

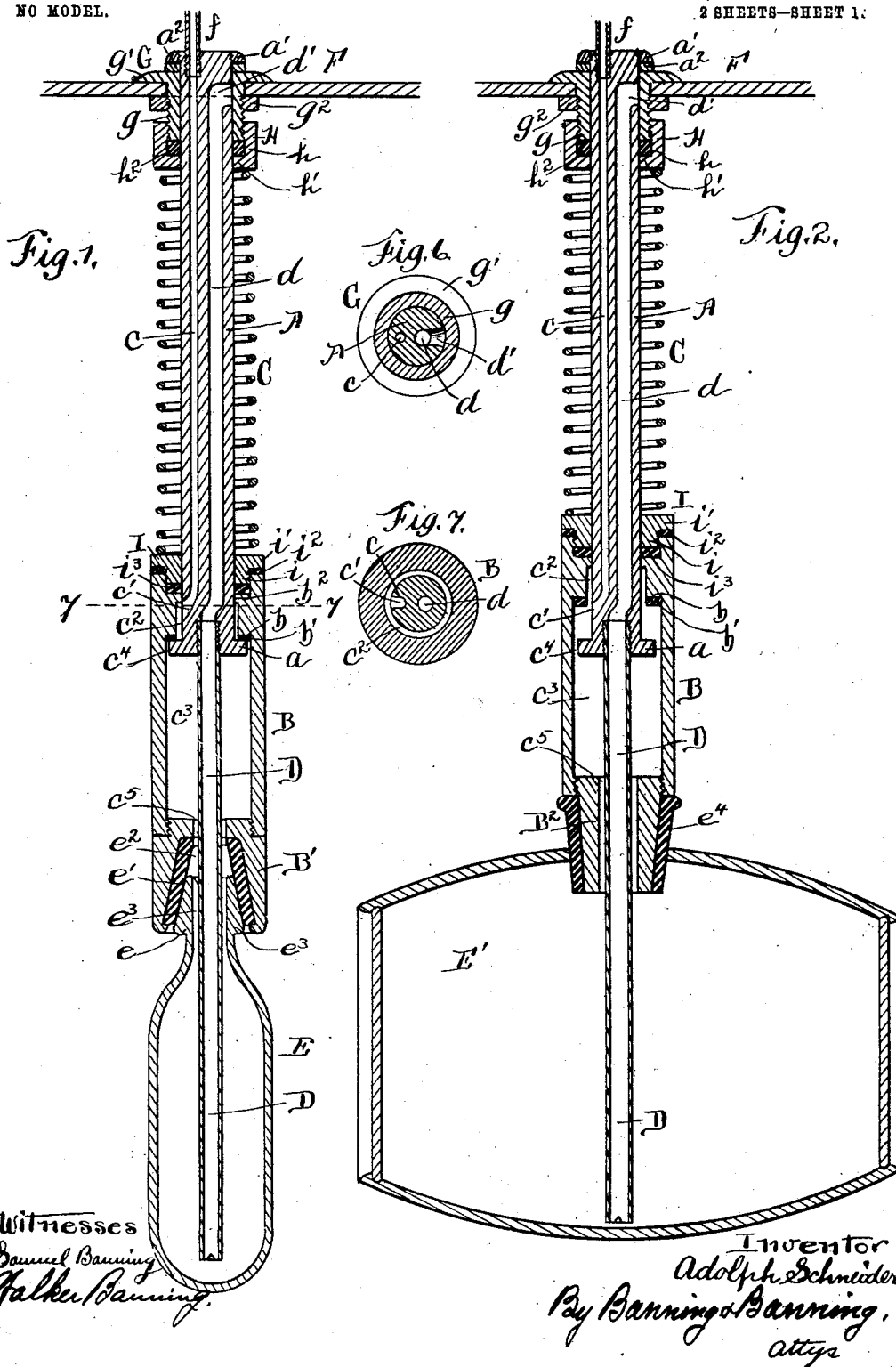
No. 762,442.

PATENTED JUNE 14, 1904.

