

(No Model.)

W. G. BROWNE.

ANTI FREEZING DEVICE FOR WATER PIPES.

No. 382,588.

Patented May 8, 1888.

Fig - 2 -

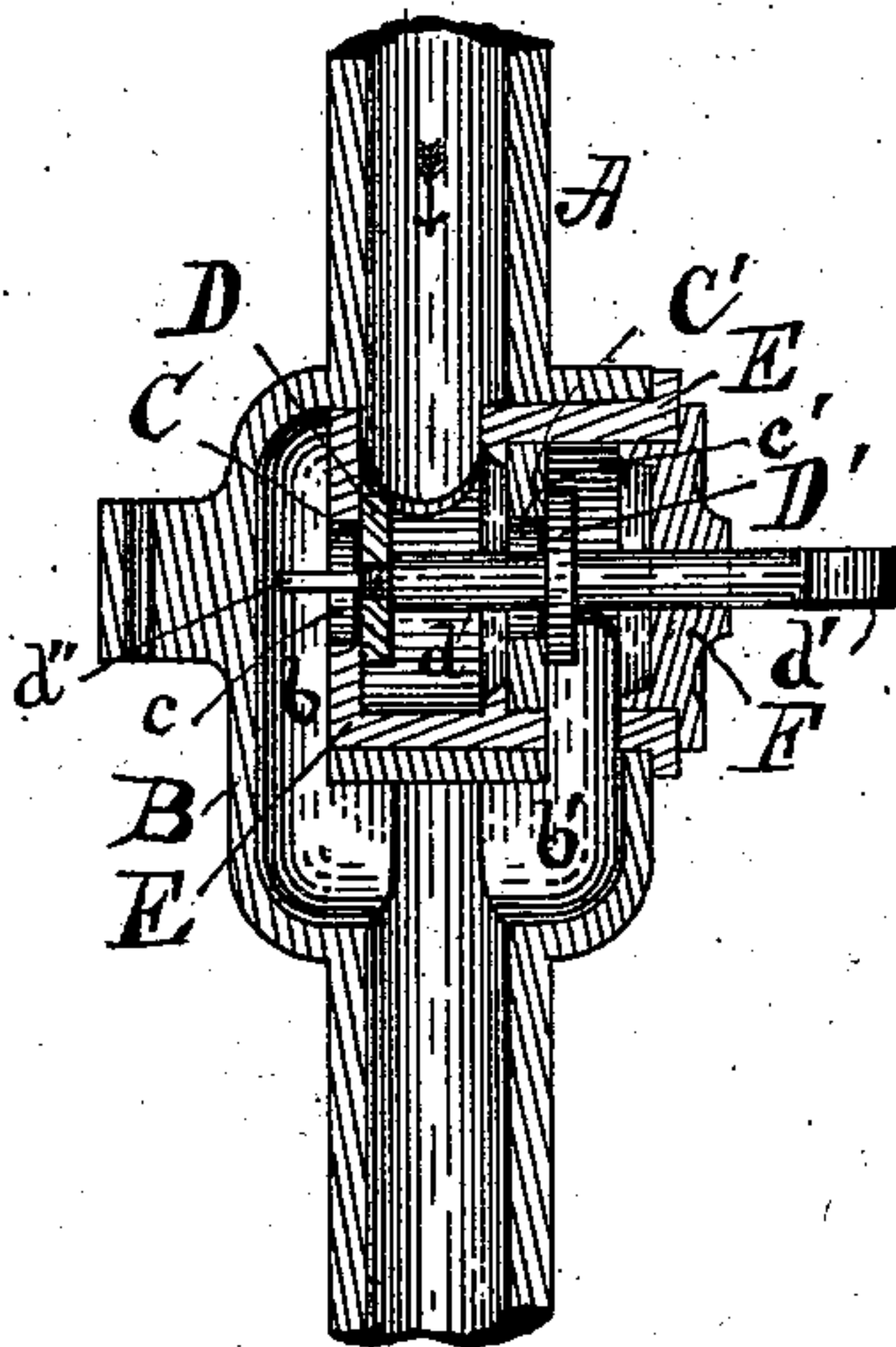


Fig - 3 -

