June 17, 1952 D. R. MYERS 2,601,166

AUTOMATIC WATER VALVE

Filed Jan. 3, 1949

Fig. 1.

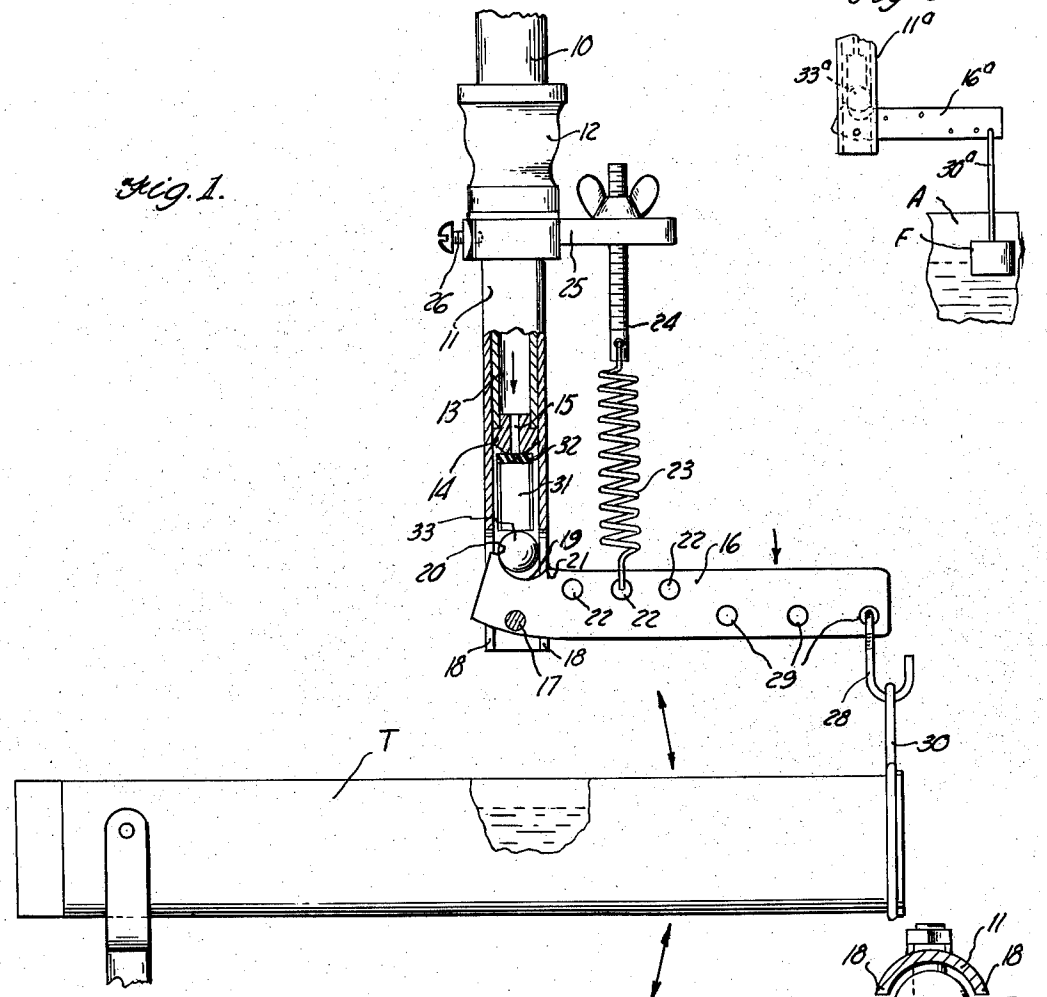


Fig. 6.

Fig. 2.

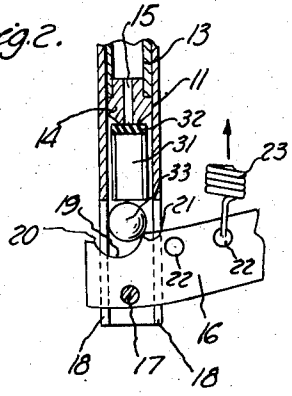


Fig. 3.

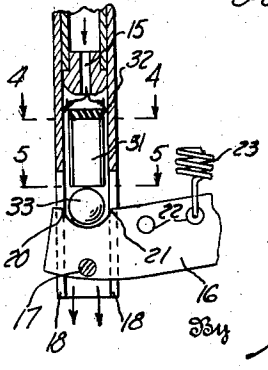
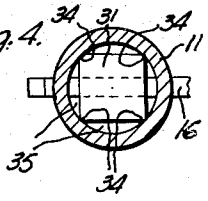


Fig. 4.



