No. 846,169. PATENTED MAR. 5, 1907.

T. L. VALERIUS.

MACHINE FOR FILLING CASED BOTTLES.

APPLICATION FILED MAY 13, 1905.

3 SHEETS—SHEET 1.

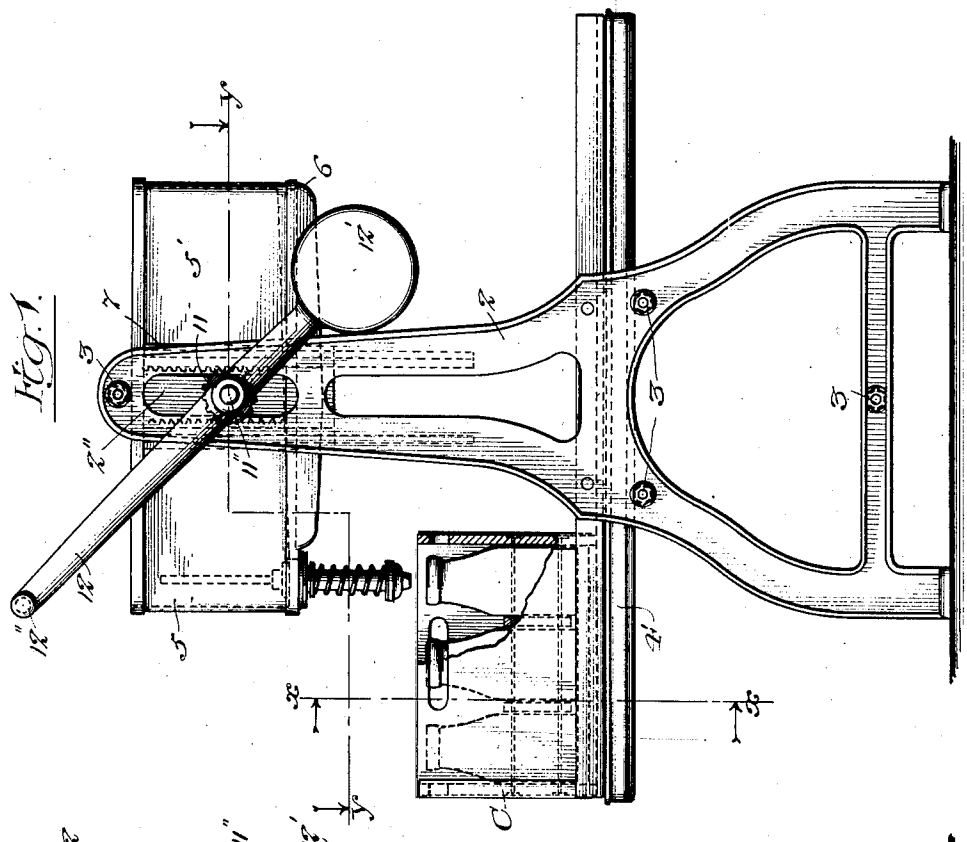

FIG. 1.

