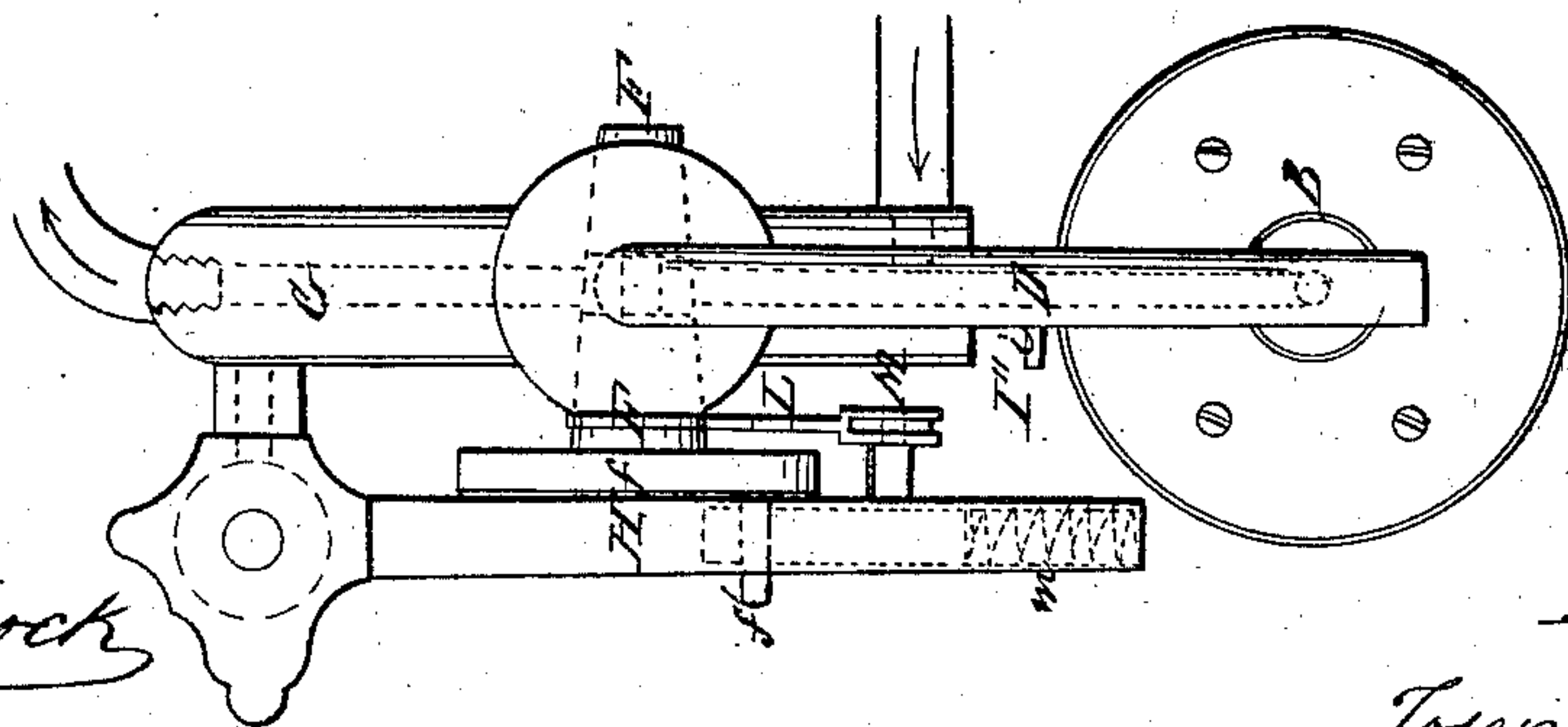


Diaphragm Meter.

Patented Oct. 1, 1861.



L. H. Babcock

Yours B Smith

Inventor
Joseph Thomas

UNITED STATES PATENT OFFICE.

JOSEPH THOMAS, OF NEW YORK, N. Y.

