

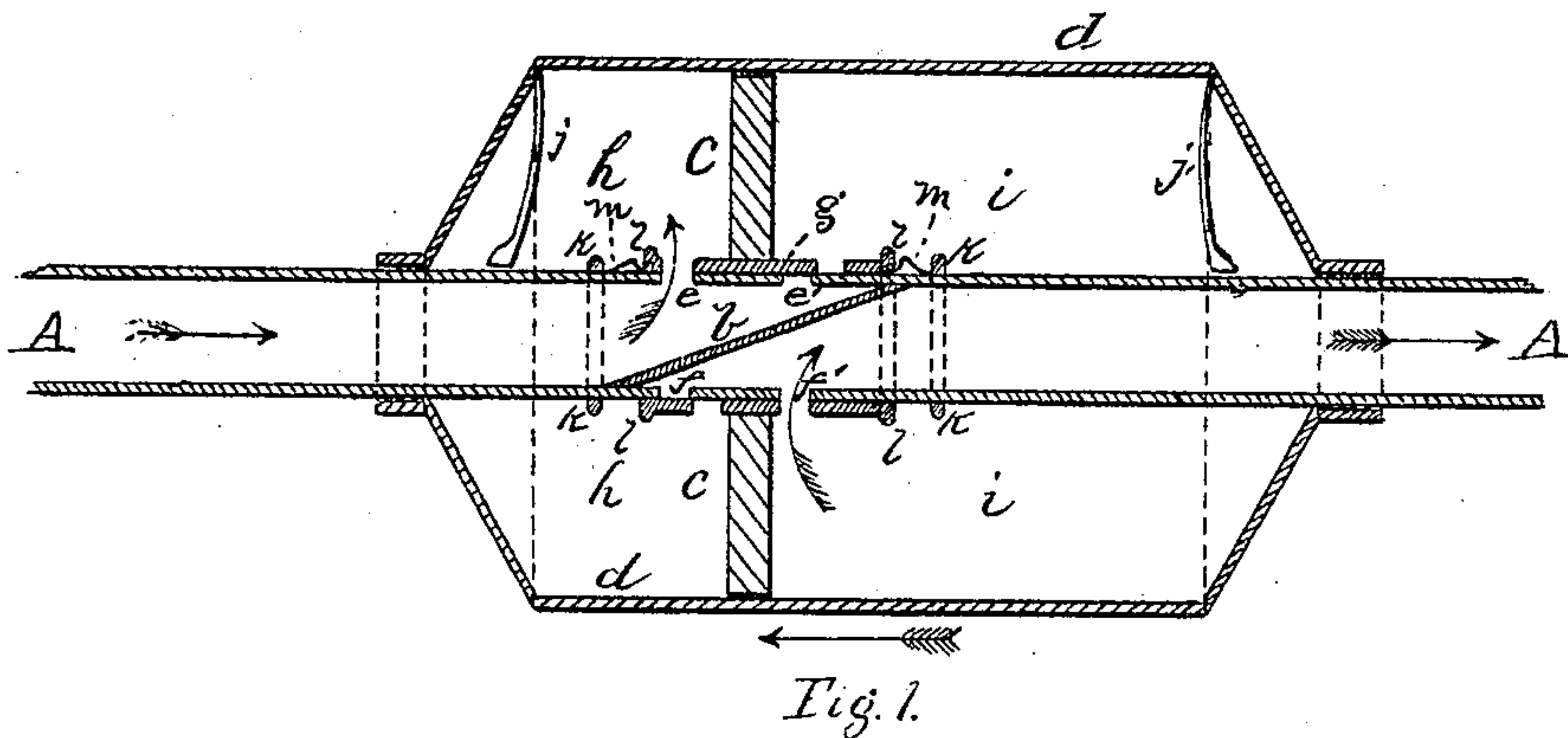
