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F. B. HOTTON

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HYDRAULIC CONTROL VALVE

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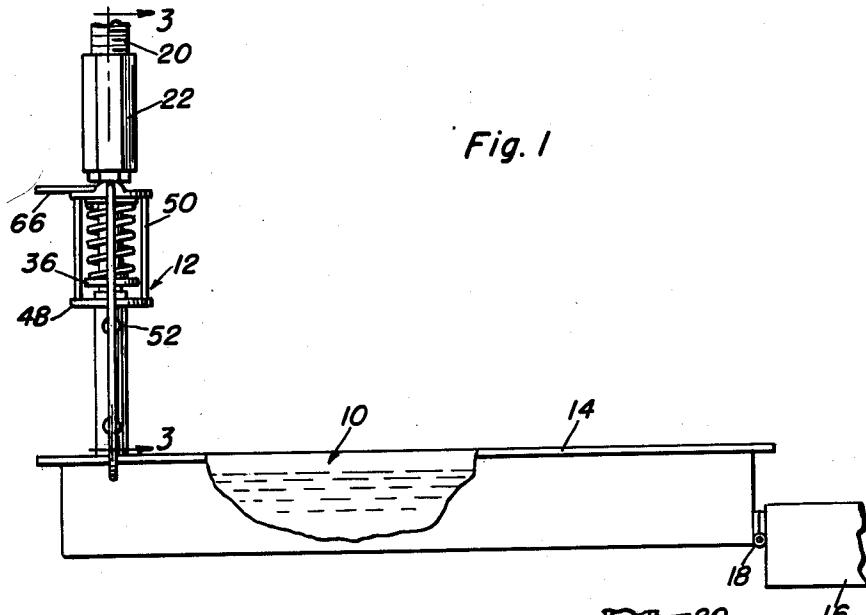


Fig. 1

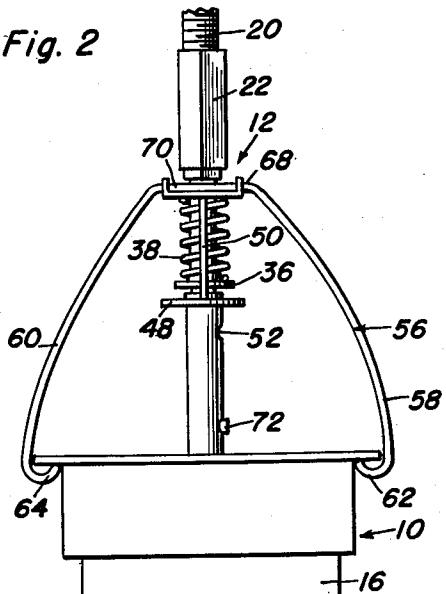


Fig. 2

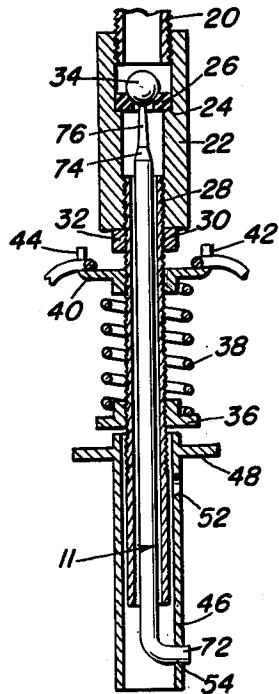


Fig. 3

Francis B. Hotton  
INVENTOR.

BY *Clarence A. O'Brien*  
*and Harvey B. Jacobson*  
Attorneys

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## HYDRAULIC CONTROL VALVE

Francis B. Hotton, Salisbury, Md.

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5 Claims. (Cl. 137—408)

1

The present invention relates to improvements in hydraulic control valves for watering troughs employed for poultry and the like.

An object of the present invention is to provide a novel means for delivering water to a trough for poultry, wherein the means of the present invention is supported by the inlet conduit.

A further object of the present invention resides in a novel arrangement for resiliently supporting the trough whereby lowering of the water level in the trough effects resilient operation of the valve for permitting inflow of water.

Still another object of the present invention resides in the arrangement of pressure closed valve and plunger means for unseating the pressure closed valve whereby upward movement of the plunger first unseats the pressure closed valve and then itself seats for closing against the flow of water upon further upward movement.