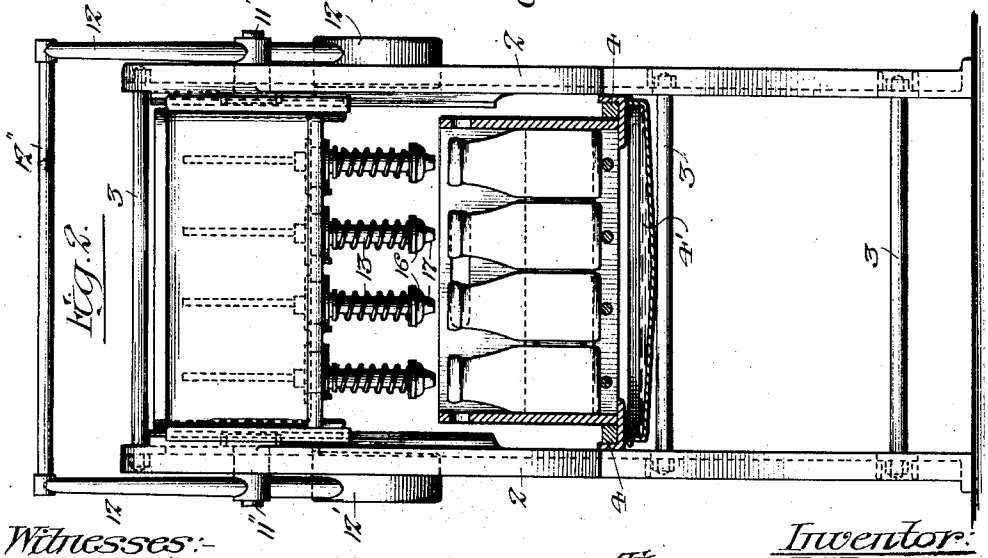

FIG. 2.

Witnesses:-

Louis M. Hollister

C. F. Murray

Inventor:

Theodore L. Valerius

By: Charles Richard Hawley

Atty:

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3 SHEETS—SHEET 2.

Fig. 3.

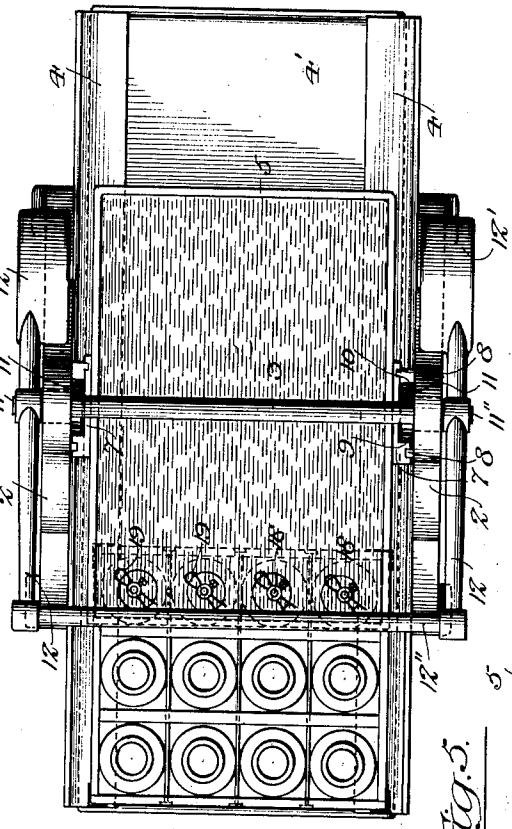


Fig. 5.

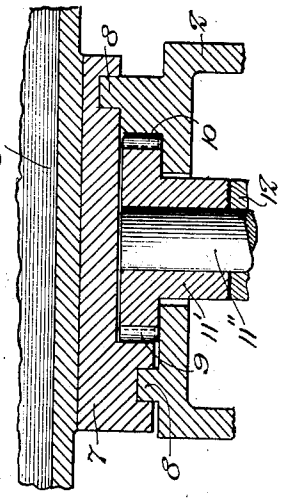
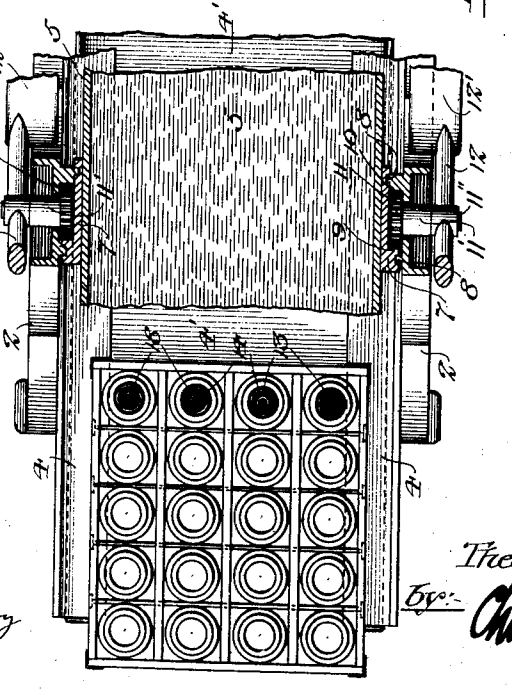


Fig. 4.



