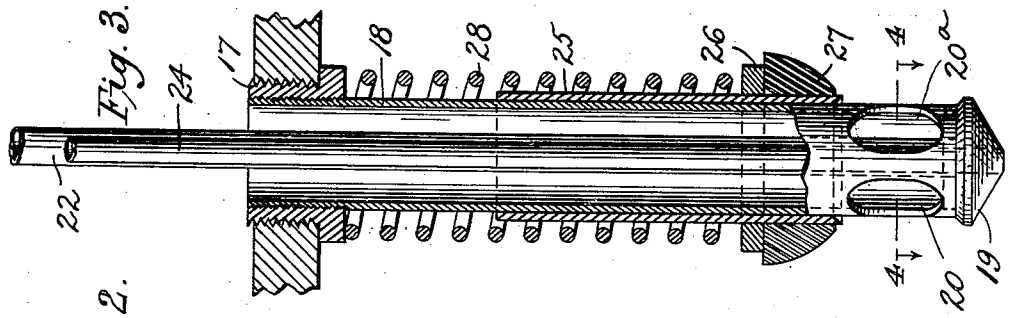
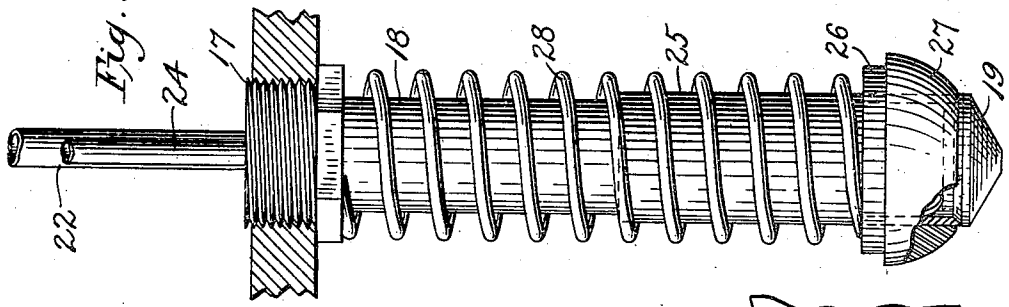
H. O. FISHER.

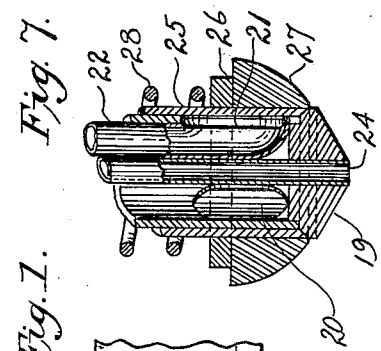
BOTTLE FILLER.

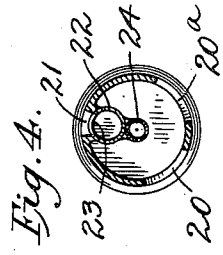
APPLICATION FILED MAY 9, 1908.

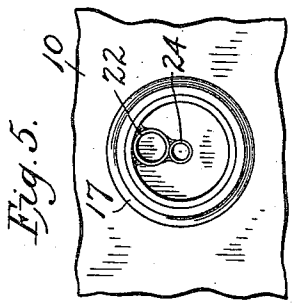
1,085,899. Patented Feb. 3, 1914.

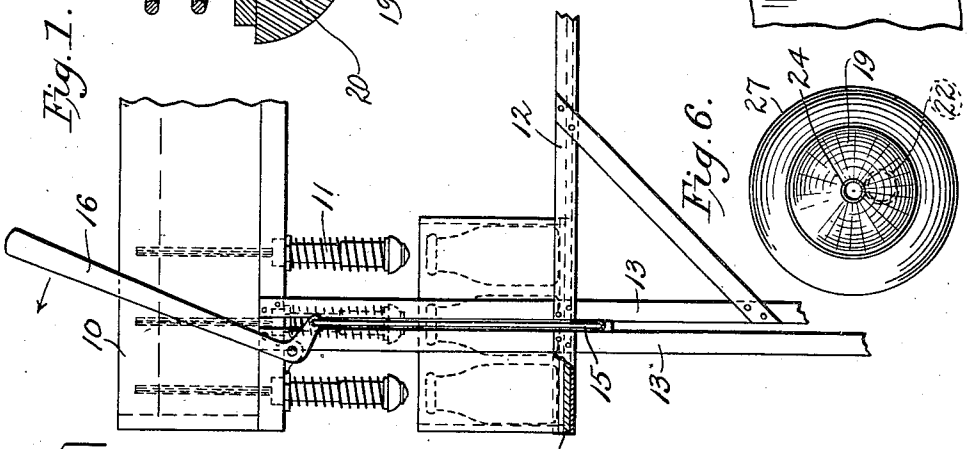












Witnesses:
Catherine Zwilling
Rae Weiss

Inventor.
Homer O. Fisher
by Brockett & Kwis
Attorneys.

