C. L. BASTIAN.

BOTTLE FILLING MACHINE.

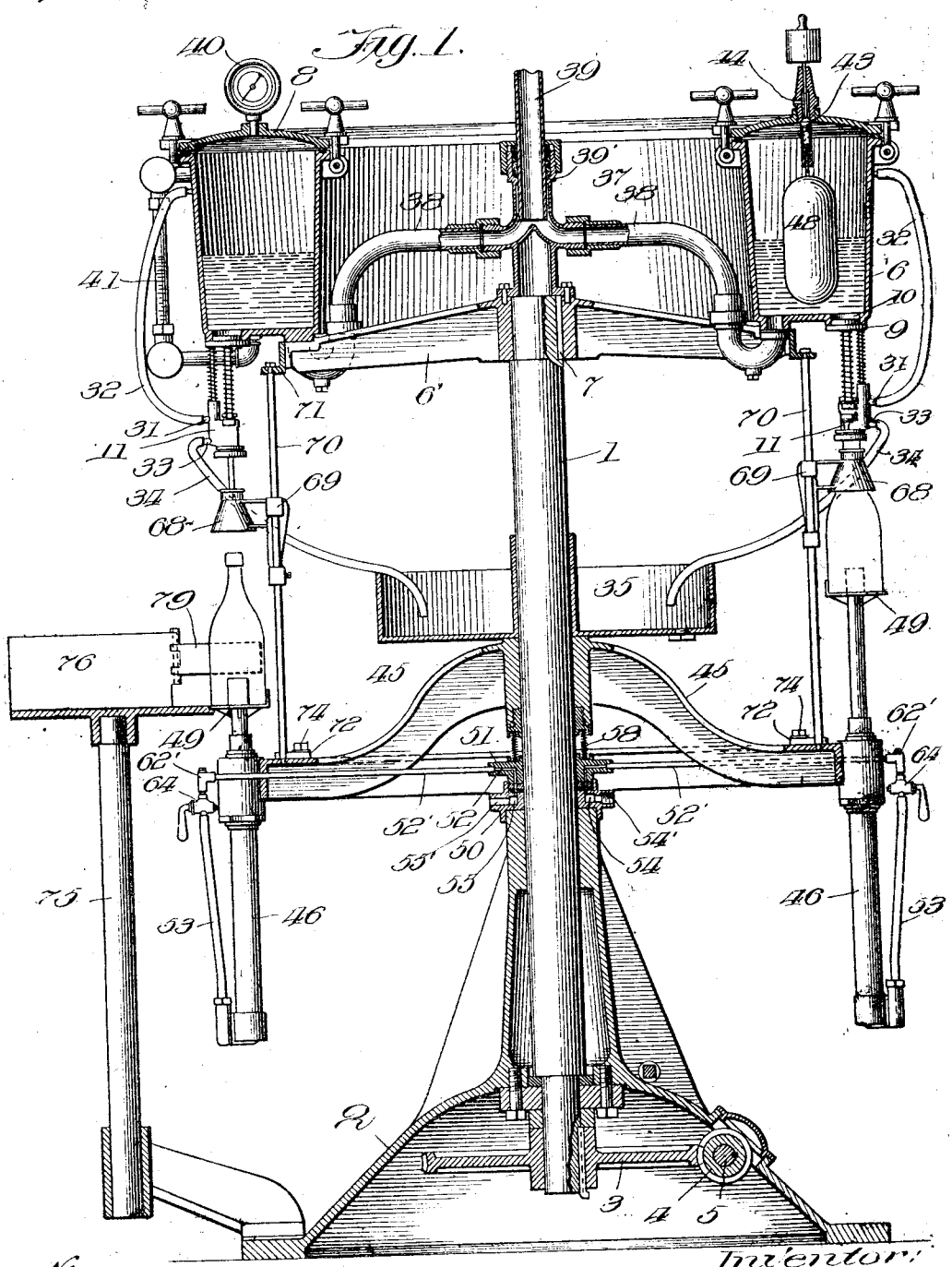
APPLICATION FILED NOV. 24, 1905.

1,046,048.

Patented Dec. 3, 1912.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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M. A. Riddell

Inventor:

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4 SHEETS—SHEET 2.

Fig. 2.

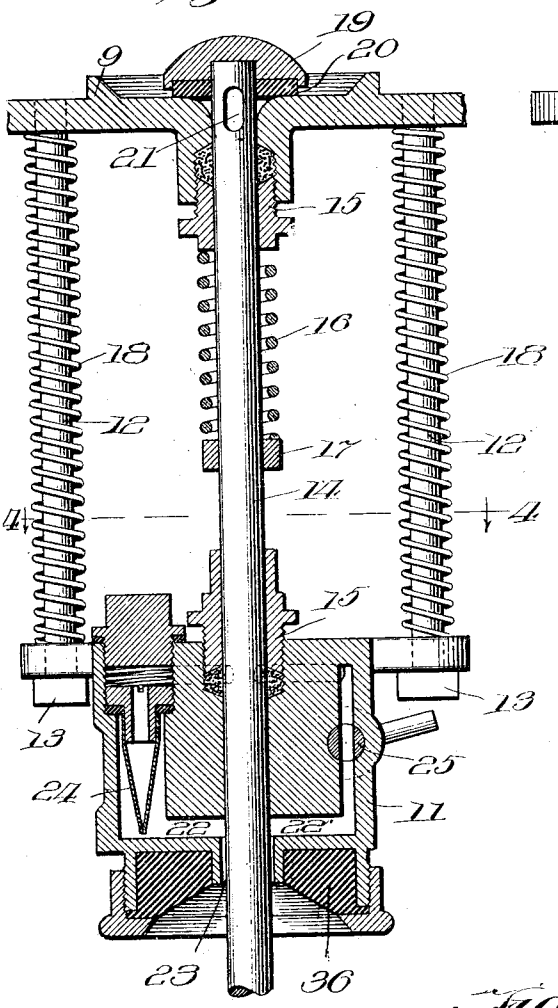


Fig. 3.

