C. Moore.

Rotary Meter.

No. 92,082. Patented Jun. 29, 1869.

Fig. 6.

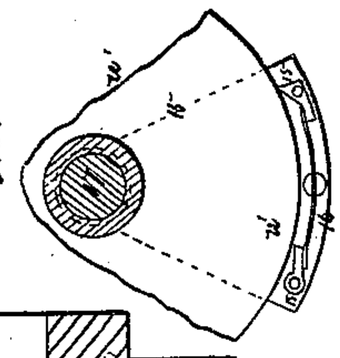


Fig. 5.

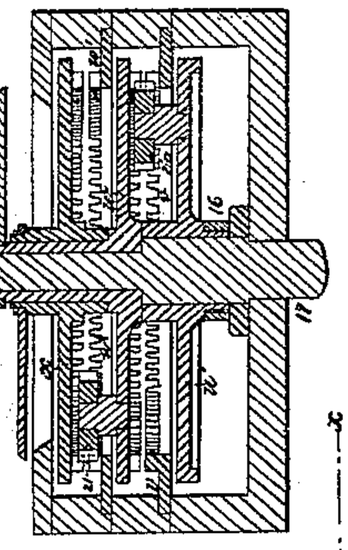


Fig. 3.

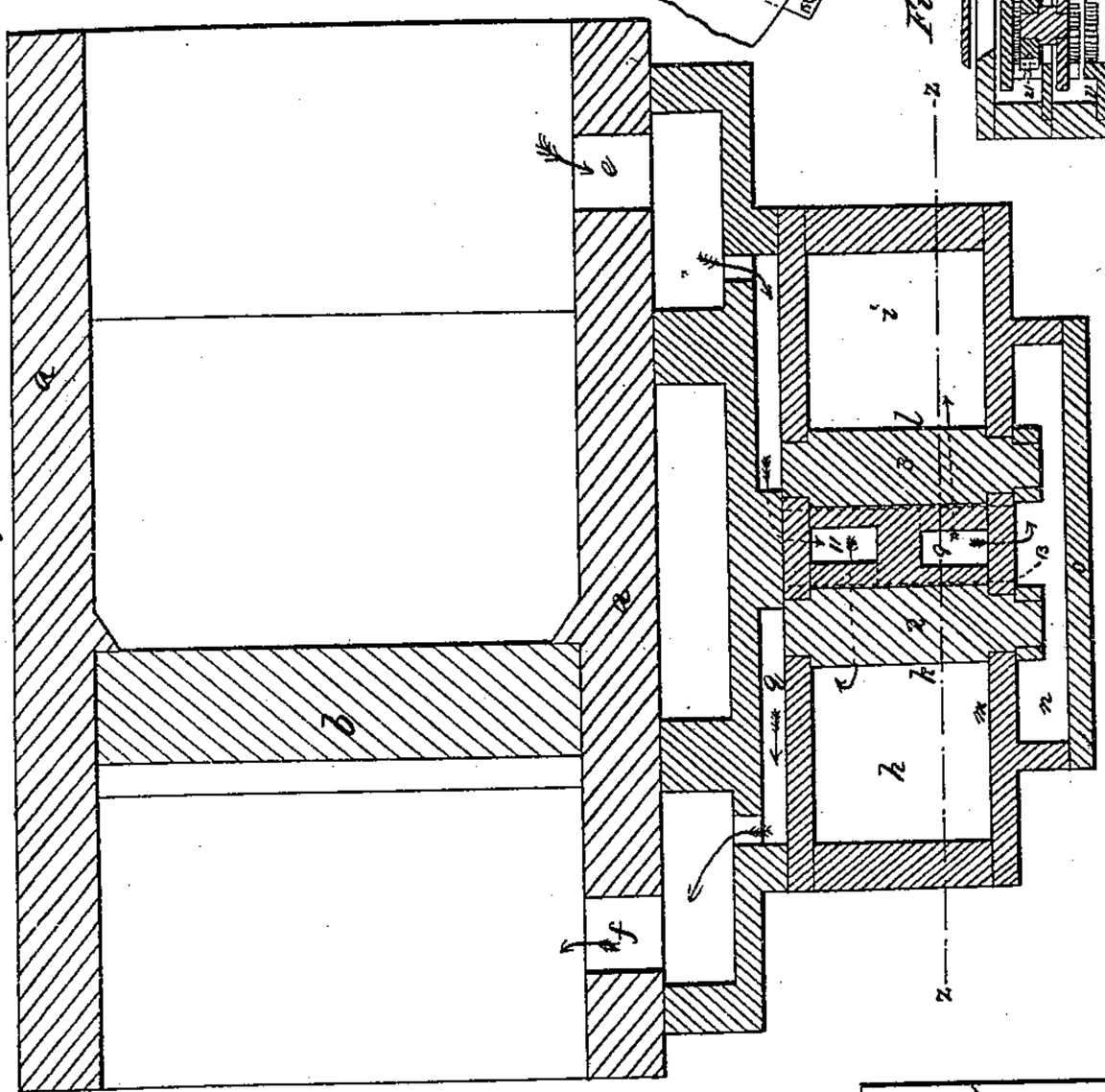


Fig. 2.

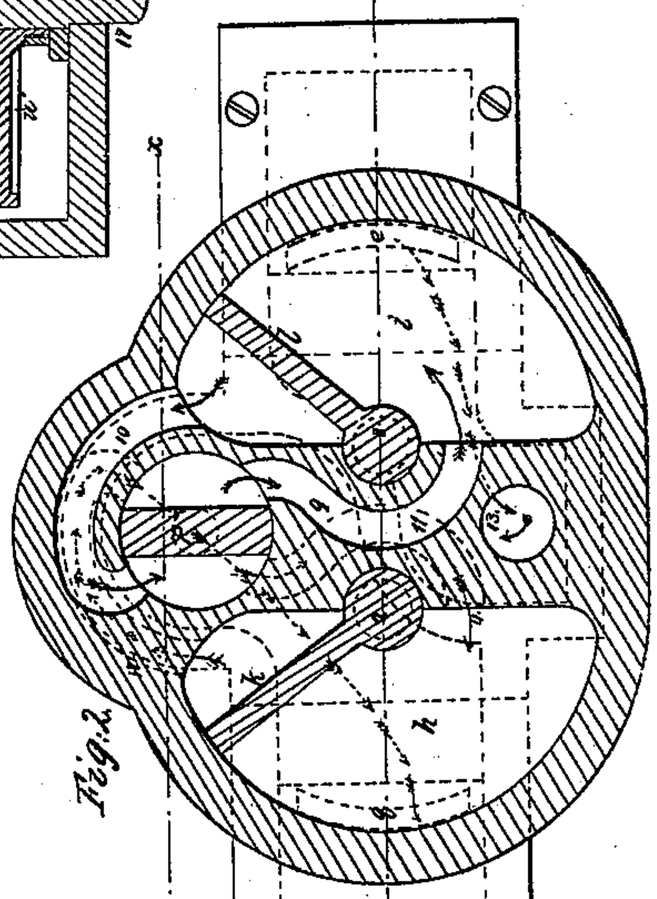


Fig. 4.

