

(No Model.)

J. HURT.  
VALVE COCK.

No. 374,188.

Patented Dec. 6, 1887.

Fig. I

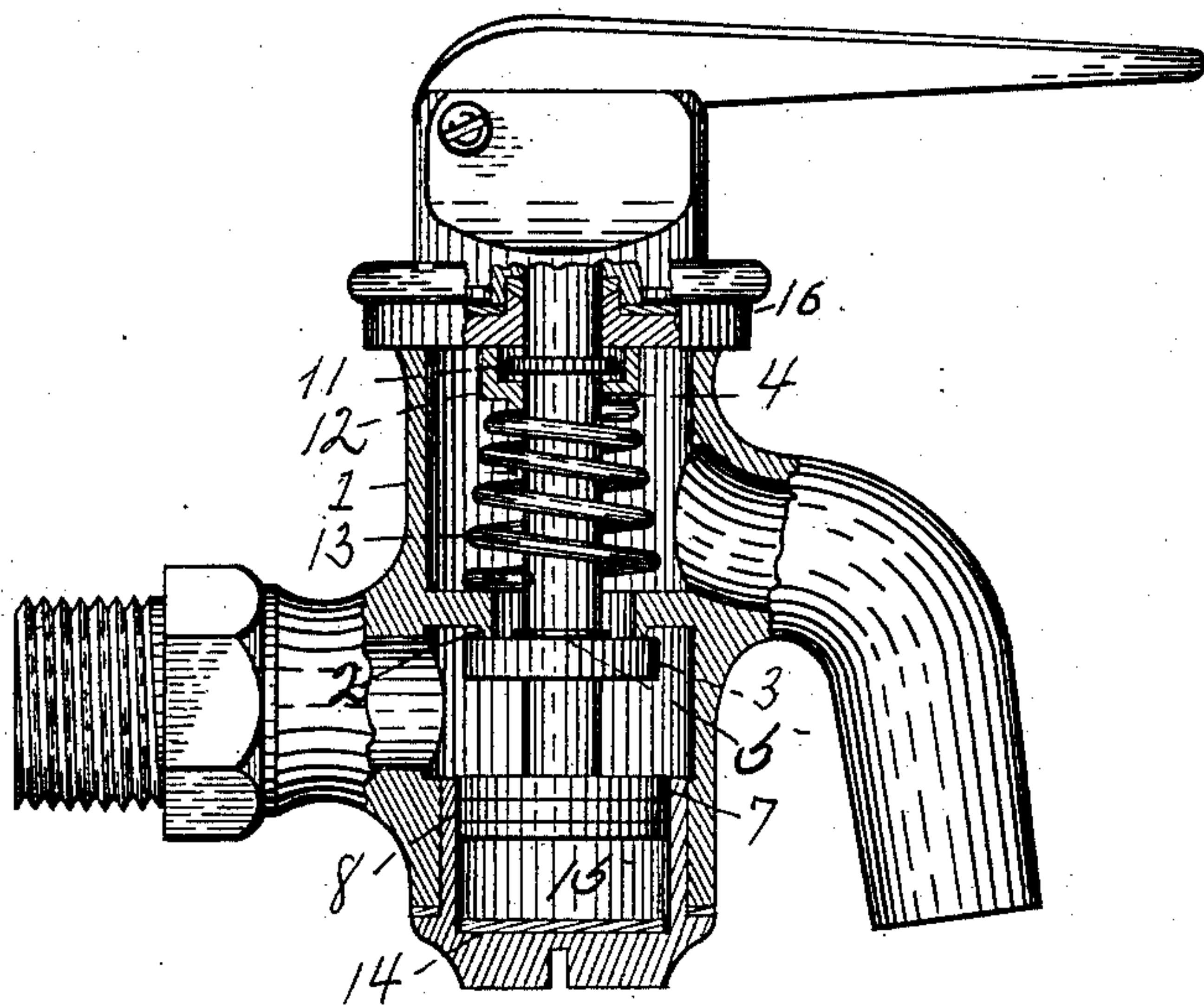


Fig. II

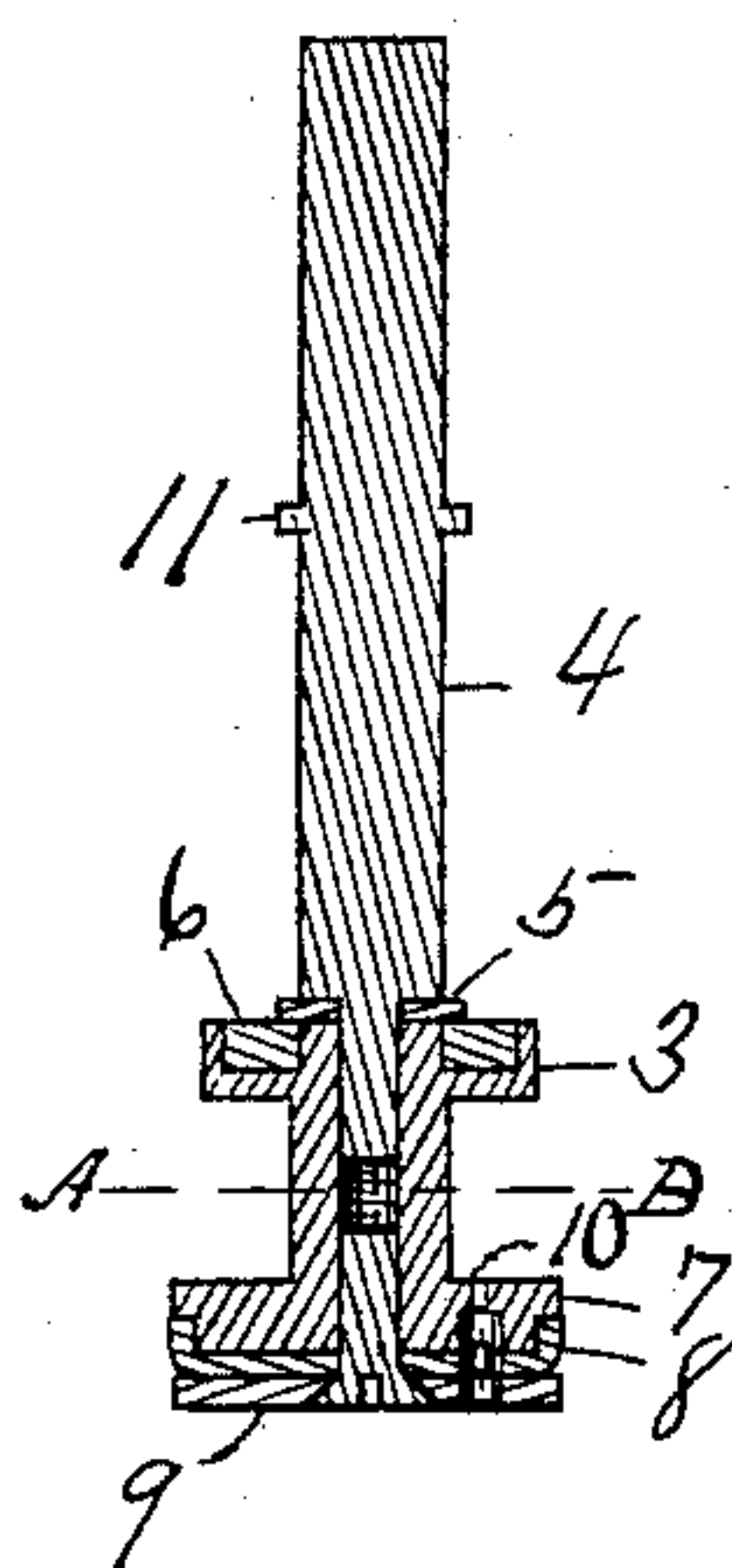


Fig. III

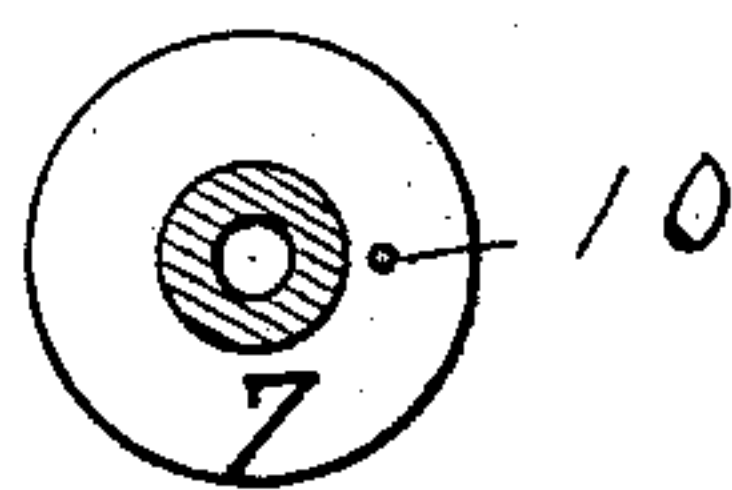
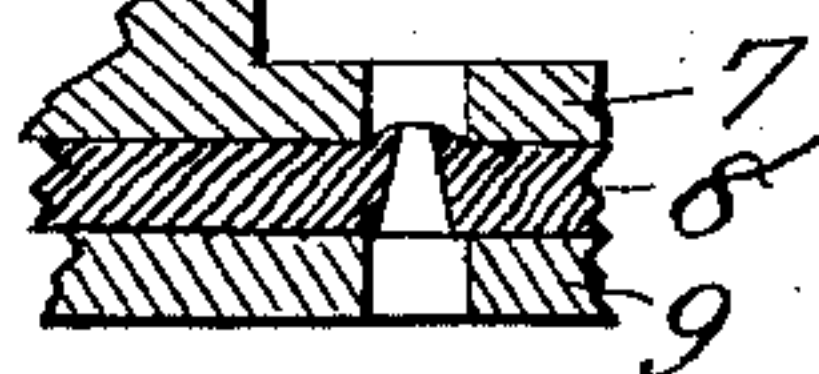


Fig. IV



Witnesses

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# UNITED STATES PATENT OFFICE

JOEL HURT, OF ATLANTA, GEORGIA.

## VALVE-COCK.

SPECIFICATION forming part of Letters Patent No. 374,188, dated December 6, 1887.

Application filed September 27, 1886. Serial No. 214,693. (No model.)

*To all whom it may concern:*

Be it known that I, JOEL HURT, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented a new and useful Valve-Cock; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to that class of valve-cocks that open against the pressure, the object being to prevent the too sudden closing of the valve by the pressure of the water, and also insuring the opening of the valve by atmospheric pressure on the water-pressure being removed; and it consists in a piston on the valve-stem, and a cylinder and a cup-shaped washer or flange on the valve-stem, and an elastic disk and a coil-spring, with the details in ordinary use, as will be hereinafter fully described, and then specifically claimed.

In the accompanying drawings, Figure I is a side view, partly in longitudinal vertical section through the center of the cock, showing the operative parts. Fig. II is a longitudinal vertical section through the valve, piston, and stem. Fig. III is a section on the line A B. Fig. IV is an enlarged sectional view showing the orifice through the packing of the piston, Fig. II.

In these figures like reference-marks indicate like parts.

A frame or shell of a cock is represented at 1. 2 is the valve-seat, and 3 the valve. The valve-stem 4 has a collar, 5, which is preferably a washer, being held between the valve and stem, which are screwed together. The function of this washer or collar is to hold the packing 6 in place. The piston 7 is attached to the valve, and is preferably made integral with the valve, and has a packing, 8, clamped between it and the washer or follower 9.