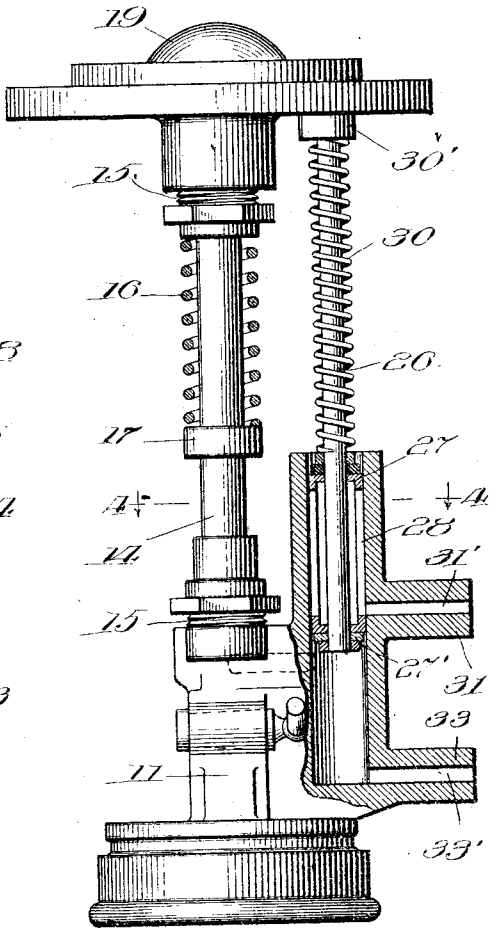
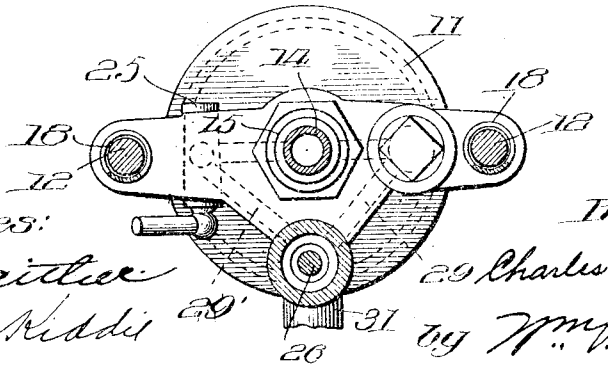


Fig. 4.



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4 SHEETS—SHEET 3.

Fig. 5.

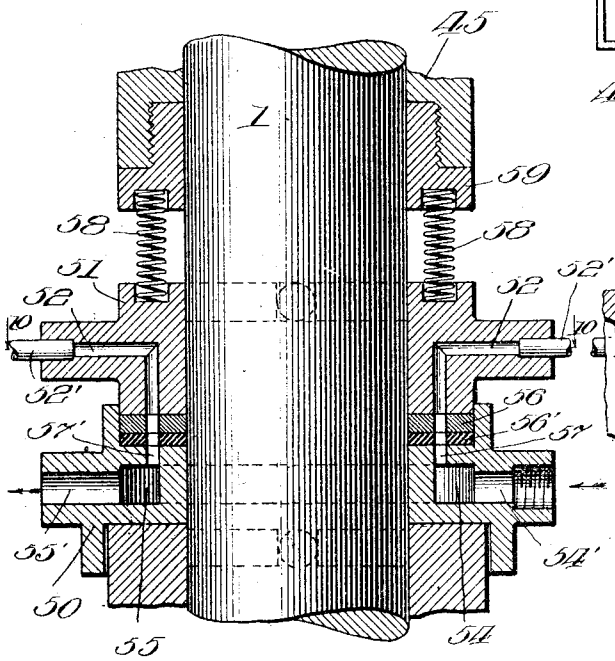


Fig. 6.

