

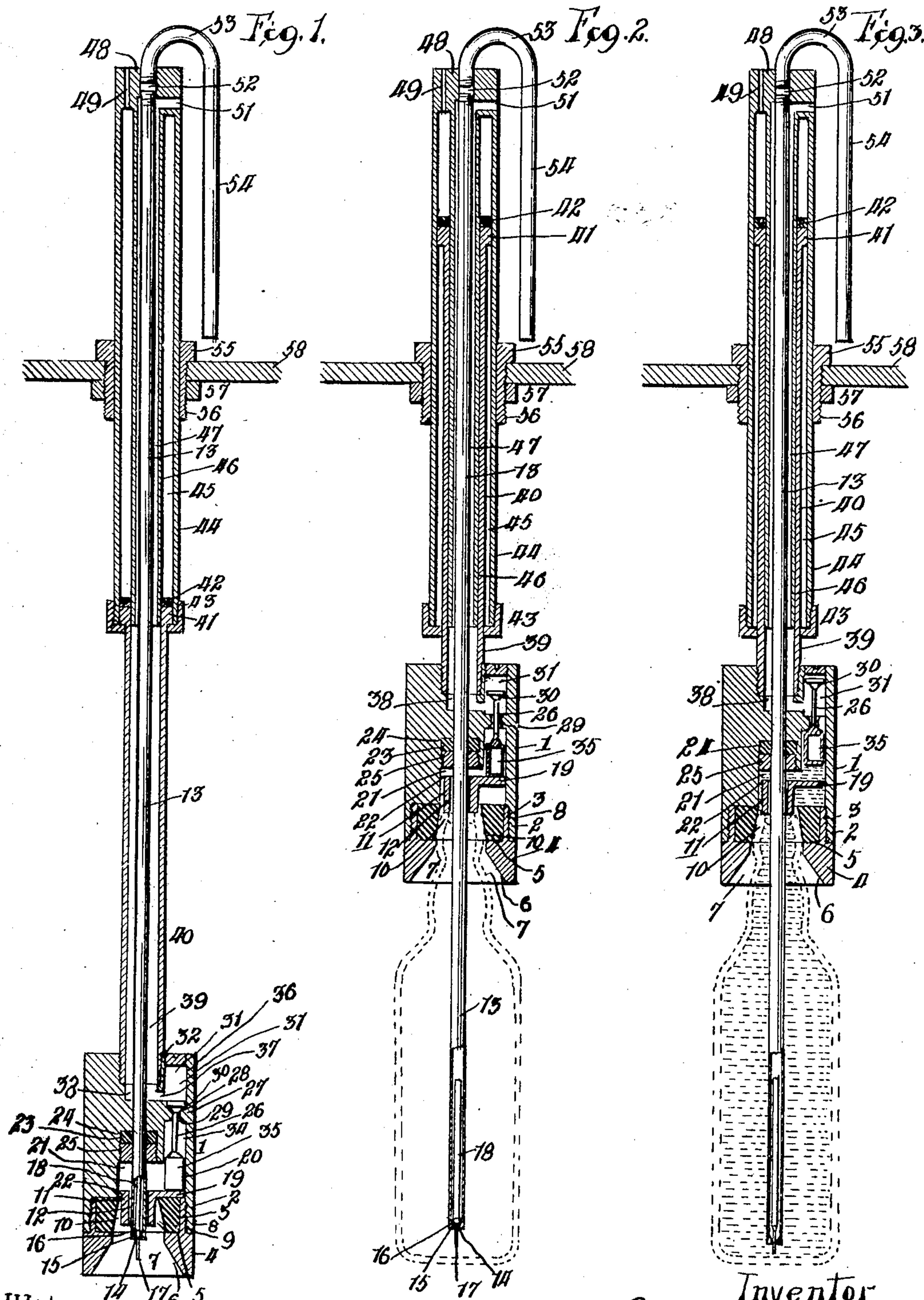
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SEALING HEAD FOR FILLING TUBES FOR LIQUIDS.

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Witnesses

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# UNITED STATES PATENT OFFICE

ADOLPH SCHNEIDER, OF CHICAGO, ILLINOIS.

## SEALING-HEAD FOR FILLING-TUBES FOR LIQUIDS.

No. 878,242.

Specification of Letters Patent.

Patented Feb. 4, 1908.

Application filed April 26, 1907. Serial No. 370,411.

*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 Sealing-Heads for Filling-Tubes for Liquids, of which the following is a specification.