A. SCHNEIDER.
FILLING TUBE FOR LIQUIDS.
APPLICATION FILED JUNE 15, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

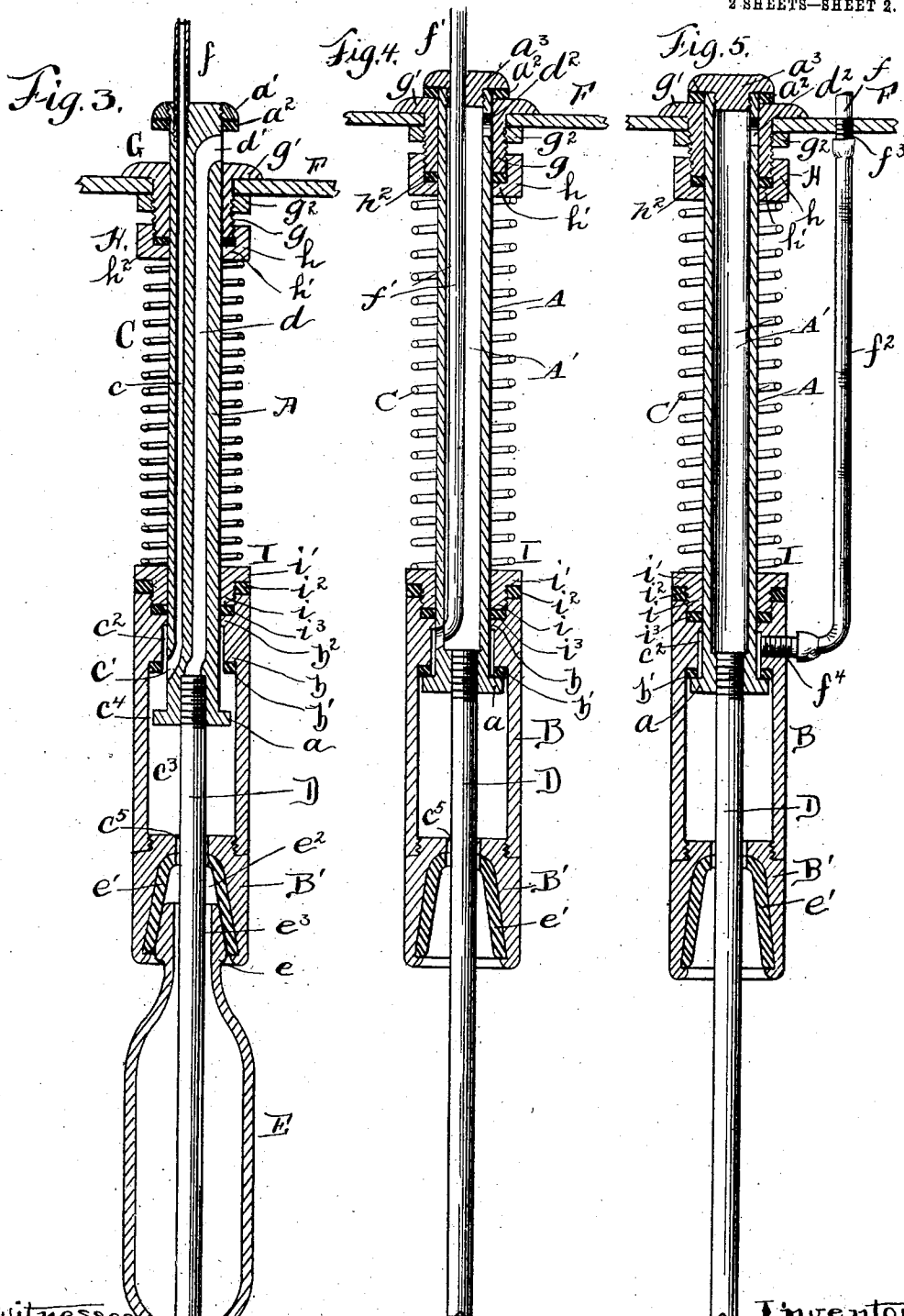


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UNITED STATES PATENT OFFICE.

