

"ANIMAL WATERING PLANT"

The invention relates to an animal watering plant for stall installations. Such a plant, suitable for a plurality of animals such as cattle, comprises a water trough with which is associated a valve connected via a flexible feed to a pressurised water line provided with a hand shut-off valve and, constructed as a float member, an actuating means for opening and closing the valve, the valve and the float member being provided on a common component which is vertically adjustably supported in the interior of the water trough.

In the case of a prior art cattle watering installation of this type (GB-PS 10 55 778), the component carrying the float member and the valve consists of an open-bottomed housing into which the valve projects from above and in the interior of which the float member which actuates the valve is so disposed that when the valve is raised and in the valve open position it projects at least partially downwardly beyond the bottom edge of the housing. The housing has on its side wall pockets to accommodate the respective arm of two U-shaped members which engage over the upper edge of the aperture of the water trough, while whichever is their other arm is supported on the upper outer edge of the water trough by clamping screws which engage through the respective arm. The housing which is thus provided at the upper edge of the water trough, with its float member, of which at least part projects downwardly beyond the bottom edge and maintains the

valve in the open position, allows water to pass into the trough until such time as the water level is close to the upper edge of the trough, when the float member is pivoted back sufficiently into the interior of the housing that in a substantially horizontal position it finally closes the valve and so terminates the supply of water.

This and similar cattle watering installations with a float control arrangement which allows an automatic supply of water to the troughs are certainly only suitable for stationary stall installations because minimal fluctuations in the water level in the trough can result in movements of the float member and thus an undesired inflow of water, which can frequently result in overfilling or overflowing of the water troughs.

For non-stationary stall installations, particularly for stall installations which are installed on marine vessels for the transportation of animals, chiefly sheep, a watering apparatus has therefore been suggested in which in the interior of the water trough, which in plan view describes a narrow rectangle, there is a rocker arm. The arm extends through the trough in a longitudinal direction and is mounted in pivotally movable fashion at both narrow ends of the trough. The rocker arm serves as a means of actuating the valve and can be set in motion by the animals themselves. In this case, the rocker arm extends at just a minimal distance above the bottom of the trough and forms a cavity in which the valve provided on the bottom of the trough is accommodated in

a concealed fashion. The valve of which the supply line is passed through the bottom of the trough is provided with horizontally extending outlet connectors and with opening mandrels which project therefrom and over which engage flexible hose portions and which, upon lateral deflection, open the valve by means of valve actuating members provided on the under side of the rocker arm when and for as long as the rocker arm is pivoted out of its inoperative position by an animal (DE-PS 34 21 664; EP 0 169 996-B1).

Although this prior art self-watering apparatus for stall installations on marine vessels has provided a reliably operating watering apparatus which, according to requirements, ensures a supply of water to animals, practical experience has revealed disadvantages which counteract general introduction on all sheep transporting vessels. For instance, cleaning of the water troughs is carried out by means of high pressure water cleaners at up to 150 bars water pressure at the spray lance or hose. First, the rocker arm has to be lifted out of the trough and then the trough with the valve parts has to be sprayed clean, after which the rocker arm is fitted again (dismantling of the valve and removing the trough is too difficult and time-consuming). This cleaning process must be carried out in the minimum of time and by unskilled people on grounds of cost. At the aforementioned spray pressures, this can quickly result in serious damage to the valve parts at the bottom of the trough so that the watering apparatus becomes unusable. On account of the installation costs entailed, there is no question of the damaged parts being replaced.

Therefore, there is once again a problem, particularly for stall installations which are set up on marine vessels, and which are intended for transporting mainly sheep, of providing a reliably operating watering apparatus which, in keeping with requirements, provides a water supply to animals but which also satisfies the requirement of not suffering when the water troughs are cleaned too robustly or rapidly.

In order to resolve this problem, the invention, based on the initially mentioned float-controlled cattle watering means for stationary stall installations, does however provide for the use of such a cattle watering system, particularly on marine vessels.

