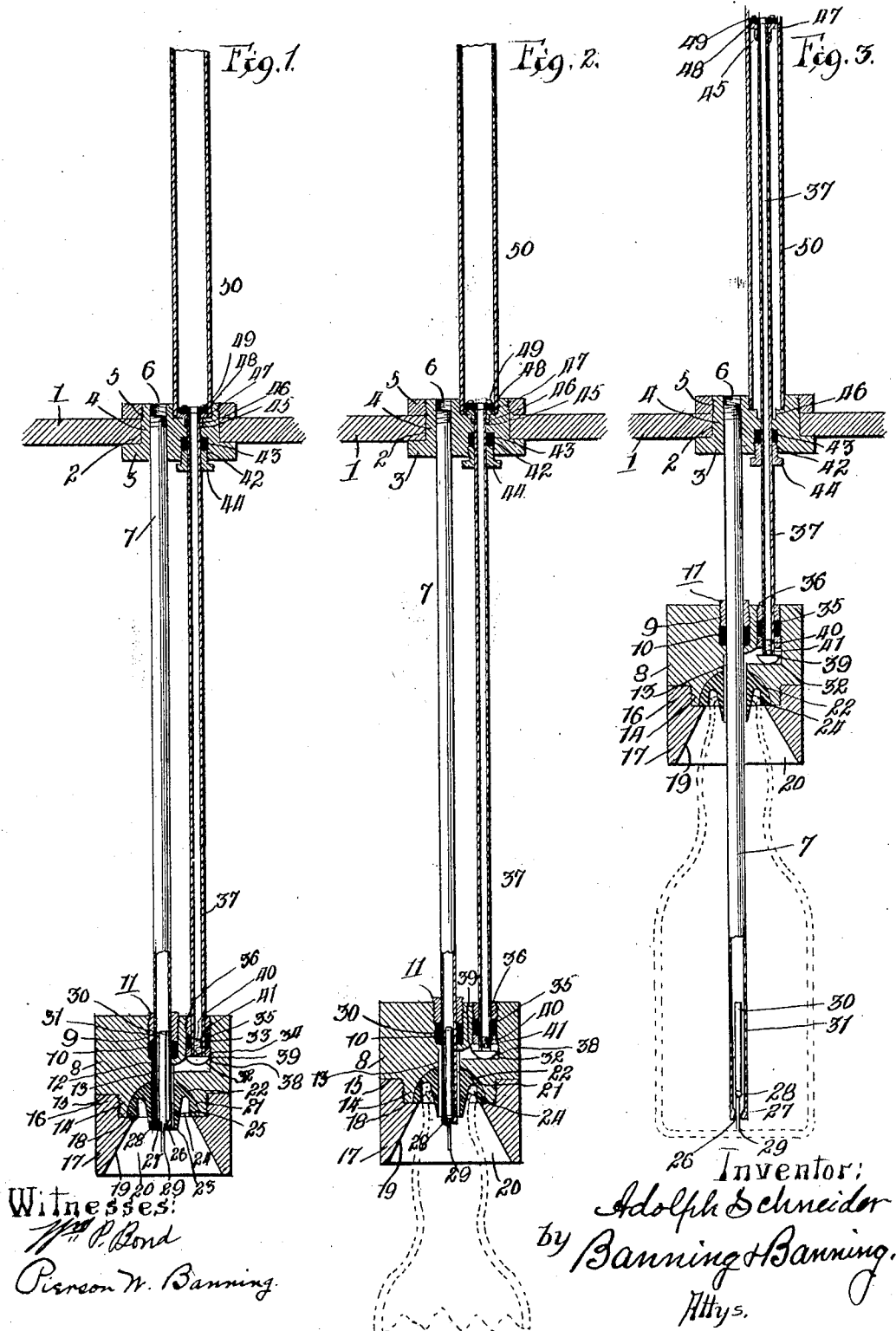


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PATENTED FEB. 4, 1908.

A. SCHNEIDER.
FILLING TUBE FOR LIQUIDS.

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UNITED STATES PATENT OFFICE.

