S. Huse,

Rotary Meter,

No. 8,686. Patented Jan. 27, 1852.

Fig. 1.

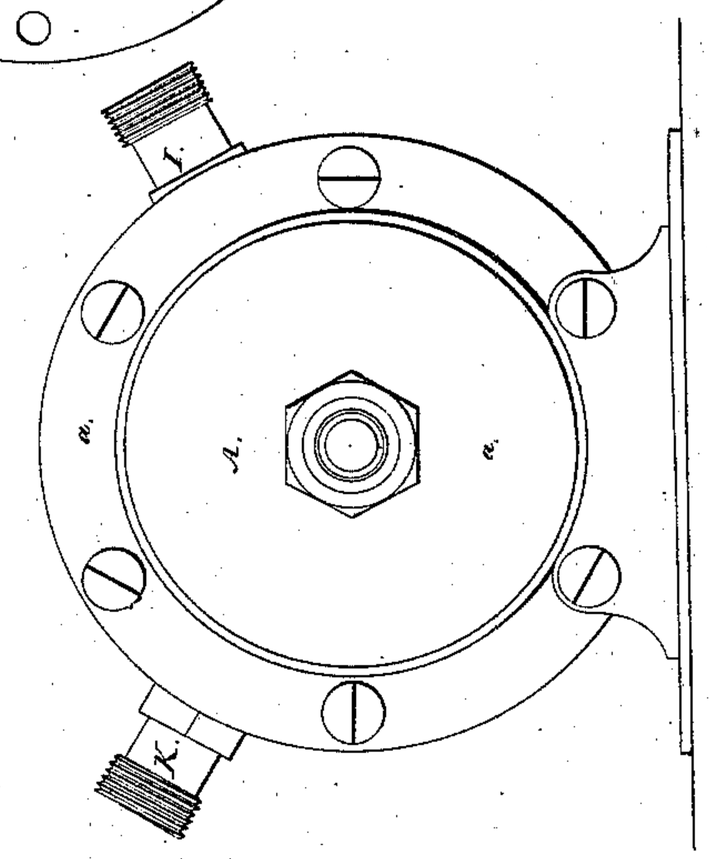


Fig. 2.

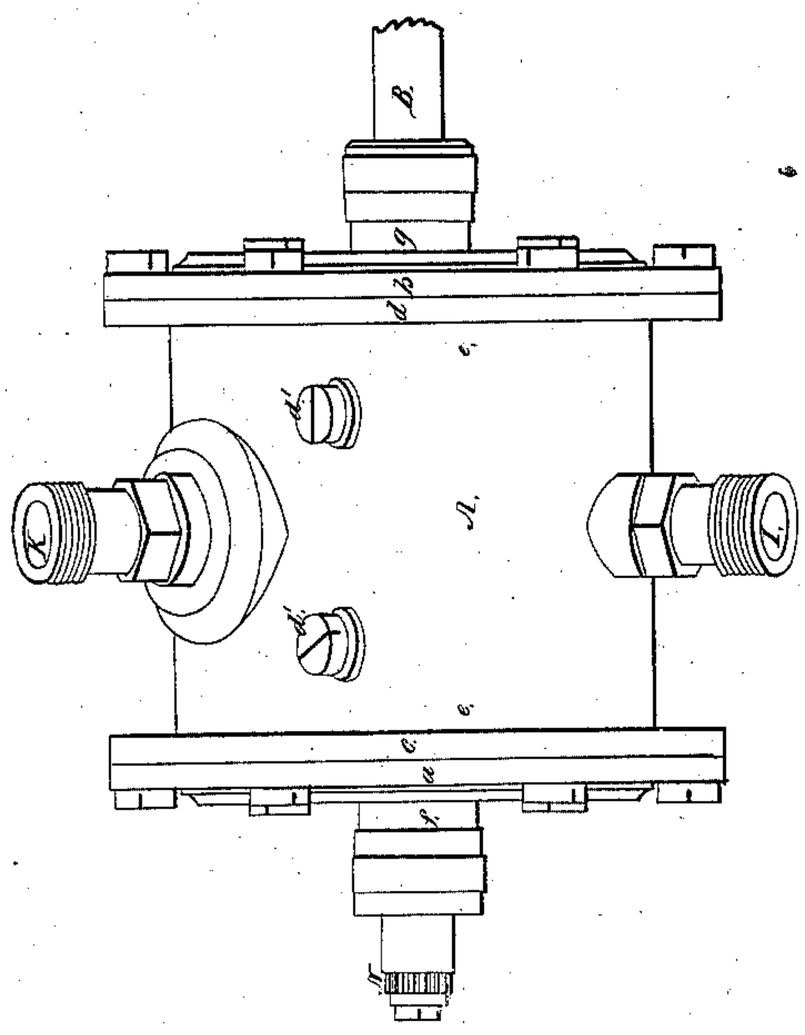


Fig. 3.