IMPROVEMENT IN WATER-METERS.

Specification forming part of Letters Patent No. 33,406, dated October 1, 1861.

To all whom it may concern:

Be it known that I, JOSEPH THOMAS, of New York, in the county and State of New York, have invented a new and Improved Water-Meter; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is an end view of my invention, and Fig. 2 is a side elevation of the same, showing a portion in section.

Similar letters of reference indicate like parts in both the figures.

To enable others skilled in the art to make and use my invention, I will proceed to describe the construction and operation of the same by the aid of the drawings.

The measuring-vessels are two cylindrical bellows, A B, both fixed to a single movable partition, I. From the exterior fixed ends of the double bellows thus formed pipes or passages E D extend, and are bent so as to unite in a vertical pipe, G, as represented. At their intersection I place a four-way cock, F, so constructed as to be capable of connecting D with the upper portion of G, and E with the lower portion of the same, or vice versa, according as it is turned. A and B are alternately filled and emptied by means now to be described. To this cock F, I affix a disk, *f*, which carries two projecting pins, *f' f''*. To a fixed point at a convenient distance above the cock F, I hang a lever, H, which extends downward between the pins *f' f''*, and by them its motion is transmitted to the cock F. The lever H receives motion alternately in opposite directions from stops or projections I' I'', attached to the movable partition I between the bellows A B, and fitted to traverse on suitable slides, *i*, extending from D to E. Beneath the cock F, I fix a double incline, L L', as represented, and upon the lever H a roller, M, adapted to bear thereon. The roller M is fitted to slide longitudinally on the lever H, and is forced upward in contact with the incline L by means of a spiral spring, *m*. (Shown in dotted lines.) The action of this spring *m*, roller M, and double incline L L' is to carry the lever H, and through that the cock F, to the full extent of its proper motion in either direction from the central position

after it has been carried to the central position by the contact of the pins I' I'', which latter are operated by the action of the bellows A B. The pipe through which the water enters the meter is attached to the bottom of the pipe G, and the exit-pipe to the top of the same.

The operation is as follows: The parts being in the position shown in the drawings, water enters through the pipe or passage D into the bellows B, expanding it and forcing that which was contained in A through E out at the top of G, as is shown by the arrows. As the bellows B is expanded, the stop I'' comes in contact with the lever H, moving it until the roller M passes the point of the double incline L L', when the spring *m*, acting through M on the incline, continues the motion of H, and suddenly changes the position of the cock F, so as to connect A with the induction-pipe and B with the discharging-pipe. The reverse action then takes place, A being expanded and B emptied. Mechanism (not represented, but which is of any of the well-known kinds) is attached to the lever H or to the sliding stops I' I'', and actuates an index (not represented) to register the number of reciprocations, and thus to record the amount of water flowing through the meter with great exactness.

Unlike those meters in which packed pistons are employed or equivalent parts sliding water-tight, my meter operates with very slight pressures without either leakage or appreciable friction. Unlike those in which screws and the like devices are employed operating by impact of an active current striking against a part and thus impelling it by very small quantities or a very slow flowage, and unlike those in which diaphragms or partial diaphragms are employed, the strain on the leather in my meter is always in the same direction, which allows the flexible material to retain its "life" much longer. This latter feature is one of great practical importance. It is well known that material bent and strained repeatedly in the same direction endures much longer than does the same material when bent and strained alternately in opposite directions.

I do not claim the employment in water-meters of a diaphragm or part moving with-

out friction in opposite directions by receiving water on opposite sides, as various devices have been used or proposed in which such feature is introduced; but

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

The stops or projections I' I'' , carried by movable partition I on slide i , double incline L L' , roller M , and spiral spring m , or their respective equivalents, arranged and operat-

ing substantially as and for the purposes herein set forth.

In testimony whereof I have hereunto set my name in the presence of two subscribing witnesses.

JOSEPH THOMAS.

Witnesses:

G. H. BABCOCK,
WM. B. SMITH.