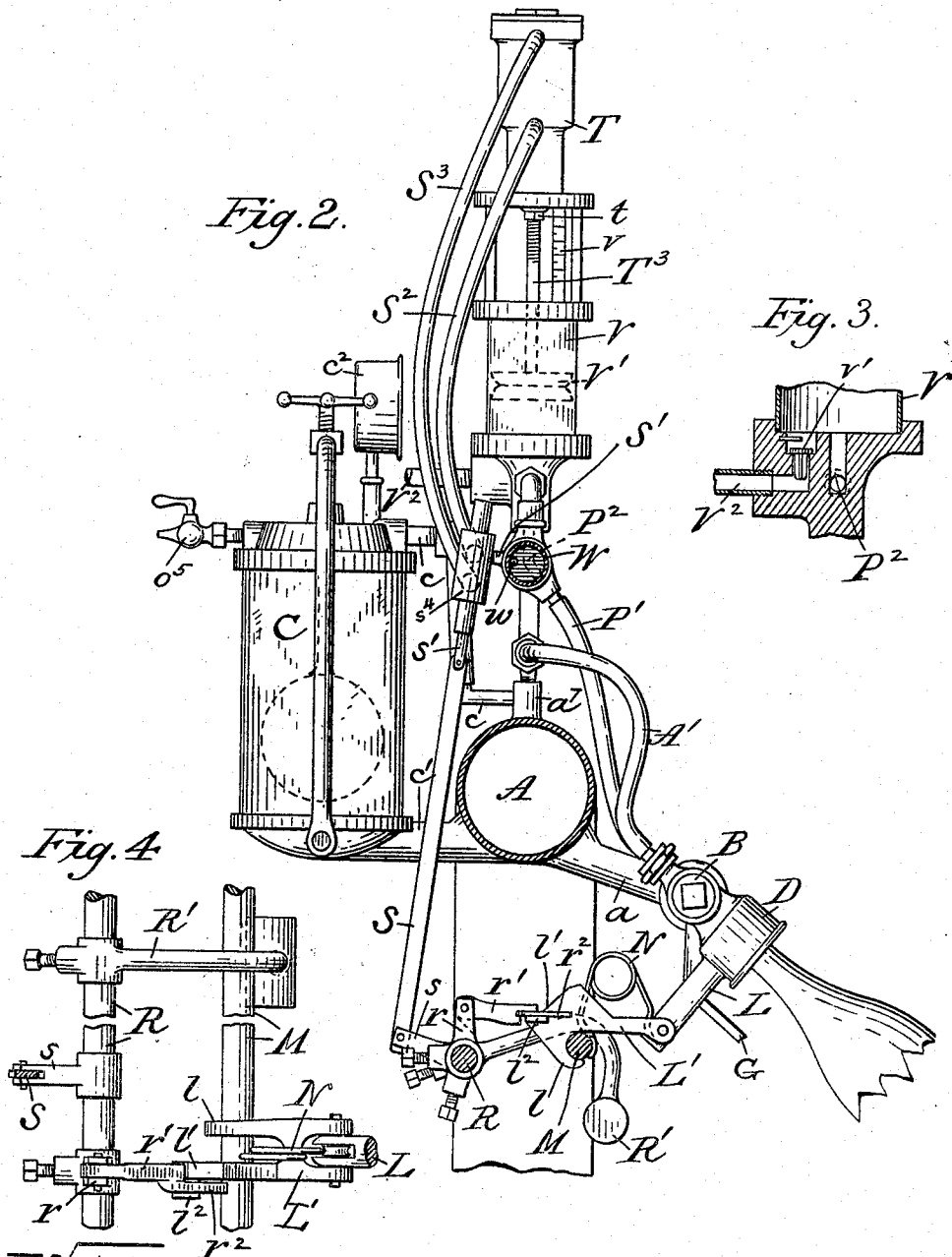


933,361.

Patented Sept. 7, 1909.
6 SHEETS—SHEET 2.



Witnesses:

