

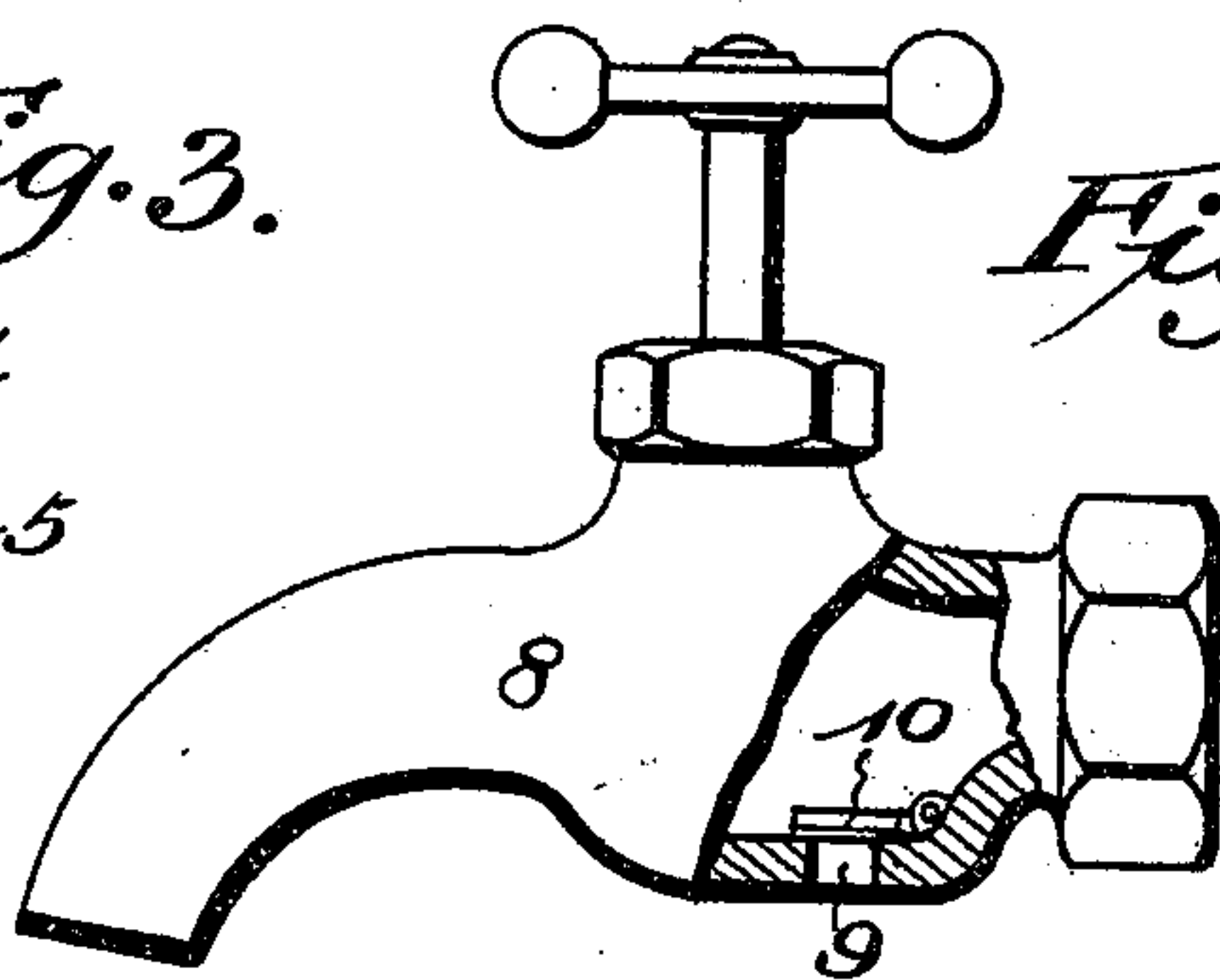
