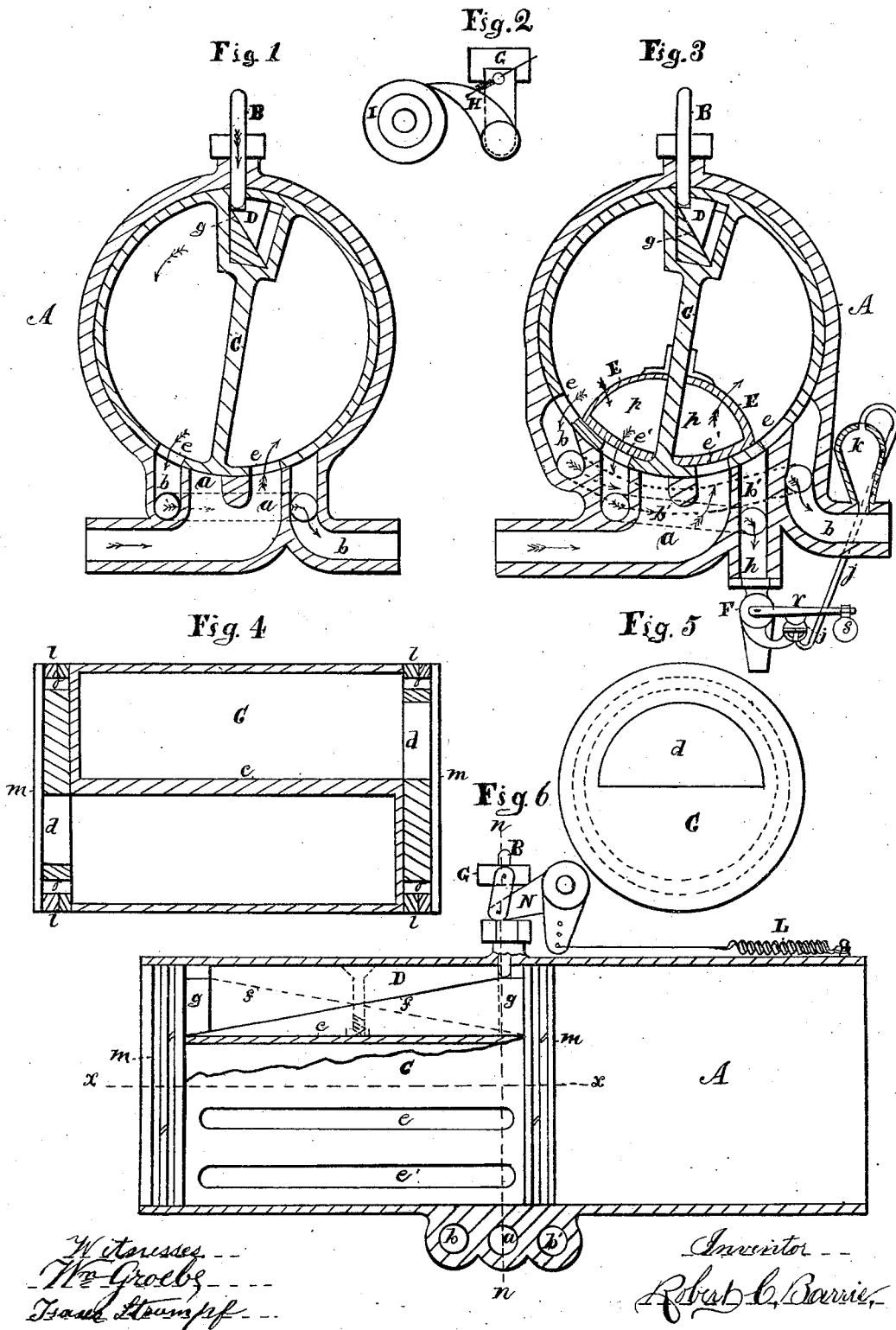


(No Model.)

R. C. BARRIE.
WATER METER AND FILTER.

No. 265,562.

Patented Oct. 10, 1882.



UNITED STATES PATENT OFFICE.

ROBERT C. BARRIE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO JOHN H. W. CHESTNUT, OF SAME PLACE.

WATER METER AND FILTER.

SPECIFICATION forming part of Letters Patent No. 265,562, dated October 10, 1882.

Application filed December 22, 1881. (No model.)

