(No Model.) 2 Sheets—Sheet 1.

W. J. WOOD.

AUTOMATIC CUT-OFF FOR WATER PIPES.

No. 345,017. Patented July 6, 1886.

Fig. 1.

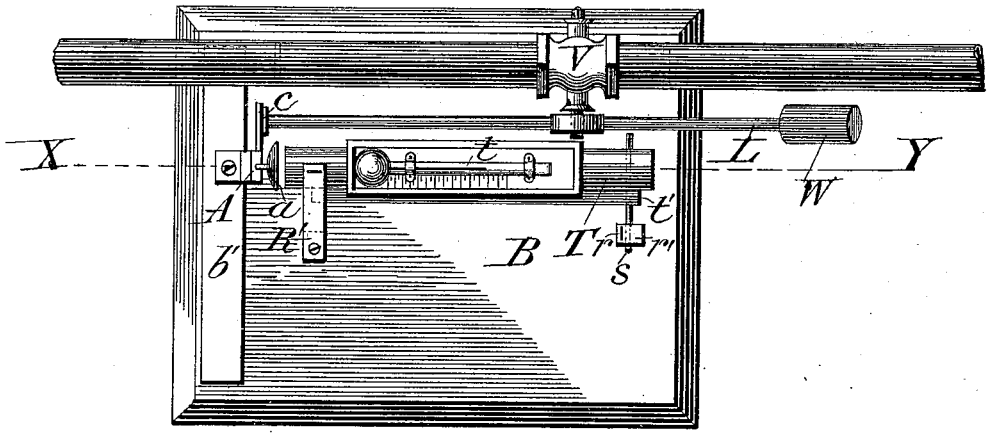
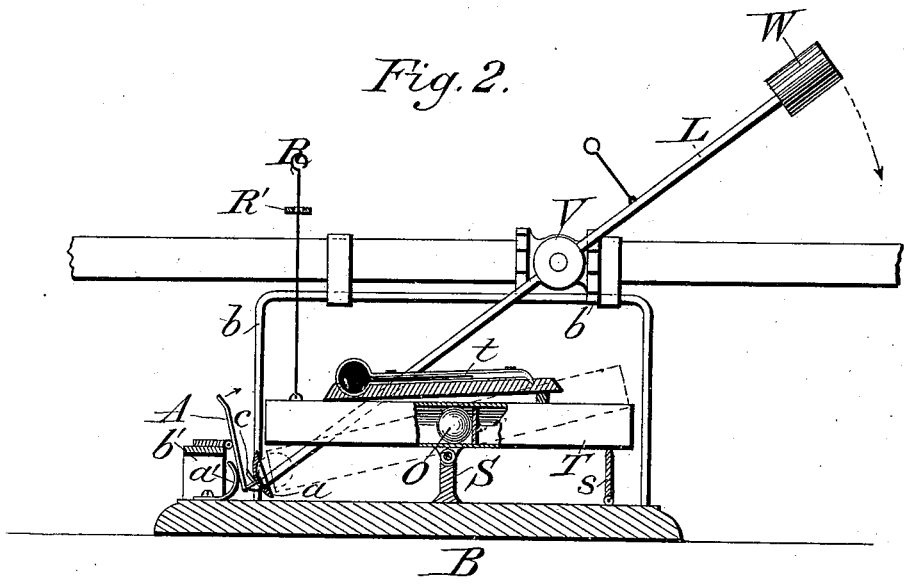


Fig. 2.



Witnesses
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Inventor
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

