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G. S. WHITE

FLUSH VALVE FOR MILK AGITATING TANKS

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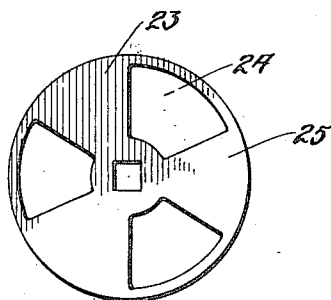
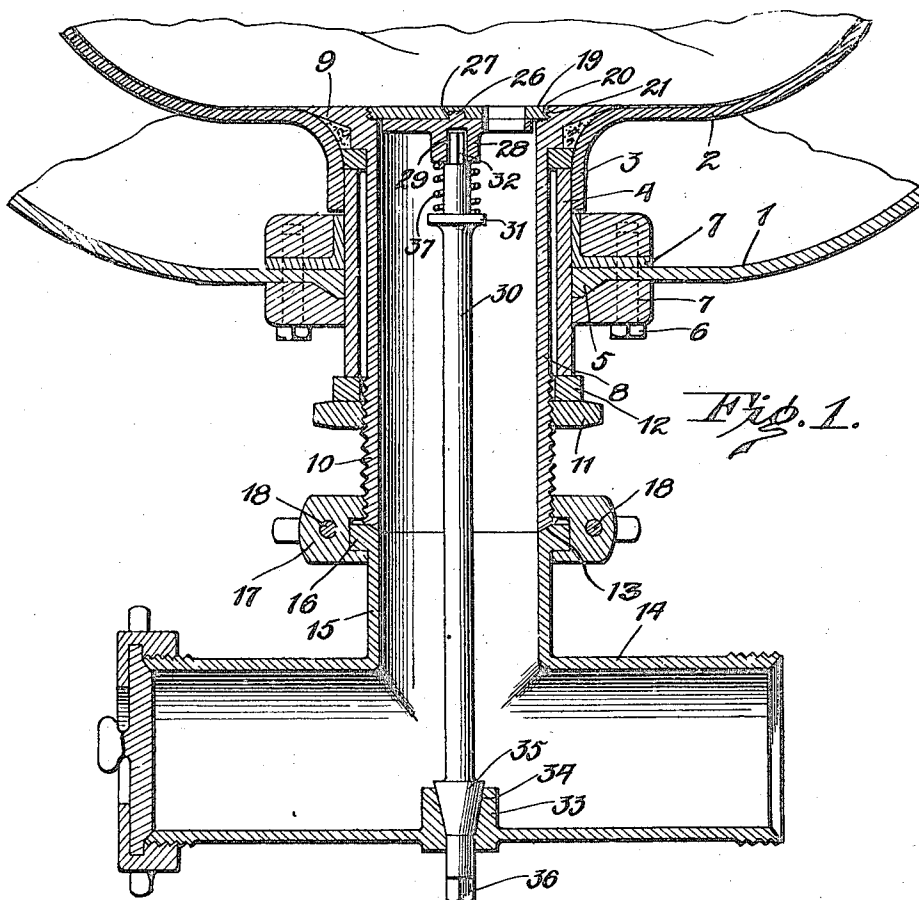


Fig. 2.

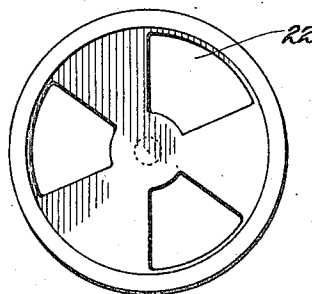


Fig. 3.

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FLUSH VALVE FOR MILK-AGITATING TANKS.

Application filed September 9, 1921. Serial No. 499,503.

To all whom it may concern:

Be it known that GEORGE S. WHITE, a citizen of the United States, residing at Washington, D. C., has invented certain new and useful Improvements in Flush Valves for Milk-Agitating Tanks, of which the following is a specification.

This invention relates to an improvement in sanitary discharge valves, designed particularly for use in connection with material treating tanks, such for example, as used in connection with dairy products.

