No. 732,123. PATENTED JUNE 30, 1903.

A. SCHNEIDER.

BOTTLING MACHINE.

APPLICATION FILED JAN. 20, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

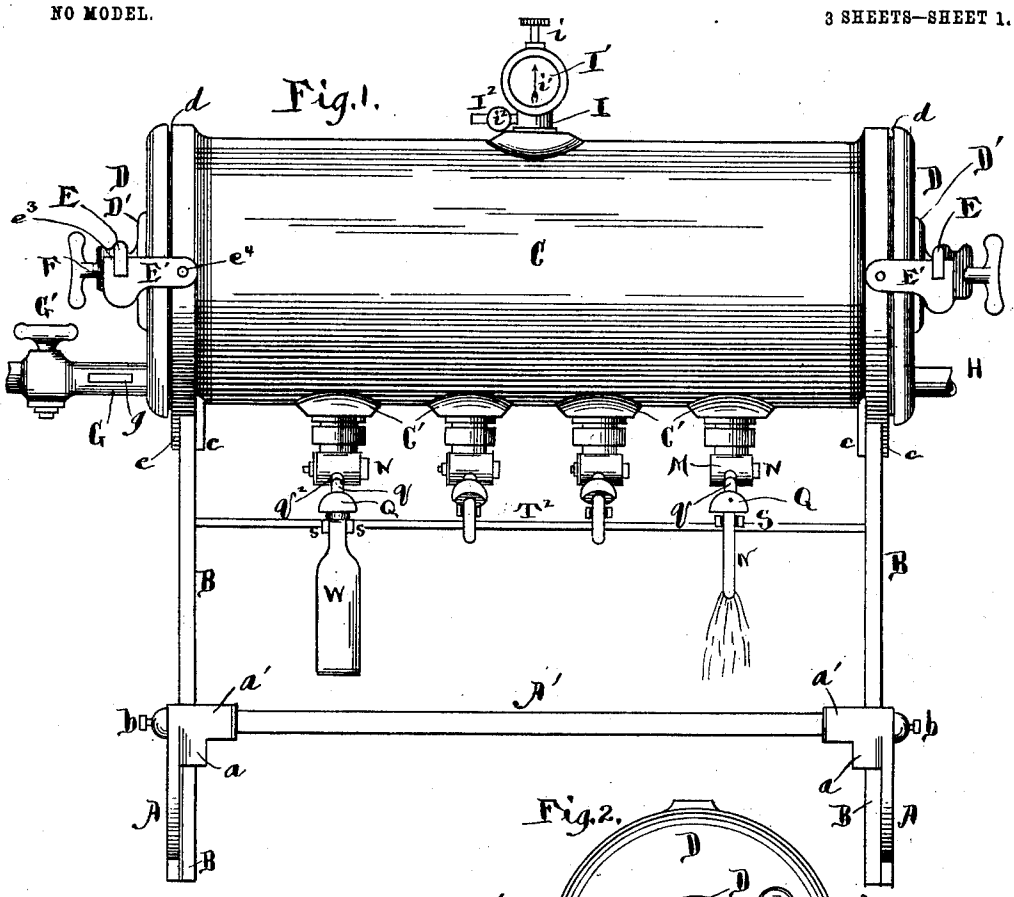


Fig. 2.

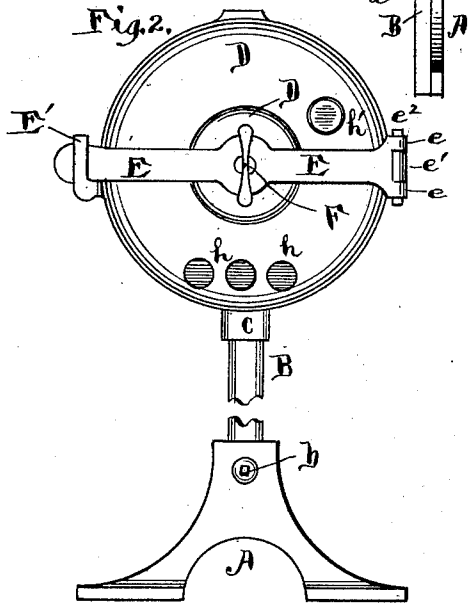
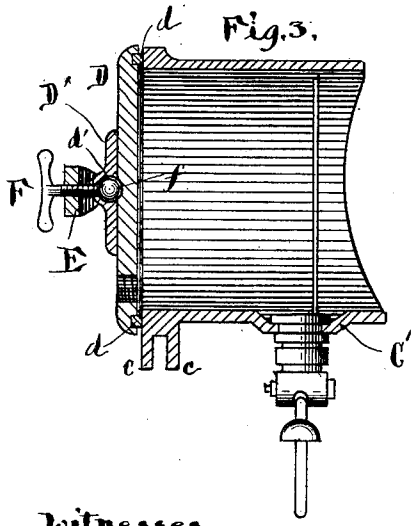


Fig. 3.



