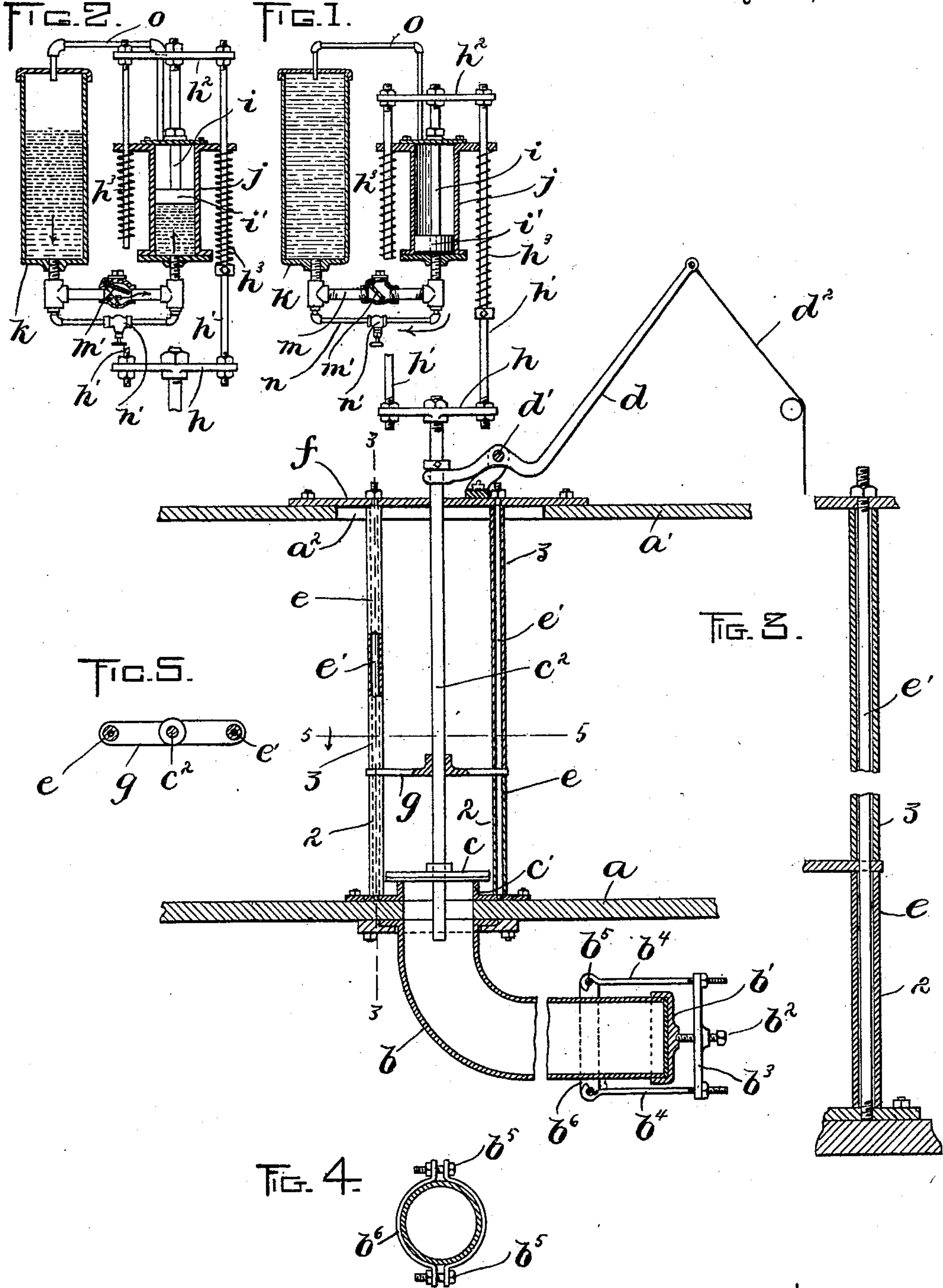


(No Model.)

J. EWART.
CISTERN VALVE.

No. 583,302.

Patented May 25, 1897.



WITNESSES:
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UNITED STATES PATENT OFFICE.

JOHN EWART, OF LAWRENCE, MASSACHUSETTS, ASSIGNOR OF ONE-FOURTH
TO JOSEPH A. EWART, OF SAME PLACE.

CISTERN-VALVE.

