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HYDRAULIC CONTROL VALVE

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Fig. 1

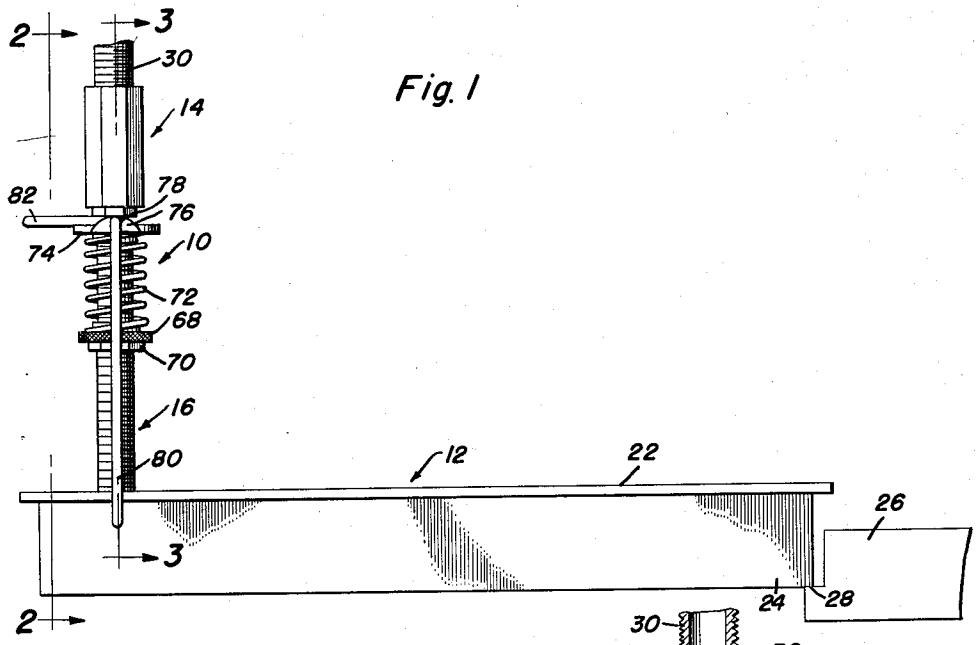


Fig. 2

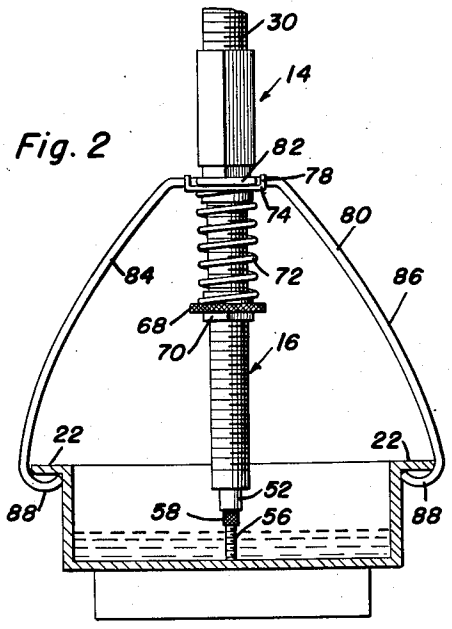
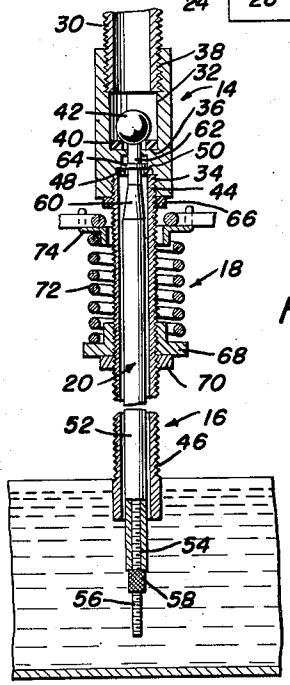


Fig. 3



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HYDRAULIC CONTROL VALVE

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The present invention relates to improvements in hydraulic control valves and more particularly to the type of valve which is well adapted for use in connection with turkey troughs and the like for controlling the amount of fluid fed to the trough.