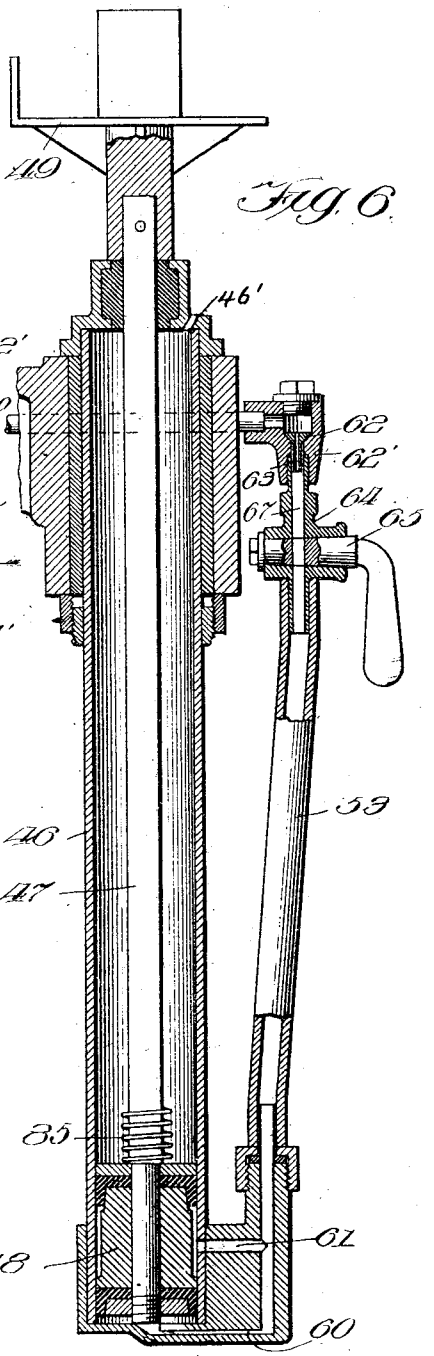


Fig. 8.

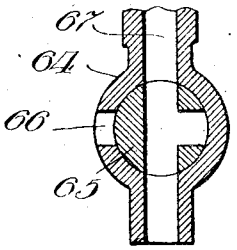


Fig. 7.

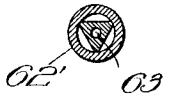
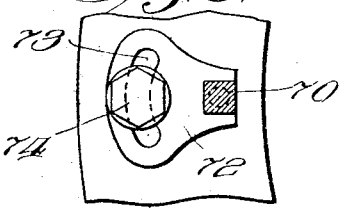


Fig. 9.



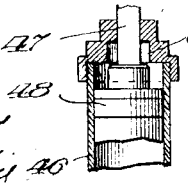


Fig. 13.

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4 SHEETS—SHEET 4.

Fig. 10.

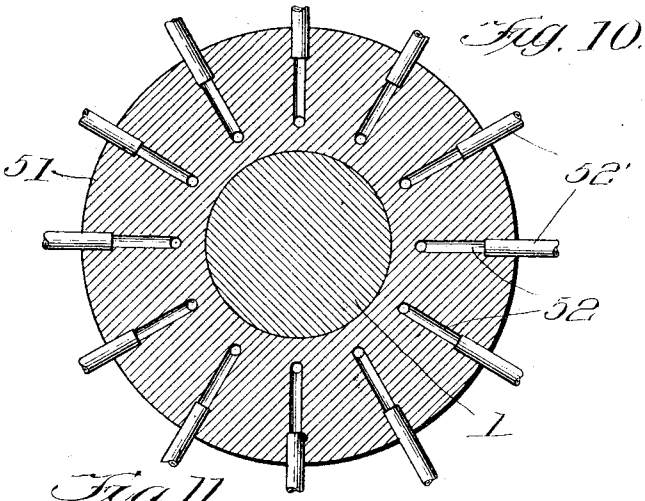


Fig. 11.

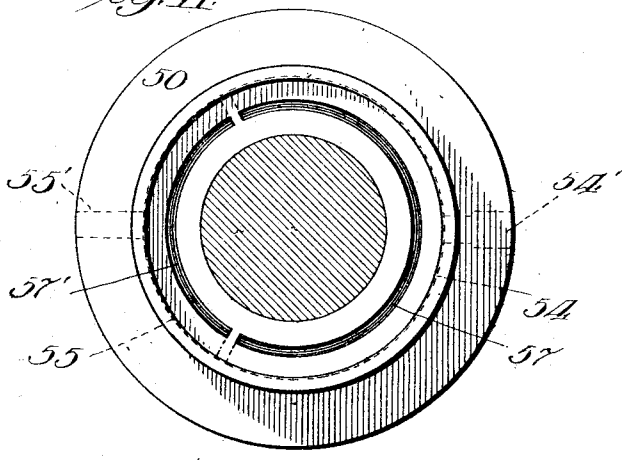
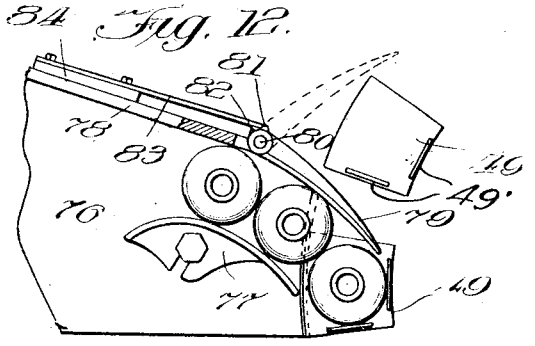


Fig. 12.



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UNITED STATES PATENT OFFICE.

CHARLES L. BASTIAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO BOTTLERS MACHINERY MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BOTTLE-FILLING MACHINE.

1,046,048. Specification of Letters Patent. Patented Dec. 3, 1912.

Application filed November 24, 1905. Serial No. 288,834.

To all whom it may concern:

Be it known that I, CHARLES L. BASTIAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Bottle-Filling Machines, of which the following is a specification.