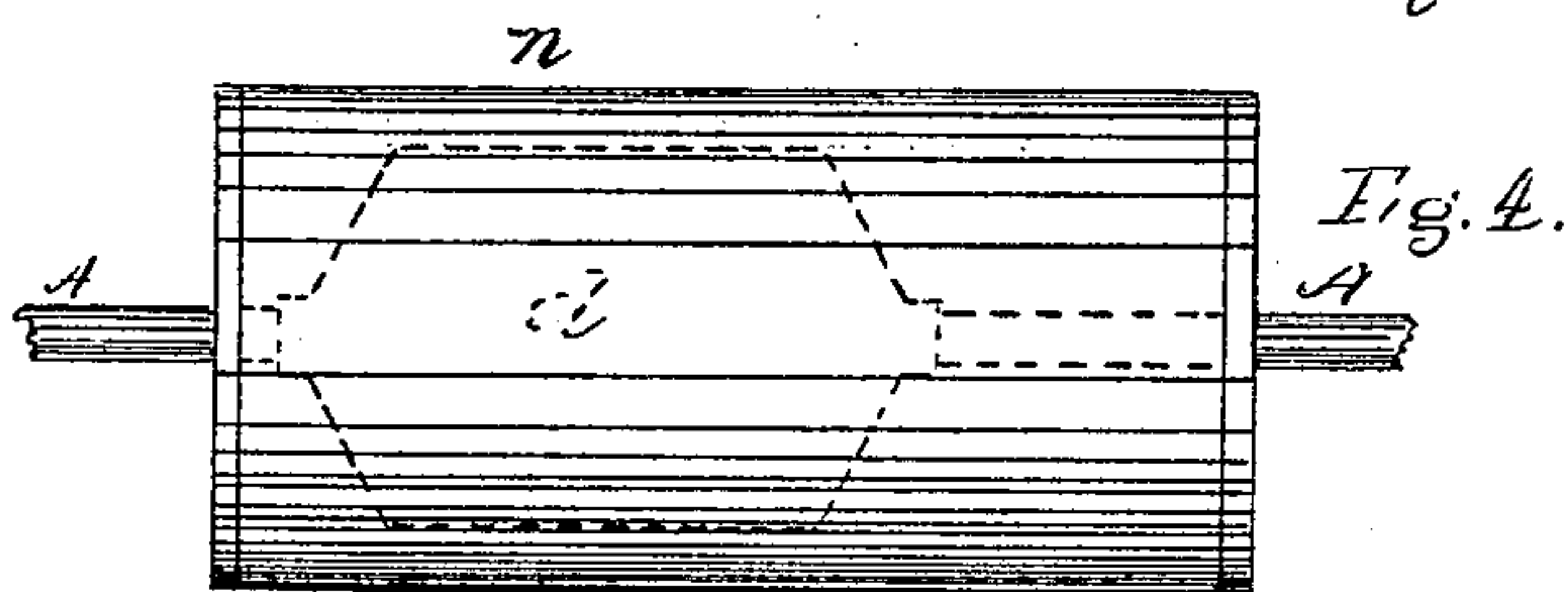
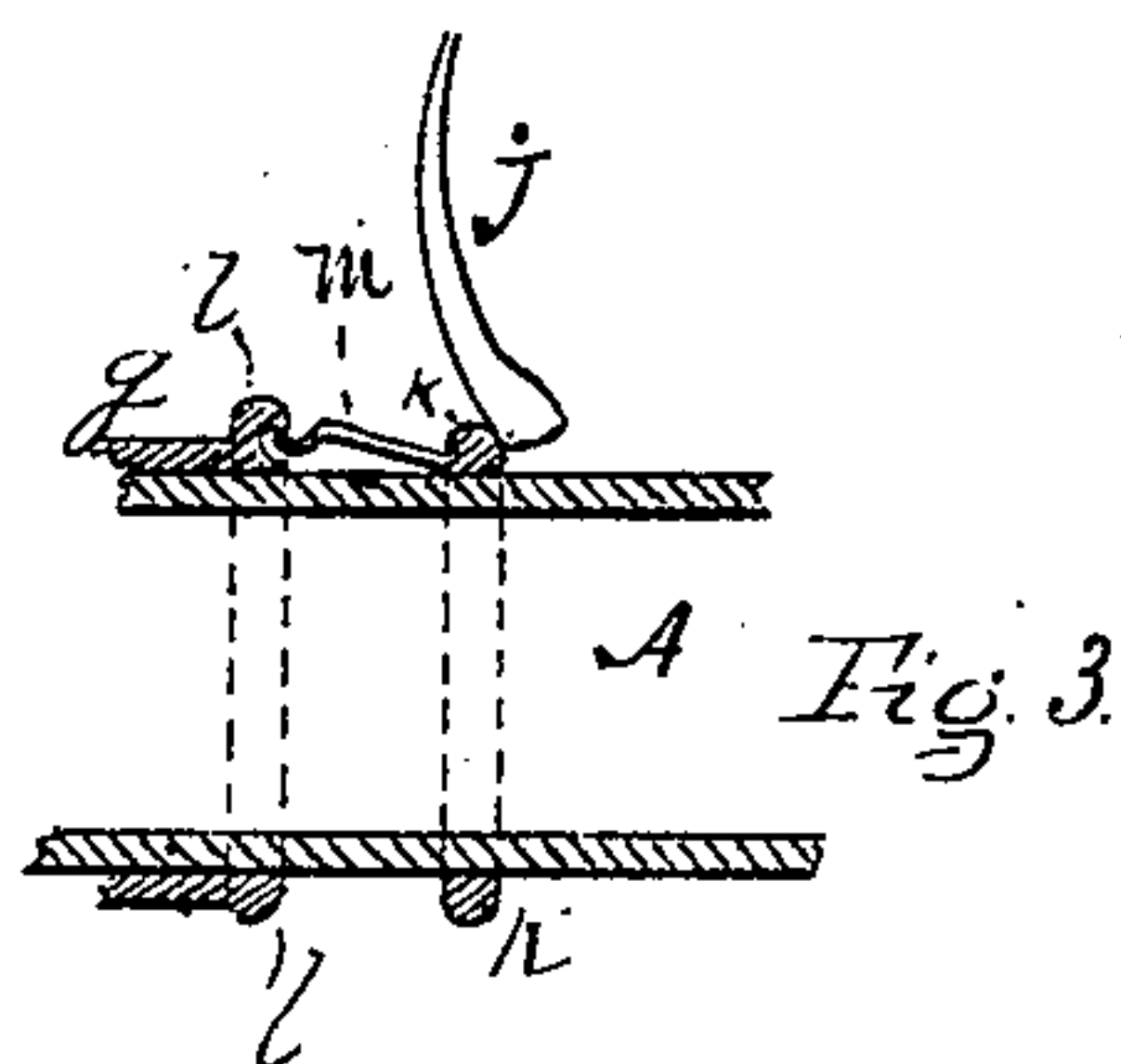