According to the present invention, there is provided a watering plant for stall installations and suitable for a plurality of animals, comprising a water trough with which is associated a valve connected via a flexible feed to a pressurised water line provided with a shut-off valve and, constructed as a float member, an actuating means for opening and closing the first-mentioned valve, the valve and the float member being provided on a common component which is vertically adjustably supported in the interior of the water trough, the said component, which carries the float member and the valve controlled thereby, in its operative position disposed in the water trough, forms a pretensioning member which in connection with the bottom of the trough establishes at a definite dimension the travel of the float member into the

valve-closed position, and the said component is mounted at the bottom end of a supporting member which is supported so as to be upwardly and downwardly adjustable, in use, on the stall installation outside and above the water trough, so that it can be moved out of the trough into a trough clearance position.

In consequence, a watering apparatus is achieved which on the one hand permits of a reliable supply of water in each case to a relatively great number of animals and which, despite float control of the water supply, guarantees that the water troughs will be filled in keeping with demand and largely independently of ship movements, thus minimising risk of any water overflowing or slopping over into walkways. On the other hand, a complete independence of the valve control with the water feed from the water trough is provided so that there is no longer any need for structural and/or mechanical adaptation of the two parts. Thus, water troughs can as desired be cleaned on board or even off the ship, free from parts of the apparatus but in situ or even at special collection points because they can be easily and rapidly detached from the stall installation and can thus be equally quickly and rapidly refitted. Damage to the parts which belong to the water supply or the control apparatus can thus no longer occur when the water troughs are cleaned. A particular advantage lies in the fact that the water troughs which can in themselves be of any desired shape to suit their attachment to the stall arrangement, may be given a configuration which corresponds to that of feed troughs so that the troughs can be interchanged with one another at will.

Moreover, a cost-saving uniform trough layout can be provided for each ship. Finally, the invention also permits of relatively simple and competitively priced conversion or addition to ships instead of the watering apparatuses which are already installed.

The invention will now be explained in more detail, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a view of the front face, which is towards the operating walkway or gangway, of a stall installation set up on a marine vessel,

Fig. 2 is a sectional view taken on the line II-II in Fig. 1,

Figs. 3 & 4 show two detailed views of the water feed control arrangement in different operating positions, and

Figs. 5 & 6 show two different views of a modified form of embodiment.

A stall installation set up on a sea-going vessel may comprise a plurality of stalls provided on each of a number of decks of the ship and intended in each case for a plurality of animals, for example, sheep. The stalls in each case may be disposed on both sides of walkways and may be provided with a fodder trough and a water trough. Fig. 1 diagrammatically shows such a stall viewed from the gangway 1. It comprises, belonging to the ship's hull, two supports 2 between which extend box grid bars 3 consisting of

square or round section tubes and possibly a bottom wall 4 for separating the stalls from the walkway 1 and for the suspension in each case of one fodder trough and one water trough. For simplicity, only the water trough 5 belonging to a stall 2, 3, 4 is shown.

In plan view, each water trough 5 preferably describes a narrow rectangle and extends in the longitudinal direction parallel with the box grid bars 3, so that in each case a plurality of animals can be supplied simultaneously with water from the trough. In themselves, the water troughs may have any desired shape and may consist of stainless steel, aluminium or plastics material, just so long as they can be suspended on one of the supporting struts 3, e.g. by means of an integrally formed suspension edge 5' and/or by means of a special suspension or bracing device (not shown). As the invention allows, it is particularly advantageous for the water troughs 5 and the fodder troughs to be of identical construction so that they are interchangeable with one another.

To supply each water trough 5, there is installed rigidly with the stall installations a pressurised water line 6 with a hand shut-off cock 7 from which a flexible feed 8, for example a portion of hose, extends to the water trough.

At a distance above the water trough 5, preferably close to the support 2, on which are fixed the pressurised water line 6 and the hand shut-off cock 7, there is disposed a support or holder generally designated 9 which, in accordance with the example of

embodiment in Figs. 2 to 4, comprises a supporting arm 9' fixed by a flange 10 to the support 2 and extending horizontally and parallel with the box grid bars 3. The supporting arm 9' has, disposed at its free end, a vertical guide 9". This vertical guide, which expediently consists of a square tube, is in the example illustrated rigidly connected to the supporting arm 9' being for example welded on, but it can however also be connected in pivotally movable fashion via an articulation member (not shown) which has at least two lockable end positions spaced apart by at least an angle of rotation of about 90°, so that the vertical guide 9" is pivotable in a substantially horizontal direction and back again.

