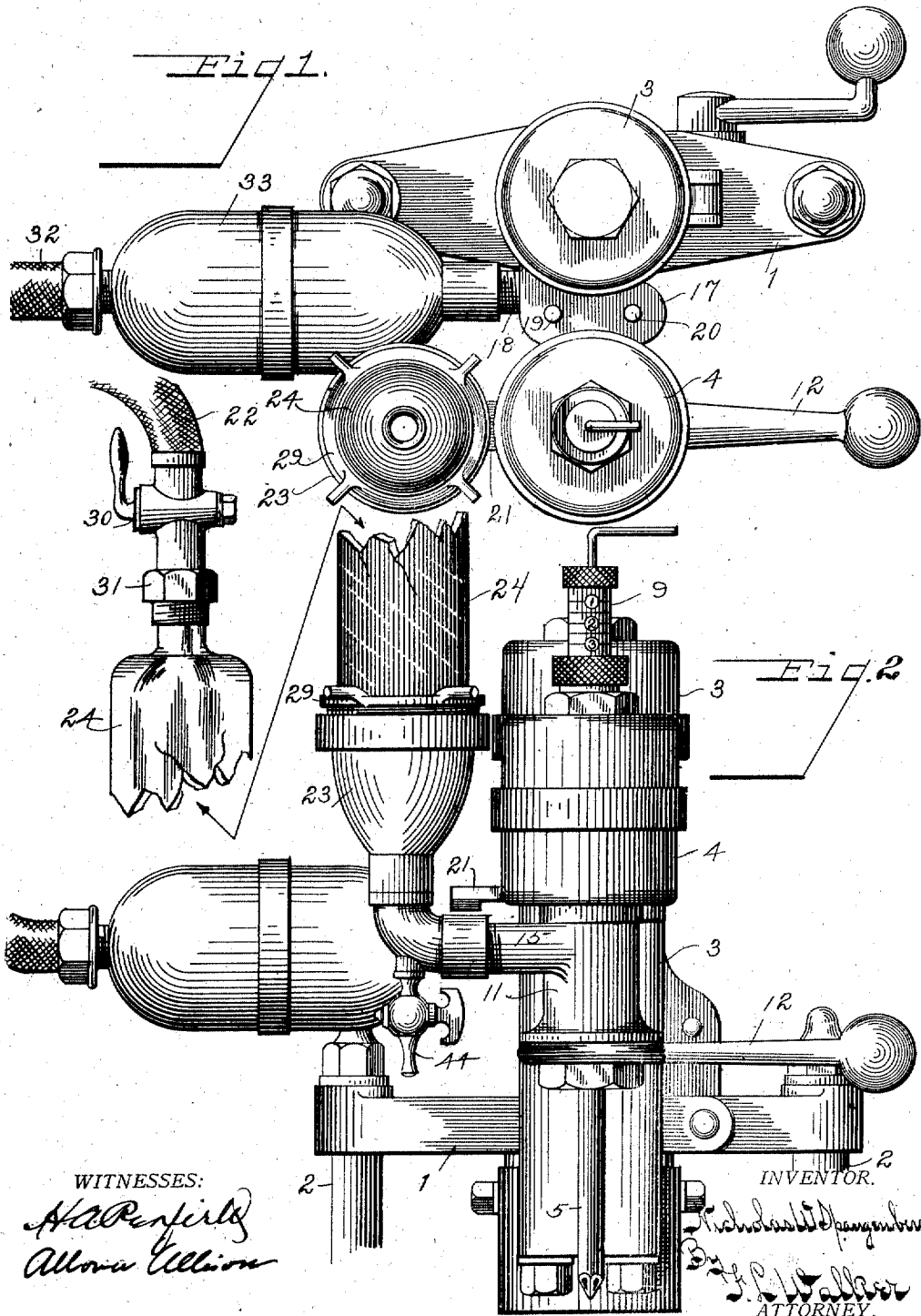


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BOTTLE FILLING APPARATUS.
APPLICATION FILED MAY 20, 1908.

980,354.

Patented Jan. 3, 1911.