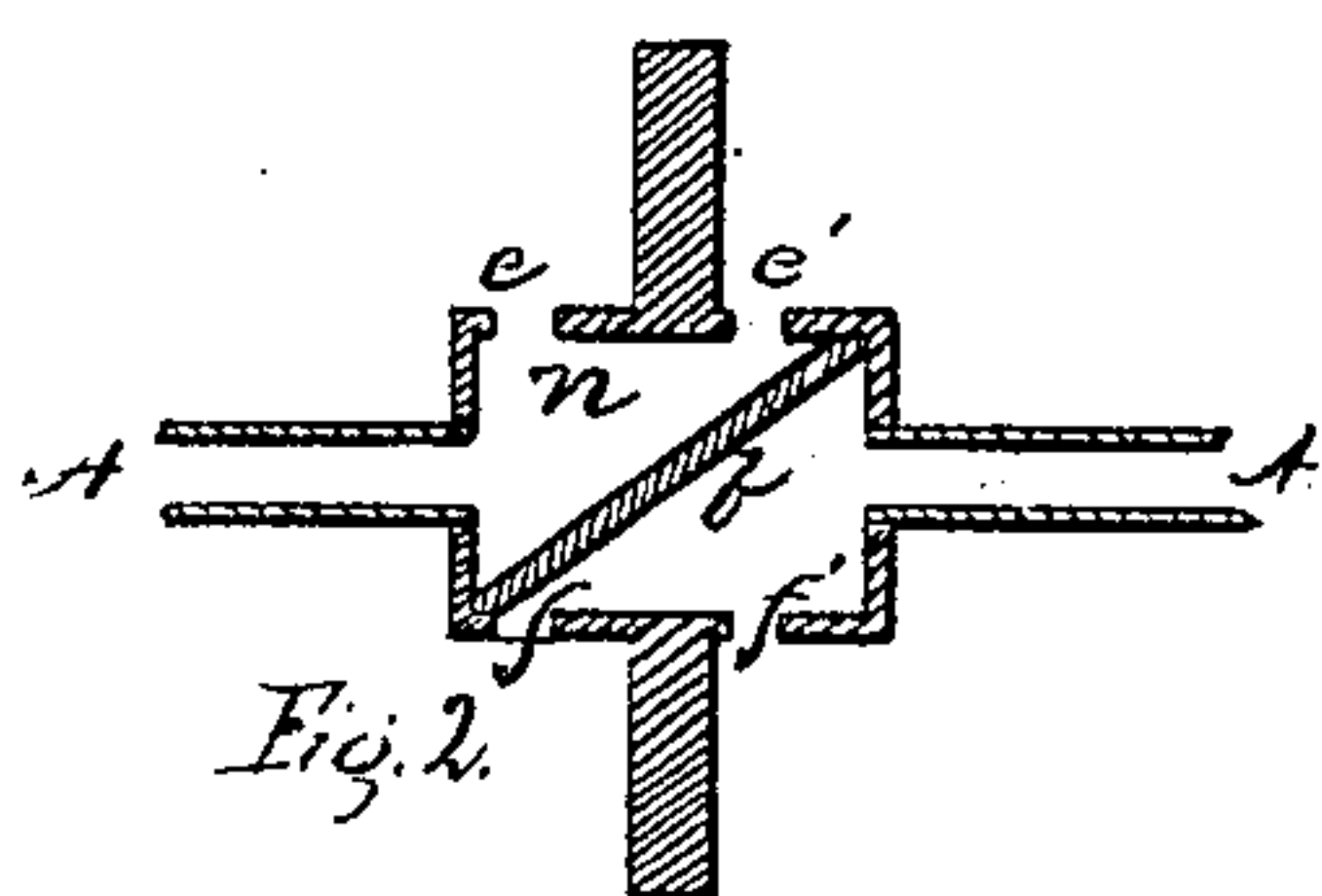
(Model.)

