

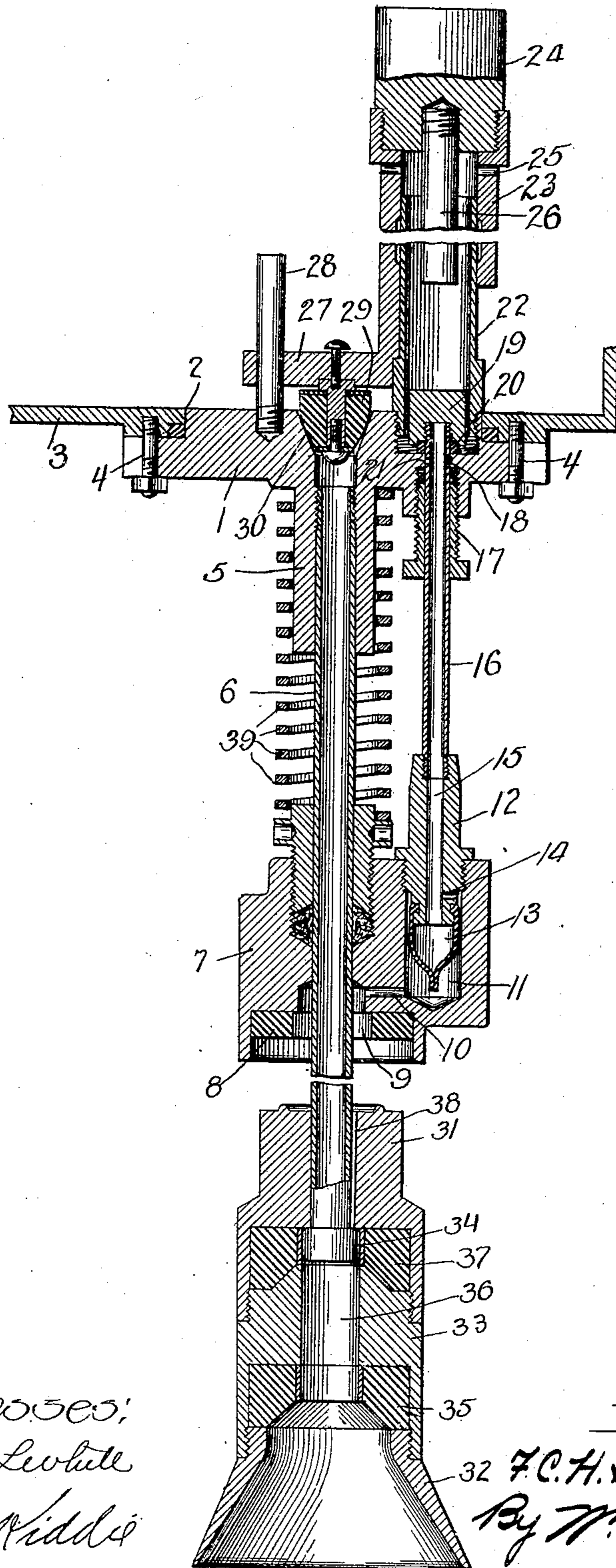
No. 869,811.

PATENTED OCT. 29, 1907.

F. C. H. STRASBURGER.

FILLING MACHINE.

APPLICATION FILED OCT. 1, 1906.



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# UNITED STATES PATENT OFFICE.

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## FILLING-MACHINE.

No. 869,811.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed October 1, 1906. Serial No. 336,929.

*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 new and useful Improvements in Filling-Machines, of which the following is a specification.

This invention relates to filling machines and more especially to machines for filling bottles with beer or other carbonated liquids.

10 In many respects the present invention is an improvement on the filling machine forming the subject matter of Patent No. 768,962 granted on August 30, 1904 to my assignee, and its object is to enable the filling operation to be performed without causing the liquid to foam or lose its gas.

