Nov. 8, 1966 H. RÜTER 3,283,746

POULTRY WATERING TROUGH WITH A FREELY SUSPENDED DRINKING VESSEL AND AN AUTOMATIC FILLING VALVE

Filed May 5, 1965 2 Sheets-Sheet 1

FIG. 1

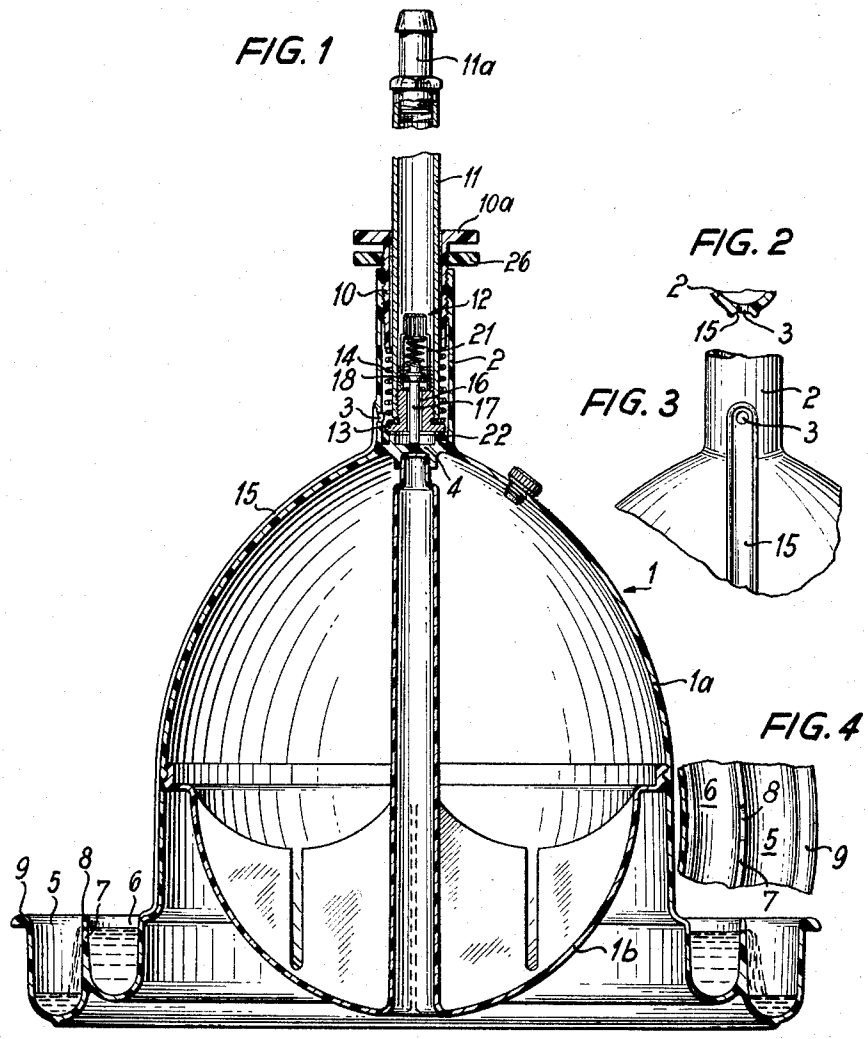



FIG. 2




FIG. 3




FIG. 4




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Filed May 5, 1965 2 Sheets-Sheet 2

