No. 779,069. PATENTED JAN. 3, 1905.

E. L. BURCHETT.

TANK VALVE.

APPLICATION FILED SEPT. 3, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

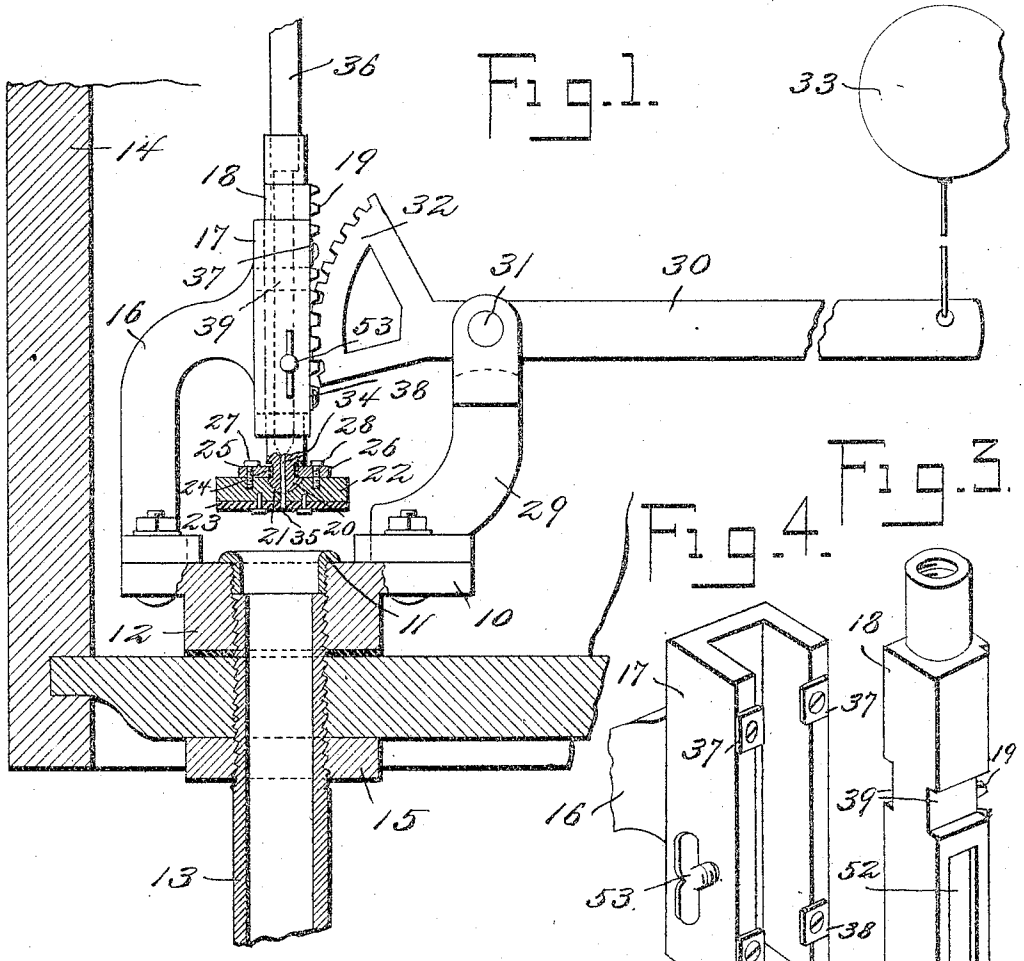


Fig. 3.

Fig. 4.

Fig. 2.

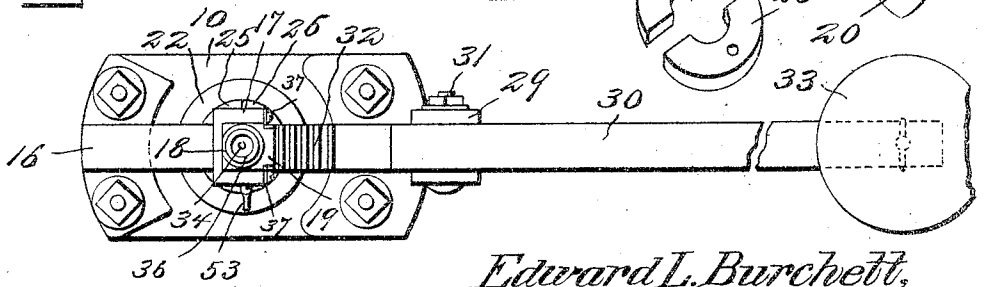
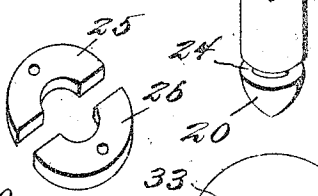


Fig. 5.