To all whom it may concern:

Be it known that I, ROBERT C. BARRIE, of Philadelphia, Pennsylvania, have invented a new and Improved Water Meter and Filter, of which the following is a specification.

My invention relates to improvements in piston-meters; and it consists in certain devices whereby a peculiarly-constructed piston is made to reciprocate within a cylinder, as shown; and it further consists in devices whereby said piston is made to oscillate within said cylinder, as and for the purpose set forth.

It also consists in certain other devices so arranged as to control automatically the inlet and outlet of water or other liquids under pressure, as will be hereinafter specified.

It further consists in certain novel devices whereby said liquid is made to pass through a filtering material, and whereby said material is cleansed automatically, in the manner as substantially set forth and described.

Figure 1 is a vertical cross-section on the line *nn* in Fig. 6. Fig. 2 is a front elevation of the pawl-and-ratchet device. Fig. 3 is a cross-section on the line *nn* in Fig. 6, and shows the inlet and outlet ports, the chambers for filtering material, and an automatic arrangement for controlling the waste-pipe *h*. Fig. 4 is a horizontal longitudinal section of the piston *C* on the line *xx*, Fig. 6. Fig. 5 is an end view of the piston *C* turned partly around. Fig. 6 is a vertical longitudinal section of the cylinder *A* with the piston inclosed.

Construction: For measuring purposes a cylinder, *A*, Fig. 1, having the usual end caps or heads, has cast or attached thereto upon the under side a projection, through which pass suitable ports entering the cylinder on a transverse central line, to accomplish which the outlet-ports *b b* are made to pass around the ports *a a*, as indicated by dotted lines, Fig. 1. Said cylinder is also provided with suitable packing device for a rod or shaft, *B*, which enters the cylinder on a line with the ports aforesaid. Within the cylinder *A* is fitted a piston or hollow cylinder, *C*, having a longitudinal partition, *c*, through its center, thus forming two separate chambers, which have communication through the openings *d d* with the alternate spaces left in the cylinder *A* by the reciprocating movement

of the piston *C*. The piston *C* has also longitudinal openings or ports *e e*, there being two or four, as plainly shown in Figs. 1 and 3, said ports being arranged to pass directly over the inlet and outlet ports *a a b b* in the cylinder *A*. Said piston is also provided with the usual packing-rings at each end, the inside diameter of said rings *l* being larger than the projected rim of the followers *m m*, thus forming the space *o*, which allows the surface of the piston to rest or fit closely upon the cylinder *A* and over the ports in said cylinder. The said piston has a longitudinal cavity, into which is fitted a corresponding piece of different metal, the object being to allow of duplication in case of wear, and said piece of metal *D* is made and provided with longitudinal inclined surfaces *ff* upon each side, the apexes being at opposite ends of the piston, as indicated. There is also provided at each end an inclined surface, *g*, uniting the apex of incline *f* on one side with the foot of the inclined surface on the other, and said surface should be wide enough to allow of a horizontal longitudinal movement of the piston *C* during the oscillating movement of said piston, the object being to guard against shock or pounding at the returning-point of the reciprocating movement of the piston *C*. Attached to the piston upon the inside of the chambers are the sieves *E*, which are made in convenient form and fit close upon and parallel with the ports in said piston, thus forming the chambers *p p*, which are to be filled with charcoal or other filtering material.

In Fig. 3 it will be seen that there are six (6) ports in the cylinder *A*. Said ports should be arranged so that the ports *b b* pass around the inlet-ports *a a* upon one side and the ports *b' b'* on the other, as indicated by dotted lines and arrows. The waste-pipe *h* may be controlled by an ordinary stop-cock or valve, or may be provided with a suitable valve, *F*, having a lever, *r*, and weight *s*, so arranged, in connection with the pipe *h* or air-chamber *k* and flexible ball *i*, with connecting-pipe *j*, as to form an automatic device for controlling the said pipe *h*, as will hereinafter be described.