FIG. 6

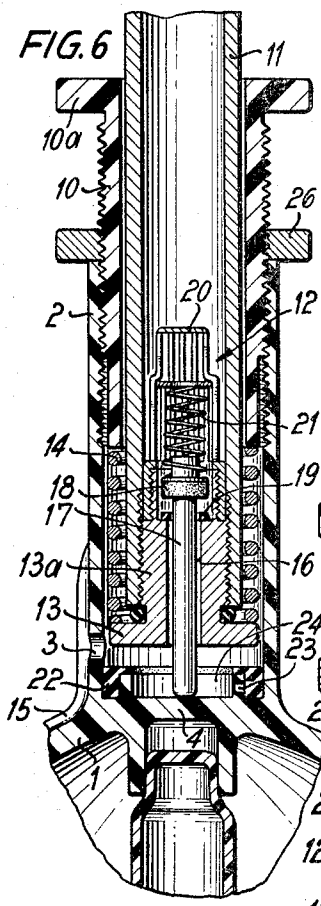



FIG. 7

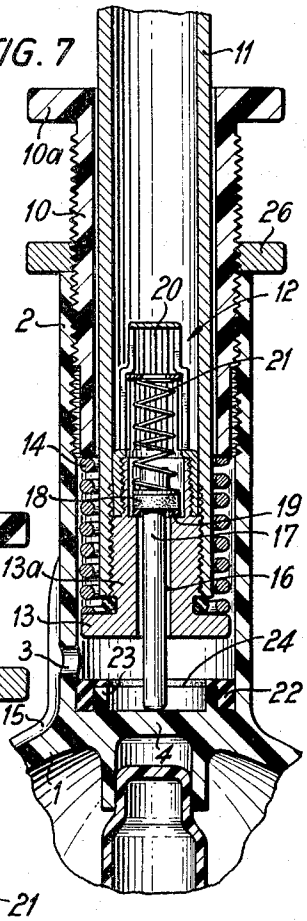
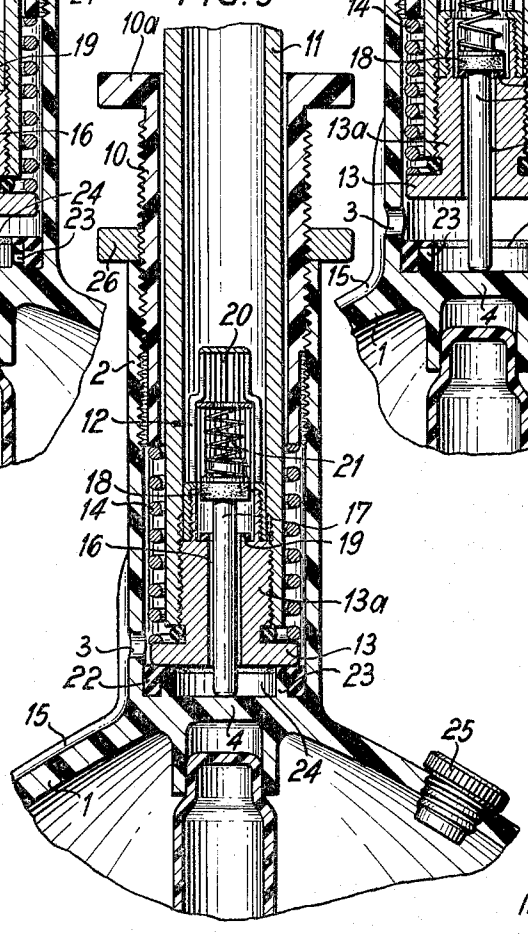



FIG. 5




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# POULTRY WATERING TROUGH WITH A FREELY SUSPENDED DRINKING VESSEL AND AN AUTOMATIC FILLING VALVE

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4 Claims. (Cl. 119—81)

The improvement relates to a poultry trough with a freely suspended bell-shaped watering vessel, the lower edge of which forms a peripheral watering trough and which is connected with a water supply and may be shut off by means of an independent filling valve. Heretofore the type of poultry watering troughs was best known in which the filling valve always remained under the weight load of a freely hanging drinking vessel. For this type of poultry watering troughs there are already known filling valves which are automatically maintained in closed position during the normal filling of the surrounding drinking gutter and which open when the fluid is removed from the drinking gutter and are closed again by an adjustable weight load extending through the drinking vessel. The known filling valves require, however, a rather large space and must support the drinking vessel which is suspended directly on the valve stem without a special guide for the vessel. Due to the fluttering about of the poultry the drinking vessel can easily be displaced from its vertical position and the liquid or fluid contained in the drinking trough may more or less spill out. There is also the danger that the valve stem may become jammed in its guide during a swinging movement of the drinking vessel suspended thereon and that the filling valve will then no longer operate in a proper manner.