The bottling or packaging of liquids, particularly liquids containing carbonic acid gas under pressure, necessitates the equalization of the pressure between the tank containing the liquid and the to-be filled bottle or package. The sealing of the mouth or end of the bottle should be perfect and complete, and furthermore, the escape of the liquid, through the sealing head, into the pressure supplying tube, should be avoided.

The object of the present invention is to construct a sealing head for a filling tube which will enable a perfect and complete seal to be obtained for the mouth of the bottle or package and which, at the same time, will prevent the flow of the liquid into the pressure supply tube; to construct a sealing head having a gasket or cushion, for sealing the mouth or end of the bottle or package, and a chamber for receiving pressure thereinto, and controlled by a positively raised valve for admitting pressure, and an automatically raised valve for closing the chamber against the admission of liquid to the pressure supply tube; to construct a sealing head for a liquid supply tube with a movable sleeve and arm operated by the insertion of a bottle, and serving to raise a valve for admitting pressure to a chamber in the sealing head, and equalizing the pressure between the filling tank and the to-be filled package or bottle; to construct a sealing head movable on a fixed filling tube for liquid, and having a chamber for receiving pressure, and a valve positively raised for admitting pressure to the chamber, in equalizing the pressure between the bottle or package and the filling tank; to construct a sealing head slidable on a fixed liquid supply tube and packed around the tube, and having a sleeve with a lateral arm for operating a valve controlling the induction and education of pressure from a chamber in the sealing head; and to improve generally the construction and arrangement of the several parts or elements entering into the formation

of the sealing head as a whole, and its use with a pressure supply tube and a liquid supply tube.

The invention consists in the features of construction and combinations of parts hereinafter described and claimed.

In the drawings illustrating the invention, Figure 1 is a sectional elevation of the sealing head, the pressure supply tube, and the fixed supporting tube, with the liquid supply tube partly in section and partly in full elevation, and showing the sealing head in its normal or at rest position; Fig. 2 a similar view to Fig. 1, showing, however, the sealing head and the slidable tube therefor partly raised or elevated, for opening the sealing head and inducting and educting pressure into and from the bottle, shown by dotted lines, with the liquid tube closed against the discharge of liquid; and Fig. 3 a similar view to Fig. 1, with the sealing head and the slidable tube therefor raised or elevated, and with the liquid tube entered into the bottle, shown by dotted lines, so as to open the valve at the lower end of the liquid tube, for discharging liquid into the bottle, and showing the controlling valve for inducting and educting pressure closed by the admission of liquid to the chamber of the sealing head.

The construction of sealing head of the present invention has a head 1, terminating, at its lower end, in an annular flange 2, forming a recess and having an interior screw thread for the flange. The head has, entered into the flange 2 at its lower end, a neck 3 of an annular ring 4, having a shoulder 5, on its upper side, and a tapered or inclined face 6 on its inside, the face forming an opening 7, for the entering thereinto of the mouth or upper end of the bottle or package.

The neck or flange 3, with the shoulder 5, and the under face of the head 1, form a recess to receive a sealing gasket or cushion 8, having an inclined or tapered face 9, which forms a tapering hole 10, through the sealing gasket or cushion, in line with the end of the bottle or package, when inserted in position for filling.

A sleeve 11 lies within the opening 10, when the parts are in normal position, as shown in Fig. 1, and this sleeve has a central hole for the passage of the lower end of a fixed supply tube for liquid, which hole forms



a space or passage 12 around the lower end of the filling tube. The filling tube 13 is of any suitable construction, and when the sealing head is normal, or at rest, the lower end of the filling tube lies within the opening 7 of the sealing head, in the construction shown, and, as shown, the lower or discharge end of the filling tube has a discharge port 14, surrounded by a valve seat 15, with which co-acts a valve 16 on a stem 17, and, as shown, a weight 18 extends upwardly from the valve in the interior of the filling tube, which weight serves to return the valve to its closed position, and to hold the valve in its closed position.

The slidable sleeve 11 has, on one side, a laterally extending arm 19, which is free to move in a lateral extension 20, of a chamber 21, in which the sleeve can be raised for opening the controlling valve and inducting and educting pressure into and from the chamber 21, in the operation of the sealing head. The slidable sleeve 11, as shown, does not quite fill the diameter of the chamber 21, leaving a space or passage 22, between the wall of the chamber and the outer face of the slidable sleeve, through which space, as well as through the space or passage 12, pressure between the filling tank and the bottle is free to be inducted and educted, and in addition, the spaces 12 and 22 allow liquid to flow into the chamber 21, when the bottle or package is filled; but if desired, either one of the spaces or passages, 12 and 22, could be omitted and one space or passage be made to serve the office of inducting and educting the pressure. A chamber 23 extends upwardly from the chamber 21, and has entered thereinto a packing ring 24, compressed by a ring nut or follower 25, so as to make a tight close joint around the filling tube against the escape of pressure and liquid from the chamber 21 in the operation of the sealing head.