Operation: In Fig. 1 it will be evident that

if a liquid be forced into the inlet-pipe *a* it will pass through the ports *e*, as indicated by the arrows, and, acting upon the same principle as steam in a direct-acting engine, it will cause the piston to move in a longitudinal direction until a certain quantity has passed therein and the piston has reached the end of its longitudinal movement. It will be evident in the meantime that the shaft B, which rests upon the inclined surface *f*, has been raised by the passage of said surface under said shaft, and by thus being raised has, through the agency of the collar G and bell-crank N, overcome the resistance of the spring L. It will further be evident that at the moment of the passing of the shaft B from the inclined surface *f* to the inclined surface *g* the tension of the spring L will thus be released, which in turn will actuate the shaft B and cause an oscillating movement of the piston C, thus changing the ports and causing the said piston to move or return in the opposite direction, thus receiving and discharging a certain quantity of liquid into and from the chambers in the cylinder. A, Fig. 2, shows the arrangement of the ratchet-wheel I and pawl H with the collar G, said arrangement forming a simple device for operating a train of recording disks or gears. In Fig. 3 it will be evident that the corresponding parts are operated in the same manner as in Fig. 1, but in addition thereto are the filtering-chambers *p p* and extra ports *b' b'*, which communicate with the waste-pipe *h*, as shown. It will be seen in this figure that the liquid entering the cylinders, as indicated by arrows, will pass through the filtering-chambers *p* and sieve E into the chambers in the piston C, and will so continue to pass until the inclined surface *f* has passed from beneath the rod B. It will be evident in the meantime that the space left within the cylinder A by the reciprocating movement of the piston C has been filled with water or other liquid, and said water has passed through a process of filtration, and also the quantity therein has been regulated by the length of inclined surface *f*. It will further be evident that upon the return-stroke of the piston the said liquid will pass through the ports *b* to the outlet-pipe, while at the same time a regulated quantity of said liquid will repass back through the filtering material and escape through the ports *b'* to the waste-pipe *h*, the operation being the same at each stroke of the piston C, the object being to cleanse the material used for filtering. There is also shown in this figure a suitable valve, F, attached to the waste-pipe *h*, and in connection with the air-chamber *k* it will be evident that if water be drawn through the outlet-pipe *b* the compressed air in the chamber *k*, pipe *j*, and ball *i* will be released, and will thus allow the weight *s* to descend and depress the flexible ball *i* and open the valve F by means of the rod *r*. It will further be evident that upon

the closing of the pipe *b* the pressure of the liquid will compress the air in the chamber *k*, which will cause the inflation of the ball *i*, which in turn will raise the weight *s* and close the valve F by means of the rod or lever *r*, thus forming an automatic arrangement for controlling the waste-pipe *h*.

Brief: The several parts embodied in my invention, the functions of which are necessary for the practical operation of the principle involved, are a cylinder having inlet and outlet ports entering upon the under side and upon a horizontal transverse central line, as shown, and having fitted therein a single piston, said piston being hollow and divided and subdivided in separate chambers, and having elongated slots or openings entering said chambers upon the under side, thereby utilizing the weight of the piston, combined with the force that actuates the rod B in a downward direction, for the purpose of keeping the under surface of the piston against the ports *e e*, and said piston having upon its upper side a peculiar-shaped inlaid piece of metal, D, the surfaces *f* controlling the actual measurement of the water and the operation of the spring or weight, the surfaces *g*, combined with the rod B, serving to partially rotate the piston, as described. The partitions and sieves E form the filtering-chambers whereby the water is purified and filtered automatically, as set forth.

Being aware that other devices exist for measuring liquids and still others for filtering the same, I desire hereby to specify what I claim as new and wish to secure by Letters Patent.

I claim—

1. In a water measuring and filtering device, the peculiar-shaped inlaid piece of metal D, having inclined surfaces *f* and *g*, in combination with the other connecting and operating parts, as and for the purpose shown and described.

2. In a water-meter, the cylinder A, piston C, and inlaid piece of metal D, having inclined surfaces *f* and *g*, in combination with the rod B and suitable connecting parts with the spring L, all arranged and operating together substantially as herein set forth and described.

3. In a water-filtering device, the filtering-chambers *p p* and sieves E, in combination with the cylinder A, piston C, inclined surfaces *f f* *g g*, rod B, and the connections with the spring L, all operating substantially in the manner and for the purpose shown and described.

4. In a meter and filter, the combination of the valve F, the rod *r*, weight *s*, flexible ball *i*, tube or pipe *j*, and air-chamber *k* with the waste-pipe *h* and supply-pipe *b*, as and for the purpose set forth.

ROBERT C. BARRIE.

Witnesses:

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