

A. A. Common's Improved Automatic Apparatus for opening & closing Cocks, Taps, or Valves.

116273

PATENTED JUN 27 1871

2 Sheets
Sheet 1.

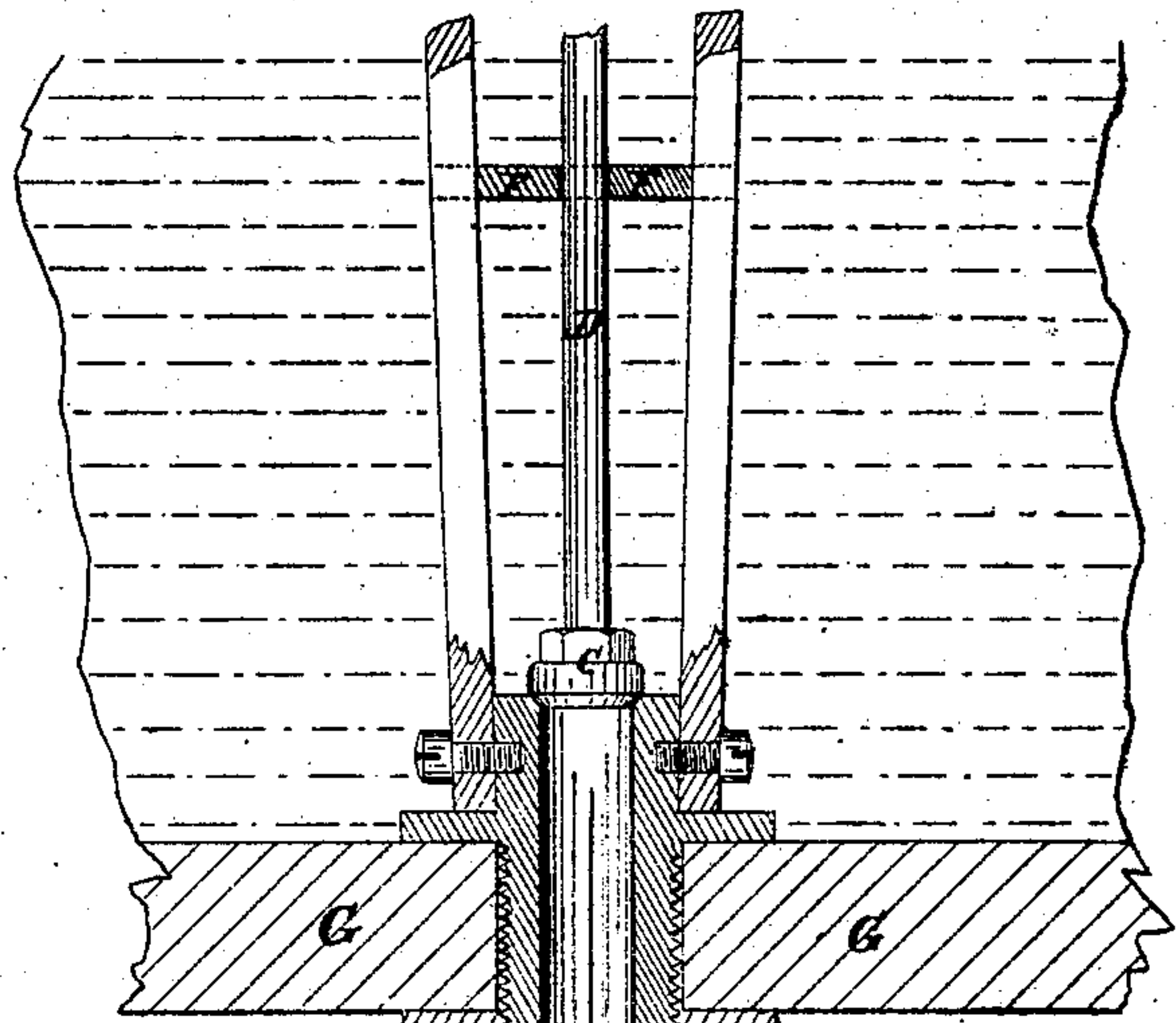
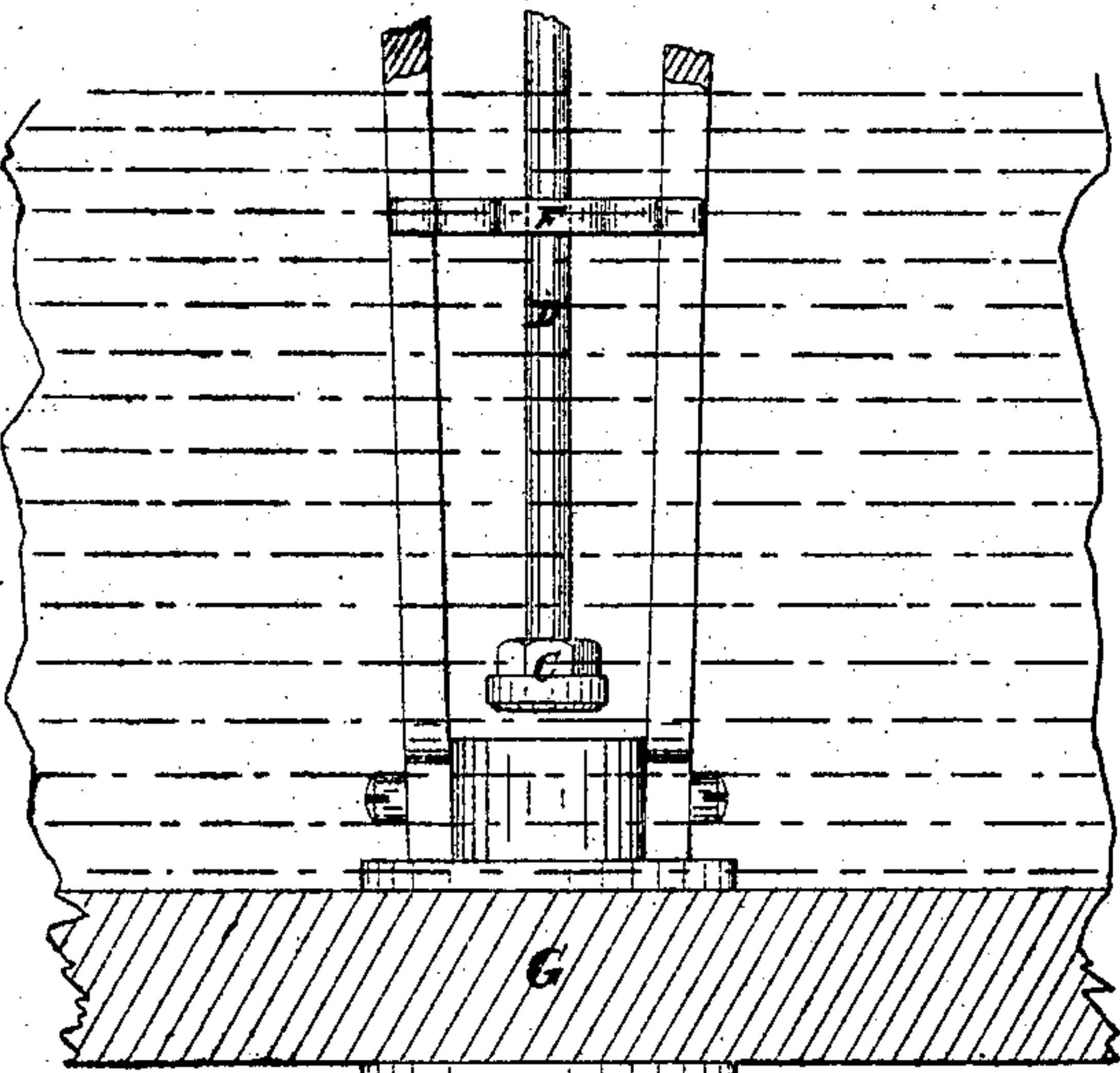