UNITED STATES PATENT OFFICE.

HOMER O. FISHER, OF CLEVELAND, OHIO, ASSIGNOR TO RICE AND ADAMS, A COPARTNERSHIP CONSISTING OF ALBERT J. RICE AND CHARLES S. ADAMS, OF BUFFALO, NEW YORK.

BOTTLE-FILLER.

1,085,899. Specification of Letters Patent. Patented Feb. 3, 1914.

Application filed May 9, 1908. Serial No. 431,967.

To all whom it may concern:

Be it known that I, HOMER O. FISHER, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Bottle-Fillers, of which the following is a specification.

This invention relates to bottle fillers and particularly to milk bottle fillers.

Bottle fillers are ordinarily made of two well known types. In one of these types the filling tube is provided with a tubular external valve which is adapted to close the liquid openings in the filling tube and to also close an air opening which permits air from the bottle to exhaust through an air tube within the filling tube. In this construction a great difficulty is encountered when the bottles are released from the valve by reason of the fact that the displacement of the lower end of the mechanism which projects into the bottle is sufficient to bring about a suction before the rubber gasket leaves the rim of the neck of the bottle causing the bottle to cling, as it were, to the valve and to be raised from the crate for a short distance until this suction is released, when the bottle usually falls and spills a quantity of the liquid. The other type of bottle filler referred to is one wherein the air tube leads directly from the bottle and out into the atmosphere but during the filling operation this tube, if it is of sufficient capacity to vent the bottle properly, fills up with a sufficient quantity of liquid so that, when the valve is removed from the neck of the bottle, this liquid is more than enough to fill the displacement of the valve mechanism in the mouth of the bottle and it runs down over the outside, thus causing a waste. If the air vent is of a size such that it only holds a sufficient quantity of milk to fill the neck properly then it does not vent properly by reason of its limited capacity.

The above mentioned difficulties are overcome in the present invention, by supplying a valve, of the first type mentioned wherein there is a main air vent which is closed when the liquid flow is shut off, with a supplemental or auxiliary air tube or other means for relieving the suction caused by the removal of the valve mechanism from the neck of the bottle and to make this vent just large enough so that its capacity, when filled with liquid, will be just sufficient to properly fill the bottle neck. At the same time this tube will relieve the suction referred to, so that the bottles may be moved down without following the valves and there is no waste of the liquid. It is quite obvious that during the filling operation all of these air tubes will be filled with liquid to the level of the liquid in the tank.

The present invention relates to the latter construction of valves and has for its object the provision of means for overcoming this last named difficulty, that is, the clinging of the bottles to the valves as the crate is lowered.

More specifically the invention aims to provide a bottle filling valve which will fill the bottle just to the desired point leaving sufficient space for the cap and will cause no loss of liquid when the bottle is withdrawn and in which there will be no tendency whatever for the bottle to cling to the valve when the support or crate is lowered.

In carrying out my invention I provide a valve having a main air tube which is closed at the bottom at the same time the milk supply is shut off and having an auxiliary air tube which is always open at the bottom and overcomes the suction or tendency of the bottle to cling to the valve.

My invention may be further briefly summarized as consisting in certain novel details of construction and combinations and arrangements of parts which will be described in the specification and set forth in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of a portion of a bottle filler equipped with my invention; Fig. 2 is an elevation, parts being broken away, of one of the valves, the valve being closed; Fig. 3 is a sectional view of one of the valves, parts being broken away and the valve being open; Fig. 4 is a transverse section substantially along the line 4—4 of Fig. 3 looking in the direction indicated by the arrows; Fig. 5 is a top plan view of one of the valves showing a portion of the tank; Fig. 6 is a bottom plan view of one of the valves; and Fig. 7 is a vertical sectional view through the lower part of the valve.

Referring now to the figures of the drawing 10 represents a tank adapted to contain the liquid from which the bottles are to be filled. To the bottom of the tank are secured a plurality of valves 11, a sufficient

number of which will be provided to fill a crate of bottles at one time. In Fig. 1, I have shown merely one end of the bottle filler, it being understood that the construction at the opposite end is similar to that shown. Below the tank is a frame consisting of a horizontal portion 12 upon which the bottle crates are normally supported and vertical supporting members 13. The crate rests upon a movable seat 14 to which is connected a lifting link 15 connected to one end of a bell crank lever 16. By shifting the lever in the direction indicated by the arrow the crate will be raised, the necks of the bottles engaging lower portions of the valves and opening the same, permitting the liquid to flow into the bottles and the air to escape through the air tubes which will be described. The construction of the frame and lifting mechanism forms no part of my invention and need be described no further.

The construction of the filling valves will now be described.

