No. 696,955. Patented Apr. 8, 1902.

E. FIGUEREDO & L. ECHEMENDIA.

BOTTLE FILLING MACHINE.

(Application filed Oct. 29, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

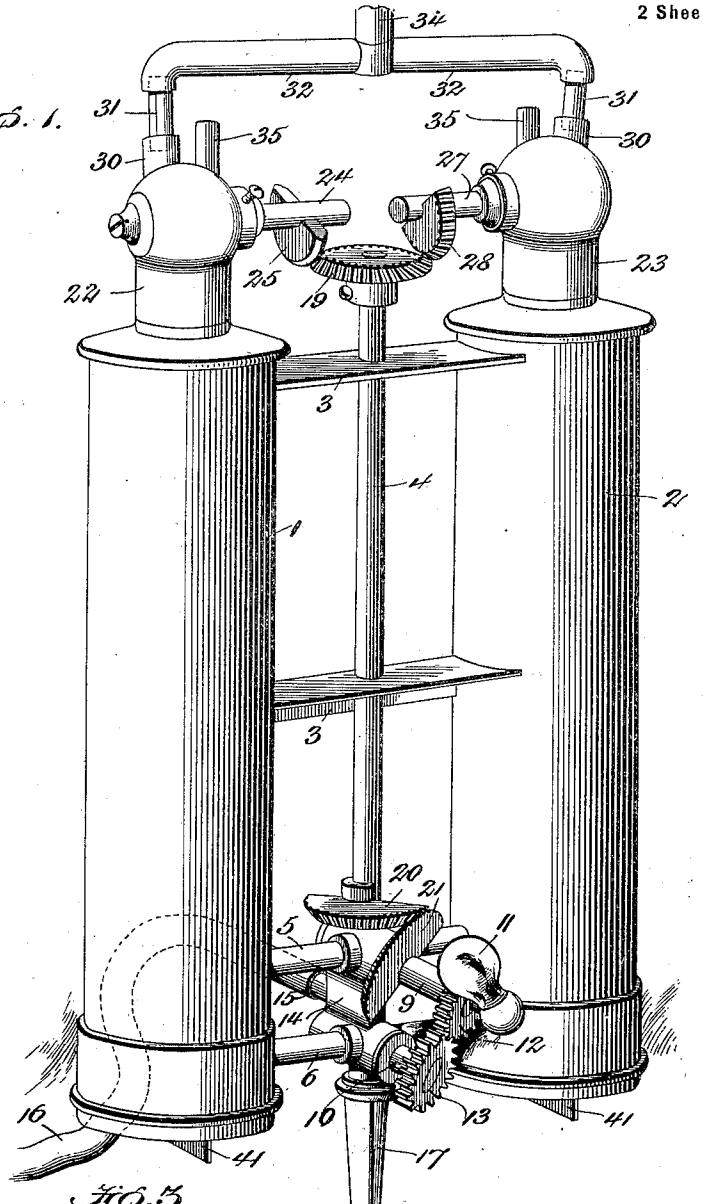
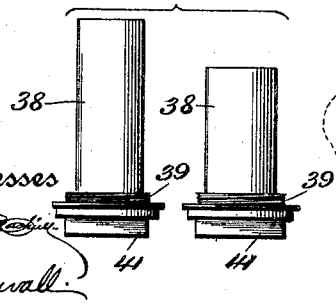


Fig. 5.



