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BOTTLE FILLING MACHINE

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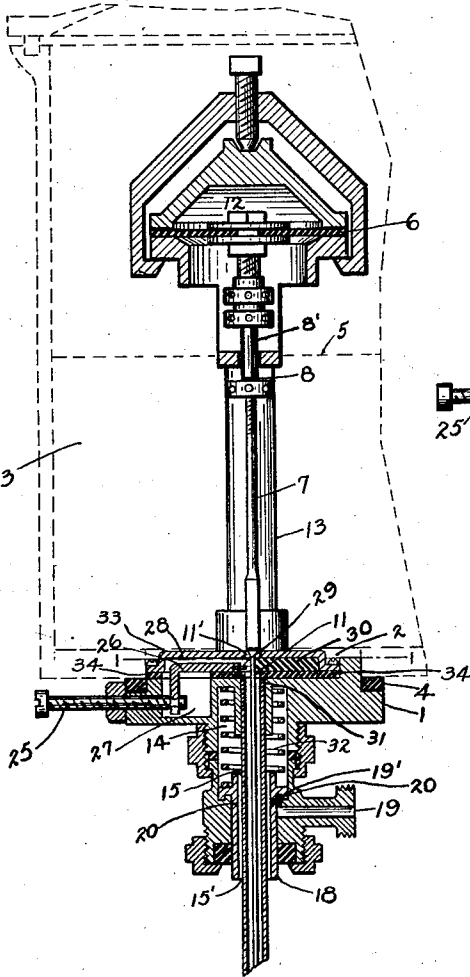


FIG. 1

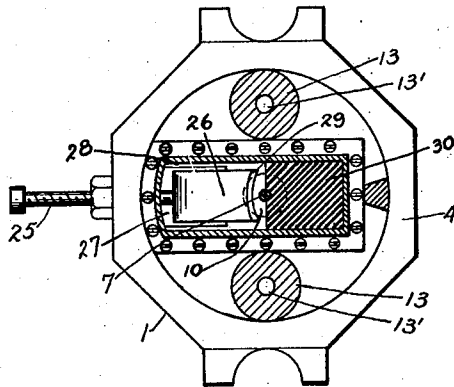


FIG. 3

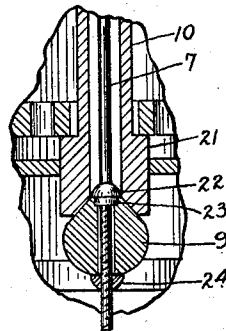


FIG. 2

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BOTTLE FILLING MACHINE

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My invention relates to a mechanism for use in filling bottles with carbonated or charged liquids, its object being to provide such a mechanism as to make repairs and replacements of parts thereof possible without its complete removal from the tank containing the liquid.

My invention is applied to and used in combination with the usual counter-pressure filling mechanism, the principles of which are shown in Patents Nos. 948,463, and 956,867, and Reissue No. 13,197 and comprised in the accompanying drawings, Figure 1.

Figure 1 is a sectional view of the complete counter-pressure mechanism comprising my invention. Figure 2 is an enlarged fragmentary sectional view of the liquid valve showing the features of my invention in detail. Figure 3 is a plan view taken on line 1—1 of Figure 1.

Referring to Figure 1, 1 designates the intermediate body of the filling mechanism, which is secured in an opening 2 in the bottom of the liquid tank 3 by bolts, or other means, the washer or gasket 4 being compressed against said tank around said opening and preventing leakage therefrom, with the vertical member extended upward through said opening 2 into said tank and above the level 5 of the liquid therein, as shown.

Said filling mechanism (excepting for the features of my invention shown in Figure 2 and Figure 3 and hereinafter described) is the usual type of counterpressure bottle filling mechanism, and is explained as follows. The liquid tank 3 is air tight to confine a certain degree of pressure therein, as required, and this pressure acts upon the diaphragm 6 to force it upward and by means of the connecting rod 7 attached thereto at 8 holds the liquid valve head 9 normally seated tight in and against the lower end of the filling tube 10. Passage of the charged liquid from the tank 3 through the passage 11—11 and downwardly out through the filling tube 10 is thereby prevented.

The counterpressure chamber 12 is normally open to the atmosphere through passages connecting therewith the two tubular supports 13, which register with passages 13'

in the body member 1, passages connecting said tubular members with the air chamber 14, and passage 15—15', said atmospheric pressure being overbalanced by the pressure in the tank with the resulting upward movement of the diaphragm 6, as hereinbefore described.