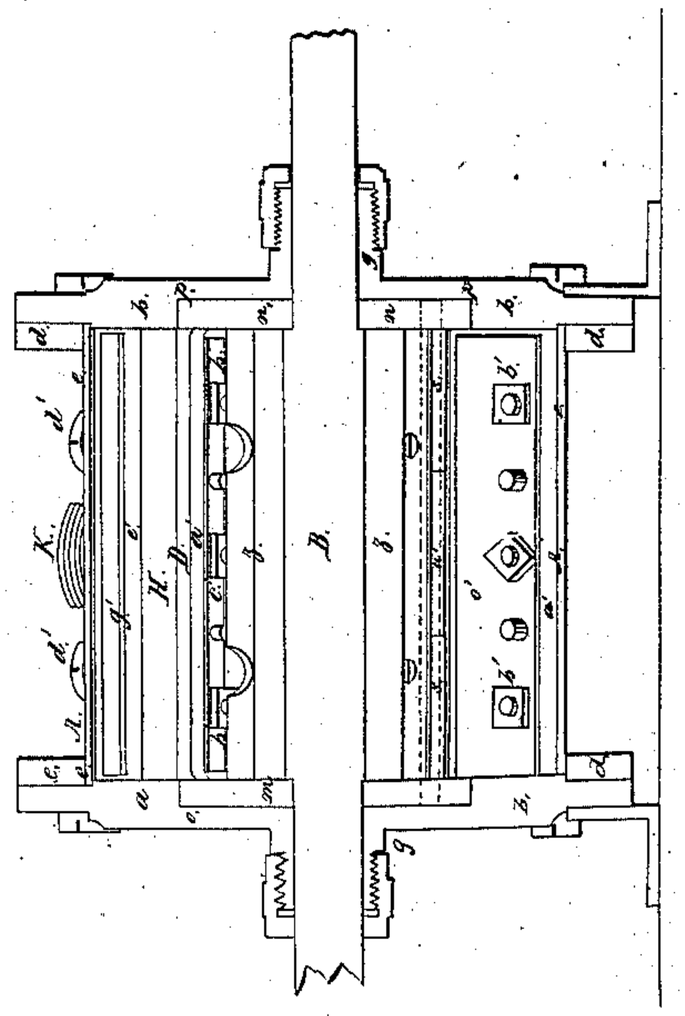


Fig. 4.

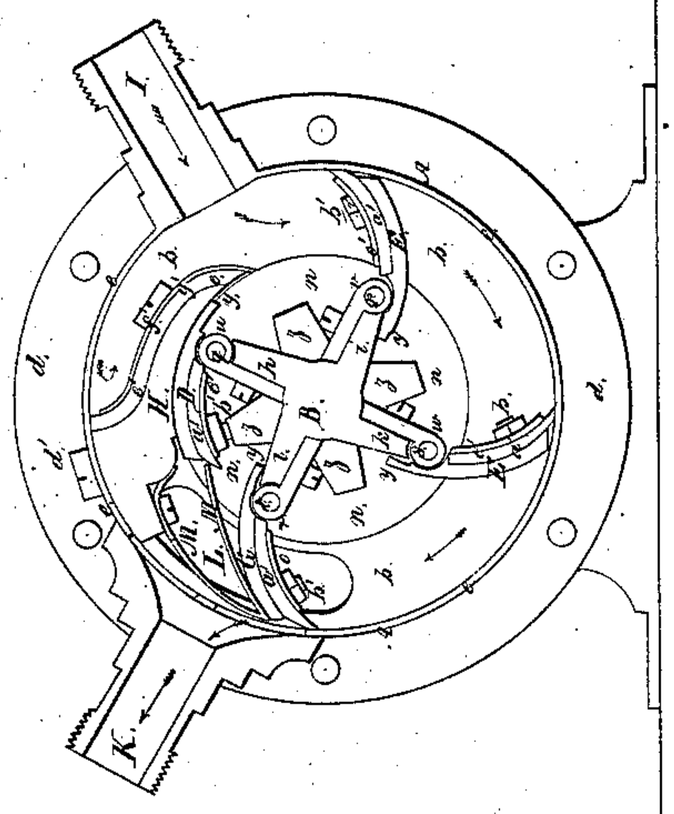
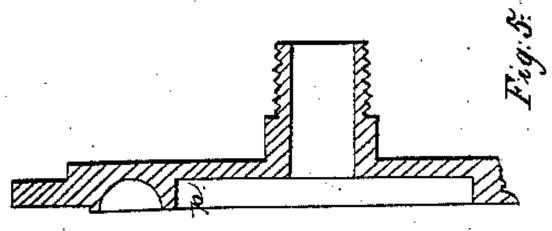


