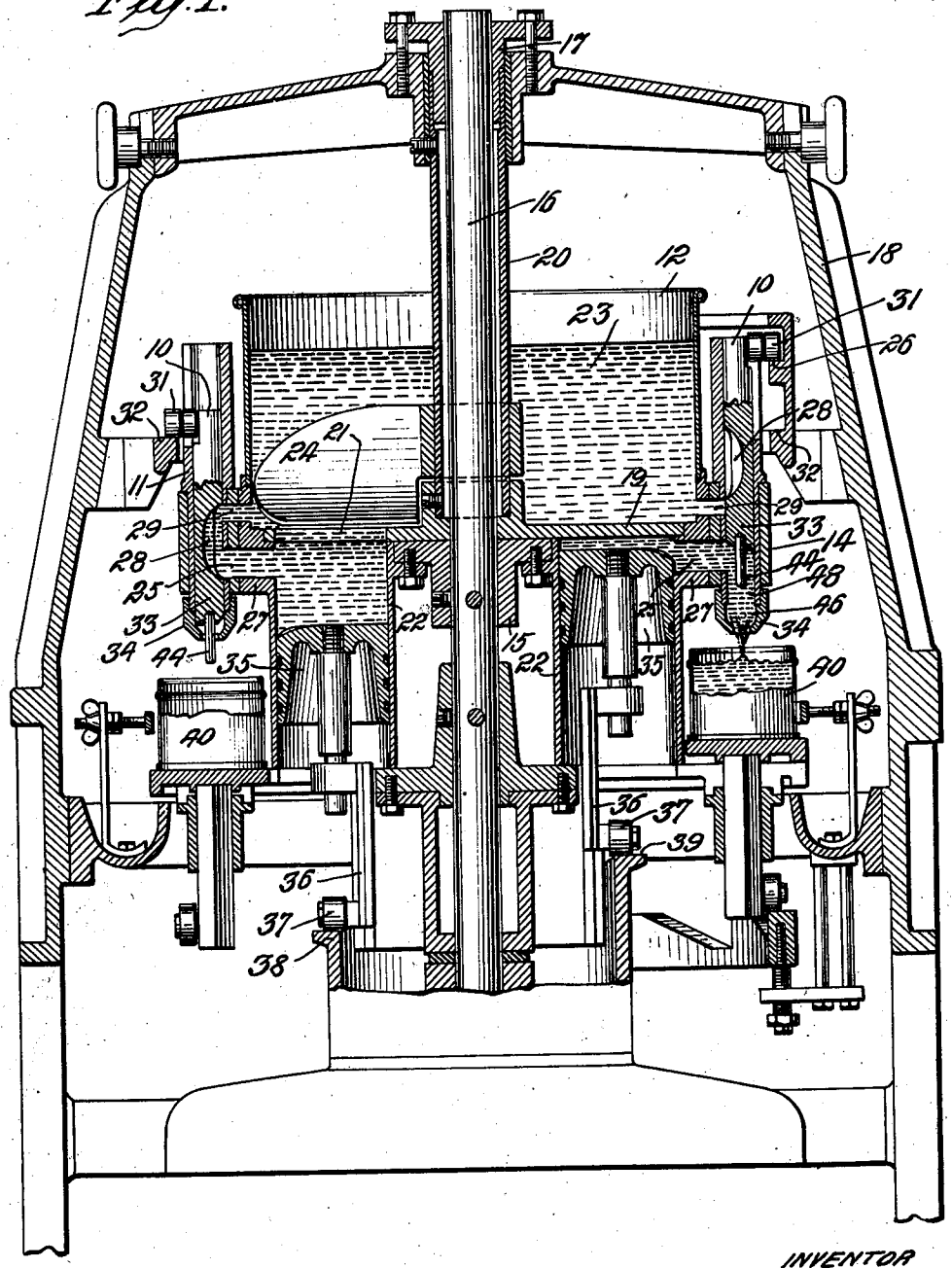
Dec. 27, 1938. E. ROGE 2,141,618

VALVE FOR CAN FILLING MACHINES

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Fig. 1.



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Fig. 2.

