

No. 768,962.

PATENTED AUG. 30, 1904.

F. C. H. STRASBURGER.

FILLING MACHINE.

APPLICATION FILED DEC. 14, 1903.

NO MODEL.

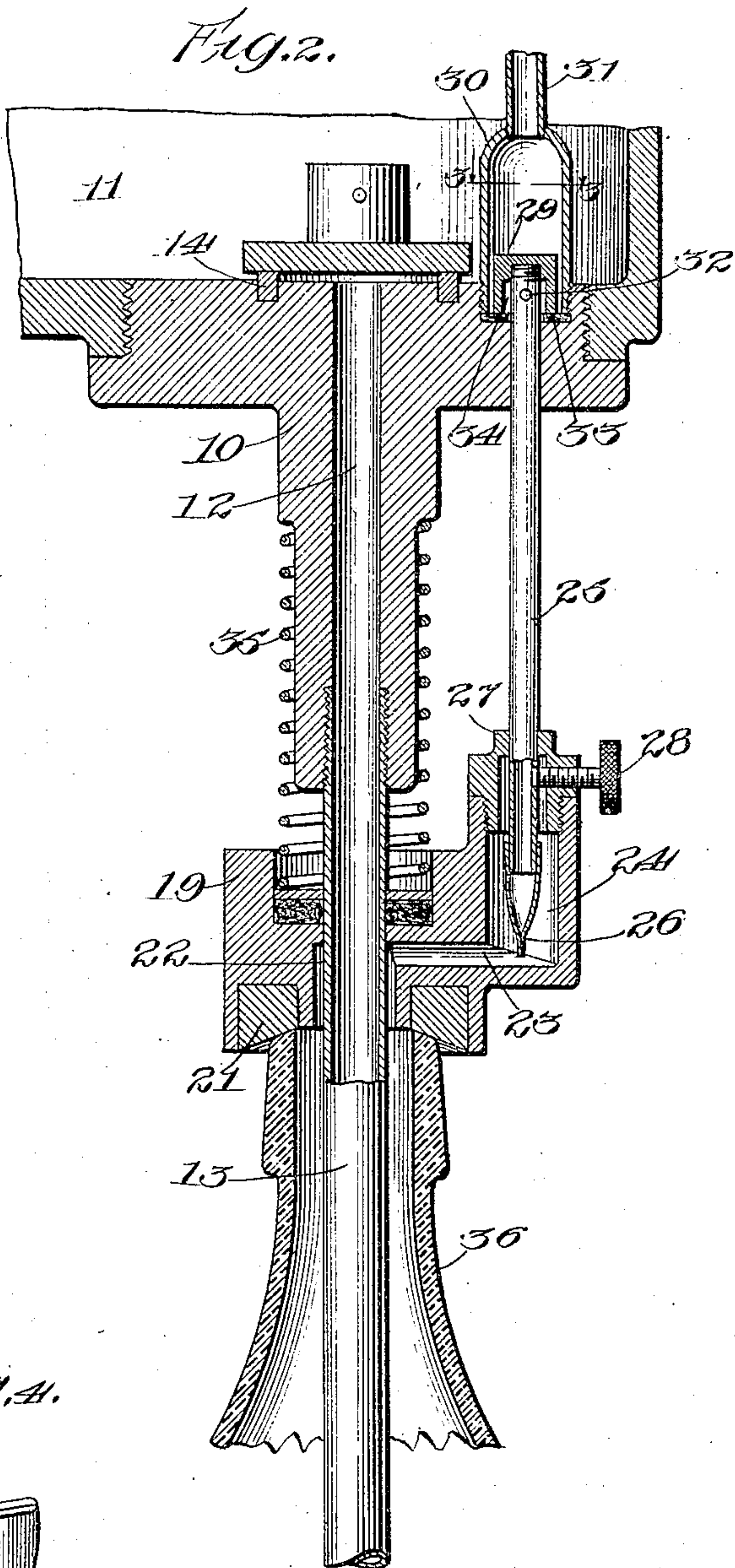
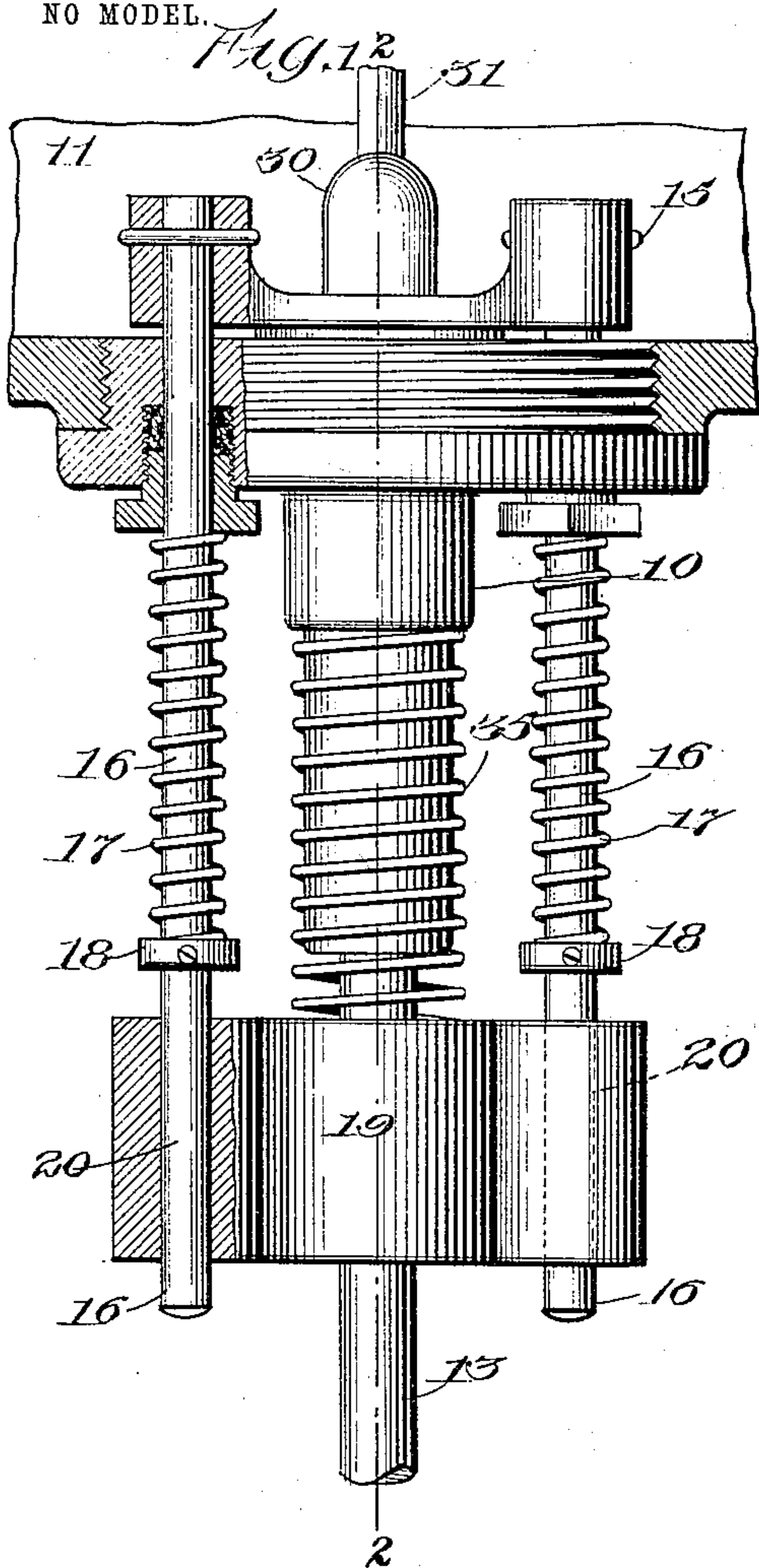


Fig. 3.