My invention relates to counter pressure bottle filling machines of the rotary type and one of its primary objects is to move the bottle gradually into filling position and permit periods of rest during this movement at the time that the bottle is sealed and at the time the air communication between the filling tank and the bottle is established, thereby to permit the bottle to be easily centered in proper position in the machine, to provide for a perfect sealing, and to enable the pressure in the tank and the bottle to be perfectly balanced before the liquid valve is opened.

Another important object of the invention is to provide a rapid return movement of the bottle after the filling operation is completed so that the seal of the bottle may be broken and the liquid valve closed quickly to avoid the loss of liquid and to enable the filling operation to take place through a large arc of the circle in which the bottle travels so that the liquid may be permitted to flow slowly into the bottle and to give the liquid in the bottle after being filled a substantial period of rest before the bottle is discharged.

Other objects of the invention are to insure the perfect centering of the bottle relative to the filling tube; to provide means for manually exhausting the motive fluid of any bottle lift whenever the main valve mechanism controlling the motive fluid fails to operate properly or with sufficient quickness of action or when it is desirable to cut out of action a filling mechanism which has been operated by a faulty bottle; to avoid jar when a lift operates without a bottle to prevent injury to the parts of the machine by the discharge mechanism if the bottle support fails to descend to discharge position at the proper time; and to provide a machine of strong and substantial character in which the several operations take place without jar or concussion.

In the accompanying drawings illustrating my invention embodied in a machine of the general character disclosed in my application No. 245522 filed February 13, 1905, Figure 1 is a central vertical sectional elevation of a machine embodying the invention. Fig. 2 is a sectional view of the filling valve mechanism. Fig. 3 is a view of the filling valve mechanism partly in elevation and partly in section and in a plane at right angles to the plane of Fig. 2. Fig. 4 is a sectional view on the line 4—4 of Fig. 3. Fig. 5 is a detail enlarged sectional view showing the main air or fluid valve. Fig. 6 is a similar view of one bottle lift cylinder and its air or fluid connections. Fig. 7 is a detail cross-sectional view of the check valve in the air connection. Fig. 8 is a detail vertical sectional view of the two way cock. Fig. 9 is an enlarged view partly in section showing the adjustment for the bottle guide and the discharge mechanism. Figs. 10 and 11 are detail cross-sectional views on the lines 10—10 and 11—11 respectively of Fig. 5. Fig. 12 illustrates the bottle discharge. Fig. 13 is a detail sectional view.

Referring to the drawings a vertical shaft 1 is mounted in a base 2 and carries a gear 3 which meshes with a gear 4 on a driving shaft 5. Power is applied to the driving shaft in any suitable manner. A head 6 is carried by a frame 6′ mounted on the upper end of the vertical shaft and secured to rotate with the shaft by one or more feathers 7. The head is in the form of a tank which is closed in an air tight manner by a cover 8. The tank carries a number of bottle filling mechanisms depending from its bottom, but in Fig. 1 I have shown only two of these mechanisms to avoid confusion. Each filling mechanism which forms the subject matter of my application No. 255153 filed April 13, 1905, comprises a plate 9 fastened to the bottom of the tank over an opening 10 and this plate carries the several parts of the filling mechanism. A valve block 11 is slidably arranged on the suspension rods 12 which depend from the plate 9 and are provided on their lower ends with nuts 13 to hold said block on the rods. The plate 9 and the block 11 are centrally apertured to slidably fit on the vertically movable filling tube 14, stuffing boxes 15 being provided to prevent leakage. A coil spring 16 is mounted on the filling tube between the upper stuffing box and a fixed collar 17 and coil springs 18

are mounted on the suspension rods 12. On the upper end of the filling tube is a valve disk 19, the lower operative face of which is provided with a fibrous or other packing ring 20 and immediately beneath this ring the tube is provided with one or more side ports 21. The valve block has an air passage divided into two separate branches 22 and 22′ each of which is connected at one end with an annular opening 23 surrounding the filling tube and adapted to be connected at the other end with the tank. A vein valve 24 is located in the branch 22 and a manually operated valve 25 is located in the branch 22′. A rod 26 having thereon a pair of separated pistons 27, 27′ is arranged to operate in a cylindrical chamber 28 in the valve block and this chamber communicates with the branches 22, 22′ by means of ducts 29, 29′. This rod extends above the valve block and carries a coil spring 30 between the upper piston head and a nut 30′ on the upper end of said rod which abuts against the plate 9, said spring normally holding the pistons in the elevated position shown in Fig. 3. A nozzle 31 on the valve block is connected by a flexible hose 32 (Fig. 1) with the interior of the tank at or near its top and is provided with an axial duct 31′ tapping the cylindrical chamber about midway of its length. A nozzle 33′ has attached thereto a drip hose 34 (Fig. 1) that may discharge into a trough 35 on the vertical shaft and this nozzle has an axial exhaust duct 33′ which taps the cylindrical chamber at its lower end. The valve block is provided with a seat 36 of suitable character for the mouth of the bottle and the construction of the valve mechanism is such that when the bottle is raised into engagement with this seat the valve block will be moved upward to first open air communication between the bottle and the tank through the air passage in the valve block and the duct 31′ and hose 32, and thus permit an equalization of pressure therein, after which the liquid valve is opened to permit the liquid to flow into the bottle. This valve mechanism permits an equilibrium of pressure to be constantly maintained in the tank and bottle during the filling operation and also provides for the snifting off of the compressed air and liquid immediately under the seal when filling is completed and before the seal is effectually broken. It is found in practice that the sudden release of the seal, which is necessary to close the fluid valve, disturbs fluids containing gas, and this invention provides for the same gradual return of the bottle to atmospheric pressure that takes place in the first operation when the bottle, which is normally under atmospheric pressure is gradually raised to the pressure in the tank before the fluid starts to flow. It is a question of balancing pressures and making all alterations of pressure slow and regular operations. On the downward movement of the bottle the springs 16 and 18 force downward the filling tube and valve block 11 and the pistons 27, 27′ will rise in the chamber 28 until, just before the bottle breaks its seal against the seat 36, the lower piston 27′ uncovers the mouth of the duct 29′ and permits such air or gas pressure as remains immediately under the seal or in the neck of the bottle to blow out quickly through the branch 22′, duct 29′, cylinder 28 and exhaust duct 33′ into the drip hose 34 to the trough 35, thus effecting the snifting of the bottle. When the liquor is of value it can be returned from the trough to its source of supply.

