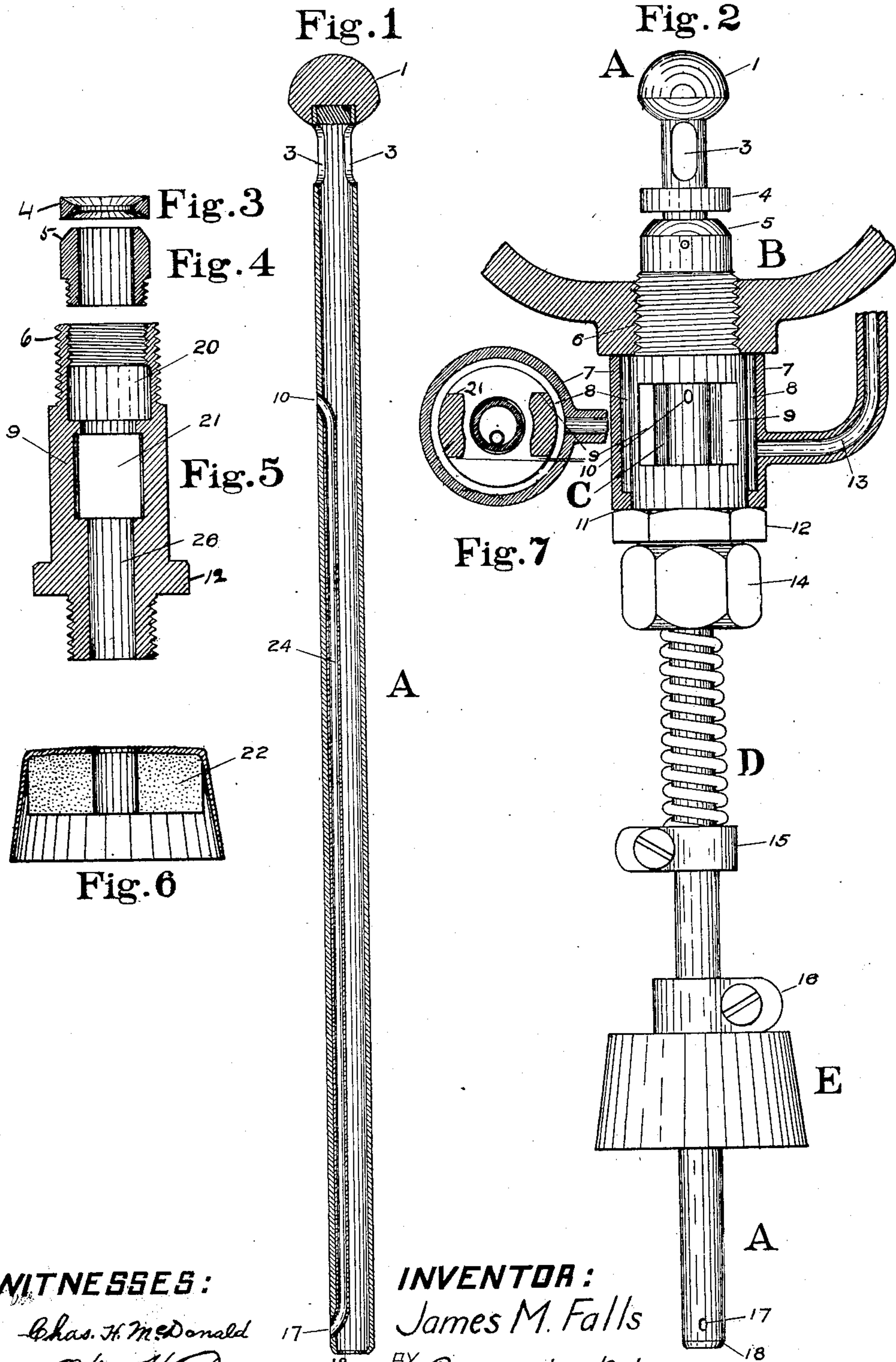


J. M. FALLS.
BOTTLE FILLING MACHINE.
APPLICATION FILED NOV. 9, 1907.

912,236.

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WITNESSES:

Chas. H. McDonald

Oliver H. Piquell

INVENTOR:

James M. Falls

BY Robert H. Miller

ATTORNEY

UNITED STATES PATENT OFFICE.

JAMES M. FALLS, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO LOUISVILLE FILLER COMPANY.

BOTTLE-FILLING MACHINE.

No. 912,236.

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To all whom it may concern:

Be it known that I, JAMES M. FALLS, a citizen of the United States, and a resident of the city of Louisville, in the county of Jefferson and State of Kentucky, have invented new and useful Improvements in Bottle-Filling Machines, of which the following is a specification.