Witnesses

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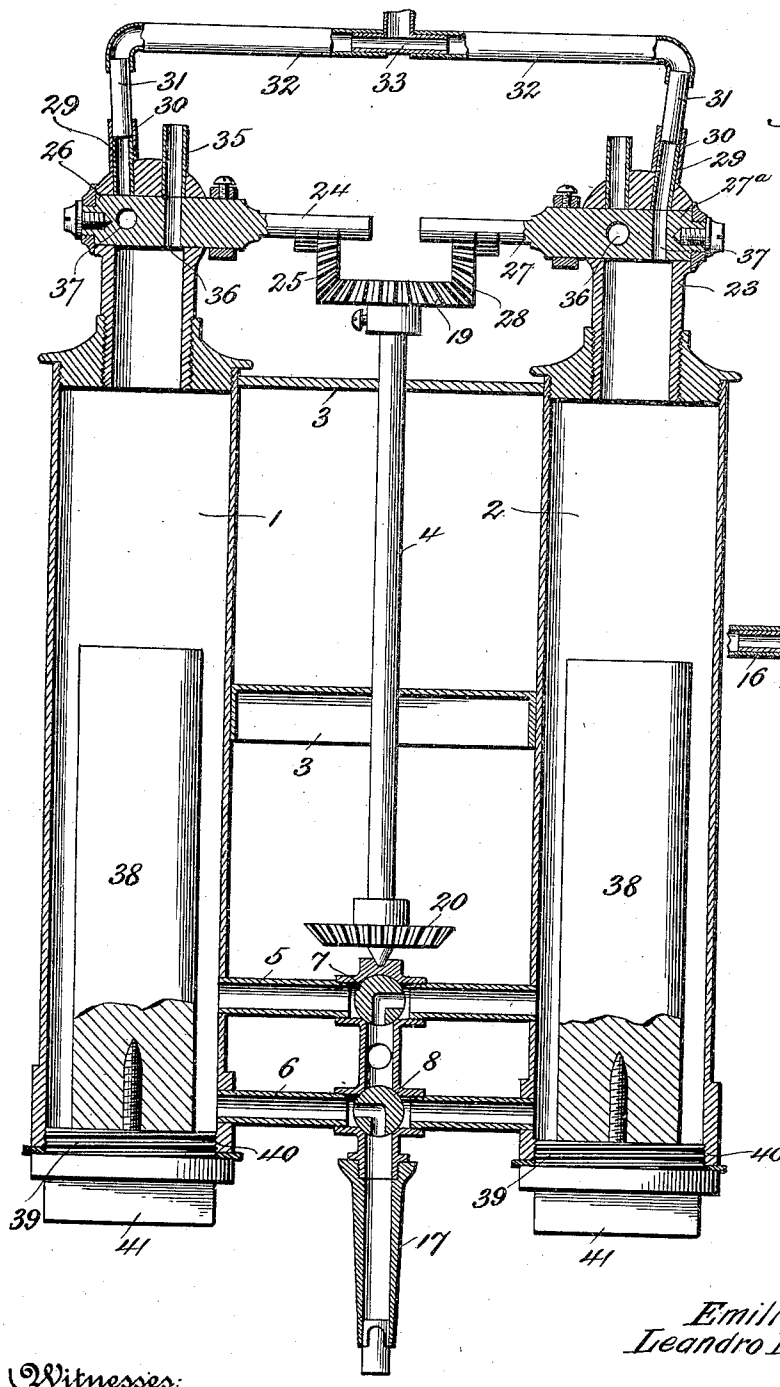


Fig. 2.

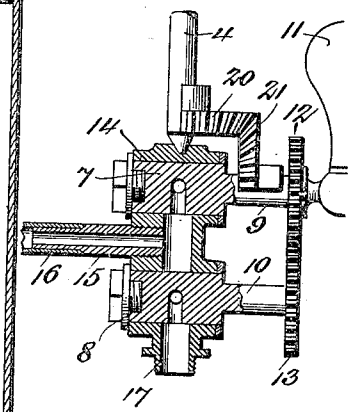


Fig. 4.

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UNITED STATES PATENT OFFICE.

EMILIO FIGUEREDO AND LEANDRO ECHEMENDIA, OF NEW YORK, N. Y.

BOTTLE-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 696,955, dated April 8, 1902.

Application filed October 29, 1901. Serial No. 80,430. (No model.)

To all whom it may concern:

Be it known that we, EMILIO FIGUEREDO, a citizen of Venezuela, and LEANDRO ECHEMENDIA, a citizen of the United States, both residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Bottle-Filling Machines, of which the following is a specification.

This invention relates to bottle-filling machines or apparati.

The main objects of the invention are to produce a compact, cheap, and simple machine or apparatus of this character which is especially adapted for bottling spirituous liquids of a volatile nature—such as chloroform, alcohol, and acids—where loss by evaporation will take place under exposure, to adapt such machine to avoid such exposure and consequent resulting loss while bottling, and finally to adapt such machine or apparatus to automatically and accurately measure the discharge into such bottles.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a perspective view of a bottle-filling machine or apparatus embodying the invention. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 represents details of two of the measuring-plugs. Fig. 4 is a transverse section of the lower valves.

Similar numerals of reference indicate similar parts in all the figures of the drawings.