ADOLPH SCHNEIDER, OF CHICAGO, ILLINOIS.

FILLING-TUBE FOR LIQUIDS.

No. 878,243.

Specification of Letters Patent.

Patented Feb. 4, 1908.

Application filed April 29, 1907. Serial No. 370,864.

To all whom it may concern:

Be it known that I, ADOLPH SCHNEIDER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Filling-Tubes for Liquids, of which the following is a specification.

The bottling or packaging of liquids, particularly carbonated liquids, in order to obtain the best results, and to prevent foaming, requires an equalization of pressure between the filling tank containing the liquid and the to-be filled bottle or package, and the discharging of the liquid into the bottle or package, after the pressure has been equalized; and for the purpose of equalizing the pressure, the bottle or package must be effectually sealed against the escape of pressure.

The objects of the present invention are to construct a filling tube for liquid, with a supplemental tube for conducting or conveying pressure back and forth between the filling tank and the to-be filled bottle or package, with the tubes so arranged as that the supplemental tube for the pressure will be opened for admitting pressure to the bottle or package before the filling tube is opened for discharging liquid into the bottle or package; to combine a filling tube for liquid, a supplemental tube for pressure, and a slidable sealing head for sealing the mouth of the bottle or package in such manner as to have the initial upward movement open the supplemental tube, for admitting pressure, and the continued upward movement of the sealing head open the liquid tube, to discharge liquid into the bottle or package, with the supplemental tube for pressure still open to escape pressure from the bottle or package back into the tank; to construct a fixed liquid tube having a discharge valve at its lower end, a slidable supplemental tube for conducting pressure between the filling tank and the to-be filled bottle or package, and a slidable sealing head for sealing the mouth of the bottle, with the sealing head slidable on the fixed liquid supply tube and the slidable supplemental tube movable with the sealing head, after the initial upward movement of the sealing head; and to improve generally the construction, arrangement and operation of the several parts entering into the formation of the filling tube as a whole.

The invention consists in the features of

construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a sectional elevation of the sealing head, the supplemental tube, and the bottom of the filling tank, with the liquid supply tube partly in section and partly in full elevation, and showing the sealing head and the tubes in normal, or at rest position for the sealing head, closing the liquid supply tube and the supplemental tube against the flow of liquid and pressure; Fig. 2 a similar view to Fig. 1, showing the sealing head initially raised to open the supplemental tube, for admitting pressure to the bottle, shown in dotted lines, with its neck or mouth end entered into the sealing gasket; and Fig. 3 a similar view to Fig. 1, showing the sealing head and the supplemental tube for pressure fully raised, for the valve of the liquid supply tube to be open, for discharging liquid into the bottle or package, with the bottle shown in dotted lines.

The filling tank can be of any suitable and well known form of construction adapted to contain liquid in its lower portion and pressure in its upper portion, with a bottom wall 1 having a hole 2, for a plug formed with a flange or rim 3 and a neck 4, with the neck entered into the hole 2 and extending beyond the inner face of the wall, and having an exterior screw thread to receive a ring nut 5, by means of which the plug is fixedly and firmly secured in the wall. The plug has, extending longitudinally therethrough, a hole 6, with a screw thread to receive the upper end of a filling tube 7, so as to suspend the tube in a fixed relation.

The lower end of the filling tube is encircled by a head 8 having a chamber 9, to receive a packing ring 10 compressed by a ring follower or gland 11 threaded into the chamber 9, and operating to compress the packing tightly around the filling tube, so as to prevent the escape of pressure and liquid around the filling tube. The chamber 9 terminates in a wall 12, below which is a hole in the head 8, of a greater diameter than the exterior diameter of the filling tube, to form a passage 13 around the exterior of the filling tube.

The head, on its lower end, has a neck with an exterior screw thread, forming a shoulder 15, and the neck 14 receives a wall or flange 16 of a ring 17, having an upper

shoulder 18, so that, when the ring is threaded onto the neck 14, the abutting faces of the shoulder 15 and flange 16, and of the ring 17 and shoulder 18, will form a close and tight joint between the head and the ring.

