

No. 756,428.

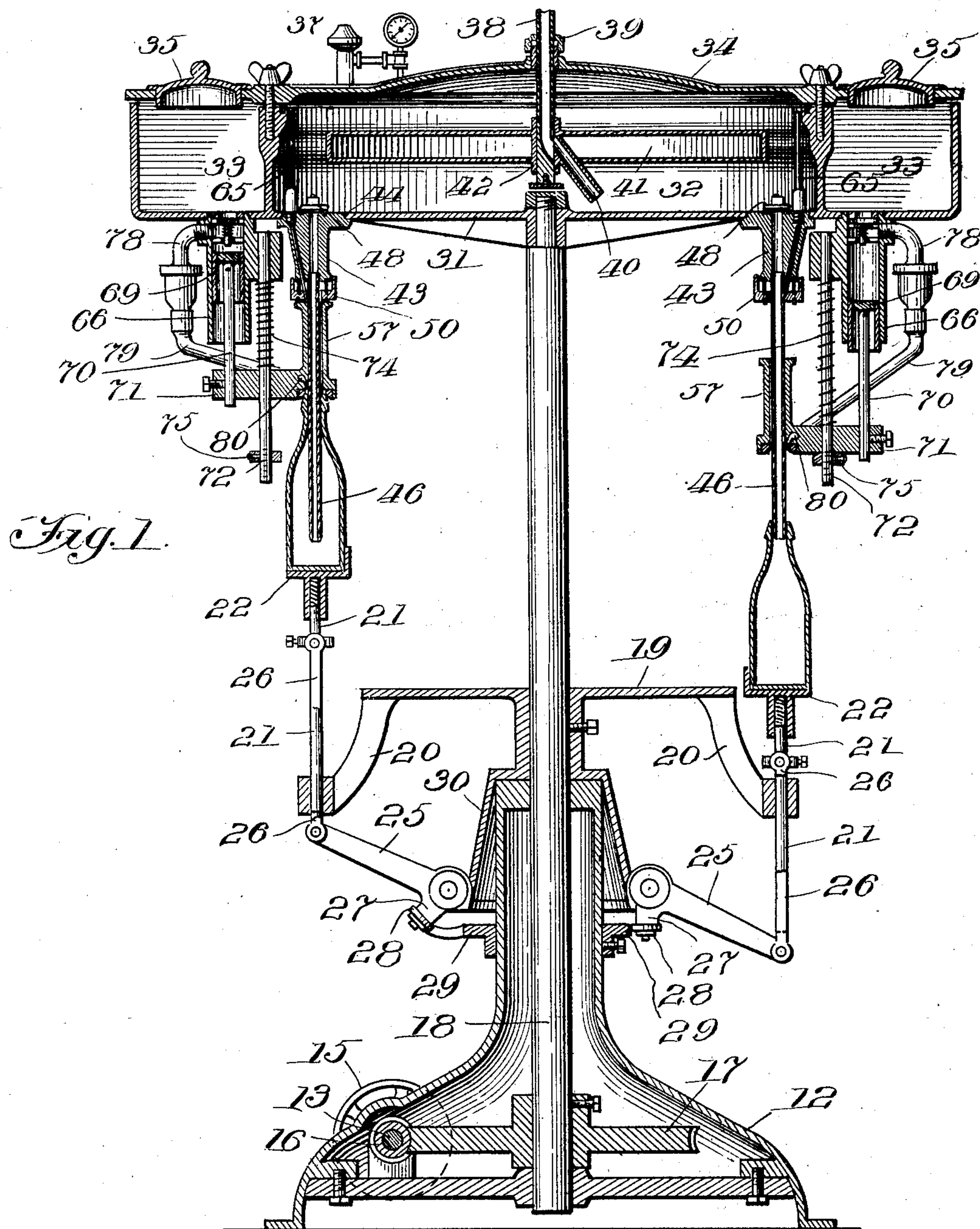
PATENTED APR. 5, 1904.

