J. Mason,

Piston Meter,

No. 69,007. Patented Sept. 17, 1867.

Fig. 1.

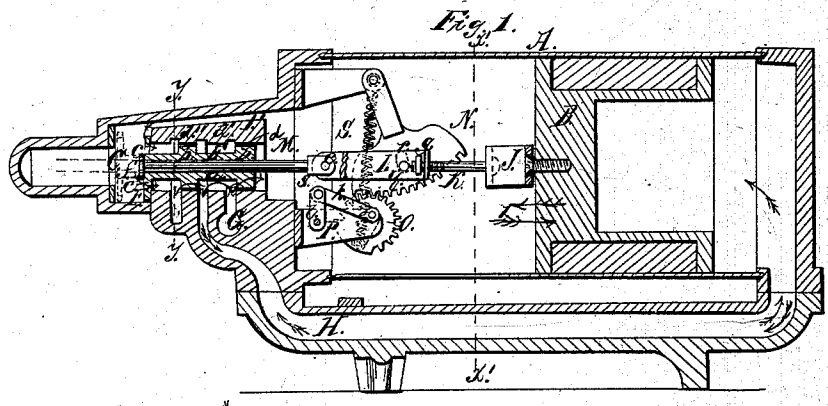


Fig. 2.

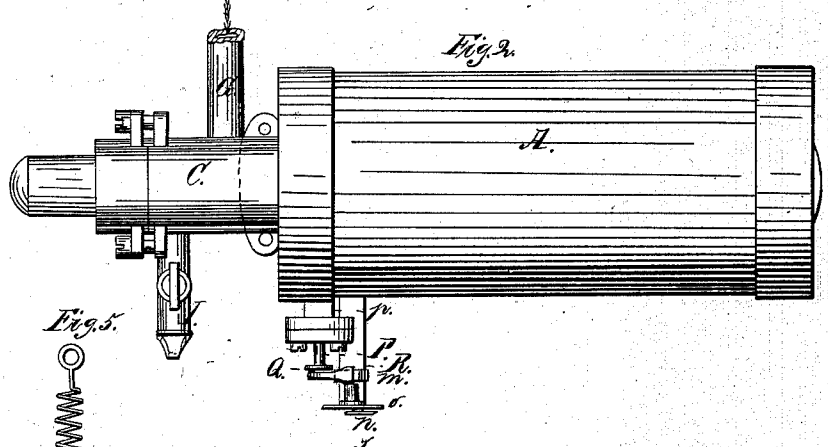


Fig. 5.

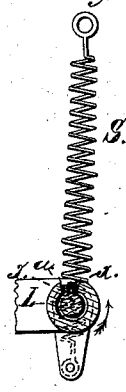


Fig. 3.

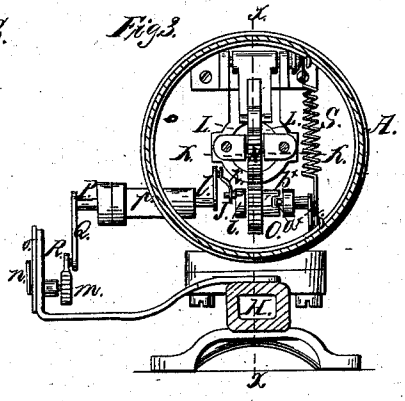
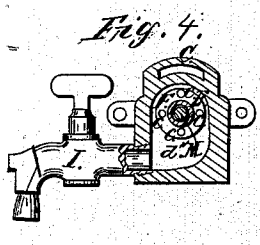


Fig. 4.



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JOSHUA MASON, OF PATERSON, NEW JERSEY.

Letters Patent No. 69,007, *dated September* 17, 1867.

IMPROVEMENT IN LIQUID AND 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, JOSHUA MASON, of Paterson, in the county of Passaic, and State of New Jersey, have invented a new and improved Water and Gas-Meter; and that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

This invention relates to a new and improved water and gas-meter, and consists in a novel construction and arrangement of parts, as hereinafter fully shown and described, whereby water or gas may be measured in the most accurate manner, and by a means not liable to get out of repair or become deranged by use. In the accompanying sheet of drawings—

Figure 1 is a longitudinal vertical section of my invention, taken in the line *x x*, fig. 3.

Figure 2, a plan or top view of the same.

Figure 3, a transverse vertical section of the same, taken in the line *x' x'*, fig. 1.

Figure 4, a transverse section of the same, taken in the line *y y*, fig. 1.

Figure 5, a detached view of a part pertaining to the same.

Similar letters of reference indicate like parts.