Witnesses:-
Louis H. Hubbard
C. J. Murray

Inventor:-
Theodore L. Valerius
By:- Charles Wilbur Stanley
Atty:-

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3 SHEETS—SHEET 3.

Fig. 6.

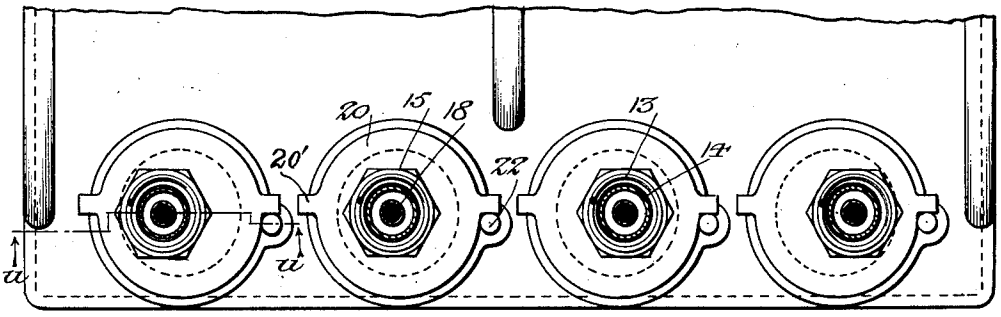


Fig. 7.

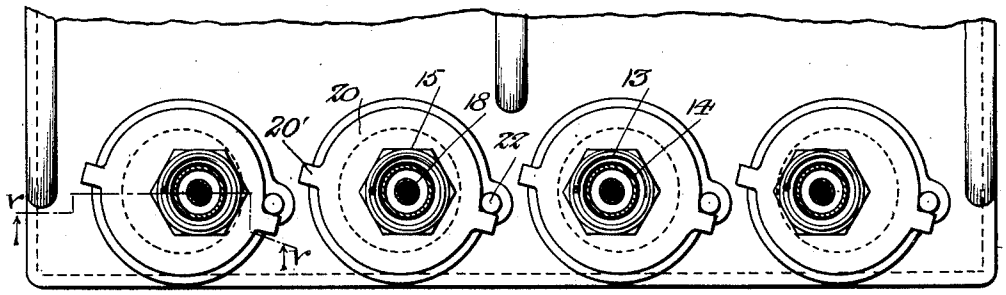


Fig. 8.

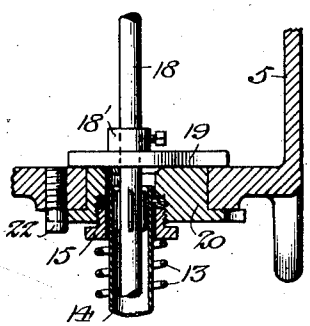


Fig. 9.

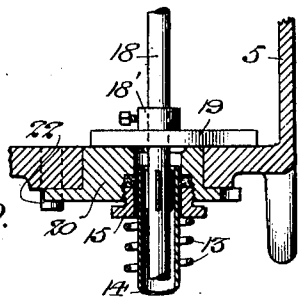
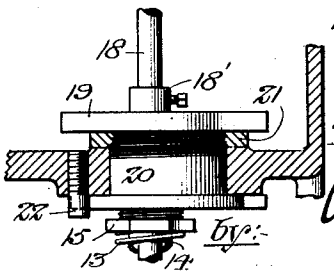


Fig. 10.



Witnesses:-

Louis W. Stubblebine

C. J. Murray

Inventor:-

Theodore L. Valerius

By:-

Charles Wilbur Hawley

Atty.

UNITED STATES PATENT OFFICE.

THEODORE L. VALERIUS, OF FORT ATKINSON, WISCONSIN, ASSIGNOR TO THE CREAMERY PACKAGE MFG. COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MACHINE FOR FILLING CASED BOTTLES.

No. 846,169. Specification of Letters Patent. Patented March 5, 1907.

Application filed May 13, 1905. Serial No. 260,196.

To all whom it may concern:

Be it known that I, THEODORE L. VALERIUS, a citizen of the United States, and residing at Fort Atkinson, Jefferson county, Wisconsin, have invented a certain new, useful, and Improved Machine for Filling Cased Bottles, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to bottle-filling machinery, and has special reference to improvements in machines of that class which are employed for filling milk and cream bottles.