3 SHEETS—SHEET 1.

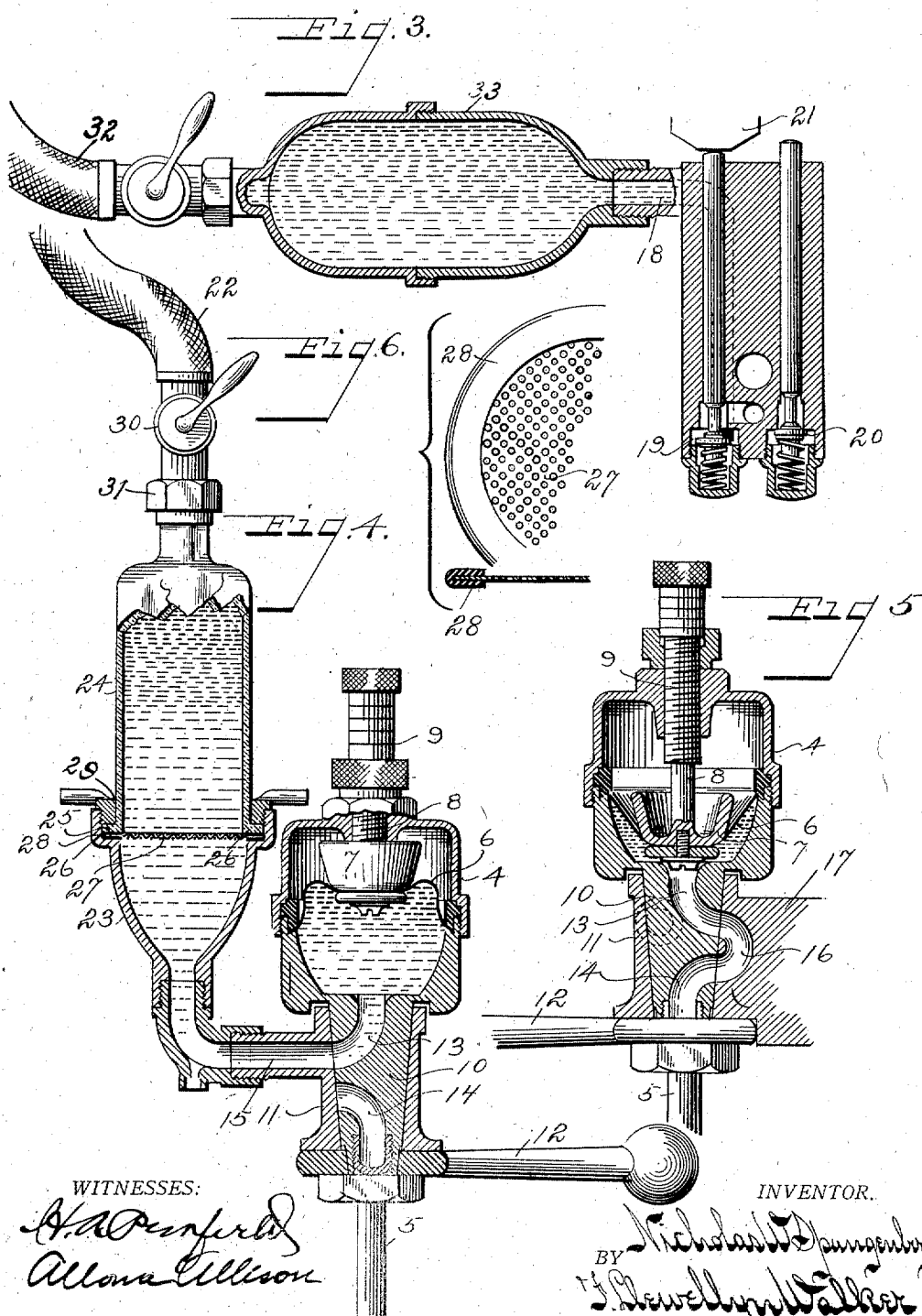


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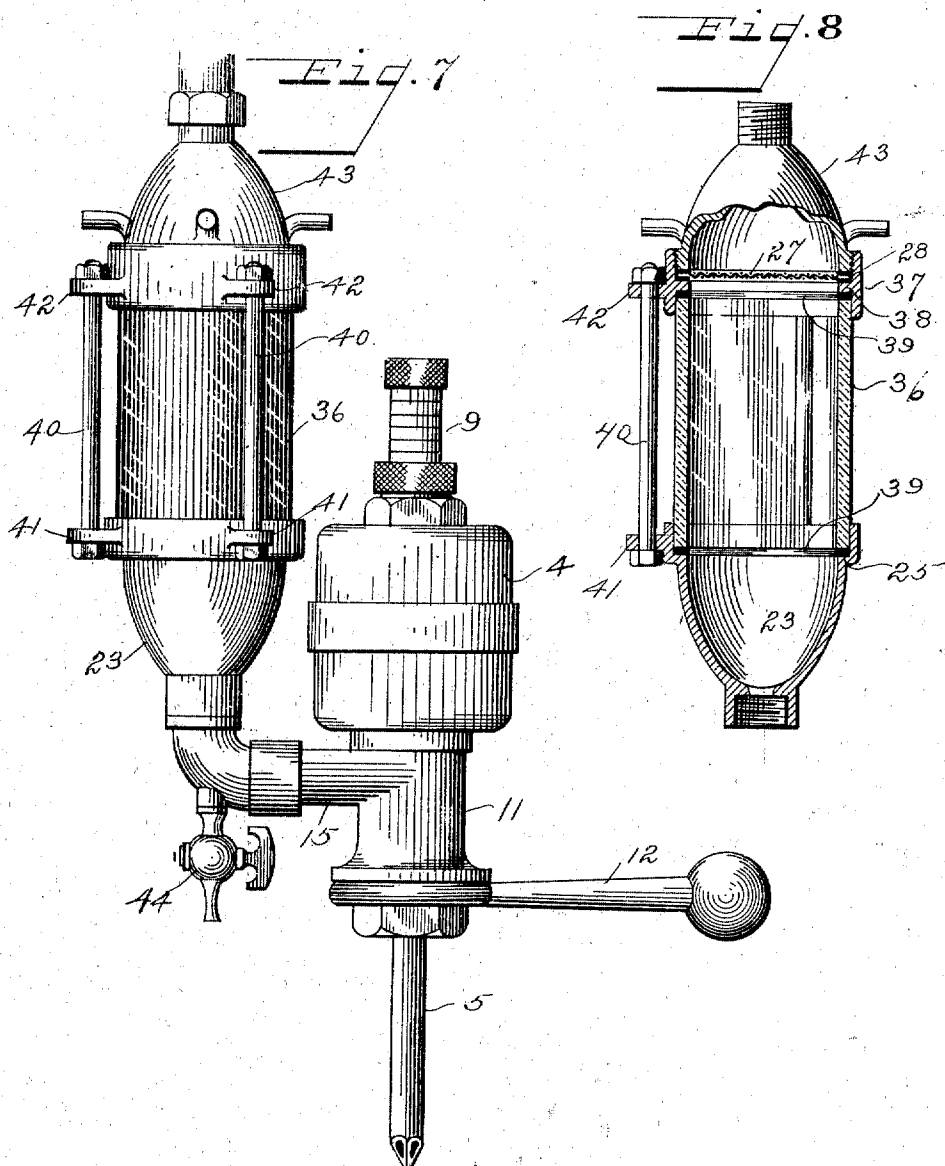
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UNITED STATES PATENT OFFICE.

NICHOLAS W. SPANGENBERGER, OF SPRINGFIELD, OHIO.

BOTTLE-FILLING APPARATUS.

980,354.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed May 20, 1908. Serial No. 433,822.

To all whom it may concern:

Be it known that I, NICHOLAS W. SPANGENBERGER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Bottle-Filling Apparatus, of which the following is a specification.

My invention relates to improvements in bottling apparatus, and more particularly to improvements upon the construction set forth in U. S. Patent No. 608,158, dated July 26 1898.

While the invention hereinafter set forth is described in connection with said patented device, it is to be understood that it is not limited to use with said construction, but may be used with other similar devices now in use.

The machines to which the present invention appertains are adapted to the bottling of liquids of either a gaseous or non-gaseous nature, either with or without charging each bottle with syrup or other flavoring or reinforcing liquids in appropriately varied and measured quantities.

The object of the invention is to provide simple and efficient means for maintaining a rapid and uniform flow of the fluids, and to obviate the necessity for frequent "sniffing", thus rendering the apparatus not only more rapid in operation, but likewise more economical, since frequent "sniffing" results in loss of both gas and liquid.

In bottling apparatus such as that to which the present invention is adapted to be applied, it is customary to locate the main liquid and syrup supply reservoirs on a floor above the bottling room, or otherwise elevated, from which reservoirs supply conduits lead direct to the bottling machine. The syrup being a viscous fluid frequently contains entrained bubbles of air which may be carried into the measuring chamber unknown to the operator, and thus reduce the charge of syrup whereby the bottled product will be ununiform. Furthermore in operating the machine rapidly it is necessary that the measuring chamber be rapidly filled during the interval between the discharge of the fluid. To provide means whereby the air bubbles may be permitted to separate from the body of syrup, and to accelerate the flow thereof, and to provide means whereby the carbonated water or other fluid may be rapidly and readily discharged without the ne-

cessity of frequent sniffing, are among the objects of the present invention.