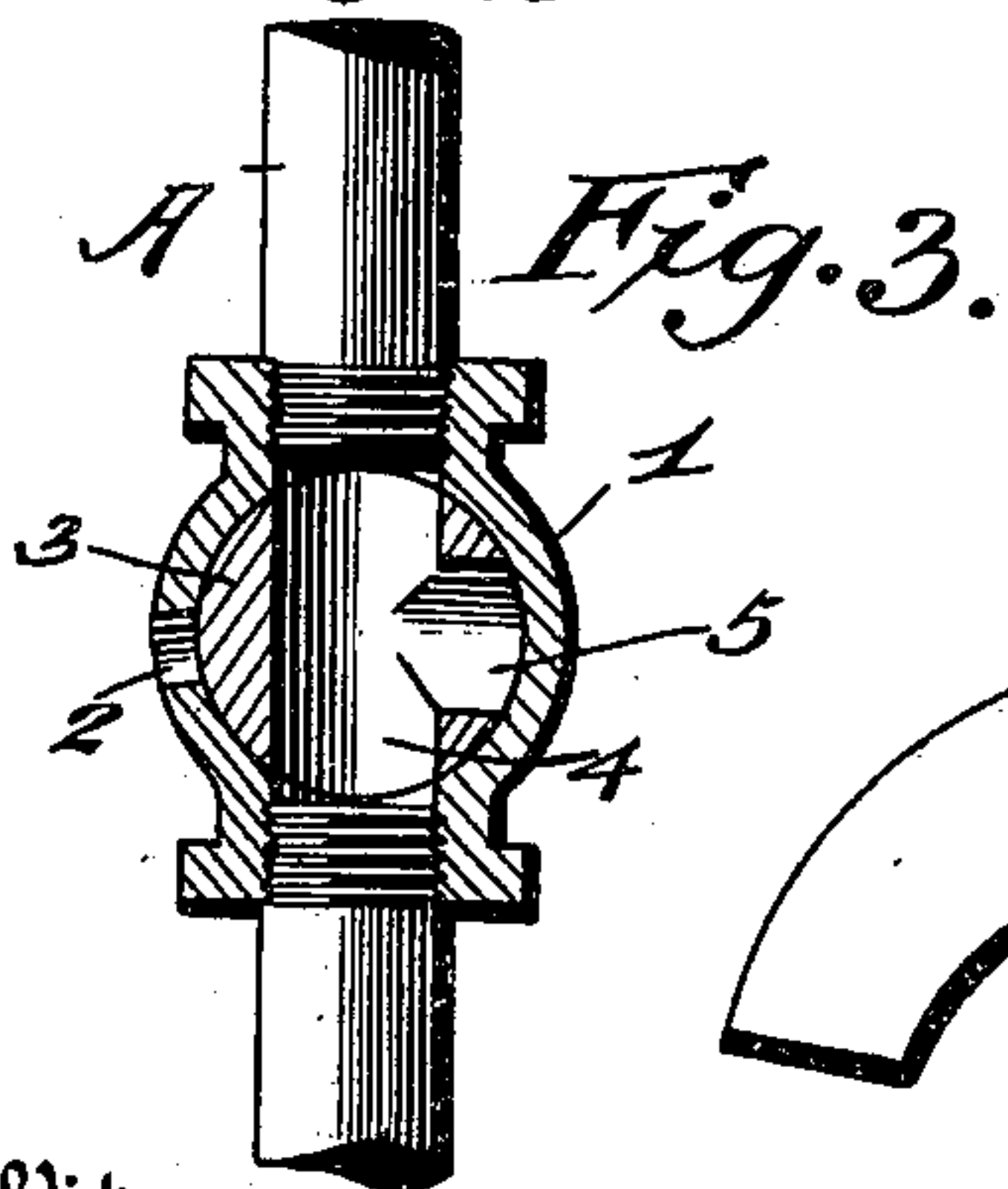
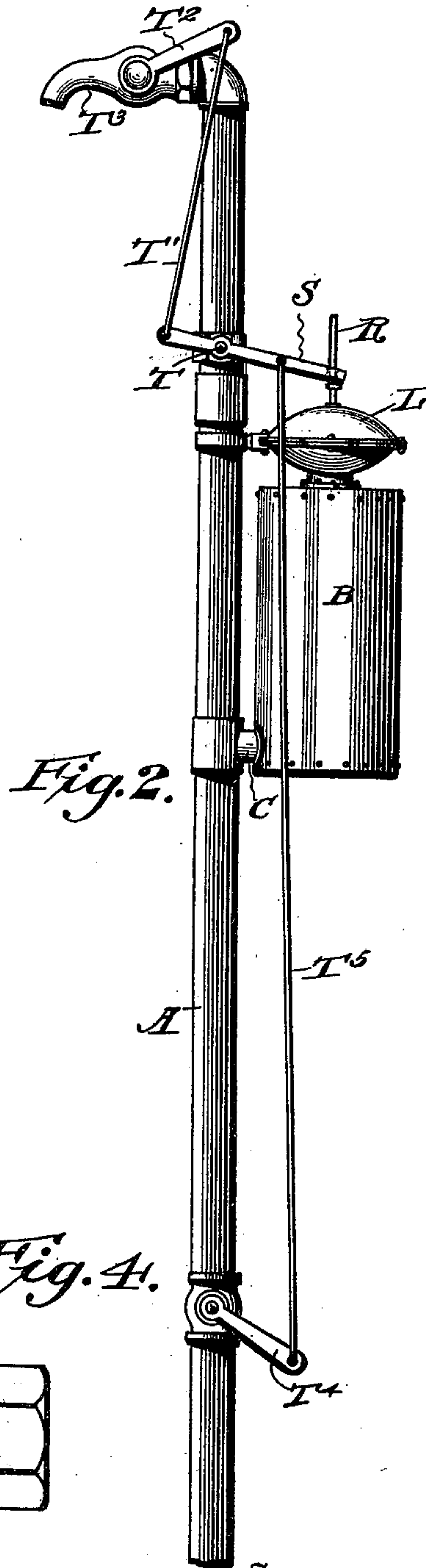