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FILLING-TUBE FOR LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 762,442, dated June 14, 1904.

Application filed June 15, 1903. Serial No. 161,474. (No model.)

To all whom it may concern:

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

This invention relates to filling-tubes for use in filling bottles, jugs, kegs, barrels, and other packages with liquid under an equalized pressure between the tank containing the liquid and the package to be filled therewith.

The objects of the invention are to construct a sectional filling-tube the lower section of which is slidable on the upper section, with the two sections so arranged and operating that the initial upward movement of the lower section vents pressure from the filling-tank into the package, equalizing the pressure between the tank and the package before the admission of liquid from the tank into the package and with the full admission of the liquid-supply tube into the package for its lower end to contact the bottom of the package, have the upward movement of the package raise both sections of the filling-tube and open the liquid-passage for the liquid to flow through the liquid-supply tube into the package, to hold the two sections of the filling-tube under a yielding force which will allow the lowermost section to be raised without raising the uppermost section for first venting pressure from the filling-tank into the package, to automatically actuate both sections of the filling-tube, to equalize the pressure and supply the liquid by elevating the to-be-filled package after it is connected with the filling-tube, to enable the two sections of the filling-tube to control in and of themselves the admission of pressure and liquid into the to-be-filled package, and to improve generally the construction and operation 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 filling-tube of the invention, showing the use thereof in connection with a

bottle with the pressure-passage and the liquid-passage closed; Fig. 2, a sectional elevation of the filling-tube of the invention, showing the use thereof in connection with a keg or barrel with the pressure-passage open and the liquid-passage closed; Fig. 3, a sectional elevation of the filling-tube of the invention, showing the use thereof in connection with a bottle with the pressure-passage and the liquid-passage both open; Fig. 4, a sectional elevation showing a modification in the arrangement of the pressure-passage and the liquid-passage; Fig. 5, a sectional elevation showing a modification in the arrangement of the pressure-passage and the liquid-passage, the pressure-passage being outside of the tube as a whole; Fig. 6, a cross-section on the line of the exterior of the filling-tank, taken through the filling-tube; and Fig. 7, a cross-section on line 7 of Fig. 1.

The construction shown in Figs. 1, 2, 3, 6, and 7 has a tube A, constituting the upper section of the filling-tube, and a tube or casing B, constituting the lower section of the filling-tube, with the tube or casing B free to slide on the exterior of the tube A in the operation of filling the package. The tube A at its lower end has thereon a flange *a*, and its upper end has threaded thereunto a ring-nut *a'* to permit of the insertion of the tube A into the tank containing the liquid. The tube or casing B has at its upper end a shoulder or abutment *b* to coact with the flange *a* to limit the downward movement of the tubular casing B, and, as shown, between the flange *a* and the shoulder or abutment *b* is a packing *b'* to insure a tight joint at that point when the tube and the casing B is down.

A coiled spring C encircles the tube A, which spring serves to force down the tube or casing B, and at the same time allows the tube or casing B to slide upward on the tube A, as hereinafter described. A supply-tube D is threaded into the lower end of the tube A and extends through and projects beyond the lower end of the tube or casing B and is of sufficient length for its lower end to contact the bottom of the package to be filled. The tube A has therein a longitudinal passage *c* for the flow of pressure through the tube, and this tube A