With the above primary and other incidental objects in view as will more fully appear from the specification, the invention consists of the means, devices, construction and mode of operation, or their equivalents hereinafter described and set forth in the claims.

In the drawings the complete bottling machine is not shown, but only such parts as are necessary to illustrate the relation of the present invention thereto, the illustrated machine parts being those of the said Patent No. 608,158, but it is to be understood that other bottle filling and sealing apparatus may be substituted therefor.

In the drawings, Figure 1 is a plan view of the bottling machine head with the present invention embodied therein. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional view of the water or other fluid dispensing devices. Fig. 4 is a sectional view of the syrup dispensing and measuring devices, the measuring device being charged. Fig. 5 is a sectional view of the measuring chamber in empty condition. Fig. 6 is a detail plan and sectional view of the strainer or sieve through which the syrup is passed, and the gasket therefor. Figs. 7 and 8 illustrate a less expensive form of syrup reservoir.

Like parts are indicated by similar characters of reference throughout the several views.

The head of the bottling machine is adapted to be vertically reciprocated, and comprises the cross head 1 carried on the vertical rods 2; on the cross head 1 is supported a cylindrical chamber 3 into which the neck of the bottle to be charged with carbonated water is inserted from below, within which chamber 3 is located the discharge orifice for the water, and the bottle sealing mechanism, all as described in the aforementioned patent. In addition to the chamber 3 there is also carried on the machine head the measuring chamber 4 provided with a control cock, and with a pendant discharge nozzle 5. The construction is such that two bottles are synchronously charged, one with syrup and the other with carbonated water or other fluid, the syrup charged bottle being shifted at each operation to receive the charge of water and an empty bottle presented to the syrup nozzle 5. In order that

the product be uniform it is necessary that each bottle receive a predetermined amount of syrup. The syrup measuring device comprises the chamber 4, divided into two compartments by a normally pendent frusto-conical flexible diaphragm 6 secured to the sides of said chamber 4. The diaphragm is secured at its center to a plunger 7 provided with a vertical stem 8. Said plunger serves as a weight to promptly return the diaphragm 6 to normal position, as in Fig. 5 to expel the syrup within the compartment below the diaphragm at each discharge operation. Upon opening the measuring chamber to the syrup supply the diaphragm is lifted to a greater or less degree according to the adjustment of the gage screw 9 by which the movement of the plunger 7 is limited. The control cock for the syrup supply comprises an integral portion 10 projecting downward from the chamber 4 and adapted to be revolved within the sleeve 11 by the hand lever 12. Within the portion 10 are two curved conduits or passages, an upper passage 13 communicating with the chamber 4, and a lower passage 14 communicating with the discharge nozzle 5. When occupying one position as in Fig. 5 the passage 13 registers with the syrup inlet 15, and the measuring chamber is permitted to fill with syrup from the supply source. Upon the portion 10 being revolved through substantially ninety degrees the passage 13 and passage 14 are brought into registry with a U shaped passage 16 in the valve block 17, whereby the nozzle 5 is brought into communication with the chamber 4 and the contents thereof discharged.

Located in the valve block 17 are an intake duct or passage for the liquid to be bottled which leads from the intake orifice 18 to the filling chamber in the chamber 3, and a "snifting" duct leading from said chamber to the atmosphere. These ducts are controlled by spring actuated plunger valves 19 and 20, which are depressed by a cam faced lug 21 on the measuring chamber 4, when said measuring chamber is rotated by the hand lever 12.

As thus far described the construction shown in the drawings is identical with that of said Patent No. 608,158 to which reference is had for more detail description of the parts and operation. The syrup inlet orifice 15 corresponds with that designated by n^5 in said patent, and the water inlet orifice 18 with i of the patent.

The above mechanism forms no part of the present invention except in combination with the constructions hereinafter described.