An object of the present invention is to provide a hydraulic control valve having a tubular housing provided with first and second bores and an apertured partition wall therebetween and a ball valve disposed in the first bore for engagement with the valve seat disposed on the partition wall, and means for selectively displacing the ball valve for permitting flow through the housing and preventing flow through the housing in response to displacement of the trough.

A further object of the present invention is to provide a novel means for unseating the ball valve whereby when the means moves upwardly a predetermined distance in unseating the ball valve, a valve portion of the means engages a second seat for preventing further flow through the housing.

Still another object of the present invention is to provide a means for adjusting the means for unseating the ball valve whereby the ball valve will be actuated upon predetermined movement of the trough for engagement with the valve unseating means.

Still other objects of the present invention will more fully appear in the detailed description to follow. The best form in which I have contemplated applying my invention is clearly illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevational view of the hydraulic control valve associated with a turkey trough;

Figure 2 is a vertical transverse sectional view taken substantially along the plane of line 2—2 of Figure 1; and

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

Referring more particularly to the drawings, wherein like numerals designate like parts throughout, the numeral 10 designates generally the hydraulic control valve means and the numeral 12 designates generally the turkey trough with which the hydraulic control valve means is associated. The hydraulic control valve means 10 is comprised of a tubular housing 14, tail pipe means 16, resilient support means 18 for the turkey trough 12 and valve unseating means 20.

As seen best in Figure 1, the trough means 12

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is comprised of an elongated substantially rectangular trough having a flange 22 formed at its upper peripheral edge. The reactangular trough 24 is pivotally supported on the beam 26 having the fulcrum 28.

The hydraulic control valve means 10 is connected to a fluid inlet conduit 30 and supported thereby. The hydraulic control valve 10 has its valve housing 14 formed from a non-circular tubular member having first and second bores 32 and 34, respectively, with an apertured partition wall 36 disposed therebetween. The first bore 32 is formed with internal threading 38 whereby the tubular housing 14 can be supported on the externally threaded conduit 30.

Seated on the apertured partition wall 36 is an annular valve seat 40 formed from suitable valve seat material having rubber-like resiliency. A ball valve 42 is disposed in the first bore 32 and engageable with the valve seat 40 for preventing flow through the housing 14, the valve 42 being downwardly urged against the seat 40 by means of the fluid pressure from the inlet conduit 30.

The second bore 34 is internally threaded at 44 whereby the tail pipe means 16 having the external threading 46 can be threaded into the valve housing 14 for support thereby. The upper end of the tail pipe 16 engages a gasket 48 which abuts the shoulder 50 to provide an effective seal for preventing flow out around the tail pipe 16.

The valve unseating means 20 is comprised of an elongated rod 52 which is internally bored and threaded at 54 throughout a substantial portion of its length. An adjusting screw 56 is received in the bore 54 with a lock nut 58 for adjustably positioning the adjusting screw 56 with relation to the actuating rod 52.

The valve unseating rod 52 is formed with a tapered valve portion 60 which is adapted to engage the gasket 48 upon predetermined upward movement of the valve unseating means 20. The rod 52 terminates at its upper end in a reduced diameter portion 62 which has its end portion disposed in the annular seat 40 when the valve unseating rod is in its lowermost position. The means for maintaining the valve unseating means 20 in its lowermost position consists of the snap ring 64 which is engaged on the reduced diameter portion 62 of the rod 52 and engageable with the gasket 48 for limiting the downward movement of the rod 52.

The tail pipe 16 has a lock nut 66 engaged thereon for abutment against the lower end of the tubular housing 14 for preventing disengagement of the tail pipe from the housing. The tail

pipe 16 also has a spring retainer 68 threaded thereon with a lock nut 70 associated therewith for adjustably positioning the retainer 68 in preselected relation to the tail pipe 16. A coil spring 72 is disposed on the spring retainer 68 to provide a supporting means 18 for the disk 74 seated on the upper end of the coil spring 72.

