F. W. CALVERT.

BOTTLE FILLING APPARATUS.

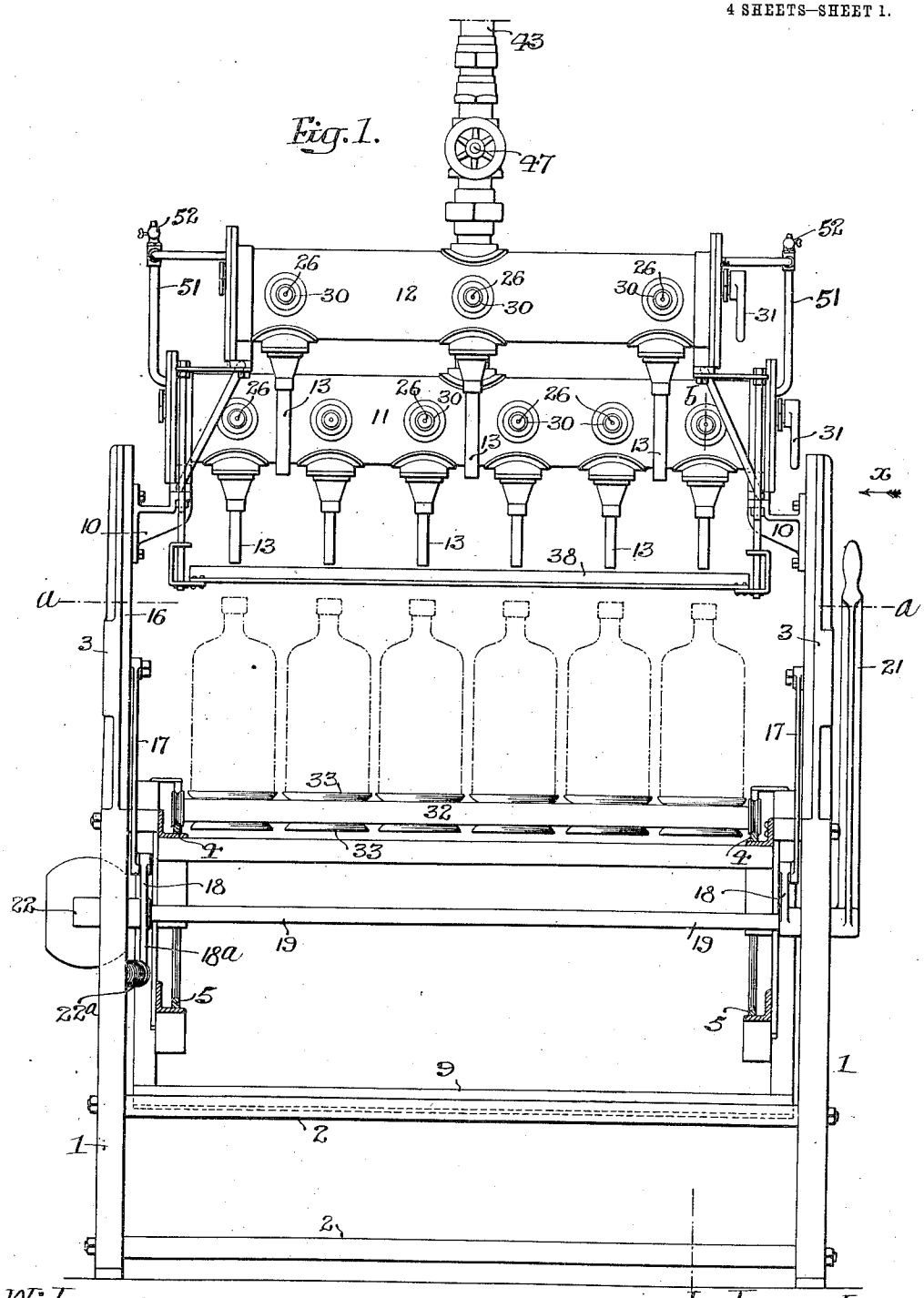
APPLICATION FILED FEB. 17, 1910.

