

Henry M. Bartlett.

119,004,

WATER METER.

Patented Sep. 19, 1871.

Fig. 1.

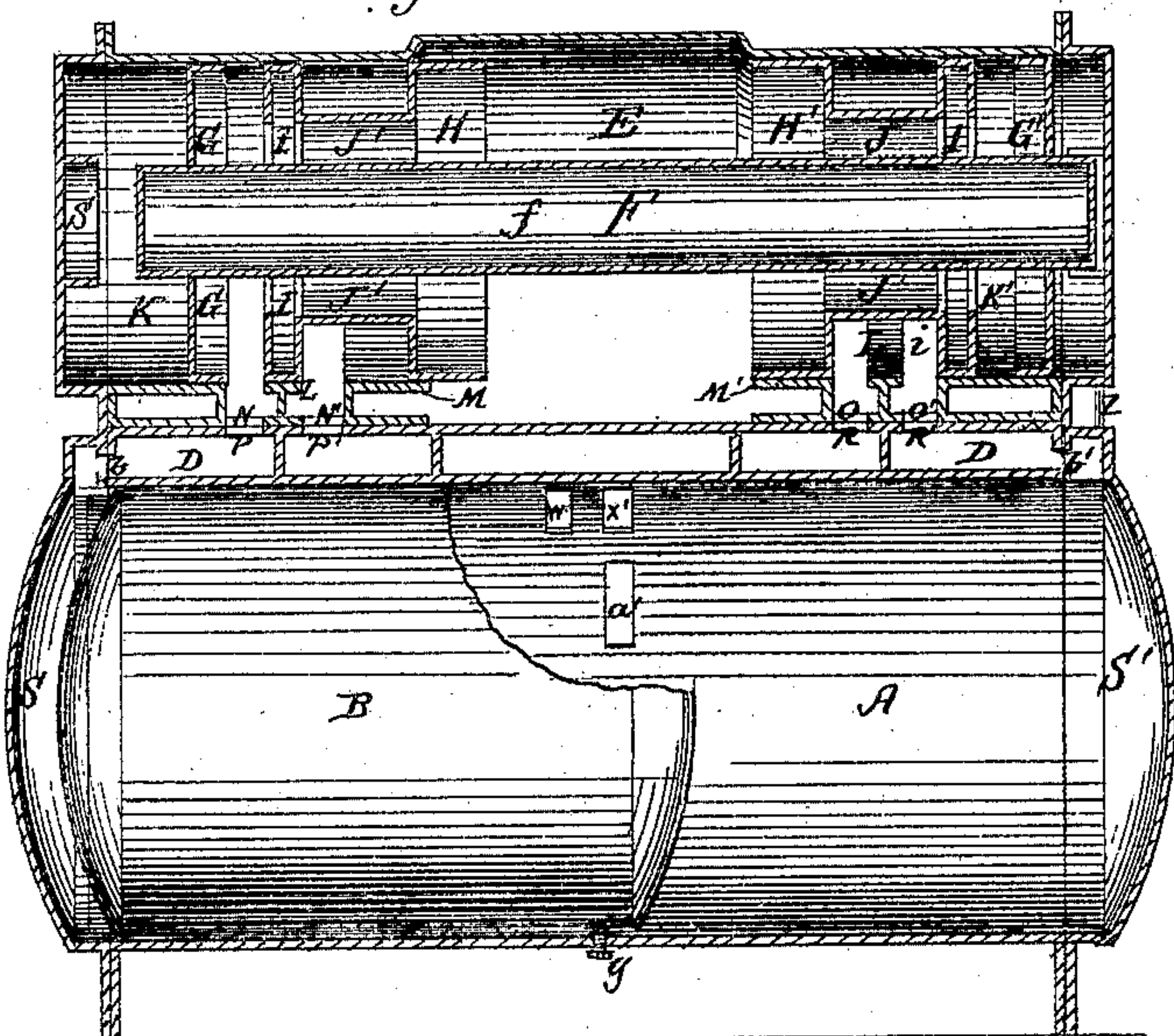


Fig. 2.