also has therein a longitudinal passage d , the lower end of which is in communication with the supply-tube D and the upper end of which opens through the wall of the tube A by a port d' . The lower end of the pressure-passage c opens through the wall of the tube A by a port c' , which when the tube or casing B is down is in communication with an annular passage c'' between the exterior of the tube A and the wall of the shoulder b , which passage c'' is closed tight by the packing b' , so that pressure cannot escape until the tube or casing B is raised, as shown in Fig. 2. The flange a is located in a chamber c^3 of the tube or casing B, and this flange is of a less diameter than the interior diameter of the chamber, so as to leave a passage c^4 , by which pressure flowing through the passage c can enter the chamber c^3 when the tube or casing B is raised, as shown in Fig. 2, and when the tube or casing B is raised the pressure is free to flow from the chamber c^3 , through a passage c^5 , around the filling-tube D into the to-be-filled package. As shown in Figs. 1 and 3, a bottle E is the to-be-filled package, and, as shown in Fig. 2, a barrel or keg E' is the to-be-filled package. The tube or casing B at its lower end is in the form of a plug B', screw-threaded into the tube or casing B, and this plug B', for use with a bottle, has a tapered opening or chamber therein which receives a packing e' , against which the end e of the bottle impinges and fits snugly, so as to make a tight joint against the escape of pressure flowing through the passage c^5 , which pressure when the bottle is in place enters the chamber or opening e'' of the packing e' and flows into the bottle through the passage e^3 between the supply-tube and the mouth or opening of the bottle. The bottle is entered onto the supply-tube D, with its neck or head end e fitting snugly within the packing e' , and when entered the raising of the bottle carries with it the tube or casing B, raising the tube or casing to open the port c' below the passage c'' for the pressure to escape in the chamber c^3 through the passage c^4 and enter the bottle, equalizing the pressure between the tank containing the liquid and the bottle. The construction shown in Fig. 2 has the packing e' , encircling a tapered plug B', threaded into the lower end of the tube or casing B, which packing enters the bung-hole of the barrel or keg, making a tight joint, so that pressure can enter the barrel or keg without escaping therefrom, the pressure flowing into the barrel or keg from the passage c , through the port c' into the chamber c^3 , through the passage c^4 , and from the chamber flowing into the barrel or keg through the passage c^5 around the supply-tube. The bottom of a filling-tank F is all that is shown, it not being deemed necessary to show a filling or liquid containing tank, as such tank can be of any usual and well-known form of construction having its lower portion adapted for contain-

ing liquid and its upper portion forming a chamber for the pressure. The end of the tube A has threaded therein in the construction shown in Figs. 1, 2, and 3 a tube f , the upper end of which communicates with the pressure-chamber of the tank F, so that pressure can flow from the chamber through the tube f into the passage c to discharge into the package to be filled with liquid. A bushing G is entered into the wall of the liquid-containing tank, which bushing has a wall g screw-threaded on its exterior and an annular rim g' fitting against the face of the wall of the tank, and, as shown, the bushing is held in place by a ring-nut g^2 , threaded on the wall of the bushing, clamping the bushing firmly in place. A packing a^2 is located around the upper end of the tube A between the ring-nut a' and the face of the rim g' , which packing forms a tight joint against leakage of the liquid at that point. A cap-nut or follower-nut H, having a side wall h and an end wall h' , is entered onto the tube A with the side wall threaded onto the wall g of the bushing, and between the end of the bushing and the end wall h' of the cap-nut H is a packing h^2 , making a tight joint around the tube A at this point. A plug-nut or follower I, having a body i and a flange i' , is threaded into the end of the tube or casing B, and between the end face of the tube or casing and the flange i' is a packing i^2 , and between the end face of the body i and the shoulder b^2 of the tube or casing is a packing i^3 , by means of which packings a tight joint is assured around the filling-tube and between the tube A and the tube or casing B against the escape of pressure. The spring C at its upper end abuts against the cap-nut H and at its lower end abuts against the plug-nut I in the arrangement shown.

The parts entering into the construction shown in Figs. 1, 2, 3, 6, and 7 are assembled by entering the tube A through the plug-nut I and the tube or casing B, for which purpose the end plug B' is removed, so that the tube A, with its flange a , can be entered into place with the flange a within the chamber c^3 of the tube or casing B, after which the plug B' is threaded into the tube or casing B and the plug-nut I is screwed to place, completing the attachment of the tube or casing B to the tube A. The spring C is entered onto the tube A and the cap-nut H is entered onto the tube A, and the end of the tube is passed through the bushing G, which has been attached to the bottom of the tank F, after which the cap-nut H is screwed to place and the ring-nut a' is entered on the end of the tube A, it being understood that the various packings a^2 , b' , h^2 , i^2 , and i^3 have been placed in position so as to be compressed by the action of the ring-nut a' , cap-nut H, and plug-nut I. The pressure-supply tube f is threaded into the end of the tube, which completes the

assembling of the filling-tube as a whole ready for use.