The tank herein shown is of annular form having a central opening 37 and the liquid pipes 38 are supported within said opening on the frame 6′ and discharge into the bottom of the tank. A centrally disposed feed pipe 39 discharges into the pipes 38 and a stuffing box 39′ is provided to prevent leakage. A pressure indicator 40 and a gage 41 are arranged on the tank at convenient points for observation. A float 42 is located within the tank and carries a valve 43 which is normally seated to close an air escape passage 44. This air escape or blow-off valve may be of any suitable construction and it is adapted to allow the escape of air from the tank and permit the inflow of liquid as occasion requires to maintain, substantially, a constant predetermined quantity of liquid in the tank. When this air escape valve is closed a pressure equal to the hydrostatic head of the inflowing liquid will be created in the tank to arrest the flow of the liquid until the level of liquid in the tank has been lowered by filling operations, when the valve will be automatically opened to relieve the tank of excess air pressure so that the flow of liquid will resume until a condition of equilibrium is again reached.

A spider 45 (Fig. 1) is slidably mounted on the vertical shaft but made fast to turn therewith and this spider carries a number of air-lift cylinders 46 located in vertical alinement with the filling tubes and each provided with an air escape port 46′. In each of the cylinders 46 is a piston rod 47 (Fig. 6) carrying on its lower end a piston 48 and on its upper end a shoe 49 adapted to support a bottle. This shoe is preferably made in rectangular form, and the bottle is positioned thereon against upstanding walls 49′ located at the inner edge of the shoe and at its side edge which is rearmost in the direction of travel of the shoe.

The main air valve comprises a pair of valve members surrounding the vertical shaft between the base and the spider. The lower stationary member 50 is secured to the top of the base and the upper rotary mem-

ber 51 is slidable on but made fast to rotate with the vertical shaft. This air valve is shown in Figs. 5, 10 and 11 and by reference thereto it will be seen that the upper member is provided with a number of angular ducts 52 which communicate through horizontal pipes 52′ and vertical pipes 53 with the bottom of the lift cylinders 46. The lower member of the valve (Fig. 11) has an inlet air passage 54 and an exhaust air passage 55, both being arc-shaped and the former having about twice the length of the latter. To the passage 54 air is admitted through a port 54′ from a suitable source of supply and from the exhaust passage 55 air is discharged through a port 55′. Between the two valve members 50 and 51 is a fibrous washer 56 superposed on a soft rubber washer 56′, and these washers are restrained by any suitable means against rotation and have arc-shaped ports co-extensive and registering with the underlying ports 57, 57′ which communicate with the passages 54, 55 respectively, in the lower member, (Fig. 5). The upper member 51 of the main air valve seats at its lower end on the washer 56 and the angular ducts 52 in this member are adapted to register with the ports on the washers which in turn register with the ports in the lower member. The upper member is held against its seat by a number of springs 58 located between said member and a collar 59 adjustably carried by the spider 45. The tension of the springs 58 can be increased or decreased by adjusting the nut 59 to compensate for variations in the initial air pressure in the main air valve. By this means the heavy load of the rotating member and spider is balanced on the seat 56 to avoid undue rubbing and wear.

The air pipe 53 communicates by a connected part 60 with the bottom of the air-lift cylinder and by a larger port 61 with [illegible] above its bottom [illegible] pipe 53 I provide a [illegible] in the form of a [illegible] as shown in Fig. 7. [illegible] section to afford a [illegible] the valve casing [illegible] permitting the [illegible] therefrom. [illegible] axial [illegible] to [illegible]

[illegible]

passage from the cylinder through the escape port 66. This is desirable when a bottle having a defective mouth is placed in the machine, which would allow the liquid to spurt out. In such case it has been the practice to shatter the bottle to allow the filling valve to close, but by turning the cock 65 the air is exhausted from the lift cylinder and the bottle descends to permit the filling valve to close, thereby avoiding the danger and litter occasioned by breaking the bottle.