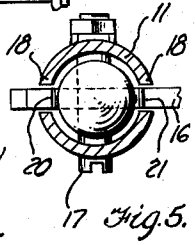


Fig. 5.

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AUTOMATIC WATER VALVE

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5 Claims. (Cl. 137—68)

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This invention relates to an automatic water valve for poultry and livestock tanks, or troughs, and has for one of its objects the production of a simple and efficient means for closing the valve in the water supply line when the water in the tank or trough exceeds a predetermined volume, or when the tank is disconnected from the actuating lever, and for opening the valve when the volume of water in the tank is below the minimum volume, to maintain the volume of water in the tank or trough at an approximate constant level.

A further object of this invention is the production of a simple and efficient means for maintaining water within a tank or trough at an approximate constant level, and also for automatically cutting off the water from a supply line to the tank or trough in the event of an accident to the tank or removal of the tank to avoid a waste of water from the supply line.

Other objects and advantages of the present invention will appear throughout the following specification and claims.

In the drawing:

Figure 1 is a side elevational view partly in section of the mechanism of the invention, the valve being shown in a closed position when the water in the tank or trough reaches a maximum volume;

Figure 2 is a vertical sectional view through the valve casing, showing the position of the valve mechanism when the water in the tank or trough falls below a minimum volume;

Figure 3 is a vertical sectional view showing the valve mechanism in an open position;

Figure 4 is an enlarged transverse sectional view taken on line 4—4 of Figure 3;

Figure 5 is an enlarged transverse sectional view taken on line 5—5 of Figure 3; and

Figure 6 is a side elevational view of a modified form of the invention showing the valve actuating mechanism connected to an actuating float.

By referring to the drawing, it will be seen that 10 designates a supply line or pipe leading from a main supply line or supply tank, reservoir or the like. A valve casing 11 in the nature of a depending tubular member is suspended from the supply line or pipe 10 by means of a suitable coupling 12. A valve seat supporting tube 13 is fixed within the casing 11 and extends longitudinally thereof. A suitable valve seat 14 is carried by the lower end of the tube 13 and is provided with a water discharge port 15.

A valve actuating lever 16 is pivotally connected to the lower end of the casing 11 by means of a journal pin 17 and this lever 16 extends transversely through the longitudinally extending slots 18 which are formed at the lower end of the casing 11 in diametrically opposed relation. This lever 16 is provided with a notch 19 upon its upper face at the inner end thereof

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and in that portion of the lever 16 which fits within the casing 11. The notch 19 is concave and is formed on the arc of the circle and is curved downwardly thereby defining spaced ball contact points 20 and 21 at the opposite ends of the notch 19. The lever 16 extends laterally of the casing 16, and is provided with a plurality of apertures 22 near its upper edge to which the lower end of the tension coil spring 23 is releasably and selectively secured. The upper end of the coil spring 23 is connected to the lower end of an adjusting screw 24. This adjusting screw is suspended from a bracket 25, which bracket 25 is held in an adjusted position on the casing 11 by means of a set screw 26. A thumb nut 27 is carried by the adjusting screw 24 to adjust the length of the screw 24 relative to the bracket 25 to regulate the tension of the spring 23. A hook 28 is fitted selectively in one of the apertures 29 formed in the lever 16 for supporting a suitable tank T through the medium of the detachable connection 30. The tank T may be of any suitable type where the weight thereof is suspended from the lever 16. The present invention, however, is not limited to the particular type of tank or trough T illustrated, since any conventional tank structure of a suitable type may be used without departing from the spirit of the invention.

A rectangular valve member 31 preferably square in cross-section extends vertically of the casing 11 below the valve seat 14. A rubber closure cap 32 is carried by the upper end of the valve member 31 and is adapted to close the port 15 of the valve seat 14 when the valve member is raised to the position shown in Figures 1 and 2. An actuating ball or circular member 33 is carried within the casing 11 and is of a diameter smaller than that of the casing 11. The ball 33 is adapted to rest in the circular or concave notch 19 when the lever 16 is in the position shown in Figure 3 for supporting the valve 31 in an open position and thereby permitting the free flow of water through the port 15 and over the rubber closure cap 32, down past the valve member 31, the ball 33, and out through the lower end of the casing 11 into the tank or trough T. The lever 16 and the valve member 31 assume the open position, as shown in Figure 3, when the volume of water in the tank T is intermediate the maximum and the minimum predetermined volume. The valve member 31 is provided with longitudinal casing contacting corners 34 thereby defining passageways, such as the passageways 35 between the inner face of the casing 11 and the sides of the valve member 31 through which water may pass longitudinally thereof.