In the drawings 22 is the conduit leading from the general syrup supply which discharges into a supplemental reservoir comprising a cup shaped member 23 attached to the orifice 15, and a transparent member 24

preferably in the form of a bottomless bottle. The upper portion of the member 23 is formed with the shoulder 25 on which the lower flanged edge 26 of the member 24 rests, a strainer or sieve 27 being interposed between the shoulder 25 and the flanged edge 26 of the member 24. The edge of the strainer or sieve 27 is inclosed in a rubber gasket 28 substantially U shaped in cross section, as shown in Fig. 6. The parts are secured together by a compression ring 29 screw threaded into the member 23 and bearing on the flanged edge of the member 23. A valve or cut off 30 is located in the conduit 22 adjacent to the supplemental reservoir.

The supplemental reservoir thus described is located as close to the measuring chamber 4 as is possible.

The supplemental reservoir permits any entrained bubbles of air which may pass through the conduit 22 with the syrup to rise to the top of the reservoir, while the syrup settles to the bottom thereof, forming a solid body of syrup from which the charge is drawn into the measuring chamber 4. When the conduit 22 was connected direct to the measuring chamber as contemplated in said patent, such entrained air bubbles passed into the measuring chamber, thereby diminishing the charge of syrup, and causing the amount of syrup delivered to various bottles to be irregular. The member 24 being of glass or other transparent material, permits the operator to observe the syrup supply within the reservoir, and if an abnormal amount of air collects it may be removed by disconnecting the coupling 31, and allowing the reservoir to fill to the top and again coupling the conduit thereto. Furthermore the operator by observing the reservoir is warned as to the condition of the syrup supply, whether it is flowing freely, and that sufficient is ready for a full charge. The syrup, which on account of its viscous nature flows slowly through a long conduit, collects in the reservoir during the time that the charge is being expelled from the measuring chamber to the bottle, so that upon operation of the control cock the measuring chamber is quickly filled from the solid body of syrup adjacently located which need only pass through a very short conduit, thus enabling the machine to be more rapidly operated than when the operator must wait for the measuring chamber to fill from the conduit 22. The strainer or sieve 27, prevents any thickened mass of material, or fruit seeds or pulp or other foreign matter to enter the measuring chamber, and further assists in restraining and breaking up the entrained air bubbles, whereby the portion 23 of the reservoir will contain a solid body of clarified syrup. By disconnecting the union 31 and connecting the reservoir with a water supply the reser-

voir and measuring chamber is readily cleaned. By separating the component parts of the reservoir by unscrewing the ring 29, the parts may be more thoroughly cleaned.

5 The annular U shaped gasket 28 has in practice been found very efficient.

In filling the bottle with water or other liquid, when the water supply conduit 32, leading from the general source of supply, 10 is connected direct to the intake orifice 18, it is found necessary to frequently open the sniffing valve 20, or as spoken of by machine operators to frequently "give the bottle air," which really is permitting the air 15 within the bottle to escape when displaced by the water.

It is frequently necessary to "sniff" the bottle as often as from four to six times during the filling process. This continual sniffing results in a great loss of gas, and of water or other liquid entrained with the gas and air and carried out, and very materially retards the speed of operation. To obviate the necessity for frequent "sniffing" an 20 auxiliary reservoir 33 for water is provided. The reservoir 33 is connected to the orifice 18, with as short a passage between the reservoir and the discharge orifice as is possible. The reservoir 33 is preferably oval in 30 form as shown, and is of a capacity somewhat greater than the bottle to be filled. The supply conduit 32 is provided with the cut off valve, and is coupled to the reservoir 33 into which it discharges. The charge of 35 water for the bottle is drawn directly from the auxiliary reservoir 33. The valve 19 being opened by the operation of the hand lever 12, a limited amount of water will flow through the filling duct to the bottle, a portion of the air within the bottle being displaced by the entrance of the water will force its way upward through the duct to the reservoir 33, and another portion of water will pass down to the bottle, this intermittent flow of water in one direction and 45 air in the other continuing until the bottle is filled, and the air collected in the reservoir. The passage between the auxiliary reservoir and the bottle being comparatively 50 short, the interval between the intermittent flow of the water will be very short, and the bottle may be rapidly filled with not more than one sniffing operation being necessary. The air from the reservoir can pass in the 55 same manner up the conduit 32 to the source of supply. However on account of the comparative great length of the conduit 32 the flow through same will be slow, but will continue irrespective of whether the valve 19 60 is open or closed until the reservoir is filled. Without the use of the auxiliary reservoir the flow through the conduit can only be had while the valve 19 is open and the bottle filling. The conduit 32 being of considerable 65 length a great interval of time will be con-

sumed by the upward passage of the air bubble and the return flow of the fluid, thereby making the filling process very slow.