When a bottle is put in the filling position in the centering bell 16, slidably arranged on the filling tube 10 and pushed upwardly, the head thereof 17 is pushed against and unseats the air valve 18. This admits pressure furnished through the air inlet passage 19—19', through the lateral ports 20, passage 15' and passages in the centering bell head 17 registering with said passage 15', to the bottle, and at the same time through the passage 15, air chamber 14, and air passages to the tubular supports 13, and connecting air passages to the chamber 12.

When the pressure in the chamber 12 is equalized with or made greater than the pressure below the diaphragm, the liquid valve 9 will be opened either by gravity or the pressure above the diaphragm, the counterpressure having been established in the bottle. The liquid valve is opened by the same pressure that is admitted to the bottle, and as this occurs when the counterpressure has been fully established in the bottle the liquid will flow into the bottle without loss of gas or production of foam.

When the bottle is removed the air valve 9 is seated and the air inlet 19' closed by the air valve 18, said air valve being actuated and kept normally seated by the spring 32 in the air chamber 14. The pressure in chamber 12 is thereby eliminated and the pressure from the liquid tank closes the liquid valve 9 in the manner hereinbefore described.

The foregoing explains the operation of the ordinary counter-pressure filling mechanism, and of which my invention is an improvement.

Heretofore, when the head of the liquid valve 9, or the lower entrance to the filling tube 10 became worn and the mechanism leaked at that point so that reseating of said valve was required, or when any internal repair to the filling mechanism below the in-

intermediate body member 1 was found necessary, it was required that the entire filling mechanism, hereinbefore described and comprised in Figure 1, be removed from the liquid tank as there was no means of disassembling the head of the liquid valve 9 from the connecting rod 7, both being made as a compact inseparable unit. This condition made it impossible to remove any of the parts comprised in the mechanism below the body member 1 as said parts were not removable over the point 21 on the filling tube, and the filling tube was not removable over the unremovable head 9 of the liquid valve.

The only means of disassembling the mechanism was the threaded connection of the connecting rod 7 with the diaphragm at 8-8'. But said unitary rod and valve head could not be disconnected at 8 while said mechanism was attached to the tank without allowing passage of the liquid from the tank through the entrance 11 to the filling tube 10 and out of said tube, and this could be accomplished only at great inconvenience and danger resulting from the force of the liquid released through the tube 10.

Accordingly, the liquid tank had to be emptied, with resulting loss of such charged liquid therein, and so that the complete mechanism might be removed, with the attendant inconvenience and labor required to perform the removal and dismantling operation so that said repairs might be made.

My invention relates particularly to an improvement in said filling mechanism whereby these adjustments and repairs can be made, or the portion of the mechanism depending from the body member 1 may be dismantled without removing said member, and members upwardly extending therefrom, from the tank and without loss of the liquid in said tank.

Figure 2 shows the demountable valve feature of my invention, the liquid valve 9 being made separate from the rod 7 and fitted thereon in the manner shown. The base of said rod 7 is threaded, and a cap 22 fitted thereon, said cap being either threaded or unitary with the connecting rod 7. The rod 7 is threaded at the top at 8 and screwed into the sleeve 8' so that it may be adjusted up or down to provide a tight seat for said valve 9 when normally closed. The liquid valve head 9 is fitted over said rod 7 and tight against said cap, the locking ridge 23 holding it rigid and preventing leakage. Said head 9 is held in position on said rod and against said cap by a base member 24 threaded and secured on said rod 7 tightly against said valve head 9.

Figure 3 illustrates the feature of my invention comprising a valve in the intermediate body member 1 adapted to close the entrance 11 from the liquid tank to the filling tube 10.

The means I have adopted to so close said entrance comprises the actuating or screw member 25 in combination with a movable member 26 within the recess 27 and chamber 28, said chamber having a removable cover 33, and kept leakproof at the base thereof by the gasket 34. The movable member 26 is fitted with resilient packing material 29 on the forward end thereof, such as rubber, adapted to fit or be compressed tightly over the passage 11 and around the downwardly extending rod 7 when actuated forward over said passage 11 and against a corresponding portion 30 of said material on the opposite side of said rod 7, thereby completely closing the passage 11 to the filling tube 10. Said passage may be reopened by merely reversing the aforesaid operation of the valve in the body member 1.

It will be noted from Figure 1 that the means 25 actuating said movable member 26 may be reached easily when the filling mechanism is fastened to the liquid tank, and the supply of liquid from said tank may be conveniently cut off by the operation thereof.