In use for filling a bottle the head or neck end of the bottle is entered into the opening of the packing d' , so that a tight joint is formed around the end of the bottle. The bottle is then raised sufficiently for the passage c^2 to be raised above the port c' , which opens the passage c for pressure to flow from the chamber of the tank F through the pipe f , passage c , port c' , and passage c^4 into the chamber c^3 and to flow from the chamber c^3 through the passage c^5 into the chamber or opening c^2 and enter the bottle through the passage c^3 , equalizing the pressure between the tank and the bottle. The upward movement of the package or the bottle is continued until the lower end of the filling-tube D strikes the bottom of the bottle, and when the end of the filling-tube engages with the bottom of the bottle a further upward movement of the bottle raises the tube or casing B and the tube A for the upward movement of the tube A to raise the port d' above the face of the flange g' of the bushing, opening the passage d through the port d' to the admission of liquid, which flows from the tank through the passage d and supply-tube D into the bottle, filling the bottle with the liquid. The liquid as it rises in the bottle forces the pressure therefrom back into the tank through the passage c^3 , chamber or opening c^2 , passage c^5 , chamber c^3 , passage c^4 , port c' , passage c , and tube f , with the result that the liquid flows into the bottle under an equalized pressure until the bottle is filled, thus preventing foaming and wastage of the liquid. After the bottle is filled the force by which it is held in its raised position is removed, allowing the spring C to act and force back or down the tube or casing B, closing the port c' and preventing the escape of pressure and also returning the tube A, closing the port d' , and stopping the flow of liquid through the passage d into the bottle, and with the parts returned to normal position, as shown in Fig. 1, the bottle can be removed and will still be under sufficient pressure to prevent foaming when removed and stoppered or corked. A new bottle is entered into the packing d' , and the parts are again operated, as above described, by raising the bottle to open the pressure-passage and equalize the pressure and by raising the bottle still farther to open the liquid-passage for the admission of liquid, and when filled the bottle can be removed. The operation can be continued until the required number of bottles have been filled. The operation with a barrel or keg is the same as described for filling bottles so far as concerns the equalizing of pressure and the admission of liquid by first raising the tube or casing B to equalize the pressure and then raising the tube or casing B and the tube A to admit the liquid.

The construction shown in Fig. 4 differs

from the construction shown in Figs. 1, 2, and 3 in having a liquid-passage A' of greater diameter than the liquid-passage d and in having a pressure-tube f' , which passes through the liquid-passage A' with its lower end in communication with a port leading through the wall of the tube A into the passage c^2 when the parts are in normal position. The tube f' passes through a plug-nut a^3 , threaded into the end of the tube A, and a port d'' furnishes communication between the interior of the tank F and the passage A' when the tube A is raised. The operation of the filling-tube shown in Fig. 4 so far as concerns the equalizing of pressure and the admission of liquid is the same as described for the construction of filling-tube shown in Figs. 1, 2, and 3. The construction of filling-tube shown in Fig. 5 is practically the same as the construction shown in Fig. 4, except that instead of having a pressure-supply tube f' within the liquid-passage A' of the tube A a pressure-fluid-supply tube f^2 in the form of a hose or other suitable pipe is used, one end of the hose or pipe f^2 being attached to a nipple f^3 in the tank F and the other end being attached to a nipple f^4 , entered through the wall of the tube or casing B to communicate with the passage c^2 . The operation of the filling-tube as a whole (shown in Fig. 5) is the same as the operation of the filling-tube shown in Figs. 1, 2, and 3 so far as concerns the equalizing of pressure and the admission of liquid to the package.