In its preferred form the machine comprises the two cylinders or reservoirs 1 2, the same being constructed of glass, metal, or other material of a non-corrosive nature or provided with a lining of such nature as may be desired. These cylinders 1 and 2 are rigidly connected in the present instance by cross-bars 3, vertically journaled, in which is a shaft 4, the ends of which extend beyond its bearings. The two cylinders are connected immediately above their lower ends by transverse upper and lower pipes 5 and 6, respectively, the upper pipe being provided at its center with a two-way rotating valve 7 and the lower pipe being similarly provided with a two-way rotating valve 8, the parts in one valve being oppositely disposed to those in the other. The upper valve is mounted upon and adapted to be operated by a stem 9, and the lower valve is mounted upon and adapted to be operated by a similar stem 10. The upper stem 9 is provided at its front end with an operating-handle 11 and immediately back of the same with a spur-gear 12, the latter being fixedly mounted and meshing with a companion gear 13, similarly mounted upon the lower stem 10. It will be obvious that a rotation of the upper stem 9 through the handle 11 and its valve will thus cause a reverse movement of the stem 10 and the valve carried thereby. The case 14, in which the two valves are mounted, is provided at its rear side with a nipple 15, which communicates with the upper valve only, and to which may be connected, through a tube 16, the source of supply—the retainers—which latter may be any distance away. At the lower end of said valve-case 14 and communicating with the lower valve only is a discharge-nipple 17, which may be tapered, so as to be inserted into the neck of a bottle, or, if desired, such nipple may be connected to a flexible tube 18, fitted at one end with a nozzle 19, adapted to enter a bottle. (See dotted lines, Fig. 1.)

At the upper end the vertical shaft 4 may be provided with a beveled gear-wheel 19, the lower end of said shaft also carrying a similar gear-wheel 20, preferably of segmental shape. This latter gear-wheel 20 meshes with and is operated by a corresponding gear-wheel 21, mounted upon and adapted to move with the upper valve-stem 9, so that, as will be apparent, movements of said stem 9 will cause a partial rotation of the shaft 4.

At the upper end of the cylinder 1 is a valve-case 22, a corresponding valve-case 23 being mounted on the upper end of the companion cylinder 2. Within the valve-case 22 is seated a horizontally-disposed valve-stem 24, which at its inner end extends beyond the case and is there provided with a beveled gear-wheel 25, preferably of segmental shape and which meshes with and is adapted to be driven by the upper gear-wheel of the vertical shaft 4. This valve-stem carries a valve 26. A similar valve-stem 27, carrying a similar valve 27^a and gear-wheel 28, is seated in the companion casing 23, the said gear-wheel 28 meshing with

and therefore being driven by said upper gear of the shaft 4, but in a reverse direction, as will be apparent.

The upper sides of the valve-cases 22 and 23 are provided with overflow-nipples 29, to which (if the parts are of metal) may be connected short sections 30, of flexible tubing. To these sections 30 glass sight-tubes 31 may be connected, they in turn being connected to other sections 32 of tubing, which latter are connected to the opposite branches of a T-shaped coupling 33, one of the branches of which, by a tube 34, may lead to the retainer or other source of supply.

At one side of each of the overflow-nipples 29 is located an air-vent 35, which extends upwardly above the valve-cases.

The two rotary valves 26 and 27ª each have two transverse ports 36 and 37, the ports of each valve being disposed at a right angle to each other and communicating with the overflow nipples or ports and the air-vents. By this arrangement, as will be apparent, when the air-vents are open the overflow-ports are closed, and vice versa.

It will be understood that the cylinders 1 and 2 are of a predetermined capacity, and for the purpose of varying this capacity there may be provided any number of plugs 38, preferably hollow. These plugs being graduated as to size will accordingly diminish the size of the cylinders. Each plug may be provided at its lower end with an exteriorly-threaded base 39, the lower ends of the cylinders 1 and 2 being open and likewise exteriorly threaded, as at 40. To provide for the ready withdrawal and insertion of these plugs, the latter may have formed on or attached to the under sides of their bases webs or flanges 41.