Further, my invention has particular reference to improvements in machines designed for filling bottles previously placed or packed in cases or crates.

The object of my invention is to provide a bottle-filling machine that shall be capable of simultaneously filling a plurality of bottles located within a shipping case or crate.

Another object of the invention is to provide a plural or gang bottle-filler of simple, economical, and durable construction and which shall be adapted for operation by hand.

A further and important object of the invention is to so improve plural or gang bottle-fillers that the same machine may be employed for filling cased bottles of different sizes.

Other objects of my invention will appear hereinafter.

My invention consists generally in a bottle-filler of the construction and combination of parts hereinafter described, and particularly pointed out in the claims.

The invention will be more readily understood by reference to accompanying drawing, forming a part of this specification, and in which—

Figure 1 is a side elevation of a bottle-filling machine embodying my invention. Fig. 2 is a front elevation thereof, partly in section, on the line *x x* of Fig. 1. Fig. 3 is a plan view of the machine. Fig. 4 is a horizontal section on the line *y y* of Fig. 1, showing a mechanism for raising and lowering the liquid-tank. Fig. 5 is an enlarged sectional detail illustrative of the tank-operating mechanism. Fig. 6 is an enlarged view of the gang of bottle-fillers upon the liquid-tank as viewed from beneath on the line *y y* of Fig. 1. Fig. 7 is a similar view showing the bottle-fillers reversed or converted for use in filling cased pint-bottles. Fig. 8 is a sectional detail on the vertical plane of the line *u u* of Fig. 6, the parts being here shown in upright position. Fig. 9 is a similar view on the line *v v* of Fig. 7, and Fig. 10 illustrates a modification of the nozzle reversing or converting device.

In carrying out my invention, I prefer to make the frame of the machine of two standards 2 2 of identical form connected by a number of cross-bars 3 3, one thereof being at the extreme top. The standards have wide bases or widely-separated feet to afford the requisite stability, while the upper portions are narrow, as shown. To the inner sides of the standards I attach the angle bars or rails 4 4, extending fore and aft of the frame and constituting a track or slideway upon which bottle-cases C may be moved beneath the bottle-filling mechanism. The track is of sufficient width to accommodate both pint and quart bottle cases. 4′ is a waste-liquid pan preferably extending from end to end of the track 4. It may rest upon the two cross-rods 3, that are just below the track. The bottle-cases which I prefer to employ with my machine are such as are shown and described in my pending application of even date herewith, entitled "Bottle-cases." A characteristic of these cases is the arrangement of the bottle-compartments in rows of four. Thus, as shown in Fig. 4, the pint-bottle cases have five rows of bottles with four bottles in each row, while, as shown in Fig. 3, the quart-cases have but three such rows. In operating my machine the cases previously filled with bottles, whether pints or quarts, are so placed upon the track that the rows of four bottles each will be transverse to the track. The bearing of this fact upon the successful operation of the machine will be understood when it is observed that the upper part of the machine-frame contains or holds a liquid-tank 5 and that a row or gang of four nozzles are at-

tached to the tank in position to overhang and enter successive rows of bottles in successive cases upon the track. As pint and quart bottles are of different diameters, there are greater distances between the centers throughout a row of quart-bottles than in the case of a row of pint-bottles, and to avoid the use of two sets of filler valves or nozzles I arrange the nozzles in such a way that they may be spread apart or moved together to correspond with the different positions of quart and pint bottles. The manner in which this important result is accomplished will be explained in detail hereinafter.