In material treating tanks, it is important that the valve when closed completely cut off the tank from outside influences, in order that no portion of the material can possibly remain beyond the influence of the treating agent, as under such circumstances, the material so remaining beyond the influence of the treating agent will eventually so change its condition thru atmospheric influence as to deleteriously affect that portion of the material within the tank. Furthermore, it is essential in valves of this type that packing within the possible reach of the material in the tank be entirely eliminated, as otherwise such packing would tend to gradually absorb a portion of the material, and this absorbed portion would be changed and so eventually affect the material of the tank passing over it.

It is therefore important in material treating tanks, and the present invention is primarily directed to providing a discharge valve absolutely packless, which will cut off the material at the immediate outlet from the tank, and hence prevent possibility of material accumulation beyond the valve or in the packing to deleteriously affect the material in the tank.

It is further an important detail of the present type of valve that it be self-grinding, in order that an absolutely active valve action be had under all conditions of use and reuse.

The invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a broken side elevation showing the particular type of material treating tank and illustrating particularly the improved packless discharge self-grinding valve in connection therewith.

Fig. 2 is a plan of the valve.

Fig. 3 is a plan of the valve abutment.

The improved self-grinding discharge valve is here shown in connection with a particular form of material treating tank, in which the tank walls 1 and 2 are provided with an outlet 3, the inner wall 1 being turned down at said outlet and having welded thereto a sleeve extension 4 between which and the opening in the outer wall 1 is interposed a packing ring 5. Bolts 6 pass thru the wall 1 adjacent the opening 3, extending thru and being threaded in annular rings 7 on opposite sides of the wall 1, the innermost ring being secured to the sleeve extension 4.

The outlet proper from the tank consists of a cylindrical member 8, the upper end of which has a lateral annular extension 9 to rest upon the curved portion of the outlet opening of the inner wall, so that the extreme upper surface of the outlet member 8 is flush with the lining, usually glass or porcelain and not shown, on the inner side of the inner wall 2. This outlet member 8 is exteriorly threaded at 10, and a ring 11 cooperates with said threaded portion and bears against a packing 12 underlying the sleeve extension 4, whereby the outlet member 8 may be drawn into desirable contact with the inner surface of the tank. Of course this cooperation of the outlet member and inner surface of the tank may be secured in any desired manner, so long as said outlet member is effectively sealed in the outlet opening of the tank to prevent possible leakage or passage of material or of the treating agent between said outlet member and the walls of the tank. The lower end of the outlet member has a downwardly and inwardly inclined edge 13, and the usual T-shape discharge 14 has its upright section 15 reversely formed on the upper edge to cooperate with said edge 13. The upright portion 15 has an annular projection 16 to rotatably receive a locking ring 17, preferably made in two parts and connected by screws 18, the upper portion of this ring cooperating with the threads 10 on the outlet member 8, whereby the discharge 14 may be connected to the outlet member in an absolutely non-leaking manner.

The improved valve with which the present invention is more particularly concerned, comprises a valve abutment 19 threaded at 20 into a recess 21 in the upper edge 9 of the outlet member. This abut-

ment is formed with a series of openings 22 to permit the passage of material thru said abutment. The valve proper comprises a plate 23 having a diameter approximating the interior diameter of the outlet member 8, this plate being formed with openings 24 and solid portions 25 adapted in proper positions of the valve to provide passages for the flow of material or cut off said flow. The valve proper has an upstanding projection 26 seating in a recess 27 in the valve abutment and providing a centering for the rotative movement of the valve. An operating extension 28 depends from the lower side of the valve and is formed with a non-circular opening 29 arranged axially of the valve.