The purpose of the invention is to overcome the deficiencies which are still associated with poultry watering troughs of the above construction, in a simple and certain manner. A particular object of the invention is to do away with hanging of the drinking vessel directly on a displaceable valve part and to provide a good guide for the vessel in a special carrying member to which the automatic filling valve is secured. To solve this problem, the improvement proposes a construction in which a watertight liquid passage valve is provided in a tube, the lower vertical end of said tube being associated with the water supply and being provided with a housing disposed under the tube member and forming a ring union. According to the improvement there is provided an adjusting bush having a sliding seat on the tube member and which is intermediately adjustable by a strong carrying spring and on which is screwed on a surrounding tubular sleeve having a corresponding clearance. This tubular sleeve, which forms an extension of the bell-shaped drinking vessel, has a closed bottom on which is disposed a sealing ring and above the sealing ring a side water outlet. A valve stem with a disc-shaped head which extends through the liquid passage of the valve housing under the valve seat and the lower ring connection of the housing and which is under the influence of a comparatively weak valve spring, is of such length that it is always disposed on the bottom of the tubular sleeve.

To adjust the drinking vessel, it is only necessary to screw in the adjusting bush into the tubular sleeve of the empty vessel, which is not yet suspended on the stationary support, to such an extent that the ring connection of the valve housing will be disposed on the sealing ring in a watertight manner on the bottom of the sealing ring mounted on the bottom of the tubular sleeve. In this position of the tubular sleeve, the bottom thereof supports the valve to such an extent that the plate-shaped stem head is no longer disposed on the valve seat. As a result, a free passage is available for the drinking liquid from the tubular member to the space between the ring connection of the valve housing and the tubular sleeve bottom, while the further passage from this space to the side water outlet of the tubular sleeve is not blocked, because the ring union of the valve housing is disposed in a watertight manner on the above mentioned sealing ring.



Should the tubular piece of the poultry watering trough according to the invention be suspended on a stationary support by means of a detachable and longitudinally adjustable carrying member, the weight of the drinking vessel itself will correspondingly press together the carrying spring surrounding the tubular piece by means of the positioning bush. The bottom of the tubular sleeve as well as the sealing ring disposed thereon moves down, whereby the space between the ring connection of the valve housing and the bottom of the tubular sleeve is brought into open connection with the side liquid outlet of the tubular sleeve. Thus the water will flow over the above described passage sideways, out of the tubular member to a tubular piece connected with a stationary water supply and will advantageously reach a vertical guide channel above the bell-shaped part of the drinking vessel and the drinking trough which surrounds the vessel. The more the drinking trough is filled with water, the greater will become the weight of the drinking vessel and the more will the carrying spring be compressed. The bottom of the tubular sleeve is thereby progressively spaced from the valve housing and the valve stem which is under the influence of the water spring moves correspondingly down, the disc-shaped stem head is emplaced on the valve seat and closes the access channel of the valve.

Water can no longer reach the drinking trough in the closed position of the filling valve and the level of the liquid in the trough is constantly decreased by the drinking poultry, until the pressure force of the carrying spring overcomes the decreasing weight of the drinking vessel and lifts this vessel again. The bottom of the tubular sleeve, which rises at the same time, presses the valve stem upward so that the filling valve is again automatically opened. The automatic opening and closing movement of the filling valve is constantly repeated according to the water level in the drinking trough.

Further details of the improvement will become apparent from the following described embodiment of a poultry watering trough with an automatic filling valve and the accompanying drawings.

In the drawings:

FIG. 1 is a vertical cross-section through the drinking vessel and the filling valve;

FIGS. 2, 3 and 4 illustrate details of the drinking vessel in partial section and on an increased scale;

FIGS. 5 to 7 similar to FIG. 1 show the upper part of the drinking vessel in different position of the filling valve.

A drinking vessel **1** which comprises an unusual bell-shaped part **1***a* extends upwardly to a tubular sleeve **2** with a side water outlet **3** and a closed sleeve bottom **4**. The lower edge of the vessel forms two concentric open troughs **5** and **6** separated from one another by a ring-shaped intermediate wall **7** and which are associated with one another by an overflow **8** provided in the wall **7**.

