H. M. SMITH.

FILLING MACHINE.

APPLICATION FILED APR. 15, 1907.

1,086,566. Patented Feb. 10, 1914.

Fig. 1.

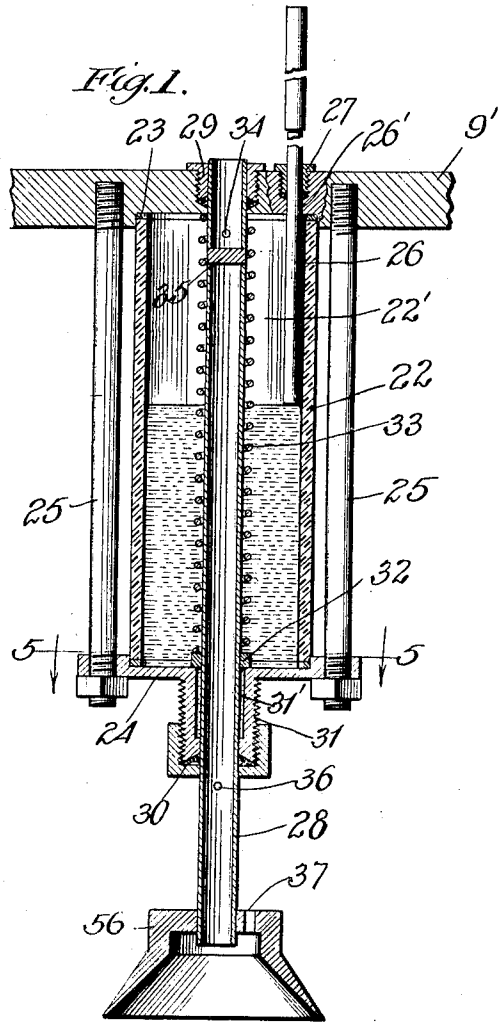
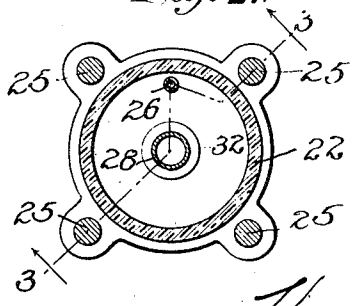


Fig. 2.



Witnesses
Harry R. L. White.
M. A. Riddle

Inventor
Horace M. Smith
By Wm. T. Belknap.

UNITED STATES PATENT OFFICE.

HORACE M. SMITH, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE LIQUID CARBONIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FILLING-MACHINE.

1,086,566. Specification of Letters Patent. Patented Feb. 10, 1914.

Application filed April 15, 1907. Serial No. 368,164.

To all whom it may concern:

Be it known that I, HORACE M. SMITH, 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.

A principal object of the invention is to provide a device of simple construction which can easily be operated to deposit a charge of syrup, salt solution or other liquid, in one or more bottles in measured quantities and to automatically recharge the filling mechanism after each operation of the machine, particular attention being paid to the prevention of leakage of the filling liquid.

The bottle filling device embodying my invention incorporates in its construction, as have a number of similar devices prior to my invention, a vertically sliding tube which, when in raised position, permits liquid to flow from the measuring tank into the bottle through the tube and which, when in lowered position, seals the measuring tank from the tube. Considerable difficulty has been experienced in devices of this character in preventing the waste of liquid between the sealing tube and the aperture in the tank through which it moves. Where stuffing boxes are used they must be made so tight as to require great force to move the tube in filling the bottles. The contacting surfaces wear and the stuffing boxes must be continually tightened, rendering it hard to keep the machine in perfect adjusted condition.

It is one of the aims of the present invention to provide automatically operable auxiliary means for preventing the leakage between the contacting relatively sliding surfaces, which means may be cheaply constructed and which will be so arranged with respect to the other parts of the device as to efficiently operate regardless of wear of the parts within wide limits.

Additional objects and advantages of the invention will be apparent as it is better understood from the following description which, taken in connection with the accompanying drawings, illustrates one preferred embodiment thereof.

On the drawings—Figure 1 is a vertical sectional view through the measuring and filling mechanism embodying my invention; and Fig. 2 is a transverse sectional view on the line 5—5 of Fig. 1.

Referring to the drawings, 9′ indicates the bottom of a tank in which the liquid to be fed into the bottles is contained. Beneath this tank is fastened one or more measuring and filling mechanisms only one of which is shown in the drawings, it being understood, however, that the bottom 9′ of the tank may be provided with any preferred number so that the machine may operate to fill one or any desired number of bottles simultaneously. This mechanism comprises a hollow member 22, preferably a glass cylinder, which is secured against a seat 23 in the bottom 9′ of the tank by a head 24 on its other end, this head being tightly clamped against the cylinder by bolts 25. The interior 22′ of the glass cylinder constitutes a measuring chamber and is preferably made of a size sufficient to contain the largest charge of liquid that may be required. An air tube 26 extends through an opening 26′ and a stuffing box 29 in the bottom of the tank and projects upwardly in the tank above the level of the fluid therein. This tube is adapted to be adjusted to project downwardly in the measuring chamber to regulate the charge received by the measuring chamber for by cutting off the escape of air through this tube from the chamber the in-flow of liquid from the tank to the chamber is controlled. A filling tube 28 is slidably arranged in the stuffing box 29 in the bottom of the tank and a stuffing box 30 at the bottom of an extension 31 on the head 24. A collar 32 is secured on the filling tube within the chamber 22′ and moves with this tube as will be later described. This collar is of sufficient diameter to extend over the bore 31′ of the extension 31 and fits snugly about the tube, so that it forms a valve having a flat-faced contact with the upper or inner surface of the head 24. The filling tube has one or more lateral ports 34 near its top, a plug 35 beneath said port, and one or more lateral ports 36 which are located so as to clear the stuffing box 30 when the filling tube is in normal position, as shown in Fig. 1.