F. C. H. STRASBURGER.  
BOTTLE FILLING MACHINE.

APPLICATION FILED OCT. 20, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:  
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Rita Winter.

Inventor:  
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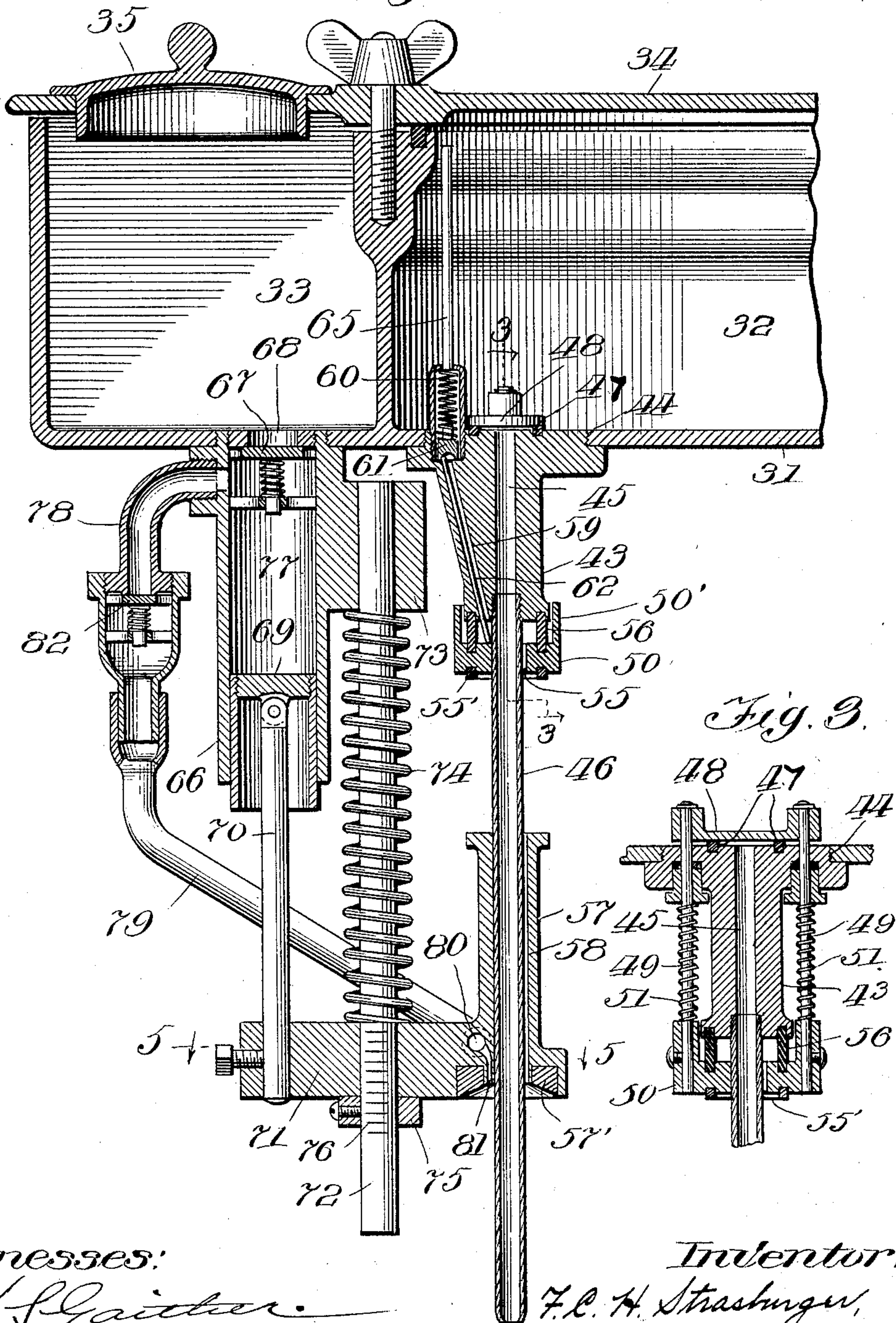
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3 SHEETS—SHEET 2.