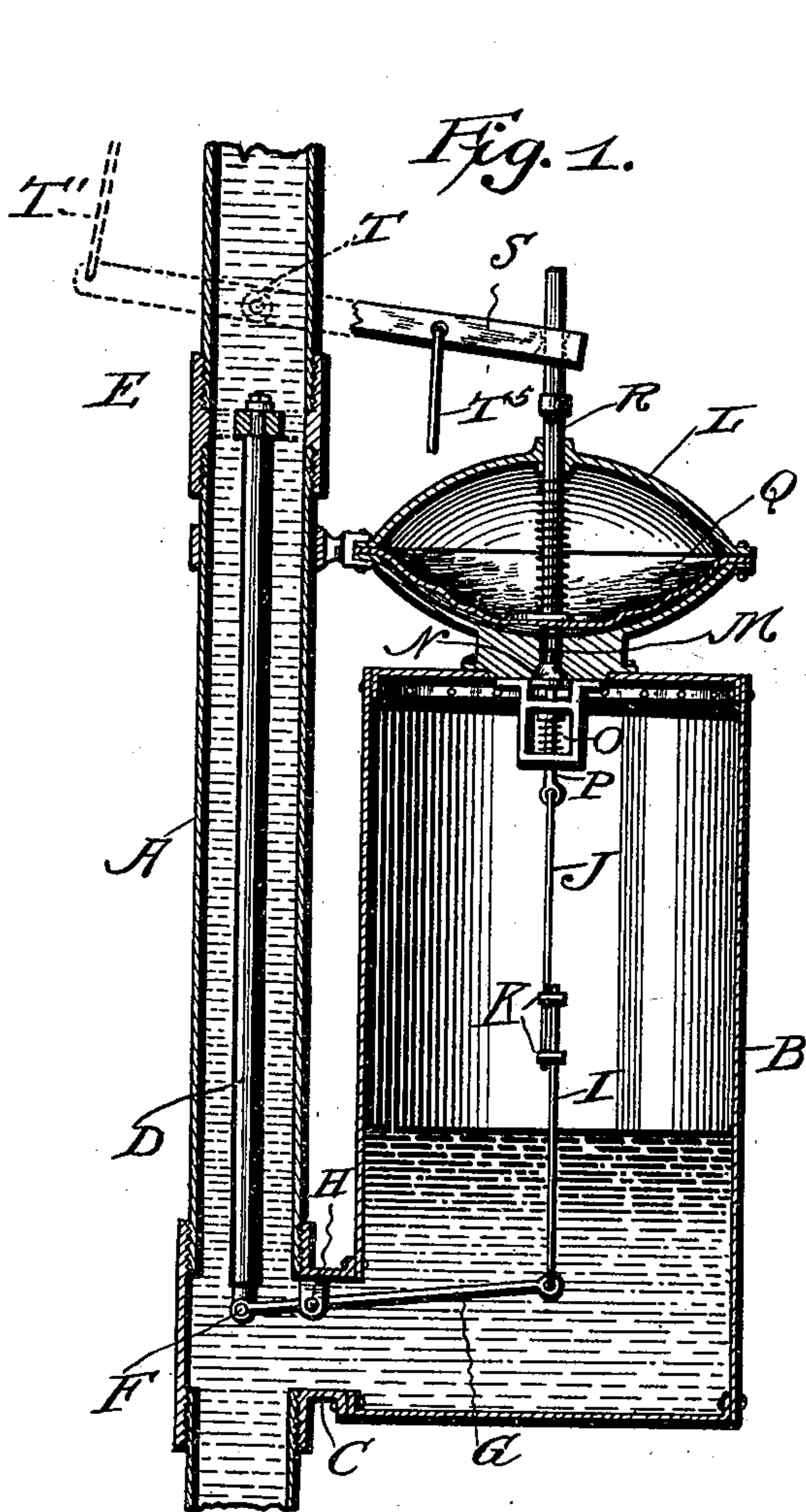
No. 623,979.

