J. C. DENNERT.

Piston Water Meter and Motor.

No. 201,505. Patented March 19, 1878.

Fig. 2.

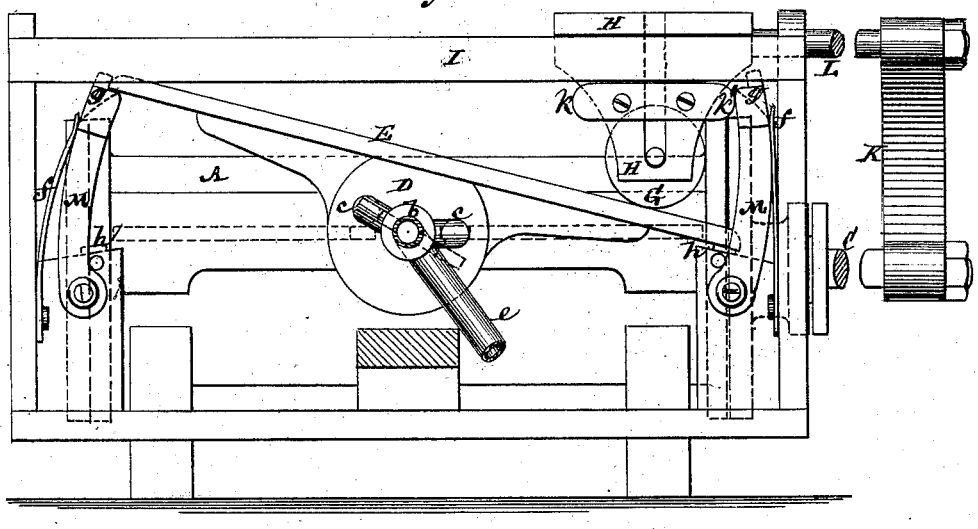


Fig. 1.

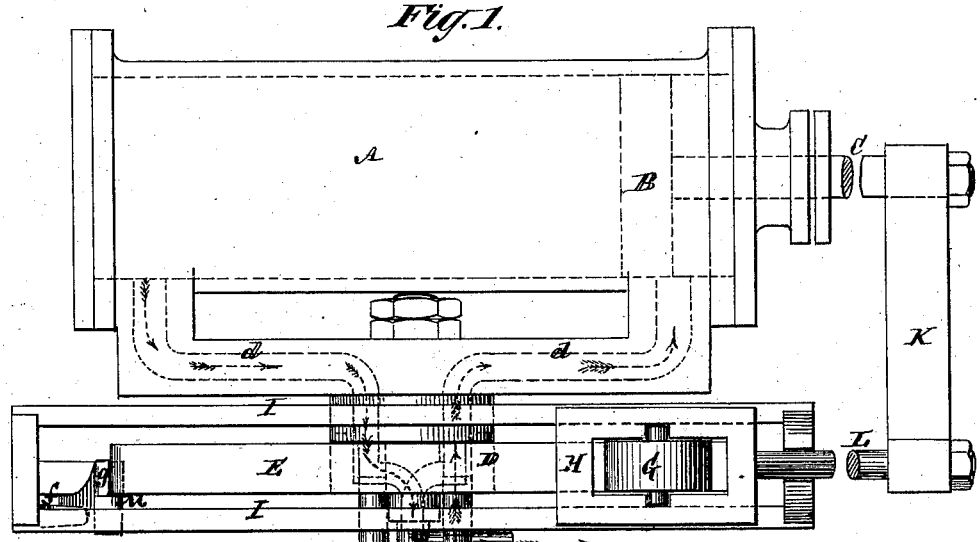


Fig. 3.

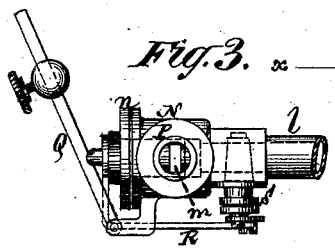
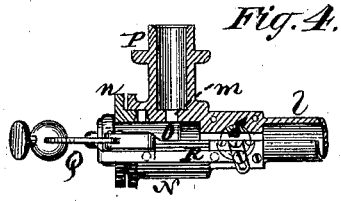


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHANN C. DENNERT, OF ALTONA, GERMANY.

IMPROVEMENT IN PISTON WATER METERS AND MOTORS.

Specification forming part of Letters Patent No. **201,505**, dated March 19, 1878; application filed October 12, 1877.

To all whom it may concern:

Be it known that I, JOHANN CHRISTIAN DENNERT, of the city of Altona, Germany, have invented certain new and useful Improvements in Liquid Meters and Motors, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

This invention is more particularly designed to be applied to water or other liquid meters or motors in which a reciprocating piston working within a stationary cylinder is used to effect the measurement of the liquid or to impart a motive force or power, as derived from the pressure of the liquid.

One part of the invention consists in certain means for changing or reversing the action of the valve which controls the motion of said piston, whereby a very quick and efficient valvular action is obtained.