*Fig. 2.*



*Fig. 3.*

*Witnesses:*

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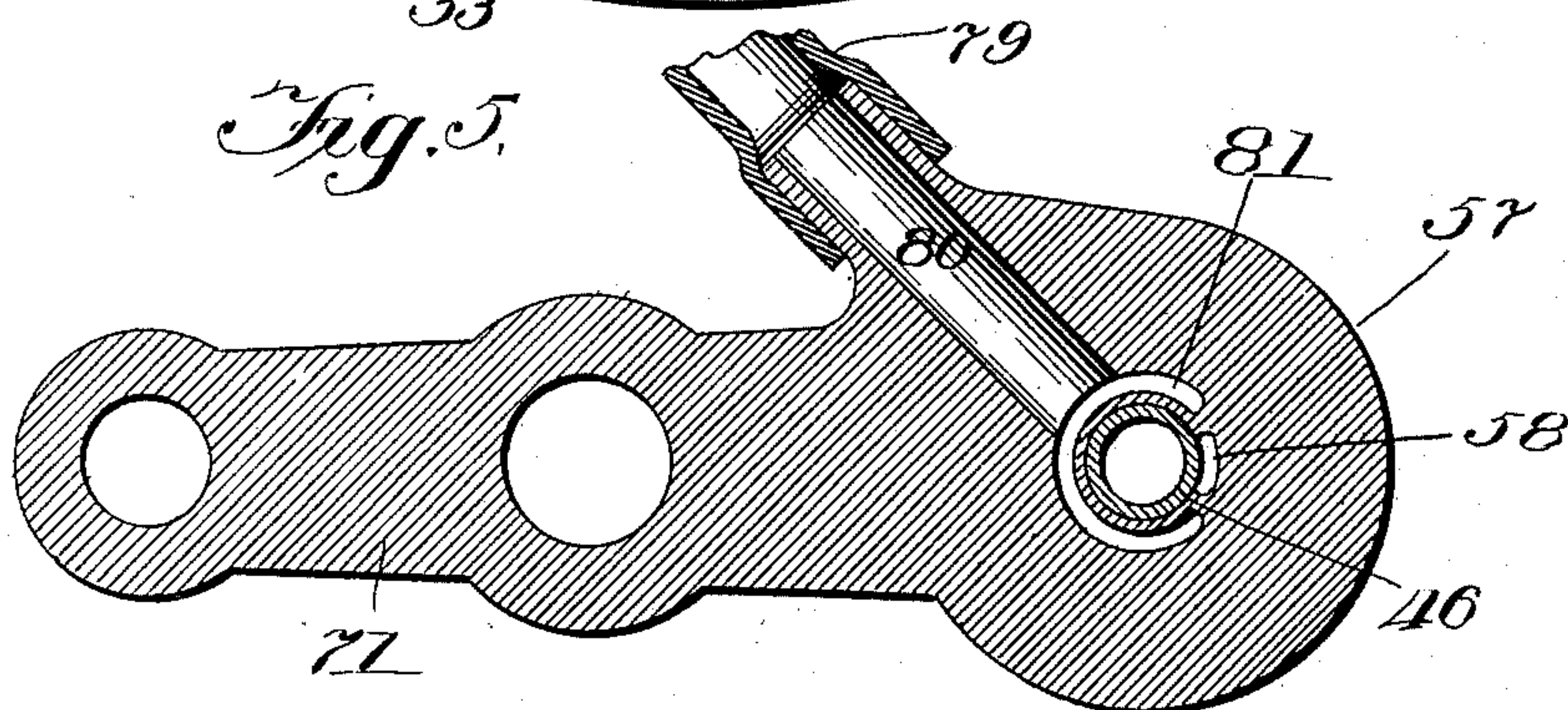