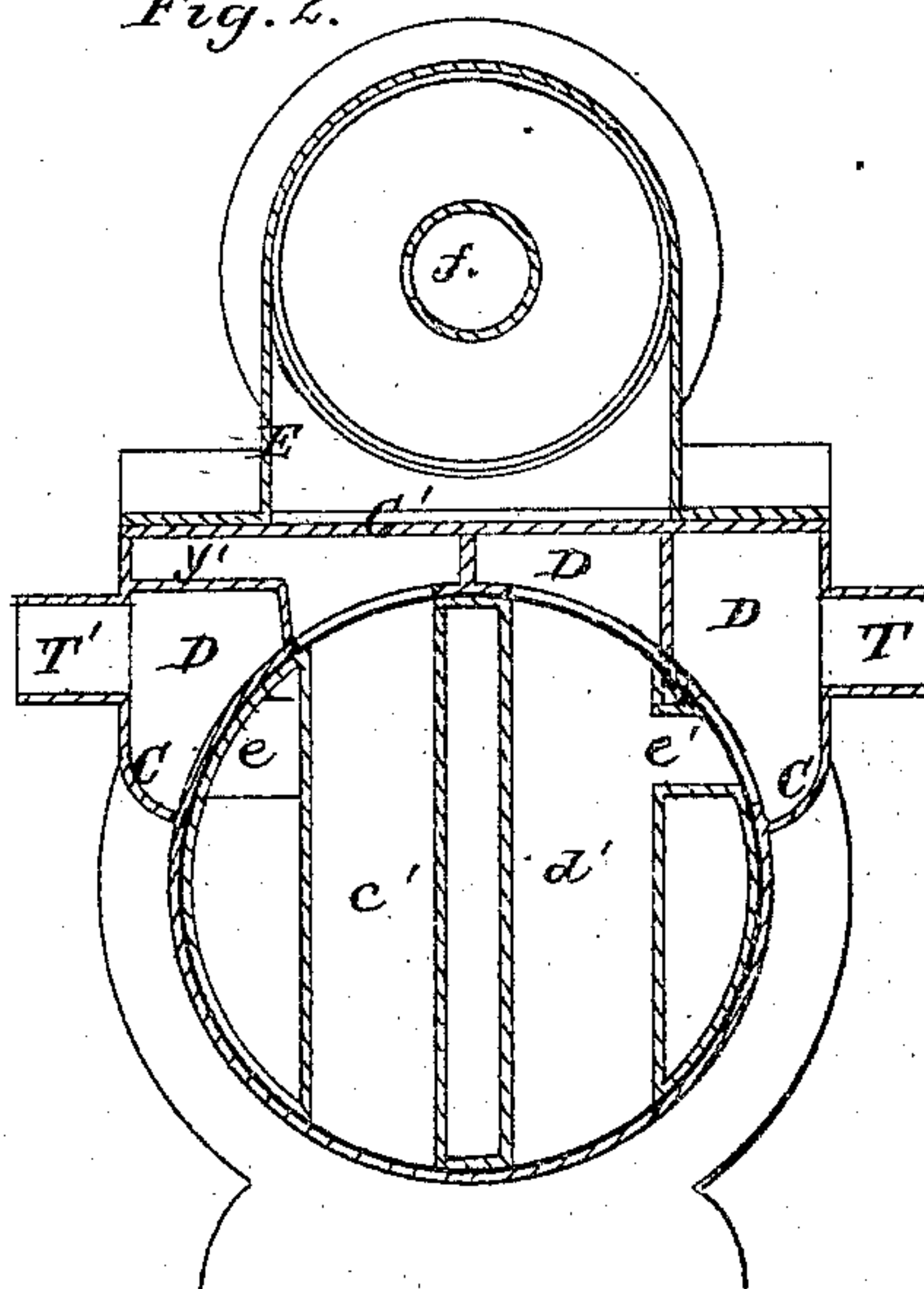


Fig. 3.