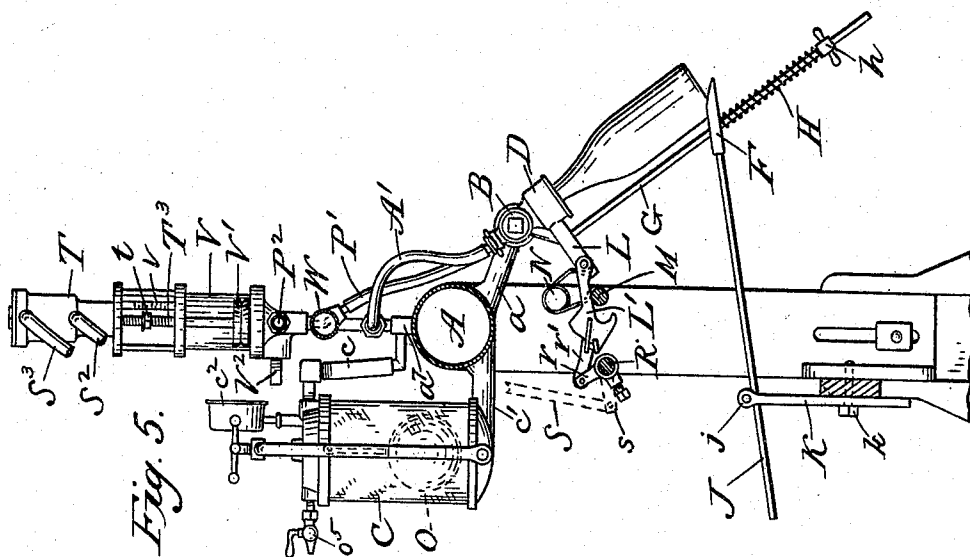
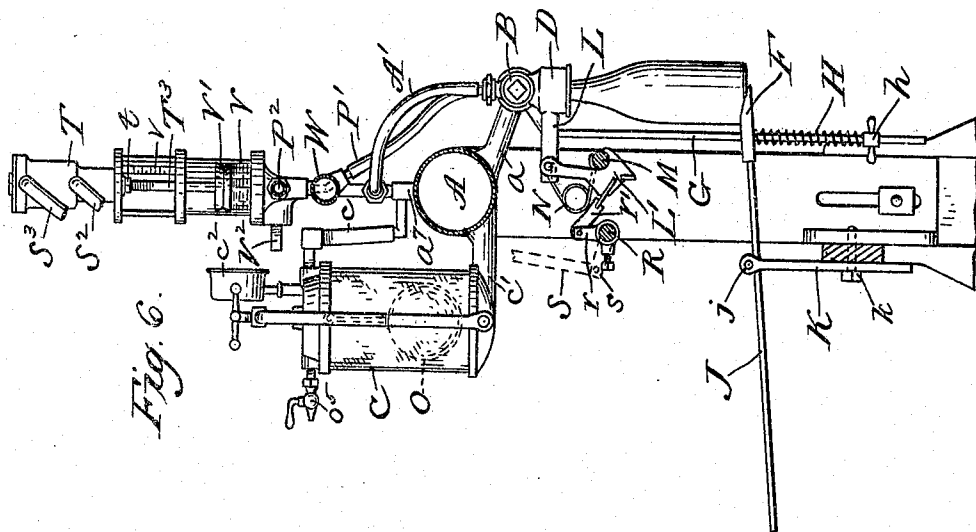
A. L. Lord.
G. Davies

Inventor
Joseph H. Champ
by Thos B. Hall
Attorney

J. H. CHAMP.
BOTTLING MACHINE.
APPLICATION FILED SEPT. 18, 1903.

933,361.

Patented Sept. 7, 1909.
5 SHEETS—SHEET 3.



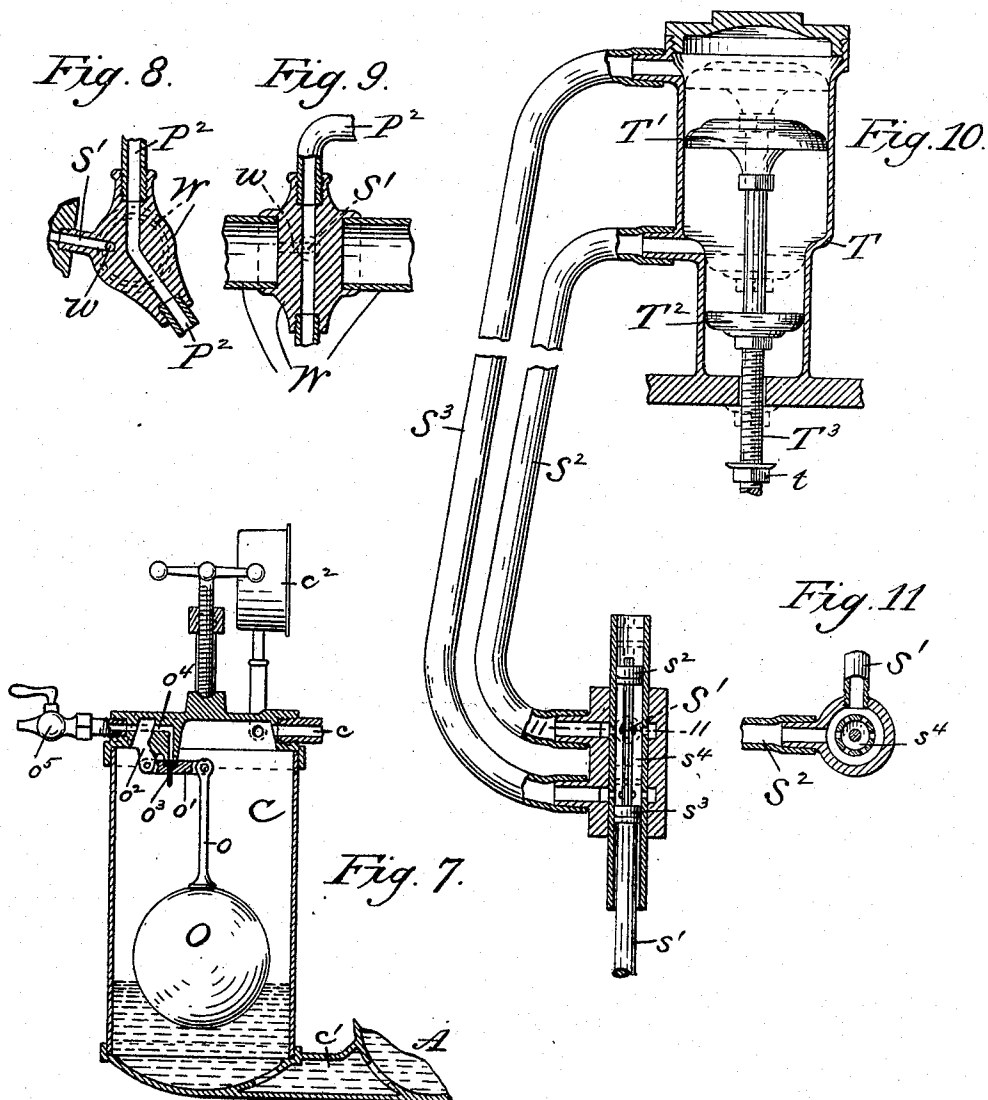
Witnesses:

A. L. Lord
J. Davies

Inventor
Joseph H. Champ
by Thos B Hall
Attorney.