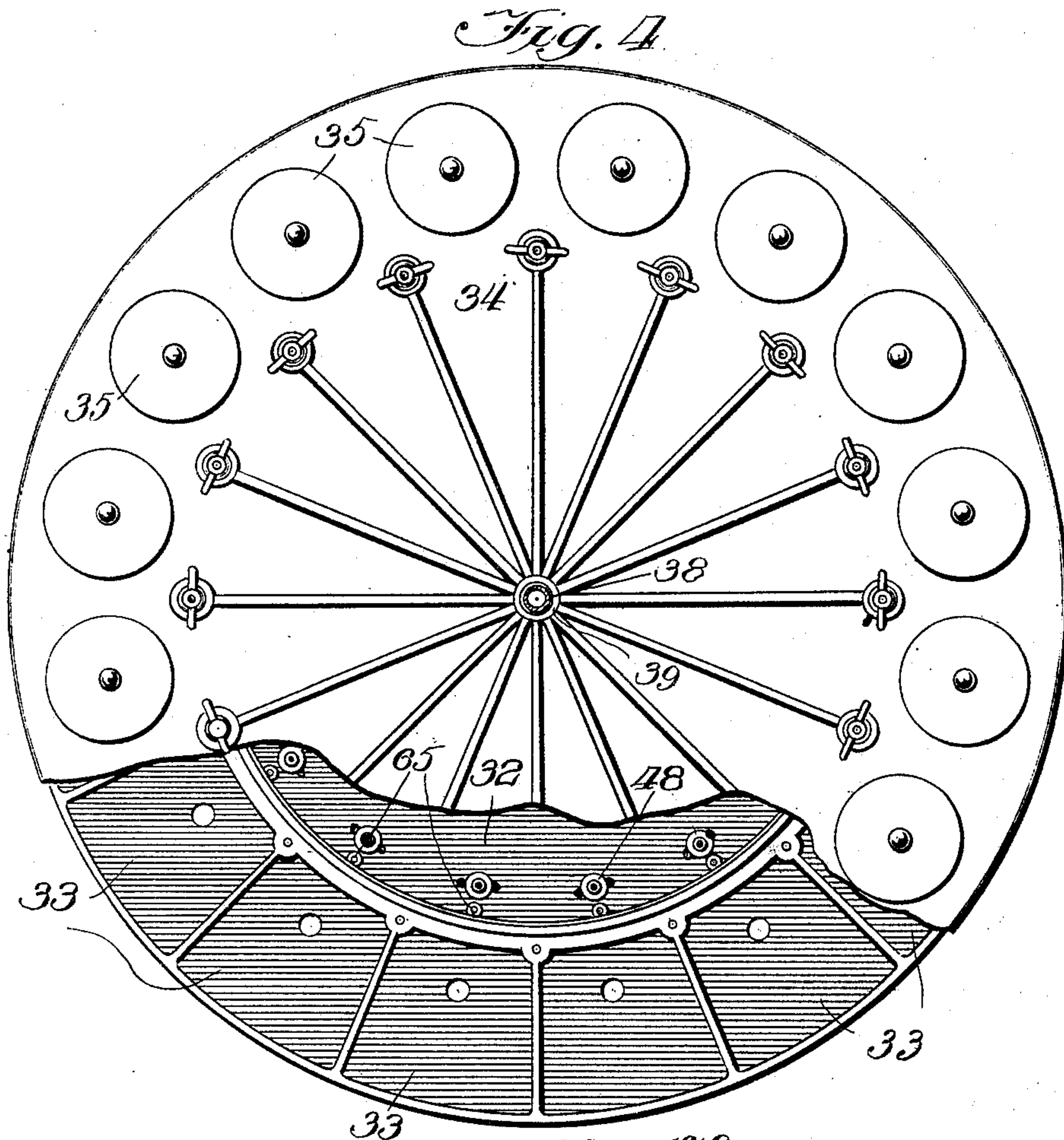
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3 SHEETS—SHEET 3.