The track which supports the bottle-cases is stationary, and to connect the bottle-filler valves or nozzles with the bottles in a case and operate or open the valves proper it is necessary to lower the liquid-tank. Reversely, it is necessary to elevate the tank after a row of bottles has been filled. The bottom of the tank is formed by a plate 6, to which the sides 5′ are attached. On the sides of the tank are plates or blocks 7 7, attached to the plate 6 and the sides of the tank. The inner sides of the standards 2 are provided with vertical guide-ribs 8, and the blocks 7 have corresponding vertical guide-grooves for holding the tank horizontal. It is obvious that the tank may be moved up and down on these guides between the standards or side frames 2. The ribs and grooves upon standards and blocks are in different planes, each plate 7 being thickened at one edge and the standards having opposite corresponding thickened portions 2′. The transverse faces of the two thickened portions on each side of the machine are provided with gear-racks, as shown in Figs. 1, 4, and 5, 9 being the rack upon the block 7 and 10 the opposed rack, upon the standard 2. Between each pair of racks 9 and 10 I arrange a gear wheel or pinion 11, which meshes with both racks. When this pinion is turned, it will rotate or roll upon the stationary rack 10 and aside from its own vertical movement will operate the rack 9, the movement of the rack 9 being twice the movement of the pinion upon the rack 10. Each pinion 11 has a long hub 11′, which extends through a slot 2″ in the standard, and the pinions have a common axis and are connected by a bail or hand-lever 12, extending in front of the tank 5. I preferably employ studs 11″ for connecting the bail and pinions. (See Fig. 5.) Counterweights 12′ or their equivalents are attached to the bail 12, and these tend to throw the bail into the position shown in Fig. 1, having sufficient force to elevate the tank. The weight is imposed upon that end of the lever or bail which is opposite the point of engagement between the pinion and the rack 9 on the tank, so that the weight exerts its leverage through the pinion, the rack 10 on the frame acting as the fulcrum. A downward pull upon the cross-bar of the bail operates in reverse manner and depresses or lowers the tank with its filler valves or nozzles.

The filler-valves hereof are of the kind shown and described in my pending application, entitled "Bottle-fillers," Serial No. 233,753, filed November 14, 1904, and are normally distended and closed by springs 13. A description of one filler-valve will serve for all. As shown in Figs. 8 and 9, the liquid duct or passage of the valve is a tube 14, which is slidable in a stuffing-box 15, provided in the bottom of the liquid-tank 5. The bottle-closure 16 is carried on the lower end of the tube 14 and is adapted to close the mouth of the bottle into which it is lowered by the depression of the tank. A central valve 17 is employed for closing the lower end of the tube 14, and this valve is attached to the lower end of an air-vent tube 18, that extends above the level of liquid in the tank. The vent-tube is supported by a removable clip or pin 19, which rest upon the bottom of the tank 5.

18′ is a collar on tube 18 for engagement with clip 19. It will be seen that the tube 18 is stationary with regard to the tank 5 and that the valve on its lower end limits the downward movement of the tube 14 in relation to the vent-tube 18. When a bottle is raised against the closure 16, said closure will be driven upward with the tube 14, and in this manner the lower end of the tube 14 is moved away from valve 17, and is thus opened to permit the flow of liquid from tank 5 into the bottle. When the tank is raised to free the bottles, the tube 14 will be instantly reseated upon the valve 17 by the action of the spring 13. The tubes are spaced to correspond with the positions of the bottles comprising a row in a bottle-case, and from the foregoing it will be evident that when the operating-bail is drawn down the tank 5 will be depressed and the filler valves or nozzles will be caused to enter the mouths of the bottles below. Thus the depression of the bail first seats the closure in the bottles and being continued results in the opening of the valves. As soon as the bottles are full it is only necessary for the operator to loose the bail, whereupon the tank will be raised by the action of the bail-weight. As the valves will be closed before the closures 16 are unseated from the bottles, all danger of waste of liquid is avoided. In the case of machines that are to be used in filling bottles of only one size the stuffing-boxes for the valve-tubes are formed directly in the bottom of the tank 5; but in all other machines I arrange these stuffing-boxes eccentrically in