This completes the description of the improved bottle-filler, and the operation is as follows: The capacities of the cylinders having been adjusted, if necessary, in the manner described and the bottle placed in position, the machine is ready for operation. It will be observed that one of the cylinders—in this instance the cylinder 1—is in open communication with the retainer and has therefore become filled. As the cylinder becomes filled any excess of liquid will pass the overflow-pipe to the height of the liquid in the retainer. The filling of a cylinder will be evidenced through the glass sight-tube, or, if the cylinder be of glass, it will also be obvious. After a filling of the cylinder 1 the operating lever or handle is reversed or swung to the opposite side, which, as will be obvious, will reverse the relative positions of the two lower as well as the two upper valves. In other words, the uppermost of the two lower valves will open communication between the companion cylinder 2 and the retainer, whereby the said cylinder will be filled, and open up communication through the lowermost valve between the cylinder 1 and the bottle or other vessel to be filled. Thus it will be seen that as one cylinder is emptying the other is refilling, so that the operation of measuring and filling is practically continuous. It will be further observed that this operation of the handle through the train of gearing described also relatively operates the set of upper valves. Thus, as shown in Fig. 1, when the cylinder 2 is filling the overflow-pipe thereof is open and the air-vent closed, while in the cylinder 1, which is emptying, the overflow-pipe is closed, so that no liquid can escape back into the cylinder from the overflow-pipe, and the vent is open. In this manner accurate measurement always results.

From the foregoing description, in connection with the accompanying drawings, it will be apparent that the machine is practically continuous in its operation in that as one cylinder is automatically filling its companion is discharging its contents into a bottle or other receptacle. It will further be seen that although the liquid thus transferred from the retainer to the bottles is each time actually and accurately measured, yet it (the liquid) is at no time exposed to the atmosphere, so that no loss by evaporation occurs.

Having described our invention, what we claim is—

1. In a filling-machine, the combination of a cylinder provided with a valve-case at its upper and lower ends, the former provided with a return or overflow port and an air-port, and the lower case provided with inlet and discharge ports, a valve seated in the upper case and provided with ports at variance with each other, upper and lower valves located in the lower case, the one communicating with the discharge-port and the other with the inlet-port and those of the two valves being at variance with each other, whereby when one is open, the other is closed, and means for simultaneously operating the three valves.

2. In a filling-machine, the combination of a pair of reservoirs, valve-cases mounted thereon and provided with return or overflow ports and air-ports, rotary valves seated in the said cases and each provided with a pair of ports disposed at a variance to each other and to those of the companion valve, a lower case common to both reservoirs and having inlet-ports communicating with the reservoirs and with a source of supply, and discharge-ports leading from each reservoir to a common discharge, pair of valves located in said lower case, the upper valve having an angular port leading from the source of supply and to one of said reservoirs, and the lower valve having an oppositely-disposed angular port leading from the other of said reservoirs to the discharge, and a mechanism common to all for operating the valves of each set reversely to each other.

3. In a filling-machine, the combination of opposite reservoirs, each provided with a valve-case at its upper end having overflow-ports, a valve in each case, upper and lower

pipes connecting the lower ends of the reservoirs, a supply-pipe leading to the upper pipe, a discharge leading from the lower pipe, a two-way valve located in the upper pipe, an oppositely-disposed two-way valve located in the lower pipe, and means for simultaneously operating the four valves for the purpose described.

4. In a filling-machine, the combination of opposite reservoirs, a valved air-vent and a valved overflow at the upper end of each of the same, a discharge-valve for the reservoirs, a valved inlet for the same, and means for positively alternately and reversely operating the valves of the overflow and outlets of the opposite reservoirs simultaneously with the operation of said discharge and inlet valves.

5. In a filling-machine, the combination of opposite reservoirs, an intermediate valve-case having an inlet-port communicating with each reservoir and with a discharge leading from each cylinder, oppositely-disposed two-way valves located in said case, intermeshing gears carried by the stems of said valves, an operating-handle on the lower stem and a gear on the upper stem, a valve-case on the upper end of each reservoir, air-vents in the same, overflow-ports also in said cases, rotatable valves for the cases each having an air-port and overflow-port, the two being arranged at an angle to each other, gears on the inner ends of the stems of said valves, a vertical shaft, gears on the upper and lower ends of the same, said gears meshing with the gears of the upper valve-stems and with that of the lower inlet-valve, and tubes adapted to lead from a source of supply to the inlet-port and from the overflow-ports to said source of supply.

In testimony whereof we affix our signatures in presence of two witnesses.

EMILIO FIGUEREDO.
LEANDRO ECHEMENDIA.

Witnesses:
H. WEINHAGEN,
H. H. WEINHAGEN.