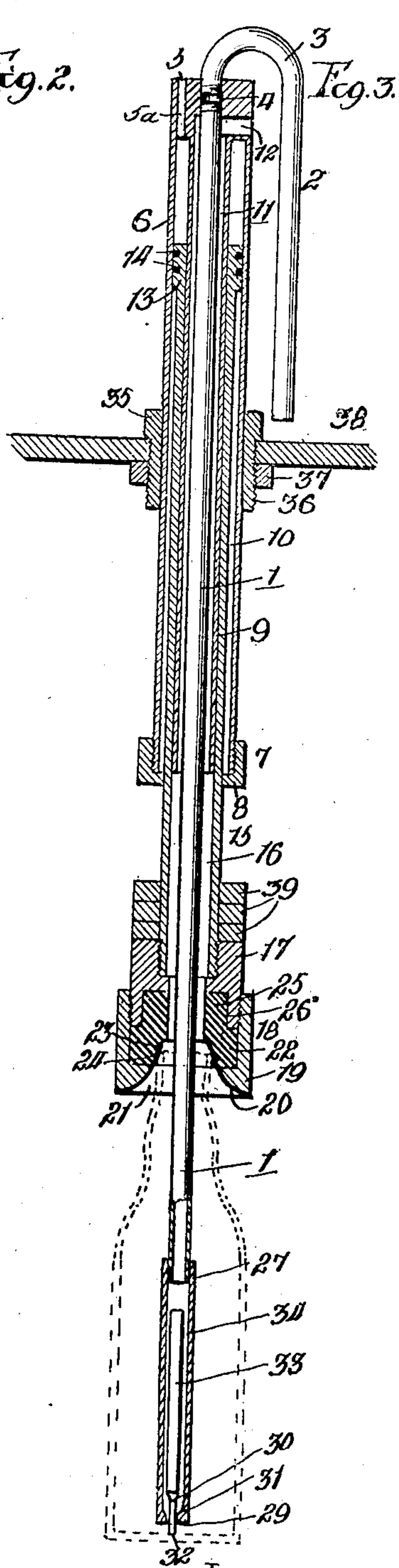
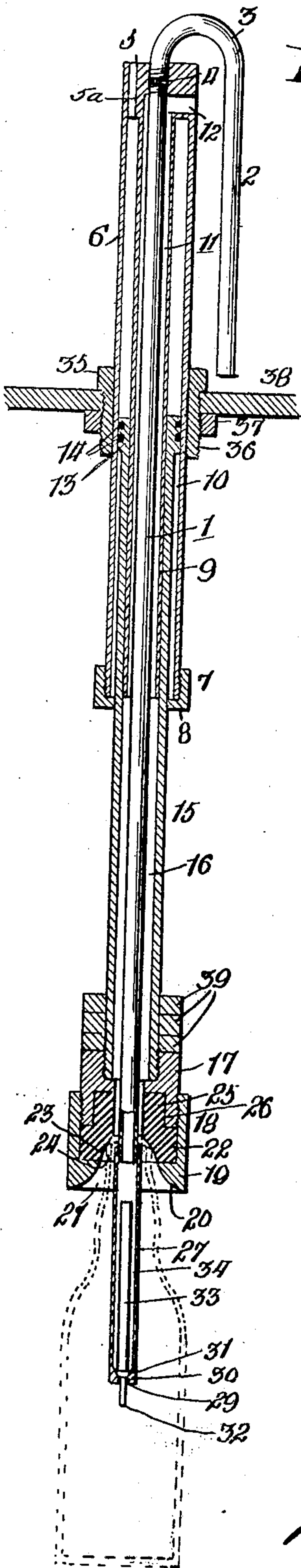
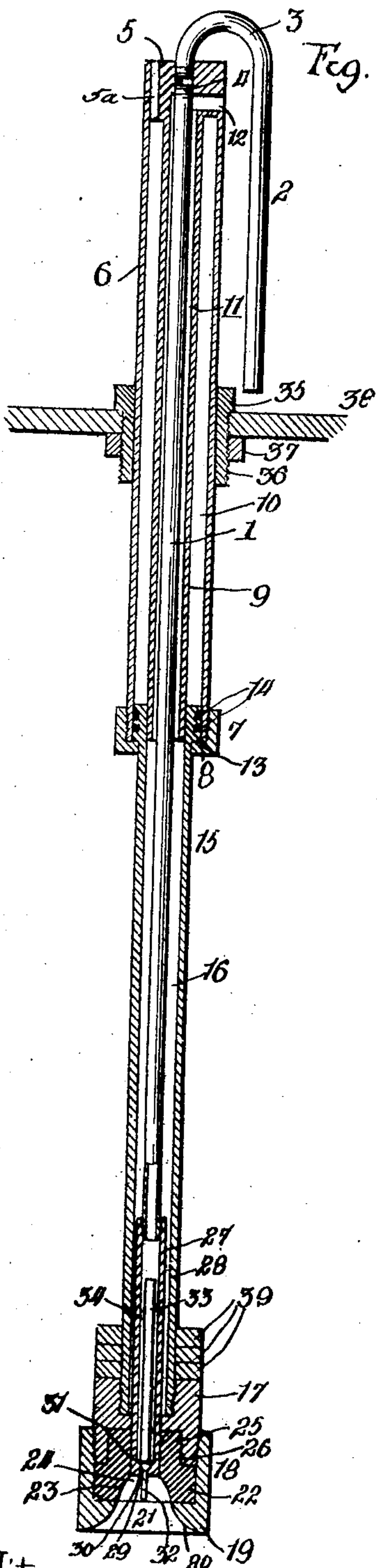