Each of the troughs **5** and **6** of the drinking vessel **1** is of such small dimensions, that grown chickens must turn their heads sideways when drinking out of these troughs. At the same time the chickens' throats dispose themselves on the rolling widened rim **9** of the outer trough **5** or on the intermediate wall **7** and no longer reach into the water contained in the vessel **1**. Since their throats remain dry, the chickens can not spray the bottom of the ring of the vessel by the water dripping from the throats. The small width of the troughs **5** and

6 also prevents young chickens being caught in the troughs and drowned in the drinking water.

An adjusting bush 10 is screwed into the upper part of tubular sleeve 2, which is provided with an inner thread, said bush surrounding the vertical lower portion of the tubular piece 11 with a sliding seat. A valve 12 is built in, in a fluid-tight manner into the lower end of the tubular piece 11, while the valve housing extends downwardly from the tubular piece 11 and carries a shoulder 13. A strong carrying spring 14, surrounding the tubular piece 11, rests on the shoulder 13 and the adjusting bush 10 is supported thereon.

The tubular piece 11 may be connected at its upper end 11*a* by means of a tube (not shown) to a stationary water conduit and may be hung on a stationary support by means of a detachable and longitudinally adjustable carrying member (not shown), for example on a carrying shell of the above water conduit. To clean and maintain the poultry watering trough it is only necessary to separate the tubular piece 11 from the water connection and remove its carrying member from the stationary support. It is then possible to place the poultry watering trough in its entirety in any desired position, where it may be cleaned and disassembled into individual parts. To permit the water to escape from the outlet 3 of the tubular sleeve when the filling valve is open, there is provided a guide in the form of a vertical gutter 15 at the bell part 1*a* of the watering trough 1. This gutter reaching from the water outlet 3 to the interior trough 6, prevents a spraying of the water in all directions during the automatic filling of the drinking trough. In addition, the bell-shaped part of the drinking vessel 1 remains fully dry outside of the guide trough 15 for the drinking fluid.

The housing of the filling valve 12 has a cylindrical part 13*a* above its shoulder 13 and can be screwed in by means of cylindrical part 13*a* into the lower end of the tubular piece 11, and it thus is also provided interiorly of its parts 13 and 13*a* with a vertical liquid passage channel 16. A valve stem 17 is guided with clearance in the channel 16, the valve's disc head 18 being disposed on the valve seat when the stem 17 is in its lower position, said valve seat being formed by a circular flange 19, mounted at the upper edge of the housing part 13*a*. Cage 20, which is screwed on the housing part 13*a*, holds a valve spring 21 which is weak in comparison with the carrying spring 14, and acts from above on the top 18 of the valve stem.

As previously mentioned, the valve stem 17 which is under the influence of the valve spring 21, is constantly disposed on the closed bottom 4 of the drinking vessel. A sealing ring 22 rests on the bottom of the sleeve 4, which is held in its position by the collar 23 of the bottom 4.

As long as the adjustable bush 10, supported on the carrying spring 14, is not yet loaded by the weight of the drinking vessel 1, therefore, before the tubular piece 11 is suspended on its stationary support, the adjustable bush 10 may be screwed conveniently into the tubular sleeve 2 to such an extent that the movable part of the drinking vessel will assume the position shown in FIG. 5. As a result, the incoming water which arrives into the tubular piece 11 from above, can reach through the valve basket 20 and the passage channel 16 into the space 24 between the ring union 13 of the valve housing and the tubular sleeve bottom 4; but not, however, from the space 24 to the side outlet 3 of the tubular sleeve 2. This is only possible, when after the suspension of the tubular piece 11 on the stationary support, the carrying spring 14 is correspondingly pressed together by the weight of the drinking vessel 1. The vessel 1, including its tubular sleeve 2 and the sleeve bottom 4 as well as the valve 17, then moves into the position shown in FIG. 6. Thus the space 24 is, as previously, in communication with the interior of the tubular piece 11 above the valve 12, now however, with the outlet 3 of the tubular sleeve 2.