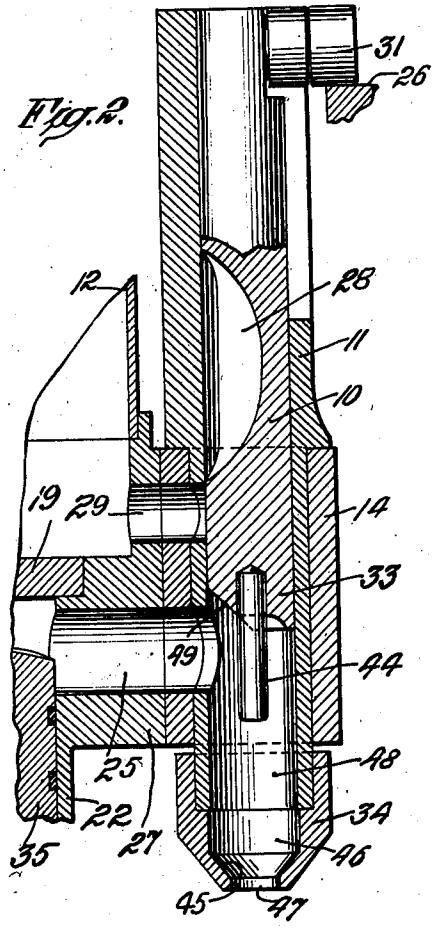


Fig. 3.

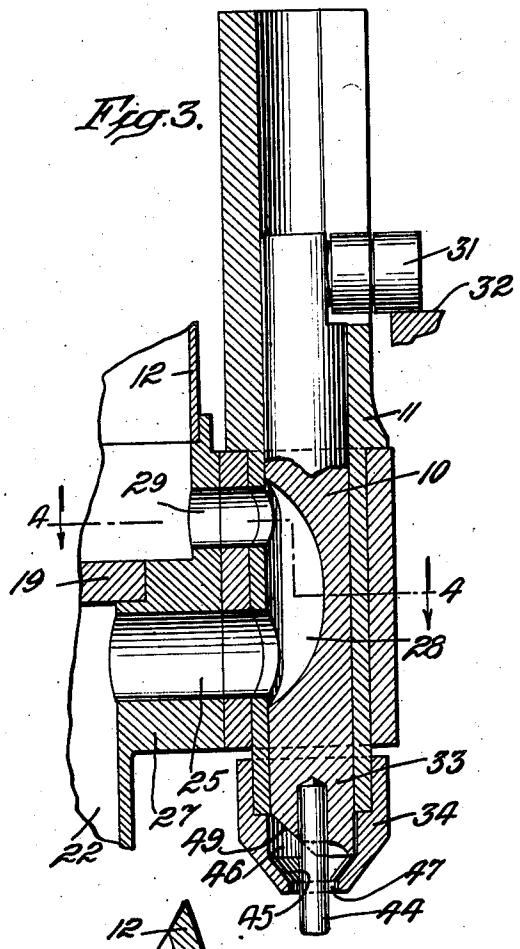
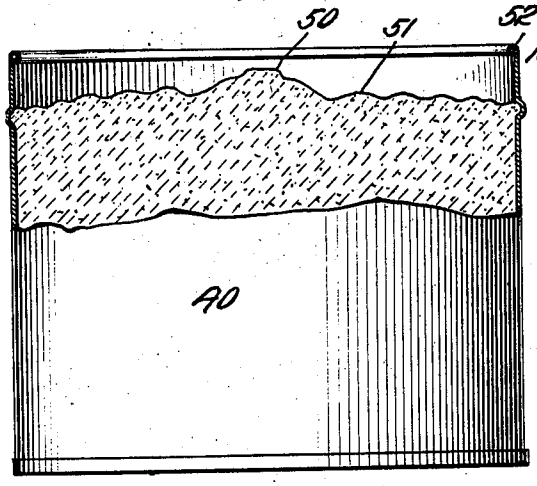


Fig. 5.



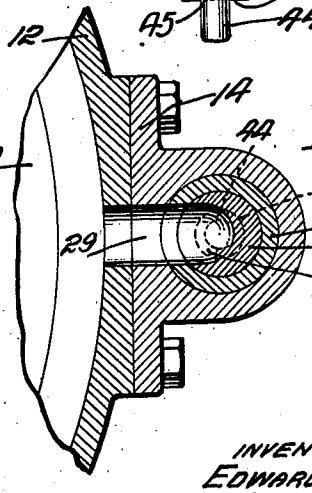


Fig. 4.

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VALVE FOR CAN FILLING MACHINES

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3 Claims. (Cl. 226—126)

The invention relates to an improvement in valves for can filling machines, and more particularly to an improvement in valves for machines especially adapted for filling cans or other receptacles with lard-like material, such as hydrogenated cotton seed oil.

