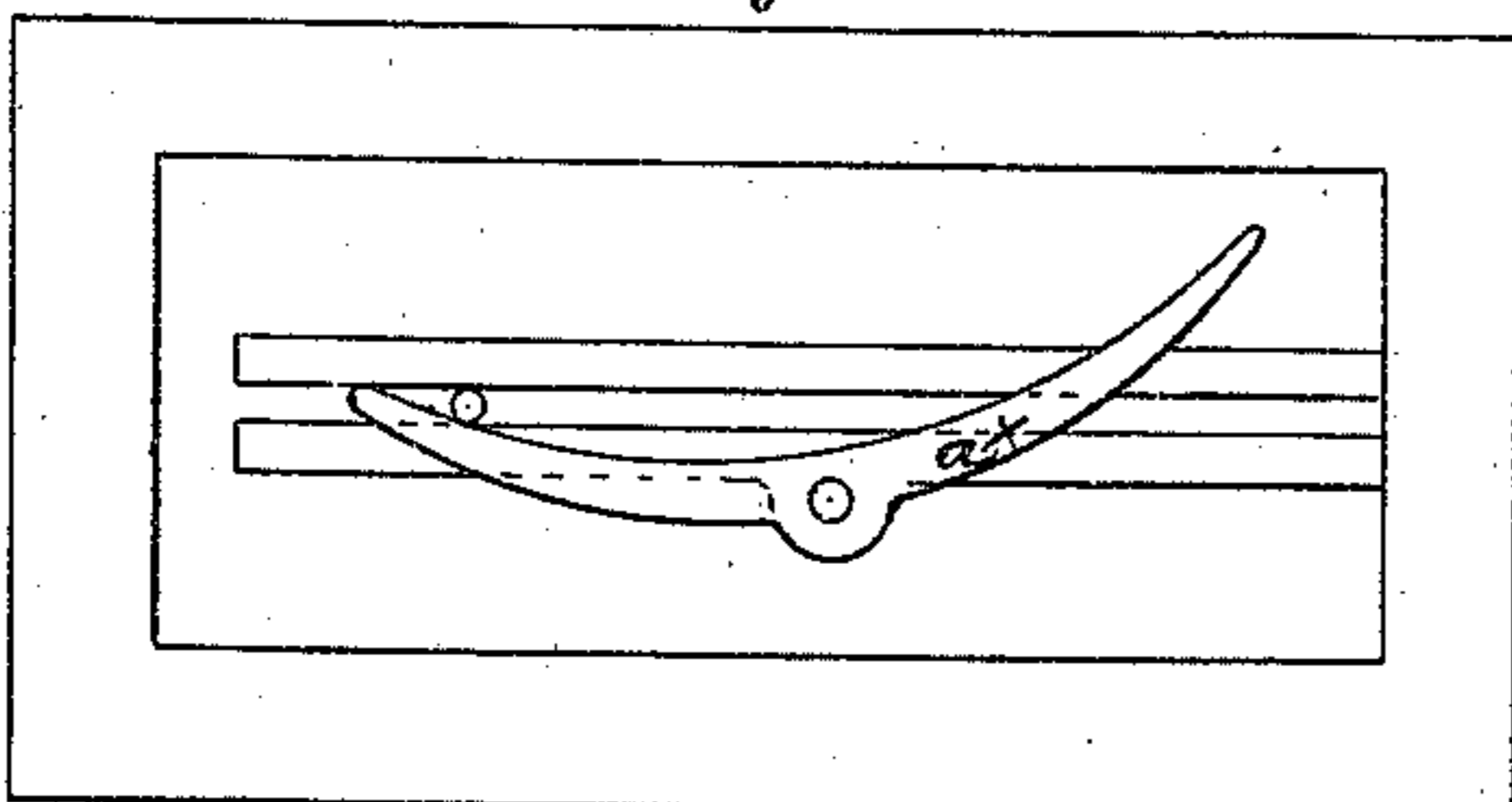