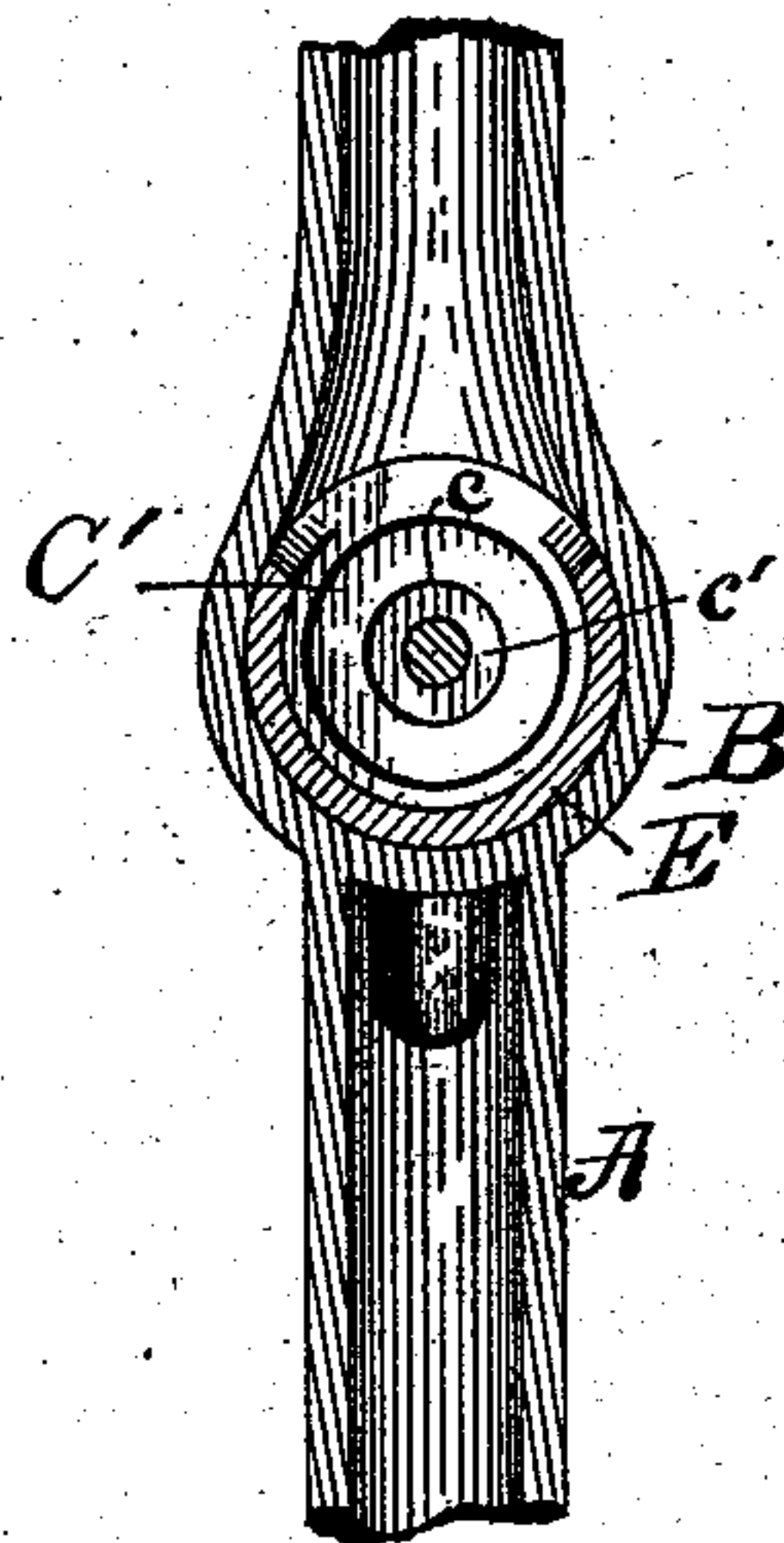
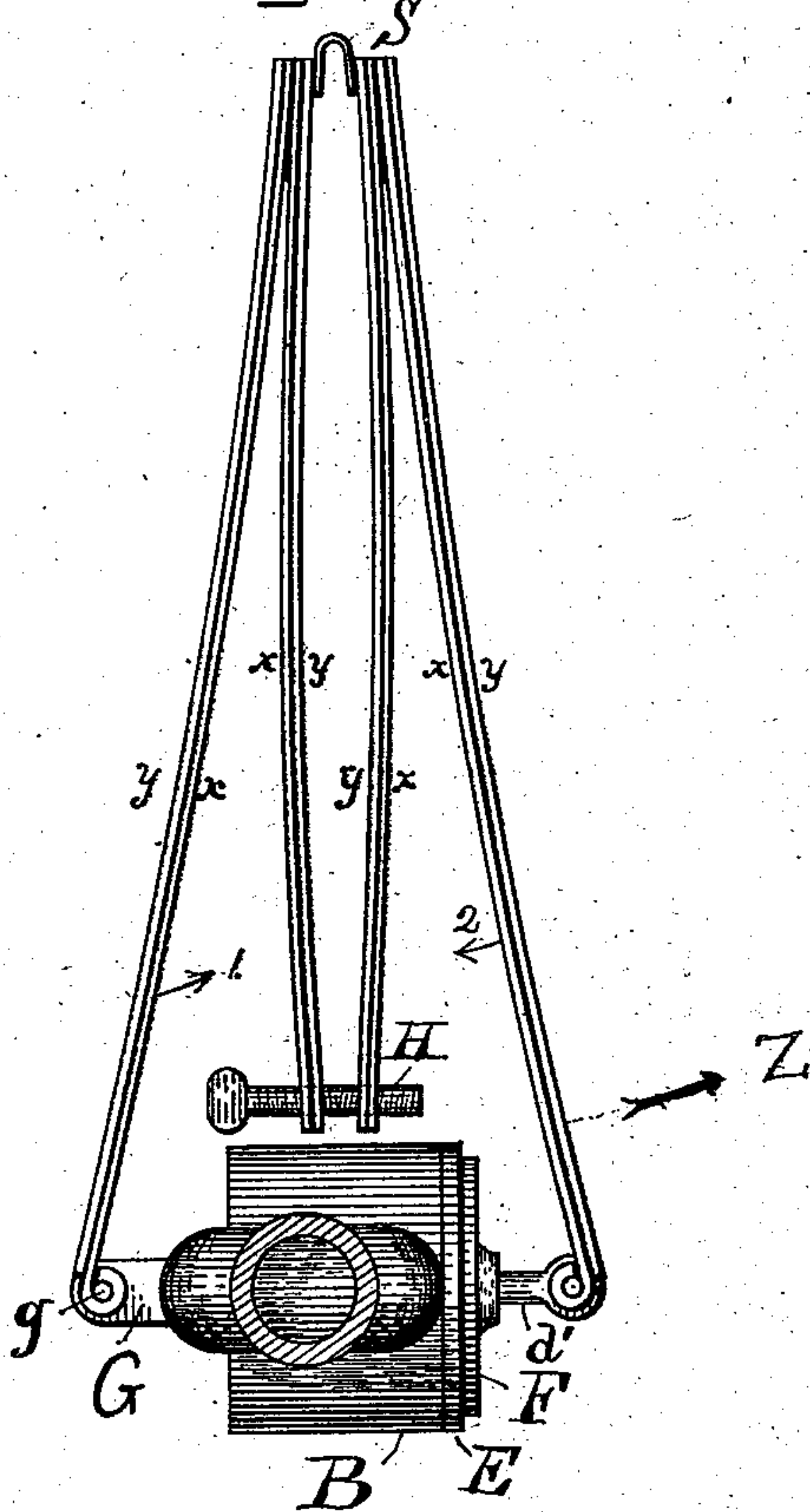