1,067,094.

Patented July 8, 1913.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

Fig. 2.

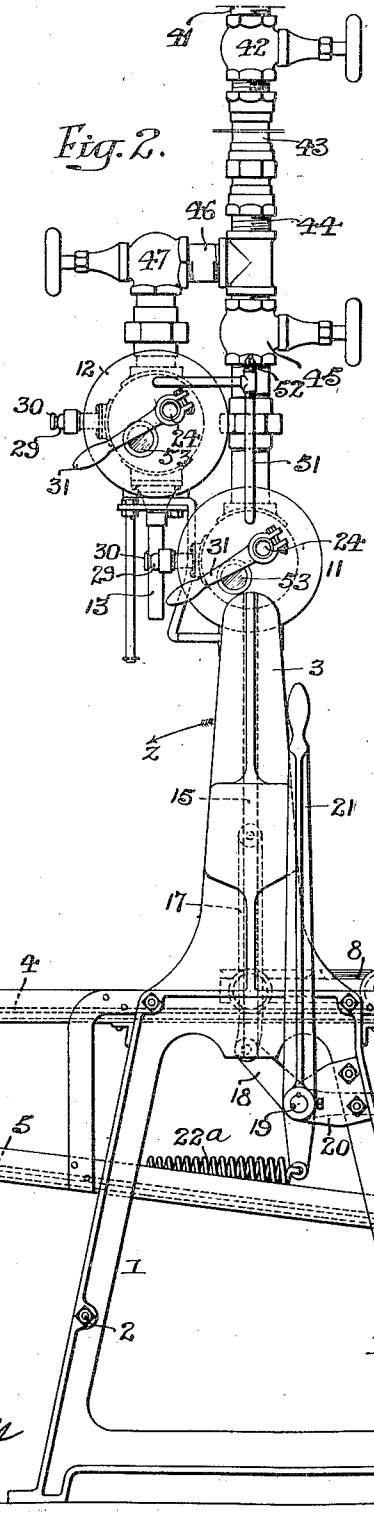
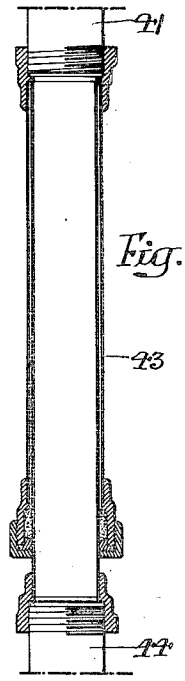


Fig. 8.



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4 SHEETS—SHEET 3.

Fig. 3.

