J. F. VAN DUZER.

Combined Cock and Anti-Concussion Valve.

No. 165,190. Patented July 6, 1875.

Fig. 1.

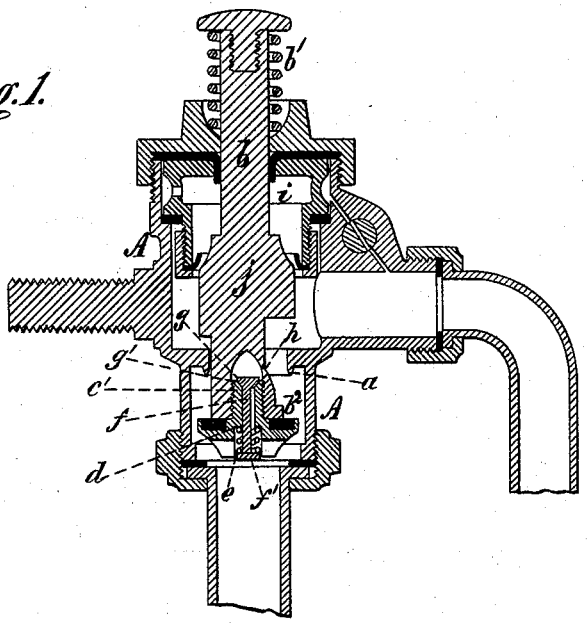
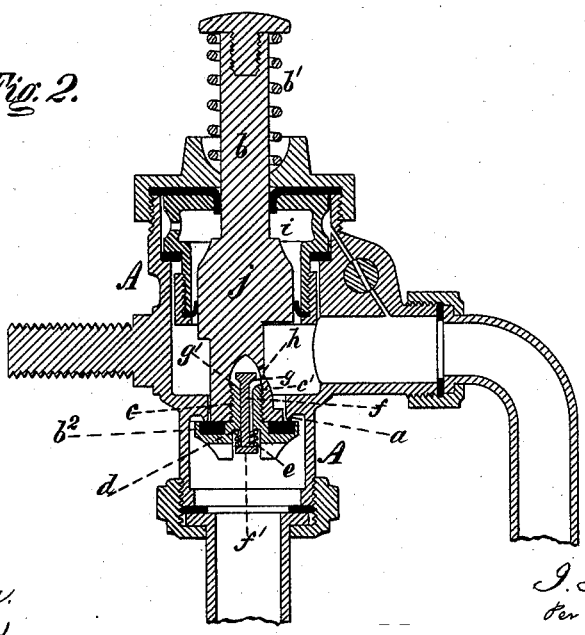


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

ISAAC F. VAN DUZER, OF MIDDLETOWN, ASSIGNOR TO CHARLES HARRISON, OF NEW YORK, N. Y.

IMPROVEMENT IN COMBINED COCKS AND ANTI-CONCUSSION VALVES.

Specification forming part of Letters Patent No. **165,190**, dated July 6, 1875; application filed June 19, 1875.

To all whom it may concern:

Be it known that I, I. F. VAN DUZER, of Middletown, Orange county, New York, have invented a Combined Cock and Anti-Concussion-Valve, of which the following is a specification:

My invention consists of a supplementary valve arranged in connection with an ordinary double-chambered valve, for the purpose of preventing concussion when the double-chambered valve is closed.

My supplementary valve is maintained upon its seat by a spring powerful enough to resist the pressure of the water when at rest, but not powerful enough to resist the pressure which ensues when the water, having been in motion through the pipes, is suddenly arrested by the closing of the valve or cock through which it has been flowing.

The accompanying drawings are as follows: Figure 1 is a longitudinal section through the center of the valve shell and stem, showing the induction and eduction passages, and showing the main valve open. Fig. 2 is a similar view, showing the main valve at the instant of closing, and the supplementary valve slightly elevated from its seat.

Referring to the drawings, A represents the valve-shell; *b*, the valve-stem, which is pressed upward by the spiral spring b^1, and thus pulls the valve b^2 up against the annular valve-seat *a*. The valve is a flat disk provided with a hollow bolt, *c*, upon which a male screw-thread is cut, which engages the female thread *c'* on the inside of a hole bored in the lower end of the valve-stem. A shoulder, *d*, is formed on the inside of the hollow bolt *c*, which engages one end of the spiral spring *e*, which is wound around the supplementary valve-stem *f*, and expands against the collar *f'* on the lower end of the supplementary valve-stem. The upper end of the supplementary valve-stem is provided with a conical collar, *g*, the under surface of which engages the countersunk seat *g'*, formed in the upper end of the hollow bolt *c*. The spiral spring *e* is made stiff enough to hold the conical collar *g* down upon its seat against the ordinary pressure of the water at rest; but when the valve is in the act of closing, and thereby suddenly checking the momentum of the water, the spiral spring *e* yields, and a jet of water passes through the hollow bolt *c* into the cavity in the lower end of the valve-stem, and out therefrom through the lateral outlet *h*.

The structure to which I have applied my supplementary valve is what is known as a "slow-closing," or otherwise a variable, chamber-valve, the closing of the main valve being regulated by the escape of water from the chamber *i* in the upper part of the valve. When the main valve is fully open, so as to withdraw the plug *j* from the variable chamber *i*, the variable chamber becomes filled with water, and in such case the valve closes slowly; but if the valve-stem is only partially depressed, so that, although the main valve is open, there is no water admitted to the variable chamber, the main valve will close suddenly if pressure is removed from the valve-stem, and in that case my supplementary valve operates to ease the closing of the main valve and prevent concussion by injecting a small jet of water into the chamber above the valve. By the gradual closing of the supplementary valve in obedience to the operation of the spiral spring *e* the momentum of the current of water is gradually, instead of suddenly, checked.

I claim as my invention—

In a cock for fluids, the combination of the main valve with a supplementary valve and a spring so graduated in strength as to hold the supplementary valve upon its seat against the ordinary pressure of water in a state of rest, while yielding to allow the supplementary valve to open when the main valve is suddenly closed.

I. F. VAN DUZER.

Witnesses:

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