933,361.

Patented Sept. 7, 1909.
6 SHEETS—SHEET 4.



Witnesses:

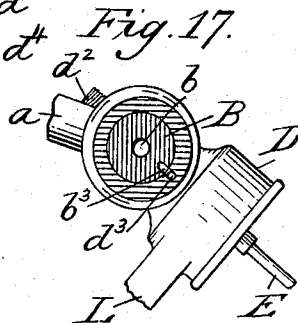
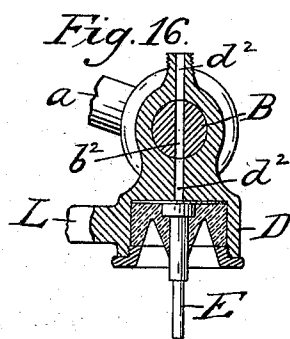
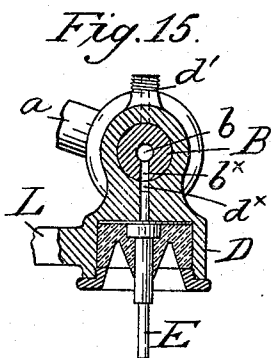
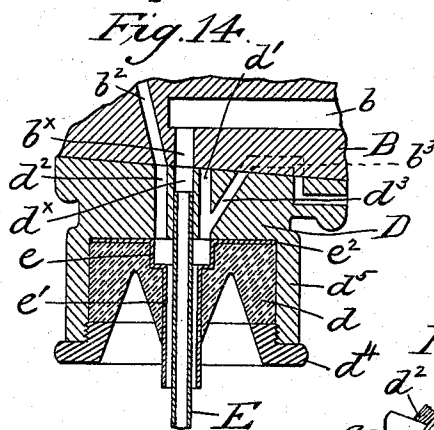
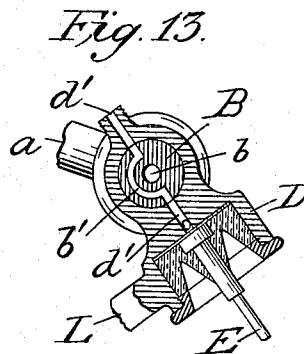
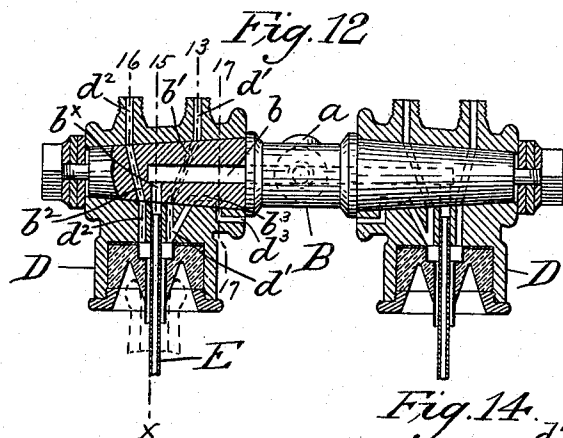
A. L. Lord.
D. J. Davies

Inventor.

Joseph H. Champ
by *Thos B Hall* Attorney.

933,361.

Patented Sept. 7, 1909.
5 SHEETS—SHEET 5.



Witnesses:

A. L. Lord.
S. J. Davies

Inventor
Joseph H. Champ
by Thos. B. Hall

Attorney.

UNITED STATES PATENT OFFICE.

JOSEPH H. CHAMP, OF CLEVELAND, OHIO.

BOTTLING-MACHINE.

933,361.

Specification of Letters Patent.

Patented Sept. 7, 1909.

Application filed September 18, 1903. Serial No. 173,696.

To all whom it may concern:

Be it known that I, JOSEPH H. CHAMP, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Bottling-Machines, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The object of my invention is to provide an improved bottling machine which involves automatic bottling of a certain charge of fluid; and is adapted particularly to the bottling of soda water charged with a predetermined quantity of syrup.

The invention consists of the means hereinafter described, and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting but one of various mechanical forms in which the principle of the invention may be used.

Figure 1 is a front elevation, with omission of certain rear construction which might confuse the front construction essentially designed to be shown in this figure. Fig. 2 is a detail, in the vertical transverse sectional plane 2—2 of the preceding figure. Fig. 3 is a detail sectional view of lower portion of the syrup pump and showing check valve in syrup inlet. Fig. 4 is a detail plan of the mechanism for operating the rock shaft which actuates the valve of the piston mechanism for operating the syrup pump,—and which appears in side elevation in the lower portion of Fig. 2. Fig. 5 is a vertical transverse sectional elevation on line 5—5 of Fig. 1,—the members being shown in their positions when the bottle has just received its charge of syrup. Fig. 6 is the same as the immediately preceding figure,—but represents the members in their position when the bottle is being filled with soda water. Fig. 7 is a detail, mainly in central vertical sectional elevation, of the pressure regulating chamber. Fig. 8 is a detail, showing a portion of the syrup way, and showing a portion of the adjacent pressure fluid way leading to the valve chamber which controls the piston mechanism for actuating the syrup pump. Fig. 9 is vertically right angular to the immediately pre-

ceding figure. Fig. 10 is a detail, partly in side elevation and partly in sectional elevation, of the piston mechanism and its valve mechanism,—controlling the syrup pump. Fig. 11 is a detail, mainly in top horizontal section on line 11—11 of the immediately preceding figure, passing through the valve chamber. Fig. 12 is a detail, partly vertical sectional and partly front elevation, showing one pair of bottle mouth pieces with their cooperating means. Fig. 13 is mainly a transverse sectional elevation on line 13—x of Fig. 12. Fig. 14 is a detail, in vertical central longitudinal section of one of the duplicate bottle mouth pieces. Fig. 15 is a detail, mainly in transverse vertical section on line 15—x, of Fig. 12. Fig. 16 is a detail, mainly in transverse vertical section on line 16—x of Fig. 12. Fig. 17 is a detail, in transverse vertical sectional elevation on line 17—17 of Fig. 12.

