

JOSEPH GUILD.

Improvement in Automatic Water-Valves.

No 114,804.

Patented May 16, 1871.

Fig. I.

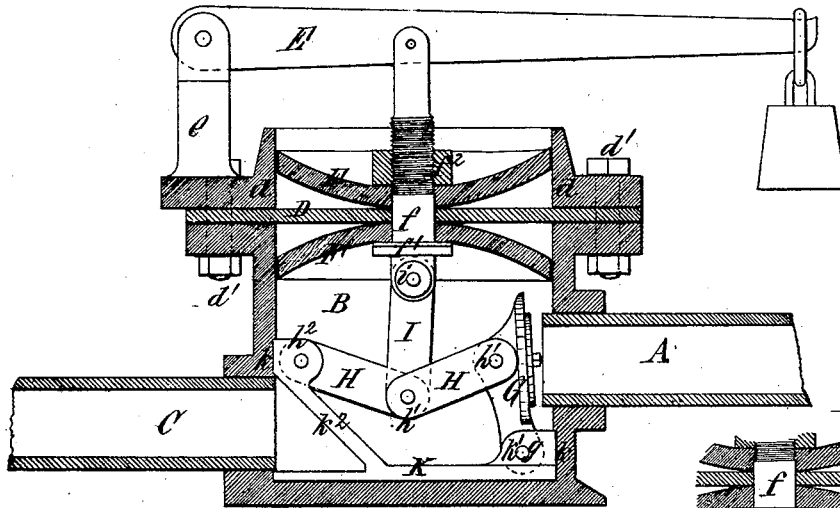


Fig. IV.

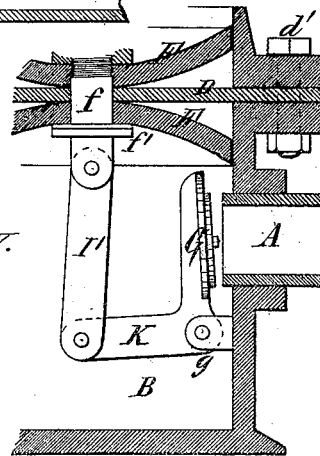


Fig. II.

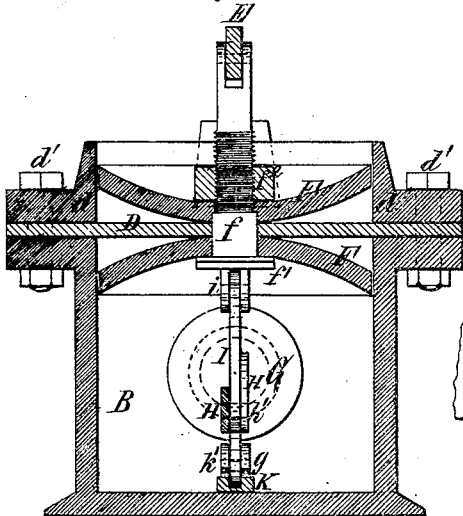
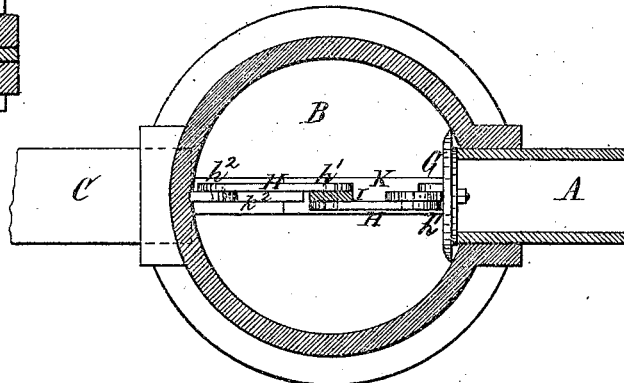


Fig. III.



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Witnesses

*Joseph Guild* Inventor  
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# United States Patent Office.

JOSEPH GUILD, OF BUFFALO, NEW YORK.

Letters Patent No. 114,804, dated May 16, 1871.

## IMPROVEMENT IN AUTOMATIC WATER-VALVES.

The Schedule referred to in these Letters Patent and making part of the same.

I, JOSEPH GUILD, of the city of Buffalo, in the county of Erie and State of New York, have invented certain Improvements in Automatic Water-Valves, of which the following is a specification.

