W. M. FOWLER.

DISPENSING NOZZLE FOR BOTTLING MACHINES.

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1,376,088.

Patented Apr. 26, 1921.

Fig. 1.

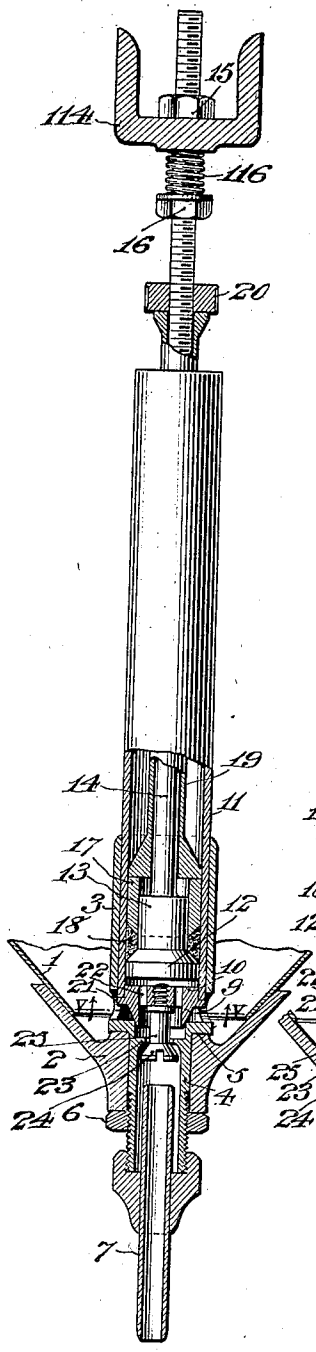

Fig. 2.

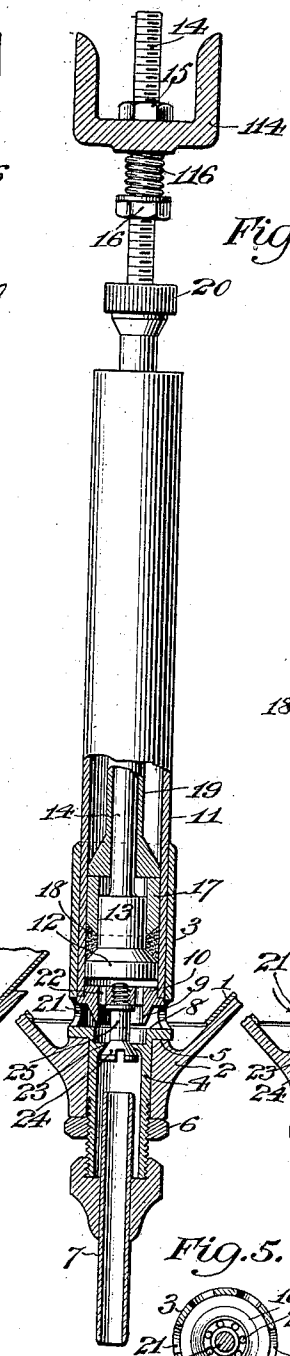

Fig. 3.

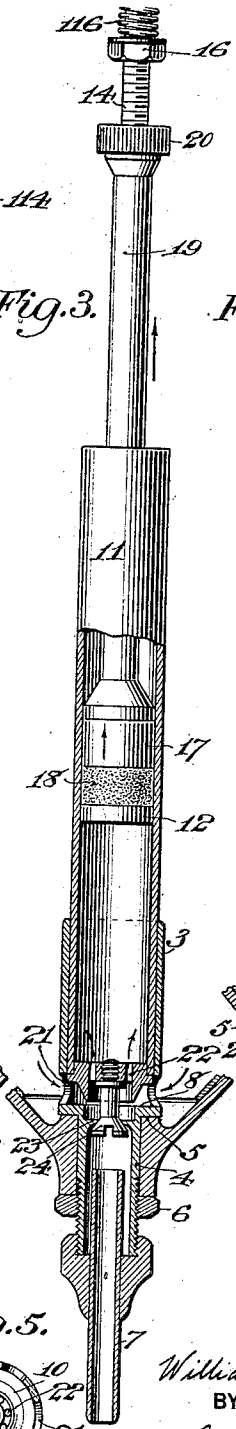

Fig. 4.