Witnesses,
Samuel W. Banning,
Pierson W. Banning.

Inventor:
Adolph Schneider,
By Banning & Banning,
Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 4.

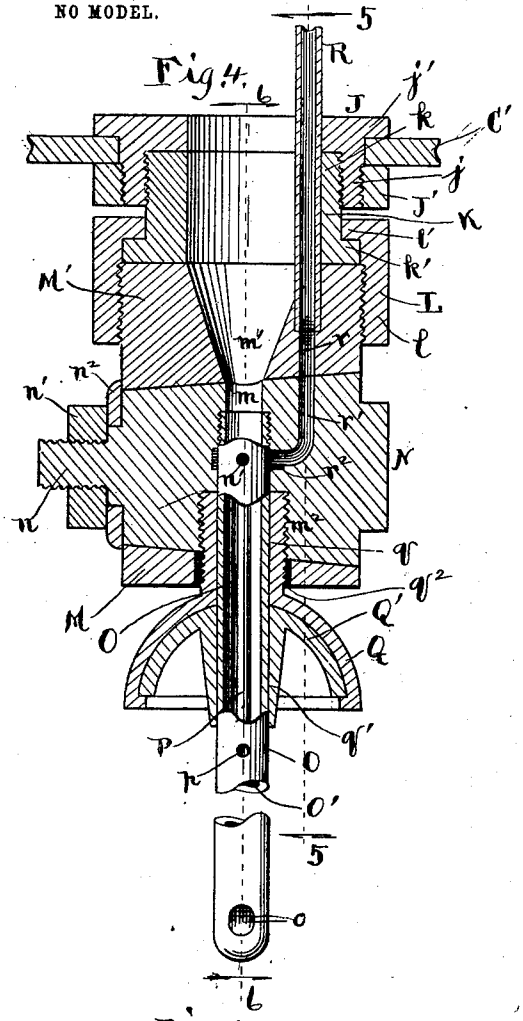


Fig. 5.

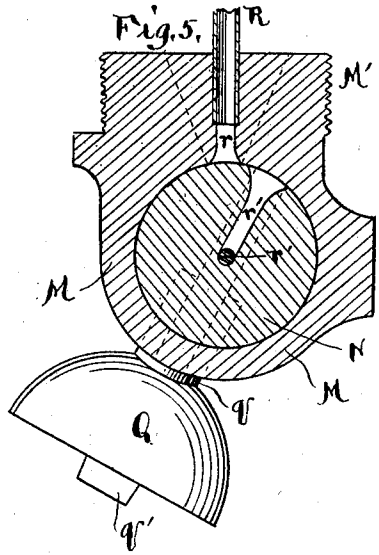


Fig. 7.

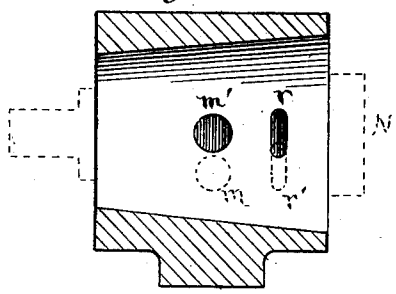
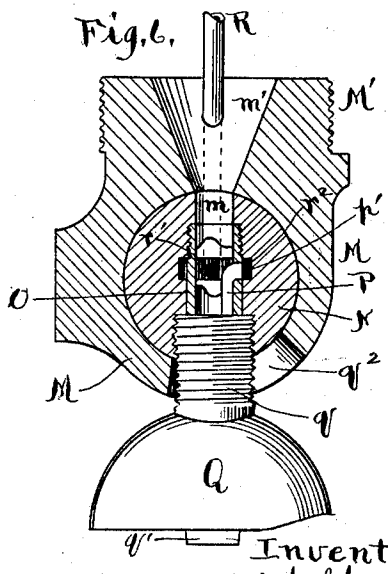


Fig. 6.



Witnesses,
Samuel W. Banning.
Pierson W. Banning.

Inventor,
Adolph Schneider
By Banning & Banning,
Att'ys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 732,123. PATENTED JUNE 30, 1903.

A. SCHNEIDER.

BOTTLING MACHINE.

APPLICATION FILED JAN. 20, 1902.

NO MODEL. 3 SHEETS—SHEET 3.

Fig. 8.