Guided for an up and down sliding movement in the vertical guide 9" is a supporting member generally designated 11 which has at its bottom free end a component 14 supporting a float member 12 and a valve 13 which can be actuated by the latter. The supporting member 11 expediently consists of a supporting bar 11' constructed as a square section tube and which is rotationally rigidly guided in the vertical guide 9", also being guided frictionally for upwards and downwards movement and being infinitely adjustable possibly by means of an inner lining provided therein and consisting of rubber, synthetic plastics material or the like. For fixing the supporting bar 11' in the vertical guide 9", it is possible to provide a clamping screw 15 having a screwthread which engages through the vertical guide 9" (see Figs. 1 to 4), so that the component 14 is adjustable and lockable at a specific distance from the

trough bottom 5", which distance can possibly be also read off from the supporting bar 11'. Instead of this clamping screw 15 or the like, it is also possible to provide a short or small-link chain 26, one end of which is rigidly attached to the component 14 at 16' while its other free end is detachably engaged on a hook 16" or the like which is fixed on the vertical guide 9" (see Figs. 5 and 6).

The component 14 which carries the float member 12 and the valve 13 preferably consists of an open bottomed housing 17 with a bottom rim 17' into which the valve 13 projects from above (see particularly Figs. 3 and 4) and in which the float member 12 for actuating the valve is so disposed that when the housing is raised, in the valve-open position, it protrudes at least partially downwardly beyond the bottom edge 19' of the housing 17 (Fig. 3), while due to a corresponding matching of its dimensions to those of the housing, when the housing (Fig. 4) has its bottom edge 17' resting on the trough bottom 5', it completely or almost completely assumes its valve-closed position. Since the float member 12 is expediently mounted for pivoting movement on the housing of the valve 13 at 12" by means of a lever 12' which acts at the same time as a thrust plate for the lever effecting the valve actuation and, to close the valve, is moved against its pressure, the float member 12 is from the first time it is supported on the trough bottom 5' (Fig. 3) until it is pushed fully up due to further lowering (arrow a in Fig. 3) of the housing under a mechanical pretensioning in order to close the valve regardless of the water level in the trough. In

other words, the component 14 which carries the float member and the valve forms, in its working position in which it is lowered in the water trough 5 by means of the support 9 (from the position shown in Fig. 3 to the position shown in Fig. 4), forms in conjunction with the trough bottom 5 a pretensioning member which establishes at a determinable amount the travel of the float member into the valve closed position and with which it is possible fairly accurately to determine the amount of water which still has to flow into the trough or the maximum level of water required to achieve complete closure of the valve (e.g. 20mm level of water for a trough height of 150 to 200mm). And as a result of this mechanical presetting of the float member on its way into the valve-closed position, brought about by the lowering of the supporting means, the float member is substantially insensitive to fluctuations in water level due to fluctuations in the trough due to movements of the ship. Nevertheless, in the event of very marked and persistent rolling of the ship resulting in the water level in the trough rising beyond the predetermined level, then the supply of water will in any case stop completely when the housing with the float member is below the surface of the water (for example one-quarter to one-third the height of the trough), because then the float member can no longer open the valve in any case; therefore, even in extreme movement situations, there is no question of the water overflowing from the trough.

For cleaning the water trough 5 - once the hand shut-off valve 7 has been closed - the supporting member 11 with the component 14 accommodating the valve

13 and the float member 12 is withdrawn fully upwardly out of the trough in the holder 9 or it may be pivoted out into a trough clearance position which makes the trough fully accessible and which also permits of its unhindered disengagement; the water trough can then be freely flushed out with a high pressure spray or cleaned at a collection point. After cleaning, the component 14 is lowered into the trough again and, by means of the briefly opened hand shut-off cock 7, it can also be cleaned and rinsed. After the component has been lowered into the predetermined working position, the water supply shut-off cock is opened and the water supply is once again ready for operation.