No. 878,241.

A. SCHNEIDER.
FILLING TUBE FOR LIQUIDS.
APPLICATION FILED APR. 25, 1907.

PATENTED FEB. 4, 1908.

2 SHEETS—SHEET 1.



Witnesses:
W. P. Bond
Orrison W. Banning

Inventor:
A. Schneider
by J. Banning
Attys.

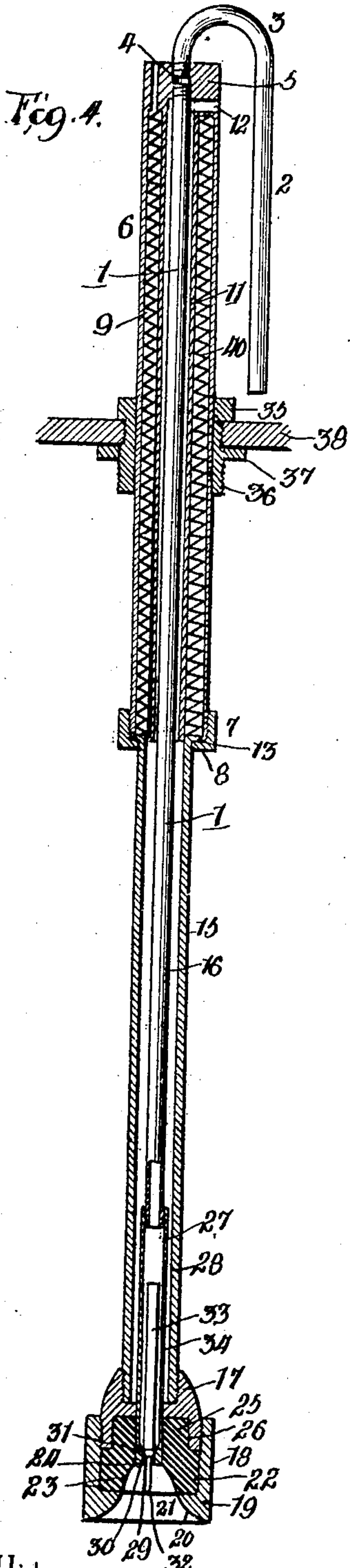
No. 878,241.

PATENTED FEB. 4, 1908.