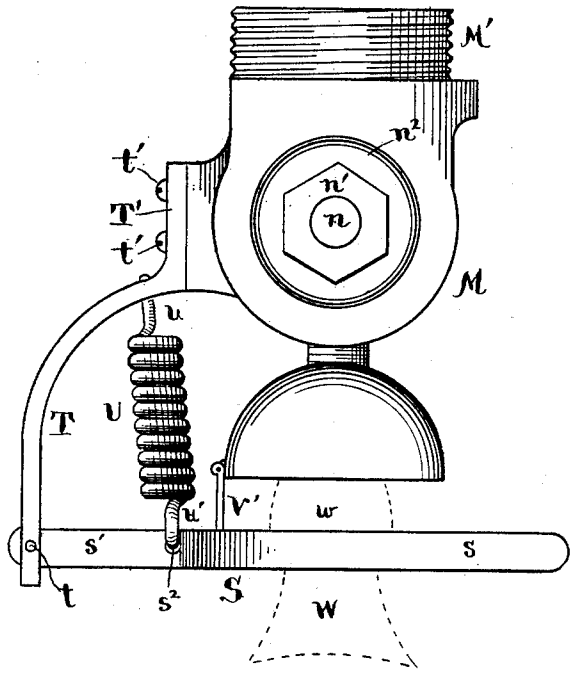


Fig. 9.

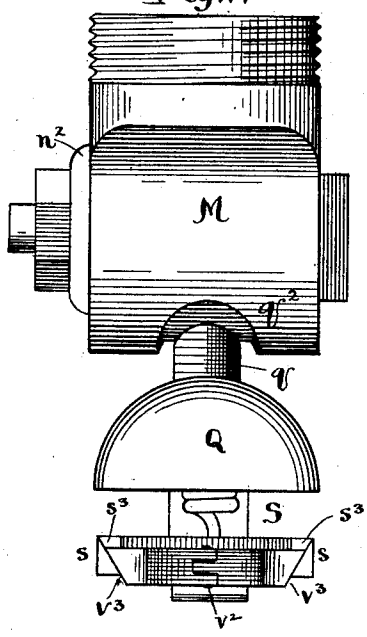


Fig. 10.

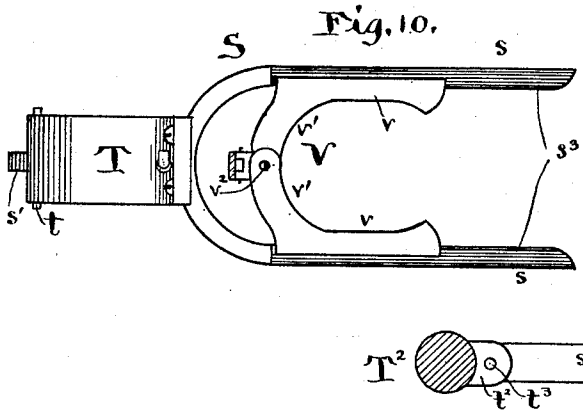
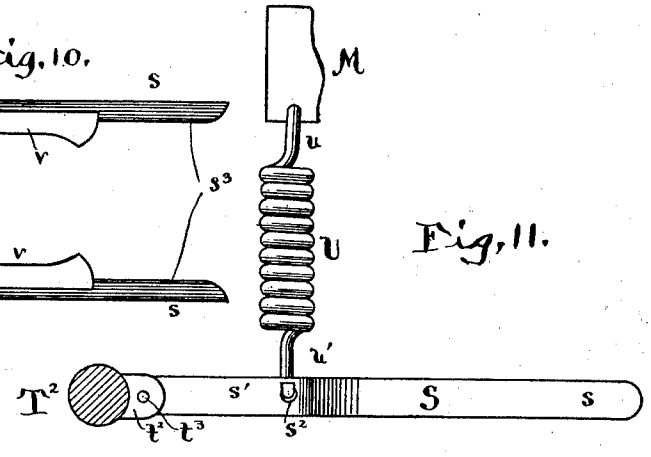


Fig. 11.



Witnesses:
Samuel W. Banning
Pierson M. Banning.

Inventor:
Adolph Schneider
By Banning & Banning,
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 732,123. Patented June 30, 1903.

UNITED STATES PATENT OFFICE.

ADOLPH SCHNEIDER, OF CHICAGO, ILLINOIS.

BOTTLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 732,123, dated June 30, 1903.

Application filed January 20, 1902. Serial No. 90,564. (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 county of Cook and State of Illinois, have invented a certain new and useful Improvement in Bottling-Machines, of which the following is a specification.

The primary object of the present invention is to construct a simple, effective, and reliable bottling-machine adapted for use in the bottling of liquids under pressure and in which the bottling operation is performed under the condition of equal pressure in the filling-tank on the liquid to be bottled and in the bottle on the liquid entering and filling the bottle, thereby preventing the foaming of the liquid in bottling and insuring the filling of the bottle with the liquid without any deterioration or loss in the quality of the liquid.

Further objects are to improve the construction and operation of the filling-tank as to the appliances and devices used therewith for maintaining a predetermined regular pressure on the liquid in the tank, to improve the construction of the filling-tank as regards its adaptation for attachment thereto of the filling-tube for the bottle or bottles, to improve the construction and operation of the filling-tube in its relation to the filling-tank, to improve the construction and operation of the bottle-holder by which the bottle is held in suspended position for filling, and to improve generally the construction and operation of the filling-machine as a whole.