A represents a cylinder, which may be of any suitable dimensions, and is provided with a plunger, B, shown clearly in fig. 1. The cylinder A has an extension or chamber, C, at one end of it, and within said extension there is a valve-chamber, D, containing a valve, E, which is a sliding one, and is composed of a rod, *a*, having two circular disks or heads, *b b'*, upon it, and a circular plate, F, at one end, which plate is perforated with holes *c* to form a communication between the interior of the valve-chamber and the extension or chamber C, as shown clearly in fig. 1. The valve-chamber is open at both ends, and is provided with three ports, *d d' d''*, which extend circumferentially around the interior of the valve-chamber. The port *d* communicates with the supply pipe G, the port *d'* with a water-passage, H, which leads into the rear end of cylinder A, and the port *d''* communicates with the discharge pipe or faucet I. The plunger B has a forked bar, J, attached to one end of it, at its centre, and to each end of said bar a rod, K, is attached, said rods being parallel with each other, and passing loosely through flanges or bent ends of plates L L, the main portions of which are parallel with each other. The outer ends of these plates L L are connected by a pin or pivot-bolt, *e*, to one end of a rod, M, which passes loosely and longitudinally through the valve E, and has a head, *f*, on its outer end, as shown clearly in fig. 1. The outer ends of the rods K are provided each with a screw-nut, *g*, to bear against the flanges or bent ends of the plates L L, as the plunger B reaches the termination of its movement in the direction indicated by arrow 1. N is a toothed segment, which is suspended within the cylinder A, and gears into a pinion, O, one end of the shaft of which is provided with a crank, *h*, and the opposite end provided with a crank-wheel, *i*, the wrist-pin *j* of which passes through an arm, *k*, connected to a crank, *l*, on the inner end of a shaft, P, the outer end of the latter being provided with a pendent arm, Q, having a pawl, R, attached, which works into a ratchet, *m*, the shaft of the latter having an index, *n*, which works over a graduated dial-plate, *o*. The shaft P passes through a stuffing-box, *p*, into the cylinder A, to avoid leakage from the cylinder around said shaft. The crank *h* is connected to a spiral spring, S, the upper end of which is fitted on the pin or shaft on which the segment N is suspended. The plates L L have a pin, *q*, passing through them, and this pin passes into a slot, *r*, in the segment N, as shown in fig. 1. When the valve E is in the position shown in fig. 1, to wit, the port *d''* between the disk *b* and the plate F, the water will pass from the supply pipe G into port *d*, and thence into the passage G, and through the same into the rear end of cylinder A, as indicated by the blue arrows, forcing the plunger B in the direction indicated by the arrow 1. After the plunger has moved a certain distance in this direction, the forked bar J comes in contact with the plates L L, when the latter are shoved forward, and consequently the rod M and the segment N will be moved as it is connected to the plates L, and the pinion O turned so that the crank *h* will distend or stretch the spring S until the crank *h* passes its centre, when the spring S immediately contracts and suddenly throws the segment N forward, and causes a shoulder, *s*, on the rod M, to actuate the valve E, and slide or shift it so that the disks *b b'* will be in the position shown in red, and the water from

the supply pipe G made to act upon the opposite side of the plunger, as indicated by red arrows, and move said plunger in the direction indicated by arrow 2, while the water in the cylinder at the opposite side of the plunger will be forced back, as indicated by the red arrows through passage H and the port d'', and out of the discharge pipe or faucet I. As the plunger B approaches the termination of its movement in the direction indicated by arrow 2, the segment N is drawn back, in consequence of the rods K K drawing back the plates L L, and the pinion O will be turned in a reverse direction, and the spring S distended until the crank h passes its centre, when said spring instantly contracts and suddenly throws the segment N in the direction the plunger is moving, and causes the plates L L to move the rod M in a corresponding direction, so that the head f will move back the valve E to its original position, so that the water will be cut off in its flow, as indicated by the red arrow, and made to pass again through the passage H, as before, and move the plunger B in the direction as indicated by arrow 1, the water which previously passed into the cylinder, as indicated by the red arrows, being forced through the extension C, through the perforations e, in plate F, and thence out through the discharge pipe or faucet I, as also indicated by blue arrows.

When the invention is used as a gas-meter the operation is precisely the same. By referring to fig. 5 it will be seen that the pinion O is connected with its shaft by means of a pin, a^x, the latter being fitted tightly in the shaft, but passing into a slot, b^x, in the hub of the pinion, which slot is considerably wider than the pin a^x, and admits of the pinion having some play on its shaft. The object of this is as follows: When the plunger B is working the toothed segment N and the pinion O, the latter turns its shaft through the medium of the pin a^x, but the instant the crank h passes its centre, the crank-shaft, by means of the spring S, drives the pinion and the rack, and the valve. Now, it is necessary, for the accurate working of the meter, that the changes of the valve be prompt, and this is effected by means of the slotted hub, as it gives the crank h a little "lead," until the space or slot in the hub of the pinion is taken up, which, although small in the hub, is considerable on the crank-pin, and it comes to its work with a little blow, and into a position more favorable for the action of the spring. By adjusting or turning the nuts g of the rods K K, the latter may be virtually lengthened or shortened, and consequently the stroke of the plunger B graduated as may be required, and an exact measurement of the water obtained, and any irregularity in the bore of the cylinder compensated for. The bar J, to which the rods K K are attached, is connected to the plunger B by a screw or pin, c^x, to form a swivel connection, and admit of the plunger casually turning within the cylinder without affecting any of the parts attached to it. The amount of water discharged is indicated by the pointer or index n on the dial o, which is operated each time the pawl R is shoved in the direction of arrow 3, which occurs at every alternate movement of plunger B, or each time said plunger reaches one end of the cylinder. The valve E works in a balanced state, and still is not liable to casual derangement or movement of any kind.

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

1. The sliding-valve E, composed of the circular disks b b' and the perforated plate F, and fitted within the circular chamber D, provided with ports d d' d'', extending circumferentially all around the interior of the chamber, and placed or arranged in relation with the supply and discharge pipes G I, passage H, extension-chamber C, and cylinder A, to operate in the manner substantially as and for the purpose set forth.

2. The operating of the valve E from the plunger B, through the medium of the rods K, plates L, rod M, segment N, pinion O, and spring S, connected with the crank k of the shaft of the pinion O, all arranged substantially as shown and described.

3. The combination and arrangement of the rods K, screw-nut g, plates L, rod M, and bar J, as herein described, for the purpose specified.

4. The combination and arrangement of the clutch, consisting of the fixed pin a^x in the shaft of the pinion O, and the slot b^x in said pinion, with the crank h, spring S, slotted segment N, and plunger B, as herein described, for the purpose specified.

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