(No Model.)

H. P. BROWN.

REGISTERING VALVE FOR WATER SUPPLY PIPES.

No. 335,213. Patented Feb. 2 ,1886.

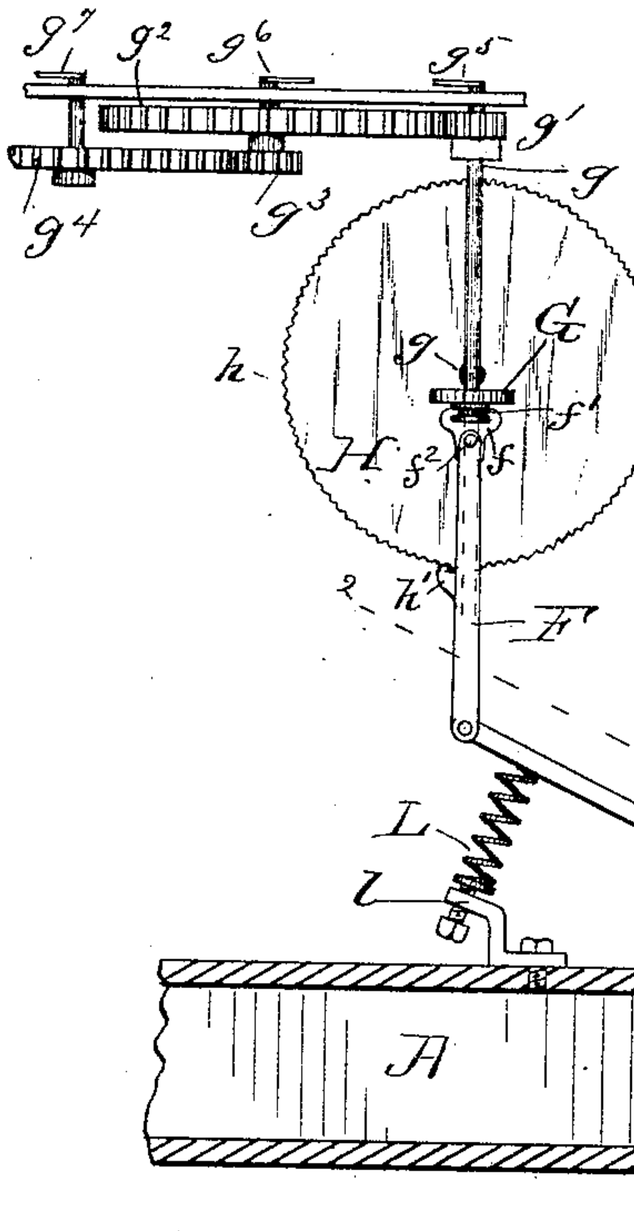

Fig. 1.