The operating valve stem 30 is formed near the upper end with an annular shoulder 31 above which the stem is projected in normal size and finally the terminal projection 32 of the valve is formed in correspondence with the sectional shape of the opening 29 and to slidably fit therein. This connection provides for a rotative movement of the valve proper in every similar movement of the valve stem. The stem extends vertically thru a bearing enlargement 33 in the lower wall of the discharge member 14, this bearing enlargement being formed to provide a conical valve seat 34. The stem is formed with a conical enlargement 35 accurately cooperating with the seat 34. Beyond the discharge member, the valve stem is formed at 36 for the reception of a suitable handle, whereby the valve may be operated.

A spring 37 of appropriate tension is coiled about the valve stem bearing between the seat 31 and the lower end of the operating extension 28 of the valve proper. Obviously, this spring operates to force the valve into close grinding contact with the abutment 19 and at the same time force the valve stem downwardly, so that its conical enlargement 35 is in grinding contact with the seat 34 in the bearing 33.

It will be apparent from the above description that the valve is self-grinding, owing to its pressure against the valve abutment in each turning movement, incident to the force of the spring 37 and also that the valve enlargement 35 cooperates in a self-grinding manner with the seat 34.

In use, the valve effectively cuts off the flow of material directly at the source of such flow into the outlet, and hence there can be no accumulation of material either in the outlet 8 or discharge 14, which is beyond the effect of the treating agent, and hence liable to such deterioration as will deleteriously affect the material in the tank. Furthermore, neither in the valve nor in the support and bearing for the stem is there necessity for packing of any character what-

soever, and hence the liability of the disadvantages result from the use of such packing as hereinbefore mentioned is entirely avoided.

The valve proper is rotative in its action and necessarily would tend to a shearing of any foreign substances caught in the closing of the valve. Thus, the valve would close by cutting away these obstructions, and this is a material advantage over discharge valves operating vertically, as in the latter case an obstruction caught by the valve when closed would necessarily tend to prevent a proper closing of the valve.

The improved valve presents a further advantage in the ease in which it may be assembled or disassembled in connection with the tank. With the present structure, proper operation of the lock ring 17 permits separation of the discharge member 14 from the outlet 8, whereupon the valve stem and valve are readily drawn from operative position, while the abutment 19 may be readily removed by the usual threading operation. If desired, the valve may be removed by simply removing the threading member 19, whereupon the valve and valve stem may be drawn upwardly thru the tank outlet opening.

Claims:

1. The combination with a cylindrical tank, of an abutment removably secured in the tank flush with the surface thereof, a material conveyer leading from the tank beyond the abutment, a plate valve mounted for rotary movement with respect to the abutment and controlling openings in said abutment, a stem connected to said valve to permit free axial movement of the valve, said valve stem extending longitudinally of said conveyer, a self-grinding mounting for the stem arranged in said conveyer remote from the valve, and a spring bearing between said stem and valve to compel a self-grinding action of the valve on the abutment and of the stem in its mounting during operation of the valve.

2. A self-grinding discharge valve for material treating tanks, comprising an abutment formed with openings and removably connected with the tank flush with the inner surface thereof, a valve underlying the abutment and formed to control the openings therein, an outlet leading from the tank into which the material is directed past the valve, a valve stem extending longitudinally of said outlet and having a remote bearing therein, said bearing comprising a conical valve seat and a cooperating conical projection on the stem to provide a self-grinding bearing, and a spring carried by the stem to force the valve into grinding cooperation with the abutment and simultaneously force the stem into grinding cooperation in its bearing.

3. In combination with a material receiving tank having an exterior wall to provide a space for a treating agent about the tank, of an outlet member communicating
5 with the tank proper and passing thru the outer wall, said outlet member being sealed against the space between the walls, a discharge member removably connected with the outlet member, and a discharge valve
10 controlling the tank end of the outlet member, said valve comprising an abutment removably secured in the outlet member flush
with the interior surface of the tank, a valve engaging said abutment, a valve stem for operating the valve and having free slid- 15
ing connection therewith, said valve passing thru the discharge member and having a packless self-grinding mounting therein, and a spring for exerting endwise pressure on the stem and forcing the valve into self- 20
grinding connection with the abutment.

In testimony whereof I affix my signature.

GEORGE S. WHITE.