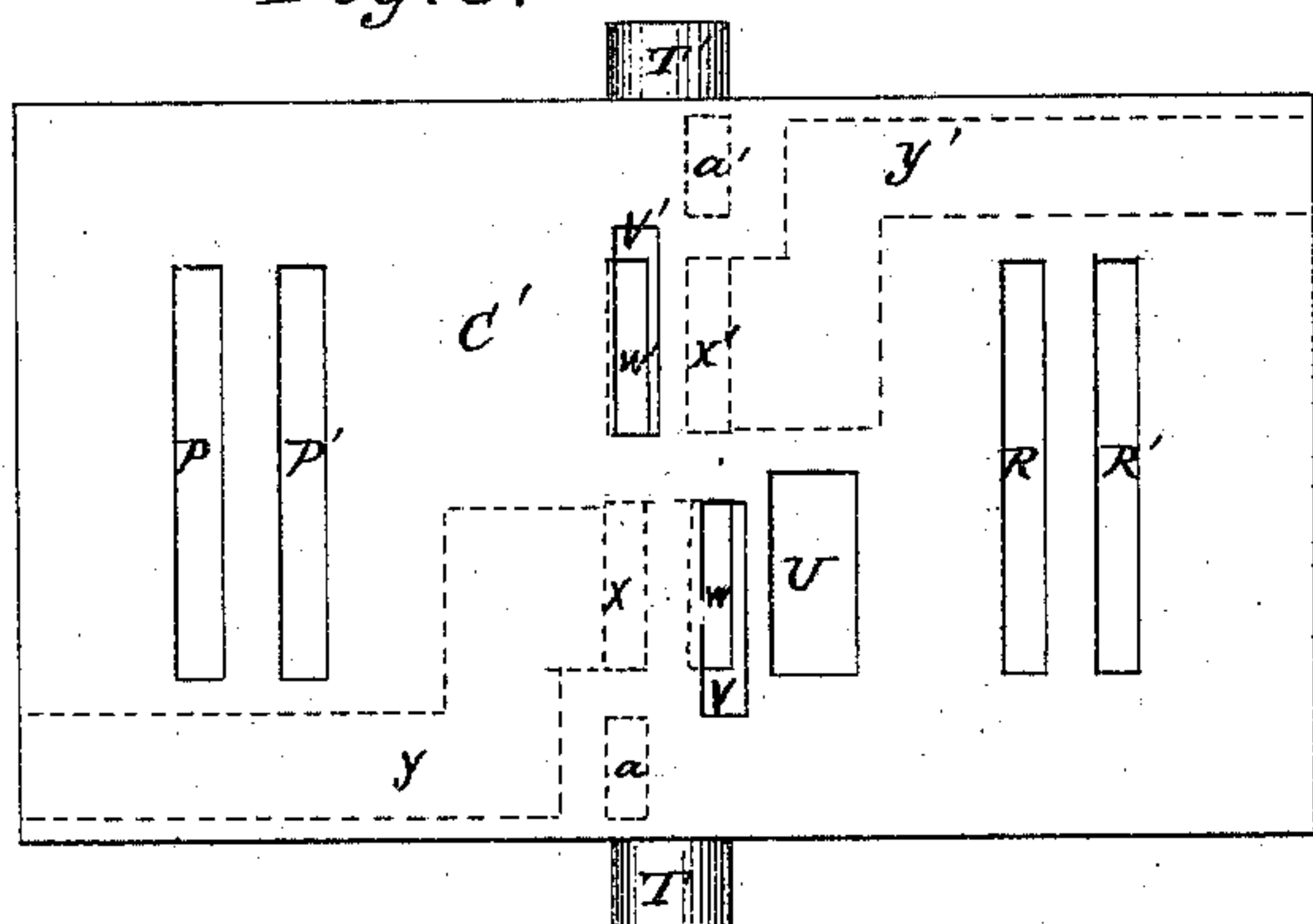


Fig. 4.

