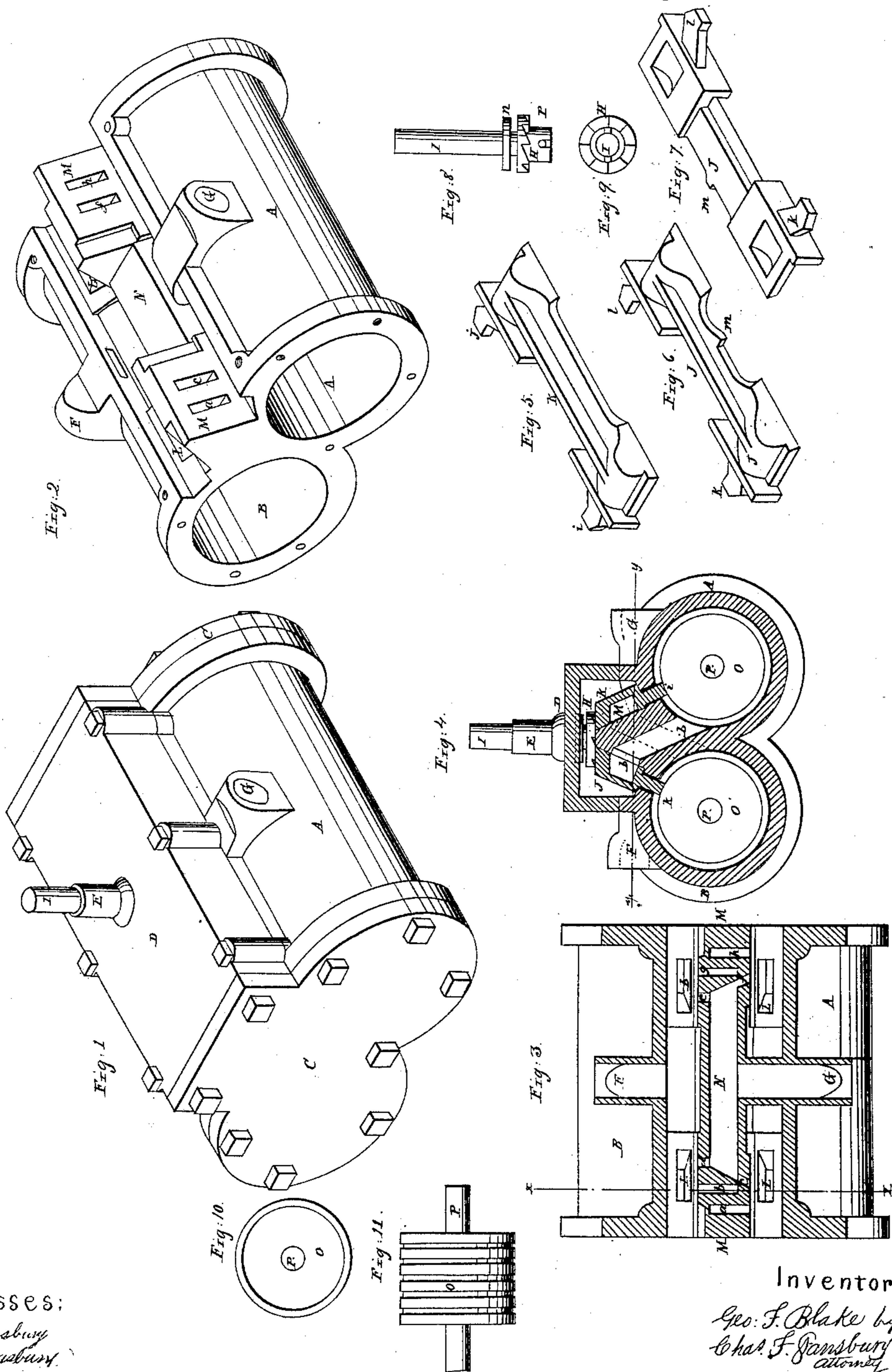


*G. F. Blake,
Piston Meter.*

No 34,857.

Patented Apr. 1, 1862.



Witnesses:

*Chas. F. Blake
N. J. Samsbury*

Inventor:

*Geo. F. Blake by
Chas. F. Samsbury
attorney*

UNITED STATES PATENT OFFICE.

GEORGE F. BLAKE, OF MEDFORD, ASSIGNOR TO HIMSELF, AND PETER HUBBELL, OF CHARLESTOWN, MASSACHUSETTS.

IMPROVEMENT IN WATER-METERS.

Specification forming part of Letters Patent No. 34,857, dated April 1, 1862.

To all whom it may concern:

Be it known that I, GEORGE F. BLAKE, of Medford, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Water-Meters; and I do hereby declare the following to be a correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is an isometrical perspective view of my improved meter complete. Fig. 2 is a similar view of the same with the cylinder-heads and valve-chest removed. Fig. 3 is a horizontal section through the line *y y* of Fig. 4. Fig. 4 is a transverse vertical section through the line *x x* of Fig. 3. Figs. 5, 6, and 7 are views of the slide-valves. Fig. 8 is a side view of the shaft of the registering apparatus with the ratchet-wheel attached. Fig. 9 is a bottom view of the ratchet-wheel. Fig. 10 is an end view of the piston or plunger, and Fig. 11 a side view of the same.

The same part is marked by the same letter of reference wherever it occurs.

The nature of my invention consists in the improved and simplified construction of that form of water-meter wherein the reciprocations of a piston or plunger in a cylinder of known capacity are made to operate a registering mechanism, and thus record the quantity of water passing through the instrument, all as hereinafter more particularly set forth.