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

In the drawings, Figure 1 is a side elevation of a complete machine adapted for the filling of four bottles; Fig. 2, an end elevation of the machine with the support or standard at the end for holding the filling-tank broken out; Fig. 3, a detail in sectional elevation of one end of the filling-tank, showing one of the filling valves and tubes in elevation; Fig. 4, a sectional elevation of a filling valve and tube, showing the attachment thereof to the filling-tank; Fig. 5, a cross-section on line 5 of Fig. 4 looking in the direction of the arrow with the filling-tube removed; Fig. 6, a cross-section of the filling-valve on line 6 of Fig. 1 looking in the direction of the arrow with the filling-tube in section for its upper end and not shown below the closing-cap; Fig. 7, a plan sectional view of the shell or casing for the filling-plug valve, showing the valve in dotted lines and showing by full lines and dotted lines the relative positions of the ports or openings in the shell or casing and the passages or openings in the plug-valve for the liquid and air; Fig. 8, an end elevation of the filling-valve and the bottle-holder for suspending the bottle in position to be filled and showing the neck of the bottle; Fig. 9, a front elevation of the parts shown in Fig. 8 with the neck of the bottle removed; Fig. 10, a top or plan view of the bottle-holder detached; and Fig. 11, a detail showing a modification in supporting of the bottle-holder forks.

The machine is constructed with a base or support consisting of two leg or base pieces, one for each side of the machine, each base-piece A, as shown, having a spread at the lower end with feet or flanges to rest on the floor or other support. Each base-piece A at its upper end has a vertical socket *a* and a horizontal socket *a'*, and a cross rod or bar A' is secured at its ends in the horizontal sockets of the base-pieces, completing the base as a whole. A sliding upright or standard B passes through each vertical socket *a* and is adjustable up and down, so as to increase or decrease the height of the standards, as required for the proper setting of the filling-tank, and when adjusted each standard is locked and held in its adjusted position by a set-screw *b* or otherwise, the set-screw passing through a boss on the face of the base-piece for its end to engage the standard.

The filling-tank C, as shown, is connected with the upper ends of the standard or uprights B by having the upper ends of the standards or uprights entered between the ears or flanges *c* on the under side of the filling-tank at each end thereof and securing the ends of the standards or uprights in place between the ears by suitable bolts or otherwise. The construction of tank shown has each end thicker than the body of the tank, forming a rim at each end, and a cover or head D is provided for each end of the tank,

each head or cover having a packing *d*, which when the head is in position tightly abuts and impinges against the end face of the rim of the tank, making a tight joint against the escape of pressure and liquid. Each cover is carried by a locking-bar E, one end of the bar being attached to the end of the tank by a hinge formed by ears *e* on the end of the bar, an ear *e'* on the end of the tank between the ears *e* when the bar is in place, and a pivot-pin e^2, forming a hinge connection by which the carrying-bar and the cover can be swung to close or open the end of the tank. Each carrying-bar in the arrangement shown at its free end enters a slot e^3 in a latch or catch E', attached to the rim at the end of the filling-tank by a pin or pivot e^4, so that the latch can be raised or lowered to hold the bar when in position for the head or cover to close the tank and to release the bar when it is desired to swing the head or cover back to open the end of the tank. Each head or cover in the arrangement shown is forced inwardly for its packing *d* to contact and impinge the end face of the tank-rim tightly by a follower-screw F, having a turn-handle at its outer end and having its body or stem screw-threaded and entered through a screw-threaded hole in the carrying-bar and having at its inner end a ball *f* in a socket *d'* of a plate D', attached to the outer face of the head or cover, so as to be held firmly in position. The advance of the follower-screw when the head or cover is closed and the carrying-bar is engaged at its free end with the latch forces the head or cover bodily forward for the packing to engage and impinge against the end face of the rim, and a receding movement of the follower-screw withdraws the head or cover, so that the free end of the carrying-bar can be released from its latch or catch and for the bar and the head or cover to be swung back and open the end of the filling-tank.

Each head or cover in the arrangement shown has adjacent to its lower edge when closed a filling-opening or a series of such openings. The head or cover at one end has entered thereinto a filling-pipe G with a controlling-valve G' and a sight-opening *g*, covered by glass or other transparent material, through which pipe from a suitable source of supply the liquid to be bottled can be charged into the filling-tank until the desired height of liquid is reached, which height is governed by the pressure of air or other fluid in the tank. The other head or cover for the tank, as shown, has therein three filling-holes *h*, though one hole for ordinary purposes will be sufficient, and entered into one or all of these holes is a filling or liquid-inlet pipe H, which may be of the same general construction as the inlet or liquid-filling pipe G as regards a controlling-valve and a sight-opening, and, as shown, the head or cover having the filling-pipe H is provided with a sight-opening *h'*, closed by glass or other transparent material, by which inspection of the interior of the filling-tank can be made to determine the height of the liquid in the tank, and a similar sight-opening can be provided for the head or cover having the filling-pipe G, so that the condition of the liquid in the tank can be determined by inspection from either end thereof. A pressure-regulator I is mounted on the top of the filling-tank and is of any usual and well-known form of construction for such regulators, having a screw-threaded stem *i* for setting the diaphragm thereof at any desired pressure, and, as shown, a gage I', with a pointer *i'*, is connected with the pressure-regulator in any usual and well-known manner. The pressure-regulator is in communication with the interior of the filling-tank, and extending out from the regulator is a tube I^2 with a controlling-valve i^2, to which tube connection is made in any suitable manner with a source of fluid-pressure, preferably compressed air or air under pressure, so that by opening the controlling-valve i^2, with the pressure-regulator set at a predetermined pressure, a corresponding pressure can be supplied to the filling-tank, which pressure controls the pressure at which the liquid is supplied to the bottle for filling purposes. The liquid is entered into the tank with the filling valves and tubes all closed, and when the liquid reaches a point in the tank at which the compression of the air or other fluid-pressure operates to open the pressure-regulator the tank is properly filled to the extent required for filling purposes, and this pressure is to be maintained in the tank on the liquid during the operation of filling the bottle.