Each valve is secured in the bottom of the tank by a threaded bushing 17, which is threaded also on the interior and receives a tightly fitting fixed filling tube 18. At the bottom of the tube is a fixed closing cap and valve seat 19 which projects outward a short distance beyond the outer wall of the tube and is adapted to be engaged by the valve sleeve as will be explained. The lower end of the tube a short distance above the valve seat is cut away at three different points forming two comparatively large liquid outlet openings 20 and 20^a and a smaller air inlet opening 21, the location and the comparative sizes of the openings being shown most clearly in Figs. 3 and 4. It is not necessary that two liquid outlet openings be provided, but I prefer this construction in order that the flow of the liquid into the bottle will be as free as possible.

Secured in the filling tube 18 preferably by solder and extending a considerable distance above the bottom of the tank is a main air conveying tube 22. The tube extends downward in line with the opening 21 at the lower end of the filling tube 18 and is provided with an opening 23 which coincides with the opening 21. The lower end of the air tube 22 preferably rests upon the upper face of the cap 19, the joint being soldered so that it will be air-tight. Also located in the filling tube is a smaller second air tube 24, which may be soldered to the main air tube as shown in Figs. 4 and 5, or may be secured in place in any other desired manner, or may have any other location relative to the main filling tube. This second tube instead of extending merely to the closing cap 19 at the bottom of the tube 18 extends through the same and is open at all times from end to end regardless of whether the valve is closed or open. It may be here stated that the purpose of this small tube is not primarily to convey the air from the bottle, the larger tube serving this purpose, but is simply to overcome the so-called suction and to prevent the bottle clinging to the valve after the bottle is filled and the valve is closed.

Surrounding the filling tube 18 is a valve sleeve or tube 25 which has a close but sliding fit on the filling tube. The valve 25 is provided with a shoulder or flange 26 and bearing against the same with a conical shaped flange or collar of yieldable material such as rubber adapted to engage the neck of the bottle. A coil spring 28 bears against the bushing 17 at the tank and against the shoulder 26 and normally holds the valve sleeve in its lowermost position against the valve seat so as to close or cover the liquid outlet openings 20 and 20^a and the air inlet opening 21 communicating with the main air tube 22.

It will be seen that, when the valve seat is raised by the pressure of a bottle against the collar 27, the liquid will pass through the openings 20 and 20^a into the bottle, and the greater portion of the air which is displaced by the liquid will pass upward in and escape through the main air tube 22, a small portion passing also through the smaller tube. When the bottle is completely filled it may be readily lowered from the end of the valve for the reason that the second air tube 24 equalizes the air pressure inside and outside of the neck of the bottle and overcomes all tendency of suction or the tendency of the bottle to cling to the valve.

The valve described above is particularly adapted for filling bottles with milk, the construction being such that the bottle will be filled to the desired point with solid milk and no foam, and when the bottle is removed there will be just sufficient space for the insertion of a cap. The second air tube 24 is so small that even if it is partially filled with milk when the bottle is filled, the milk which runs back into the bottle when the bottle is removed is so small in quantity as not to cause the bottle to overflow or to interfere with the insertion of the cap.

Having described my invention, I claim:—

1. In a bottle filler, a filling tube having outlet and inlet ports for liquid and air respectively, a valve member movable relatively to the ports and serving to close both of them, and means for overcoming the suction of the bottle to the valve member comprising an air tube extending through the filling tube and open at the bottom at all times.

2. In a bottle filler, a filling tube, a member closing the tube at the bottom, said tube having lateral liquid outlet and air inlet ports, a valve sleeve movable relative to the filling tube and serving to close the liquid

and air ports, an air tube communicating with the air port and extending lengthwise of the filling tube and through the closing member at the bottom thereof.

3. In a bottle filler, a filling tube having at the bottom a liquid outlet opening and an air inlet opening, a main air tube secured to said filling tube and having an opening communicating with said air inlet opening, and adapted to convey air from the bottle, a second air tube smaller than the main air tube, said second air tube being open at the bottom at all times, and a valve sleeve adapted to close the liquid outlet opening and air inlet opening of the main air tube.

4. In bottle filling apparatus, a filling tube, having a lateral filling opening, a lateral air escape opening, and a bottom provided with a perforation, an upward extending air tube having communication with said lateral air escape opening, an upward extending air tube having communication with the perforation of said bottom, and a spring pressed slidable sleeve normally closing the lateral filling and air escape openings and adapted for insertion into the mouth of a bottle.

5. In bottle filling apparatus, a filling tube, having a lateral filling opening, a lateral air escape opening, a bottom provided with a perforation, and an exterior stop, an upward extending air tube having communication with said lateral air escape opening, an upward extending air tube having communication with the perforation of said bottom, and a spring pressed slidable sleeve normally closing the lateral filling and air escape openings, adapted for insertion into the mouth of a bottle, and having at its lower end close engagement with said exterior stop.

In testimony whereof I affix my signature in presence of two witnesses.

HOMER O. FISHER.

Witnesses:
A. F. Kwis,
Rae Weiss.