Witnesses

E. F. Stewart

E. M. Woodward.

Edward L. Burchett,
Inventor.

by A. Snow & Co
Attorneys

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2 SHEETS—SHEET 2.

Fig. 6.

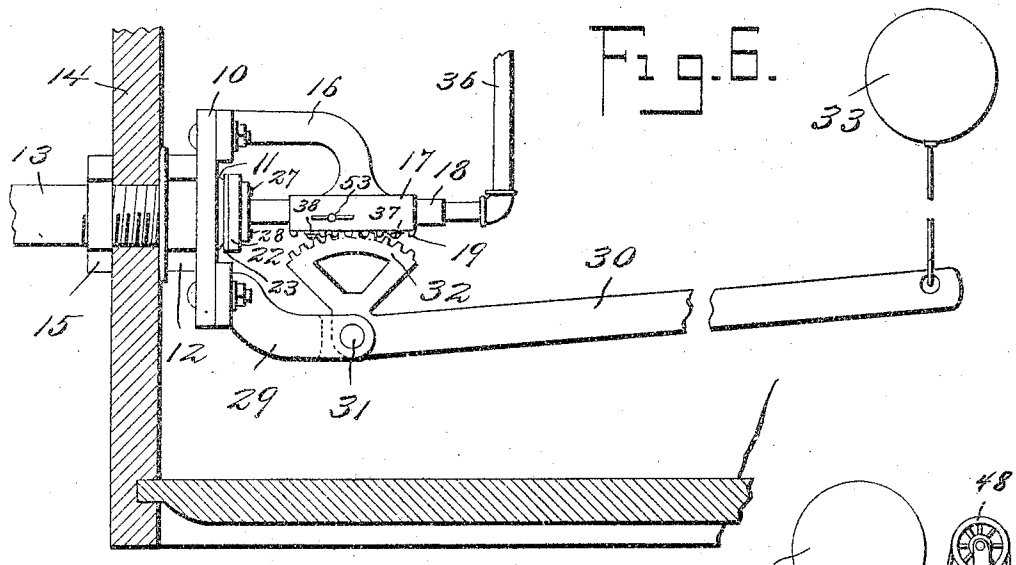


Fig. 7.

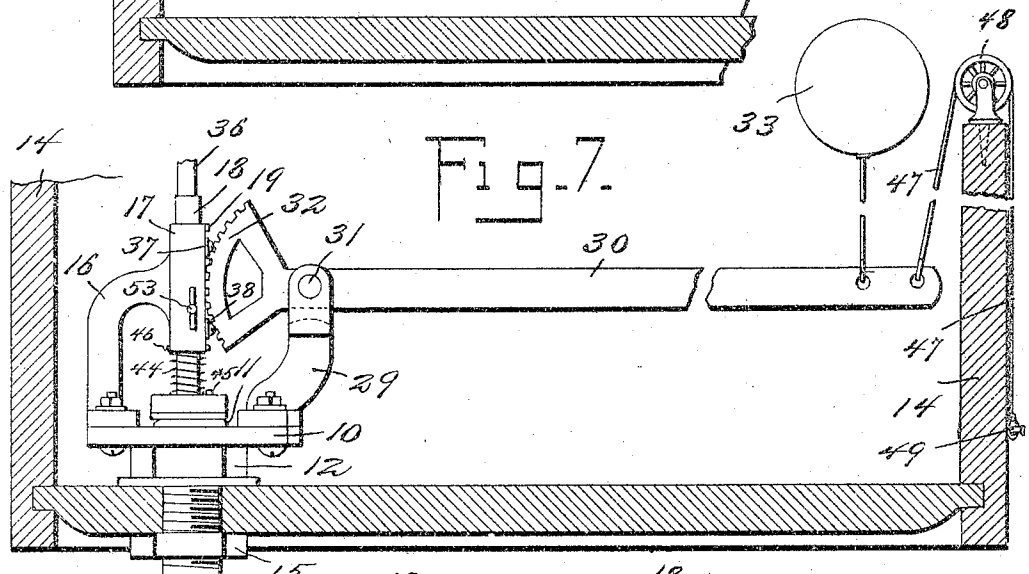


Fig. 8.