The under side of the filling-tank is formed to have depressed portions C', which furnish a rim for the attachment of the filling appliances, and, as shown, four of these depressed rims are provided for the attachment of four bottle-filling appliances, and a description of the attachment of one of the appliances and the construction thereof will be a description of the attachment and construction of all of the filling appliances. A bushing J, having a circumferential or annular wall *j*, with a screw-thread on its interior and exterior and a peripheral flange *j'*, is entered into the opening of the depressed rim C' for the peripheral flange to rest on the inner face of the rim, with the circumferential or annular wall extending below the under face of the rim, as shown in Fig. 4, and when inserted the bushing is locked and held in position by a ring-nut J', which abuts against the under face of the rim, with the edge of the rim between the peripheral flange of the bushing and the ring-nut, so as to make a liquid and pressure tight joint. A coupling-collar K, having a circumferential or annular wall *k* screw-threaded on its exterior, is entered into the screw-thread on the interior of the wall of the bushing, and this collar has an annular flange or shoulder *k'* at its outer end. A coupling-collar L, hav-

a wall or body l with an interior screw-thread, is entered onto the coupling-collar K, and this coupling-collar L has an inwardly-projecting annular flange or shoulder l', which when the collars are together abuts or is in contact with the outwardly-extending annular flange or shoulder k' of the collar K, uniting the two collars against separation, it being understood that the collars K and L are brought together prior to the entering of the collar K into the bushing. A valve shell or casing M, having on its upper side an annular neck M', screw-threaded on its exterior, is entered into the wall or body of the coupling-collar L and, as shown, abuts against the end face of the coupling-collar K when entered, so that the shell or casing is connected with the tank and has communication therewith through the opening of the bushing and the opening of the coupling-collar L and an opening m', which, as shown, is of a funnel shape, in the body of the neck and terminating at its apex end at the opening for the filling-valve. The shell or casing M has entered thereinto a filling-valve N, which, as shown, is in the form of a tapered plug-valve having at its narrow end a stem n, with a screw-thread on its exterior to receive a tightening-nut n', which abuts against the end of the valve adjacent to the stem and against a washer n^2, surrounding the end of the valve adjacent to the stem and abutting against the end face of the plug-valve and the end face of the shell or casing, overlapping the joint between the valve and the shell or casing and insuring a tight fit for the valve against leakage of liquid and fluid pressure.