Another object of the present invention is to provide a novel resilient bracket whereby one end of a trough may be supported and wherein the bracket is readily removably positioned upon a supporting member.

Various other objects and advantages will be apparent from a detailed description to follow. In the description as well as in the claims, parts are at times identified by specific names for convenience, but such nomenclature is intended to be as generic in its application to analogous parts as the prior art will permit.

The best form in which I have contemplated applying my invention is illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevational view showing the hydraulic control valve of the present invention with the drinking trough supported thereby;

Figure 2 is an end elevational view of Figure 1; and

Figure 3 is a vertical transverse sectional view taken substantially along the plane of line 3—3 of Figure 1.

Referring more particularly to the drawings, wherein like numerals designate like parts throughout, the numeral 10 designates generally the trough for poultry and the like, and the numeral 12 designates generally the hydraulic control valve means of the present invention.

The trough 10 is of conventional form, having a flange 14 integrally formed with its upper edge and outwardly extending therefrom. The trough 10 is hingedly connected to a block 16 at 18 whereby the loss of weight in the trough due to drinking and evaporation effects pivoting movement of the trough 10 with respect to the block 16.

The hydraulic control valve 12 is best disclosed in Figure 3. An inlet conduit 20 provides means for supporting the valve arrangement and has threadably secured to its extremity the valve cas-

2

ing 22 which is shown of non-circular form whereby it may be threaded onto the end of the conduit 20. The casing 22 is formed with an annular shoulder 24 upon which an annular valve seat 26 is securely positioned. The casing 22 is internally threaded at 28 for receiving the externally threaded tubular outlet conduit 30. A locking nut 32 is threadably engaged on the tubular conduit 30 for securely locking the same in position within the casing 22. A ball valve 34 is positioned above the annular valve seat 26 within the casing 22 and is engaged with the seat 26 as a result of the fluid pressure exerted thereagainst by the inlet fluid.

The outlet conduit 30 is of elongated form and is completely threaded on its exterior surface, the conduit 30 being of sufficient length to extend downwardly to a point near the upper surface of the trough 10. A spring retainer 36 is threadably and adjustably secured on the outlet conduit 30 and a spring 38 is seated thereon. Positioned above the spring 38 and resiliently supported thereby is the supporting member 40 which is provided with a pair of angulated end portions 42 and 44 which are bifurcated for a purpose to be hereinafter described.

The outlet sleeve 46 is received on the lower end of the outlet conduit 30 and has an annular flange 48 extending outwardly from a portion adjacent its upper ends. The flange 48 is maintained in spaced relation to the supporting member 40 by means of a plurality of spacing and supporting pins 50. The sleeve 46 is provided with a plurality of apertures 52 and 54 along its longitudinal length for reasons to be hereinafter set forth.

The means for supporting the trough 10 include the bracket 56 which has a pair of downwardly extending arcuated arms 58 and 60 terminating in upwardly arcuated portions 62 and 64 for engagement with the under surface of the flange 14 of the trough 10. The upper portion of the bracket 56 is horizontally angulated with respect to the arms 58 and 60 as shown at 66. The angulated portion 66 is formed with a pair of radially extending supporting portions 68 and 70 which are adapted to be received in the bifurcated portions of the supporting member 40 hereinabove described. The centermost portion of the bracket 56 is of elongated arcuate form and provides a finger holding portion whereby the bracket 56 may be removed from the bifurcations 42 and 44 or inserted therein.

The plunger means 11 is provided with an angulated end 72 which is adapted to be selectively positioned in one of the apertures 52 or 54 provided for adjustment purposes. The upper end of the plunger 11 is provided with an annular seating surface 74 and a needle-like end 76. The

needle-like end 76 is adapted to unseat the ball valve 34 upon upward movement of the plunger 11, and continued upward movement of the plunger effects seating engagement of the seating surface 74 against the annular seat 26.

From the foregoing description, taken in conjunction with the drawings, it is believed that a device has been provided which will accomplish all of the objects hereinabove set forth and that the operation thereof will be readily obvious to one skilled in the art. As the water in the trough 10 is drunk or evaporates, the trough 10 will pivot upwardly, lightening the load on the supporting member 40 and effecting upward movement of the sleeve 46. The plunger 11 will be carried upwardly therewith and will unseat the ball valve 34, permitting entry of additional water.