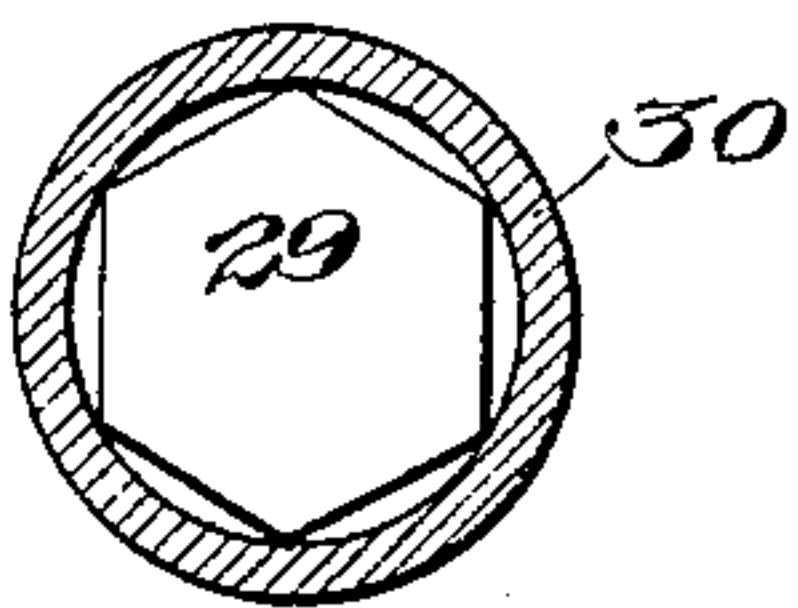
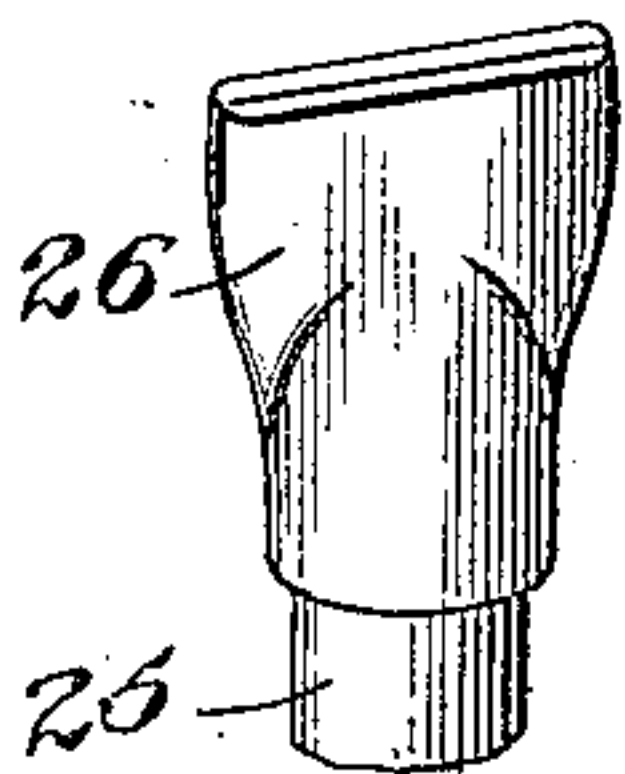


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANK C. H. STRASBURGER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE
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FILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 768,962, dated August 30, 1904.

Application filed December 14, 1903. Serial No. 185,161. (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 Filling-Machines, of which the following is a specification.

This invention relates to bottle-filling machines; and its object is to prevent the liquid from foaming, and thus enable the bottle to be completely filled with liquid.