It should furthermore be noted that if the component 14 is constructed as an open-bottomed housing 17 of substantially rectangular plan view, as shown, then it is expedient to provide at the bottom edge 17' one or a plurality of water outlet apertures 17" and in the upper part of the housing 17 one or a plurality of air outlet orifices 17'''.

For the rest, from a structural point of view, in contrast to the embodiment described hereinabove and shown in Figs. 1 to 4, other designs or modifications are possible. For example, it is possible for the holder 9 with its supporting arm 9' which carries the vertical guide 9" not to be mounted on the support 2 but on one of the box grid bars 3 and secured there by means of a clip 10' as shown in Figs. 5 and 6. Furthermore, as already mentioned, instead of the clamping screw 15 which secures the supporting member 11 or 11' in the vertical guide, it is also

possible to provide the aforementioned link chain 16 which permits of a finely graduated adjustment with rapid and reliable relocation of the lowering depth for the component 14 which carries the float member 12 and the valve 13. Furthermore, as Figs. 5 and 6 also show, the component 14 may be lowered into the water trough 5 transversely to the longitudinal extension of this latter if the trough is of sufficient width at the bottom. If the supporting member 11 or 11' is constructed as a square tube and the holder 9 is constructed with a vertical guide 9" which also takes the form of a square tube, then it is necessary only to pull out and reinsert the supporting rod after rotating it through 90° in order to dispose the component 14 in or at right-angles to the longitudinal extension of the trough 5, as desired.



CLAIMS:

1. A watering plant for stall installations and suitable for a plurality of animals, comprising a water trough with which is associated a valve connected via a flexible feed to a pressurised water line provided with a shut-off valve and, constructed as a float member, an actuating means for opening and closing the first-mentioned valve, the valve and the float member being provided on a common component which is vertically adjustably supported in the interior of the water trough, the said component, which carries the float member and the valve controlled thereby, in its operative position disposed in the water trough, forms a pretensioning member which in connection with the bottom of the trough establishes at a definite dimension the travel of the float member into the valve-closed position, and the said component is mounted at the bottom end of a supporting member which is supported so as to be upwardly and downwardly adjustable, in use, on the stall installation outside and above the water trough, so that it can be moved out of the trough into a trough clearance position.

2. A watering plant according to claim 1, in which the component carrying the float member and the valve is an open bottomed housing into which the valve projects from above and in the interior of which the float member which actuates the valve is so disposed that when the housing is raised in the valve-open position, it projects at least partially downwardly beyond a bottom rim of the housing, and the dimensions



of the float member and the housing are so matched to each other that when the bottom edge of the housing is resting on the trough bottom, the float member completely or almost completely assumes its valve-closed position.

3. A watering plant according to claim 2, wherein the housing is provided in its upper portion with at least one air outlet orifice.

4. A watering plant according to claim 2 or claim 3, wherein the housing is provided at its bottom edge with at least one water outlet orifice.

5. A watering plant according to any one of the preceding claims, wherein the supporting member for the component which carries the float member and the associated valve is formed by a supporting bar adapted to be mounted or guided for sliding or pivoting movement on a holder or support mounted on the stall installation outside of and above the water trough.

6. A watering plant according to claim 5, wherein the said supporting bar consists of a square tube while the holder or support comprises a vertical guide which engages frictionally and non-rotatably about the holder or support and in which the supporting bar is guided for upwards and downwards movement and for infinite adjustment.

7. A watering plant according to claim 6, wherein the vertical guide is connected to the holder or support rigidly or through an interposed pivot joint having at least two lockable extreme positions which



are spaced apart by an angle of rotation of about 90°.

8. A watering plant according to any of claims 6 to 7, wherein in the region of the holder or support there are means of fixing the supporting member so that the said component is at a specific distance from the bottom of the water trough and/or there are in the trough means for reading off the water filling level which is associated with a specific immersion position of the component.

9. A watering plant according to claim 8, wherein the means of fixing the supporting member comprise a clamping screw traversing the vertical guide, or a link chain which is fixed to the said component and has a free end separably attached to the vertical guide.

10. An animal watering plant suitable for use in transportation such as a sea-going vessel, substantially as hereinbefore described with reference to Figures 1 and 2 or Figures 3 and 4 or Figures 5 and 6 of the accompanying drawings.

---