Fig - 1 -



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## ANTI-FREEZING DEVICE FOR WATER-PIPES.

SPECIFICATION forming part of Letters Patent No. 382,588, dated May 8, 1888.

Application filed March 15, 1887. Serial No. 231,040. (No model.)

*To all whom it may concern:*

Be it known that I, WALKER G. BROWNE, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented a new and useful Thermal Valve; 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 thermal valves; and it consists of a balanced puppet-valve, or valve of like general character, compound plates for actuating the valve, and an adjusting-screw to cause the valve to open or close at any given temperature.

The details of construction and the mode of operation will be hereinafter fully set forth.

In the accompanying drawings, Figure 1 is an end view of the pipe showing the outside of the valve and compound plates, adjusting-screw, and the pivot by which the fixed end of the compound plate is hinged to the valve-casing, and the pivot by which the free end is hinged to the rod or stem of the valve. Fig. 2 is a horizontal section through the center of the pipe, Fig. 1, showing the water-passages, the valves and valve-seats, and the general construction of the valve-cock. Fig. 3 is a vertical section through the center of the pipe, Fig. 1, showing several of the details.

In the figures, like reference-marks referring to corresponding parts in the several views, A is a water-supply pipe on which is a valve-cock consisting of a shell or casing, B, in which are the water-passages *b* and *b'*, and the valve-seats C and C', having ports *c* and *c'*, and the puppet-valve D and D', having the stem *d*, and actuated by the stem *d'*, by which it is also guided, as well as by the guiding-arms *d''*. In the construction of this valve it is preferable to form the valve-seats in a hollow plug, E, the seat C being made integrally with it and the seat C' being inserted. The plug F, being inserted to close the aperture in the outer end of the plug E, forms a guide for the actuating-valve stem. Around this stem and in the plug F may be placed packing in cases when the

water-pressure requires it. In the plug E is an aperture, on one of its sides coincidental with the pipe and opening from the pipe into the space between the valves, as shown in Figs. 2 and 3, and opening out from the plug is an aperture, as shown in Fig. 1, that is coincidental with the water-passage *b'*. The water passing through this valve-cock, coming in the direction indicated by the arrow, Fig. 1, and the valves being open, will pass partly through the port *c* in the valve-seat C and through the passage *b*, and partly through the port *c'* in the valve-seat C' and the passage *b'*, into the continuation of the pipe A.

The valves C and C' and their ports *c* and *c'* should be of such relative sizes as to cause the pressure of the water to be slightly greater on the valve C than on the valve C', in order to make these valves self-closing whenever they shall come nearly into that position, for reasons that will be hereinafter given.

On one side of the valve-casing is the lug G, Figs. 1 and 2, (but best shown in Fig. 1,) to which is hinged by the pin *g* one end of the compound plates that are composed of two metals having different contracting and expanding properties when exposed to varying temperatures, and to the other or free end is hinged the valve-stem *d'*. In the construction shown the strips marked *y* are much more affected by the change of temperature than those marked *x*. When the temperature lowers, the first compound plate will bend or bow in the direction indicated by the arrow marked 1. The last plate will bend or bow in an opposite direction, indicated by the arrow 2. As the first compound plate is fixed, the last must do all the moving, and that in the direction of the arrow Z. The tops of the compound plates are fixed nearly parallel with the sides of the U-shaped spring S. As the temperature lowers, the two inner compound plates will form an ellipse, thereby throwing or spreading out the ends of the spring S. As the angle which the sides of this spring makes grows greater, so will the angle or distance between the first and last plates become greater, thus adding an additional force to the two outside plates.

This device may be used for various purposes. In the construction shown the valve



will open on the lowering of the temperature and allow the water to flow, thus preventing freezing, and as the temperature again rises the valve will be closed. This arrangement  
5 might also be used in case of accidental fires, the heat causing the valve to open and the water to flow.

Of course in all the above cases the free end of the compound plates must be adjusted at a  
10 proper distance from the fixed end, the preferred way of doing which is by an adjusting-screw, H, Fig. 1, the ends of the central plates being united by a U-shaped elastic metal strip, S, or other hinge, the plates being oth-  
15 erwise rigidly fastened.

The valves  $c$  and  $c'$  are nearly balanced, for the reason that, having considerable length in proportion to their thickness, the compound plates will be somewhat elastic and will be  
20 only able to start the valves open against a slight pressure, after which, having acquired some tension by the unequal expansion before starting the valves, and the resisting pressure of the water being mostly removed by the  
25 starting of the valves, the accumulated ten-

sion of the compound plates will open them sufficiently to allow the water to flow freely. When the unequal expansion of the compound plates closes the valves, it will be by bringing the valves to the position in which the water  
30 will, by its unequal pressure on the valves  $c$  and  $c'$ , assist in the closing, by reason of which the valves will be more suddenly closed than if closed by the compound plates alone.

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

The combination of the compound plates  $x$   $y$ , the valve-stem  $d'$ , the different-sized valves  $C$   $C'$ , so arranged as to allow the pressure of  
40 the water to help open them after being started by the compound plates, the guide  $d''$ , the valve-shell, and the lug G.

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

WALKER G. BROWNE.

Witnesses:

MAX BAYERSDORFER,  
VALENTINE HATCH.