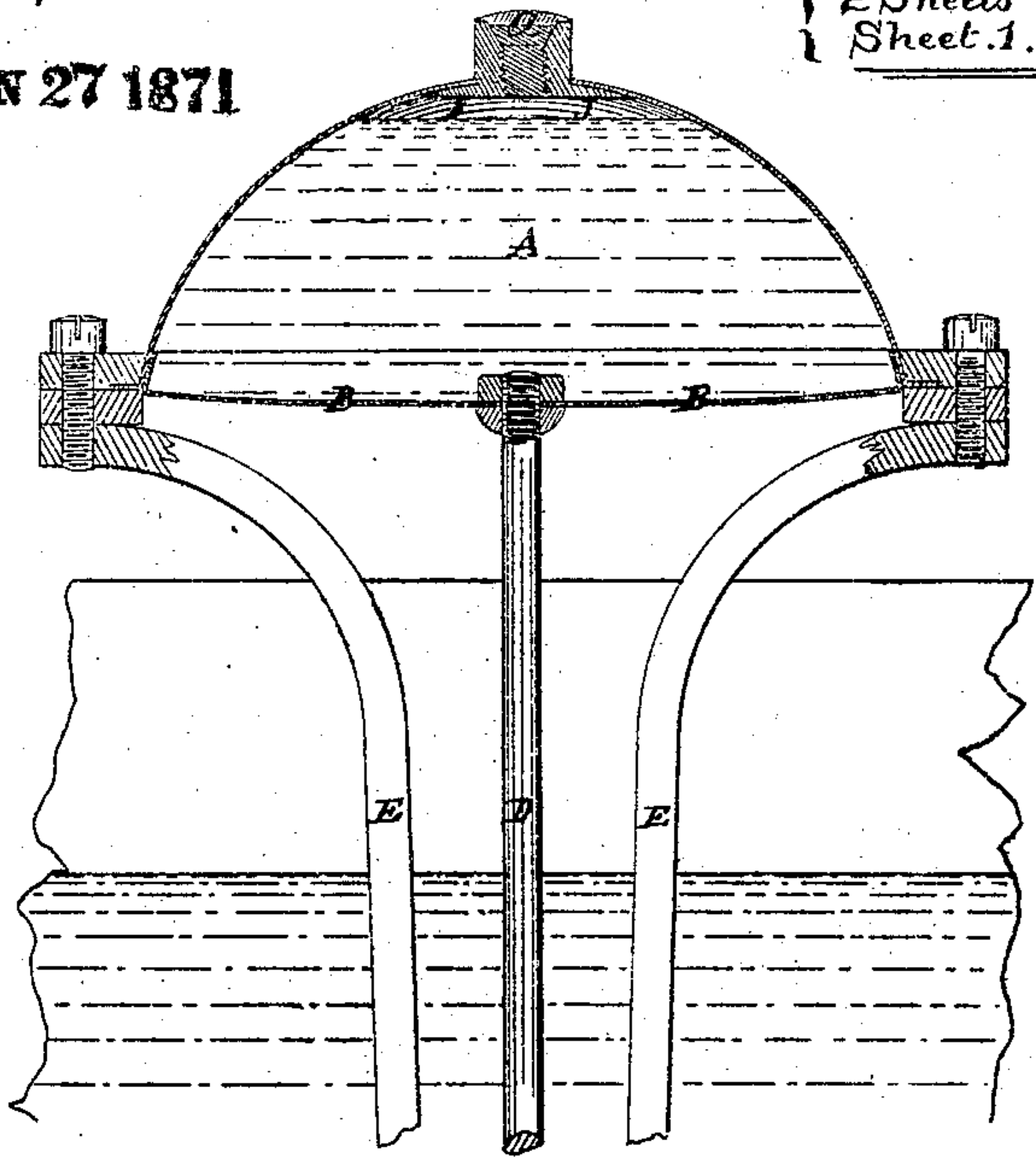
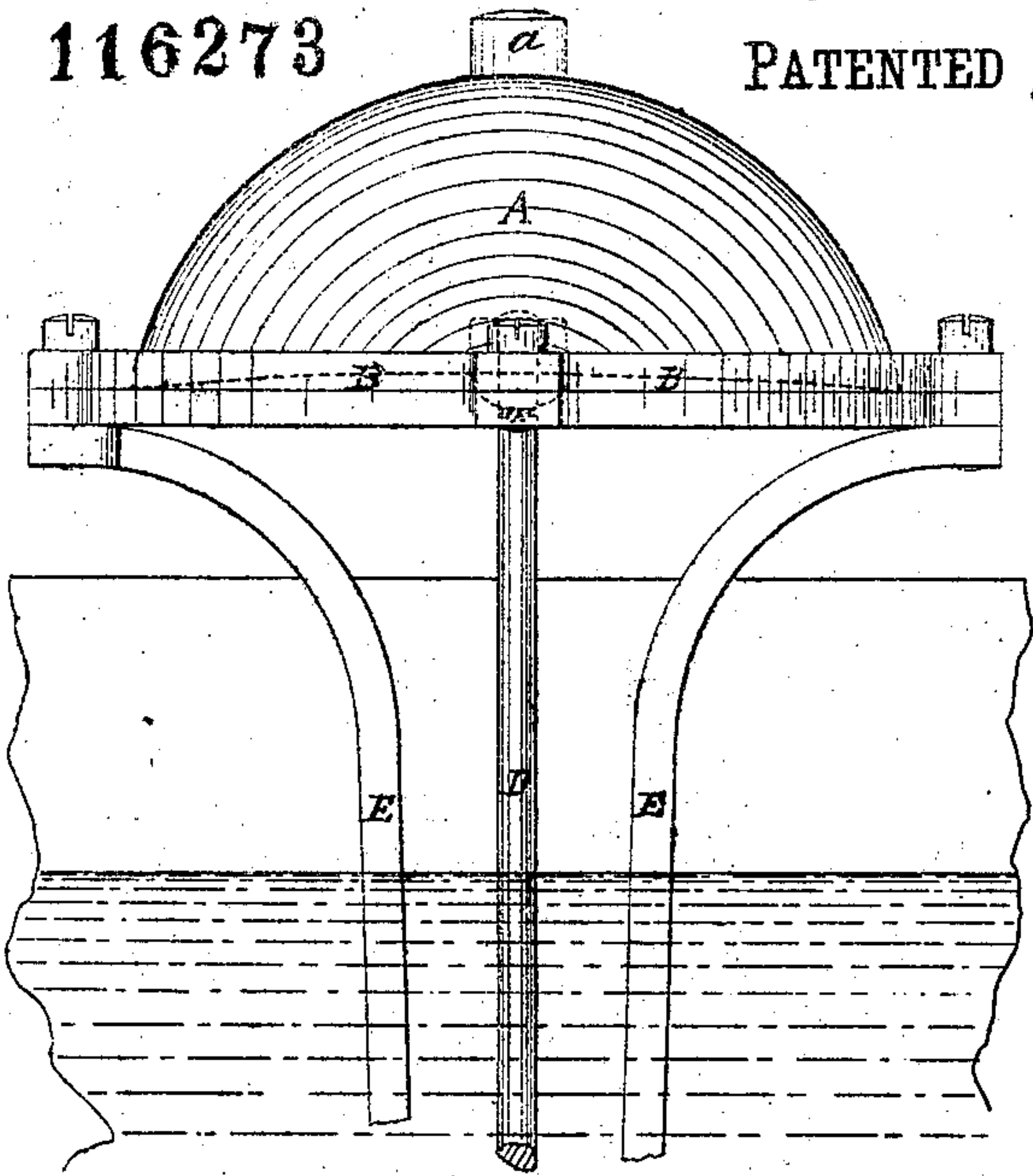