15 is a cylinder for the piston 7.

The valve-stem extends upwardly through the top of the shell, and is guided and actuated in any ordinary way. On the valve stem is a stop, preferably a collar, 11, and surrounding it a cup-shaped washer, 12, against which presses the coil-spring 13. It will be observed

that after the valve-stem has been depressed and the valve is being again raised to its seat by the spring 13, before said valve can reach its seat the cup-washer 12 will come in contact with the cap 16 and prevent the further action of the spring upon the valve-stem, the continued movement of the valve to its seat being carried out by the pressure of the water on the under side of the valve, the valve, when seated, being wholly relieved from the pressure of the spring. The hole through the packing 8 (which is preferably of leather) is made slightly tapering, the bottom end being larger than the top, and should be punched from the bottom, thereby forcing the leather about the upper end of the hole upwardly in the shape of a flange; or, if the packing is made in a mold and of rubber or other elastic material, it may be molded in that form.

14 is a rubber or other elastic disk.

The operation of this device is as follows: The valve 3, being open, is closed by the pressure of the water entering the cylinder through the aperture 10, and is assisted by the spring 13 up to the point where the top of the cup-shaped washer shall come in contact with the top cover of the cock, when the action of the spring will cease and the closing of the valve will be completed by the pressure of the water under the piston. The collar 11 being so placed as to not permit the action of the spring alone to bring the valve to its seat, provides for a lost motion, whereby, when the pressure of the water under the valve shall be removed, the valve will be forced open by its own weight and the atmospheric pressure and vent the pipes and allow them to drain. On the pressure being renewed the water entering through the aperture in the piston will close the valve on account of the area of the piston being greater than the opening through the valve-seat. In opening the valve the water is discharged from the cylinder through the aperture 10, and on releasing the valve it can close only as fast as the water can return through this aperture and fill the cylinder. The hole through the packing being elastic and somewhat flanged on the upper side of the packing, will allow the water to flow more freely through it when the valve is being opened than when it is closing, which will allow it to be opened rapidly and cause it to close slowly. The area



of the piston should be as great or greater than the area of the aperture through the valve-seat, as otherwise any water-pressure greater than the atmospheric pressure would assist the valve to close more rapidly than the water could enter and fill the cylinder, thereby causing a vacuum in the cylinder which would prevent the regulation of the speed at which the valve would close, and should be as much larger as will allow the atmospheric and water pressures against the top of the piston and valve to overcome the spring. Whenever the water under the piston shall be frozen, the expansion thereof is provided for by the elastic disk 14, which would be thereby compressed and prevent the bursting of the cylinder.

I am aware that it is not new to provide a piston with an aperture through the same for the passage of fluids or to support a valve upon its seat by a spiral spring surrounding the valve-stem, and I do not broadly claim these devices as a means for operating a valve, my invention consisting, essentially, in a novel construction and arrangement of parts by which the automatic action of the valve is produced.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

30 1. In a valve-cock, the combination, with

the case provided with a valve-seat, of a valve closing against said seat under pressure of the water, and provided with a stem which passes through said case, and is provided with a fixed collar within the case and adjacent to its wall, 35 and a loose cup-shaped washer inclosing said collar and having a depth greater than the thickness of the collar arranged within its open side toward the case, and a spring bearing against the closed side of said washer, as and 40 for the purpose set forth.

2. In a valve-cock, the combination of the case provided with a valve-seat, a valve closing against said seat under pressure of the water, and provided with a stem having a fixed 45 collar, and a loose cup-shaped washer inclosing said collar, having a depth greater than the thickness of the collar, arranged with its open side toward the case, a spring bearing against the closed side of said washer, and a piston at- 50 tached to said valve-stem having a tapering orifice through the same, as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOEL HURT.

Witnesses:

JACK J. SPALDING,  
WM. S. THOMSON.