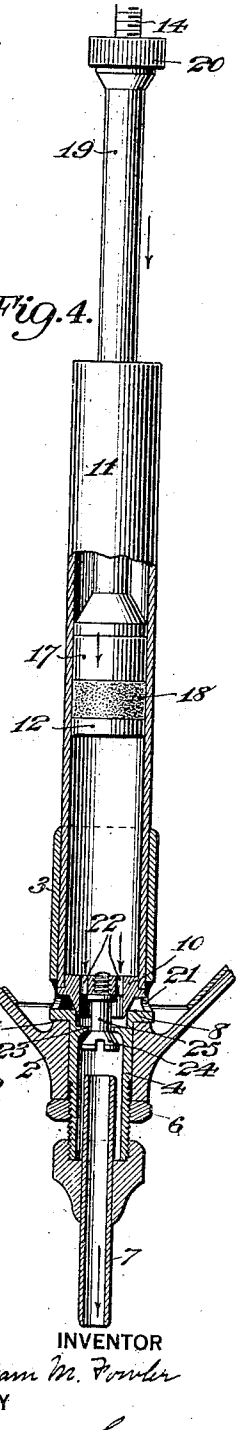

Fig. 5.

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DISPENSING-NOZZLE FOR BOTTLING-MACHINES.

1,376,088. Specification of Letters Patent. Patented Apr. 26, 1921.

Application filed June 23, 1920. Serial No. 391,115.

To all whom it may concern:

Be it known that I, WILLIAM M. FOWLER, a citizen of the United States, and a resident of Sound Beach, in the county of Fairfield, in the State of Connecticut, have invented a new and use Improvement in Dispensing-Nozzles for Bottling-Machines, of which the following is a specification.

The object of my invention is to provide a dispensing nozzle of novel construction rendering it applicable for use in connection with machines for filling receptacles with a measured quantity of the substance being supplied, said nozzle being particularly useful in connection with machines for dispensing viscous fluids such as jellies, salves, jams, pastes, cold creams, etc.

A practical embodiment of my invention is represented in the accompanying drawing, in which,

Figure 1 represents the dispensing nozzle partly in side elevation and partly in longitudinal central section, the movable parts being at the limits of their downward movement.

Fig. 2 represents a similar view with the parts shown in the positions they assume when the two valves and barrel are at the limits of their upward movement.

Fig. 3 represents a similar view with the plunger moved upwardly away from the main valve to draw in a measured supply into the barrel.

Fig. 4 represents a similar view immediately after the start of the downward movement of the plunger showing the valves at the limits of their downward movement.

Fig. 5 represents a cross section taken in the plane of the line V—V of Fig. 1, looking in the direction of the arrows.

The bottom of the magazine is denoted by 1, which bottom terminates in a hollow fitting 2, which forms a rigid support for the dispensing nozzle.

A hollow cylindrical casing 3 is provided with a hollow cylindrical screw-threaded shank 4, having between them an exterior annular shoulder 5 which rests upon the fitting 2. The nut 6 on said shank serves to clamp the casing rigidly to the fitting 2. The nozzle tip 7 is screw-threaded onto the lower end of the shank 4 of the casing.

An annular shoulder 8 is formed at the upper end of the hollow shank 4, which shoulder forms a seat for receiving the tapered end 9 of the main valve 10, which valve is secured to the lower end of a cylindrical barrel 11 slidably fitted within the hollow casing 3.

The plunger which is slidable in the barrel 11 comprises a head 12 which loosely fits within the barrel, a reduced portion 13 and the plunger rod 14. This plunger rod extends upwardly beyond the top of the barrel 11 through the cross head 114 of the filling machine. The upper portion of this plunger rod 14 is screw-threaded and the rod is adjustably secured to the cross head 114 by nuts 15, 16.