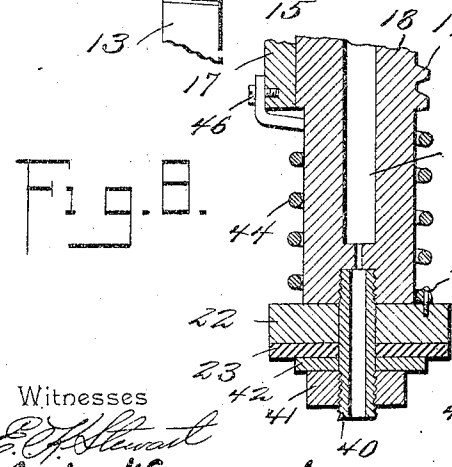
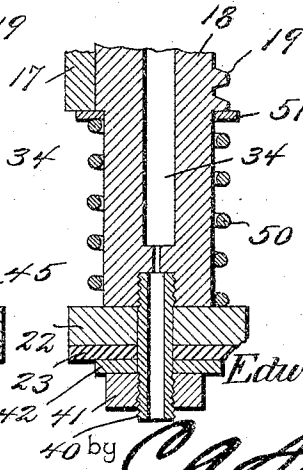


Fig. 9.



Witnesses

E. F. Stewart

E. M. Woodward.

Edward L. Burchett,
Inventor

by Cushman & Co

Attorneys

No. 779,069. Patented January 3, 1905.

UNITED STATES PATENT OFFICE.

EDWARD LEE BURCHETT, OF SAN ANGELO, TEXAS, ASSIGNOR OF ONE-HALF TO JOHN FINDLATER, JR., OF SAN ANGELO, TEXAS.

TANK-VALVE.

SPECIFICATION forming part of Letters Patent No. 779,069, dated January 3, 1905.

Application filed September 3, 1904. Serial No. 223,224.

To all whom it may concern:

Be it known that I, EDWARD LEE BURCHETT, a citizen of the United States, residing at San Angelo, in the county of Tom Green and State of Texas, have invented a new and useful Tank-Valve, of which the following is a specification.

This invention relates to the valves employed for controlling the supply of water to tanks of various kinds, more particularly to the tanks associated with stock-watering apparatus, but may also be employed in any of the various forms of tanks wherein it is desired to automatically control the supply of water thereto.

The object of the invention is to simplify and improve the construction and operating means and produce a valve which may be readily detached for renewal or repairs and adaptable without material change of structure to any of the various forms and structures of tanks manufactured.

With these and other objects in view, which will appear as the nature of the invention is better understood, the same consists in certain novel features of construction, as hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which corresponding parts are denoted by like designating characters, is illustrated the preferred form of the embodiment of the invention capable of carrying the same into practical operation, it being understood that the invention is not necessarily limited thereto, as various changes in the shape, proportions, and general assemblage of the parts may be resorted to without departing from the principle of the invention or sacrificing any of its advantages.

In the drawings thus employed, Figure 1 is a sectional side elevation of the improved device applied. Fig. 2 is a plan view of the same. Figs. 3 and 4 are perspective views of the valve-stem and guide member of the frame detached. Fig. 5 is an enlarged perspective view of the clamp-plates detached. Fig. 6 is a view similar to Fig. 1, illustrating a modified form of the construction. Fig. 7 is a view similar to Fig. 1, illustrating another modified form of the construction. Figs. 8 and 9 are enlarged sectional details illustrating modified constructions of the coupling means between the valves and stems.

The improved device comprises a base-frame 10, having a valve-seat 11 on one side and means, such as a threaded hub 12, on the other side to receive the supply-pipe 13 of the tank, a portion of which is represented at 14 and through the bottom or side wall of which the pipe 13 passes. The outer surface of the hub 12 is preferably six-sided or otherwise irregularly formed to receive an operating-wrench and will engage the inner face of the tank, and the frame, firmly bound in position, as by clamp-nut 15, engaging the supply-pipe outside the tank, as shown. The inner diameter of the valve-seat is greater than the inner diameter of the supply-pipe, as shown in Fig. 1, so that a free and unobstructed flow of the water is secured.