The accompanying drawing illustrates a sectional view of the machine and referring thereto 1 designates the body of the filling valve which may be fastened in an opening 2 in the bottom of the liquid tank 3 by bolts 4, as shown, or by any other suitable means. The body of the valve has a central bore 5 into which the filling tube 6 is screwed or otherwise secured. A head 7 is arranged on the filling tube and has a seat 8 in its lower face. An enlarged bore 9 is provided in this seat and in a part of the head and it communicates by a lateral passage 10 with a valve chamber 11 in the head. A tubular nipple 12 is screwed or otherwise secured in the upper end of said chamber and carries on its lower end a check valve 13. The nipple has a lateral port 14 just above the check valve which forms a contracted communication between the bore 15 of the nipple and the chamber. An air tube 16 is secured in the upper end of the nipple and projects upward through a stuffing box 17 and through an opening 18 in the body 1, and carries on its upper end a head 19 and a gasket 20 beneath the head. The air tube is provided with one or more lateral port openings 21 beneath the gasket. The upper end of the air tube is located within a tube 22 which is arranged within the tank and secured to the body 1 over the head 19 and the upper end of the air tube. A sleeve 23 is arranged to slide on the tube 22 and it is provided with a head 24 and one or more lateral port openings 25 beneath the head. A rod or projection 26 is fastened in the head 24 of the sleeve and projects downward in the tube to be engaged by the head 19 on the air tube as will be described hereafter. The sleeve has a lateral projection or foot 27 which is guided on a post 28 fixed on the body 1 and carries the liquid valve 29 to and from its seat 30 in the body at the upper end of the bore 5. I have shown the sleeve, the head and the rod made separate and screwed together, which is a convenient manner of making them, but it will be apparent that all of these parts could be made in one piece.

55 To center the bottle automatically so that the tube

will enter the bottle properly without encountering the edge of its mouth I provide a guide on the lower end of the filling tube which slides thereon and is prevented from slipping off of the filling tube by a collar 34. This guide is made adjustable to accommodate large 60 or small bottles and in the drawings I have shown it adapted for small, that is to say short, bottles. The guide comprises a body 31, a flared or bell-shaped member 32 and an intermediate removable member 33.

The body 31 is arranged to slide on the filling tube 65 and is held thereon by collar 34 fitted on the lower end of said tube. The intermediate member 33 is provided with a rubber seat 35 at the lower end of a central bore 36 and the flared or bell-shaped member 32 is screwed into the lower end of said intermediate member and 70 against said seat. The intermediate member is screwed into the lower end of the body against a rubber seat 37. The bore 36 is enlarged and the guide head 31 has a longitudinal passage 38 to communicate with the bore 9 in the gasket 8 and head 7 when the guide is pressed by 75 the bottle against the gasket 8. It will be clearly apparent that for large, that is to say tall, bottles the intermediate member 33 and the seat 35 can be removed from the head 31 and the flared or bell-shaped member 32 screwed into the lower end of the body 31 80 against the seat 37. It will also be observed that this can be accomplished quickly and readily because the two parts 32 and 33 are carried by the head 31 which alone is slidably mounted on the filling tube.

A spring 39 inclosing the filling tube and operating 85 between the body 1 and head 7 presses said head away from the body 1 and seats the gasket 20 against the body to close communication between the tube 22 and the tube 16. This gasket and the lateral openings 21 in the air tube constitute with the adjacent portion of the body 90 1 an air valve whereby communication is established between the interior of the tank and the bottle.

In practice the air valve, which I will refer to generally by the numeral 20 and which of course may vary in details of construction like the other details of the 95 several parts, from those specifically illustrated and described here, is held normally closed by the spring 39, the check valve is normally closed and the liquid valve 29 is also normally closed, being held in its seat by gravity. A bottle is moved up against the guide and on 100 the filling tube, the guide being carried up against the head and the filling tube entering the bottle. On the continued upward movement of the bottle the head is carried upward on the tube against the pressure of the spring 39 and the air tube 16 moving with the head 105 opens the air valve 20. The filling operation is usually conducted under pressure, that is to say a pressure of from 3 to 20 pounds is maintained in the liquid tank 3 and when communication is established through the ports 25, the sleeve 23, tube 22, ports 21, tube 16, valve 110



13, passage 10, bore 9, bore 38 and bore 36 with the bottle an opportunity is afforded for the equalization of pressure in the bottle and the liquid tank before the liquid valve is opened. On the continued upward movement of the bottle and head 7, the head 19 on the upper end of the air tube engages and pushes upward the rod 26, thereby lifting the sleeve 23 and unseating the liquid valve 29. When the liquid begins to flow through the filling tube into the bottle the air or gas in the bottle escapes through the bore 36, passage 38, bore 9, and the passage 10 into the chamber 11 and thence through the port 14 into the air tube and into the liquid tank. The port 14 is contracted or, in other words, it is made of such a size that the air escaping from the bottle will be retarded in its passage to the liquid tank, thereby constantly maintaining a greater pressure in the bottle than in the tank and preventing the forcible discharge of the liquid into the bottle. This avoids undue agitation of the liquid and the consequent loss of gas and prevents foaming, thereby permitting the bottle to be filled as desired without sniffing. After the bottle is filled it is removed from the filling tube, the guide following the bottle to the end of the tube, and the spring returns the head 7 to its normal position closing the air valve and the sleeve 23 falls to its lowest position seating the liquid valve.