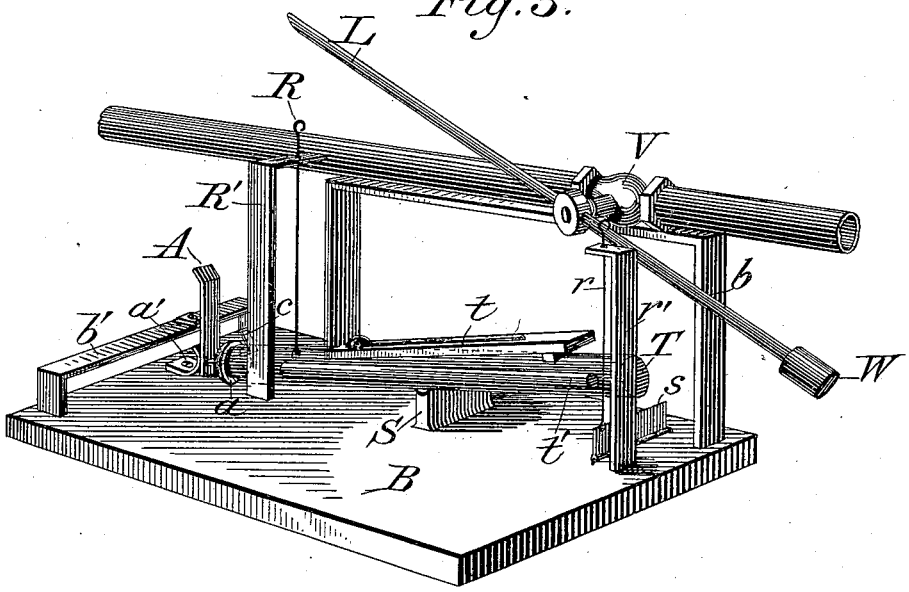


Fig. 5.

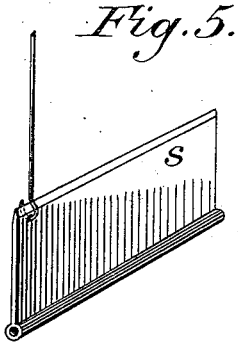
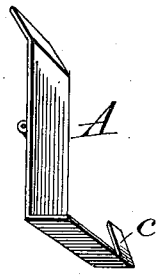


Fig. 4.



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UNITED STATES PATENT OFFICE.

WALTER J. WOOD, OF ATLANTA, GEORGIA.

AUTOMATIC CUT-OFF FOR WATER-PIPES.

SPECIFICATION forming part of Letters Patent No. 345,017, dated July 6, 1886.

Application filed March 9, 1886. Serial No. 194,719. (No model.)

To all whom it may concern:

Be it known that I, WALTER J. WOOD, a citizen of the United States of America, residing at Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Automatic Cut-Offs for Water-Pipes; 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 is a device for automatically closing the cock of a water-main or other pipe-valve, to prevent the bursting of pipes by freezing.

It consists of means for utilizing the contracting property of mercury or other expansive non-freezing liquid, which is so arranged that in contracting it changes its center of gravity, and thereby furnishes, in combination with the weights or springs, the motive power necessary to close the valve, as will be hereinafter fully described and then specifically claimed.

In the accompanying drawings, Figure 1 is a plan with the valve open. Fig. 2 is a longitudinal vertical section through the line X Y, showing the valve open, and by dotted lines showing the movement of the tube T when, by the contraction of the liquid in the tube *t*, it shall have sufficiently changed its center of gravity. Fig. 3 is a perspective view of the device, showing the valve closed. Fig. 4 is a detail showing the tilting arm A and catch *c*. Fig. 5 is a detail showing hinged support *s*.

Similar letters refer to similar parts in the several views.

By some suitable means, preferably by a bracket, *b*, I connect the valve V to the base-plate B. On the stem of this valve I attach a lever, L, which is weighted on its outer end sufficiently to turn by gravity in the direction indicated by the arrow and close the valve.

For the weight W may be substituted a spring; but at present I prefer to use the weight. When the weight is up, which opens the valve, it is held in that position by the catch *c*, under which is the lighter end of the lever. The catch *c* is attached to and forms a part of the tilting arm A, which is hinged to the bracket *b'*, or other suitable support, whereby it can swing in such a way as will release the light end of the lever L.

Attached permanently to the base B is a standing lug or support, S, on which is pivoted or hinged the tube T. To this tube is attached the tube *t*, which has a bulb, as shown in Fig. 2, in which the expansive fluid is placed. The tube *t* is placed in such a position on the tube T that whenever the temperature shall be as cold as to be about at the freezing-point, or any other point at which it is desired to shut the water off, the expansive fluid will have changed its position sufficiently to tilt the tube T, as shown by the dotted lines in Fig. 2.