plugs or disks 20, that are journaled in the bottom of the tank. The disks may be of any suitable design, and any suitable means, such as a threaded collar 21, (shown in Fig. 10,) may be used for securing each disk and to make a tight joint in the bottom of the tank 5. As stated, the filler-valve is eccentrically located in the disk 20, and it will be obvious that when the disk is turned in the bottom of the tank 5 the tube will be moved in a horizontal plane. The two positions of the gang or row of valves are well illustrated in Figs. 6 and 7, Fig. 6 showing the tubes in their most distended relations and Fig. 7 showing them more closely assembled for use with smaller bottles. The degree of eccentricity of the filler-tubes is greatest in the case of the two end valves to preserve the distances between centers throughout the row in both positions of the plugs. To facilitate the accurate adjustment of the filler-valve, I prefer to provide the disks 20 with stop-lugs 20′ and arrange stop-pins 22 on the bottom of the tank 5 for operation, as shown in Figs. 6 to 10. If desired, the rotation of the several valve disks or eccentrics may be accomplished by automatic means, (not shown;) but in the machine herein illustrated, which has only four filler-valves, the adjustment may be made quickly by hand, and I have found it unnecessary to provide mechanism for the purpose. The eccentric mountings of the filler-valves render the machine capable of handling pint and quart bottles successively; but in practice all bottles of one size are passed through the machine and filled before the machine is converted or adjusted for filling bottles of the other size. As the filler plugs or eccentrics are exposed upon the bottom of the tank, the machine may be converted without emptying the tank. This feature of the present machine is applicable to substantially all gang bottle-fillers, and as numerous modifications of my invention will readily suggest themselves to one skilled in the art I do not confine my invention to the specific constructions herein shown and described.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a bottle-filling machine, a suitable bottle-support, in combination with a liquid-tank, means for relatively moving said tank and support, and a plurality of bottle-filler valves mounted for relative movement upon said tank in a horizontal plane, substantially as described.

2. In a bottle-filling machine, a bottle-support and a liquid-tank relatively movable, in combination with a plurality of bottle-filler valves depending from said tank, and means permitting the horizontal movement of said valves with relation to one another to increase or decrease the distances between the centers of said valve, substantially as described.

3. In a bottle-filling machine, a liquid-tank, in combination with a plurality of bottle-filler valves, each provided with a movable eccentric mounting upon said tank, substantially as and for the purpose described.

4. In a bottle-filling machine, a liquid-tank, provided with a plurality of openings or journals in its lower part, in combination with disks rotatably mounted in said openings, and bottle-filler valves eccentrically mounted in said disks, as and for the purpose specified.

5. In a bottle-filling machine, a liquid-tank, in combination with a row of disks revolubly mounted in the bottom of said tank, and a plurality of bottle-filler valves eccentrically mounted upon respective disks and communicating with said tank, substantially as described.

6. In a bottle-filling machine, a liquid-tank, in combination with a disk or plug revolubly mounted in the bottom of said tank, a stuffing-box eccentrically mounted in said disk, and a bottle-filler valve having a tubular portion slidably held in said stuffing-box, substantially as described.

7. In a bottle-filling machine, a suitable frame, provided with a bottle-case track or slideway, adapted to hold cases containing bottles of different sizes, a liquid-tank arranged above said track, means for raising and lowering said tank, and a row of bottle-filler valves depending from said tank and relatively adjustable thereon to correspond to each row of bottles placed upon said track, substantially as described.

8. In a bottle-filling machine, a liquid-tank, in combination with a plurality of bottle-filler tubes, each provided with a movable eccentric mounting upon said tank for changing the spacing of said tubes, and stops to limit the movement of said mountings; substantially as described.

9. In a bottle-filling machine, a liquid-tank provided with a plurality of openings in its lower part, in combination with disks rotatably mounted in said openings, bottle-filler tubes eccentrically mounted in said disks, and stops for limiting the eccentric movement of the tubes; substantially as described.

10. In a bottle-filling machine, a liquid-tank, in combination with a row of disks detachably mounted in the bottom of said tank, a plurality of bottle-filler tubes eccentrically mounted upon respective disks and communicating with said tank, and stops for limiting the eccentric movement of said tubes; substantially as described.

11. In a bottle-filling machine, a liquid-tank, in combination with a disk or plug revolubly mounted in the bottom of said tank, a packing-ring eccentrically mounted in said disk, and a bottle-filler valve having a tubular portion slidably held in said packing-ring; substantially as described.

In testimony whereof I have hereunto set my hand, this 2d day of May, 1905, in the presence of two subscribing witnesses.

THEODORE L. VALERIUS.

Witnesses:

CHAS. D. PEARCE,

I. R. HIPPENMEYER.