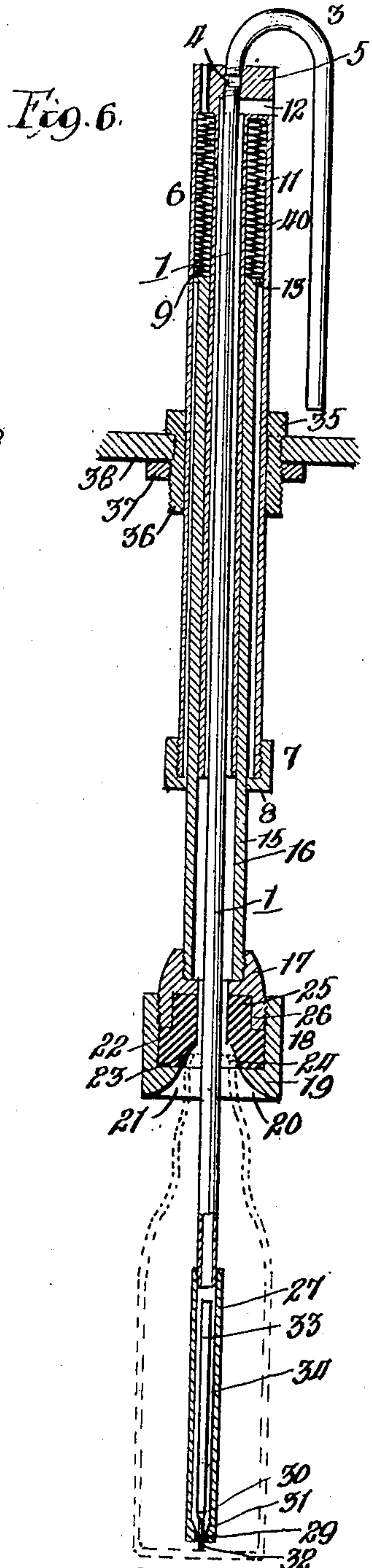
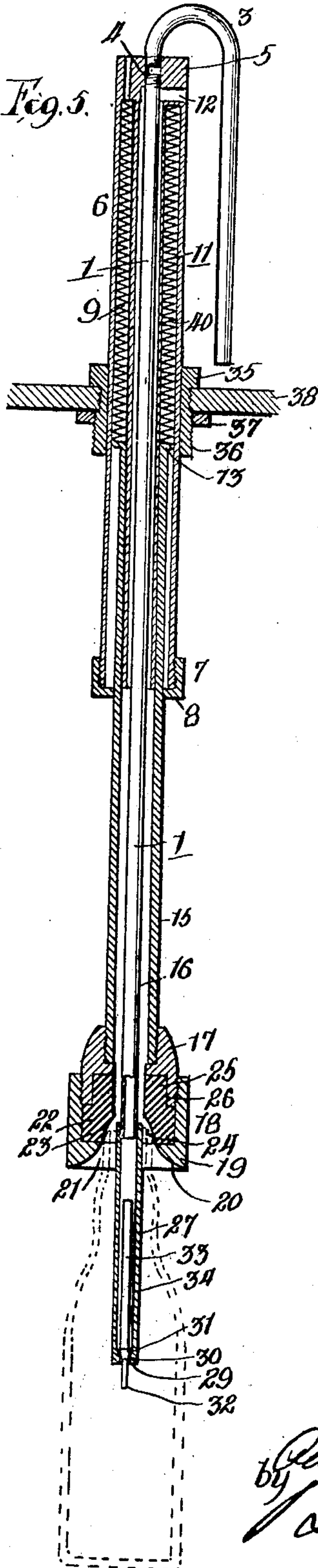
A. SCHNEIDER.
FILLING TUBE FOR LIQUIDS.

APPLICATION FILED APR. 25, 1907.

2 SHEETS—SHEET 2.



Witnesses:
J. P. Bond
Person N. Banning.



Inventor:
Adolph Schneider
by Banning & Banning
Attys.

UNITED STATES PATENT OFFICE.

ADOLPH SCHNEIDER, OF CHICAGO, ILLINOIS.

FILLING-TUBE FOR LIQUIDS.

No. 878,241.

Specification of Letters Patent.

Patented Feb. 4, 1908.

Application filed April 25, 1907. Serial No. 370,320.

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.

It is desirable and necessary, in the bottling or packaging of liquids, and particularly with liquids containing carbonic acid gas under pressure, that the pressure between the tank containing the liquids and the to-be filled bottle or package, should be equalized in order to prevent foaming of the liquid in filling the bottle or package. This operation of equalizing the pressure requires a perfect seal for the mouth of the bottle or package, and means for equalizing the pressure between the tank and the bottle or package, and escaping the pressure from the bottle or package as the liquid flows into and fills the bottle or package.