The bottle is centered to receive the filling tube by a bell 68 (Fig. 1) carried by a bracket 69 mounted to slide freely on the vertical square rod 70. This rod is mounted with capacity for turning on its own axis in a bracket 71 at its upper end and in a segment plate 72 at its lower end, the bracket being made fast to the frame 6′ and the segment plate being fastened on the spider 45. This segment plate (Fig. 9) has an arc-shaped slot 73 to receive the bolt 74 by which the plate is fastened to the spider. By loosening the bolt and moving the plate to one side or the other, using the rod 70 as a center, the rod will be axially adjusted to swing the bell to a position in which it will be axially concentric with the axis of the filling tube.

The parts of the machine are constructed and the operations timed so that immediately after the bottle is placed on the shoe it will be moved up into filling position and remain in this position until the shoe approaches discharge position comparatively close to the position where it received the bottle. A discharge mechanism is located to receive the filled bottle immediately after it has returned to its lowered position, and this mechanism comprises a standard 75 which carries a guide chute 76 on its upper end. One side wall of said chute is constituted by an adjustable member 77 (Fig. 12) and the other side wall is constituted in part by a stationary portion 78 and in part by a wing 79 hinged at 80 to the stationary part 78. The hub of the wing 79 has on its rear side a projection 81 and an adjacent flat or square surface 82. A strong leaf spring 83 is secured, through a block 84, to the stationary wall 78 some distance back of the hinge. The free end of the spring bears upon the flat surface and against the projection on the hinged wing and with sufficient pressure to hold the wing in its normal position illustrated in full lines in Fig. 12 in which it lies across the path of the bottles and above the plane of the shoes. This wing coöperates with the side edge wall 49′ of each succeeding shoe to deflect the bottles outward into the chute as they approach the [illegible] but if for some reason the bottle is not carried down to its lowered position the shoe or the piston carrying the shoe will

strike the wing and swing it backward as shown in dotted lines whereby the operation of the machine is not interrupted and the parts are not injured.

I have shown and described the bottle lifting mechanism as operated by air pressure, but obviously any suitable form of fluid pressure may be employed for the same purpose.

When the machine is used in the filling of heavy liquids, such as catsup or other liquids not charged with air or gas and hence not liable to foam during the filling operation, the means described for maintaining an equilibrium of pressure in the tanks and bottles may be dispensed with or rendered inactive by allowing the interior of the tank to remain in constant communication with the atmosphere. But in the filling of all liquids under counter pressure when the pressure in the bottle to be filled is atmospheric only up to the time it is carried into filling position, it is necessary that this atmospheric pressure should be reinforced from the constant pressure maintained above the liquid in the head of the machine, and this reinforcement should take place and be absolutely balanced with the pressure in the head before the liquid valve is opened. It is therefore apparent that an arrangement which permits of a pause in the movement of the bottle to enable perfect sealing of the bottle before opening the air duct from the head of the machine to the bottle, and another pause immediately prior to the opening of the liquid valve to give time for the establishment of an equilibrium of pressure in the head and bottle, is of high value particularly when obtained by the simple means of the nature described.

The operation of the machine may be briefly described as follows:—The liquid to be filled is allowed to flow into the tank and the air therein will escape through the valve 43 until this valve is closed by the rising of the float 42, after which the air in the tank is compressed until the hydrostatic head or pressure of the liquid at its source of supply is equaled whereupon the flow of the liquid ceases. The machine is placed in operation to revolve the vertical shaft and the parts carried thereby and bottles are placed upon the shoes while the latter are in lowered position. When each of the ducts 52 registers with the port 57 that communicates with the inlet passage 54 of the main air valve, compressed air from the reservoir (not shown) flows through the conduit formed by the pipes 52′ and 53 and through the duct 60 to the bottom of the piston 48 causing the latter to rise slowly and carry the bottle against its seat 36. After passing the duct 61 the piston will rise more rapidly but still gradually. The bell 68 centers the bottle in its upward movement to receive the filling tube and the bell is carried upward with the bottle. The bottle engages and raises the valve block 11 and in so doing establishes communication first between the bottle and the air space in the top of the tank and then raises the liquid valve to permit liquid to flow into the bottle slowly by gravity until the bottle is filled. The bottle may be filled before the machine has completed its cycle of operation and this is an advantage because it gives time for the liquid to become quiescent which tends to avoid foaming. During the filling operation the air in the bottle displaced by the liquid will flow into the tank and when the float opens the air valve 43 this excess air will escape to reduce the pressure in the tank below the hydrostatic pressure of the liquid and permit the replenishing of the supply of liquid in the tank until the air escape valve has been closed by the rise of the float and the hydrostatic pressure of the supply liquid has been exceeded by the pressure in the tank. The valve 25 in the air passage 22′ enables the machine to be set to obtain perfect smoothness of flow with liquids varying in density or chemical composition.