A centering bell 56 is secured rigidly on the lower end of the filling tube 28 and is provided with an air escape opening 37. The bore 31′ of the extension is greater in

diameter than the diameter of the filling tube, so that the lateral ports 36 start to fill as soon as they enter within the bore 31' when the bottle pressing upwardly against the bell lifts the tube into filling position.

When it is desired to fill a bottle with my new and improved filling mechanism the bottle is positioned beneath the bell and pressed upwardly thereagainst, carrying the bell up until the filling tube 28 is lifted sufficiently to bring the port 36 in communication with the enlarged bore of the extension 31. As the tube moves upwardly during this operation the collar 32 moves with it and communication is thus established between the chamber 22 and the bottle. When the bottle has been filled it is removed and the spring 33 immediately presses the tube downwardly until the collar 32 rests upon the head 24 and closes the bore of the extension at which time the port 36 is disposed beneath the stuffing box 30 at the bottom of the extension.

The extension 31 greatly increases the accuracy of the filling operation and causes the bottles to effectively drain the tank as the filling operation is completed. The bore should be of appreciable length and of a diameter only sufficiently greater than the external diameter of the filling tube to prevent capillary retardation of the flow of liquid. When it is constructed in this fashion the port in the filling tube remains in direct communication with the interior of the measuring tank an appreciable period after it has passed the bottom of the tank. Difficulty has been experienced in the use of these devices in the past in draining the bottom of the tank because of the comparatively rapid passing of the bottom by the port of the filling tube. When the tank is nearly emptied the remaining liquid flows much slower into the tube than it does when the tank is full, so that in the past frequently the tank has not been completely emptied because of too rapid lowering of the bottle. It will be apparent that this difficulty is overcome where this extension is provided and constructed as described, as the port must remain in communication with the interior of the filling tank while it is passing through the bore of the extension. It will also be apparent that this construction prevents appreciable leakage should the stuffing box or tube passing through it become worn in use as the collar 32 is pressed against the inner face of the head 24 by the spring and by the weight of the liquid in the tank. Wear of the parts will not affect this collar as it slides over none of the surfaces of any of the parts, merely coming to rest as soon as it contacts with the head, so that it does not subject itself to frictional engagement therewith which would wear it or destroy its efficiency should the other parts become loose.

The machine is comparatively simple in construction, capable of being operated easily and waste of fluid is practically eliminated by the provisions made for emptying the measuring chamber at each operation of the machine and for the prevention of leakage.

I claim:

1. In a filling machine of the character described, the combination of a measuring chamber having a hollow extension depending from its bottom, a movable endwise filling tube of diameter less than the internal diameter of said extension, open at its bottom and disposed through said extension, said tube having an inlet port adjacent its end arranged to rest beneath said extension when the filling tube is in normal position and to pass through said extension when said filling tube is moved to raised position, a stuffing box at the end of said extension and embracing said tube and means for supplying liquid to said chamber.

2. In a filling machine of the character described, the combination of a measuring chamber having a hollow extension depending from its bottom, a movable endwise filling tube of diameter less than the internal diameter of said extension, open at its bottom and disposed through said extension, said tube having an inlet port adjacent its end arranged to rest beneath said extension when the filling tube is in normal position and to pass through said extension when said filling tube is moved to raised position, a stuffing box at the end of said extension and embracing said tube, and means for automatically supplying a predetermined quantity of liquid to said chamber after each filling operation is completed.

3. In a filling machine of the character described, the combination of a measuring chamber having a hollow extension depending from its bottom, a movable endwise filling tube of diameter less than the internal diameter of said extension, open at its bottom and disposed through said extension, said tube having an inlet port adjacent its end arranged to rest beneath said extension when the filling tube is in normal position and to pass through said extension when said filling tube is moved to raised position, a stuffing box at the end of said extension and embracing said tube, a collar fixed to said tube and positioned to seal said extension from said chamber when the tube is in normal position, means for pressing said collar against the bottom of said chamber and means for supplying liquid to said chamber.

4. In a filling machine of the character described, the combination of a measuring chamber having a hollow extension depending from its bottom, a movable endwise filling tube of diameter less than the internal diameter of said extension, open at its bot-

tom and disposed through said extension, said tube having an inlet port adjacent its end arranged to rest beneath said extension when the filling tube is in normal position and to pass through said extension when said filling tube is moved to raised position, a stuffing box at the end of said extension and embracing said tube, a collar fixed on said tube and positioned to seal said extension from said chamber when the tube is in normal position, means for pressing said collar against the bottom of said chamber and means for automatically delivering a predetermined quantity of liquid to said chamber after each filling operation is completed.

HORACE M. SMITH.

Witnesses:
J. H. RANDALL,
A. C. WOOD.