The object of the present invention is to construct a filling tube so as to enable a perfect and complete seal to be obtained for the mouth of the bottle or package, and at the same time to furnish a free communication, between the filling tank and the bottle or package, for equalizing the pressure, and a discharge for the liquid into the bottle or package under conditions that will prevent foaming; to construct a filling tube for liquid having a fixed tube for supplying liquid to the bottle or package, and a surrounding slidable tube, carrying the sealing head for the filling tube and the slidable tube; to construct a filling tube for liquids, having a fixed liquid tube, with a siphon action, for withdrawing the liquid from the tank and discharging the liquid into the bottle or package, and combined with a slidable tube encircling the liquid tube, and carrying a sealing head for the mouth of the bottle or package; to construct a filling tube for liquids, having a fixed liquid supply tube, terminated at its discharge end in a port, with a weighted valve controlling the port, and combining the fixed liquid supply tube with a slidable tube carrying the sealing head and weights, for effecting a perfect and complete seal for the mouth of the bottle or package; to furnish a filling tube for liquids, having a fixed supply tube for the liquid, a slidable tube carrying a sealing head, weights for forcing the sealing head against the mouth of a bottle or package, to effect a perfect and complete seal for the

bottle or package, and a passage for admitting pressure from the filling tank into the bottle or package, said passage formed between the wall of the liquid supply tube and the wall of the slidable tube; to furnish an automatic cut-off, for preventing the escape of pressure when the sealing head is at rest and in normal position; to furnish an automatic control for the pressure in equalizing the pressure between the filling tank and the to-be filled bottle or package, by which, with the inserting and raising of a bottle or package, the pressure passage will be opened, for admitting pressure to the to-be filled bottle or package; and to improve generally the construction, arrangement and operation of the several parts or elements entering into the formation of the filling tube as a whole.

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 filling tube of the invention, with the sealing head, the slidable tube therefor, and the guide and supporting tube in full section, and 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 passage to admit pressure to the bottle, shown by dotted lines, with the liquid tube closed against the discharge of liquid; Fig. 3 a similar view to Fig. 1, with the sealing head and the slidable tube therefor fully 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 Figs. 4, 5 and 6 are similar views to Figs. 1, 2 and 3 respectively, showing coil springs, or a coil spring, for holding the sealing head against the mouth of the bottle or package, instead of the weights for this purpose shown in Figs. 1, 2 and 3.

The construction shown in all of the figures has a supply tube 1, for the liquid, which tube, at its upper end, is in communication with a tube 2, having a curved neck 3, and constituting a siphon tube, for withdrawing liquid from the filling tank and supplying the withdrawn liquid to the liquid supply tube 1 proper, through a chamber or passage 4 formed in a head or plug 5, and into which

hole or passage 4 the ends of the tubes 1 and 2 are threaded or otherwise secured. The plug or head 5 has a longitudinal passage 5^a therethrough and the plug is entered into the upper end of a supporting tube 6, the lower end of which has entered thereonto a coupling formed of a circular wall 7, and an end wall 8, with a central hole through the end wall. The construction shown has a guide tube 9, between which and the supporting tube 6 is a chamber or passage 10; and the guide tube 9, at its upper end, is secured to the head or plug 5 in any suitable manner. The guide tube 9 encircles the liquid supply tube 1, within the outer tube or casing 6, so as to furnish a passage 11 between the liquid supply tube and the guide tube 9, which passage is in communication with a lateral port 12 opening through the head or plug 5 and the wall of the outer casing or tube 6, so as to have full communication with the interior of the filling tank above the liquid, for pressure, from the filling tank, to flow through the port 12 into the passage 11, for supplying pressure to and withdrawing pressure from the to-be filled bottle or package. The guide tube 9 is not an actual necessity, and can be omitted, in which case the lateral port 12 would open direct into the chamber 10 between the liquid supply tube 1 and the outer tube or casing 6, for supplying pressure to and withdrawing pressure from the to-be filled bottle or package, but by using the guide tube 9 the size of the pressure conducting passage is reduced in cross diameter, which obviates the necessity of filling the larger chamber, furnished by the outer tube or casing and the liquid supply tube, when the guide tube is omitted. It is to be understood, however, that it is the intent to use the filling tube, as a whole, either with or without the central guide tube 9, as may be desired.