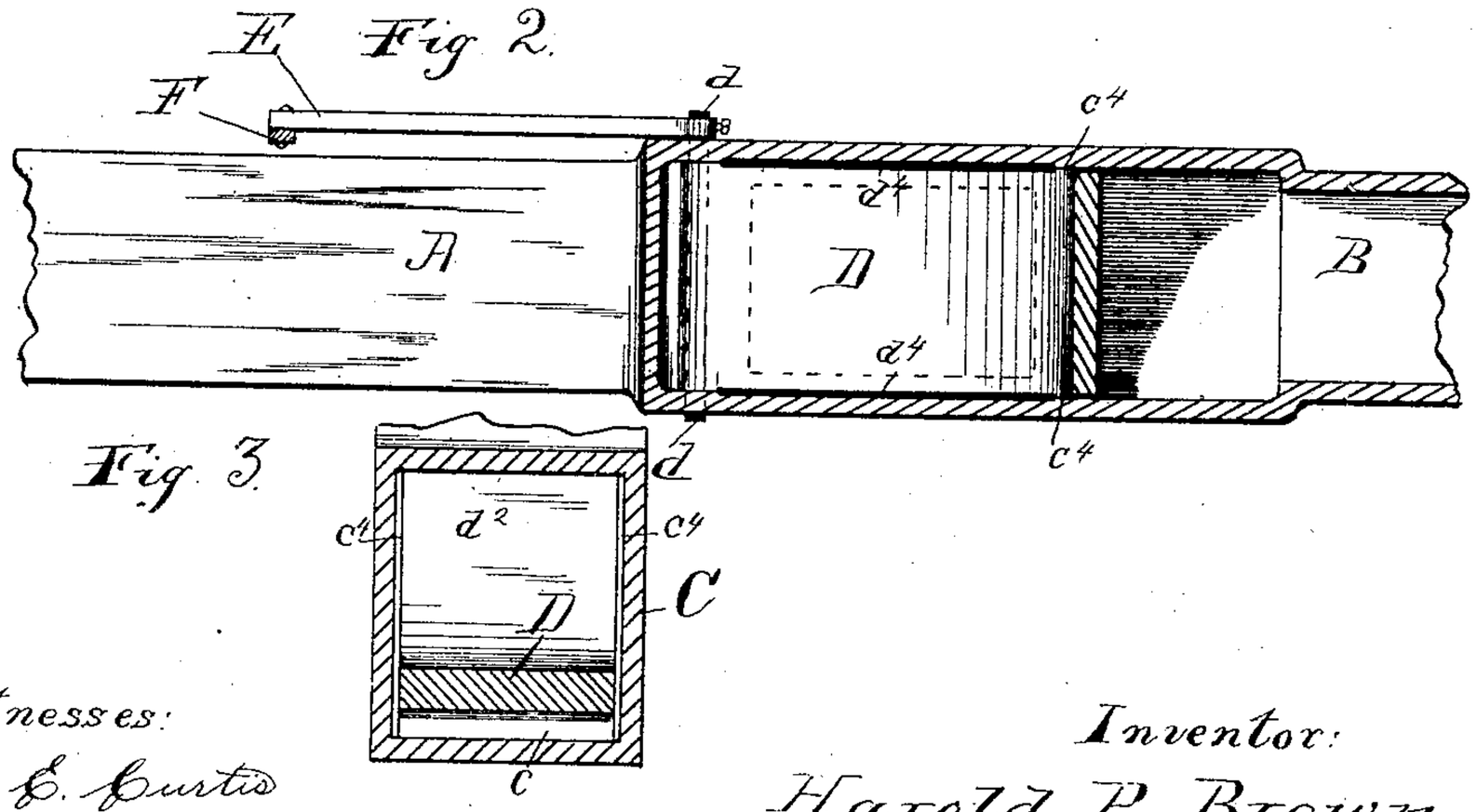

Fig. 2.

Fig. 3.

Witnesses:
Lew E. Curtis
Taylor E. Brownd

Inventor:
Harold P. Brown
per
Munday, Evarts & Adcock
his Attorneys:

UNITED STATES PATENT OFFICE.

HAROLD P. BROWN, OF CHICAGO, ILLINOIS.

REGISTERING-VALVE FOR WATER-SUPPLY PIPES.

SPECIFICATION forming part of Letters Patent No 335,213, dated February 2, 1886.

Application filed January 20, 1885. Serial No. 153,406. (No model.)

To all whom it may concern:

Be it known that I, HAROLD P. BROWN, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Water-Meters, of which the following is a specification.

The object of my invention is to provide a simple, cheap, and efficient device for accurately measuring the quantity of water used from or flowing through a supply-pipe.

In my invention a registering-valve is employed back of the water cock or outlet, and the length of time this valve is raised, as well as the size of the orifice produced thereby, is indicated, the former by a suitable clock-work mechanism and the latter by suitable mechanism, which is put in operation at a greater or less speed, according to the extent the valve is raised. This water-flow registering-valve is mounted in an enlarged closed chamber back of the water cock or outlet, and is so arranged as to be balanced—that is to say, so that the pressure of water is practically the same on both sides of it, excepting, momentarily, when the cock or outlet is being opened and the valve is assuming its new or raised position due to the flow of water through the same. This chamber is made of a rectangular form in cross-section, so that one dimension of the orifice produced by raising the valve will remain the same, and the size of the orifice be indicated or measured by the extent to which the valve is lifted or raised.

In order to give a steady movement to the valve and prevent its jumping, I furnish the valve and valve-chamber with extensions, which serve as a kind of dash-pot.

As the pressure on both sides of the valve is practically the same, the force by which the valve is raised is the friction of the moving body of water beneath it, and the extent to which it will be raised will therefore be in proportion to the amount of this friction—that is to say, to the velocity and amount of water flowing through the opening.

The mechanism I employ for indicating or registering the extent to which the valve is raised consists of a revolving wheel or shaft moved by the valve over and in contact with a surface the different parts of which move at different speeds, so that the wheel will be revolved faster or slower according to the extent the valve is raised. This revolving wheel or shaft is connected with an appropriate train of gears or other indicating mechanisms.

In the drawings I have shown, as illustrative of my invention, one good way, and that which I deem to be the best means, of reducing it to practice.

In said drawings, Figure 1 is a central vertical section of a device embodying my invention. Fig. 2 is a section on line 2 2 of Fig. 1; and Fig. 3 is a cross-section on line 3 3 of Fig. 1.

Similar letters of reference indicate like parts.

In said drawings, A represents a supply-pipe; B, the exit-pipe, which is furnished with the usual cock for opening and closing it.

C is an enlarged chamber in the rear of the exit-orifice or stop-cock, furnished with a valve-seat, *c*, preferably arranged in an inclined position in front of the supply-pipe A.