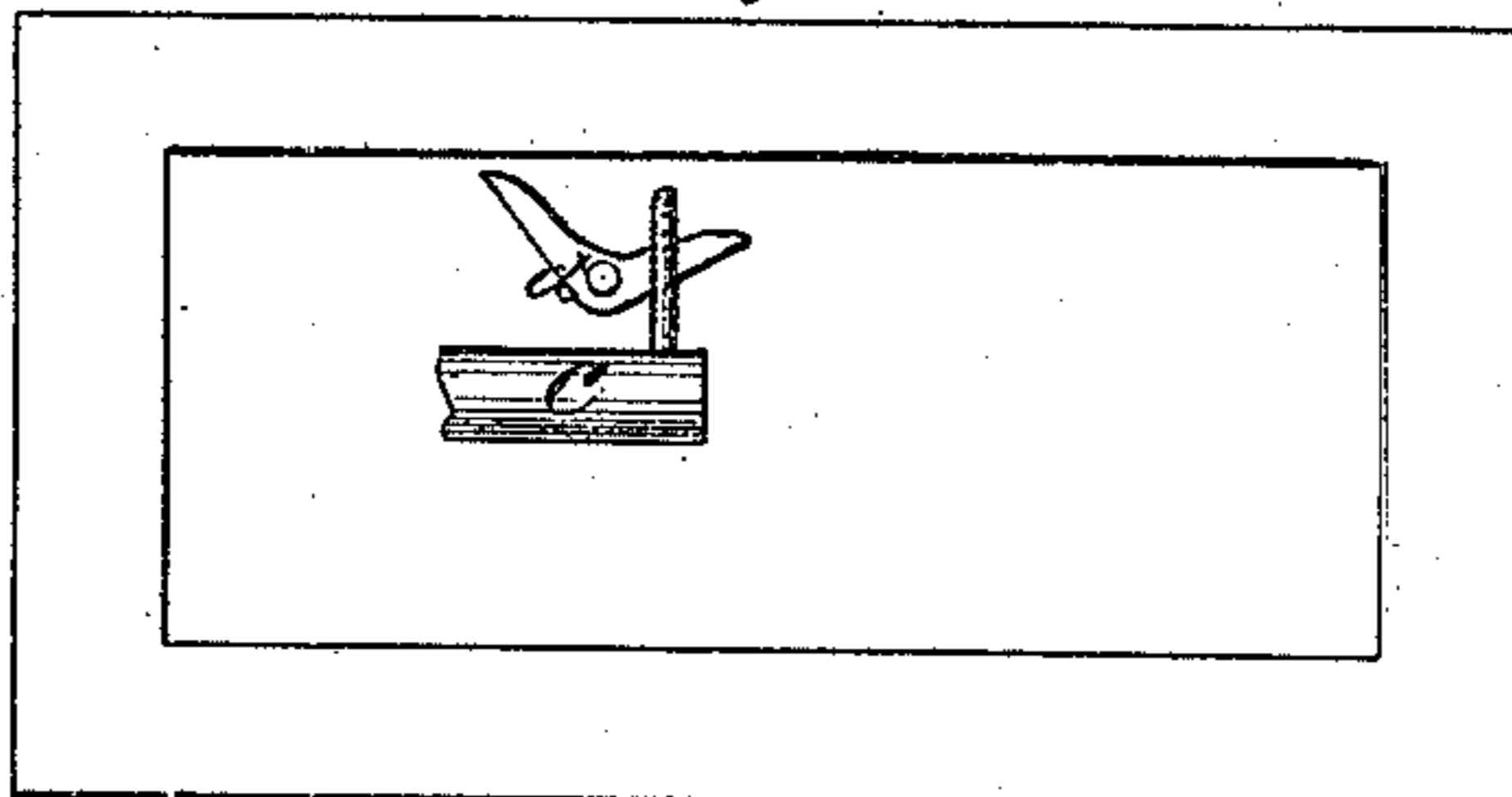