The outer supporting tube or casing 6 receives into its interior a head 13, with circumferential packing rings 14, so as to make a close tight joint against the escape of pressure around the head. The head 14 is formed with, or suitably secured to, an endwise slidable tube 15 encircling the liquid supply tube 1, with a passage 16 between the liquid supply tube and the wall of the endwise slidable tube 15, which passage is in communication with the pressure conducting passage 11, in the arrangement shown, but with the central guide tube 9 omitted, the passage 16 would be in direct communication with the chamber or passage 10, between the outer wall or casing 6 and the liquid supply tube. The construction shown has the lower end of the central guide tube 9 entered into the hole or passage of the endwise slidable tube, so that the endwise slidable tube is guided and directed in its reciprocating movements by the inner central guide tube and the outer

tube or casing, thus insuring a straight line of movement for the endwise slidable tube, in operating the liquid supply tube as a whole.

The lower end of the endwise slidable tube 15 has threaded thereonto, or otherwise secured thereto, a head 17, onto which is threaded, or otherwise secured, an annular wall 18, having, at its end, an inwardly extending flange 19, with a curved inner face 20, forming a guide for directing and centering the mouth end of the bottle into sealing position, the curved face 20 forming an opening 21 suitable for the purpose.

A sealing gasket or cushion has its body 22 entered into a chamber or recess, formed between the outer face of the flange 19 and the end face of the head 17 and the inner face of the annular wall 18, and the inner face of the body, at the center, is curved so as to form a curved face 23 coacting with the curved face 20, and forming a chamber 24, into which the mouth end of the bottle or package is entered, so as to tightly seal and close the end of the bottle around the exterior edge thereof, as shown by the dotted lines in Figs. 2, 3, 5 and 6. The sealing head, gasket or cushion, has a neck 25 entered into a chamber or recess 26 in the end of the head 17, and encircling the discharge tube 27, at the end of the liquid supply tube, so as to prevent liquid and pressure from escaping around the liquid supply tube, when the parts of the filling tube, as a whole, are in normal position, or at rest, as shown in Figs. 1 and 4.

The discharge tube 27, for the liquid, is threaded, or otherwise attached, to the main liquid supply tube 1, in the construction shown, and this tube is of greater exterior diameter than interior the diameter of the main liquid supply tube, so as to leave a less space or passage 28, between it and the endwise slidable tube 15, than the passage or space 16 between the endwise slidable tube 15 and the main liquid supply tube 1, when the parts are in normal position, or at rest, as shown in Fig. 1; and the space or passage 28 terminates against the shoulder or abutment of the head 17, when the parts are as shown in Fig. 1, sealing the pressure passage against the escape of pressure at the sealing head. The discharge end of the tube 27 has a port 29, with a surrounding valve seat 30, with which a valve 31, on a stem 32, coacts to close the port against the discharge of liquid, when the filling tube, as a whole, is in the position shown in Fig. 1, or at rest. The valve is raised to open the port 29 by the engagement of the valve stem 32, with the bottom of the bottle or package, as shown in Fig. 3, permitting liquid to flow through the liquid supply tube and discharge into the bottle or package at the port 29 of the liquid supply tube. The valve 31 is closed, and held closed, by a weight 33, extending up-

wardly within the interior of the discharge section 27 of the liquid supply tube, which weight is of a less diameter in cross section than the interior diameter of the section 27 of the liquid supply tube, so as to leave a space or passage 34 around the weight, for the outflow of the liquid to discharge into the bottle or package.

The construction shown has, around the exterior of the outer casing or tube 6, a flange 35, on a sleeve 36, which sleeve is screw threaded and receives a ring nut 37, by means of which the filling tube, as a whole, is attached in position to the bottom wall 38, of a filling tank, the bottom wall having a suitable hole for the passage of the sleeve 36 to project below the under side of the wall, for the reception of the ring nut, so that the ring nut will act and clamp and hold the filling tube, as a whole, in position between the flange 35 and the ring nut 37, fixedly mounting the outer casing or wall and the liquid supply tube in position on the filling tank, with the siphon tube within the filling tank, and also the upper portion of the supporting tube or casing and the filling tube proper. The filling tank is not shown, but can be of any usual and well known form of pressure tanks, for containing liquid under pressure for filling bottles or packages.