Although the valve of the present invention is adapted for use in connection with automatic machines for introducing or feeding a large variety of materials into cans or other receptacles, it has been especially developed in connection with machines for filling cans with lard-like material, such as hydrogenated cotton seed oil, in order to prevent at the end of the can filling operation a comparatively large drop or mass of material falling onto the top of the material in the can and projecting upwardly beyond the plane passing through the upper rim of the can. This condition prevails in the usual commercial can filling machine, with the result that when cans filled in this way are capped and the covers or caps are afterwards removed therefrom a portion of the material in the cans adheres to the under surface of the cover. To prevent the material from projecting upwardly beyond the rim of the can when the requisite quantity or weight of material has been introduced into the can, it has been proposed to shake the cans during the filling operation. Although the shaking or vibration of the cans during the filling thereof assists in leveling off the upper surface of the material in the cans, it has been found that by using valves as heretofore constructed the final or "tail end" portion of the material fed into the cans is so large that it does not sometimes settle into and be leveled off with the rest of the material, even though the cans are shaken or vibrated during the filling thereof, with the result that in some cans a portion of the material projects upward beyond the rim of the can.

The object of the present invention is to provide can filling machines with a valve of such construction as to cause the last portion of the material fed or introduced into the cans to dwindle down to a comparatively thin tail-like end, which will readily settle into the upper surface of the material in the can, especially if the can is shaken or vibrated during the filling thereof, thereby preventing the formation of a mound of material at the center of the cans projecting upwardly beyond the plane passing through the upper rim of the cans. To this end the invention consists in providing the lower end of the plunger of the valve with a downwardly projecting rod or teat which functions to retain a part of the last portion of the material passing through the nozzle, thereby causing the material which has passed through the nozzle downwardly into the can to taper off into a comparatively thin tail-like end, which although it lies on the top of the middle part of the material in the can is so small as not to project upwardly beyond the rim of the can when the requisite quantity or weight of material has been fed into the can. The invention is more fully described hereinafter and is particularly pointed out in the appended claims.

In the accompanying drawings illustrating the preferred form of the invention, Fig. 1 is a vertical longitudinal section through a can filling machine provided with the improved valve of the present invention; Fig. 2 is a longitudinal section through the improved valve in open position; Fig. 3 is a longitudinal section similar to Fig. 2, but showing the valve in closed position; Fig. 4 is a transverse section taken on the line 4—4 of Fig. 3; and Fig. 5 is a side elevation of a filled can, with the upper portion thereof shown in section to illustrate the comparatively small tail-end portion of the material caused to be fed into the can by the improved valve at the end of the filling operation.

The improved valve, as illustrated in detail in Figs. 2, 3 and 4, comprises a cylindrical body portion 10 slidingly received within the vertically-arranged sleeves or casings 11, each of which is supported on the periphery of the cylindrical material-containing head 12 of the can filling machine by means of a bracket 14. The can filling machine, as illustrated in Fig. 1, may be of any usual construction and mode of operation and comprises in general the material-containing head or receptacle 12 secured by the hub 15 to a vertical shaft 16 journalled at its upper end in the gland 17 supported from the frame 18. The disk-like bottom 19 of the material-containing head is stationary and is fastened at its hub portion to a vertical sleeve 20 which serves as the central wall of the materal-containing head 12. At spaced intervals under the periphery of the head 12 are a series of cylinders 22 corresponding to the valves and connected with the head so as to rotate therewith during the can filling operation. As the head 12 with the material 23 therein rotates the material is forced under a propeller-shaped blade 24 secured to the sleeve 20, and the material is thereby forced through an opening (indicated at 21 in Fig. 1) formed in the disk 19 down into the cylinder 22 then located under the blade 24.

As the head 12 and the parts connected there-

with rotate, the rolls 31, each of which is connected with the upper end of a valve stem 10, travel on an annular cam surface 32 which is so shaped that the lower end 33 of the valve is held in the mouth or nozzle 34 at the lower end of each valve casing 11 during the cylinder-filling operation. If there is a can 40 in the machine corresponding to the cylinder being filled, the cam roll 31 travels up an incline 26 of the cam 32 and the valve is thereby lifted, permitting the piston 35 operating in the cylinder 22 in question to force the material through the nozzle 34 into the can beneath it, as indicated at the right side of Fig. 1. Each piston 35 is provided with a downwardly extending part 36 carrying on its lower end a roll 37 which travels on an annular cam surface 38 of which the high section 39 corresponds to the incline 26 of the cam 32.