Witnesses:

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# UNITED STATES PATENT OFFICE.

FRANK C. H. STRASBURGER, OF CHICAGO, ILLINOIS.

## BOTTLE-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 756,428, dated April 5, 1904.

Application filed October 20, 1903. Serial No. 177,726. (No model.)

*To all whom it may concern:*

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

This invention relates to bottle-filling machines, and particularly to certain improvements and additions to the machine covered by United States Letters Patent No. 732,065, dated June 30, 1903. and my application for United States Letters Patent, Serial No. 164,815, filed June 9, 1903.

The object of this invention is to provide a machine of simple construction and large capacity, principally for filling bottles with flavored drinks, especially for the soda-water and mineral-water trades.

With these ends in view the invention consists, broadly, of a machine provided with a carbonated liquid-receptacle and one or more receptacles containing syrup or a salt solution, and means for automatically discharging into the bottles at first a predetermined quantity of the syrup or salt solution and then filling the bottle with carbonated liquid, preferably by gravity.

The invention has other objects in view, which will be fully pointed out hereinafter in the detailed description, reference being had to the accompanying drawings, showing one embodiment of the invention, in which—

Figure 1 is a central sectional view of a machine embodying the invention and showing only two filling tubes and valves to avoid confusion. Fig. 2 is an enlarged sectional view showing one set of valves and the receptacles to which they are connected. Fig. 3 is a sectional view of one filling-valve on the line 3 3 of Fig. 2. Fig. 4 is a top plan view, partly in section, of the tank. Fig. 5 is a sectional view on the line 5 5 of Fig. 2.

Like numerals of reference indicate corresponding parts in the several figures of the drawings, and, referring thereto, 12 is a base of suitable character, and 13 is a driving-shaft carrying the belt-pulley 15 and a worm 16, meshing with the worm-gear 17 on the vertical driven shaft 18. A plate 19 is fastened

on the driven shaft above the base and carries at its periphery a number of arms 20, each of which is bored to receive and guide the stem 21 of the bottle-rest 22. Each bottle-rest is thrust upward by means of a crank-lever, which is preferably in the form of an elbow and has its long arm 25 connected by links 26 with the upper part of the stem and its short arm 27, provided with an antifriction roller 28, arranged to travel around a cam 29, rigid with the base. This actuating-lever is carried by a support 30, which may be connected with the plate 19, as shown, or made separate therefrom.

The machine may be constructed to accommodate at one time any number of bottles; but in Fig. 1 I have shown only two sets of the filling mechanism to avoid confusion, while in Fig. 4 the tank is shown as provided with sixteen sets of the filling mechanism for this machine. The cam is constructed to move the bottle-rest upward after the empty bottle has been placed thereon to open the filling-valve and hold it open until the bottle has been filled, at which time the cam permits the bottle-rest to descend, so that the filled bottle can be removed. The tank 31 is mounted on the driven shaft and comprises a receptacle 32 for containing a carbonated liquid and one or more receptacles 33 for the syrup. I have shown a separate syrup-receptacle for each set of the filling-valve mechanism, and these syrup-receptacles are located around the liquid-receptacle, which is a convenient arrangement, but of course may be varied, if found desirable, without departing from the invention. The tank is provided with a removable cover 34, adapted to be fastened securely in place to confine the pressure in the liquid-receptacle 32, and that portion of the cover 34 which covers the syrup-receptacles is provided with removable covers 35, so that access can be had to the syrup-receptacles without removing the main cover 34. A regulating-valve 37 is provided to control the pressure in the tank. A feed-pipe 38 enters the receptacle 32 through a stuffing-box 39 in the cover and discharges at its side, preferably into a spout 40, which is carried by a float 41, provided with a sleeve 42 to receive



the feed-pipe. The lower end of the feed-pipe is closed, and it discharges at the side into the spout 40 when alined therewith, so that the carbonated liquid will be discharged into its receptacle close to the bottom thereof to avoid agitation. As the liquid rises in the receptacle 32 it will carry the float up with it until the spout is out of alinement with the discharge-opening, and thus cut off the supply.