Fig. 4.



Witnesses.

Edw. F. Brown.
Wm. S. Smith

Inventor.

Isaac P. Tice

UNITED STATES PATENT OFFICE.

ISAAC P. TICE, OF NEW YORK, N. Y.

IMPROVEMENT IN WATER-METERS.

Specification forming part of Letters Patent No. 113,366, dated April 4, 1871.

To all whom it may concern:

Be it known that I, ISAAC P. TICE, of the city, county, and State of New York, have invented a new and Improved Water-Meter; 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, making a part of this specification, in which—

Figure 1 is a plan sectional view of my invention; Fig. 2, a side view of the same, the side plate of one of the valve-chambers being detached; Figs. 3 and 4, internal views of the two valve-chambers.

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

This invention relates to a new and improved water-meter for measuring and recording the volume of water that passes into buildings for the purpose of supplying the same, and enabling a correct assessment being made on the amount consumed.

The invention is one of that class in which cylinders with pistons working therein are employed as measures of capacity, and has for its object the avoiding of inaccuracies of measurement consequent upon the failure of the piston's complete or full strokes under a small head or pressure of water—a contingency which occurs with other machines of the same class.

A A' represent two cylinders, and B B' pistons working therein, C C' being the piston-rods. D D' are two valve-chambers, and E E' the valves. (See more particularly Fig. 1.) The valve-chambers adjoin the cylinders at opposite ends of the same. G is the induction, and H the outlet or eduction, pipe, the former, G, being divaricated or branched, so that both cylinders may be supplied from one and the same inlet-pipe. The outlet or eduction pipe H communicates with the valve-chambers, as shown at *a a'*, Fig. 2. The valve E in the chamber D is what may be termed a "double D-valve," (shown clearly in Fig. 1,) and is operated by the piston-rod which works into said chamber. The valve E' of the other chamber, D', is operated similarly, but is an ordinary single slide-valve, as shown in Fig. 1. In each valve-chamber there is what I term a "resisting mechanism," to retard the movement of the valves at certain points, for the purpose herein-after set forth. The means employed for effect-

ing this result is friction, caused by the piston-rods coming in contact with pivoted arms attached to and within the valve-chambers, (see fig. 1,) in which the pivoted arm or lever *a^x* is indicated in the path of the movement of the piston-rod C.

The operation of the pistons and valves is as follows: Water is let into the valve-chambers through the pipe G. The piston C' is shown as having completed its stroke by the passage of the water from the valve-chamber D, containing the double D-valve E, through the port *o*, into the cylinder. The piston-rod of the head B' has moved the single valve E', so that water is taken into the cylinder A through the port *o'*. Upon the completion of the stroke of the piston B the double valve E will be moved in the direction of its stroke, when the opposite port will be open, and the piston-head B' will resume its motion.

The great defect in piston-meters heretofore has been found to be in the uncertainty of the length of stroke when delivering variable quantities of water. The cause of this difficulty lies in the movement of the valves over the ports. If a very small stream is passing through the meter, a slight opening of the valves is sufficient to allow the water to pass through the meter without either piston making a complete stroke. The error may be to the extent of the width of the ports nearly. To obviate this difficulty I apply resistance to the movement of the pistons at such points of the stroke as to allow one piston to be retarded while the other moves in its normal condition. For instance, one piston is retarded in its stroke or movement both ways at the middle of its stroke or movement, while the other meets with resistance at a point, say, one-fourth of the distance from the ends of the stroke. Suppose the piston B' to have nearly completed its stroke, the piston B meets with resistance at the center of its stroke. Normally, the pistons are in equilibrium; but the water makes an outlet in the direction of least resistance, and the piston B' being free to move when the piston B is not, a complete stroke is insured, and the desired effect produced at the end of each stroke, by the mechanism shown in Figs. 3 and 4. Both of the retarding or resisting mechanisms—that is to say, those for both

cylinders—are shown in Figs. 3 and 4, the parts being indicated by similar letters.

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

1. The arrangement of two cylinders, A A', and two independent or separate valve-chests, D D', connected with a common inlet-pipe, G, substantially as and for the purpose set forth.

2. The combination of the inlet and outlet pipes G H, valve-chambers D D', and the cylinders A A', substantially as and for the purpose specified.

3. The combination of the two cylinders A A', valve chests or chambers D D', and the single and double valves E E', substantially as and for the purpose described.

4. The arrangement of the valves E E', piston-

rod CC', and the independent valve chests or chambers D D', substantially as shown and described.

5. The resisting mechanism applied to a water-meter, in the manner substantially as shown and described, so as to compel the pistons to make complete or entire strokes at all times.

6. The arrangement of the cylinders A A' and the valve chests or chambers D D' in such a manner that the piston-rod of one cylinder will pass or work directly into the valve-chamber of the other cylinder, as set forth.

ISAAC P. TICE.

Witnesses:

EDM. F. BROWN,

JAMES S. GRINNELL.