Another part of the invention consists in a combination, with the inlet-pipe to the meter or motor, of an automatic regulator of novel construction, for controlling the supply of the liquid by the pressure thereof.

Figure 1 represents a plan view of a liquid meter or motor in part, with my invention applied; Fig. 2, a sectional side view of the same on the line *x x*. Fig. 3 is an inverted view from the interior of the automatic regulator for controlling the supply of the liquid according to its pressure, and Fig. 4 a horizontal section of the same.

A is the stationary working cylinder of a reciprocating piston meter or motor; B, its piston, and C the piston-rod. The water or other liquid is admitted to said cylinder by an inlet, *b*, and branch pipes *c c* therefrom, subject to the control of a rolling valve, D, which accordingly as it is vibrated admits the liquid by passages *d d*, alternately to and exhausts it alternately from opposite ends of the working cylinder, the exhaust flow ultimately passing off by an outlet, *e*. The invention is not restricted, however, to any particular construction of the valve or of the passages which it controls. Seated on or connected with the valve D is a transverse beam or bar, E, which, as it is rocked, gives motion to the valve D. This rocking beam or bar is preferably of a flat construction on its upper surface, and resting freely on it is a weight, G. Said weight is carried by and is free to move up and down within a frame or box, H, which is arranged to slide along ways I I, above the beam E, and is reciprocated along said ways with a corresponding motion to that of the piston B, by means of a rod, L, and cross bar or piece K, connecting said rod with the piston-rod C.

M M are trip-levers at or beyond the opposite ends of the rocking beam or bar E. These levers, which form part of the trip mechanism of the valve, are controlled or pressed inward by springs *f f*, or weights may be substituted for the springs. Each of said levers is constructed at or near its top with a side lip or catch, *g*, on which the elevated end of the rocking bar or beam E rests till tripped, and at a suitable distance below each of said lips or catches is a rest or cushion, *h*, which receives upon it the depressed end of the beam or lever E, as the latter is rocked to change the position of the valve. These rests may be faced with rubber to bear shock as the ends of the lever come down upon them.

In the operation of the meter or motor the valve controlling its piston is quickly and suddenly reversed, as the working piston approaches the end ef either of its strokes, by a projection, *k* or *k'*, on the sliding frame or box H, striking that one of the levers M which holds up, by its catch *g*, the elevated end of the beam or bar E, and, so soon as said lever is tripped or released, the weight G bearing on said end of the beam or bar E depresses it and causes the opposite end of said beam or bar to be raised and to be secured in its raised position by its trip-lever M springing inward or forward. The same action takes place alternately at opposite ends of the piston's stroke.

The regulator for controlling the supply of liquid by the pressure thereof forms an attachment to the inlet *b* in advance of it. The construction of said regulator is substantially as follows: N is a cylinder, into one end of which the water to supply the meter or motor enters, by a pipe, *l*. This cylinder contains a piston, O, which serves to control an aperture, *m*, in a branch, P, leading to the inlet *b* of the meter or motor. Said piston is extend-

ed backwardly through a stuffing-box, *n*, at the reverse end of the cylinder to that with which the pipe *l* connects, and is controlled at its protruding end by an adjustable weighted lever, Q; also, is connected by an arm or rod, R, with a cock or other suitable valve, S, in the pipe *l*, or between said pipe and the cylinder N. When the water enters the regulator it presses back the piston O, so as to open the aperture *m*, by or through which the water passes to the inlet *b* of the meter or motor. The adjustable weighted lever Q or adjustable weight on said lever gives the necessary pressure, which the piston O is required to resist. Should the pressure of the incoming water be in excess, the piston O is pressed further back, and the valve S turned to shut off or reduce the supply, thus allowing less water to pass into the meter or motor. The farther the piston O is moved back, the more the valve S is closed, and the greater is the reduction in the amount of water entering the meter or motor within a given time.

I claim—

1. The combination, with the reciprocating piston of the meter or motor and valve which controls the motion of said piston, of the rocking beam or bar E, the trip-levers M M, and the sliding box or frame H, actuated by the piston and provided with a loose or free weight, G, for operation on the beam or lever E when tripped or released at the end of the piston's stroke, substantially as specified.

2. The combination, in an automatic regulator for controlling the supply of liquid by the pressure thereof, of the cylinder N, with its weighted piston O arranged to control an aperture, *m*, in communication with the inlet *b* of the meter, the opening or pipe *l* through which the incoming liquid is admitted to said cylinder and caused to press upon one end of the piston therein, the rod or connection R, and the valve S, controlled by said piston, substantially as specified.

3. The combination of the cylinder N, having an aperture, *m*, in communication with the inlet *b* of the meter or motor, the piston O, the weighted lever Q, the rod or connection R, and the valve S in or controlling the inlet to the cylinder N, substantially as and for the purpose herein set forth.

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