The construction shown in Figs. 1, 2 and 3, employs one or more weights 39, for returning the endwise slidable tube 15, and the sealing head and parts connected therewith, from the filling position shown in Fig. 3, to the normal or at-rest position shown in Fig. 1; and, in order to maintain the seal around the mouth or neck end of the bottle, the weights must be sufficiently heavy to counteract the force of the admitted pressure and hold the sealing gasket or cushion so as to closely and tightly impinge the end of the bottle and form a tight joint against the escape of pressure and liquid in filling the bottle or package.

The construction shown, in Figs. 4, 5 and 6, differs, in no respect, from the construction shown in Figs. 1, 2 and 3, as to the formation and arrangement of the several parts or elements of the filling tube, as a whole, but instead of employing weights to return the endwise slidable tube, carrying the sealing head and operating to maintain the seal at the mouth or end of the bottle, the construction of Figs. 4, 5 and 6 employs coil springs, or a coil spring, within the chamber 10 of the outer casing or tube 6, the springs or spring having sufficient force to return the sealing head and the endwise slidable tube to normal position, or to a state of rest, when the spring or springs is or are expanded, as shown in Fig. 4; and when contracted, as shown in Fig. 6, the spring or springs will furnish the necessary force and pressure to hold the sealing head, with its

sealing gasket or cushion, in close impingement against the mouth or end of the bottle, so as to furnish a tight closure against escape of pressure and liquid.

It is to be understood that in the construction and operation of the liquid supply tube of the present invention, a weight and a spring are to be regarded and considered as an equivalent means for returning the sealing head and its carrying tube to normal position, and for maintaining the requisite force or pressure to make a tight seal or closure around the mouth, or end, of the bottle or package; and under the term weight, wherever used, is included both a weight and a spring.

The operation will be understood from the foregoing description, but briefly is as follows: The filling tube, as a whole, is in normal position when the parts are as shown in Figs. 1 and 4, and in this position the valve, at the discharge end of the liquid supply tube, is closed and held closed, by the weight extending up therefrom within the discharge end of the filling tube; and the escape of pressure at the sealing head is prevented from the closing of the passage 28, by the cross wall or shoulder of the head 17 and the wall of the discharge section of the liquid supply tube, as shown in Figs. 1 and 4. A bottle, or other package of similar nature, has its neck, or mouth end, entered into the chamber or space formed by the interior faces of the annular wall 18 and the sealing gasket or cushion 24, and the raising of the bottle into a filling position carries with it the sealing head and the endwise slidable tube, and when the sealing head and the endwise slidable tube are raised, by the bottle, into the position shown in Figs. 2 and 5, the upper end of the lower or discharge section 27 of the liquid supply tube is passed by the lower end of the sealing gasket or cushion, so as to bring the space or passage 16 into communication with the passage at the end or neck of the bottle and between the inner face of the sealing gasket or cushion and the inner face of the end or neck of the bottle, allowing pressure to flow through the port or passage 12 into the space or passage 11, to enter the space or passage 16, and discharge into the interior of the bottle or package, equalizing the pressure between the interior of the filling tank and the bottle or package.

The bottle or package, after the equalization of pressure between the filling tank and the bottle or package has been established, is raised to a higher plane, carrying with it the sealing head and the endwise slidable tube into the position shown in Figs. 3 and 6, in which position the end of the stem 32 strikes the inner face of the bottom of the bottle or package and raises the valve 31 from the seat 30, so as to open the discharge port 29 for liquid to flow through the siphon

tube 2 and main supply liquid tube 1, into the discharge section or end 27 of the liquid supply tube, and enter the bottle through the port 29, gradually filling the bottle with liquid against an equalized pressure by which foaming is prevented. The pressure in the bottle is forced out therefrom by the gradual rise of the liquid in the bottle, and this pressure returns to the tank through the space or passage 16, and space or passage 11, and port 12, so that the spaces or passages and the port serve both as a means for inducting pressure from the tank into the bottle and educting pressure from the bottle back into the tank. It will be understood that with the central guide tube 9 omitted, the pressure is inducted and educted through the port 12 and the chamber or passage between the outer tube or casing 6, and the main liquid supply tube, but the operation will be the same so far as concerns the inducting and educting of pressure as described.

The weights, when used, or the spring or springs, when used, furnish a sufficient force or pressure to hold the sealing gasket or cushion tightly against the end of the bottle or package, so as to prevent the escape of the pressure and liquid around the end of the bottle, and in addition the weights, or the spring or springs, furnish the required force to return the endwise slidable tube and the sealing head into normal position, as shown in Figs. 1 and 4, from the elevated position shown in Figs. 3 and 6.