The filling-tube of my invention is simple in construction, but will be found effective and reliable in use. The making of the tube in two sections, one sliding on the other, enables an initial movement to be obtained by which a free passage for pressure to enter the package and equalize the pressure between the tank and the package and this without opening the filling-tube for the admission of liquid, and when the pressure is equalized both sections of the filling-tube can be moved as one, opening the liquid-passage without closing the pressure-passage. The movements of both sections of the filling-tube are dependent on the upward movement of the package to be filled, so that when the package is in place and raised assurance is had that the pressure will be first equalized before the liquid is admitted, and with the equalization of pressure the liquid is admitted. The lower section of the filling-tube controls the admission of pressure, and the upper section of the filling-tube controls the admission of liquid, so that the control of the pressure and the liquid are each independent of the other and at the same time both are dependent on the movements of the filling-tube as a whole, and after a package has been filled the removal of the package insures the closing of both the pressure-supply passage and the liquid-supply passage, making the control of the two passages

in opening and closing both positive and dependent on the entering of the package into filling position and the removal of the package after being filled.

5 It will be seen that the passage *c*, the pipe *f*, and the hose *f*² each form a conduit for the transmission of pressure from the chamber containing the fluid-pressure to enter the to-be-filled package and that in each instance this
10 conduit is wholly independent of and has no connection with the liquid-passage of the filling-tube. The conduit no matter in what way arranged or how formed opens into a chamber
15 or annular passage in the lower tube or casing, so that with the raising of the lower tube or casing a free exit for the supply-pressure is obtained, which exit is under the control of the lower section of the filling-tube as a whole.

20 What I regard as new, and desire to secure by Letters Patent, is—

1. In a filling-tube for liquids, the combination of a slidable primary tube having therein a passage for liquid, a conduit for fluid-pressure, and a second tube slidable on the slid-
25 able primary tube and into the interior of which the fluid-pressure conduit opens exteriorly of the slidable primary tube for controlling the flow of fluid-pressure into and out
30 from the conduit or passage therefor, substantially as described.

2. In a filling-tube for liquids, the combination of a slidable primary tube having therein a passage for liquid, a conduit for fluid-pressure, a second tube slidable on the slidable primary tube and into the interior of which the fluid-pressure conduit opens exteriorly of the
35 slidable primary tube for controlling the flow of fluid-pressure into and out from the conduit therefor, a liquid-discharge tube extending through the second tube and having communication with the liquid-passage of the slidable primary tube, and a spring encircling the slid-
40 able primary tube and bearing against the slidable second tube, substantially as described.

3. In a filling-tube for liquids, the combination of a slidable primary tube having therein a passage for fluid-pressure and a passage for liquid, a second tube slidable on the slidable
50 primary tube and into the interior of which the fluid-pressure passage opens exteriorly of the slidable primary tube for controlling the outflow of pressure into and out from the fluid-pressure passage therefor, substantially as described.
55

4. In a filling-tube for liquids, the combination of a slidable primary tube having therein a passage for fluid-pressure and a passage for liquid, and a second tube slidable on the slid-
60 able primary tube and into the interior of which the fluid-pressure passage opens exteriorly of the slidable primary tube for controlling the outflow of pressure into and out from the fluid-pressure passage therefor, and
65 a spring encircling the slidable primary tube

and bearing against the slidable second tube, substantially as described.

5. In a filling-tube for liquids, the combination of a slidable primary tube having therein a passage for fluid-pressure and a passage for
70 liquid, a second tube slidable on the slidable primary tube and into the interior of which the fluid-pressure passage opens exteriorly of the slidable primary tube for controlling the outflow of pressure into and out from the fluid-
75 pressure passage therefor, a spring encircling the slidable primary tube and bearing against the slidable second tube, and a liquid-discharge tube extending through the second tube or casing and in communication with the liquid-
80 passage of the slidable primary tube, substantially as described.

6. In a filling-tube for liquids, the combination of a slidable upper tube having a head at its top end and having therein a passage for
85 fluid-pressure opening through the head of the tube with a port at its lower end opening through the wall of the tube and a passage for liquid with a port at its upper end opening through the wall of the tube, and a lower tube
90 or casing slidable on the upper tube and into the interior of which the fluid-pressure passage opens at its lower end exteriorly of the slidable upper tube for controlling the flow of pressure through the upper tube, substan-
95 tially as described.