If it is not desired to retard the escape of air or gas from the bottle as herein before described the check valve may be omitted.

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

1. The combination with a liquid tank, of a liquid valve, a stationary tube arranged within the tank, an air connection between the tank and the bottle to be filled, said connection comprising an air valve at the bottom of said stationary tube and a movable air tube arranged to unseat said air valve and operating in said stationary tube, a part slidable on said stationary tube and carrying said liquid valve and arranged to be engaged by said air tube after the air valve is opened and moved to unseat said liquid valve, and means for operating said movable tube.

2. The combination with a liquid tank, of a liquid valve, a stationary tube within the tank, an air connection between the tank and the bottle to be filled, said connection comprising an air valve at the bottom of said stationary tube and a movable air tube arranged to unseat said air valve and operating in said stationary tube, a sleeve movably arranged on said stationary tube, a foot on said sleeve carrying the liquid valve, a projection on said sleeve extending downward in the stationary tube to be engaged by the air tube and lifted to unseat the liquid valve after the air valve has been unseated, and means for operating said movable tube.

3. The combination with a liquid tank, of a liquid valve, a stationary tube arranged within the tank, an air connection between the tank and the bottle to be filled, said connection comprising an air valve at the bottom of said stationary tube, a movable air tube arranged to un-

seat said air valve and operating in said stationary tube, a sleeve slidably arranged on said stationary tube, a foot on the sleeve carrying said liquid valve, a fixed guide for said foot, a rod carried by the sleeve and projecting downward in the stationary tube to be engaged by the movable tube and moved to unseat the liquid valve, and means for operating said movable tube.

4. The combination with a liquid tank, of a liquid valve, a stationary tube arranged within the tank, an air connection between the tank and the bottle to be filled, said connection comprising an air valve and a movable air tube arranged to unseat said air valve and operating in said stationary tube, a movable part guided on said tube and carrying said liquid valve and arranged to be engaged by said movable tube within the tank and moved to unseat the liquid valve after the air valve has been unseated, a head arranged to be operated by the bottle and provided with an air chamber and an air connection leading therefrom to the bottle, a nipple on said head connected to the air tube and having its lower end arranged in said chamber, a check valve on the lower end of said nipple, and a contracted port in said nipple above the check valve and within said chamber.

5. The combination with a liquid tank, of a liquid valve, a stationary tube within the tank, an air connection between the tank and the bottle to be filled, said connection comprising an air valve at the bottom of said stationary tube and a movable air tube arranged to unseat said air valve and operating in said stationary tube, a sleeve slidably arranged on said stationary tube and provided at its upper end with one or more lateral ports, a foot on said sleeve carrying the liquid valve, a fixed guide for said foot, a rod carried by said sleeve and projecting down in the stationary tube to be engaged by the movable tube to unseat the liquid valve after the air valve has been unseated, and a body carrying all of said parts.

6. In a filling machine, the combination with a liquid tank, of a liquid valve on the tank, a filling tube, a head slidable on the filling tube, means intermediate of said head and valve for opening the valve when the head is raised, and a guide to adjust the mouth of the bottle to receive the tube, said guide comprising a body slidably held on the tube and provided with a seat in its lower end, a flared or bell-shaped member, and an intermediate removable member having a seat in its lower end, said parts being screwed together and constructed so that the intermediate member may be removed and the bell-shaped member screwed directly into the body to adapt the guide for taller bottles.

7. In a filling machine, the combination with a liquid tank, of a liquid valve on the tank, a filling tube, a head slidable on the filling tube, and a guide to adjust the mouth of the bottle to receive the tube, said guide comprising a body slidable on the tube and having an air passage, means on the end of said tube to hold the body thereon, a rubber seat in the lower end of said body, an intermediate member removably secured against said seat in the lower end of the body and provided with an enlarged bore, a seat in the lower end of said intermediate member, and a flared or bell-shaped member removably secured against said seat in the lower end of the intermediate member.

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