The inner face 19 of the ring 17 has an upward and inward taper, forming a guide for directing the end of the bottle or package to proper position and relation with the sealing gasket carried by the head, the end of the bottle or package passing into the tapered opening 20, formed by the inclined inner walls of the ring. The under face, or lower end, of the head 8 has a semi-circular chamber 21 formed therein, which chamber 21 receives the body 22 of a sealing gasket, the exterior face of the body of the sealing gasket being formed on a semi-circle to closely fit the semi-circular chamber 21 of the head. The gasket has a central tapered plug or stopper 23, between the exterior of which and the interior face of the body 22, is a channel 24, into which is entered the extreme end of the neck of the body or package, so that the mouth of the bottle or package is sealed on the interior by the plug or stopper 23, and on the exterior by the body of the gasket, as shown in Figs. 2 and 3.

The body of the gasket and the plug or stopper thereof have an axial or central hole through which the filling tube passes, forming a passage 25 in communication with the passage 13 of the head 8, furnishing a continuous passage opening at the end of the plug or stopper of the sealing gasket or cushion. The discharge end of the filling tube has a port 26, with a seating face 27 around its inner end, which seating face 27 coacts with a valve 28 having a stem 29 extending below the lower end of the filling tube, for engaging the bottom of an entered bottle or package, for the engagement, with the upward movement of the bottle or package and the sealing head, to raise the valve from the seat and open the discharge port 26, for liquid to flow from the filling tube into the bottle or package; and, as shown, the valve is returned to closing position by a weight 30 extending up into the filling tube, and sufficiently heavy to seat the valve, when the parts are in the normal position, or at rest, as shown in Fig. 1; and the weight is of a less diameter in cross section than the interior diameter of the filling tube, so as to leave a passage 31 between the exterior of the weight and the interior face of the filling tube for liquid to flow out at the discharge port.

The head 8 has therein a lateral chamber 32, in communication with the passage 13, and extending upwardly from the lateral chamber 32 is a chamber 33, with a screw thread, and receiving a ring nut or plug 34, a packing 35, and a follower or gland 36, by means of which the packing is tightly compressed around a tube 37 extending through the ring nut 34,

the packing 35 and the follower or gland 36, so that the head has a limited upward movement on the tube 37, with the initial entering of a bottle or package into filling position. The lower end of the tube 37 carries a valve 33, with a seating face 39, to engage the end face of the ring nut 34 and tightly close the end of the tube; and the valve 38 has a stem 40 for attaching the valve to the end of the tube, and, as shown, the wall of the tube and the stem have a port or opening 41, for discharging pressure when the valve is opened, as shown in Figs. 2 and 3.

The flange 3, and the neck 4 of the plug carrying the filling tube, have a chamber 42, which receives a packing 43, compressed, by a follower or gland 44, around the upper end of the supplemental tube 37, which tube passes through the packing 43 and the follower or gland 44, and through a hole in a wall 45 of the plug, above which wall is a chamber 46, which receives a flange or rim 47, of a head 48, on which is secured a packing 49 constituting, with the head 48, a piston operative in a tube 50, upwardly extending from the plug, and having its upper end terminating above the liquid in the filling tank, so that pressure can enter the tube 50 and flow through the tube 37 into the chamber 32, when the valve 38 is open, as shown in Figs. 2 and 3, for the inflow of pressure into the chamber 33 to pass through the passages 13 and 25 to enter the bottle or package and equalize the pressure between the filling tank and the bottle or package, and for the pressure in the bottle or package to outflow therefrom, as the liquid fills the bottle or package, and enter the chamber 33 from the passages 25 and 13, and return through the tube 37 and tube 50 to the interior of the filling tank. The supplemental tube 37 furnishes a means for conducting pressure from the filling tank into the to-be filled bottle or package, for equalizing the pressure between the filling tank and the to-be filled bottle or package, and for returning pressure from the bottle or package back to the tank; and the control of the flow of pressure in either direction through the supplemental tube is obtained by the initial upward movement of the head 8, which opens the valve 38, permitting the flow of pressure in both directions through the supplemental tube, and with the return of the head 8 to its normal, or at rest position, as shown in Fig. 1, the flow of pressure through the supplemental tube 37 is shut off by the closing of the valve 33 against the face of the ring nut or wall 34 thus placing the control of the pressure under the movement of the sealing head.