7. In a filling-tube for liquids, the combination of a slidable upper tube having a head at its top end and having therein a passage for fluid-pressure opening through the head of
100 the tube with a port at its lower end opening through the wall of the tube and a passage for liquid with a port at its upper end opening through the wall of the tube, a lower tube or casing slidable on the upper tube and into
105 the interior of which the fluid-pressure passage opens at its lower end exteriorly of the slidable upper tube for controlling the flow of pressure through the upper tube, a spring encircling the upper tube and bearing against
110 the lower tube, a liquid-discharge pipe in communication with the liquid-passage of the slidable upper tube and extending through the lower tube, and a packing carried by the bottom end of the lower tube, substantially as
115 described.

8. In a filling-tube for liquids, the combination of a slidable upper tube having a head at its top end and having therein a passage for fluid-pressure opening through the head of
120 the tube with a port at its lower end opening through the wall of the tube and a passage for liquid with a port at its upper end opening through the wall of the tube, a lower tube or casing slidable on the upper tube and into
125 the interior of which the fluid-pressure passage opens at its lower end exteriorly of the slidable upper tube for controlling the flow of pressure through the upper tube, a spring encircling the upper tube and bearing against
130

the lower tube, a liquid-discharge pipe in communication with the liquid-passage of the slidable upper tube and extending through the lower tube, a packing carried by the bottom end of the lower tube, and a fluid-pressure-supply discharge-pipe in communication with the head end of the pressure-passage of the upper tube, substantially as described.

9. In a filling-tube for liquids, the combination of a slidable upper tube having a head at its top end and having therein a passage for fluid-pressure opening through the head of the tube with a port at its lower end opening through the wall of the tube and a passage for liquid with a port at its upper end opening through the wall of the tube, a lower tube or casing slidable on the upper tube and into the interior of which the fluid-pressure passage opens at its lower end exteriorly of the slidable upper tube for controlling the flow of pressure through the upper tube, a spring encircling the upper tube and bearing against the lower tube, a liquid-discharge pipe in communication with the liquid-passage of the slidable upper tube and extending through the lower tube, a packing carried by the bottom end of the lower tube, and a bushing in which the upper tube is slidable for controlling the liquid-passage in the upper tube, substantially as described.

10. In a filling-tube for liquids, the combination of a slidable upper tube having a head at its top end and having therein a passage for fluid-pressure opening through the head of the tube with a port at its lower end opening through the wall of the tube and a passage for liquid with a port at its upper end opening through the wall of the tube, a lower tube or casing slidable on the upper tube and into the interior of which the fluid-pressure passage opens at its lower end exteriorly of the slidable upper tube for controlling the flow of pressure through the upper tube, a

spring encircling the upper tube and bearing against the lower tube, a liquid-discharge pipe in communication with the liquid-passage of the slidable upper tube and extending through the lower tube, a packing carried by the bottom end of the lower tube, a bushing in which the upper tube is slidable for controlling the liquid-passage in the upper tube, and a cap-nut with a packing around the upper tube and entered onto the bushing, substantially as described.

11. In a filling-tube for liquids, the combination of a slidable upper tube having a head at its top end and having therein a passage for fluid-pressure opening through the head of the tube with a port at its lower end opening through the wall of the tube and a passage for liquid with a port at its upper end opening through the wall of the tube, a lower tube or casing slidable on the upper tube and into the interior of which the fluid-pressure passage opens at its lower end exteriorly of the slidable upper tube for controlling the flow of pressure through the upper tube, a spring encircling the upper tube and bearing against the lower tube, a liquid-discharge pipe in communication with the liquid-passage of the slidable upper tube and extending through the lower tube, a packing carried by the bottom end of the lower tube, a bushing in which the upper tube is slidable for controlling the liquid-passage in the upper tube, a cap-nut with a packing around the upper tube and entered onto the bushing, and a plug-nut and packing around the upper tube and entered into the top of the lower tube, substantially as described.

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