A chamber 26 extends upwardly from the lateral continuation 20 of the chamber 21, and terminates in a cross wall 27, having a port 28, with a valve seat 29 around the port in the under face of the cross wall, and a valve seat 30 around the port in the upper face of the cross wall, and the port opens into a chamber 31 in the head 1, which chamber is closed by a plug 32 screw threaded, or otherwise entered into the head.

A float 33 is located and operates in the lateral extension 20 of the chamber 21 and the vertical chamber 26, and this float 33 carries a valve stem 34 having, at its lower end, a valve 35, to coact with the valve seat 29, and having, at its upper end, a valve 36, to coact with the valve seat 30, for opening and closing the port against the passage of pressure and liquid through the port, according to the position of the float. A lateral port 37 leads from the chamber 31 into a

chamber 38, formed in the end of the head 1, into which chamber pressure is admitted in inducting and educting pressure between the tank and the to-be filled bottle or package.

The sealing head, of the present invention, is adapted for, and intended to be used with any suitable arrangement of filling tube and pressure supply tube. The arrangement shown has a passage 39, in an endwise slidable tube 40, which passage is in direct communication with the chamber 38 of the head, and serves as a conducting passage for pressure. The endwise slidable tube 40, at its upper end, has a head 41, with a packing ring 42, forming a piston, which piston is located within the interior of a fixed supporting tube, the lower end of which supporting tube has a coupling 43, formed of an annular wall and an end wall, through which end wall the body of the tube 40 is free to slide.

The fixed supporting tube 44 furnishes a chamber or passage 45, between its interior face and the exterior face of a fixed tube 46, the lower end of which, when the parts are in normal position, or at rest, projects into the passage of the endwise slidable tube 40; and the fixed central tube 46 encircles the fixed liquid supply tube 13, so as to furnish a space or passage 46, for conducting pressure.

The upper end of the fixed supporting tube 44 is closed by a plug 48, having a passage 49, for admitting pressure into and escaping pressure from the chamber 45, so that the admitted pressure will act against the piston on the endwise slidable tube 40, and return such tube to normal position, as shown in Fig. 1, and the pressure will escape from the chamber 45, through the passage 49, with the raising or elevating of the endwise slidable tube, from the inserting of the bottle into the sealing head into position, for equalizing the pressure and receiving the liquid.

The plug and the wall of the fixed supporting tube, have a lateral passage 51 communicating with the interior of the tank above the liquid in the tank, as does also the passage 49 in the plug. The plug 48 has a central hole or passage 52, into which is entered the upper end of the liquid supply tube 13, also the curved end 53 of a siphon tube having a leg 54, by means of which the liquid can be siphoned from the filling tank into the liquid supply tube, for discharge into the bottle or package.

The construction shown has, around the exterior of the tube or casing 44, a flange 55, with a neck 56 having a screw threaded exterior, and receiving a ring nut 57, by means of which the supporting tube or casing 44 is fixedly attached to the wall of the tank, for the lower portion to extend below the wall of the tank, and the upper portion to lie within the tank, as does also the upper portion of the fixed liquid supply tube and the



center guide tube, both of which are suspended, or carried, by the plug 48 at the upper end of the fixed supporting tube.

The present invention relates solely to the construction and operation of the sealing head, and such operation is all that need be specifically described, it being understood that the filling tube, the endwise slidable carrying tube of the sealing head, and the pressure supply tube, and the manner of supporting the various tubes, can be varied or changed, so long as the arrangement of the tubes is such as to enable liquid to be discharged into the bottle or package and the pressure to be equalized between the filling tank and the bottle or package through the sealing head.