If no can is in the machine opposite the cylinder being filled, the cam roll 31 does not rise up on the incline 26 and the lower end 33 of the valve remains in the nozzle. Under this condition, when the roll 37 reaches the rise 39 of the cam 38, and the piston 35 is thereby moved upwardly, the material in the cylinder 22 is forced back into the head 12 through an opening 25 formed in the boss 27 projecting outwardly from the upper part of the cylinder, thence through a slot 28 cut in the inner side of the valve stem 10, and thence through the opening 29 in the wall of the head 12. The parts thus far described are of usual construction and mode of operation.

At nearly the end of the can filling operation, the valve 10 starts to descend, so that by the time the requisite quantity or weight of material has been introduced into the can under the nozzle 34 the lower end 33 of the valve has passed into the nozzle, thereby shutting off the flow of material from the cylinder 22. In order to cause the last portion of material discharged through the nozzle 34 into the can to terminate in a thin, tapering formation, the lower end of the valve 10 is provided with a downwardly-projecting centrally-located cylindrical teat or pin 44. Each nozzle 34, as best indicated in Figs. 2 and 3, has a hollow center 46 which receives the lower end 33 of the valve and a restricted discharge opening 47 through which the material passes. When the valve body 10 is in lowermost position, a space separates its lower end from the upper, shelf-like surface 45 of the lower end of the nozzle, as shown in Fig. 2. When the valve is in open position, as shown at the right in Fig. 1 and in Fig. 2, the teat 44 of the valve is withdrawn into the hollow portion 48 of the valve body about opposite the opening 25 leading from the cylinder 22. In order to eliminate obstruction to the flow of material through the opening 25 from the cylinder 22 into the can the lower end 33 of each valve is cut away or bevelled, as indicated at 49. When almost the requisite quantity or weight of material has been introduced into the can the valve descends and the lower end of the pin 44 passes into the restricted orifice 47 of the nozzle 34, and extends below it, as shown in Fig. 3. The pin is somewhat smaller in diameter than the discharge orifice 47 of the nozzle so as not entirely to block up the passage of the last portion of the material, but is adjusted in size with respect to the orifice 47 and the viscosity of the material discharged therethrough, so that when the requisite quantity of material has been introduced into the can and the valve is closed the last portion of material passing through the orifice adheres to the pin 44. The upper part of the last portion of the material discharging through the orifice 47 rests on the surface 45 of the lower end of the nozzle and thus assists in preventing the lard-like material surrounding and in immediate contact with the cylindrical pin 44 from falling. The tail end of the material discharging through the orifice 47 is thus caused to thin out into a thread-like formation, so that when the material is entirely received in the can the last portion 50 thereof, as indicated in Fig. 5, will not project upwardly beyond the general upper surface 51 of the material, and in any event, will not project up beyond the upper rim 52 of the can.

Having thus described the invention, what I claim as new is:—

1. A valve for filling machines and the like comprising a vertically-arranged valve casing, a nozzle at the lower end of the casing having a restricted orifice at its lower end, a valve body slidably mounted in the casing and having an upper open position and a lower closed position, the lower end of the valve body being spaced from the restricted orifice of the nozzle when the valve body is in closed position, and a member smaller than the orifice extending downwardly from the lower end of the valve body, said member being arranged when the valve body is in closed position to be located in the orifice.

2. A valve for filling machines and the like comprising a vertically-arranged valve casing having an opening in one side for the passage of material therethrough, a nozzle at the lower end of the casing having a restricted orifice, a valve body slidably mounted in the casing and having an upper position uncovering the opening and a lower position shutting off the opening, and a cylindrical pin smaller than the orifice extending downwardly from the lower end of the valve body, said pin being arranged when the valve body is in lower position to project through the orifice to retain a part of the last portion of the material discharged through the orifice.

3. In a machine of the character described including means for holding a supply of lard-like material and means for forcing the material from the holding means, a vertically-arranged cylindrical valve casing having an opening in one side communicating with the supply of material, a nozzle at the lower end of the casing having a restricted orifice, a cylindrical valve body mounted in the casing and having an upper position uncovering the opening and a lower position shutting off the opening, the lower end of said valve body being spaced from the orifice in the nozzle when the valve body is in lower position, and a cylindrical pin smaller than the orifice extending downwardly from the lower end of the valve body and arranged when the valve body is in its lower position to project downwardly beyond the orifice to retain the last part of the material passing through the orifice.

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