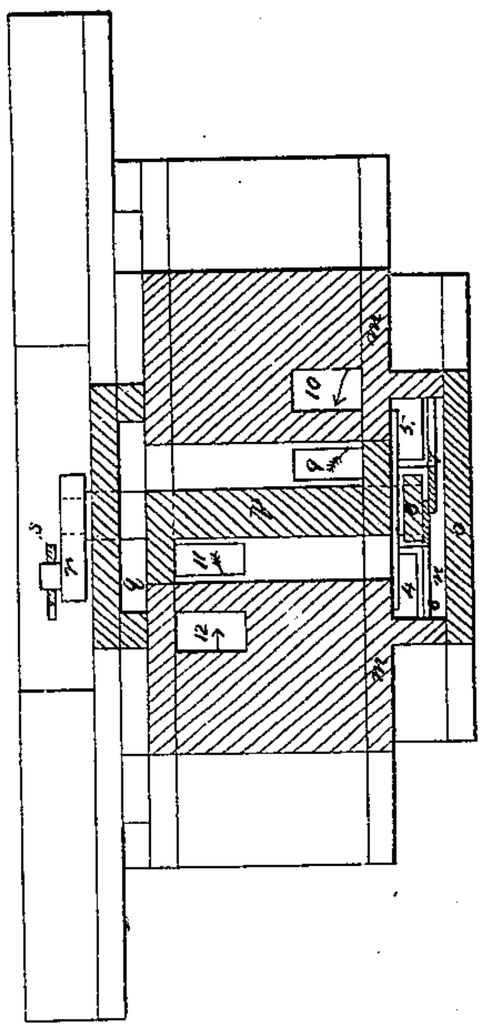
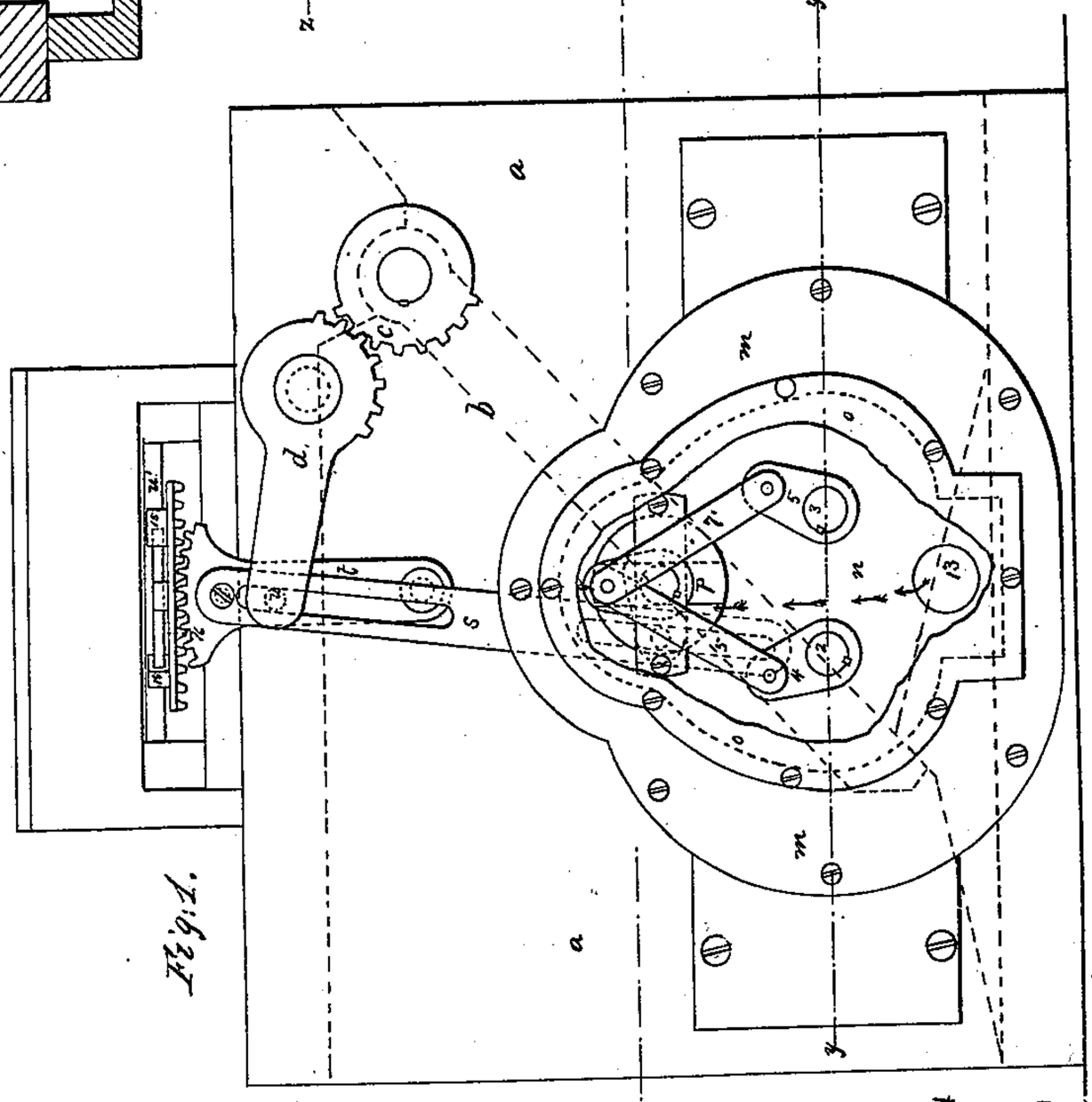