The operation will be understood from the foregoing description, but briefly is as follows: The sealing head and the supplemental tube for pressure, when in their normal, or at rest position, as shown in Fig. 1, effectually

close the liquid supply tube and the pressure tube, the liquid supply tube being closed by the seating of the valve 28 against the face 27 around the port 26 of the liquid tube, and the supplemental pressure tube 27 being closed by the seating of the face 39 of the valve 38 against the end of the ring nut or wall 34 through which the supplemental tube passes.

The entering of the bottle or package into the sealing head, as shown in Fig. 2, with the initial upward movement of the bottle, raises the sealing head 8 sufficiently to open the valve 38, for pressure to escape through the port or hole 41, into the chamber 32, and flow through the passages 13 and 25, into the interior of the bottle and equalize the pressure between the filling tank and the bottle or package. The exterior of the valve 38 contacts the bottom wall of the chamber 32, when the valve is opened by the initial upward movement of the sealing head and bottle, and with the further upward movement of the bottle or package and the sealing head into the position shown in Fig. 3, the liquid supply tube fully enters the bottle or package, for the stem 29 of the valve 28 to contact the bottom of the bottle or package and open the valve, allowing liquid to flow through the passage 31 and discharge port 26 into the bottle or package; and with the upward movement of the sealing head and the bottle or package, the piston, at the upper end of the supplemental pressure tube 37, passes upwardly in the inclosing tube 50, as shown in Fig. 3, so that the supplemental pressure tube 37 furnishes an open conduit for returning pressure from the package or bottle forced out by the liquid entering the bottle or package, allowing the pressure to escape from the bottle or package back into the filling tank.

The fixed liquid supply tube, in conjunction with the supplemental pressure tube 37 and the slidable sealing head, furnish a perfect means for discharging liquid into a to-be filled bottle or package, and for equalizing pressure between the filling tank and the to-be filled bottle or package, and places the control of the pressure entirely under the position of the slidable sealing head, as with the sealing head in normal position, as shown in Fig. 1, the discharge of liquid and pressure into the to-be filled bottle or package is closed, and with the sealing head initially raised, as in Fig. 2, the pressure is free to flow into the to-be filled bottle or package from the filling tank, for equalizing the pressure with the filling tube for the liquid still closed; and with the sealing head in the position shown in Fig. 3, the passage or pressure between the bottle or package in the filling tank remains open and the liquid supply tube is opened for discharging liquid into the bottle or package.

The filling tube of the present invention

is simple in construction, and performs the required work in an efficient and reliable manner.

The piston on the upper end of the tube 37, in connection with the valve 38 at the lower end of said tube, limits the descent of the sealing head; and the sealing head, when down, is supported by the piston at the upper end of the tube 37, and the valve 38 at the lower end of said tube, so that the tube 37 serves both as a suspending means for the sealing head and a conduit for pressure; the piston also serves as a retarder, for the sealing head in descending, causing a gradual descent of the head by which serious jar or concussion is prevented; and the piston forms a cut-off against any inflow of liquid into the tube or casing 50 in case of an overflow of liquid entering the tube 37 from the bottle or package.

What I claim as new and desire to secure by Letters Patent is:

1. In a filling tube for liquids, the combination of a fixed liquid supply tube, a pressure transmitting tube consisting of a fixed upper member and a lower member slidable in the fixed member, a slidable sealing head having therein a pressure transmitting passage, and movable on the liquid supply tube and having the slidable member of the pressure transmitting tube entered therinto and movable therewith, and a headed valve on the lower end of the sliding member of the pressure transmitting tube, said valve controlling the flow of pressure between the pressure transmitting tube and the pressure transmitting passage in the sealing head, substantially as described.