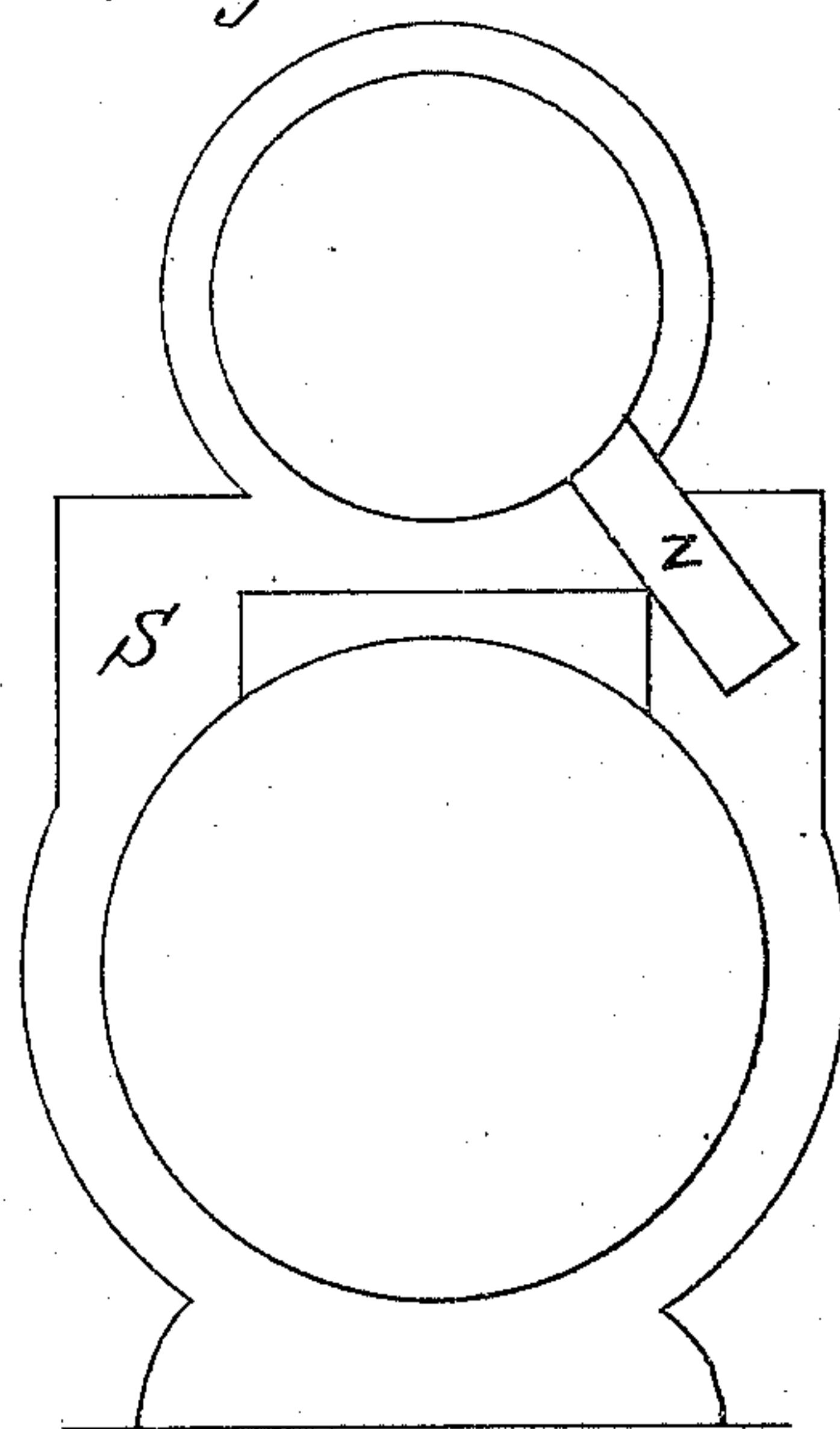
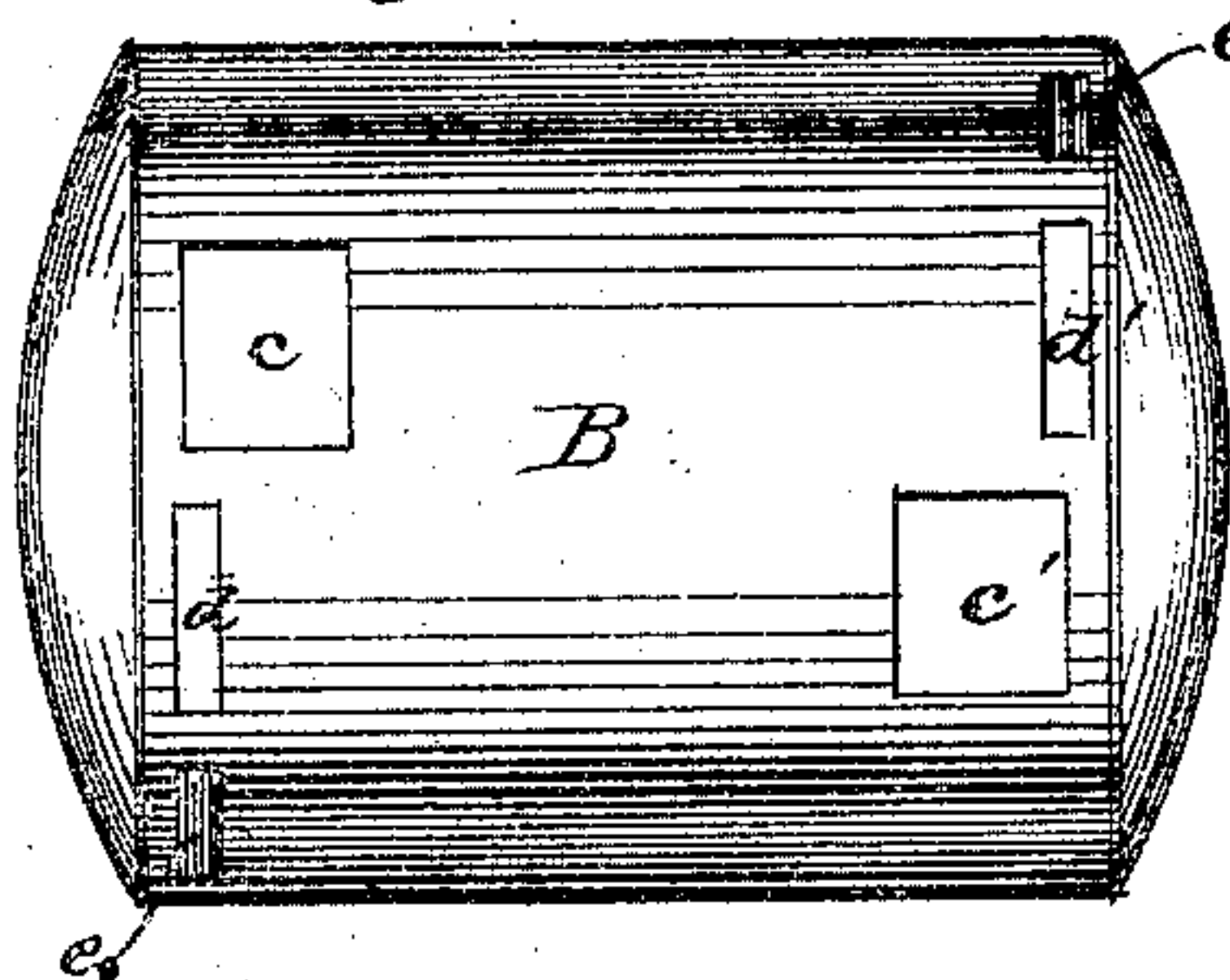