The plug-valve N has transversely therethrough an opening or passage m, which when the valve is properly turned alines with the opening m' in the shell or casing, and this opening has a plane face at its upper end and below the plane portion is screw-threaded to receive the screw-threaded end of the filling-tube, and, as shown, a screw-threaded hole m^2 is provided in the body of the valve in line with the opening or passage m around the filling-tube and of a greater diameter than the tube. The filling-tube O at its upper end is screw-threaded into the enlarged portion of the passage or opening m for the passage in the filling-tube to be in alinement with the opening or passage m in the plug-valve, as shown in Fig. 4, and this tube extends down a sufficient distance for entrance into the neck of the bottle and at its extreme end, as shown, has on one or more sides a discharge port or opening o, which when the end of the filling-tube is in the neck of the bottle discharges liquid into the bottle. The filling-tube, as shown, has in its interior a vent-pipe P, having an opening or port p at its lower end through the wall of the filling-tube and having an opening or port p' at its upper end through the wall of the filling-tube, as shown in Fig. 4, which pipe is also a pressure-supply pipe for admitting a pressure corresponding to the pressure in the filling-tank into the bottle before supplying liquid to fill the bottle. The body of the filling-tube above the opening or port p is encircled by a closing-cap Q, which has a neck q screw-threaded on its exterior and entered into the screw-threaded hole m^2 of the plug-valve, so that with the movement of the filling-tube the closing-cap will move therewith, and in order to allow of the swing of the filling-tube the neck q passes through an elongated opening or slot q^2, formed therefor in the wall of the shell or casing, as shown in Figs. 4 and 6. The interior of the closing-cap is of a hemispherical shape and has therein a packing Q', having a hemispherical rim and made of rubber or other suitable material and having, as shown, a conical depending center plug q', which when the filling-tube is in the neck of the bottle enters the mouth of the bottle and in connection with the packing Q' tightly closes the mouth of the bottle against the escape of liquid and pressure when the neck of the bottle at its end is held against the packing of the closing-cap. A pressure-supply and vent tube R for each filling-valve extends from the shell or casing of the valve nearly to the top of the filling-tank, as shown in Fig. 3, and the lower end of this supply and vent tube is entered into the neck of the shell or casing in line with a passage r, which terminates at the opening of the shell or casing for the plug-valve. The plug-valve has therein a passage r', which when the valve is properly turned is in communication at its outer end with the passage r and with the supply and vent tube R, and this passage R' at its inner end is in communication with a chamber or concavity r^2, formed in the body of the valve adjacent to the filling-tube and in line with the port or opening p' of the supply and vent tube P, so that when the valve is properly turned pressure can flow from the tank into the bottle and return from the bottle back into the tank as the bottle is filled with liquid. The mouth of the passage r is elongated, as shown in Fig. 7, and the mouth of the passage r' is likewise elongated, as shown in Fig. 7, and the length of space covered by the two elongated mouths is greater than the space covered by the openings m and m' at the juncture between the valve shell or casing and the valve, as shown by dotted lines in Fig. 7. The elongated mouths of the passages r and r' are so located and arranged in relation to the openings m and m' as that with the turning of the plug-valve in the proper direction the passages r and r' and the openings m and m' are both closed against the admission of pressure and against the discharge of liquid; but with the turning of the valve after the bottle has been entered on the filling-tube in the direction to bring the bottle in filling position the elongated mouths of the passages r and r' are open, so that pressure will enter the bottle coinciding to the pressure in the tank, with

the result that when the valve is turned into position to fully open both the passages r and r' and the passages m and m' for filling the bottle the liquid will enter the bottle under the same pressure as the pressure on the liquid in the tank, thus insuring the bottling of the liquid under equal pressure in both the tank and bottle and an equal pressure on the liquid in both the tank and bottle, thereby preventing any foaming in filling the bottle and insuring the bottling of the liquid without waste and deterioration and in the best possible manner for preserving the full qualities of the liquid.

The bottle is held in filling position, with the end of the filling-tube in its neck, by a holder-fork S, having, as shown, two side bars or ams s with an open end and an extension or neck s', pivoted by a suitable pin or pivot t to a supporting-bar or bracket-arm T, having a plate end T', attached by screws t' or otherwise to one side of the shell or casing M in the arrangement shown in Figs. 8, 9, and 10; but the holder-fork could be otherwise attached. The holder-fork is sustained, so as to exert an upward pressure to force the end of the bottle-neck into the closing-cap, by a coil-spring U, having a pull or draw action, one end u of the spring connected with the supporting-bar or bracket-arm and the other end u' entered into a hole s^2 in the holder-fork, which spring allows of a sufficient yield to permit the open end of the fork to be depressed for entering the end of the filling-tube into the neck of the bottle and moving the bottle into position for the neck end to enter the closing-cap, with the center plug q' of the packing projected into the mouth of the bottle and the exterior face of the bottle end in contact with the hemispherical interior face of the packing Q', closing the end of the bottle against the escape of liquid and pressure, and the spring has a sufficient draw or pull when the free end of the holder-fork is released from downward force or pressure thereon to force and hold the end of the bottle tightly in the closing-cap. A clamp V of a fork shape, having side arms or bars v and end arms or bars v' pivoted one to the other by a suitable pin or pivot v^2, is employed in the construction shown for carrying the bottle W, the neck of which is entered into the open space between the side arms or bars of the clasp for the end face of the flange or taper w to rest on the upper face of the side bars. A hanger V', Fig. 8, pivoted at its upper end to the closing-cap Q and pivoted at its lower end to the rear end of the clamp V, suspends the clamp from the closing-cap to lie within the side arms of the fork, as shown in Fig. 10. This clasp is self-adjustable when in position on the holder-fork to fit the necks of bottles having a variation in diameter and to furnish a secure support for the flange or taper when the bottle is in place, and this adjustment is attained in the construction shown by forming the inner face of the side arms or bars of the holder-fork with a taper s^3 and forming the exterior face of the side arms or bars of the clasp with a taper v^3, the tapers furnishing a wedge action in connection with the upward force exerted by the spring and the resistance from the contact of the bottle end with the packing by which the side arms or bars of the clasp will be forced inwardly, so as to insure the engagement of the end face of the flange or taper of the bottle end with the faces of the side bars of the clasp.