The valve mechanism for regulating the discharge of the carbonated liquid from the tank 32 into the bottle comprises a body 43, screwed into an opening 44 in the bottom of the tank and provided with a central bore 45, into the lower end of which the filling-tube 46 is secured. On the upper face of the body 43 and around the bore 45 is a rubber gasket 47, which forms a seat for the valve 48, and this valve is fastened on the rods 49, which also carry the collar 50. A spring 51 is mounted on each of the rods 49 to hold the valve normally seated. The collar 50 is provided with an enlarged bore 55 and is made cup shape with the upstanding wall 50', which incloses the lower end of the body 43, and a rubber gasket 56, which is seated in the upper face of the collar and the lower face of the body. The head 71 comprises a sleeve 57, which is provided with an enlarged bore 58 to receive the filling-tube, and has a seat 57', against which the mouth of the bottle is forced by the actuating-lever heretofore described. This sleeve is mounted in a suitable manner to slide upon the filling-tube, and when it strikes the collar 50 the latter is moved up sufficiently to unseat the valve 48 and permit the liquid in the tank to flow in the bottle. To provide for equalizing the pressure in the bottle and the receptacle 32 before the liquid in said receptacle enters the bottle, I arrange a passage 59 in the valve-body 43, which opens at its lower end in the space inclosed by the gasket 56 and at its upper end in a chamber 60, which contains the spring-pressed valve 61. A valve-stem 62 is located in this passage and projects below the body 43 to be engaged by the collar 50, so that as the bottle forces the collar upward the stem 62 will unseat the valve 61. A pipe 65 is connected with the valve-chamber 60 and extends above the level of the liquid in the receptacle 32, so that when the valve 61 is unseated at the initial upward movement of the collar 50 air or gas in said receptacle under pressure will flow through the passage 65, the passage 59, the bore 55, and the bore 58 into the bottle to raise the pressure in the bottle to that in the tank before the valve 48 has been completely opened to permit the beer to flow into the bottle.

I prefer to embody in my present machine the operative mechanism and the valve mechanism heretofore described, which corresponds in the essential parts and operation, although differing in certain features of construction, to the machines described in the pat-

ent and application aforesaid; but it will be apparent to those skilled in the art that changes and modifications in the operative mechanism and the valve mechanism heretofore described may be made in my present machine without affecting the parts about to be described and without departing from the broad invention.

A cylinder 66 is fastened to the bottom of each of the receptacles 33, and it contains a spring-pressed valve 67, which normally closes an opening 68 in the bottom of the receptacle. A piston 69 is arranged to work in said cylinder below the valve, and the piston-rod 70 is fastened to the head 71, which is guided on a rod 72, fastened in a lug 73 on the cylinder. A spring 74 is interposed between the lug and the head to hold the head and the piston normally in their lowest positions. The stroke of the piston may be regulated by adjusting the stop 75 on the guide-rod, and this rod may be provided with a scale 76 to facilitate the proper adjustment. The syrup-chamber 77 in the cylinder is connected by an elbow 78 and the hose 79 with a horizontal passage 80 in the lower end of the sleeve 57, and this passage communicates with a vertical passage 81, opening at the lower end of said sleeve and adapted to discharge into the bottle when in place against the gasket 57'. As shown in Fig. 5, the discharge-passage 81 does not communicate with the enlarged bore 58 through the sleeve 57, which permits the air to escape from the bottle while the syrup is being discharged therein and later permits communication between the receptacle 32 and the bottle, as previously described. When the piston 69 is moved to the downward limit of its stroke, as shown in Fig. 2, by the spring 74 operating against the head 71, the valve 67 will be unseated by suction and a quantity of the syrup in the receptacle 33 permitted to flow into the chamber 77, after which the valve is seated again. When the bottle engages and pushes upward the head 71, the piston will force the syrup out through the elbow 78 and the hose 79 through the passages 80 and 81 into the bottle before the sleeve engages the collar 50 to open the valve in the liquid-tank 32, and thus the syrup is deposited in the bottle before connection is made with the receptacle containing the carbonated liquid. On the lower face of the collar 50 I provide a gasket 55', which insures a tight engagement between the sleeve 57 and the collar 50 and prevents the escape of the air or gas when this connection is made, and to prevent the air or gas pressure from entering the charging-chamber 77 I provide a spring-pressed valve 82, which will open to permit the passage of the syrup when forced out of the chamber by the piston. The amount of the charge of syrup can be regulated by adjusting the stop 75, which governs the stroke of the piston, and consequently controls the capacity of the charging-chamber 77.