Extending from the base-frame 10 is a standard 16, having a guideway 17, open on one side and supporting the stem 18 of the valve. The stem is preferably square or otherwise irregular in transverse section to prevent rotation in the guideway, and also provided with a gear-rack 19, extending through the open side of the guideway. The valve-end portion of the stem 18 is conical, as at 20, the conical portion having curved sides and engaging a correspondingly-conical socket 21 in the rear side of the valve 22, the face of the valve having a rubber, leather, or other yieldable packing, (represented at 23.) The stem 18 is provided with an annular channel 24 adjacent to its conical terminal, and fitting this channel are clamp-plates 25 26, connected, as by screws 27 28, to the valve 22. The clamp-plates fit the channel with sufficient looseness to permit a certain degree of play between the valve and stem, so that the latter will automatically adapt itself to any irregularities in the face of the valve-seat or to any discrepancy between the seat and stem. This flexible coupling also prevents foreign substances which may from any cause pass into the supply-pipe 13 from holding the valve wholly open, but

will permit the valve to tilt sufficiently to close upon the unobstructed side of the valve-seat, as will be obvious. The stem 18 is provided with an elongated recess, as shown at 52, into which extends the inner end of a set-screw 53, tapped through one of the side walls of the guideway to enable the stem to be rigidly coupled to guideway, if required, and also to prevent the stem from being removed therefrom. Extending from the base-frame 10 is another standard, 29, forked at the free end and supporting a lever-arm 30 therein, as by a pivot-pin 31. The shorter end of the lever-arm is provided with a gear-segment 32 for engaging the rack 19 and with a "float" 33, connected to the longer end. The segment 32 is disposed upon the lever-arm with a greater number of its teeth upon one side of the center than the other to provide for the adjustment of the stem 18, as hereinafter described.

The stem 18 is provided with a longitudinal central vent-cavity, as at 34, registering with a similar cavity 35 through the valve 22, and the outer end of the stem is provided with a conductor-pipe 36, extending above the water-line in the tank to supply air to the pipe 13 and prevent the formation of a vacuum therein, and thus provide for the perfect and automatic drainage of the supply-pipe.

When it is required to change the relative positions of the valve and float or to regulate the depth of water in the tank, the lever-arm 30, together with its segment 32, is removed by detaching the pivot-pin 31 and the teeth of the segment set higher or lower in mesh with the rack 19, as the case may be. If a greater or lesser range of adjustment is required, the lever-arm is reversed to bring the longer or shorter side of the segment into operative position relative to the rack. By this means the range of adjustment is materially increased without increase in expense or weight.

When the valve is to be attached to one of the vertical walls of the tank, the modification shown in Fig. 5 will be employed, requiring no change except to construct the lever-arm 30 at right angles to the segment 32.

Attached to the open side of the guideway portion 17 of the standard 16 are spaced stop-plates 37 38 for projecting over the stem 18 to prevent it from moving laterally, but not preventing its longitudinal movement. The portion of the stem 18 adjacent to the valve 22 is smaller than the remainder of the same and will freely pass between the inner or lower pair 38 of the stop-plates, while the stem 18 is provided with oppositely-disposed recesses 39 for enabling the stem to pass between the other pair, 37, of the stop-plates. The stop-plates and recesses are so disposed that the stem cannot be removed unless elevated to an unusual extent or into a position which it could not assume when in use. Hence while in operation the stem cannot be removed laterally from the guideway. When, however, it is desired to remove the stem and valve bodily from the standard and supporting-frame, it is only necessary to detach the single pivot-bolt 31, remove the lever-arm 30 and its segment 32, elevate the stem with the valve attached until the recesses 39 are opposite the stop-plates 37 and the reduced portion of the stem opposite the stop-plates 38, when the whole stem and attached valve can be moved laterally toward the standard 29 and detached. This is an important feature of the invention and adds materially to the value of the invention, as by this means the labor of repairing or renewing the valve or its packing is greatly reduced.