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY M. BARTLETT, OF SOUTH DEDHAM, MASSACHUSETTS.

IMPROVEMENT IN WATER-METERS.

Specification forming part of Letters Patent No. 119,004, dated September 19, 1871.

To all whom it may concern:

Be it known that I, HENRY M. BARTLETT, of South Dedham, in the county of Norfolk and State of Massachusetts, have invented certain Improvements in Water-Meters, of which the following is a specification:

Figure 1 is a longitudinal vertical central section of my invention. Fig. 2 is a transverse vertical central section; Fig. 3, a plan view with the upper portion removed; Fig. 4, an end elevation; and Fig. 5, a plan view of the piston.

This invention is analogous to one for which application for Letters Patent was made by me, of even date with this; and it consists mainly of a floating valve-piston, and an arrangement of ports in connection therewith, whereby a perfect reciprocating motion is produced, while certain parts which were essential to the above-mentioned invention are omitted. The details of construction and method of operation will be more fully described hereinafter.

In the drawing, A represents a cylinder, in which is the floating air-tight piston B, which moves freely therein, and is somewhat more than half its length. Above the cylinder A is a casing, C, having a plane upper surface, C', below which is a space, D, which is subdivided by vertical partitions. E represents a casing or cap with a semicircular upper surface, which covers the casing C. Within the cap E, and resting on suitable seats, is a valve, F, which consists of a tube, f, having right-angled circular flanges G G' near the ends, and the wider flanges H H' near the center, and between these the cylindrical flanges I I' and annular passages J J'. The interior of cap E is provided with semicircular bands or rests K K', L L', and M M', which form circles in connection with the semicircular top or cap E. Between the rests K K', &c., and the bottom of cap E are spaces, which are also subdivided by vertical partitions, and are provided with ports N N' O O', which connect with the ports P P' R R' on the surface of the casing C, which latter communicate with the interior of casing C. S S' represent end caps, which are attached, through flanges, to the ends of cylinder A and cap E, thereby connecting the same. T represents the induction-pipe, and T' the eduction-pipe, which enter casing C at opposite sides. U represents a port in the surface C', through which the water from induction-pipe T passes into cap E. V