By the use of the respective reservoirs the filling operation is greatly accelerated, the 70 bottle is charged with water directly from a body of liquid in the reservoir 33, the passage between the reservoir and bottle being short the interchange of air and water will be rapid. The movement of air and 75 water in the conduit 32 will be much slower but to compensate for this the movement in the conduit will continue after the closing of the valve 19, and during the interval between the filling operations. Thus there 80 will be a differential flow of the fluid, slowly and substantially continuous from the supply to the reservoir, and rapidly but intermittent from the reservoir to the bottle.

It is to be understood that the filling operation just described is more or less theoretical, but the advantages of the construction shown and described in connection with both the syrup and water supply have been 85 fully demonstrated by extensive practical use. Between the syrup and water dispensing mechanism there is an interdependence, it being necessary for the economical operation of the machine that the syrup and water 90 charges be delivered in substantially the same time, and it would be of but little advantage to provide means to accelerate one and not the other, as the slow flowing charge would determine the speed of the operation.

It has been found that the manufacture of 100 the member 24 is somewhat expensive therefore to further reduce the cost of manufacture a syrup reservoir as illustrated in Figs. 7 and 8 may be employed. In constructing this form of reservoir the lower 105 portion 23 is shaped as before described, on the inner annular shoulder 25 of which rests a cylindrical glass tube 36 surmounted by a collar 37 having an inner annular flange 38 resting on the tube 37. Rubber or other gas- 110 kets 39 are interposed between the tube and shoulder 25 and between the tube and flange 38, as shown in Fig. 8.

The parts are held in adjustment by tie rods 40 engaging ears or lugs 41 on the 115 lower member 23 and similar ears or lugs 42 on the collar 37. The interior upper portion of the collar 37 is screw threaded for the reception of a cap or dome portion 43, to which the syrup conduit 22 is connected by a 120 suitable union as before described. Between the cap 43 and flange 38 is interposed the strainer or screen 27 inclosed in a gasket 28 as described and shown in Fig. 6. It is obvious that if desired the strainer 27 might 125 be substituted for the lowermost gasket 39, between the tube 36 and shoulder 25. The operation is exactly as before described. Intermediate the reservoir and the measuring chamber is a drainage cock 44 by which the 130

contents of the reservoir may be drawn off after the valve 30 has been closed, and also for use in flushing or washing the reservoir.

Having thus described my invention I claim;

1. In a bottle filling apparatus, in combination with the syrup supply conduit, a supplemental reservoir comprising a cup-shaped member carried by said conduit adjacent the measuring device, an upwardly extending internally threaded flange forming a seat on the upper edge of said cup-shaped member, a transparent bottle-shaped member seated on said seat, an annulus surrounding said bottle-shaped member and threaded within said flange to secure said bottle shaped member, an inlet removably secured to the mouth of said bottle-shaped member, and a valve disposed in said conduit directly above said mouth.

2. In a bottle filling apparatus, in combination with the syrup supply conduit, a supplemental reservoir comprising a cup-shaped member carried by said conduit adjacent the measuring device, an upwardly extending internally threaded flange forming a seat on the upper edge of said cup-shaped member, a transparent bottle-shaped member seated on said seat, a straining device carried between said seat and the lower edge of said transparent member, an annulus surrounding said bottle-shaped member

and threaded within said flange to secure said bottle-shaped member, an inlet removably secured to the mouth of said bottle-shaped member, and a valve disposed in said conduit directly above said mouth.

3. In a bottle filling apparatus, in combination with the syrup supply conduit, a supplemental reservoir comprising a cup-shaped member carried by said conduit adjacent the measuring device, an upwardly extending internally threaded flange forming a seat on the upper edge of said cup-shaped member, a transparent bottle-shaped member seated on said seat, a straining device carried between said seat and the lower edge of said transparent member, said straining device comprising a sheet of perforated material joined by an annular gasket U-shape in cross section, an annulus surrounding said bottle-shaped member and threaded within said flange to secure said bottle-shaped member, an inlet removably secured to the mouth of said bottle-shaped member, and a valve disposed in said conduit directly above said mouth.

In testimony whereof, I have hereunto set my hand this 1st day of May A. D. 1908.

NICHOLAS W. SPANGENBERGER.

Witnesses:

JOSEPH SPANGENBERGER,
HORACE C. KEIFER.