My invention relates to that class of bottle-filling machines in which bottles are filled from depending tubes and in which the bottle is tightly stopped while filling, the contained air being permitted to escape through a small tube.

The invention consists in the novel design, mechanism and combination of parts, as described herewith, and shown in the accompanying drawings.

The objects of said invention are first, to provide a filling tube which shall be of simple construction and positive operation, and which offers the greatest simplicity in the parts exposed to the liquid. Second, to furnish an outlet for the air-tube provided for the escape of air from the bottle, so as to dispose of liquid overflowing through said tube. Third, to provide a means of cutting off both air and filling tubes when bottles are not filling.

In the accompanying drawings, Figure 1 is a sectional view of the filling-tube proper. Fig. 2 is a view of the filling-tube with all its attachments and connections, with the collar 7 and tube 13 cut to cross-section to show the chamber within. Fig. 3 is a cross-section of a seat-ring shown in Fig. 2 at 4. Fig. 4 is a cross-section of a stuffing-box nut, shown in Fig. 2 at 5. Fig. 5 is a cross-section of the part which combines a stuffing box and the inner portion of the framework of the chamber shown at C in Fig. 2. Fig. 6 is a cross-section of the cap (appearing at E in Fig. 2) which receives the bottle top, showing the pad for closing said top. Fig. 7 is a horizontal cross-section of the parts forming the chamber shown at C in Fig. 2.

Similar parts are indicated by similar letters and figures in all figures.

A is the filling tube proper, open at its lower end, closed at the top by the ball 1, and provided with windows or openings 3, 3 into the interior of the tube, just below the ball 1. Within this filling tube proper is fixed a tube 24 (see Fig. 1), of much smaller bore, its extremities so soldered to the walls of the layer tube as to penetrate said walls,

and open on the exterior surface of said tube. The lower opening is shown at 17, the upper at 10.

B is a portion of the filling tank of the bottle-filling machine.

The filling tube proper above described is adapted to slide in a water tight stuffing-box 20 (see Fig. 5) screwed into the bottom of the filling tank B, the upper surface of the stuffing-box nut 5 (see Figs. 2 and 4) being adapted as the seat of a valve formed by the seat ring 4 and the lower surface of the ball 1, surmounting the filler-tube. It will be seen that when the tube A is pulled down so that this valve is seated, no liquid can flow, while if the tube is pushed up, liquid flows from the filling tank through the windows 3, 3 and down the tube A.

Rigidly attached to the lower portion of the stuffing-box 20 (see Fig. 5), and below the bottom of the filling-tank, are arranged a sleeve 9 and collar 7 forming a chamber C surrounding the filler tube A, and through which the said tube A slides. A tube 13 provides an exit from the said chamber, the construction of which is as follows:—The part shown at Fig. 5 forming the principal part of the stuffing-box 20, and screwed into the bottom of the filling tank with the thread 6 is extended downward in the form of a cylinder, the inner diameter of which, for some distance (at 21), is considerably greater than the diameter of the filling tube A, but which, at the lower portion 26 has a bore just large enough to allow the filler-tube to slide through if properly lubricated. The portion of this cylinder which has the larger internal diameter is pierced with two windows shown at 21, their sides being shown around the same portion, and leaving a slight clearance shown at 8, fits a collar or jacket 7, with an outlet tube 13, making a watertight joint above by being forced against the lower surface of the bottom of the filling tank, and below by a contraction of its bore at 11 so as to come closely in contact with the cylinder, and by being pressed firmly against an enlargement 12, projecting from the exterior of the cylinder shown at Fig. 5. This collar is provided with faces so as to be readily grasped by a wrench. Below, the collar is threaded for a stuffing-box nut 14, against which bears a spiral spring D whose other extremity presses against the lock nut 15.

The clamp 16 is capable of being rigidly

attached to the filler tube proper A. Against it, near the end of the latter, bears a cap E (see Fig. 6), having in its interior a flat pad of elastic material adapted for the closing of the mouth of a bottle pressed against it. The sides are extended downward to intercept the squirting from imperfect bottle mouths. The cap E is preferably rounded on its upper surface so as to permit a slight rocking motion against the clamp 16 above facilitating the closing of irregular mouthed bottles.

When by proper mechanism the filling-tank and tubes are depressed, and the row of filling tubes depending therefrom are inserted each into a bottle beneath, the top of the bottle, pressing upward on the pad 22 in the cap, compresses the spring D and pushes the tube A upward through the stuffing boxes and the chamber C, raising the valve 1 and permitting the liquid to flow from the tank into the bottle. Air escapes from the bottle through the air-tube 24 and emerges therefrom at the upper opening 10, which is so placed that it opens into the chamber C when the tube is raised and the bottles are filling.