In Figs. 6, 7, and 8 modified forms of the valve-coupling are shown which may be employed under some circumstances, if required. In these figures the valve 22 is secured to the stem by a tubular stud 40 and nut 41, the stud being tapped into the end of the stem 18 and the packing 23 supported by a disk 42 and the whole clamped together by the nut 41. A coiled spring 44 surrounds the stem 18 between the valve 22 and guideway 17 and is connected by its ends, respectively, to the valve and to the guideway, as at 45 46. The spring thus exerts its force to hold the valve normally open when released from the weight of the lever-arm 31. A cable or chain 47 is connected to the free end of the lever-arm 30 and carried over a guide-pulley 48 on the tank and thence to a stop-pin 49 exteriorly of the tank, to which it may be engaged when required. By this means when it is desired to lock the valve 22 positively closed the chain 47 is drawn down and one of its links connected to the pin 49, the spring 44 being by this action distended, as will be obvious. Then when the chain is detached from the pin the reaction of the spring will automatically open the valve, which will thereafter be controlled by the float. In Fig. 8 a similar construction is shown, but with a spring, as at 50, arranged to bear against a stop-plate 51 and the valve 22 and exert its force to maintain the valve normally closed, which arrangement may be required under some circumstances.

By this construction a very simple, easily-operated, and efficient valve is produced, which may be inexpensively constructed, readily adjusted as required, and which may be quickly adapted to any of the various tanks manufactured and to tanks employed for various purposes, as will be obvious.

Having thus described the invention, what is claimed is—

1. In a valve mechanism a base-frame having a valve-seat, a supply-pipe leading through said base-frame and terminating at said valve-seat, a standard rising from said base-frame and having a guideway open on one side and disposed at right angles to said valve-seat, a

valve for engaging said valve-seat and having a stem movable longitudinally in said guideway and removable laterally therefrom, and means controlled by a float for actuating said stem.

2. In a valve mechanism a base-frame having a transverse aperture with a valve-seat at one end and a supply-pipe at the other end of the aperture, a guideway open at one side and supported at right angles to said valve-seat and base-frame, a valve for seating on said valve-seat and provided with a stem slidably engaging said guideway and removable laterally therefrom, and means for actuating said valve-stem and valve.

3. In a valve mechanism, a base-frame having a transverse aperture with a valve-seat at one end and a supply-pipe at the other end of the aperture, a standard extending from one side of the base member and provided with a guideway open on one side and disposed at right angles to said valve-seat and base member, a valve for seating on said valve-seat and having a stem slidably engaging said guideway and removable through said open side, said stem having a gear-rack on the side opposite the open side of said guideway and projecting through the same, a bracket extending from said base member and pivotally supporting a lever having a gear-segment at one end for engaging said gear-rack and with a float connected to the other end.

4. In a valve mechanism, a base member having a valve-seat, a guideway open on one side and supported at right angles to said valve-seat and base member, a valve for seating on said valve-seat and having a concave socket in its rear face, a stem movably engaging said guideway and having a convex terminal for loosely engaging said socket and provided with an annular channel adjacent to said terminal, clamp-plates for connection to said valve and loosely engaging said channel, and means for actuating said valve-stem.

5. In a valve mechanism, a base-frame having a transverse aperture with a valve-seat at one end and a supply-pipe at the other end of the aperture, a guideway open on one side and supported at right angles to said valve-seat and base-frame, a valve for seating on said valve-seat and provided with a stem slidably engaging said guideway and removable laterally therefrom, said stem having a gear-rack opposite the open side of said guideway, a lever reversibly pivoted and provided with a gear-segment at one end for engagement with said gear-rack with a greater number of the teeth upon one side of the center, and a float connected to the free end of said lever.

6. In a valve mechanism, a base member having a valve-seat, a guideway open on one side and supported at right angles to said valve-seat and base member, a valve for seating on said valve-seat and having a stem extending for slidable engagement with said guideway and removable laterally therefrom, said stem reduced at certain predetermined points, stop-plates attached to said guide member and extending partially over the open side of the same and holding said stem within said guideway until disposed with the reduced portions opposite said plates.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

EDWARD LEE BURCHETT.

Witnesses:
H. W. N. GARDER,
A. S. PRESCOTT.