Fig. 5.

Fig. 6.



UNITED STATES PATENT OFFICE.

SAMUEL HUSE, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN WATER-METERS.

Specification forming part of Letters Patent No. **8,686,** dated January 27, 1852.

To all whom it may concern:

Be it known that I, SAMUEL HUSE, of Boston, Massachusetts, have invented certain new and useful Improvements in Meters for Measuring Water and other Fluids; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an end elevation; Fig. 2, a plan; Fig. 3, a longitudinal central section; Fig. 4, a cross vertical section; Fig. 5, an elevation of the inside face of one of the heads of the cylinder, and Fig. 6 a central section thereof.

The same letters indicate like parts in all the figures.

The object of my invention was the production of a meter which should measure the quantity of fluid discharged and be operated by the pressure or force of the column of the said fluid. Such an apparatus, to be practically efficient, should be simple, not liable to derangement, and work with little friction to meet the requirements above enumerated.

The nature of my invention consists in combining, with a hollow cylinder provided with induction and eduction pipes and an inward-projecting stop or segment having a concentric face, a series of hinged segmental pistons hinged or jointed to arms projecting from a central shaft, and so hinged thereto that when thrown open their outer ends or the packing thereon shall run in contact with the inner periphery of the cylinder and their inner ends rest against the arms to which they are hinged to prevent binding against the inner periphery of the cylinder, and thus avoid undue friction, and to balance in part the resistance of the liquid, that the pistons may turn freely in closing to pass the segmental stop, and when closed to pass the projecting or segmental stop their outer face shall be concentric and run nearly in contact with the said stop, provided with a cap of leather at one end to prevent the passage of the fluid between them and the stop, and be retained in that position by their inner faces resting on a rest or projection from the central shaft or arms, and thus have a free space between their inner faces and the central shaft or boss to contain fluid, to admit of the free passage of fluid when they are being closed, instead of closing into a recess fitting them and made in a central wheel, as in the case of some steam-engines heretofore made, and which, if applied to the measurement of liquids, would prevent the proper and rapid closing of the said pistons.

In the accompanying drawings, A denotes a cylindrical box or case, of which *a* and *b* are the two circular ends or heads, they being respectively confined to flanges *c d*, extending from the cylindrical shell *e* of the case. A horizontal shaft, B, extends through the center part of both heads or through suitable stuffing-boxes, *f g*. From this shaft four or any other proper number of arms, *h i k l*, radiate and extend from one circular plate or head, *m*, to another one, *n*, which are fixed or fastened on the shaft and extend and rotate in circular or corresponding recesses made in the two heads of the meter-case, as seen at *o p* in Fig. 3 and at *p* in Figs. 5 and 6.

D E F G are sectional piston-plates, made with their external surface portions of a cylindrical surface whose radius is equal to that of each of the plates or heads *m n*. They respectively turn on pins or rods *q r s t*, made to extend from one head, *m*, to the other, *n*, and through the same. The said rods pass through cylindric joints *u v w x*, projecting from each piston, as seen in the drawings, and abutting close against the respective outer end of the radial arms *h i k l*. These joints are set out of the line of the piston, as clearly shown in the section, by which they are more easily closed and with less shock to the parts than if otherwise placed. Each piston-plate D E F G extends inward beyond the joint which forms the fulcrum or center of motion of the piston, and which should be about one-third of the whole breadth of the piston from the inner end, *y*, as seen in Fig. 4, and is so arranged and applied as to abut against the side of the adjacent radial arms and pack, to prevent leakage and prevent the outer end of the piston-plate from coming in contact with the internal surface of the case A when the said piston-plate is opened to its greatest extent.