A coil spring 116 is interposed between the cross head 114 and the nut 16 to provide a yielding connection between the cross head and the rod 14.

I provide for an adjustable frictional engagement between the plunger and the barrel as follows:

A collars 17 slidably fits on the reduced portion 13 of the plunger and a packing 18 is located between the lower end of this collar 17 and the head 12 of the plunger. The lower end of the collar 17 is preferably tapered as shown and the shoulder between the head 12 and reduced portion 13 of the plunger is preferably tapered as shown so that the movement of the collar 17 toward the head 12 will tend to crowd the packing 18 outwardly against the inner wall of the barrel 11. A sleeve 19 surrounds the plunger rod 14 and rests on the upper end of the collar 17. This sleeve projects upwardly beyond the upper end of the barrel 11 and is there engaged by an adjusting nut 20 threaded onto the rod 14. By screwing this nut 20 downwardly, the sleeve 19 will move the collar 17 downwardly to compress to a greater or lesser degree, the packing 18, and thereby adjust the frictional engagement between the plunger and barrel.

Open communication is established between the bottom of the casing 3 and the interior of the magazine 1 by providing one or more holes 21 at the base of the casing. Open communication from the space below the main valve 10 to the space within the barrel 11 below the plunger is established through one or more holes 22. In the present instance, there is an annular series of these holes 22.

An interior annular rib 23 located within the hollow shank 4 forms a seat for the auxiliary valve 24, the shank 25 of which is rigidly secured to the main valve 10, as

for instance, by screwing the said shank centrally into the said main valve.

It will be seen that the main valve controls the admission of the fluid and that the auxiliary valve controls the discharge of the fluid, and that, when the main valve is closed the auxiliary valve is opened, and when the auxiliary valve is closed, the main valve is opened. It will also be seen that the upward movement of the main valve and barrel is limited by the closing of the auxiliary valve onto its seat and that the downward movement of the main valve and barrel is limited by the closing of the main valve onto its seat.

In operation, as the plunger starts on its upward movement it will, because of its frictional engagement with the barrel 11, lift the barrel, the main valve and the auxiliary valve to open the main valve and close the auxiliary valve. The closing of the auxiliary valve will stop the further upward movement of the barrel, the main valve and the auxiliary valve. The further upward movement of the plunger will then draw the predetermined amount of fluid from the magazine through the main valve into the space within the barrel below the plunger head. After the plunger has been raised to draw in the predetermined amount of fluid, its downward movement will commence. The first part of its downward movement will cause the barrel to move downwardly to close the main valve and open the auxiliary valve, thus opening communication between the space within the barrel below the plunger head to the outlet past the auxiliary valve, communication from the magazine at the same time being cut off by the closure of the main valve. The further downward movement of the plunger will serve to discharge the fluid into the receptacle. This completes one cycle of operations of the nozzle.

While this nozzle is particularly intended for use in dispensing viscous materials, it is to be understood that it may be used for dispensing either thick or thin fluids with equal facility.

It is evident that various changes may be made in the construction, form and arrangement of the several parts of the nozzle without departing from the spirit and scope of my invention; hence I do not wish to limit myself to the particular embodiment herein shown, but,

What I claim is:—

1. A dispensing nozzle including a casing having an inlet and an outlet, a barrel slidable in said casing, stops carried by the barrel for limiting its downward and upward movements, a reciprocating plunger within the barrel and a frictional connection between the plunger and barrel whereby the plunger is first movable with and then along the barrel in both directions to control the admission and discharge of the fluid.

2. A dispensing nozzle including a casing having an inlet and an outlet, a barrel slidable in said casing, stops carried by the barrel for limiting its downward and upward movements, a reciprocating plunger within the barrel and an adjustable frictional connection between the plunger and barrel whereby the plunger is first movable with and then along the barrel in both directions to control the admission and discharge of the fluid.

3. A dispensing nozzle including a casing having an inlet and an outlet and two valve seats located therebetween, a barrel slidable in the casing and carrying two valves alternately engaging said valve seats to limit the downward and upward movements of the barrel, a reciprocating plunger within the barrel, and a frictional connection between the plunger and barrel whereby the plunger is movable with and then along the barrel in both directions to control the admission and discharge of the fluid.