When the bottle has filled so that the lower air-tube opening 17 is covered with liquid the air cushion between the surface of the liquid and the pad 22 prevents the liquid from rising higher, and a small portion of liquid will be forced through the air-tube until the operator cuts off the flow by raising the tubes and tank. This overflow liquid passes into the chamber C and out through the tube 13, leading to a vessel adapted to its reception and disposal.

When the operator raises the tank and tubes, the pressure on the pad 22 is relieved, the spring D pushes the tube down into place, seating the valve 1 and closing the air tube by bringing its upper opening 10 down out of the chamber and opposite the close fitting portion of the cylinder shown at 26, Fig. 5. If the tubes are properly proportioned liquid will not escape from them after the device is withdrawn from the bottle, owing to atmospheric pressure.

Having described my invention, I claim as new and desire to protect by Letters Patent the following:

1. In a bottle filling device, a reservoir, a tubular member extending into said reservoir, a filling tube within said member, an air exhaust connected with the filling tube, and a collar surrounding the tubular member, such tubular member rigidly supported in the wall of the reservoir, constituting in itself the support of the filling tube, provided with an inner exhaust chamber, and supporting the collar on said member and spaced therefrom to form an outer annular exhaust chamber, but holding the collar in positive contact with the wall of the reservoir, said

collar provided with an opening connecting with the exterior and through an opening in the tubular member with the air exhaust.

2. In a bottle filling device, a reservoir, a tubular member extending into said reservoir, a reciprocable filling tube within said member, an air exhaust tube within said filling tube, a collar surrounding the tubular member, such tubular member rigidly supported in the wall of the reservoir, constituting in itself the support of the filling tube, provided with an inner exhaust chamber, and supporting the collar on said member and spaced therefrom to form an outer annular exhaust chamber, but holding the collar in positive contact with the wall of the reservoir, said collar provided with an opening connecting with the exterior and through an opening in the tubular member with the air exhaust tube, and means on the tubular member for holding the collar in position.

3. In a bottle filling device, a reservoir, a tubular member carrying a valve seat at its upper end projecting into said reservoir, said member provided with openings in the sides thereof, a filling tube within said tubular member, a valve at the upper end thereof engaging said valve seat, and a collar surrounding the tubular member and provided with an opening communicating through said member with an air exhaust device within the filling tube, such tubular member rigidly supported in the wall of the reservoir, constituting in itself the support of the filling tube, provided with an inner exhaust chamber, and supporting the collar on said member and spaced therefrom to form an outer annular exhaust chamber, but holding the collar in positive contact with the wall of the reservoir.

4. In a bottle filling device, a reservoir, a tubular member carrying a valve seat at its upper end projecting into said reservoir, said member provided with openings in the sides thereof, a spring held reciprocable filling tube within said tubular member, a valve at the upper end thereof engaging said valve seat, and a collar surrounding the tubular member and provided with an opening communicating through said member with an air exhaust device within the filling tube, such tubular member rigidly supported in the wall of the reservoir, constituting in itself the support of the filling tube, provided with an inner exhaust chamber, and supporting the collar on said member and spaced therefrom to form an outer annular exhaust chamber, but holding the collar in positive contact with the wall of the reservoir.

5. In a bottle filling device, a reservoir, a tubular member projecting into said reservoir and provided with apertures in the sides thereof, with means for connecting with the walls of the reservoir, and with an enlarge-

ment on one end, a reciprocable filling tube within the tubular member, an air exhaust device connecting with said tube, and a collar surrounding the tubular member and having an opening communicating with the exterior and through the openings in the tubular member with the air exhaust device within the filling tube, such tubular member rigidly supported in the wall of the reservoir, constituting in itself the support of the filling tube, provided with an inner exhaust chamber, and supporting the collar on said member and spaced therefrom to form an outer annular exhaust chamber, but holding the collar in positive contact with the wall of the reservoir.

6. In a bottle filling device, a reservoir, a tubular member projecting into said reservoir and provided with apertures in the sides

thereof, with means for connecting with the walls of the reservoir, and with an enlargement on one end, a reciprocable filling tube within the tubular member, an air exhaust device connecting with said tube, and a collar surrounding the tubular member spaced therefrom to form an annular chamber and having an opening communicating with the exterior and through the openings in the tubular member with the air exhaust device within the filling tube, a sleeve carrying a valve seat connected with the upper end of the tubular member, and a valve on the filling tube contacting with said seat.

JAMES M. FALLS.

Witnesses:

LEAVILLE McCAMPBELL,
LOUISE C. STARK.