

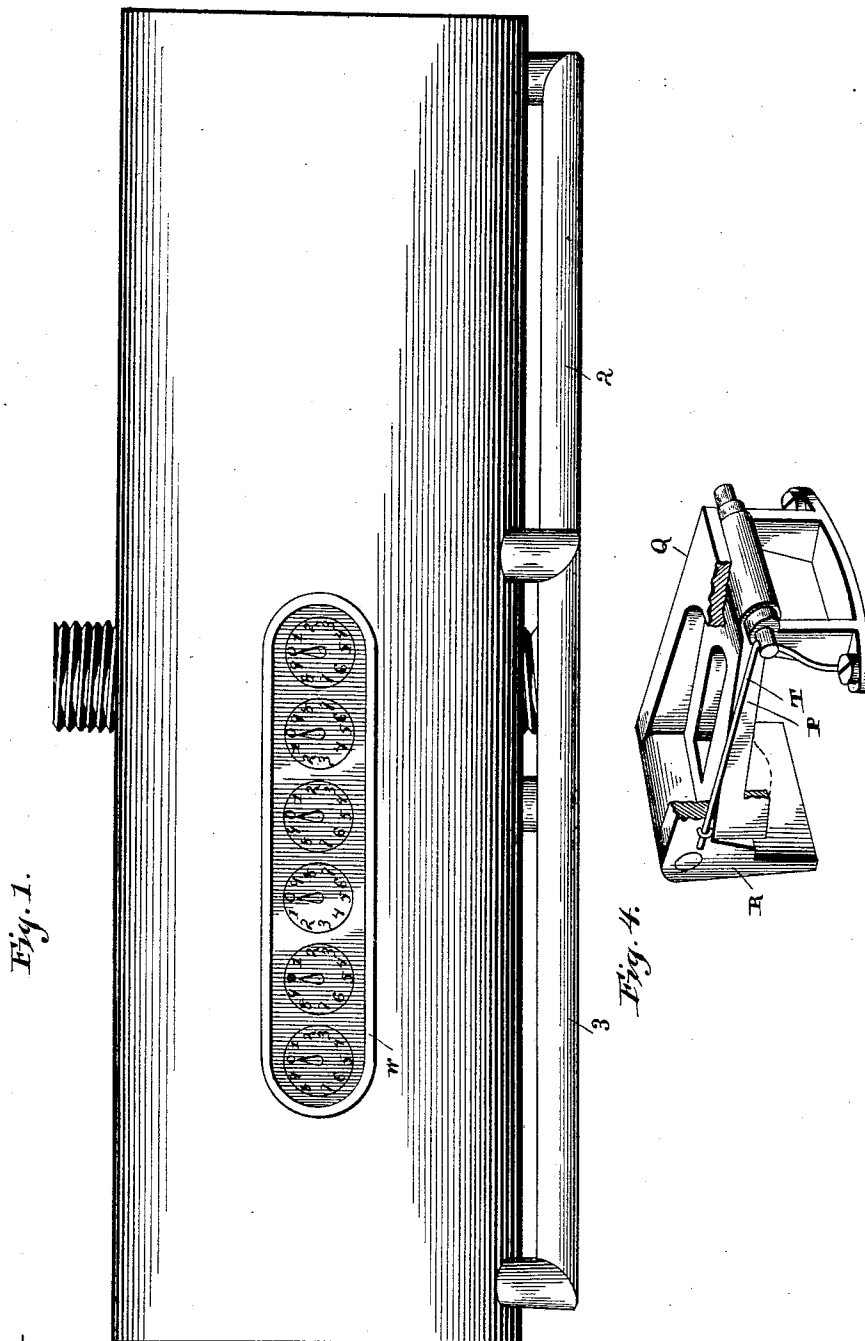
(No Model.)

2 Sheets—Sheet 1.

J. A. MYERS.
PISTON METER.

No. 480,606.

Patented Aug. 9, 1892.



WITNESSES.
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UNITED STATES PATENT OFFICE.

JOHN A. MYERS, OF LOUISVILLE, KENTUCKY.

PISTON METER.

SPECIFICATION forming part of Letters Patent No. 480,606, dated August 9, 1892.

Application filed March 25, 1892. Serial No. 426,435. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. MYERS, of Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Fluid-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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in fluid-meters; and it consists in certain novel features of construction, which will be fully described hereinafter, and more particularly referred to in the claims.

The object of my invention is to construct a meter of the piston type, which will measure with great accuracy the quantity of water which passes through it.