4. A dispensing nozzle including a casing having an inlet and an outlet and two valve seats located therebetween, a barrel slidable in the casing and carrying two valves alternately engaging said valve seats to limit the downward and upward movements of the barrel, a reciprocating plunger within the barrel, and an adjustable frictional connection between the plunger and barrel whereby the plunger is first movable with and then along the barrel in both directions to control the admission and discharge of the fluid.

5. A dispensing nozzle including a casing having an inlet and an outlet and two valve seats, one at the upper end of the outlet and the other in the outlet at a distance below the upper end, a barrel slidable in the casing, said barrel carrying a main valve for opening and closing the outlet at the first named seat and an auxiliary valve for opening and closing the outlet at the second named seat, said valves serving to limit the downward and upward movements of the barrel, a reciprocating plunger within the barrel, and a frictional connection between the plunger and barrel whereby the plunger is first movable with and then along the barrel in both directions to control the admission and discharge of the fluid.

6. A dispensing nozzle including a casing having an inlet and an outlet and two valve seats, one at the upper end of the outlet and the other in the outlet at a distance below the upper end, a barrel slidable in the casing, said barrel carrying a main valve for opening and closing the outlet at the first named seat and an auxiliary valve for opening and closing the outlet

at the second named seat, said valves serving to limit the downward and upward movements in the barrel, a reciprocating plunger within the barrel, and an adjustable frictional connection between the plunger and barrel whereby the plunger is first movable with and then along the barrel in both directions to control the admission and discharge of the fluid.

7. A dispensing nozzle including a casing having an inlet and an outlet and two valve seats located therebetween, a barrel slidable in the casing, a main valve secured to the lower end of the barrel, an auxiliary valve secured to said main valve, the main valve having a passage-way therethrough into the barrel, said main and auxiliary valves serving to limit the downward and upward movements of the barrel, a reciprocating plunger within the barrel, and a frictional connection between the plunger and barrel whereby the plunger is first movable upwardly with and then along the barrel to draw the fluid through the main valve into the barrel and then downwardly with and then along the barrel to close the main valve and discharge the fluid past the opened auxiliary valve.

8. A dispensing nozzle including a casing having an inlet and an outlet and two valve seats located therebetween, a barrel slidable in the casing, a main valve secured to the lower end of the barrel, an auxiliary valve secured to said main valve, the main valve having a passage-way therethrough into the barrel, said main and auxiliary valves serving to limit the downward and upward movements of the barrel, a reciprocating plunger within the barrel, and an adjustable frictional connection between the plunger and barrel whereby the plunger is first movable upwardly with and then along the barrel to draw the fluid through the main valve into the barrel and then downwardly with and then along the barrel to close the main valve and discharge the fluid past the opened auxiliary valve.

9. A dispensing nozzle including a casing having an inlet and a reduced discharge passage, the upper end of the discharge passage forming the main valve seat, said passage having an auxiliary valve seat, said barrel slidable in the casing and carrying a main valve for opening and closing the inlet, and an auxiliary valve carried by the main valve for opening and closing the discharge passage, said valves limiting the movements of the barrel, a reciprocating plunger within the barrel, and a frictional connection between the plunger and barrel whereby the plunger is first movable with and then along the barrel in both directions to control the admission and discharge of the fluid.

10. A dispensing nozzle including a casing having an inlet and a reduced discharge passage, the upper end of the discharge passage forming the main valve seat, said passage having an auxiliary valve seat, a barrel slidable in the casing and carrying a main valve for opening and closing the inlet, an auxiliary valve carried by the main valve for opening and closing the discharge passage, said valves limiting the movements of the barrel, a reciprocating plunger within the barrel, and an adjustable frictional connection between the plunger and barrel whereby the plunger is first movable with and then along the barrel in both directions to control the admission and discharge of the fluid.

In testimony, that I claim the foregoing as my invention, I have signed my name this fifteenth day of June, 1920.

WILLIAM M. FOWLER.