As before stated, I may divide the tank into



separate receptacles 33 for each filling-valve mechanism, so that different kinds of syrup can be placed therein; but instead of the separate receptacles 33 I may provide only one receptacle extending entirely around the receptacle 32 if it is desired to work with only one syrup at a time. The syrups are not under pressure, but the liquid in the receptacle 32 is under pressure, and for this reason the top for this liquid-receptacle must be secured tightly in place.

While my invention is particularly adapted for filling bottles with sarsaparilla, root-beer, ginger-ale, and other beverages and tonics, it is also adapted for filling bottles with carbonated beverages of all kinds. Salt solutions or other ingredients may be placed in the receptacles 33, and it will be understood that in referring to these as "syrup-receptacles" and to the charging mechanism as a "syrup-charger" herein I do so simply for convenience and without limiting the uses of the invention.

It will be understood that an independent mechanism for raising the bottle and an independent valve mechanism are provided for each bottle, and the valve mechanism comprises both the syrup-charging-valve devices and the carbonated-liquid-filling valve. The machine can be constructed to accommodate at one time as many bottles as may be desired by duplicating the bottle-raising mechanism and the valve mechanism. The cam is preferably made so that each bottle will descend immediately or shortly after it is filled at or near the point where the operator stands to remove the filled bottles and insert the empty bottles. If the operator fails to arrange a bottle on any of the bottle-rests, the valve mechanism would not be operated, and hence none of the syrup or liquid would be wasted, and it does not matter particularly how long the valve remains open after the bottle is filled, because neither the syrup nor the liquid can escape.

The machine can be operated rapidly and requires only a single attendant, whose work consists simply in placing the empty bottles properly in the machine and taking the filled bottles therefrom, which can be done by any unskilled boy or girl. The syrup-charging devices operate in conjunction with the filling-valve mechanism automatically and do not require extra handling of the bottles.

The invention can be embodied in machines which differ more or less in construction from the one illustrated in the drawings and herein described, and I would therefore have it understood that I reserve the right to make all changes which may be fairly considered to come within the scope of the invention. Under some conditions the float in the liquid-receptacle may be dispensed with, as the pressure therein will act as a regulator to control the operation of the carbonating-machine connected with the inlet-pipe.

Without limiting myself to the exact con-

struction and arrangement of parts herein shown and described, what I claim, and desire to secure by Letters Patent, is—

1. A bottle-filling machine comprising a tank having a liquid-receptacle and a syrup-receptacle, a filling-valve connected with the liquid-receptacle, a syrup-charger connected with the syrup-receptacle, and a head adapted to be engaged and operated by the bottle to successively operate said charger and open the filling-valve.

2. A bottle-filling machine comprising a tank having a liquid-receptacle and a syrup-receptacle, a filling-valve connected with the liquid-receptacle, a syrup-charger connected with the syrup-receptacle and comprising a piston, and a head connected with said piston and adapted to be engaged and operated by the bottle to successively operate the charger and open the filling-valve.

