M. HOGAN.
Water-Cock.

No. 202,653. Patented April 23, 1878.

Fig. 1.

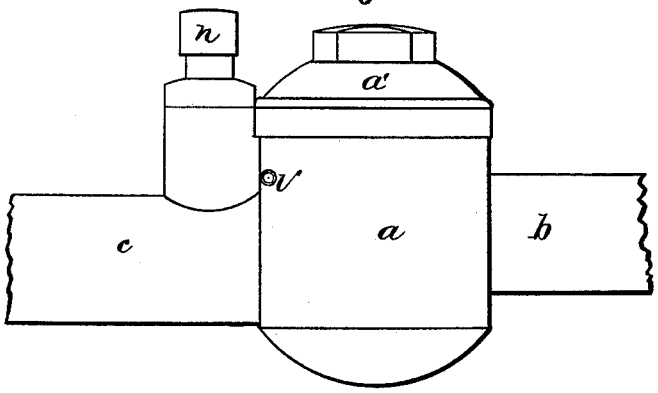
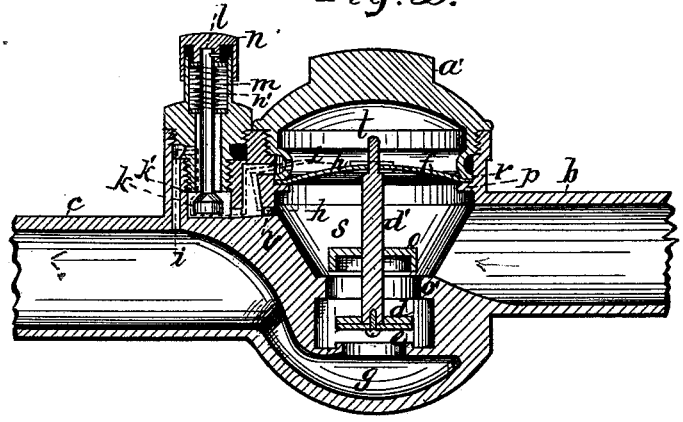


Fig. 2.



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UNITED STATES PATENT OFFICE.

MATTHEW HOGAN, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN WATER-COCKS.

Specification forming part of Letters Patent No. **202,653**, dated April 23, 1878; application filed December 24, 1877.

To all whom it may concern:

Be it known that I, MATTHEW HOGAN, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements pertaining to a Water-Cock, of which the following is a specification, reference being had to the accompanying drawings, where—

Figure 1 is a side view. Fig. 2 is a view in central vertical section.

The letter *a* denotes the body of the cock; *b*, the entrance-pipe, and *c* the exit-pipe. The letter *d* denotes the principal valve, and *e* the valve-seat for this valve. This valve depends, by the intermediate rod *d'*, from the diaphragm *f*, made of rubber or equivalent material.

It is obvious that, otherwise unaffected, the pressure of the water entering through the pipe *b* will raise this diaphragm, and with it the valve *d*, and the water will run freely through the valve-opening, and through the intermediate water-way *g*, out through the exit-pipe *c*; but there is a water-way (denoted by dotted line *h*) leading from below the diaphragm to the chamber above the diaphragm. This admits water above the diaphragm, so as to balance the water-pressure, and I will call it the "balance-conduit." Thus balanced, it is evident that, otherwise unaffected, the incoming water will not raise the valve *d*, and the gravity of the valve and the smaller area on top of the diaphragm exposed to pressure (either or both) tend to close the valve.

I will now describe how the valve is opened: From the chamber above the diaphragm an escape-conduit, *i*, (denoted by dotted lines,) leads to the exit-pipe *c*. Midway of this escape-conduit is located a subsidiary valve, described hereinafter, which, when opened, allows the water above the diaphragm to escape, so that it can rise and the main valve be opened. When this subsidiary valve is closed the chamber above the diaphragm again fills with water and the main valve closes. The balance-conduit *h* is smaller than the escape-conduit, so as not to materially interfere with the operation of the escape-conduit.

It will be seen from the drawings that the balance-conduit and the escape-conduit are the same for a part of their course. This is not essential; they can be entirely distinct.

I will now describe the subsidiary valve: The letter *k* denotes the valve, and *k'* the valve-seat. When the valve is pressed down, as shown in Fig. 2, in order to show the exit-conduit as continuous, the water passes freely through. This valve is borne on the rod *l*, running to the finger-cap *u*, which (for the mere purpose of keeping the subsidiary valve closed, it may have any proper spring) contains the closing-spring *m*, of rubber, kept from "setting" and from adhering to the valve-rod by the interposed helical spring *n'*.

I will now describe a device for preventing the main valve from hammering when suddenly closed. The valve-rod *d'* is furnished with the disk *o*, which fits (not too tightly) into the corresponding disk-seat *o'*. The thickness and relative arrangement of the valve *d* and this disk are such that this disk will shut into its seat before valve *d* strikes the valve-seat, the effect of which is to mainly, but not wholly, check the inflowing current before the main valve strikes squarely on its seat, giving as a result the prevention of hammering.

The diaphragm rests on the shoulder *p*, and is confined or held between this shoulder and the flange *r*, which is on the cap *a'*, which screws into the body *a*. The flange *r* is concaved or curved, and perforated, to allow the contained water access to the escape-conduit.

The chamber below the diaphragm is denoted by the letter *s*, the one above the diaphragm by the letter *t*.

It will be understood that the cock is opened by pressing on the finger-cap *u*, and when the pressure is removed the spring underneath closes the subsidiary valve, and consequently the water-cock.

The letter *v* represents a small screw, which is used to make the balance-conduit larger or smaller, as it may be found necessary for the successful working of the valve. This screw pierces into the balance-conduit, and is screwed in to make the conduit smaller, and vice versa.

I claim as my invention—

1. In combination, the chambers *s* and *t*, con-

nected by the balance-conduit *h*, the valve *d*, connected to the diaphragm *f*, the escape-conduit *i*, provided with a subsidiary valve, and the entrance and exit pipes.

2. In combination, the valve-rod *l*, the rubber spring *m*, and the interposed helical spring *n*.

3. In combination, the valve *d*, disk *o*, and disk-seat *o'*.

4. In combination, the diaphragm *f*, the shoulder *p* on the case *a*, and the cap *a'*, provided with the concaved and perforated flange *r*.

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