To the inner or concave side of each piston-plate D E F G a rectangular piece or sheet of leather or other suitable flexible material, *a′*, is fastened by means of screws and nuts (seen

at *b' b'*, &c.) and washer or seat plates *e' e'*, &c. These pieces of leather bear at their outer edges against the inner curved surfaces of the case A and at their ends against the inner faces of the two ends or heads *a b* of the case A. Each of the pistons is provided with a rest, *z*, which extends from the shaft B and supports the piston when thrown down or closed. In Fig. 4 the piston D is represented as so closed and supported on its rest *z*. The case A is provided with an induction-opening, I, and an eduction-passage, K, the water pipe or conduit being screwed or otherwise properly adapted to the opening I. A discharge-pipe may also be applied to the eduction-passage K, the said two passages I and K being arranged as seen in Fig. 4.

Between the passages I K and the rotary system of pistons a curved partition or segmental stop, H, is disposed, as seen in Fig. 4, such partition being fastened by screws *d* to the case. A rectangular piece of leather or other suitable flexible material, *e'*, is screwed to the upper side of the said partition by screws *f' f'* and a washer-plate, *g'*, the lower edge of the said piece of leather being made to extend somewhat beyond the partition H and so as to rest in contact with the outer surface of each piston-plate D E F G while the piston is resting on its seat *z* and is passing directly underneath and by the said partition H. The edge of the leather *e'*, by the superincumbent pressure of the water, is forced closely against the water-curved surface of the piston, and so as to make a joint sufficiently close to prevent the passage of the water between the partition H and the piston.

In the inner surface of one or both of the plates or heads of the case A a recess or cavity, L, is formed and placed with respect to the opening K as seen in Fig. 4. As soon as any one of the pistons during its upward motion toward the opening K passes beyond the lower end of the concavity or depression L, a free communication takes place between the water on both sides of it. This removes the pressure from against the inner surface of the piston, so as to permit it to readily or freely fall by the power of gravity into a vertical position and toward its rest *z*, enabling the water which may be in the chamber between the arms and the under face of the piston freely to pass out of the opening K without obstruction to the closing of the piston.

A spring, M, is placed within the case A over the piston G. As seen in the position in Fig. 4, it is fastened to the case and so arranged and formed that the piston may impinge against it and be closed down upon its rest in time to prevent its projection *y* from improper contact with the partition H.

A pinion-gear, N, is attached to one end of the shaft B. To this gear, and so as to be operated thereby, a suitable indicating apparatus or clock-work may be applied in order to register the number of revolutions of the shaft, and in consequence thereof the number of cubic feet of water made during any given time to pass through the meter or case A. To the other end of the shaft a pulley or any other suitable contrivance may be attached for the purpose of moving any mechanism by the power of the water when it is made to pass through the case A. The mechanism above described, instead of being used as a water-meter, may be employed as a motive power, or as a measurer of gas or any other liquid than water. The apparatus so constructed may be used in any part of a building below the level of the head of water and be productive of similar or nearly similar results as when placed at the lowest parts of the said building.

From the above it will be seen that the piston-plates D E F G are not allowed to come in contact with the inner curved periphery of the case A, the piece of leather *a'* being caused to rest against the same, and thus to make a close joint and one not liable to wear, the portion *y* of each piston-plate, by contact with the radial arm to which it is hinged, preventing the plate when entirely open from touching the said curved surface.

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

Combining with a cylindrical case such as herein described, and provided with induction and eduction passages and with a segmental stop and leather cap-plate for packing, substantially as described, a series of hinged segmental pistons hinged to arms projecting from a central shaft or hub and hinged at about one-third of the distance from their inner ends, so that when thrown open their outer ends shall not bind against the inner periphery of the cylinder, and when closed to pass the segmental stop they shall be sustained by a rest projecting from the central shaft or its equivalent, having a space between them and the shaft and arms for the free flow of water or other fluid under the said pistons to admit of their closing freely, the whole being made and combined substantially in the manner and for the purpose specified.

SAMUEL HUSE.

Witnesses:
CAUSTEN BROWNE,
WM. H. BISHOP.