The form of the machine shown in the drawings is adapted to fill several pairs of bottles simultaneously; but it will be understood that a machine could equally well embody the invention though such machine be adapted to at one time fill more or less number of bottles. Detail description will therefore be given of the construction and operation of the invention as embodied in means for filling a single bottle; such construction and operation being substantially the same as in means for filling at one time more than one bottle.

The soda water with which the bottle is to be filled is supplied under proper pressure through horizontal soda water main A, which has communication at its one end with its source of supply. The horizontal stationary plug B, parallel with soda water main A, is provided with a central longitudinal bottling fluid way b, which is in constant communication with the lower portion of the soda water main by intermediate branch pipe a.

Pressure regulating chamber C is located rearwardly of the central length portion of soda water main A. Its upper portion has constant fluid connection c with the upper portion of said main. Its lower portion has constant fluid connection c' with the lower portion of said main. Its upper portion is provided with a gage c².

Mounted on horizontal stationary plug B so as to have an oscillatory or rocking movement with reference thereto, are suitable

bottle holding means including a bottle mouth-piece D and a bottle rest F adapted to receive the bottle and hold its mouth against such mouth-piece. Bottle mouth-piece D comprises as its base member a tubular valve portion fitted around plug B. Such valve portion of the mouth-piece is provided with three fluid ways, each divided into two transverse parts; each one of such three fluid ways having said plug B located between its said two transverse parts. Said three two part ways are respectively: the syrup inlet way d' , the vent way d^2 and the final relief way d^3 . The syrup inlet way d' has its two transverse parts adapted to communicate with each other by intermediate registration of channel b' formed in said plug B. The vent way d^2 has its two parts adapted to communicate with each other by intermediate registration of channel b^2 formed in plug B. The soda water way b is provided with port b^* adapted to register under proper conditions with way d^* formed in holder D. The final relief way d^3 has its two transverse parts adapted to communicate with each other by intermediate registration of channel b^3 formed in plug B. The formations of the said ways are such that the two transverse parts of fluid way d' register with channel b' and complete the operation resulting from such registration and pass out from said registration,—all before the two transverse parts of vent way d^2 register with channel b^2 , and also all before way d^* registers with port b^* . The bottle is thereby fully charged with the syrup before soda water communication with the bottle is had and before vent is given to the bottle. At the close of the movements, the cooperating parts of the final relief way communicate, and relieve any pressure of fluid within the bottle, so that the latter may be removed from the machine without overflow.

Bottle filling tube E is connected to and depends from way d^* , down through tubular formation $e e'$ depending from annular plate e^2 fitted between the upper face of gasket d and mouth piece D; such gasket having thereby formed in its central upper portion a chamber, from which a passage of less diameter than said chamber depends, through which chamber and passage said tube E depends clear thereof. Nut d^4 is threaded to the lower portion of depending annular wall d^5 of said mouth piece D, within which wall said gasket is fitted, and clamps together said gasket and plate and mouth piece.

The bottle rest F is cup-shaped on its upper surface, adapted to receive and closely hold the bottom of a bottle of corresponding size. A rod G has its upper extremity rigidly connected to arm L which projects rigidly and rearwardly from bottle mouth piece D; such rod has its depending portion

passing freely through an opening in the rear portion of rest F, so as to have loose engagement with such rest. A spiral spring H is loosely fitted about said rod, being compressed between the rest F and a clip h adjustable on said rod. A rod J projects rearwardly from rest F angularly to said rod G and is adapted to have longitudinal travel beneath roller j , fastened by clamp K to the framework of the machine; such clamp having its lower portion slotted and adapted to be maintained at different points of vertical adjustment on the machine-frame-work by clamping-bolt k , fitted within such slotted portion.

To the outer end of arm L is pivoted the member L' ; the latter being formed with two parallel rear hooks l passing over rod M of the machine frame-work. A coiled spring N has its forward end connected to said pivotal connection of arm L and member L' , and has its rear end connected with said rod M; the construction being such that said spring exerts pressure upon said arm, in tendency to throw the latter into desired position respectively after the pivotal connection of said arm L and member L' has passed dead center.

The pressure regulating chamber C is provided with ball float O having upwardly extending stem o , to whose upper extremity is pivoted the power end of valve stem o' ; such valve stem being a lever of the second order and having its fulcrum end horizontally pivoted to hanger o^2 of the chamber top. Valve o^3 is located between said two pivotings of its stem, and controls communication between the upper interior portion of said pressure regulating chamber and the escape passage o^4 ; the latter passage being provided at its outer end with vent cock o^5 .

Tube P' constantly connects the upper part of syrup way d' of the bottle mouth piece with syrup way P^2 leading from bottom of the syrup pump cylinder V. Passage A' constantly connects the upper part of vent way d^2 of the bottle mouth piece with the upper portion of soda water main A, by intermediate branch pipe a' .