In the tube T is a ball, O, which, when the tube is inclined, as shown in Fig. 2 by the dotted lines, would roll by gravity to the lower end of said tube, and which is prevented from rolling in the other direction beyond a fixed point by the stop *o*.

On the side of the tube T is another tube, *t'*, which is partially filled with a liquid.

On the tilting arm A is a buffer, *a*, which receives the impact of the ball O, and imparts a motion to the arm A and catch *c* that will release the lever L.

Under the tube T, and hinged to the base B, is support *s*, which is of sufficient height to sustain the tube T in the desired position whenever the liquid in the tube *t* shall be sufficiently expanded to make it necessary. Attached to this hinged support is a rod, *r*, by which it can be raised or lowered to a position having more or less height. This rod *r* passes through a bracket, *r'*, or other suitable support.

Attached to the tube T is a rod, R, by which said tube can be raised or lowered, as shown in Fig. 2. This rod passes through bracket R' or other suitable support.

The operation of this device is as follows: The cock V being of that class that is opened and closed by a partially rotary movement of the valve, the lever L is adjusted on the stem of the valve so as to close the valve on the descent of the weighted end of the lever. It is obvious that when the light end of the lever is under and held down by the catch *c*

the valve will open the cock and allow the flow of water. The arm A, being provided with a spring, *a'*, at its back, as shown, keeps the catch *c* in contact with the lever until, by the contraction of the fluid in the tube *t*, the center of gravity is changed sufficiently to tilt the tube T, as shown by the dotted lines, Fig. 2, when the ball O will roll to the lower end of the tube and against the buffer on the arm A, which it will press back, thereby allowing the lever L, by releasing it, to close the valve. On the center of gravity being changed the tube will instantly commence to tilt, which movement will be accelerated by the liquid in the tube *t'* changing its center of gravity toward the falling end of the tube, and also by the ball rolling toward that end. To open the valve and start the flow of water the end of the tube T in which the ball is should be raised until the ball rolls back to its position near the center of the tube and is stopped by the stop *o*, to do which necessitates tilting the tube beyond the point at which it is desirable to leave it, which consequently necessitates lowering the support *s*, which is done by turning it down on the base. After the ball shall have been brought back to its position near the center of the tube T, the support *s* can be raised, thereby adjusting the tube to the position in which it is desired to leave it. The valve can then be opened, and the arm A having been released from the pressure of the ball O, it is actuated by the spring *a'*, keeping the catch *c* firmly on the end of the lever L, and preventing the weight from opening the valve until released by a change of temperature, as above described, or by depressing the tube T by the rod R, or otherwise. It is obvious that at all times when the temperature is as low as or lower than the point at which this machine is set to close the valve, the valve, on being opened, will not stay in that position, but will be immediately closed by the weighted lever, and while water may be drawn through this valve it cannot be set to stay open when the temperature is lower than that at which it is set to close the valve.

In constructing this machine the tube *t'* may be omitted; but it is advantageous to use it, for the reason that on the slightest movement of the tube the liquid will flow toward the descending end and assist the tilting movement more promptly than will the ball, and consequently make it descend more rapidly, which would have the effect of giving a greater impetus to the ball.

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

1. In a cut-off for water-pipes, the valve V, the stem of which is provided with a self-acting actuating-lever, in combination with the tilting arm A, provided with catch *c*, buffer *a*, and actuated by spring *a'*, the ball O, and the tube T, substantially as described.

2. In a cut-off for water-pipes, the thermometric tube *t*, the tube T, the ball O, and the buffer *a*, in combination with the catch *c* and the self-closing valve V, provided with a restraining-rod, substantially as shown.

3. In a thermometric cut-off for water-pipes, the combination of the bed-plate B, the horizontally-poised tube T, the ball O, and the tube *t'*, partially filled with liquid, as shown, and for the purpose specified.

4. In a cut-off for water-pipes, the combination of the tubes T, *t*, and *t'*, the ball O, the stop *o*, and the support *s*, with the tilting arm A, provided with the catch *c*, and the valve V, provided with the weighted actuating-lever, all combined and operating substantially as described.

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

WALTER J. WOOD.

Witnesses:

THOS. M. MCKINNON,

A. P. WOOD.