Referring to the accompanying drawings, Figure 1 is a plan view of my improved meter. Fig. 2 is a longitudinal vertical sectional view. Fig. 3 is a horizontal sectional view. Fig. 4 is a detail view of the valve-tripping mechanism.

A B represent the chambers in the opposite ends of the meter, and C a double head, which is located in the center of the meter, and which separates the said chambers. Extending through the center of this head is the longitudinal guideway C', through which extends the reciprocating rod D, to the ends of which are secured the piston-heads E and F, which move in the chambers A and B, respectively.

Inlet-chamber G and an outlet-chamber H are formed upon opposite sides of the meter by the double head C, and these chambers communicate with the chambers A B through the longitudinal ports I I', the former being regulated by the internal single valve K and the latter by the external double valve L, as shown. These valves are mounted on the valve-stems M, which extend through the valved opening of the head C and which are secured at their opposite ends to the longitudinally-moving valve-carriage N, supported on the extended ends of the guide C'. This carriage is provided on its ends with the depending perforated lips N', which move on the guiding-

studs N'', and by this means any rotary motion of the carriage is prevented, which if allowed would throw the valves out of proper adjustment, which they control.

O represents projecting bearings secured to opposite sides of the head C, and pivoted thereto are the arms P, which are slotted near their opposite ends and through which slots the rod D extends. These arms are formed with the projections P' on their inner sides, which bear against the valve-carriage N. The free ends of these arms have a slight upward turn, and pivoted thereto are the slotted trips Q, which extend backward over the arms P, as shown.

Projecting downward from the pivotal points are the arms R, which rest normally against the outer sides of the head C; but when the trips are turned on their pivots the said arms are thrown outward at their lower ends, and an inward pressure being exerted on the trips the arms are forced into the grooves S, formed in the opposite sides of the head C. These arms are held normally slightly inward from the said grooves by the springs T, secured to the bearings O and which exert an outward pressure on the trip Q, to which they are connected. The arms P, which are adapted to bear against the ends of the valve-carriage N, being connected to the trips Q, are held from contact with the carriage by the arms R and can only engage therewith when the said arms have been swung outwardly sufficiently far to enter the grooves S. By means of the inward movement of the arms P the positions of the valves are changed and the chambers A B alternately thrown in communication with the inlet and outlet chambers.

Placed upon the opposite ends of the rods D are the springs U, which are confined between the piston-heads and the arms P.

Formed upon the heads E F are the peripheral flanges V, which when the heads are drawn inward sufficiently far engage the outer ends of the trips Q, forcing them downward and at the same time throwing outward the lower ends of the arms R. When the trip Q is thus engaged by the flange V, the spring U is exerting a strong inward pressure on the arm P, so that when the lower end of the arm R reaches the slot S it is forced therein by the

action of the said spring, which at the same time forces the arm P inward, pushing with it the valve-carriage and reversing the positions of the valves.

- 5 Upon the top of the meter is a suitable registering mechanism W, which derives its motion from the inwardly-projecting shaft X, carrying the ratchet-wheel Y.

Extending into one of the meter-chambers 10 is a hollow casing Z, and placed therein is the longitudinally-moving spring-actuated rod Z', which engages the ratchet Y. This rod is moved inward against the pressure of the spring by the flange V on the piston-head, 15 and by this means the ratchet is given a partial turn, setting in motion the registering mechanism, which may be of any preferred construction.

The piston F, moving toward the right 20 hand, as shown in Fig. 2, the operation is as follows: The port I, communicating with the chamber A, being closed by the valve K, the opposite port is open, and water entering the chamber G passes therefrom to the chamber 25 B, and by the pressure of the water the piston F is moved outward, drawing inward the piston E. This movement continues by the flow of water until the lower end of the spring U reaches the arm P, against which it bears. 30 The said spring exerting considerable resistance, a strong outward pressure on the head F will be required to contract the spring sufficiently to bring the flange V on the inwardly-moving head into engagement with 35 the end of the trip Q. When sufficient pressure has accumulated, the trip is moved upon its pivot, throwing the arm R into the groove S and pushing inward the arm P and the valve-carriage, reversing the position of the latter. 40 During the above-described operation the chamber A is in communication with the discharge-chamber H, so that water in the chamber B in front of the outwardly-moving head F is free to pass through the pipe 2 to the 45 chamber A, and from thence to the discharge, as above described. A similar pipe 3 connects the chamber B with the outer end of the chamber A. It will be seen that a portion of the water entering the chamber from 50 the inlet G is conveyed through the pipe 3 to the outer end of the chamber A, thus creating a pressure in the same direction on each of the piston-heads. When the movement of the latter is reversed, the water 55 passes back through the pipe 3 into the chamber B, which is then in communication with the discharge-chamber H.