Patented May 2, 1899.

C. L. BROWN.
ANTIFREEZING APPARATUS.

(Application filed Feb. 7, 1898.)

(No Model.)



Witnesses
A. Roy Appelman
Milton B. Schley

Inventor,
Charles L. Brown.
by Geo. Hagler Jr.
Attorney

UNITED STATES PATENT OFFICE.

CHARLES LAKE BROWN, OF PHILADELPHIA, PENNSYLVANIA.

ANTIFREEZING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 623,979, dated May 2, 1899.

Application filed February 7, 1898. Serial No. 669,337. (No model.)

To all whom it may concern:

Be it known that I, CHARLES LAKE BROWN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Antifreezing Apparatus, of which the following is a specification.

My invention relates to a new and useful improvement in apparatus for automatically preventing the freezing of water in service-pipes by drawing the water therefrom when the temperature has fallen to a dangerous point, and to prevent the overheating of water in domestic boilers by automatically permitting the escape of a certain amount of water from the boiler in order that it may be replaced by water of a lower temperature.

With these ends in view this invention consists in the details of construction and combination of elements hereinafter set forth, and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, the construction and operation will now be described in detail, referring to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical section of an apparatus embodying my improvement for use in connection with water-service pipes to prevent the freezing thereof; Fig. 2, a view showing a service-pipe with the apparatus illustrated in Fig. 1 attached thereto and the connections properly made. Fig. 3 is a sectional view of the drain-valve. Fig. 4 is a view of a faucet to be substituted under certain conditions for the faucet shown in Fig. 2.

In carrying out my invention as embodied in Figs. 1, 2, and 3, A represents a service-pipe, to which is connected the cylinder B by means of the passage-way C, formed by a suitable coupling. The rod D, of zinc or any other suitable material, is secured at one end within the pipe, as indicated at E, and projecting downward has pivoted thereto at F the lever G, which latter is pivoted at H to a suitable lug, while its other end has attached thereto the rod I. This rod is attached to the corresponding rod J by means of the clips K, which per-

mit a certain amount of movement of the rod I before transmitting movement to the rod J, for the purpose hereinafter set forth.

The dome L is mounted upon the top of the cylinder and is connected therewith by the opening M, in the lower portion of which is formed the valve-seat for the reception of the valve N, which latter is normally held upon its seat by the spring O, coiled around the stem P, and the upper end of the rod J is attached to the lower end of this stem. From this it is obvious that should the rod D be contracted by an undue fall in temperature the rod I would be drawn downward in the direction of the arrow marked adjacent thereto, the first portion of which movement would be lost relative to the rod J by the sliding of the clips K; but should the downward movement of the rod I continue until the clips come in contact with each other a further downward movement thereof would withdraw the valve from its seat against the action of the spring O, for the purpose hereinafter set forth.