The filling tube, as a whole, of the present invention, is simple in construction, and easily and quickly operated for equalizing the pressure between a filling tank and a to-be filled package or bottle, and to enable liquid under pressure to be discharged against an equalized pressure without the production of foam. The act of entering and raising the bottle to a filling position, first opens the pressure passages to equalize the pressure, and then, when the final raised position is reached, opens the liquid supply tube, to discharge liquid into the bottle or package, thus insuring an equalization of pressure between the filling tank and the bottle or package, before the liquid can discharge into the bottle or package, which is very desirable in filling bottles or packages with carbonated liquids.

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

1. In a filling tube for liquid, the combination of a fixed vertical liquid supply tube, a siphon tube in communication with the liquid supply tube, a fixed vertical casing surrounding the liquid supply tube with a conducting passage for pressure around the liquid supply tube, an endwise slidable tube encircling the fixed liquid supply tube with a conducting passage for pressure between the two tubes and vertically slidable within the fixed vertical casing, a head carried by the endwise

slidable tube, a sealing gasket for the head with a conducting passage for pressure between the head, the sealing gasket and the liquid supply tube, opened when the head and gasket are partially elevated and means for returning the endwise slidable tube, the head and the sealing gasket to normal position, substantially as described.

2. In a filling tube for liquids, the combination of a fixed vertical liquid supply tube, a siphon tube in communication with the vertical liquid supply tube, a fixed vertical casing surrounding the liquid supply tube with a conducting passage for pressure around the liquid supply tube, a closing plug for the upper end of the outer casing, and carrying the liquid supply and siphon tubes, an endwise slidable tube encircling the fixed liquid supply tube with a conducting passage for pressure between the two tubes, a head carried by the endwise slidable tube, a sealing gasket for the head with a conducting passage for pressure between the head, the sealing gasket and the liquid supply tube, opened when the head and gasket are partially elevated and means for returning the endwise slidable tube, the head and the sealing gasket to normal position, substantially as described.

3. In a filling tube for liquids, the combination of a fixed vertical liquid supply tube, a siphon tube in communication with the vertical liquid supply tube, a fixed vertical casing surrounding the liquid supply tube with a conducting passage for pressure around the liquid supply tube, a closing plug for the upper end of the fixed vertical casing and carrying the liquid supply and siphon tubes, a weighted endwise slidable tube encircling the liquid supply tube with a conducting passage for pressure between the two tubes, a head on the upper end of the slidable tube and having circumferential packing rings and entered into the outer casing, a head carried by the endwise slidable tube at its lower end, a sealing gasket for the head with a conducting passage for pressure between the head, the sealing gasket and the liquid supply tube, opened when the head and gasket are partially elevated, substantially as described.

4. In a filling tube for liquids, the combination of a fixed vertical liquid supply tube, a fixed vertical casing surrounding the liquid supply tube, a central guide tube around the liquid supply tube, with a conducting passage for pressure between the guide tube and the liquid supply tube, a weighted endwise slidable tube encircling the liquid supply tube with a conducting passage for pressure between the two tubes, a head carried by the endwise slidable tube, a sealing gasket for the head with a conducting passage for pressure between the head, the sealing gasket and the liquid supply tube, opened when the head and gasket are partially elevated, substantially as described.

5. In a filling tube for liquids, the combination of a fixed vertical liquid supply tube, a fixed vertical casing surrounding the liquid supply tube, a central guide tube around the
5 liquid supply tube with a conducting passage for pressure between the guide tube and the liquid supply tube, a siphon tube in communication with the vertical liquid supply tube, a closing plug for the upper end of the fixed vertical casing and carrying the liquid supply
10 tube, the central guide tube and the siphon tube, a weighted endwise slidable tube encircling the liquid supply tube with a con-

ducting passage for pressure between the two tubes, a head carried by the endwise slidable
15 tube, a sealing gasket for the head with a conducting passage for pressure between the head, the sealing gasket and the liquid supply tube, opened when the head and gasket are partially elevated, substantially as de-
20 scribed.

ADOLPH SCHNEIDER.

Witnesses:

OSCAR W. BOND,
WALKER BANNING.