The valve 62 in the air connection between the main valve and the lift cylinder controls and governs the flow of air into the cylinder and provides for a high velocity. Considerable expansion takes place below this valve which insures a reduced pressure operating under the piston until a resistance is met when the bottle engages valve block 11; then in a period of time, during which air communication between the head and bottle is established, sufficient pressure will accumulate to overcome this resistance and thereafter expansion and consequent reduction of pressure occurs until a second resistance is met when the valve block is carried into engagement with the stop 17 preliminary to opening the liquid valve. In a period of time sufficient pressure will again accumulate to overcome this resistance and permit the valve block to rise farther to open the liquid valve. This valve enables the use of a high reservoir compression to overcome resistance and at the same time produces a comparatively slow and gradual intermittent movement of the piston when the resistance is small and a rest period of high mechanical value when resistance is met to permit accumulation of pressure. When the air duct 52 arrives in communication with the exhaust passage 55 of the main air valve the air in the cylinder will escape to the atmosphere and this permits the piston to fall rapidly because the valve 62 will be lifted from its seat. After the piston passes the duct 61 in its downward movement (Fig. 6) it will be arrested by reason of the fact that the duct 60 is

restricted in area and hence a cushion will be formed by the air between the piston and the bottom of the cylinder after the piston passes the duct 61. This cushion is of importance in preventing shocks or jars to the mechanism which would have a tendency to agitate the liquid in the bottle.

I have shown a puppet valve 62 but any form of check valve suitable for this purpose may be employed and it will be understood that this valve is of considerable importance for the reason that it provides for a gradual rise and a rapid fall of the lift piston. The lowering of the filled bottle to discharge position may therefore be delayed until the discharge mechanism has been closely approached and the filling operation may thus be permitted to take place through a large arc of the circle through which the bottle travels so that the filling operation may be conducted slowly and the liquid in the bottle may be given a substantial period of rest before the bottle is discharged. This rapid lowering movement of the bottle after being filled also enables the liquid valve to close quickly and thereby avoid the loss of liquid.

It may happen occasionally that the operator will fail to place a bottle on a shoe and to prevent any shock or jar to the machine in such event I provide a cushion above the piston 48 which may be in the form of a spring 85 on the piston rod adapted to be compressed between the piston and the head of the cylinder, or in the form of a dash pot 86 as shown in Fig. 13. This cushion will prevent the piston from striking the cylinder head on its upward movement when no bottle is on the shoe and thereby relieve the machine from shocks and jars by reason of such conditions.

It is evident that the machine as herein shown and described might be considerably modified and varied in respect to the details of construction and the relative arrangement of parts without departing from the principle or sacrificing any of the benefits of the invention and hence I do not limit the invention to such details and arrangement of parts except to the extent hereinafter indicated by specific claims.

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

1. In a bottle filling machine, the combination of a rotatable tank, a plurality of bottle filling valves carried by the tank, a plurality of fluid pressure bottle lifting mechanisms rotatable with the tank and located opposite the filling valves, each of said lifting mechanisms comprising a cylinder, a piston working in the cylinder, a piston rod, a shoe on the piston rod to support the bottle, a conduit to conduct the actuating fluid from a supply to the cylinder, and a restricted port in said conduit to permit the flow of said fluid to the cylinder under high velocity and allow for an expansion of pressure in the conduit between said port and the cylinder to provide for a gradual rise of the piston.

2. In a bottle filling machine, the combination of a rotatable tank, a plurality of bottle filling valves carried by the tank, a plurality of fluid pressure bottle lifting mechanisms rotatable with the tank and located opposite the filling valves, each of said lifting mechanisms comprising a cylinder, a piston working in the cylinder, a piston rod, a shoe on the piston rod to support the bottle, and means for controlling the flow of the actuating fluid to and from the cylinder to impart to the piston a gradual rising movement and a comparatively rapid lowering movement.

3. In a bottle filling machine, the combination of a rotatable tank, a plurality of bottle filling valves carried by the tank, a plurality of fluid pressure bottle lifting mechanisms rotatable with the tank and located opposite the filling valves, each of said lifting mechanisms comprising a cylinder, a piston working in the cylinder, a piston rod, a shoe on the piston rod to support the bottle, a conduit to conduct the actuating fluid from a supply to the cylinder, and a valve in said conduit having a restricted port to control the flow of said fluid to the cylinder and impart a gradual rising movement to the piston, said valve being constructed to permit a rapid escape of fluid from the cylinder to provide for a comparatively rapid lowering of the piston.

4. In a bottle filling machine, the combination of a rotatable tank, a plurality of bottle filling valves carried by the tank, a plurality of fluid pressure bottle lifting mechanisms rotatable with the tank and located opposite the filling valves, each of said lifting mechanisms comprising a cylinder, a piston working in the cylinder, a piston rod, a shoe on the piston rod to support the bottle, and means for imparting to the piston an intermittent rising movement to provide a period of rest for the lifting means when the bottle encounters resistance.

5. In a bottle filling machine, the combination of a rotatable tank, a plurality of filling valve mechanisms carried by the tank, each of said mechanisms comprising an air valve and a liquid valve, fluid pressure means rotatable with the tank and located opposite each filling mechanism for lifting the bottle into engagement with said mechanism to open said valves successively, said means comprising a cylinder, a piston working in the cylinder, a piston rod, a shoe on the piston rod to support the bottle, and means for imparting to the piston an intermittent rising movement to provide a period of rest for the lifting means at the time

the bottle encounters a resistance before the air valve is opened to provide for perfect sealing of the bottle.