The operation of the sealing head will be understood from the foregoing description, but briefly is as follows: The sealing head is shown in Fig. 1 in normal position for receiving a bottle or package, and in normal position the sleeve 11, with its lateral arm 19, is down, with the float 33 resting on, or in adjacent relation to the lateral arms. The float 33, with the valve stem 34, are in their lower position, and the valve 36 seats against the face 30, closing the port 28, and shutting off the flow of pressure into the chamber 21 from the filling tank. The valve 16 is seated against the face 15, of the port 14, shutting off the flow of liquid through the filling tube from the filling tank. The neck end of the bottle is inserted into the opening 10 of the sealing gasket or cushion 8, so as to seal the mouth of the bottle against the escape of pressure and liquid around the exterior of the neck, and the act of fully inserting the neck end of the bottle, in position to be encircled by the sealing gasket or cushion, raises the slidable sleeve or collar 11, with its lateral arm 19, into the position shown in Fig. 2. The raising of the slidable sleeve or collar, with its lateral arm, as shown in Fig. 2, raises the float 33, and with it the stem 34, and the valves 35 and 36, for the valve 36 to clear its seat 30 and open the port 28, for free communication between the upper side chamber 31 and the lower side chamber 26, for pressure to flow through the space or passage 39, into the receiving chamber 38, and through the lateral port 37, into the chamber 31, and pass through the port 27, into the chamber 32, and escape into the chamber 21, to discharge from the chamber 21, through the passage 12, or the passage 22, into the bottle or package, equalizing the pressure between the filling tank and the bottle or package. The further or continued elevation of the bottle or package, with its neck end in the opening therefor of the sealing gasket or cushion, causes the stem 17 of the valve 16, to strike the bottom of the bottle or package,

and open the port 14, for liquid to discharge into the bottle from the filling tank, filling the bottle with liquid against the counter pressure, or equalized pressure, between the bottle or package and the filling tank. The continued rise of the liquid within the bottle or package forces out the pressure which escapes into the chamber 21, and flows into the chamber 26, passing through the port 28 into the chamber 31, and entering the chamber 38 from the lateral port 37, to return, by the passage 39, to the filling tank. The liquid, after the bottle has been filled to its full capacity, escapes through the passages 12 and 22, or either one of said passages, into the chamber 21, and as the liquid rises in the chamber 21, it will cause the float 33 to rise for the valve 35 to seat against the valve seat 29 and close the port 28, shutting off the flow of liquid through the port and the consequent filling of the pressure supply passage between the filling tank and the sealing head, thus insuring safety against liquid entering the pressure supply passage. The liquid discharged into the chamber 21 will flow back into the bottle, as the bottle is withdrawn from the filling tube, and the capacity of the chamber, when the float is raised, should be sufficient to contain the amount of liquid required to completely fill the bottle or package when the bottle or package is withdrawn from the filling tube.

The sealing head, of the present invention, effectually and positively seals the mouth of the bottle for effecting an equalized pressure between the filling tank and the bottle or package, and against the escape of pressure and liquid in filling the bottle; and the entering of the neck end of the bottle into the sealing gasket or cushion raises the slidable collar or sleeve and the lateral arm, for the arm to raise the float and open the connecting port between the upper and lower side chamber, for admitting pressure from the tank to the bottle or package, thus equalizing pressure between the tank and the bottle or package, and with the further elevation of the bottle the filling tube is entered into the bottle or package, for the stem of the controlling valve, at its discharge end, to engage the bottom of the bottle or package, and open the controlling valve, permitting liquid to flow into the bottle, and with the complete filling of the bottle, and the overflow of the liquid into the chamber above the sealing gasket or cushion, the float is raised so as to close the port between the upper and lower side chambers, shutting off the escape of pressure through the port, and preventing liquid from flowing through the port into the pressure supply passage between the filling tank and the sealing head. The sealing head of the present invention, furnishes a perfect and complete seal for the



end of the bottle or package, and, by the insertion of the end of the bottle or package into the sealing gasket or cushion, communication is established for admitting pressure to the bottle or package from the filling tank, for equalizing the pressure; and with the further raising of the bottle or package, liquid is discharged into the bottle or package, and serves as a medium for raising the float, and shutting off the flow of liquid into the pressure supply passage between the filling tank and the sealing head. It will thus be seen that with the sealing head of the present invention a perfect and absolute control of the pressure, and a complete stoppage of the liquid into the pressure supply passage is obtained, and this through the act of entering the bottle or package into filling position, and the overflow of the liquid from the bottle or package, making the control of the pressure and the liquid dependent solely on the insertion and withdrawal of the bottle or package.

While the sealing head is shown and described in connection with a fixed filling tube, it is to be understood that the sealing head could be used fixed instead of slidable, and the filling tube be made to slide in the sealing head, without in any manner changing the operation of the shut off for pressure and liquid. The induction and eduction chambers for the pressure, instead of being arranged as shown, at one side of the head, could be otherwise arranged, so long as the arrangement and construction would furnish chambers in communication with each other, and having the communication controlled by a valve, with the valve positively raised to open communication for admitting and educting pressure, and automatically raised by the inflow of liquid into the lower chamber to act on a float, or other device, by which the valve would be raised to prevent the outflow of liquid into the tube supplying pressure.