Horizontal rock shaft R is located rearwardly of rod M, and is provided with counter-balance R' whose rear extremity is adjustably secured to said rock shaft, and whose forward portion projects over rod M and thence downwardly. Said rock shaft is provided with upwardly projecting arm r adjustably secured thereto; the upper end of such arm having horizontally pivoted thereto dog r' whose forward end is adapted to engage with rear edge of cam l' formed on the upper rear portion of one of the rear parallel hooks l of member L' . Immediately below said cam l' is formed side lip l^2 adapted to engage forwardly projecting side lip r^2 formed on the corresponding side of the

forward end of said dog r' . The construction of said members and their relations to one another are such as to cause these members to operate as follows: As the bottle is initially moved rearwardly from its position when first placed in the machine, the cam l' positively engages the forward end of dog r' so that the latter moves rock arm r sufficiently rearwardly to operate the valve of the piston mechanism,—as hereinafter more fully appears in the description of the first portion of the rear movement of the bottle mouth piece. As the latter member thereafter moves still farther rearwardly, dog r' becomes freed from working engagement of cam l' ; whereupon counterbalance R' becomes effective, dropping down on to rod M , and actuating rock shaft R so as to throw rock arm s sufficiently upwardly to operate the piston mechanism valve,—as hereinafter more fully appears in the description of the second portion of the rear movement of the bottle mouth piece.

Fig. 5 shows the positions which the said members have at the close of said first portion of the rear movement of the bottle mouth piece. Fig. 6 shows the positions which the said members have at the close of said second portion of the rear movement of the bottle mouth piece.

Connecting rod S has its lower extremity pivoted to rock arm s , and has its upper end pivoted to valve stem s' . The latter is provided with upper end piston s^2 , and with lower piston valve s^3 ; such piston and piston valve having reciprocating vertical movement in upright valve chamber s^4 . Tube S' , connected by members w W W' with the piston actuating fluid under pressure, and the lower end of tube S^2 , have constant communication with each other and with the valve chamber s^4 ,—in horizontal transverse plane 11—11 of said valve chamber that is always located between piston s^2 and piston valve s^3 . At a suitable distance below said horizontal transverse plane 11—11 said valve chamber connects with the lower end of tube S^3 . Piston valve s^3 has vertical reciprocating movement to points respectively below and above the said connection of tube S^3 with said valve chamber s^4 ; and thereby opens and closes communication between tubes S' and S^3 , through the intermediate portion of the valve chamber. It will be understood that connecting rod s' does not fit so tightly in valve chamber s^4 but that air can pass thereby when said piston valve s^3 is raised to its upper position. In other words, in such upper position of the valve, tube S^3 is adapted to be vented through the communication with the external atmosphere thus had past rod s' .

Upright cylinder T has its upper transverse section of greater diameter than its lower transverse section. The upper end of pipe

S^2 connects with said cylinder, at the horizontal junction of its said two diametrically differing sections. The upper end of pipe S^3 connects with the upper end of the larger diameter section of said cylinder.

Piston T' is at the upper end of rod T^3 , and is of diameter corresponding to the larger diameter transverse section of cylinder T . Piston T^2 is of size corresponding to the smaller diameter section of cylinder T , and is at a point on rod T^3 suitable for working in the smaller diameter transverse section of said cylinder.

When valve s^3 is below the connection of tube S^3 with valve chamber s^4 , and tube S^3 thereby communicates with tube S' through the intermediate portion of said chamber; then, piston T' is balanced by equal fluid pressure respectively against its upper and lower faces, permitting the fluid pressure against the upper face of piston T^2 to force the latter down, with its accompanying members. When valve s^3 is above the connection of tube S^3 with valve chamber s^4 , and tube S^3 thereby does not communicate with tube S' ; then, piston T' has fluid pressure only against its lower face, which dominates the fluid pressure against the upper face of piston T^2 , and forces the latter up, with its accompanying members. During such upward movement of the differential piston the air confined in the portion of the cylinder chamber above piston T' escapes through tube S^3 and the vent way provided in effect, as has been described, past loose-fitting valve stem or rod s' .

The lower end of rod T^3 is mechanically connected with plunger V' of the syrup pump V located below the piston cylinder T . Such rod is threaded along its length suitably to permit of any desired vertical adjustment thereon of stop nut t ; which latter is adapted to engage with the lower side of the base of cylinder T , so as to limit the upstroke of the rod, and thereby gage the suction stroke of syrup plunger V' . Said base of cylinder T is centrally provided with an opening of sufficient size to permit said rod T^3 to work freely therethrough in vertical movement, and to permit free air passage between the lower face of piston T^2 and the atmosphere exterior to the cylinder.

A vertical scale v is located between the piston cylinder T and the pump cylinder V ; such scale permitting gage nut t to be accurately set at the vertical point on rod T^3 , suitable to draw into the pump the precise predetermined quantity of syrup. The bottom of the syrup cylinder being connected with pipe V^2 leading from a suitable source of syrup supply; an automatic check valve v' being fitted in said pipe V^2 , and adapted to permit syrup to pass from said pipe into said pump, and to prevent passage of syrup from out said pump into said pipe.

Horizontal tubular support W is provided at one end portion with a longitudinal way *w*, which connects with tube S', and which is supplied by a tube W' leading from the supply source of fluid under pressure which is to actuate the differential piston mechanism; such a pressure fluid being, for instance, compressed air, or water furnished by ordinary city water service. Syrup way P² passes transversely through said horizontal tubular support W, in order to secure strength, and connects tube P' with the bottom of syrup cylinder V.