SPECIFICATION forming part of Letters Patent No. 583,302, dated May 25, 1897.

Application filed March 25, 1897. Serial No. 629,157. (No model.)

To all whom it may concern:

Be it known that I, JOHN EWART, of Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Cistern-Valves, of which the following is a specification.

This invention relates to distributing-reservoirs, such as railway watering-tanks; and it has for its object to provide an improved valve mechanism for such tanks having retarding devices to prevent the sudden closing of the valve due to pressure of the liquid, and also to provide a construction whereby the valve and other parts may be removed without emptying the liquid from the tank.

The invention consists in the improved construction which I shall now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 is a vertical section through an apparatus embodying the essential features of my invention. Fig. 2 is a portion of the apparatus with the parts in a different relation. Fig. 3 is a section on line 3 3 of Fig. 1. Fig. 4 is a section through the discharge-pipe, showing the collar clamped thereon. Fig. 5 is a section on line 5 5 of Fig. 1.

The same letters and numerals of reference indicate the same parts in all the figures.

Referring to the drawings, a designates the bottom or floor, and a' the top or cover, of any supply tank or cistern, such as the tanks used to supply water to steam-railway locomotives, the tank having an outlet-pipe b and a lift-valve c , controlling said outlet.

c' designates the annular valve-seat, fixed to the floor of the tank.

The vertical valve-stem c^2 extends upwardly through the top of the tank and is lifted by means of a lever d , fulcrumed at d' and provided at its outer end with a cord d^2 , which hangs within reach of the operator or fireman of the locomotive.

$e e$ designate two tubular standards, situated on either side of the valve-rod c^2 , the said standards surrounding two vertical rods $e' e'$, which are fixed at their lower ends to the metal flanges surrounding the outlet-opening in the floor of the tank, and at their up-

per ends to a removable cover f , which covers an opening a^2 in the roof of the tank. Each of the tubular standards e is composed of two sections 2 3, either or both of which may be slipped off the rod e' when the cover f is removed. Between the two sections and resting with its ends on the lower section 2 of each tubular standard is a cross-bar g , which has a middle aperture surrounding and forming a guide for the valve-rod c^2 .

b' designates a cap adapted to fit over the end of the outlet-pipe b when it is desired to remove the valve, as will presently be described, the said cap being clamped in place by means of a screw-bolt b^2 , applied to its center, the bolt screwing into a yoke-piece b^3 , which is anchored to the pipe by means of rods b^4 . These rods have hooks at their ends which take over the clamping-bolts b^5 of a collar b^6 , which surrounds and is clamped to the outlet-pipe b near its orifice.

To remove the valve, the outlet-pipe having been closed by means of the cap b' , the cover f is unfastened from the roof a' and from the rods e' , and the upper end of the valve-rod being free from its attachments it is then easy to bodily remove the cover f , the valve c , and its rod c^2 , the cross-bar g , and the upper sections of the tubular standard e , the rods e' remaining in place and acting as guides during the replacement of the parts. This construction affords a convenient means for repairing or replacing the valve or any of the submerged working parts without having recourse to the undesirable and wasteful proceeding of emptying the tank of its contents.

I will now describe the valve-retarding mechanism. At the upper end of the valve-rod c^2 is fixed a yoke h , which is connected by means of two upright rods $h' h'$ with an upper yoke h^2 . The said yoke is secured to the upper end of a piston-rod i , attached to a piston i' , which travels in a stationary hollow cylinder j , the supports of which are not shown. The cylinder communicates by two channels with a second cylinder k , which contains a non-freezable liquid, such as oil or glycerin. The two channels are arranged below the cylinders, and consist of a wide

pipe *m* and a narrow pipe *n*, each communicating with both of the cylinders. In the pipe *m* is arranged a valve *m'*, which allows liquid to flow freely in the direction of the cylinder *j*, but closes when the liquid is forced in the opposite direction, compelling it to seek the narrow channel through the pipe *n*. Thus when the piston *i'* is raised by the raising of the main valve *c* the liquid flows freely from the cylinder *k* to the cylinder *j*, Fig. 2, a vent being provided by way of a pipe *o*, which connects the upper parts of the two cylinders. When, however, the operator releases the cord *d*² and the valve *c* starts to descend, the pressure of the piston *i'* causes the liquid to close the valve *m'* and compels it to return to the cylinder *k* by means of the narrow pipe *n*. This it can only do somewhat slowly on account of the narrowness of the passage, which is regulated by a cork *n'* in the pipe *n*, and hence the descent of the valve *c* is retarded. Coiled springs *h*³ surround the rods *h'* and bear against collars on said rods and projections on the casing of the cylinder *j*, the said springs serving to prevent leaking of the valve when the tank is nearly empty.