When the trough is completely removed from the trough supporting means, the spring 38 will urge the sleeve 46 upwardly, with the plunger 11 moving therewith. The plunger will first unseat the ball valve, but continued upward movement will effect seating of the surface 74 against the ring 26.

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

1. A hydraulic control valve comprising an inlet and valve support conduit, a valve casing secured to the lower end of said conduit, a pressure closed valve means in said casing, an outlet conduit associated with said casing, means for resiliently supporting a water trough by said outlet conduit, and plunger means responsive to a lowering of the water level in said trough to a predetermined amount for opening said valve means in opposition to the pressure, said means for resiliently supporting a water trough including a spring retainer on said outlet conduit, a spring mounted on said retainer, a supporting member mounted on the upper end of said spring, a trough supporting bracket removably positioned on said supporting member and having hook portions for engagement with the trough, and an outlet sleeve rigidly secured to said supporting member and receiving said outlet conduit therein said outlet sleeve being connected to said plunger means.

2. A hydraulic control valve comprising an inlet and valve support conduit, a valve casing secured to the lower end of said conduit, a pressure closed valve means in said casing, an outlet conduit associated with said casing, means for resiliently supporting a water trough by said outlet conduit, and plunger means responsive to a lowering of the water level in said trough to a predetermined amount for opening said valve means in opposition to the pressure, said means for resiliently supporting a water trough including a spring retainer on said outlet conduit, a spring mounted on said retainer, a supporting member mounted on the upper end of said spring, a trough supporting bracket removably positioned on said supporting member and having hook portions for engagement with the trough, and an outlet sleeve rigidly secured to said supporting member and receiving said outlet conduit therein, aperture means formed in the wall of said sleeve, said plunger means including a plunger having a needle end for engagement with said valve means, the other end of said plunger being angulated for insertion into said aperture means.

3. A hydraulic control valve comprising an inlet and valve supporting conduit, a valve casing secured to the lower end of said conduit, a pressure

closed valve means in said casing, an outlet conduit associated with said casing, means for resiliently supporting a water trough by said outlet conduit, and plunger means responsive to a lowering of the water level in said trough to a predetermined amount for opening said valve means in opposition to the pressure, said pressure closed valve means including an annular seating ring in said casing, and a ball valve positioned thereon, said means for resiliently supporting a water trough including a spring retainer on said outlet conduit, a spring mounted on said retainer, a supporting member mounted on the upper end of said spring, a trough supporting bracket removably positioned on said supporting member and having hook portions for engagement with the trough, and an outlet sleeve rigidly secured to said supporting member and receiving said outlet conduit therein, aperture means formed in the wall of said sleeve, said plunger means including a plunger having a needle end for engagement with said valve means, the other end of said plunger being angulated for insertion into said aperture means.

4. A hydraulic control valve comprising an inlet conduit, a valve casing secured to the end of said conduit, a pressure closed valve means in said casing, an outlet conduit connected to said casing, a spring retainer mounted on said outlet conduit, a spring mounted on said retainer, a trough supporting member mounted on said spring, means supporting a trough from said supporting member, an outlet sleeve rigidly secured to said supporting member, said outlet conduit extending into said sleeve, a plunger extending through said outlet conduit, said plunger having an end for engagement with said valve means, said sleeve having apertures therein and said plunger having a portion for insertion into one of said apertures, whereby said plunger operates said valve means in response to movement of said sleeve.

5. A hydraulic control valve comprising an inlet conduit, a valve casing secured to the end of said conduit, an annular valve seat member and a pressure closed valve member in said casing, an outlet conduit connected to said casing, a spring retainer mounted on said outlet conduit, a spring mounted on said retainer, a trough supporting member mounted on said spring, means supporting a trough from said supporting member, an outlet sleeve rigidly secured to said supporting member, said outlet conduit extending into said sleeve, a plunger extending through said outlet conduit, said plunger having an end for engagement with said valve member, said sleeve having apertures therein and said plunger having a portion for insertion into one of said apertures, an annular seating surface on said plunger below said valve member, said annular seating surface cooperating with said annular valve seat member to provide a secondary valve action, whereby said plunger operates said valve member in response to movement of said sleeve.

65

FRANCIS B. HOTTON.

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