Heretofore efforts have been made to prevent foaming by providing for an equal pressure in the bottle being filled and in the tank from which the liquid is drawn, and while a filling-valve working under such conditions may be satisfactory for some purposes it will not avoid the production of foam when the liquid is carbonated, and especially when the bottling is being done under a high pressure. This is due to the fact that when the pressure in the tank and in the bottle is equalized the weight of the liquid in the filling-tube is not accounted for, and consequently the liquid is discharged into the bottle with sufficient force to liberate the gas from the liquid and produce foam in the bottle, which prevents completely filling the bottle without sniffing.

It is my object, therefore, to overcome this difficulty, and I accomplish it by retarding the outflow of air from the bottle during the filling operation, so that a higher pressure will be maintained in the bottle than in the tank after the liquid begins to flow into the bottle.

In the accompanying drawings I have illustrated one embodiment of my improved filling-valve, in which—

Figure 1 shows the valve partly in section and partly in elevation. Fig. 2 is a sectional view on the line 2 2 of Fig. 1. Fig. 3 is a sectional view on the line 3 3 of Fig. 2. Fig. 4 is a detail view of the valve 26.

Referring to the drawings, in which like numerals of reference designate corresponding parts in the several figures, 10 designates the body of the filling-valve, which, as shown, may be screwed into the bottom of a liquid-

tank 11 and is provided with a central bore 12, into the lower end of which the filling-tube 13 is screwed. A rubber gasket 14 on the upper face of the body around the bore 12 forms a seat for the liquid-valve 15, which is carried by the rods 16. Springs 17 are held by adjustable collars 18 on these rods to normally hold the liquid-valve against its seat. A head 19 is arranged on the filling-tube and is provided with openings 20 to receive the rods 16 and a seat 21 on its lower face for the mouth of the bottle. This head is provided with an enlarged bore 22, which communicates by a lateral passage 23 with a valve-chamber 24, and an air-tube 25 projects into this chamber and carries a check-valve 26, which will open to permit air to flow into the bottle, but will not open to permit air to flow therethrough from the bottle.

The lower end of the air-tube within the air-chamber is provided with a lateral opening 27, and a set-screw 28 or other suitable device is adjustable in the head to work in or opposite to said opening, and thereby regulate the flow of air therethrough. The upper end of the air-tube projects through the body of the filling-valve and carries a valve 29 within a housing 30, to which is attached a tube 31, extending above the level of the liquid in the tank, so that air may flow therethrough between the tank and the bottle. I prefer to make the valve 29 in the form of an inverted cup with openings 32 in the air-tube located above the valve-seat 33 and communicating with the space 34, so that these openings will be kept clear and free from dirt. The head 19 is held normally in lowered position, with the valve 29 tightly closed against its seat by a spring 35, operating against the head, and the collars 18 are located above the head when the latter is in its lowered position.

The operation of my improved filling-valve will be readily understood. The liquid-valve 15 and the air-valves 26 and 29 are normally closed; but when a bottle 36 is clamped in filling position and caused to move the head the air-tube being carried by the head will

first unseat the valve 29 to permit the flow of air from the tank into the bottle and to equalize the pressure in the tank and bottle before the head engages the collars 18, and thus unseats the liquid-valve 15. If no means were provided to regulate the outflow of air from the bottle during the filling operation, the liquid would be discharged into the bottle with a force corresponding to the weight of the liquid in the filling-tube as the pressure in the bottle and tank is equalized. This would liberate the gas from carbonated liquids and produce foam in the bottle and prevent the bottle from being completely filled, which is a very serious disadvantage, as it requires sniffing, and that consumes much time and labor; but with my improved valve this difficulty is entirely overcome by adjusting the set-screw 28 to regulate the outflow of air from the bottle during the filling operation, so as to provide a greater pressure in the bottle than in the tank and in this way prevent the forcible discharge of the liquid into the bottle. The set-screw or other adjusting means can be adjusted to regulate the flow through the opening 27 according to the degree of pressure and other conditions, and when once set it needs no further attention until the conditions are changed. If it is desired to fill bottles with still or uncarbonated liquids under a very low pressure or under no pressure at all, the opening 27 may be left wide open, so that the flow of air through the bottle will be unimpeded.