R. S. MORISON.

WATER METER.

No. 245,310.

Patented Aug. 9, 1881.



Witness
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UNITED STATES PATENT OFFICE.

RUSSELL S. MORISON, OF BANGOR, MAINE.

WATER-METER.

SPECIFICATION forming part of Letters Patent No. 245,310, dated August 9, 1881.

Application filed February 15, 1881. (Model.)

To all whom it may concern:

Be it known that I, RUSSELL S. MORISON, of Bangor, in the county of Penobscot and State of Maine, have invented certain new and useful Improvements in Water-Meters; and I do hereby declare that the following is a full, clear, and exact description of the invention, which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 shows a longitudinal section of my invention; Fig. 2, a modification; Fig. 3, a detail of retaining-spring; Fig. 4, a side view of water-jacket.

Same letters show like parts.

My invention consists of an improved water-meter operating automatically by the action of the water passing through it. It is simple and cheap in construction, and is capable, with slight change, of serving as a water-motor. It will be readily understood by reference to the accompanying drawings.

A A show a section of the water-service pipe, divided at *b* by a diagonally-placed dam. At *c* is a stationary head, packed around its periphery and fitting closely a cylinder, *d*, arranged to slide on the pipe A, and closely packed at its ends. This cylinder may be of any convenient size or length, and furnishes the measure for the water, as hereinafter described. The current of water being in the direction of the arrows, the pipe A, on each side of the head *c*, is provided with an induction-port, *e e'*, and eduction-port *f f'*. These ports are alternately opened and closed by a sleeve, *g*, serving as a valve, its parts connected through the permanent head *c*, so as to be operated from either side thereof. By it the ports are opened in pairs, so that while an induction-port is open on one side of the head an eduction or discharge port is simultaneously open on the opposite side. The head *c* being stationary, the cylinder is divided by it into two chambers, *h i*. Now, the induction-port *e* of the chamber *h* being open and the water admitted through the pipe, it gains access, under full head, to the chamber *h*, filling it and forcing the cylinder along the pipe, at the same time diminishing the length of the chamber *i*. As the head of

this cylinder approaches the fixed head *c* the sleeve *g* is automatically operated, as will be hereinafter explained, closing the induction-port *e* of the chamber *h* and opening the discharge-port *f*, while at the same time the induction-port *e'* of the chamber *i* is opened and the port *f'* closed. The water is now admitted to the chamber *i* and discharged from *h*, and the motion of the cylinder on the pipe is reversed until the chamber *i* is filled, when the sleeve is again operated with like result as before. The number of times the cylinder travels on the pipe may be registered by any of the well-known registering devices, and will accurately indicate the consumption of water.