V' represent ports in the surface C', which communicate with ports W W', which latter are in the upper part of cylinder A. X X' represent similar ports in cylinder A corresponding to ports W W'. Said ports X X' communicate, through horizontal passages Y Y' in casing C and inclined passages Z in end pieces S S', with the ends of cap E. a a' represent ports in cylinder A, lower on the periphery of the same than the others, the former a being in line with ports X W' and the latter a' being in line with ports W X'. b b' represent orifices in the ends of casing C, through which orifices communication is had from said casing to the ends of cylinder A through end caps S S'. c c' represent vertical passages or valves running through piston B. Said valves are of sufficient width to cover both of the ports W' X' or W X and bring the same into connection with each other at certain stages of the operation. The valves c c' are at opposite ends of piston B and on opposite sides of the same, as shown. d d' represent narrower valves running through piston B and occupying corresponding positions to valves c c'. The valves d d' are provided with right-angled branches e e', which lead from the same horizontally to the sides of the piston B. The valve d' and its branch e' connect at certain stages of the operation with the ports X and a', while at opposite stages the valve d and branch e connect ports X and a. The piston B is kept in a vertical position by a pin, g, which enters a groove in the bottom of the same.

Water is admitted to cap E through pipe T and port U, and finds access, by means hereafter described, to one end of cylinder A, and, entering the same, forces the piston B toward the opposite end of said cylinder, thereby forcing the water which had accumulated in said opposite end of cylinder A through a series of ports and valves and out at the eduction-pipe T', the piston B, just at the end of its stroke, operating valve F in such manner as to admit the incoming water to force the piston back and open a passage to the eduction-pipe T' for the water expelled by the backward motion of the piston. In Fig. 1 the piston B is represented as having completed its stroke in the direction of cap S and forced the valve F toward the opposite end of the cap E, thus leaving the ports N and P in connection with the interior of cap E through flanges I H and passage J' of valve F,

and at the same time cutting off ports N' and P' from connection with said cap. The ports O O' and R R' are connected with each other by the space *i* between flanges H' and I', forming a siphon-like passage over rest L. It will now be seen that the conditions are favorable for the incoming water through pipe T and port U to pass up into cap E through flanges H I, passage J', ports N P, space D, and orifice *b*, into the lower part of cap S, where it presses against piston B and propels the same toward the opposite end of cylinder A, thereby forcing the water from said cylinder upward through orifice *b'*, space D, ports R' O' and space *i*, over rest L, then downward through ports O R and out at eduction-pipe T'. When the piston reaches the end of its passage toward end piece S', the same being prescribed by pin *g*, the valve *c* comes in connection with the ports W' X', and at the same time the valve *d*, with its branch *e*, comes in connection with the ports X *a*, thus opening a passage from port V' through ports W' X', channels Y' and Z, to the end of cap E, and the incoming water through port U, flowing through said passage, strikes the flange G' of valve F and forces said valve toward the opposite end of the cap E, displacing the water in the end S, and forcing it downward through passages Z and Y into port X, which, as before stated, is in connection with valve *d* and branch *e* of piston B, thus opening a passage from port X to port *a*, through which the ejected water from cap E flows and finds egress through eduction-pipe T'. The valve F being now in contact with the end cap S, its position with relation to the ports P P' R R' is reversed, the conditions being now favorable for the water to flow from cylinder A through ports P, N, N', and P' to the eduction-pipe, and for the incoming water to pass through passages J of valve F and ports O' R' into end cap S', revers-

ing the motion of piston B and forcing it toward the opposite end of cylinder A, where the valves *c'* and *d'* perform the same functions in connection with ports W X, passage Y, ports X' and *a'*, as that of valves *c* *d* with relation to ports X' W' X *a* and passage Y'.

It will be seen that, as the length of stroke of valve F is comparatively short, the time required to reverse its position and remove the water from the opposite end of cap E, by the means described, is brief, the connection of valves in piston B and ports in cylinder A during the transit of the former being sufficient to effect the desired result.

By this arrangement I dispense with one of the valves used in the invention above referred to, thereby simplifying the machine and reducing friction.

The object of running the valves *c* *c'* and *d* *d'* of piston B entirely through the same is to equalize the pressure.

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

1. The floating valve-piston B, constructed as described, in combination with cylinder A having ports W W', X X', and *a* *a'*, substantially as described.

2. The described arrangement of valves *c* *c'* *d* *d'* and their branches *e* *e'* of piston B with relation to ports W W', X X', and *a* *a'*, of cylinder A, passages Y Y' Z Z, and valve F, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY M. BARTLETT.

Witnesses:

CARROLL D. WRIGHT,
C. F. BROWN.

(25.)