The bottle to be filled is locked in position between the bottle mouth piece and the bottle rest. At the commencement of use of the machine, the vent cock *o*⁵ is to be closed; but after the machine has gotten sufficiently into operation, said vent cock is to be opened. There are three distinct positions of the bottle while thus locked in the machine, in which positions respectively different operations of the valve mechanism of the bottle mouth piece obtain. These three positions are taken respectively during the first portion of the rearward movement of the bottle mouth piece, during the second portion of such rearward movement, and during the forward movement. The syrup charging mechanism operates during said rearward movement of the bottle mouth piece, and remains inoperative during said forward movement.

During the first portion of the rear movement of the bottle mouth piece, cam *l'* engages dog *r'* so as to move the latter rearwardly and thus actuate the rock shaft R rearwardly, giving valve stem *s'* its down stroke, opening communication between tubes S' S³; thus causing the differential piston mechanism to give rod T³ its down stroke, causing plunger V' to force into the bottle the charge of syrup then in the pump. During the second portion of the rear movement of the bottle mouth piece, cam *l'* releases working engagement with dog *r'*, whereupon counter-balance R' actuates the rock shaft R forwardly, giving valve stem *s'* its upstroke, closing communication between tubes S' S³; thus causing the differential piston mechanism to give rod T³ its upstroke, causing plunger V' to draw into the pump a fresh charge of syrup,—ready for the next bottle. During the succeeding forward movement of the bottle mouth piece, the machine members do not actuate rock shaft R, and the aforesaid charge of syrup in the pump remains undisturbed; but lip *l*² lifts lip *l*², and dog *r'* is placed in position for working engagement with cam *l'* during the first portion of the succeeding rear movement of the bottle mouth piece.

During the first portion of the rearward movement of the bottle mouth piece, members of the machine take positions shown in

Figs. 5 and 13; by reason thereof, the syrup way of the bottle mouth piece establishes communication between the syrup pump and the bottle, and the pump forces a charge of syrup through such communication,—from the pump into the bottle. During the second portion of the rearward movement of the bottle mouth piece, members of the machine take positions shown in Figs. 6, 15 and 16; by reason thereof, the pump draws into itself a charge of syrup for the next bottle, the soda water way of the bottle mouth piece establishes communication between the lower portion of the soda water main and the bottle, and the vent way of the bottle mouth piece establishes communication between the bottle and the upper portion of the soda water main; whereby said vent way permits air to pass out from the bottle into the upper portion of the soda water main,—as the soda water, having a pressure within its said main coequal with the pressure of the air within the bottle, passes, solely by gravity, from out of the lower portion of its main, into the bottle; the air displaced from the bottle during such soda water filling, passes from the upper portion of the soda water main into the upper portion of the pressure regulating chamber; the float controlled valve in the latter meanwhile maintains conditions of desired pressure of the contents of such chamber. The bottle being thus filled, it is thereafter moved, in forward movement, whereby members of the machine take positions shown in Figs. 2 and 17; by reason thereof, the final relief way of the bottle mouth piece establishes communication between the bottle and the outer air, and thus permits of escape from the bottle of any air or gas that might otherwise cause any of the liquid of the bottle to fly out of the latter when the bottle is removed from the mouth piece. The bottle may then be taken from the machine and corked.

The invention may be used to bottle any suitable fluid. Wherever the term soda water occurs in the foregoing description or the following claims, the same should be understood as including, under the rule of equivalents, any suitable fluid, as a known substitute for soda water.

The invention may be used with any suitable fluid. Wherever the term syrup occurs in the foregoing description or the following claims, the same should be understood as including, under the rule of equivalents, any suitable fluid, as a known substitute for syrup.

It should be further pointed out that inasmuch as the illustrative apparatus, chosen as the basis of this specification, is designed primarily for filling bottles with soda water or like artificially carbonated beverages, it does not show special means for raising the pressure of the air in the bottle to that under

which the beverage is held preliminarily to admitting the latter, such means not being ordinarily necessary with the particular class of liquids in hand. Where, however, beer or the like is the liquid with which the bottles are being filled such preliminary raising of the bottle pressure might become advisable. The only variation that adaptation to this requirement would introduce into the device as described would obviously be in the number and arrangement of the fluid ways and passages in valve-plug B and bottle mouth-piece D, whereby communication might be had by the bottle with the stratum of compressed air or other gases supernatant upon the liquid in the main or reservoir A, as well as with such liquid itself.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention—

1. In a bottle filling machine, the combination of movable bottle holding means, bottle charging means, and power means independent of said bottle holding means for operating said charging means, the operation of said power means, however, being controlled by the movement of said holding means.

2. In a bottle filling machine, the combination of movable bottle holding means, positively operating bottle charging means, and means for controlling operation of said charging means, said controlling means being operatively connected with said holding means, but during a part only of the latter's movement.

3. In a bottle filling machine, the combination of movable bottle holding means, and fluid-pressure-actuated bottle charging means, the operation of said charging means being controlled by the movement of said holding means.

4. In a bottle filling machine, the combination of movable bottle holding means, bottle charging means, piston means for actuating said charging means, a valve controlling fluid flow to said piston means, and means operatively connecting said valve with said bottle holding means.

5. In a bottle filling machine, the combination of movable bottle holding means, bottle charging means, piston means for actuating said charging means, a valve controlling fluid flow to said piston means, and means adapted to operatively connect said valve with said bottle holding means during a part only of the latter's movement.

6. In a bottle filling machine, the combination of movable bottle holding means,

positively operating bottle charging means, and means adapted to provide communication between said charging means and a bottle supported in said holding means, the operation of said last two means being controlled by the movement of said first named means.

7. In a bottle filling machine, the combination of movable bottle holding means, fluid-pressure-actuated bottle charging means, and means operatively connecting said charging means with said bottle holding means.