Fig. 1.



Witnesses
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CHARLES MOORE, OF NEW YORK, N. Y.

Letters Patent No. 92,082, *dated June* 29, 1869.

IMPROVEMENT IN FLUID-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, CHARLES MOORE, of the city and State of New York, have invented and made 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 said invention, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1 is an elevation of said meter, with the cap-plate of the motor broken open to show the cranks;

Figure 2 is a section vertically of the motor at the line *z z* of fig. 3;

Figure 3 is a sectional plan at the line *y y*, fig. 1;

Figure 4 is a sectional plan of the valve of the motor at the line *x x*;

Figure 5 is a vertical section of the indicating-mechanism; and

Figure 6 is a plan of part of the friction-wheel and clamp for moving the indicator.

Similar marks of reference denote the same parts.

This invention is intended to measure the quantity of water, or other liquid, gas, or other fluid, that may be allowed to pass through a pipe. The registering-motion is derived from the fluid that passes through a small pipe, and acts upon swinging pistons or diaphragms, and the extent of registering-motion is increased proportionately to the movement given to a swinging gate in the main supply-pipe, so that when but a small quantity of liquid is being used, the measure will be accurate, and when there is a large amount of fluid passing through the pipe, the measure is effected by the increased movement given to the registering-device by the motor-portion of the apparatus, in consequence of the gate being opened by the liquid flowing past it. This renders it unnecessary to have all the fluid pass through the motor-portion of the apparatus; hence this meter can be adapted to large or to small pipes with facility, and without change in the motor-portion.

In the drawing—

a represents a square trunk or pipe, to the ends of which the water or fluid-pipes are connected. Within this a gate, *b*, is hung, as shown by dotted lines, fig. 1, and this acts at its fulcrum upon the pinion *c* and segmental pinion and arm *d*, for a purpose hereafter named.

When only a small quantity of liquid is being drawn, it passes in at the orifice *e*, (see fig. 3,) through the motor, and returns on the other side of *b* into the tube *a*, by the opening *f*. When the quantity of fluid exceeds the capacity of *e f*, then the pressure causes the gate *b* to rise a distance proportioned to the quantity of liquid or fluid passing along through *a*, and this motion makes the registering-mechanism denote the proper measure of the fluid.

The orifice *e* is connected with the inlet-ports of the respective chambers *h i*, as hereafter described.

The pistons, or diaphragms *k l* are fitted to swing in the chambers *h i*, upon the arbors or shafts 2 and 3. These arbors project through the head-plate *m* into the chamber *n*, between *m* and a cap-plate, *o*; and in this chamber *n* are the cranks 4 and 5, united by the links 6 and 7, with a crank, 8, on the arbor of the rotary valve *p*. The length of these respective cranks is such that the swinging of the pistons *k l* in their respective chambers shall cause the rotation of the valve *p*.