Fig.

H

1. *Hydraulic*

Fig.

.11.

Witnesses

Walter, Philip. Reese, Manly.
William Edward Gedge.

Inventor

Andrew A. Common

A. A. Common's Improved Automatic Apparatus for opening
& closing Cocks, Taps, or Valves.

{ 2 Sheets
 Sheet 2.

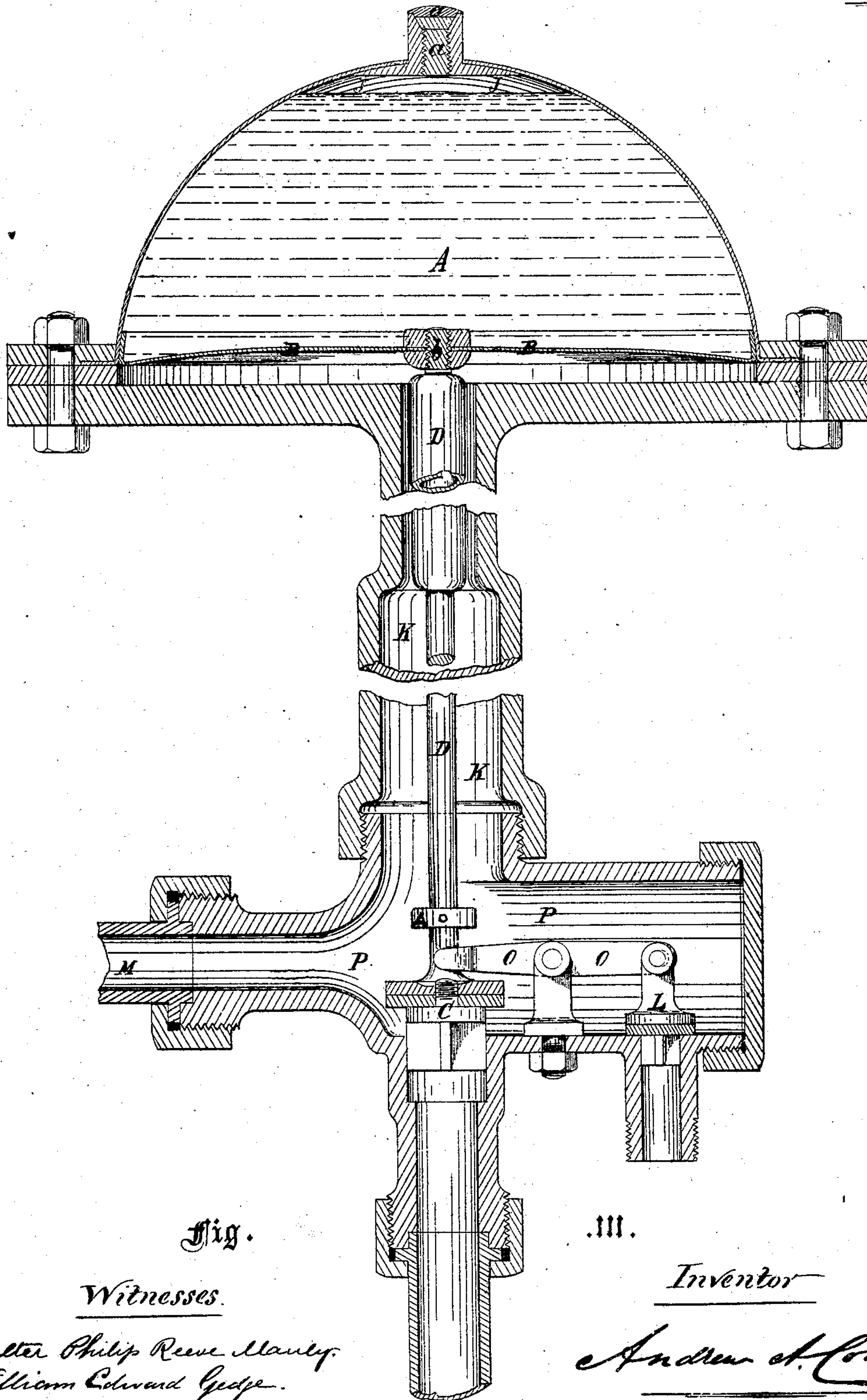


Fig.

.III.

Witnesses.

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ANDREW AINSLIE COMMON, OF SOUTH BANK, REGENT'S PARK, LONDON,
ENGLAND.

IMPROVEMENT IN AUTOMATIC APPARATUS FOR OPENING AND CLOSING VALVES BY THE EFFECTS OF TEMPERATURE.

Specification forming part of Letters Patent No. 116,273, dated June 27, 1871.

To all whom it may concern:

Be it known that I, ANDREW AINSLIE COMMON, of South Bank, Regent's Park, England, engineer, have invented an Improved Automatic Apparatus for Opening and Closing Cocks, Taps, or Valves, of which the following is a specification:

My invention relates to the application of the principle of the expansion and contraction of water and other fluids under changes of temperature for the purpose of opening and closing valves of any kind; the main object of my invention being to prevent the bursting of pipes and reservoirs from frost and sudden overflows upon a change of temperature.

Figure 1, Sheet I, is an elevation of an apparatus embodying my invention, adapted to the supply-pipe from a tank or cistern, and opening a valve. Fig. 2 is a section through same, closing valve. Fig. 3, Sheet II, is an adaptation of my apparatus to a service-pipe or main with double-action valve.