8. In a bottle filling machine, the combination of oscillatory bottle holding means, bottle charging means, and power means independent of said bottle holding means for operating said charging means, the operation of said power means, however, being controlled by the oscillation of said holding means.

9. In a bottle filling machine, the combination of oscillatory bottle holding means, positively operating bottle charging means, and means controlling operation of said charging means, said controlling means being operatively connected with said holding means, but during a part only of the latter's oscillation.

10. In a bottle filling machine, the combination of bottle holding means oscillatory about a substantially horizontal axis, and fluid-pressure-actuated bottle charging means, the operation of said charging means being controlled by the movement of said holding means.

11. In a bottle filling machine, the combination of bottle holding means oscillatory about a substantially horizontal axis, said means being adapted to clamp and release a bottle in different positions about such axis respectively, bottle charging means, piston means for actuating said charging means, a valve controlling fluid flow to said piston means, and means operatively connecting said valve with said bottle holding means.

12. In a bottle filling machine, the combination of bottle holding means oscillatory about a substantially horizontal axis, said means being adapted to clamp and release a bottle in different positions about such axis respectively, bottle charging means, piston means for actuating said charging means, a valve controlling fluid flow to said piston means, and means adapted to operatively connect said valve with said bottle holding means during a part only of the latter's oscillation.

13. In a bottle filling machine, the combination of bottle holding means oscillatory about a substantially horizontal axis, said means being adapted to clamp and release a bottle in different positions about such axis respectively, positively operating bottle charging means, and means adapted to pro-

vide communication between said charging means and the bottle clamped in said holding means, the operation of said charging means and said communication providing means being controlled by the oscillation of said holding means.

14. In a bottle filling machine, the combination of bottle holding means oscillatory about a substantially horizontal axis, said means being adapted to clamp and release a bottle in different positions about such axis respectively, fluid-pressure-actuated bottle charging means, and means operatively connecting said charging means with said bottle holding means.

15. In a bottle filling machine, the combination of a liquid charging device, means adapted to provide liquid communication between such charging device and the bottle at certain time, piston mechanism mechanically connected with such charging device, a valve controlling fluid flow to such piston mechanism, mechanism adapted to connect such bottle and valve together at certain time so that certain movement of the former may operate the latter, substantially as set forth.

16. In a bottle filling machine, the combination of a pump, means adapted to provide liquid communication between such pump and the bottle, piston mechanism mechanically connected with such pump, a valve controlling fluid flow to such piston mechanism, movable bottle holding means mechanically connected with said first named valve, substantially as set forth.

17. In a bottle filling machine, the combination of movable bottle holding means, bottle charging means, means adapted to provide communication between said charging device and a bottle supported in said holding means, and dependent for operation upon the movement of the latter, piston means for actuating said charging means, a valve controlling fluid flow to said piston means, and means operatively connecting said bottle holding means.

18. In a bottle filling machine, the combination of movable bottle holding means, bottle charging means, means adapted to provide communication between said charging device and a bottle supported in said holding means and dependent for operation upon the movement of the latter, piston means for actuating said charging means, a valve controlling fluid flow to said piston means, and means adapted to operatively connect said valve with said bottle holding means during a part only of the latter's movement.

19. In a bottle filling machine, the combination of movable bottle holding means, a fluid reservoir, positively operating bottle charging means independent thereof, and means adapted to connect a bottle supported in said holding means with said charging

means and reservoir, respectively, the operation of said charging means and connecting means being dependent upon the movement of said first named means.

20. In a bottle filling machine, the combination of movable bottle holding means, a fluid reservoir, fluid-pressure-actuated bottle charging means independent thereof, and means adapted to connect a bottle supported in said holding means with said charging means and reservoir, respectively, the operation of said charging means and connecting means being dependent upon the movement of said first named means.

21. In a bottle filling machine, the combination of movable bottle holding means, a plurality of independent fluid reservoirs, a pump connected with one of said reservoirs, means adapted to connect a bottle supported in said holding means with said pump and the other of said reservoirs, respectively, piston means adapted to operate said pump, and a valve controlling fluid flow to said piston means, the operation of said connecting means and valve being dependent upon the movement of said bottle holding means.

22. In a bottle filling machine, the combination of movable bottle holding means, a plurality of independent fluid reservoirs, bottle charging means connected with one of said reservoirs, means adapted to connect a bottle supported in said holding means with said charging means and the other of said reservoirs, respectively, the operation of said connecting means being controlled by the movement of said bottle holding means, piston means adapted to operate said charging means, a valve controlling means, a valve controlling fluid flow to said piston means, and means adapted to operatively connect said valve with said bottle holding means during a part only of the latter's movement.

23. In a bottle filling machine, the combination of a pump, means adapted to provide liquid communication between such pump and the bottle at certain time, differential piston mechanism mechanically connected with such pump, a valve controlling fluid flow to such differential piston mechanism, movable bottle holding means and mechanism adapted to connect the same at certain time with said first named valve, substantially as set forth.

24. In a bottle filling machine, the combination of a movable bottle mouth piece, a fluid reservoir connected with said mouth piece, mechanism for forcing fluid from such reservoir to said mouth piece, said forcing mechanism and mouth piece connected together, whereby movement of the mouth piece may start the forcing mechanism in operation, substantially as set forth.

25. In a bottle filling machine, the combination of a movable bottle mouth piece,

two fluid reservoirs independent of each other, fluid connections respectively between such reservoirs and mouth piece, mechanism for forcing fluid from one of the two reservoirs, such forcing mechanism connected with the mouth piece whereby movement of the latter may start the forcing mechanism in operation, substantially as set forth.