The disk 74 is provided with a pair of upwardly extending flanges 76 having open ended slots 78 therein whereby the hanger rod 80 may be supported on the disk 74.

The hanger rod 80 is comprised of an elongated and arcuated resilient rod having a bight portion formed with a loop 82 for positioning around the tail pipe 16, the leg portions 84 and 86 of the hanger 80 terminating in arcuated ends 88 and 90 for resilient clamping engagement with the flanges 22 of the trough 12.

In view of the foregoing, the manner in which the hydraulic control valve operates should be readily understood by one skilled in the art. The trough 12 is clampingly supported at one end on the hanger 80 and is pivotally supported on the fulcrum 28 at its other end. Inasmuch as the trough is relatively light from lack of water, the spring 72 will urge the trough to its uppermost position for engagement with the rod 56. The rod 20 will be upwardly urged to unseat the valve 42 and the tapered valve portion 60 will be engaged against the valve seat gasket 48, thereby preventing flow through the housing 14 to the tail pipe and trough. When it is desired to fill the trough, the trough must be manually urged to compress the spring, thereby causing the rod 20 and the tapered valve portion 60 to move downwardly to an intermediate position. Fluid will then flow into the trough. When a predetermined amount of fluid has entered the trough, the trough can be released and the valve will automatically control the fluid flow into the trough to maintain it at a predetermined level. Thus as the trough becomes heavier by the added fluid, the spring 72 will become compressed and the trough will lower to a position out of engagement with the rod 56, thus permitting the closing of the valve 42, and preventing further fluid flow through the housing, as seen best in Figure 3.

It will therefore be seen that should the trough be accidentally disconnected from the control valve the valve will automatically close and practically no loss of fluid will occur. Furthermore, the trough can be removed for cleaning without the necessity of turning the fluid off at some remote point. The bight portion 82 of the hanger 80 need only be unhooked from the supporting disk 74 for removal of the trough and hanger.

In view of the description and drawings of the hydraulic control valve, it is believed that one skilled in the art will understand the various other uses to which the invention can be adapted.

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

1. A hydraulic control valve comprising a tubular housing having first and second bores and an apertured partition wall therebetween, a tail pipe connected to said housing and in said second bore, an annular valve seat disposed on said partition wall, a ball valve disposed in said first bore for engagement with said seat, first means for unseating said ball valve, and second means connected to said tail pipe for supporting a trough, said first means including an elongated rod having a reduced end portion extending through said apertured partition and engageable with said ball valve, said elongated rod having its lower end bored and internally threaded, and an adjusting rod received therein for engagement with the bottom of said trough.

2. A hydraulic control valve comprising a tubular housing having first and second bores, a partition between said bores, said partition having an aperture therein, a tail pipe threadedly secured in said second bore, a valve seat gasket secured between said tail pipe and said partition, a valve seat on said partition in said first bore, a ball valve in said first bore, an actuating rod slidably mounted in said tail pipe, a tapered valve seat on said actuating rod, a valve unseating rod on said actuating rod, said valve unseating rod extending through said aperture, a retaining ring secured on said valve unseating rod, an adjusting screw mounted in said actuating rod at the end remote from said valve unseating rod.

3. A hydraulic control valve comprising a tubular housing having first and second bores, a partition between said bores, said partition having an aperture therein, a tail pipe threadedly secured in said second bore, a valve seat gasket secured between said tail pipe and said partition, a valve seat on said partition in said first bore, a ball valve in said first bore, an actuating rod slidably mounted in said tail pipe, a tapered valve seat on said actuating rod, a valve unseating rod on said actuating rod, said valve unseating rod extending through said aperture, a retaining ring secured on said valve unseating rod, an adjusting screw mounted in said actuating rod at the end remote from said valve unseating rod, a disk resiliently mounted on said tail pipe, a hanger rod supported on said disk, a trough held by said hanger rod, said hanger rod supporting said trough for engagement with the adjusting screw of said actuating rod.

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