Now with the valve 12 open, the water arriving into the tubular piece 11 and the outlet 3 can reach into the channel 6 of the vessel through the guide groove 15 and into the outer channels 5 through the overflow 8, into the outer channel 5. When the channel 5 is filled with water to a certain level, the carrying spring 14 will have been compressed, as shown in FIG. 7. At the same time tubular sleeve 2, i.e. its bottom 4 and the valve stem 17 which is supported thereon, will move downward to such an extent, that the disc-shaped stem head 18 will be seated on the valve seat 19 in a sealing manner and the supply of water to the liquid pasage 16 of the valve 12 will be blocked. The filling valve 12 is thus closed again when the displaceable part is in an entirely different position, as shown in FIG. 5, and is only opened when, due to the removal of water from the channel 5, the entire weight of the vessel 1 and the load on the carrying spring 14 is reduced to such an extent that the movable parts again reach the position shown in FIG. 6.

With the exception of the springs 14 and 21, which may advantageously be of rustproof metal or covered with a rustproof protecting substance, all other parts of the poultry drinking trough may be made of synthetic material. In such a case, in order to attain the necessary dead weight of the drinking vessel 1 itself, an insert 1*b* is advantageously provided in this vessel, which may be filled to a required level with a liquid or with fine-grain solid particles through a filing screw secured in the bell-shaped vessel part 1*a*, (FIGS. 1 and 5). The locknut 26 for the ring union 10*a* of the adjustable bush 10, which is shown in the drawing on the upper end of the tubular sleeve as being rigidly secured, can be dispensed without affecting the operation of the invention.

The automatic closing of valve 12 in the position shown in FIG. 5 is especially important. It takes place when the drinking vessel 1 is raised by an animal slipping under it, or when this is done manually, when it is desired to clean the vessel where the water can not flow, thus preventing an overflow of the trough. Obviously, the valve 12 may be reset in such a manner that it is in closed position, according to FIG. 7, after the automatic filling of the channel 6 with water, without filling the outer channel 5. Flooding with water when the drinking vessel 1 is tilted by a flying chicken or when it is being cleaned is only possible from the outer channel. The interior of the stall is thus kept dry.

The pollution of the water reaching the channels 5, 6, is prevented by providing a retarding valve cage 20 provided with a filter screen.

Furthermore, the water reaches the channels only through the narrow vertical groove 15 and not over the entire upper surface of the bell-shaped vessel part 1*a* on which a large amount of dust usually settles in the stall.

I claim:

1. In a poultry watering device of the type having a freely suspended drinking vessel, a vertically disposed tubular member, the upper end of which is adapted to be secured to a water supply, a valve housing secured in the lower end of said tubular member, said housing having a passage channel extending axially of said tubular member and a circular flange extending outwardly of the lower end of said tubular member, a bush slidably mounted on said tubular member, a bell-shaped drinking vessel formed with an upwardly extending sleeve and having an open portion in threaded engagement with said bush, the lower portion of said sleeve being laterally spaced from said tubular member, a spring in said space for biasing said bush away from said flange, said sleeve having a closed bottom and a side outlet adapted to communicate with said channel, a cage mounted on the top of said valve housing, a valve element having a stem displaceable vertically in said passage channel and in contact with said closed sleeve bottom and a disc head, for closing said channel, the diameter of said stem being smaller than that of said passage channel and a spring in said cage for biasing said disc head against said passage channel, said drinking vessel having a bottom edge portion formed as trough means.

2. In a poultry watering device according to claim **1**, said bell-shaped drinking vessel trough means comprising a pair of concentric open troughs, an inner trough and an outer trough and an overflow wall intermediate said troughs.

3. In a poultry watering device according to claim **2**, wherein there is further provided a gutter extending from said side outlet along the outer surface of said drinking vessel into the inner trough of said concentric troughs.

4. In a poultry watering device according to claim **2**, said drinking vessel being further provided with a container insert for receiving liquid or fine-grain solid substance for weighing down said vessel, and an opening in said vessel wall for filling said container with such substance.



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