6. In a bottle filling machine, the combination of a rotatable tank, a plurality of filling valve mechanisms carried by the tank, each of said mechanisms comprising an air valve and a liquid valve, fluid pressure means rotatable with the tank and located opposite each filling mechanism for lifting the bottle into engagement with said mechanism to open said valves successively, said means comprising a cylinder, a piston working in the cylinder, a piston rod, a shoe on the piston rod to support the bottle, and means for imparting to the piston an intermittent rising movement to provide a period of rest for the lifting means after the air valve is opened to permit an equalization of pressure in the tank and bottle before the liquid valve is opened.

7. In a bottle filling machine, the combination of a rotatable tank, a plurality of filling valve mechanisms carried by the tank, each of said mechanisms comprising an air valve and a liquid valve, fluid pressure means rotatable with the tank and located opposite each filling mechanism for lifting the bottle into engagement with said mechanism to open said valves successively, said means comprising a cylinder, a piston working in the cylinder, a piston rod, a shoe on the piston rod to support the bottle, and means for automatically controlling the flow of the actuating fluid to the cylinder and thereby impart to the piston rod an intermittent rising movement to provide a period of rest for the lifting means at the time the bottle encounters a resistance before the air valve is opened and again before the liquid valve is opened.

8. In a bottle filling machine, the combination of a rotatable tank, a plurality of bottle filling valves carried by the tank, a plurality of fluid pressure bottle lifting mechanisms rotatable with the tank and located opposite the filling valves, each of said lifting mechanisms comprising a cylinder, a piston working in the cylinder, a piston rod, a shoe on the piston rod to support the bottle, a conduit to conduct the actuating fluid from a supply to the cylinder, and a check valve having a restricted port in said conduit to control the flow of the actuating fluid to and from the cylinder and impart to the piston a gradual rising movement and a comparatively rapid lowering movement.

9. In a bottle filling machine, the combination of a rotatable tank, a plurality of filling valve mechanisms carried by the tank, each of said mechanisms comprising an air valve and a liquid valve, fluid pressure means rotatable with the tank and located opposite each filling mechanism for lifting the bottle into engagement with said mechanism to open the valves successively, said means comprising a cylinder, a piston working in the cylinder, a piston rod, a shoe on the piston rod to receive the bottle, a conduit to conduct the actuating fluid from a supply to the cylinder, and a puppet valve in said conduit adapted to be unseated while the fluid is being exhausted from the cylinder and having a restricted port through which the fluid flows into the cylinder.

10. In a bottle filling machine, the combination of a vertical rotary shaft, filling mechanism carried by the shaft, fluid pressure means for lifting the bottle into engagement with said valve mechanism and comprising a main valve surrounding said shaft, said valve consisting of a stationary lower member and a rotatable upper member, a spider on the shaft carrying said lifting means, a collar adjustable on the spider and longitudinal of the up-right shaft, and a series of springs interposed between said collar and the upper member of the valve.

11. In a bottle filling machine, the combination with a filling valve mechanism, and means for raising a bottle into engagement therewith, of means for accurately centering said bottle during its rising movement comprising a vertical angularly adjustable guide-rod, a bracket slidably mounted on said guide-rod, and a centering bell carried by said bracket and overlying the bottle.

12. In a bottle filling machine, the combination with a filling valve mechanism, and means for raising a bottle into engagement therewith, of means for accurately centering said bottle during its rising movement comprising a vertical angular pivoted guide-rod, a bracket slidably mounted on said guide-rod, a centering bell carried by said bracket and overlying the bottle, a laterally projecting member connected to said guide-rod for turning the latter about its axis, and means for securing said member in adjusted position.

13. In a bottle filling machine, the combination with a filling valve mechanism, and means for raising a bottle into engagement therewith, of means for accurately centering said bottle during its rising movement comprising upper and lower support, a vertical angular guide-rod pivoted at its upper and lower ends in said supports, respectively, a bracket slidably mounted on said guide-rod, a centering bell carried by said bracket above the bottle, a laterally projecting segment plate non-rotatably connected to said guide-rod and having an arc shaped slot in its outer end, and a clamping bolt mounted in one of said supports and engaging said slot.

14. In a bottle-filling machine, the combination of a rotatable member, a plurality

of vertically movable bottle-supporting shoes carried by the said member, a discharge chute supported adjacent the path of travel of said shoes and adapted to receive the bottles carried by the said shoes, said discharge chute being disposed with its bottom on a level with the upper surface of said shoes to permit the bottles to slide freely from the shoes into the chute, a wing hinged to the farthest side wall of the said chute in the direction of rotary movement of the said member, said wing being provided with a projection and an adjacent flat surface upon the outer side of the said wing adjacent its pivotal connection with the said side wall. and a leaf-spring secured to said side wall and adapted to engage said projection to hold the wing yieldingly in normal position projecting across the path of travel of the shoes to deflect the bottles into the discharge chute and to lock the said wing in open position out of the path of travel of the said shoes.

15. In a bottle-filling machine, the combination of a rotatable member, a plurality of bottle-supporting shoes carried by said member, each of said shoes being substantially square in shape and provided with upstanding walls at its rear edge and at that side edge which is rearmost in the direction of travel of the shoe, a discharge chute supported adjacent the path of travel of said shoes and adapted to receive the bottles carried by the said shoes, the farthest side wall of the said chute in the direction of rotation of the said member being extended across the path of travel of the shoes and adapted to coöperate with the upstanding wall at the side edge of the shoe to remove the bottle from the shoe and to dispose the same in the receiving chute.

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