My invention relates to that class of devices which is employed for regulating the pressure in the pipes used for distributing the water in houses, and in which the valve controlling the flow of water is actuated by the movement of a flexible head or diaphragm against which the water-pressure acts.

My invention consists—

First, in the arrangement, in the valve-chamber and with the flexible head of an automatic water-valve, of a hinged valve and toggle-bars and link, or equivalent connecting mechanism, as hereinafter described.

Second, in the arrangement, with the flexible diaphragm and cylindrical valve-chamber, of two curved plates attached to said diaphragm, so as to guide the same in the valve-chamber and to equalize the strain thereon.

Third, in the arrangement, with the valve-chamber, hinged valve, and toggle-bars, of a frame held in recesses formed in the valve-chamber and receiving the valve-hinge and the fixed end of the toggle-joint, as hereinafter described.

In the accompanying drawing—

Figure I is a sectional elevation of my improved automatic water-valve.

Figure II is a similar view at right angles to Fig. I.

Figure III is a horizontal section of the apparatus.

Figure IV represents a modified form of the mechanism for operating the valve.

Like letters designate like parts in each of the figures.

A is the induction-pipe;

B, the cylindrical valve-chamber; and

C, the discharge-pipe.

D is the flexible diaphragm, made of India rubber or other elastic material. It is secured to the top of the valve-chamber by means of a flange, *d*, forming a continuation of the latter above the diaphragm D and screw-bolts *d*.

E is a weighted lever, pivoted to a standard, *e*, projecting from the flange *d* and bearing on the diaphragm D by means of a spindle, *f*, secured to and passing through the latter.

All of these parts are old and well known.

F F are two curved plates, secured to both sides of the diaphragm D by means of a shoulder, *f*<sup>1</sup>, formed with the spindle *f* and a screw-nut, *f*<sup>2</sup>. These plates fit snugly in the bore of the valve-chamber B and flange *d* respectively, and serve to guide the flexible diaphragm in its movement in the valve-chamber.

The plates F are arranged with their convex side next to the diaphragm D, so that when the latter is

forced out of its normal position it will, more or less, conform with the curvature of one or the other of said plates. The strain brought upon the diaphragm D by the mechanism actuating the valve is in this manner distributed over a greater portion of the diaphragm, whereby its durability is considerably increased.

G is the valve regulating the water-pressure in the distributing-pipes. It is arranged within the valve-chamber B and hinged at *g*. Its seat is formed by the end of the induction-pipe A projecting slightly into the chamber B.

H H are the bars of a toggle-joint, connected at *h*, taking hold of the valve G at *h*<sup>1</sup>, and having the fixed point at *h*<sup>2</sup>.

I is a link, attached to the stem *f* of the flexible head at *i*, and joined to the toggle-bars H at *h*.

K is a frame, resting on the bottom of the valve-chamber B, and fitting with its ends in recesses *k k* formed therein. It is provided with lugs *k*<sup>1</sup> for the reception of the hinge *g* of the valve G, and also with an arm, *k*<sup>2</sup>, to which the fixed end *h*<sup>2</sup> of the toggle-joint is pivoted.

The operation of my improved automatic water-valve is as follows:

The discharge-faucet being opened, the pressure in the valve-chamber B is lessened, when the weighted lever E will cause the head D to bend downward.

By means of the link I and toggle-joint H H the valve G is proportionally opened and the required quantity of water allowed to pass through the valve-chamber into the distributing-pipes. In the same measure as the outflow of water is reduced the pressure in the valve-chamber is increased, causing the flexible head to rise, thereby closing the valve G proportionally.

In Fig. IV is represented a modified form of the mechanism for actuating the valve G.

The link I' is attached to an arm, K, arranged at right angles to the face of the valve G, and formed with the hinge *g* thereof.

The operation of this device is obvious.

What I claim as my invention is—

1. The arrangement, in the valve-chamber B and with the flexible head D, of the hinged valve G and toggle-bars H, and link I or equivalent connecting mechanism, substantially as hereinbefore set forth.

2. The arrangement, with the cylindrical valve-chamber B and flexible diaphragm D, of the convex plates F F, constructed substantially as hereinbefore described.

3. The arrangement, with the valve-chamber B, valve G, and toggle-bars H H, of the frame K, constructed substantially as hereinbefore set forth.

Witnesses:

JOSEPH GUILD.

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SAMUEL SMITH.