The operation will be understood from the foregoing description, but briefly is as follows: Air or other fluid-pressure to the resistance required is supplied to the filling-tank and the beer or other liquid is supplied to the tank from the inlet-pipes, the beer having a pressure sufficient to overcome the pressure of the air or other fluid as it flows into the tank, forcing out the fluid-pressure at the regulator. The beer or other liquid to be bottled is supplied to the tank until the desired height is reached, and the beer or other liquid in the tank will be under the pressure of the air or other fluid. Bottles are filled with the beer or other liquid by entering a bottle onto a holder-fork with the end of the filling-tube in the neck of the bottle and turning the bottle and with it the filling-tube into position to be suspended in a vertical plane practically, and when the bottle is in this position the liquid from the tank is free to flow by gravity from the tank into the bottle, as the bringing of the bottle into the filling position first opens the vent and supply tubes and passages in the filling-tube, the filling-valve and its shell or casing, and the supply and vent tube in the filling-tank, so that the pressure in the bottle will be equal to the pressure in the tank, as already described. The completion of the movement of bringing the bottle into filling position opens the passages for the liquid to flow into the filling-tube and discharge at the port or opening of the filling-tube into the bottle, and such discharge will be under a pressure in the bottle corresponding to the pressure in the filling-tank. The bottle when filled is swung from its vertical filling position into an inclined position, shutting off by its movement the passages for the liquid and the pressure through the filling-valve, and when the bottle is turned to the limit of its upward swing, which is determined by the contact of the neck or stem of the closing-cap with the end wall of the shell or casing, the bottle can be readily and quickly removed from the holder-fork by a downward pull on the fork sufficient to withdraw the neck of the bottle from the end of the filling-tube and detach the bottle, which can then be removed from the fork to be corked and set away. A new bottle is placed in position and entered on the holder-fork for the filling-tube to enter the neck of the bottle and the bottle brought into position for filling in the

manner described and when filled carried out of the filling position into a position for removal, as described, and these operations can be continued until the required number of bottles have been filled. The filling-tank can have only a single bottle-filling device applied thereto or can have any number of such devices, depending upon the length of the tank, and each filling device operates in filling a bottle suspended by its fork in the manner already described.

The holder-forks in a machine having a plurality of filling-tubes can be pivotally supported each at its rear end on a bar T^2, extending from end to end of the machine, as shown in Fig. 1. This bar T^2 has at intervals thereon in line with the filling-tubes ears t^2 to receive the extension or neck s' of the fork, and the extension or neck is pivotally attached between the ears to the bar by a suitable pin or pivot t^3, which allows the forward end of the fork to rise and fall. The spring U at its upper end can be connected to the casing or shell of the valve, as shown in Fig. 11, or to any other suitable support. The clamp V for the fork can be carried from the closing-cap by a suspending-bar V', suitably hinged at one end to the cap and at the other end to the clamp, so that the clamp and the cap will move in unison in the swing of the filling-tube for inserting and removing a bottle, thus maintaining a unity of movement and relation between the cap and the clamp of the fork. The conical depending center plug q' of the packing Q' for the closing-cap extends below the edge of the cap and when entered into the neck of the bottle forms an effectual stopper or closure within the neck of the bottle around the end of the filling-tube, by which, in connection with the impact of the cap packing against the exterior of the end of the bottle, a positive prevention is provided against the escape of pressure and liquid.

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

1. In a bottle-filling machine, the combination of a filling-tank under pressure, a filling-valve having therein a passage for liquid and an independent single passage for both inducting and educting pressure and connected with the filling-tank, and a filling-tube connected to and carried by the filling-valve and having therein a passage for liquid and a single passage for both inducting and educting pressure for the pressure inducting and educting passages to establish communication between and equalize the pressure in the bottle to be filled before admitting liquid to the bottle, substantially as described.

2. In a bottle-filling machine, the combination of a filling-tank, means for supplying fluid-pressure to and regulating fluid-pressure in the tank, means for supplying liquid to the tank against fluid-pressure, a filling-valve having therein a passage for liquid, and an independent single passage for both inducting and educting pressure and connected with the filling-tank, a filling-tube carried by the valve and having therein a passage for liquid and a single passage for both inducting and educting pressure for the pressure inducting and educting passages to establish communication between and equalize the pressure in the bottle and filling-tank before admitting liquid to the bottle, and a fluid-pressure supply and vent tube both in one extending from the inducting and educting passage of the valve to the top of the tank and coacting with the pressure inducting and educting passage of the filling-tube, substantially as described.

3. In a bottle-filling machine, the combination of a filling-tank, means for supplying fluid-pressure to and regulating fluid-pressure in the tank, means for supplying liquid to the tank against fluid-pressure, a filling-valve having therein a passage for liquid, and an independent single passage for both inducting and educting pressure and connected with the filling-tank, a filling-tube carried by the valve and having therein a passage for liquid and a single passage for both inducting and educting pressure for the pressure inducting and educting passages to establish communication between and equalize the pressure in the bottle and filling-tank before admitting liquid to the bottle, a fluid-pressure supply and vent tube both in one extending from the inducting and educting passage of the valve to the top of the tank and coacting with the pressure inducting and educting passage of the filling-tube, and a bottle-holder coacting with the filling-tube for suspending the bottle with the discharge end of the filling-tube in the neck of the bottle and with the end of the pressure inducting and educting passage of the filling-tube within the bottle, substantially as described.