It will be seen that the retarding mechanism which I have just described prevents the violent closing of the valve *c* against its seat due to the pressure of a heavy column of water in the tank, which has heretofore been objectionable on account of its destructive effect upon the valve and adjacent parts.

My invention is not of course limited in its application to railway watering-tanks, but may be applied to any distributing-reservoir of like character, and it is clear that the valve-retarding mechanism may be applied directly to many of the tank-valves now in use or to any valve with a lifting motion similar to that which I have described above.

I claim—

1. In an appliance of the character specified, the combination with a tank adapted to contain liquid and having a discharge-aperture, of a valve for said aperture, means for opening said valve, and means for retarding the closing movement of said valve comprising two fixed hollow vessels communicating with each other and containing a constant quantity of liquid independent of the liquid in the tank, means in one of said vessels for drawing the liquid from the other into the said vessel, and for forcing it back again, suitable connections between the said means and the valve whereby the two operate conjointly, and suitable means arranged in the path of the liquid whereby the liquid is allowed to flow freely between the vessels when the said valve is opened, and is retarded in its return flow when the opening means are released.

2. In an appliance of the character specified, the combination with a tank having a discharge-aperture, of a valve for said aperture, the said valve having a stem, means

connected with said stem for opening the valve, and means for retarding the closing movement of the valve when the said opening means are released, the said retarding means consisting of a piston connected with the said valve-stem, and adapted to move therewith, a cylinder in which said piston moves, a liquid-containing reservoir, a relatively large outflow-passage connecting the reservoir with the cylinder, and having a check-valve to prevent the return of liquid from the cylinder through said passage, and a relatively small return-passage connecting the cylinder with the reservoir, and adapted to retard the flow of liquid from said cylinder to said reservoir.

3. In an appliance of the character specified, the combination with a tank having a discharge-aperture, of a valve for said aperture, the said valve having a stem, means for opening the valve, a cross-bar or yoke fixed to the outer end of the valve-stem, rods fixed to the said yoke, and extending on either side of a fixed hollow cylinder, a cross-piece or yoke fixed to said rods beyond said cylinder, springs surrounding said rods and arranged so that their pressure tends to close the said valve, a piston-rod fixed at its outer end to the last-mentioned yoke, and carrying a piston in said cylinder, a liquid-containing reservoir arranged alongside of said cylinder, a vent-passage connecting the upper portions of the reservoir and cylinder, a relatively large outflow-passage connecting the lower part of the reservoir with the lower part of the cylinder and having a check-valve to prevent the return of liquid from the cylinder through said passage, a relatively small return-passage connecting the cylinder with the reservoir and adapted to retard the flow of liquid from said cylinder to said reservoir, and means in said passage for regulating the flow of liquid therethrough.

4. In an appliance of the character specified, the combination with a tank having a discharge-aperture, of a valve for said aperture, means for opening said valve, means for retarding the closing of said valve when the said opening means are released, removable guides for said valve, and means for retaining the liquid in said tank to permit of the removal of said valve.

5. In an appliance of the character specified, the combination with a tank having a discharge-pipe, of a valve for controlling the receiving end of said pipe, the said valve having a stem, removable guides for said stem arranged to permit the removal of said valve, and means for closing the discharge end of said pipe, whereby the liquid may be retained in said tank when said valve is removed.

6. In an appliance of the character specified, the combination with a tank having a discharge-aperture, of a valve for said aperture, the said valve having a stem, removable guides for said stem consisting of fixed rods surrounded by tubular standards, and a cross-

bar arranged between said standards and
having an aperture to receive and act as a
guide for the valve-stem, and a cover ar-
ranged over an opening in the roof of said
5 tank, the said cover acting as an upper sup-
port for the said fixed rods.

In testimony whereof I have signed my

name to this specification, in the presence of
two subscribing witnesses, this 15th day of
March, A. D. 1897.

JOHN EWART.

Witnesses:

A. D. HARRISON,
E. BATCHELDER.