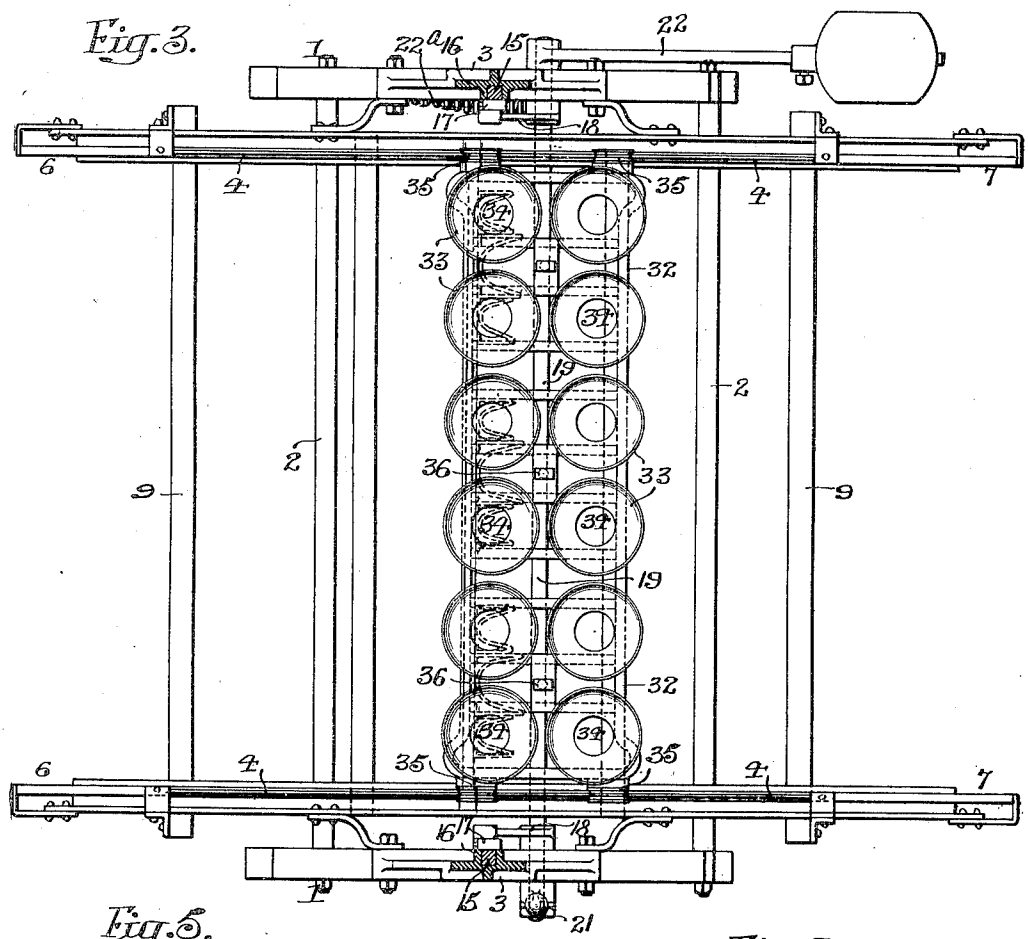


Fig. 5.

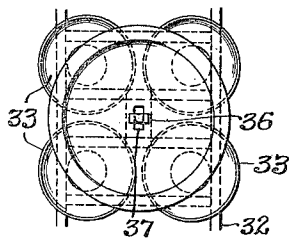
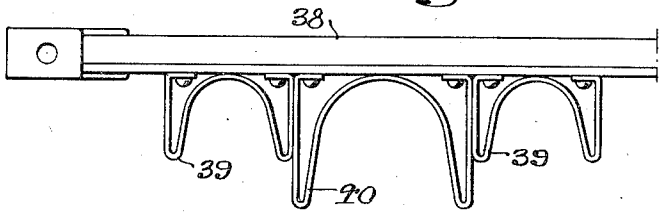


Fig. 6.



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4 SHEETS—SHEET 4.