A diaphragm Q is secured within the dome in such manner as to divide the latter into two compartments, one above and one below the diaphragm, and the center of this diaphragm is attached to the rod R in any suitable manner, which projects upward through the top of the dome and is connected at its upper end to the lever S, which lever is so arranged as to operate the faucet-lever when the rod R is moved upward.

In practice the operation of my improvement as embodied in this construction would be as follows: Water being admitted to the pipe A will enter the cylinder B at the bottom thereof and will compress the air in the upper portion of this cylinder by moving upward therein; but so long as the valve N is properly seated this compressed air cannot pass to the dome, and therefore the diaphragm remains unaffected; but should the temperature of the water fall to such an extent as to sufficiently contract the rod D to draw the valve from off its seat, as before set forth, the air previously compressed in the cylinder B will pass upward to the dome and acting upon the inner side of the diaphragm force the latter upward, and with it the rod R, which will bring about the proper movement

of the lever S. This lever is pivoted approximately at the center thereof, as indicated at T, and has attached thereto the rod T', which connects this lever with the faucet-lever T², thus causing the faucet-lever and the lever S to move in unison. The faucet T³, which is connected with the service-pipe A, will therefore be under control of the lever S, and this lever is also connected with the lever T⁴, which operates an ordinary stop-cock in the drain-pipe, said lever T⁴ being connected by the rod T⁵. As illustrated, a coupling or casing 1 is provided with a drain-opening 2, while a plug 3, having a passage 4 through its center and an opening 5, intercepting the passage 4, is fitted in the casing, so that if the plug is given a quarter-rotation the opening 5 will register with the pipe A and the passage 4 will register with the drain-opening 2. Now when the lever S is operated as just described the faucet T³ will be opened, while the drain-valve T⁴ is so operated as to shut off the supply of water and drain from the pipe A the water standing above this valve, the faucet T³ serving as a vent for the admission of air to permit the downflowing of water. During this downflowing of water in the service-pipe the water which has previously been forced within the cylinder B will also be withdrawn therefrom, thereby removing the pressure from the air in said cylinder and permitting the reaction of the diaphragm Q. The valve will remain seated until removed by hand, and as the faucet T³ and the valve T⁴ will be reset by the reverse movement of the diaphragm, brought about through its coil-spring U, the apparatus will be in condition for the repetition of the above-described operations. Thus it will be seen that water cannot freeze within the service-pipe, since it will be invariably withdrawn therefrom when reaching a temperature likely to bring about the congealing thereof. When it is not practical to connect the faucet-arm T² by a rod T', actuated by the lever S, the faucet 8 is attached to the pipe II, the opening 9 of the faucet having a gravity-valve 10, thus allowing for the admission of air through the opening for venting the

pipe A to allow the water to flow downward through the drain.

Having thus fully described my invention, what I claim as new and useful is—

1. In combination with a water-supply pipe, a rod therein, a cylinder connected with the supply-pipe, a dome mounted upon the cylinder having a passage connecting the dome and cylinder, a valve controlling the passage, a connection between the valve and the rod in the supply-pipe, a diaphragm in the dome, and a rod operated by the diaphragm for controlling the valve to the supply-pipe, as and for the purpose described.

2. In combination with a water-supply pipe, a rod located therein, a cylinder connected with the supply-pipe a dome mounted upon the cylinder, a valve for controlling the passage between the dome and cylinder, a yoke depending into the cylinder, a stem operating through the yoke and connected with the valve, a spring in the yoke encircling the stem, connections between the stem and the rod of the supply-pipe, a diaphragm in the dome and connections, whereby the operation of the diaphragm controls the supply-pipe, as and for the purpose described.

3. In combination with a water-service pipe, a rod located therein adapted to change with the changes of temperature, a cylinder connected with the supply-pipe, a dome mounted upon said cylinder, a valve for controlling the passage between the cylinder and dome, mechanism connecting said valve with the dome, a diaphragm dividing the dome into compartments, a rod carried by the diaphragm projecting through the top of the dome, and valve mechanism connected with the last-named rod for controlling the supply of water, as specified.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

CHARLES LAKE BROWN.

Witnesses:

H. B. HALLOCK,
R. M. PIERCE.