D is a valve closing the opening in the valve-seat when resting thereon. It is hinged on a pin or shaft, *d*, which extends out through a suitable stuffing-box at the side of the valve-chamber C. The valve-chamber C is made rectangular in cross-section, as shown at Fig. 3. The valve D is provided with a curved extension, d^2, which fits in a corresponding curved extension, c^2, on the valve-chamber, so as to leave a narrow opening, c^3, between the back of the extension d^2 and the extension c^2, for the escape of the water back of the valve when it is raised, thus giving it a steady movement.

In order to lessen the friction of the valve upon the sides of the chamber, the walls of the chamber are provided with projecting webs c^4, against which the edges of the valve fit closely, thus permitting the back portion of the valve to be slightly cut away, as shown at d^4.

E is an arm secured rigidly to the pin or shaft *d*, and pivoted at its other end to a rod, F, which operates to reciprocate the wheel or roller G over and in contact with the surface of the revolving disk H. The wheel or roller G is mounted to slide on a splined shaft, *g*, so as to revolve this shaft, which operates the train of gears $g' g^2 g^3 g^4$. The shafts of these gears carry the pointers or indicating-fingers $g^5 g^6 g^7$, the former of which may indicate tens,

the next hundreds, and the last thousands. Revolving disk H is operated by clock-work mechanism, and it may preferably be provided with teeth *h* on its periphery, so as to also serve, in connection with the arm or projection *h'* on the rod F, as the means of stopping and starting the clock-work mechanism by which said disk H is driven. The rod F is connected to the wheel or roller G, so as to slide the same, and still permit the same to revolve by means of the knuckle *f*, the jaws of which fit in a groove, *f'*, on the hub of the wheel or roller G; but other suitable means may be employed for operating the wheel from the rod G, and, if preferred, the shaft *g* may be made to reciprocate, in which case the wheel or roller G would be secured rigidly thereto. The rod F is pivoted at f^2 to the knuckle *f*.

L is a spring mounted on a bracket, *l*, on the pipe A, the upper end of which bears against the rod E, and will serve to cause the valve to seat itself when the cock or outlet of the pipe B is closed and no water is flowing through beneath the valve D. If the valve is arranged, as shown in Fig. 1, to swing vertically on a horizontal pivot, the valve may seat itself by gravity and this spring be dispensed with.

In place of employing a revolving disk the wheel or roller G may be moved over and in contact with some other kind of surface, the different parts of which move or revolve at different speeds—as, for example, the surface of a cone.

I have not in the drawings shown in detail the clock-work mechanism for measuring the time the valve is raised, as any suitable clock-work mechanism may be employed, and as the construction of the same is well known. For these reasons I have deemed it sufficient to simply show the disk H, having teeth, and the means by which the clock is started or released whenever the valve is raised, and stopped or locked whenever the valve is again closed, by the disengagement or engagement of the arm *h'* with the teeth on the periphery of said disk H. By this means it will be seen that I measure the size and velocity of the stream of water passing beneath the valve, and also the time the same is running, from which the amount or number of gallons can be readily determined, and the same may be indicated by the pointers g^5 g^6 g^7 on appropriate dials, as the number of revolutions of the wheel G or shaft *g* depends not only upon the time the valve is raised, but also upon the extent to which it is raised. The enlarged chamber C should preferably be about four times the size or capacity of the supply-pipe, in order that the pressure on both sides of the valve may be practically the same. The rod F is provided with an arm or projection, *h'*, which engages the teeth *h* of the escapement wheel or disk H when the valve is closed, and which releases the clock-work mechanism when the valve is raised.

I claim—

1. The combination, with enlarged valve-chamber C, of registering-valve D, mounted therein, a clock-work mechanism, a moving surface operated by said clock-work mechanism, different parts of which move at different speeds, a wheel or roller reciprocated by the movement of said valve in contact with said moving surface, and means for releasing and stopping said clock-work mechanism by the movement of said valve, substantially as specified.

2. The measuring device consisting of a wheel or roller reciprocated in contact with a surface different parts of which move at different speeds, and means for stopping and releasing said moving surface, substantially as specified.

3. The combination of pipe A, outlet B, enlarged chamber C, valve D, operating-stem E, rod F, wheel G, reciprocating on shaft *g*, revolving disk H, teeth *h*, and gears g^5 g^6 g^7, substantially as specified.

4. The combination of pipe A, outlet B, enlarged valve-chamber C, having inclined valve-seat *c*, valve D, provided with extension d^2, and extension c^2 on said valve-chamber, substantially as specified.

5. The combination of pipe A, outlet B, enlarged valve-chamber C, having inclined valve-seat *c*, valve D, provided with extension d^2, and extension c^2 on said valve-chamber, and mechanism for registering the product of the factors, the extent to which and time during which said valve is raised, substantially as specified.

6. The combination of a reciprocating wheel or roller operated by a valve with a revolving disk over the surface of which said wheel is reciprocated, and mechanism for registering the number of revolutions of said wheel, and means for stopping and releasing said revolving disk by the movement of the valve, substantially as specified.

HAROLD P. BROWN.

Witnesses:
H. M. MUNDAY,
EDMUND ADCOCK.