The meter can be adjusted to an exact and accurate scale of registration by gaging the 60 length of the reciprocating piston-rod D.

My improved meter is simple in construction, most effectual in its automatic operation, and is capable of a very exact registering adjustment.

- 65 Having thus described my invention, I claim—

1. The combination, with the double head

provided with longitudinal ports, valves therefor, and valve-stems upon which the said valves are mounted, of plates on opposite 70 sides of the head to which the said stems are connected, and guides projecting from the head on which the said plates move, substantially as shown and described.

2. The combination, with the double head 75 provided with longitudinal ports, valves therefor, and valve-stems upon which the valves are mounted, of plates to which the said valve-stems are connected and concentric and eccentric guides projecting from the head upon 80 which the said plates move, substantially as shown and described.

3. The combination, with a double cylinder and a double head therein having inlet and outlet chambers, which are provided with ports 85 on their opposite sides, of a double valve arranged within one of the chambers, two valves for the opposite chamber, a valve-carriage to which the said valves are secured, and a means for throwing the said valves, substan- 90 tially as shown and described.

4. The combination, with a cylinder, a double head therefor having inlet and outlet chambers which are provided with longitudinal 95 ports, valves for said ports, and a valve-carriage, of arms pivotally connected to the head and which bear against the said carriage, trips pivoted to the free ends of said arms having vertical and horizontal extensions, the latter 100 of which normally engage the head, but which are adapted to be thrown upward when their vertical arms are pushed inward, and longitudinally-movable connecting-pistons on opposite sides of the head, which engage the 105 trips and throw their vertical extensions inward, substantially as shown and described.

5. The combination, with a cylinder, a double head therefor having inlet and outlet chambers which are provided with longitudinal 110 ports, the heads being provided with exterior grooves, valves for the said ports, and a valve-carriage, of arms pivotally connected to the heads and which bear upon the said carriage, angular spring-actuated trips pivoted to the 115 outer ends of said arms, the horizontal arms of the said trips resting normally to one side of the grooves in the head, but which when 120 turned outward enter said grooves, and longitudinally-movable connected pistons on opposite sides of the said double head, which engage the trips and throw their horizontal 125 arms outward, substantially as shown and described.

6. The combination, with a cylinder, a double head therein having inlet and outlet chambers 125 which are provided with longitudinal ports, the head being provided with exterior grooves, valves for the ports, and a valve-carriage, of slotted arms pivotally connected to the head and which engage the said carriage, angular slotted trips pivoted to the 130 outer ends of the arms, the horizontal arms of the trips being adapted to enter the grooves in the heads when turned outward, a longi-

itudinally-movable rod extending through the said head, the slotted arms and the trips, and pistons on the opposite ends of the rod, which are adapted to turn the said trips upon their pivots, substantially as shown and described.

7. The combination, with a double cylinder having a double head therein, the latter being provided with longitudinal ports, the head being provided with exterior grooves, valves for the ports, and a valve-carriage, of slotted arms pivotally connected to the head, angular slotted trips pivoted to the outer ends of the arms, the horizontal arms of the trips being adapted to enter the grooves when turned outward, a longitudinally-movable rod extending through the head, the slotted arms and the trips, pistons on the opposite ends of the arms, which are adapted to turn the said trips upon their pivots, and springs on said rod between the tripping mechanisms and the pistons, substantially as shown and described.

8. The combination, with a cylinder, a double head therein having inlet and outlet chambers which are provided with longitudinal ports, the head being provided with exterior grooves, valves for the ports, and a valve-carriage, of posts projecting from the head, slotted arms pivoted thereto which engage

the said carriage, angular-slotted spring-actuated trips pivoted to the free ends of the said arms, the horizontal arms of the trips being adapted to enter the grooves in the head when turned outward, a longitudinally-movable rod extending through the head, the slotted arms, and the trips, flanged pistons secured to the ends of the rods, which are adapted to turn the said trips upon their pivots, and springs interposed between the pistons and the said slotted arms, substantially as shown and described.

9. The combination, with a meter of the character described, having a reciprocating piston, of a registering mechanism, a shaft projecting therefrom carrying a ratchet-wheel, and a longitudinally-movable spring-actuated rod which engages the said wheel at its inner end and which is engaged by the said piston at its outer end, substantially as shown and described.

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

J. A. MYERS.

Witnesses:

JOHN L. HENNING,
P. W. DIETRICH.