2. In a filling tube for liquids, the combination of a fixed liquid supply tube, a slidable tube for transmitting pressure, a slidable sealing head having therein a pressure transmitting passage with a lateral extension therefrom and movable on the liquid supply tube, and having the slidable pressure transmitting tube entered therinto and movable therewith, the head having an initial movement independent of the tube, a headed valve on the lower end of the slidable tube for transmitting pressure and controlling the flow of pressure through such tube, and a fixed tube for transmitting pressure and located in the filling tank and in which the slidable pressure transmitting tube is vertically movable, substantially as described.

3. In a filling tube for liquids, the combination of a fixed liquid supply tube having an endwise discharge port at its lower end, a slidable tube for transmitting pressure, a slidable sealing head having therein a pressure transmitting passage and encircling and movable on the liquid supply tube, and having the slidable tube for transmitting pressure entered therinto and movable

therewith, the head having an initial movement independent of the tube, a weighted valve for the liquid supply tube located and operating within the tube at the discharge
 5 end thereof, a stem for the valve projecting through the discharge port at the lower end of the liquid supply tube, and a headed valve for the slidable pressure transmitting tube at the discharge end thereof, opened by the
 10 initial upward movement of the sealing head and when opened engaged by the head and raising the tube with the upward movement of the head, substantially as described.

4. In a filling tube for liquids, the combination of a fixed liquid supply tube, a tube for transmitting pressure consisting of a sliding section and a fixed section, with the fixed section entered into a liquid supply tank and the sliding section movable in the fixed section, a piston on the upper end of the sliding
 20 section of the pressure transmitting tube, operating in the fixed section of the tube and closing the section against the admission of liquid pressure below the piston and furnishing a stop and support for the movable section of the pressure transmitting tube, a
 25 slidable sealing head having therein a pressure transmitting passage with a lateral extension leading therefrom and encircling and movable on the liquid supply tube, and a
 30 headed valve at the lower end of the sliding section of the pressure transmitting tube, controlling the flow of pressure in the tube and forming a contact for raising the sliding section of the tube with the upward movement
 35 of the sealing head, substantially as described.

5. In a filling tube for liquids, the combination of a fixed liquid supply tube having
 40 an endwise discharge port at its lower end, a tube for transmitting pressure consisting of a sliding section and a fixed section, with the fixed section entered into a liquid supply tank and the sliding section movable in the
 45 fixed section, a piston on the upper end of the sliding section, operating in the fixed section of the tube and closing the section against the admission of liquid below the piston and furnishing a stop and support for
 50 the movable section of the pressure transmitting tube, a slidable sealing head having

therein a pressure transmitting passage with a lateral extension leading therefrom, and encircling and movable on the liquid supply tube, a weighted valve located and operating
 55 within the liquid supply tube, a stem for the valve projecting through the discharge port at the end of the liquid supply tube, and a headed valve for the sliding section of the pressure transmitting tube at the discharge
 60 end thereof, opened by the initial upward movement of the sealing head and when opened forming a contact for raising the sliding section of the tube with the upward movement of the sealing head, substantially
 65 as described.

6. In a filling tube for liquids, the combination of a slidable head having a chamber for pressure with a lateral extension leading therefrom, a gasket entered into the
 70 head and having a passage for pressure in communication with the chamber of the head, a pressure conducting tube entered into and slidable with the head and leading into the lateral extension of the chamber of
 75 the head, and a rigid valve at the entered end of the tube in the head, opened and closed by an initial movement of the head and engaged by the head for raising the tube with the upward movement of the head, substantially as
 80 described.

7. In a filling tube for liquids, the combination of a slidable head having a chamber for pressure with a lateral extension leading therefrom, a gasket entered into the head and
 85 having a passage for pressure in communication with the chamber of the head, a pressure conducting tube entered into and slidable with the head and leading into the lateral extension of the chamber of the head, a
 90 rigid valve at the entered end of the tube in the head and opened and closed by an initial movement of the head and engaged by the head, for raising the tube with the upward movement of the head, a liquid supply tube
 95 extending through the head and gasket, and a valve at the lower end of and within the liquid supply tube, substantially as described.

ADOLPH SCHNEIDER.

Witnesses:

OSCAR W. BOND,
 PIERSON W. BANNING.