The method of operating the valves shown in the drawings is as follows: To each of the heads of the cylinder *d* is attached a spring, *j* or *j'*, and the pipe A is provided at *k k* with stops or rings placed a short distance from the ends of the sleeve or valves *g*, which are also turned up, as at *l l*, sufficiently to receive the blow from springs *j j'*. As the cylinder approaches the permanent head the spring *j* is forced against the ring *k*, bending it back. As the chamber becomes full it is released, striking the valve or sleeve sharply, and instantaneously reversing the valves, as before described; but I do not desire to limit myself to the precise form of the devices employed for operating the ports, the gist of this feature of my invention being that the spring-strikers should be set or compressed by the action of the incoming water, and released when the chamber is full, instantaneously reversing the valves by percussion against them.

In order to guard against any accidental displacement of the valves, springs *m* may be attached to the pipe, inclined upward from the stop *k* to the under side of the sleeve or valve-stem, and entering a cavity therein. When the spring *j* is released from the stop it strikes first the spring *m*, pressing it down and releasing the valve, which can then be operated by the continuation of the blow. This is illustrated in the detail.

Instead of placing the dam across the service-pipe itself, a chamber, *n*, (see modification,) having the permanent head attached and containing the dam and ports, with appropriate valves, may be used and the service-pipe cut

and screwed into each end of the chamber. The cylinder will move on the pipe A, as before; nor do I consider this change as affecting the principle of my invention.

5 The reciprocating cylinder may, if desired, (to avoid too close packing,) be covered with an outer cylinder or jacket, *n*, closely packed upon the pipe A, and having sufficient length to permit the movements of the reciprocating
10 cylinder. This jacket may be filled with water; but I do not consider this attachment as always essential.

As the cylinder has a reciprocating motion, impelled by the full head of the water, the
15 power thus obtained may be utilized as a motive power by the attachment to the cylinder of a connecting-rod with the ordinary guides, &c., and motion communicated through it to machinery, &c.

20 I do not claim a meter embodying a stationary casing secured to the service-pipe and inclosing a reciprocating piston-head carrying valves operated by pressure against the heads of the cylinder, either with or without interme-
25 diate springs. In my meter the head is stationary and the valves are operated by the motion of the cylinder through the percussive action of the springs *j j'*, thus causing an instantaneous reversal of the valves.

30 What I claim as my invention is—

1. In a water-meter, the combination of the divided service-pipe, the stationary head, the induction and eduction ports on each side thereof, and the reciprocating cylinder, actuated by

the force of the water and automatically oper- 35
ating the valves thereof by its motion through the percussive action of the springs *j j'*, substantially as and for the purposes set forth.

2. In a water-meter, the combination of the service-pipe A, diagonally dammed at *b*, and 40
provided with the stationary head *c* and ports *e e' f f'* on each side thereof, sleeve or valves *g*, connected through the head *c*, spring-stri-
45 ckers *j j'*, and reciprocating cylinder *d*, automatically moved by the force of the water on said pipe A, and forming, with the head *c*, the cham-
bers *h i*, alternately filling and discharging by the action of the water, substantially as here-
in set forth.

3. In a water-meter, the combination of the 50
divided service-pipe A, head *c*, ports *e e' f f'*, and reciprocating cylinder *d*, with springs *j j'*, attached to the cylinder-heads, stops *k*, and sleeve
or valves *g*, operating substantially as set forth.

4. In combination with the sliding sleeve or 55
valves *g*, the retaining-springs *m*, operated by the springs *j j'*, as herein described.

5. In combination with a water-meter em-
bodying a reciprocating cylinder substantially
as described, the water-filled cover or jacket *n*, 60
substantially as and for the purposes specified.

In testimony that I claim the foregoing I have hereunto set my hand this 10th day of February, 1881.

RUSSELL S. MORISON.

Witnesses:

ARTHUR M. MASON,

WM. FRANKLIN SEAVEY.