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

1. In a sealing head for filling tubes, the combination of a head having a central lower chamber, a lateral extension of the central lower chamber, an upper and lower side chamber in a common vertical plane with the lateral extension at one side of the central lower chamber, a lateral passage inwardly leading from the lower end of the upper side chamber, and an upper central chamber into which the lateral passage opens, and a float actuated valve controlling communication in both directions between the upper and lower side chambers, substantially as described.

2. In a sealing head for filling tubes, the combination of a head having a central lower chamber, a lateral extension of the central

lower chamber, an upper and lower chamber in a common vertical plane at one side of the central chamber, a lateral passage leading from the upper side chamber, and an upper central chamber into which the lateral passage opens, a slidable collar, an arm laterally extending from the sliding collar, with the collar and arm operative in the central lower chamber and its lateral extension, a float engaged by and initially raised by the lateral arm, a stem carried by the float, and a valve at each end of the stem controlling communication between the upper and lower side chambers, substantially as described.

3. In a sealing head for filling tubes, the combination of a head having a central lower chamber, a lateral extension of the central lower chamber, an upper and lower chamber in a common vertical plane at one side of the central chamber, a lateral passage leading from the upper side chamber, and an upper central chamber into which the lateral passage opens, a slidable collar, an arm laterally extending from the sliding collar, with the collar and arm operative in the central lower chamber and its lateral extension, a float engaged by and initially raised by the lateral arm, a stem carried by the float, a valve at each end of the stem, and a cross wall between the upper and lower side chambers and having a port controlled by the valves on the valve stem, substantially as described.

4. In a sealing head for filling tubes, the combination of a head having a central lower chamber, a lateral extension of the central lower chamber, an upper and lower chamber in a common vertical plane at one side of the central chamber, a lateral passage leading from the upper side chamber, and an upper central chamber into which the lateral passage opens, a slidable collar, an arm laterally extending from the sliding collar, with the collar and arm operative in the central lower chamber and its lateral extension, a float engaged by and initially raised by the lateral arm, a stem carried by the float, a valve at each end of the stem controlling communication between the upper and lower side chambers, and a filling tube extending through the head and encircled by the sliding collar, with a passage between the filling tube and the slidable collar, substantially as described.

5. In a sealing head for filling tubes, the combination of a head having a central lower chamber, a lateral extension of the central lower chamber, an upper and lower chamber in a common vertical plane at one side of the central chamber, a lateral passage leading from the upper side chamber, and an upper central chamber into which the lateral passage opens, a slidable collar, an arm laterally extending from the sliding collar, with the collar and arm operative in the central lower chamber and its lateral extension



sion, a float engaged by and initially raised by the lateral arm, a stem carried by the float, a valve at each end of the stem controlling communication between the upper and lower side chambers, and a pressure supply tube having a passage in communication with the upper central chamber of the head, substantially as described.

6. In a sealing head for filling tubes, the combination of a head having a central lower chamber, a lateral extension of the central lower chamber, an upper and lower chamber in a common vertical plane at one side of the central chamber, a lateral passage leading from the upper side chamber, and an upper central chamber into which the lateral passage opens, a slidable collar, an arm laterally extending from the sliding collar, with the collar and arm operative in the central lower chamber and its lateral extension, a float engaged by and initially raised by the lateral arm, a stem carried by the float, a valve at each end of the stem controlling communication between the upper and lower side chambers, a filling tube extending through the head and encircled by the sliding collar, with a passage between the filling tube and the slidable collar, and a pressure supply tube having a passage in communication with the central upper chamber of the head, substantially as described.

7. In a sealing head for filling tubes, the combination of a head having a central lower chamber, a lateral extension of the central lower chamber, an upper and lower chamber in a common vertical plane with the lateral extension at one side of the central chamber, a lateral passage inwardly leading from the upper side chamber, and an upper central

chamber into which the lateral passage opens, a float actuated valve controlling communication in both directions between the upper and lower side chambers, and a sealing gasket carried by the sealing head and engaging and sealing the entered end of a bottle, substantially as described.

8. In a sealing head for filling tubes, the combination of a head having an upper central and lower central chamber for inducting and educting pressure, an upper and lower side chamber in communication respectively with the upper and lower central chambers and with each other, and a valve controlling communication between the two side chambers, said valve positively raised by the insertion of a bottle, to open communication and automatically raised by the admission of liquid to close communication between the two chambers, substantially as described.

9. In a sealing head for filling tubes, the combination of a head having an upper central and lower central chamber, an upper and a lower side chamber in communication respectively with the upper and lower central chambers and with each other, for inducting and educting pressure, a valve controlling communication between the two side chambers, a float carrying the valve, and means for positively raising the valve by the insertion of the bottle, for opening communication between the two side chambers and the upper and lower central chambers, substantially as described.

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Witnesses:

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