When the passage 11 is so closed, with the removal by unscrewing of the base portion 24 of the liquid valve and removal of the head 9 thereof from the rod 7, the filling tube 10 which is threaded into the body member 1 at 31, all of the separate portions of the mechanism depending from the body member 1, with the exception of said rod 7, may be dismantled and removed for whatever purpose required without removing the said intermediate body member 1 and upwardly extending members of the filling mechanism from the tank. The usual means of cutting off the pressure in the line connecting with air inlet 19 may be employed.

My invention comprises in principle a means in the body member 1 of the filling mechanism for closing the passage 11 to the filling tube 10 and a demountable liquid valve at the base of said filling tube, said valve being actuated by the operation of the diaphragm and connecting rod hereinbefore described, it being recognized that the means I have adapted thereto may be modified or improved upon to suit the individual requirements without departing from the scope of my invention, or the subjoined claims.

Having thus described my invention, I claim:

1. In a demountable filling machine, comprising in combination a tank connecting base member, a filling tube removably mounted on said base, filling tube closing means comprising a rod extending through said base and tube with a valve head removably mounted thereon and seated in the free end of said tube, and a valve in said base member adapted to close around said rod and prevent passage of liquid through said base member and filling tube.

2. In a demountable filling machine, comprising in combination a tank connecting base member, a filling tube removably mounted on said base, filling tube closing means comprising a rod extending through said base and tube with a valve head removably mounted thereon and seated in the free end of said tube, a valve in said base member adapted to close around said rod and prevent passage of liquid through said base member and filling tube, and an actuating member for said valve extending horizontally through said base member to the edge thereof.

3. In a demountable filling machine, comprising in combination a tank connecting base member with an aperture therein, a filling tube removably mounted on said base and registering with said aperture, filling tube closing means comprising a rod extending through said base and tube with a valve head removably mounted thereon and seated in the free end of said tube, and a valve in said base member adapted to close said aperture around said rod and prevent passage of liquid through said base member and filling tube.

4. In a demountable filling machine, comprising in combination a tank connecting base member with an aperture therein, a filling tube removably mounted on said base and registering with said aperture, filling tube closing means comprising a rod extending through said base and tube with a valve head removably mounted thereon and seated in the free end of said tube, a valve in said base member adapted to close said aperture around said rod, and an actuating member for said valve extending horizontally through said base member to the edge thereof.

5. In a base member for a counterpressure filling machine of the nature described, comprising a plate with an aperture and a recess therein, a plunger movable over said aperture, plunger operating means fitted into said recess and comprising a member extending to the edge of said plate, resilient material secured to said plunger, and resilient material secured adjacent to said aperture and opposing said plunger.

6. In a base member for a counterpressure filling machine of the nature described, comprising a plate with an aperture and a recess therein, a plunger movable over said aperture, plunger operating means fitted into said recess and comprising a member extending to the edge of said plate, resilient material secured to said plunger, resilient material secured adjacent to said aperture and opposing said plunger, and a cover for said recess and plunger, said cover being secured to said plate and having an aperture therein registering with the aperture in said plate.

7. In a base member for a counterpressure

filling machine of the nature described, comprising a plate with an aperture, a recess, and an opening therein, said opening connecting said recess with the edge of said plate, a plunger movable over said aperture, plunger operating means fitted into said recess and opening in said plate, resilient material secured to said plunger, and resilient material secured adjacent to said aperture and opposing said plunger.

8. In a base member for a counterpressure filling machine of the nature described, comprising a plate with an aperture, a recess, and an opening therein, said opening connecting said recess with the edge of said plate, a plunger extending above said recess and movable over said aperture, plunger operating means secured to said plunger and fitted into said recess and opening in said plate, resilient material secured to said plunger, resilient material secured adjacent to said aperture and opposing said plunger, and a cover for said recess, plunger, and resilient material, said cover being secured to said plate and having an aperture therein registering with the aperture in said plate.

9. In a base member for a counterpressure filling machine of the nature described, comprising a plate with an aperture in the center and a recess in the surface thereof, a threaded opening connecting said recess with the outer edge of said plate, an operating means screwed into said opening and into said recess, a plunger secured to the end of said operating means and extending above said recess and toward the center of said plate, said plunger being movable over the aperture in said plate, by operation of the actuating means, resilient material secured on the end of said plunger, resilient material secured adjacent to the aperture opposite the plunger, a cover for said recess, plunger, and resilient material, said cover being secured to the plate and having an aperture therein registering with the aperture in the plate.

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