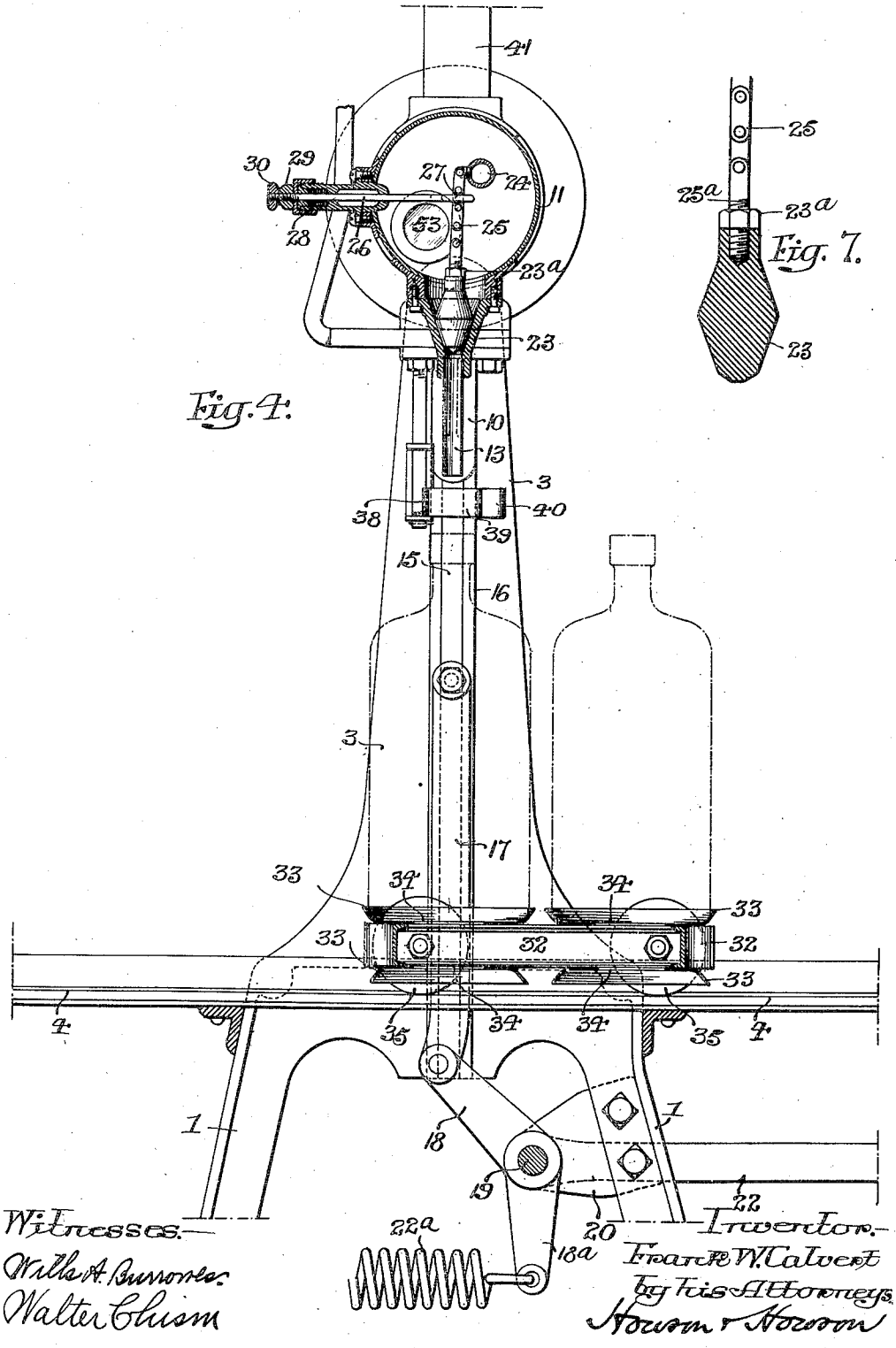


Fig. 4.

Fig. 7.

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UNITED STATES PATENT OFFICE.

FRANK W. CALVERT, OF NARBERTH, PENNSYLVANIA, ASSIGNOR TO THE CHARLES E. HIRES COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

BOTTLE-FILLING APPARATUS.

1,067,094. Specification of Letters Patent. Patented July 8, 1913.

Application filed February 17, 1910. Serial No. 544,345.

To all whom it may concern:

Be it known that I, FRANK W. CALVERT, a citizen of the United States, residing in Narberth, Montgomery county, Pennsylvania, have invented certain Improvements in Bottle-Filling Apparatus, of which the following is a specification.

This invention relates to machines for filling bottles with liquids; the particular use to which the present invention having been put being to fill bottles with potable water, and the object of my invention is to provide a simple and efficient device capable of filling bottles of various sizes and so constructed as to take care of a number of bottles at one time and arranged to receive fresh supplies of bottles in such a manner as to be capable of working continuously. These and other features of my invention are fully illustrated in the accompanying drawings, in which:

Figure 1, is a front elevation of a bottle filling machine embodying my invention; Fig. 2, is a side elevation of the same looking in the direction of the arrow *x*, Fig. 1; Fig. 3, is a plan view, partly in section on the line *a*—*a*, Fig. 1; Fig. 4, is an elevation, partly in section on the line *b*—*b*, Fig. 1, of a portion of the machine shown on a larger scale than in Fig. 1, and Figs. 5, 6, 7 and 8, are views illustrating details of my invention.