My improved valve is of especial value and importance in machines for bottling all carbonated liquids whether the bottling is done under pressure or not, for it entirely prevents undue agitation of the liquid and the consequent loss of gas and also avoids producing foam, which prevents the bottle from being completely filled without sniffing. This valve is of course adapted for various uses and may be employed in connection with various machines; but I deem it particularly useful in connection with the machines described in Letters Patent No. 732,065, dated June 30, 1903, and in my applications, Serial No. 164,815, filed June 9, 1903, and Serial No. 177,726, filed October 20, 1903, although it is in no respect limited to use with those particular machines.

It will be apparent that changes in the form, proportion, and arrangement of parts may be made in embodying the invention in physical form, and I desire to have it understood that I reserve the right to make all such changes as fairly fall within the spirit and scope of the invention. The valves 15, 26, and 29 (shown and described) are very satisfactory for the purpose intended; but other valves producing equivalent results may be substituted, if found desirable.

Without limiting myself to the exact construction and arrangements of parts herein

shown and described, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a liquid-tank, of a liquid-valve, an air connection between the tank and the bottle being filled to permit equalization of pressure in the bottle and tank before the liquid flows into the bottle, an air-valve in said connection, and means independent of said air-valve for maintaining a higher pressure in the bottle than in the tank after the flow of liquid commences.

2. The combination with a liquid-tank, of a liquid-valve, an air connection between the tank and the bottle being filled to permit equalization of pressure in the bottle and tank before the liquid flows into the bottle, an air-valve in said connection, and means independent of said air-valve for retarding the escape of the air in the bottle after the flow of liquid commences.

3. The combination with a liquid-tank, of a liquid-valve, an air connection between the tank and the bottle being filled to permit equalization of pressure in the bottle and tank before the liquid flows into the bottle, an air-valve in said connection, and means independent of said air-valve for regulating and controlling the flow of air from the bottle to the tank while the liquid is flowing into the bottle.

4. The combination with a liquid-tank, of a liquid-valve, an air connection between the tank and the bottle being filled to permit equalization of pressure in the bottle and tank before the liquid flows into the bottle, an air-valve in said connection, and means independent of said air-valve for compensating for the weight of the liquid in the filling-tube to prevent the forcible discharge of the liquid therefrom into the bottle and thereby avoid producing foam.

5. The combination with a liquid-tank, of a valved filling-tube and a valved air-tube connected with the tank and having independent communication with the bottle being filled, means adapted to be operated by the bottle for opening the air-valve before the liquid-valve is opened to permit equalization of pressure in the bottle and tank before the liquid flows into the bottle, and means for retarding the flow of air from the bottle to the tank while the liquid is flowing into the bottle to compensate for the weight of liquid in the filling-tube and prevent the forcible discharge of liquid from the filling-tube into the bottle and to avoid producing foam.

6. The combination with a liquid-tank, of a liquid-valve and a filling-tube connected therewith, a head movable on said filling-tube and adapted to unseat said liquid-valve, a chamber in said head to communicate with the bottle being filled, an air-valve in the tank, an air-tube having one end fastened in said chamber and its other end adapted to operate said air-valve, and means for regulating the

flow of air from the bottle through said air-tube and valve to the tank while the bottle is being filled.

7. The combination with a liquid-tank, of
5 a liquid-valve and a filling-tube connected therewith, rods carrying said valve, stops on said rods, a head movable on the filling-tube and said rods and adapted to engage said stops to unseat the liquid-valve, an air-chamber in said
10 head to communicate with the bottle being filled, an air-valve in the tank, an air-tube adapted to operate said air-valve and con-

nected with said head with one end entering the chamber, a valve within the chamber on the end of the air-tube, an opening in said air- 15 tube above said valve to permit the escape of air from the bottle to the tank when the liquid flows into the bottle and means for regulating the outflow of air through said opening.

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Witnesses:

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