26. The combination of a movable bottle holding device, a pump, a fluid way from the latter adapted to communicate at certain time with the bottle, a piston connected with said pump, a valve that controls pressure fluid against said piston, connection between said valve and said bottle holding device, substantially as set forth.

27. The combination of a movable bottle holding device, a pump, a fluid way from the latter adapted to communicate at certain time with the bottle, piston mechanism mechanically connected with said pump, valve mechanism that controls pressure fluid against said piston mechanism, mechanical connection between said bottle holding device and said valve mechanism so that the latter is operated by certain movement of said bottle holding device, substantially as set forth.

28. The combination of two separate fluid conduits, movable bottling holding mechanism having fluid ways adapted at certain time to place the bottle in communication with said two conduits, a device adapted to charge one of said conduits, a pressure fluid actuated device connected with said bottle holding mechanism and with said conduit charging device and adapted to operate the latter as it is itself operated by certain movement of such bottle holding mechanism, substantially as set forth.

29. The combination of two separate fluid conduits, movable bottle holding mechanism having fluid ways adapted at certain time to place the bottle in communication with said two conduits, a pump connected with one of said two conduits, a piston that operates said pump, a valve that controls pressure fluid against said piston, mechanism connecting said bottle holding mechanism with said valve so as to actuate the latter co-jointly with certain movement of such bottle holding mechanism, substantially as set forth.

30. The combination of a syrup conduit, a soda water conduit, movable bottle holding mechanism having fluid ways adapted to place the bottle in communication with said two conduits severally at different times, a pump cylinder having a syrup outlet way connected with said syrup conduit, a piston mechanically connected with the plunger of said pump, a valve mechanically connected with said bottle holding mechanism and controlling flow of pressure fluid against said piston, substantially as set forth.

31. The combination of a syrup supply

conduit, a soda water conduit, movable bottle holding mechanism having at least three distinct fluid ways, one of said ways adapted to connect said holding mechanism with said syrup conduit, one of said ways adapted to connect said holding mechanism directly with the upper portion of said soda water conduit, one of said ways adapted to connect said holding mechanism directly with the lower portion of said soda water conduit, a pump for charging said syrup conduit, a piston mechanically connected with said pump, a valve that controls pressure fluid against said piston, connection between said valve and said bottle holding mechanism, substantially as set forth.

32. The combination of a syrup conduit, a soda water conduit, movable bottle holding mechanism having at least three distinct fluid ways, one of said ways adapted to connect said holding mechanism with said syrup conduit, one of said ways adapted to connect said holding mechanism directly with the upper portion of said soda water conduit, one of said ways adapted to connect said holding mechanism directly with the lower portion of said soda water conduit, a pump chamber having a syrup inlet way from a suitable syrup source and having a syrup outlet way into said syrup conduit, a plunger working in said pump chamber, a differential piston chamber, differential pistons working within the latter chamber and mechanically connected with said pump plunger, valve mechanism mechanically connected with said holding mechanism and adapted to automatically control flow of pressure fluid into said differential piston chamber, substantially as set forth.

33. The combination of a movable bottle holding device, a pump, a fluid way from the pump adapted to communicate at certain time with the bottle, a piston connected with said pump, a valve that controls pressure fluid against said piston, a rock shaft mechanically connected to said valve, a dog mechanically connected to said rock shaft, a cam member pivoted to said bottle holding device and adapted to engage at certain time with said dog, substantially as set forth.

34. The combination of a movable bottle holding device, a pump, a fluid way from the latter adapted to communicate at certain time with the bottle, a piston connected with said pump, a valve that controls pressure fluid against said piston, a cam member pivoted to said bottle holding device and having a lip, a rock arm, a dog pivoted to such arm and having a lip, said two lips adapted to engage each other in certain position of said bottle holding device so as to operate said dog, said valve and rock arm connected together, substantially as set forth.

35. The combination of a movable bottle holding device, a pump, a fluid way from the

latter adapted to communicate at certain time with the bottle, a piston mechanically connected with said pump, a valve that controls pressure fluid against said piston, a
5 cam member pivoted to said bottle holding device, and having a lip, a rock shaft having an arm, a dog pivoted to said arm and having a lip, the free end of said dog adapted to be engaged at certain time by said cam
10 member, the lips respectively of said cam member and dog adapted to engage each other at certain time, said valve and rock shaft mechanically connected together, substantially as set forth.
15 36. The combination of a movable bottle holding device, a pump, a fluid way from the latter adapted to communicate at certain time with the bottle, a piston mechanically connected with said pump, a valve that controls pressure fluid against said piston, said
20 bottle holding device having a rigid arm, a hook member pivoted to said arm and having a cam and a lip, a rod engaged by said hook member, a rock shaft having an arm, a
25 dog pivoted to the latter and having a lip at its free end, the free end of said dog adapted to ride over said cam, said dog lip adapted

to be actuated by said hook member lip, said valve and rock shaft mechanically connected together, substantially as set forth.

30

37. The combination of a movable bottle holding device, a pump, a fluid way from the latter adapted to communicate at certain time with the bottle, a piston mechanically connected with said pump, a valve that controls pressure fluid against said piston, said
35 bottle holding device having a rigid rearwardly projecting arm, a hook member pivoted to the free end of said arm and having a cam and a lip, a horizontal rod engaged by
40 said hook member, a rock shaft having an arm, a dog pivoted to the latter and having a lip, said dog adapted to ride over said cam, said dog lip adapted to be engaged by and raised with said hook member lip, said valve and
45 rock shaft mechanically connected together, substantially as set forth.

Signed by me, this 16th day of September, 1903.

JOSEPH H. CHAMP.

Attested by—

E. SARGENT,
THOS. B. HALL.