3. A bottle-filling machine comprising a tank having a liquid-receptacle and a syrup-receptacle, a liquid-valve connected with the liquid-receptacle, a syrup-charger connected with the syrup-receptacle, a filling-tube connected with the liquid-valve, a piston forming part of the syrup-charger, and a head slidably arranged on the filling-tube and connected with said piston and adapted to be engaged and operated by the bottle.

4. A bottle-filling machine comprising a tank having a liquid-receptacle and a syrup-receptacle, a liquid-valve connected with the liquid-receptacle, a syrup-charger connected with the syrup-receptacle and comprising a piston, a filling-tube connected to the liquid-valve, and a head adapted to be engaged and operated by the bottle and connected with said piston and provided with a sleeve operating on the filling-tube to open the liquid-valve after the charger has been operated.

5. A bottle-filling machine comprising a liquid-receptacle and a syrup-receptacle, a liquid-valve connected to the liquid-receptacle, a syrup-charger connected to the syrup-receptacle, a filling-tube connected to the liquid-valve, a head adapted to be engaged and operated by the bottle to operate the syrup-charger and open the liquid-valve, said head provided with a passage around the filling-tube to discharge into the bottle, and a hose connection between the syrup-charger and said passage.

6. A bottle-filling machine comprising a liquid-receptacle and a syrup-receptacle, a liquid-valve in the bottom of the liquid-receptacle, a filling-tube depending from said valve, a charger comprising a cylinder depending from the syrup-receptacle and containing a charge-chamber, a valved connection between said charge-chamber and the syrup-receptacle, a piston operating in said chamber, a head slidably arranged on the filling-tube and connected with said piston and adapted to be engaged and operated by the bottle, a hose connection



between the charge-chamber and said head, said head provided with a passage connected with said hose to discharge into the bottle and an independent passage to permit the escape  
5 of air from the bottle.

7. A bottle-filling machine comprising a liquid-receptacle and a syrup-receptacle, a liquid-valve in the bottom of the liquid-receptacle, a filling-tube depending from said valve and  
10 adapted to enter the bottle, a syrup-charger connected to the syrup-receptacle and comprising a piston, a guide-rod, a spring-pressed head on said guide-rod connected to said piston and slidable on said filling-tube, a passage  
15 in said head to discharge into the bottle and a passage to permit the escape of air from the bottle, and a hose connected to the charger and said discharge-passage.

8. A bottle-filling machine comprising a liquid-receptacle, a liquid-valve connected to said  
20 receptacle and comprising a body depending therefrom, a filling-tube connected to said body, an air-valve in the receptacle, an air-passage in the body communicating with said  
25 air-valve, a stem in said passage and adapted to unseat the air-valve, a collar on the filling-tube connected to the liquid-valve and provided with an air-passage to communicate with the passage in said body, a head slidable  
30 on the filling-tube and provided with an air-passage to communicate with the passage in the collar, said head adapted to be engaged

and operated by the bottle to engage and operate the collar and thereby cause the stem to unseat the air-valve and the liquid-valve to  
35 open.

9. A bottle-filling machine comprising a liquid-receptacle, a liquid-valve connected to said receptacle, a filling-tube connected to said liquid-valve, a collar connected to the liquid-  
40 valve and movable on the filling-tube, an air-valve in the liquid-receptacle, a syrup-receptacle, a syrup-charger connected to the syrup-receptacle, a head, an air-valve in the liquid-receptacle, passages to connect said air-valve  
45 with the bottle, said head adapted to be engaged and operated by the bottle to first operate the syrup-charger, then open the air-valve and then open the liquid-valve.

10. A bottle-filling machine comprising a  
50 tank divided into a central liquid-receptacle and a series of separate syrup-receptacles surrounding the liquid-receptacle, a syrup-charger connected to each of the syrup-receptacles, a filling-valve in the liquid-receptacle  
55 opposite each syrup-charger, a filling-tube connected to each liquid-valve, and a head for operating each syrup-charger and opening the liquid-valve opposite thereto, said head adapted to be engaged and operated by the bottle.

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