This rotary valve *p* is made as a cylinder from which segments are removed on opposite sides, as seen in fig. 4, to form water-ways, one opening at the front into the chamber *n*, and the other at the rear into the channel *q* that connects with the outlet *f*.

9 and 10 are the ports to the chamber *i*, and there are corresponding ports, 11 and 12, to the chamber *h*, shown by dotted lines in fig. 2, also in fig. 4.

The water passes through the hole 13 into the chamber *n*, and by the rotation of the valve *p*, said water or fluid is admitted, to first one side of the piston *l*, and then the other, the eduction on one side being opened simultaneously with the induction on the other side of the piston *l*.

The fluid is admitted to act upon the piston *k* in the same manner, but in consequence of the arrangement of the cranks 4 and 5, and connections, there is a sufficient lead for one piston to complete its stroke, while the other piston is still operative, and thereby prevent the cessation of the power that rotates the valve *p*, and there is no dead-point or centre upon which the crank 8 can stop, as the connecting-rods 6 and 7 stand at different angles to said crank.

The motor, formed and operated as aforesaid, by the passage of a small quantity of fluid, is employed to operate the registering-mechanism by means of a crank, *r*, (see fig. 4,) at the rear end of the arbor of the rotary valve *p*, which crank *r* acts in the slot of a swinging lever, *s*, that is jointed at its upper end to the feed-motion arm *t*, and has for its fulcrum a pin, *u*, in the end of the arm *d*.

The registering-apparatus is formed of a wheel, *u'*, acted upon by clamping-pawls 15, that are similar in action to the clamp of a wheel-feed on a sewing-machine.

These clamps 15 are upon a plate, 16, that has the stud 17 for its centre, and it will now be apparent that when the gate *b* is closed, the clamps 15 will move the wheel *u'* a given distance each rotation of the valve *p*, but when the gate *b* is raised, the fulcrum *u* is lowered, increasing the motion of the clamps and the wheel *u'* in proportion to the amount the gate *b* is raised, and the consequent flow of the fluid.

From the wheel *u'* the indicator or dials usually employed to register the number of revolutions receive motion. I have shown a series of wheels for this purpose.

Upon the wheel *u'* is a pinion, 20, the teeth of which

gear into the teeth around a stationary circular rack, *v*, and also into the teeth on the under side of the wheel *w*. There is one less tooth in the wheel *w* than in the rack *v*; hence, for every revolution of the wheel *u*, the wheel *w* will be moved the extent of one tooth. This mode of indicating the number of revolutions may be still further extended by using the pinion 21, rack *w'*, and wheel *x*.

The arbors of the respective wheels *w* and *x* are to be pipe-shaped, and provided with hands or dials, and if required, the computation might be still further extended by the use of a greater number of wheels and racks.

What I claim, and desire to secure by Letters Patent, is—

1. The combination of the following devices: first, the swinging pistons *k l*, actuated by a portion of the fluid; second, the gate *b*, that is opened in proportion to the flow of water; third, the indicator that is connected to the gate, substantially as set forth, so that the movement of the gate causes the indicator to act in proportion to the flow of water, as specified.

2. The swinging pistons *k l* in the chambers *h i*, in combination with the rotary valve *p*, inlet and eduction-ports 9, 10, 11, 12, and cranks 4, 5, and 8, arranged and acting in the manner and for the purposes set forth.

3. The lever-link *s*, between the crank *r* and clamp that operates the wheel *u'* of the indicator, in combination with the arm *d* and fulcrum-pin *u*, operated by the movement of the gate *b*, as and for the purposes set forth.

4. The indicator, formed of the wheel *u'*, pinion 20 rack *v*, and wheel *w*, in combination with the actuating-clamp 16 and levers moving the same, as set forth.

In witness whereof, I have hereunto set my signature, this 9th day of March, A. D. 1869.

CHARLES MOORE.

Witnesses:

CHAS. H. SMITH,

GEO. T. PINCKNEY.