4. In a bottle-filling machine, the combination of a filling-tank, means for supplying fluid-pressure to and regulating fluid-pressure in the tank, means for supplying liquid to the tank against fluid-pressure, a filling-valve having therein a passage for liquid and an independent single passage for both inducting and educting pressure and connected with the filling-tank, a filling-tube carried by the valve and having therein a passage for liquid and a single passage for both inducting and educting pressure for the pressure inducting and educting passages to establish communication between and equalize the pressure in the bottle and filling-tank before admitting liquid to the bottle, a fluid-pressure supply and vent tube both in one extending from the inducting and educting passage of the valve to the top of the tank and coacting with the pressure inducting and educting passage of the filling-tube, a bottle-holder coacting with the filling-tube for suspending the bottle with the discharge end of the filling-tube in the neck of the bottle and with the end of the pressure inducting and

educting passage of the filling-tube within the bottle, a closing-cap on the filling-tube for the end of the bottle, and a spring operating on the bottle-holder to hold the end of the bottle in the closing-cap of the filling-tube, substantially as described.

5. In a bottle-filling machine, the combination of a tank having a depression on its under side forming a supporting-rim, a bushing entered into and secured in the rim, coupling-collars the inner one of which is entered into and abuts against the end face of the bushing, a valve shell or casing entered into the outer coupling-collar and abutting against the end face of the inner coupling-collar, and a controlling filling-valve in the shell or casing, substantially as described.

6. In a bottle-filling machine, the combination of a tank having a depression on its under side forming a supporting-rim, a bushing entered into and secured in the supporting-rim, coupling-collars the inner one of which is entered into and abuts against the face of the bushing, a valve shell or casing entered into the outer coupling-collar and abutting against the end face of the inner coupling-collar, a controlling-valve in the shell or casing, a filling-tube entered into the controlling-valve, and a closing-cap on the filling-tube, substantially as described.

7. In a bottle-filling machine, the combination of a filling-tank under pressure, a pressure supply and vent tube both in one located in the filling-tank and extending above the liquid in the tank, a valve shell or casing having therein a liquid-opening in communication with the filling-tank and an induction and eduction passage both in one in communication with the pressure supply and vent tube, a valve-plug in the shell or casing having therein a transverse opening for communication with the liquid opening or passage of the shell or casing and a single passage for both inducting and educting pressure and in communication with the inducting and educting passage of the shell or casing and operating to establish communication for inducting pressure before establishing communication for admitting liquid and with the establishment of the liquid communication to establish communication for educting-pressure, a filling-tube entered into the transverse opening of the plug-valve for the liquid, a tube for both inducting and educting the pressure carried by the filling-tube, and an annular chamber in the body of the plug adjacent to the filling-tube and in communication with the pressure induction and eduction passage of the plug and the pressure induction and eduction tube of the filling-tube, substantially as described.

8. In a bottle-filling machine, the combination of a filling-tank under pressure, a pressure supply and vent tube in the filling-tank, a controlling-valve having a passage for communication with the filling-tank and a passage for communication with the pressure supply and vent tube and operative to establish communication for the pressure before establishing communication for the liquid, a filling-tube carried by the controlling-valve, and a pressure supply and vent tube in the filling-tube having communication with the pressure supply and vent passage of the valve, substantially as described.

9. In a bottle-filling machine, the combination of a filling-tube, a closing-cap having a hemispherical interior face and carried by the filling-tube, a packing for the interior of the closing-cap, consisting of a hemispherical rim terminating within the cap and a central conical depending plug integral with the rim and having its end projecting below the edge of the closing-cap for the plug to enter the mouth of the bottle and the inner face of the closing-cap to encompass and fit tightly around the end of the bottle, substantially as described.

10. In a bottle-filling machine, the combination of a bottle-holder fork pivoted to rise and fall at its receiving end and a clamp carried by the receiving end of the holder-fork, the engaging faces of the side arms or bars of the fork and clamp having an inclination in relation to each other for the incline of the engaging faces to act and force the side bars of the clamp inwardly and to close the clamp around the neck of a bottle, substantially as described.

11. In a bottle-filling machine, the combination of a filling-tube, a closing-cap carried by the filling-tube, a bottle-holder fork pivoted to rise and fall at its receiving end and a clamp carried by the receiving end of the holder-fork, the engaging faces of the side arms or bars of the fork and clamp having an inclination in relation to each other for the incline of the engaging faces to act and force the side bars of the clamp inwardly and to close the clamp around the neck of a bottle, substantially as described.

ADOLPH SCHNEIDER.

Witnesses:
THOMAS A. BANNING,
OSCAR W. BOND.