To enable others to avail themselves of my invention, I will now describe the construction and operation of the instrument, referring to the drawings, wherein—

A and B mark a pair of cylinders of known capacity, made of brass, iron, or other suitable material. Their ends are closed by the heads C, which are bolted to the flanges of the cylinders in the usual manner. On top of the cylinders A B is the valve-chest D, which incloses the slide-valves and water-ways. From the top of the chest D rises a sleeve E, in which works the shaft of the registering mechanism.

F marks the inlet-pipe, and G the outlet or delivery pipe.

H is the ratchet-wheel, attached to the lower end of the shaft I of the registering mechanism.

J, Figs. 4, 5, and 7, is the slide-valve, which operates the ratchet-wheel H, and K, Figs. 4 and 5, is the opposite slide-valve.

L L, &c., are the slots in which the tappets *i j k l* of the slide-valves J K work.

M M mark the valve-seats.

N is the water way or passage leading to the delivery-pipe G.

O marks the pistons or plungers, which fit the cylinders A B and have a reciprocating movement in them, and P the shafts of said plungers.

The ports connecting the valve-chest with the cylinders A B and the water-way N are marked, respectively, *a b c d e f g h*. The port *a*, Fig. 3, leads from the front side of valve-seat M to the left-hand end of cylinder B. The port *b* leads from the rear side of valve-seat M to the left-hand end of cylinder A. Port *c* leads from the front side of valve-seat M into the water-way N, communicating with the delivery-pipe G. Port *d* leads from the rear face of the valve-seat into the water-way N. Ports *a* and *c* are controlled by the left-hand end of slide-valve K, while ports *b* and *d* are controlled by the left-hand end of slide-valve J. Port *e* leads from the rear side of the valve-seat into the right-hand end of the water-way N, and port *f* from the front side of the valve-seat to the same end of the water-way. Port *g* leads from the rear side of the valve-seat to the right-hand end of cylinder A, and port *h* from the front side of the valve-seat to the right-hand end of cylinder B. Ports *e* and *g* are controlled by the right-hand end of slide-valve K, the same valve that controls ports *b* and *d*. Ports *f* and *h* are controlled by the right-hand end of the same valve that controls ports *a* and *c*. The above description of the position of the ports applies to Figs. 2 and 3.

The slide-valves are clearly represented in Figs. 5, 6, and 7. They differ in form only in the fact that valve J has a notch *m* upon it which acts like a pawl or tooth to operate the ratchet-wheel H. The tappets *i j k l*, which project downward from the ends of the valves, pass through the inclined slots L and project into the cylinders A and B near their ends. The slots L are long enough to allow play to the tappets equal to the stroke of their respective valves.

The slide-valves are operated by the striking of the pistons against the tappets at the end of each stroke.

The instrument being in the condition represented in Fig. 2, the remaining parts are added as follows: The plungers *O O'* are inserted in the cylinders *A* and *B*, respectively, and the slide-valves are put in place. The ratchet-wheel *H* is so fixed as to engage the tooth *m* of slide-valve *J* when the valve-chest *D* is put on, the shaft *I* being passed up through the sleeve *E*, in which it is supported and works. The heads *C* are then bolted onto the flanges of the cylinders, and the instrument is complete. The shaft *I* is made to operate any registering mechanism that may be preferred, such mechanism forming no part of my present invention. The shaft *I* has a flange *n* near its lower end, against which the wheel *H* rises and rests when in its highest position. The shaft *I* also has a pin *p* below the wheel *H*, which supports said wheel in its lowest position. The wheel *H* is capable of moving up and down on shaft *I* within the limits just described; but it is prevented from rotating on the shaft by the pin *p*, which is received into a slot in the box or sleeve of said wheel, as clearly shown in Figs. 8 and 9. The teeth of wheel *H* are on its lower face. They engage with the tooth or notch *m* on slide *J*, and the wheel is rotated one tooth at each entire stroke of that slide. The slide acts upon the wheel only while moving in one direction. While moving in the opposite direction the tooth of the wheel slides up on the inclined face of the tooth *m* and receives no rotary impulse. The plungers *O* and *O'* are cylindrical in shape, as shown in Fig. 11, and have shafts *P*, which project from their ends and limit the length of their stroke. These plungers may be wholly of metal, or of metal packed with leather.

The operation of the instrument is as follows: The water is admitted to the valve-chest through the inlet-pipe *F* and enters port *a*, driving plunger *O'* to the right-hand end of cylinder *B*, the water in front of the plunger escaping through ports *h* and *f* into water-way *N*, and so out through delivery-pipe *G*. When plunger *O'* comes near the end of its stroke, its forward edge strikes the tappet *l* of slide-valve *J*, and so places that valve as to allow the water to enter port *g* and drive the plunger *O* toward the left-hand end of cylinder *A*, the water in that cylinder escaping through ports *b* and *d* into water-way *N* and out at delivery-pipe *G*. This operation is continually repeated as long as the water is passing through the instrument. The plungers reciprocate in opposite directions and the ports of one cylinder are controlled by the plunger of the opposite one. At each stroke of the plungers the ratchet-wheel is rotated a distance equal to that between its teeth.

Having thus fully described the construction and operation of my invention, what I claim, and desire to secure by Letters Patent, is—

1. Operating the registering mechanism of a water-meter by means of a ratchet-wheel driven directly by the slide-valve, substantially as described.

2. The tappets *i j k l*, in combination with the slides *J K*, slots *L*, and plungers *O O'*, arranged and operating substantially in the manner set forth.

The above specification signed and witnessed this 24th day of February, A. D. 1862.

GEORGE F. BLAKE.

Witnesses:

J. E. M. GILLEY,
I. H. HUBBELL.