When a predetermined volume of water is delivered to the tank T, the weight thereof will swing the outer end of the lever 16 downwardly

thereby rolling the ball 33 at the inner end thereof into engagement with the contact point 20 and lifting the valve member to a closed position relative to the port 15, as shown in Figure 1. This will cut off the flow of water and prevent the tank T from overflowing.

When the tank T is disconnected from the arm 16 for cleaning, or if the tank T is accidentally disconnected from the arm 16, the coil spring 23 will swing the lever 16 upwardly to the position shown in Figure 2. The ball 33 will then roll within the concave notch 19, which constitutes a double cam, and by contacting the contacting point 21, the ball 33 will contact the valve member 31 and force the valve member 31 to a closed position relative to the port 15. In this way, the valve 31 will automatically close and prevent waste of water from the line 10. The valve may be used for controlling the flow of liquids of other types without departing from the spirit of the invention.

From the foregoing description, it will be noted that the valve 31 will automatically cut off the discharge of water from the line 10 when a predetermined amount of water has entered the tank T and also the valve 31 will automatically close if the tank T is detached from the arm 16. The valve 31, however, will be opened when the tank T is again connected to the arm 16. It should further be noted that an attendant easily may open the valve 31 by pressing downwardly upon the outer end of the lever 16, when desired.

In Figure 6 there is shown a modified form of the invention wherein the actuating arm 16*a* actuates a valve element 33*a* similar to the valve 33 carried within the casing 11*a*. A float F is suspended from the outer end of the arm 16*a* and this float F floats upon the liquid within the tank A. This type of structure may be used where the container or tank itself is too heavy to hang from the valve actuating arm. The action of the valve element 33*a* in this instance will be the reverse of that described relative to structure shown in Figures 2 and 3. That is to say, the arm 16*a* will be raised to close the valve on the up stroke, when a predetermined volume of water has entered the tank A, and the valve also will be closed if the arm 16*a* swings below a predetermined distance.

Certain detail changes in the mechanical construction may be employed without departing from the spirit of the invention, so long as such changes fall within the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A valve comprising a casing having a valve seat and port, a reciprocating valve for opening and closing said port, an actuating lever pivoted to said casing below said valve, said lever having a concave notch, an intermediate actuating member interposed between the valve and notch, said notch constituting a cam having spaced portions to alternately engage the intermediate actuating member to move said valve to a closed position when said lever is selectively raised and lowered, and said intermediate actuating member being adapted to fall into said notch to release said valve to an open position when said lever moves to a position intermediate its raised and lowered positions.

2. A valve comprising a casing having an apertured valve seat, a valve for opening and closing said valve seat, a ball supporting said valve, an actuating lever pivoted to said casing below said valve, said lever having a concave notch in which said ball normally rests to support said valve in an open position, and said notch having a ball-contacting point at each end thereof located laterally of the pivot point of said lever to raise said ball and move said valve to a closed position when said lever is raised to a predetermined distance and also when said lever is lowered to a predetermined position.

3. A valve comprising a casing having an apertured valve seat, a valve for opening and closing said valve seat, a ball supporting said valve, an actuating lever pivoted to said casing below said valve, said lever having a concave notch in which said ball normally rests to support said valve in an open position, said notch having a ball-contacting point at each end thereof located laterally of the pivot point of said lever to raise said ball and move said valve to a closed position when said lever is raised to a predetermined distance and also when said lever is lowered to a predetermined position, tension means for raising said lever, and a predetermined weight engaging said lever for lowering said lever.

4. A valve comprising a casing having an apertured valve seat, a valve for opening and closing said valve seat, a ball supporting said valve, an actuating lever pivoted to said casing below said valve, said lever having a concave notch in which said ball normally rests to support said valve in an open position, said notch having a ball-contacting point at each end thereof located laterally of the pivot point of said lever to raise said ball and move said valve to a closed position when said lever is raised to a predetermined distance and also when said lever is lowered to a predetermined position, an adjustable tension means for raising said lever, and a predetermined weight engaging said lever for lowering said lever.

5. A valve comprising a casing having an apertured valve seat, a valve for opening and closing said valve seat, a ball supporting said valve, an actuating lever pivoted to said casing below said valve, said lever having a concave notch in which said ball normally rests to support said valve in an open position, said notch having a ball-contacting point at each end thereof located laterally of the pivot point of said lever to raise said ball and move said valve to a closed position when said lever is raised to a predetermined distance and also when said lever is lowered to a predetermined position, tension means for automatically raising said lever when a predetermined weight is released from the lever, and means adapted to receive a predetermined weight of liquid secured to said lever for lowering said lever.

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