A is a water-chamber, the bottom B of which is in connection with the valve C by the connecting-rod D. This water-chamber may be of copper or of any suitable metal, its main and essential feature being that one of its parts, in this case the bottom B, must be so shaped as to permit it to move to and fro, yielding to internal or external pressure. The slightly-domed shape of the part B (see dotted line, Fig. 1) gives it this faculty. E E, supports of water-chamber A; F, guide for valve-rod D, secured to supports E E. The rod D may be fixed to the center of B in any convenient manner. G, bottom of tank or cistern with supply-pipe H attached; j, Fig. 2, air-space left within water-chamber A; a, screw-plug for introduction of water into chamber A. This may, if desired, be dispensed with, and the water be introduced at b before the connecting-rod D is fixed to bottom B.

The working of my apparatus, when applied as shown at Figs. 1 and 2, is as follows: The chamber A is filled with water through the screw-plug a, all but the air-space J, the part B being, during the filling, pressed inward to the fullest possible extent, which position it will retain when the chamber is closed. It will be observed that the chamber A rises above the top of the tank

and is, therefore, more exposed to the effects of change of temperature than the water within the tank. The result is, that so long as the water within the chamber is not congealed the part B remains in the position shown in dotted lines at Fig. 1, and the valve C remains open; but that directly the water in A freezes and expands its pressure upon the inside of B, which is the only yielding part of the chamber, causes it to move or bulge outward, carrying the rod D with it, and bringing the valve C onto its seat, as at Fig. 2, the air-space J acting as a cushion and entirely preventing any undue pressure upon the valve. When the temperature rises sufficiently to thaw the ice in chamber A the pressure within diminishes, and the part B, being forced inward by the atmospheric pressure from without the valve, is thereby brought back to its normal position, as at Fig. 1. I need scarcely observe that the action may be reversed, and that, by means of ordinary mechanical connections, the valve may be opened when the water in the chamber A freezes, and closed when it thaws. Also that some other fluid, more or less rapidly congealed than water, may be introduced into the chamber A if found desirable.

In the adaptation of my apparatus shown, Fig. 3, Sheet II, it will be observed that the rod D is inclosed in a tube, K, which replaces the supports E E, Figs. 1 and 2, and that the valve C is enlarged at its upper end in order to reduce the air-space in the tube K. L is a waste-valve to allow of the discharge of the dead water in the pipe M or box P after the supply has been cut off by means of the valve C. Upon the expansion of the water in the chamber A by frost the rod D is depressed, as before described, and closes the valve C, while, by means of the collar or stop N and rocking lever O, it raises the valve L, permits the escape of the dead water in the tube K or valve-box P, and thereby obviates all possibility of bursting from frost.

It will be obvious that my apparatus may be applied to various kinds of valves in various ways, the adaptations herein described and shown on the drawing being merely illustrative of my invention. The size of the chamber A and of its yielding part B will vary, according to the length of stroke it is desired to give to the connecting-

rod D, and the shape of the chamber, with the position in which it is to be placed, which may sometimes be under ground when it is desired to open and close automatically the valves of pipes deeply buried, but not to close them until almost reached by the frost. The connecting-rod may be of any desired length, this being dependent upon the position of the valve in relation to a place more exposed to variations of temperature. I have not deemed it necessary to show the rod connected to a cock or tap, such connection being essentially the same as to a valve. In the case of pipes coming from a cistern the pipe supplying which is protected by one of my apparatus, another apparatus, working in connection with a valve opening inward, can be put at the lowest part of the pipe, and so draw off the water from the cistern and the pipes; or, if it should not be necessary to empty the cistern, another apparatus may be fixed onto top of pipe in the cistern, as shown, Figs. 1 and 2, Sheet I. As the apparatus can be protected from the cold in due

proportion as the pipes are protected, they will, in the case of well-protected pipes, act only in cases of intense cold.

My apparatus may be applied, by ordinary mechanical means, to protect hot-water apparatus and pipes, water-meters, fountains of all sorts, more especially drinking-fountains, which could be left to themselves with safety in winter instead of being shut up, and to protect pipes and reservoirs generally.

I do not claim the valve shown, Fig. 3, Sheet II, or any of the fittings.

I claim as my invention—

The chamber A, with slightly-domed part B, in combination with the connecting-rod D or its equivalent, substantially as and for the purpose hereinbefore set forth.

ANDREW A. COMMON.

Witnesses:

WALTER PHILIP REEVE MANLY,
WILLIAM EDWARD GEDGE.