In the accompanying drawings I have shown a machine embodying my invention which comprises in general a suitable framework carrying a track for bottle carriers and movable tanks or receptacles containing water or other liquid from which the bottles are filled.

The frame of the machine may consist of base frames 1 suitably connected together and spaced apart by brace rods or bars 2, and upwardly extending sides or supports 3, carried by said base and which may be integral therewith. In addition, said base carries a track comprising upper and lower rails 4 and 5, with curved connecting ends 6 and 7 so that carriers 8 for the bottles may be traversed back and forth through the machine. The upper rail is preferably horizontally disposed so that the carriers can be maintained relatively fixed at any point on the same and in position to receive liquid delivered from the receptacles or tanks, while the lower rail is inclined so that the carriers may automatically return to the feed end of the machine, and from there be placed upon the upper portion 4 of the track to receive the bottles and be subsequently moved to the filling position. In addition to this function, the rails 4 and 5 add stiffness and strength to the frame of the machine and are preferably connected adjacent their ends by cross-bars or rods 9.

Carried by the upper portion of the machine, being supported by brackets 10 vertically movable with respect to the arms 3, are tanks or receptacles 11 and 12 for water or other liquid from which the bottles are filled. In the present instance, two tanks only are shown, designed to deliver water to two sets of different sized bottles, but it will be understood that a greater number of tanks may be provided, if desired, and that the apparatus may be constructed and successfully operated with but a single tank. Each tank is provided with discharge nozzles 13; in the present instance the tank 11 having six and the tank 12 three. These nozzles are preferably set equidistantly apart and project a suitable distance below each of said tanks; the latter being movable vertically so as to position said nozzles in and remove the same from the necks of the bottles. This movement is accomplished as follows: The brackets 10 are suitably connected to bars 15 adapted to slideways 16 formed in the arms 3, and connected to these bars 15 are links 17, which are in turn connected to crank arms 18 carried by a rock shaft 19 suitably journaled in brackets 20 carried by the base frames 1 of the machine. The rock shaft is also provided with an operating handle or lever 21 disposed at the side of the machine and normally in a vertical position when the tanks are in the elevated position. The tanks are maintained in this position by a weighted lever 22, and in addition a spring 22^a is connected to an arm 18^a forming part of the arm 18, and assists in holding the tanks in the elevated position. Movement of the lever 21, in the direction of the arrow *z* lowers the tanks or water receptacles 11 and 12, and water or other liquid may then be discharged from either one by manipu-

lating the proper delivery means, depending upon the size of the bottles in position to be filled.

The tanks are provided with plug valves or stoppers 23 for each of the nozzles 13, one of which is clearly illustrated in Fig. 4, and the series of valves are connected to an operating shaft 24 by suitable means, in the present instance chains 25 suitably attached to said shaft being employed. The valves are usually sufficiently heavy to seat by gravity assisted by the weight of the liquid, avoiding therefore the necessity of a rigid connection between said valves and the operating shaft. It is desirable that the valves open simultaneously and each to the same extent in order that the flow of water may be such as to insure the filling of the bottles simultaneously and to the same degree. To this end I provide adjusting means to regulate the operative length of each of the chains so that each valve may be lifted the same distance from its seat. The end of each chain has a threaded stem 25^a entering the stopper or plug valves 23 and a lock nut 23^a is provided to hold the threaded stem when it is adjusted; such mechanism being clearly illustrated in Fig. 7. The use of the chains makes it possible, should occasion arise for such action, to cut out any one or a number of the nozzles. In addition I may provide stems 26, inserted in the tanks and having apertured ends 27 through which the chains 25 pass; the other portion of the stems extending through stuffing-boxes 28 disposed at one side of the tanks. These stems may be threaded and adjustable by means of nuts 29 and 30 on said threaded portion. By this means, if the valves are not accurately adjusted for simultaneous opening, the chains may be flexed to insure uniform lift of the valves with the consequent simultaneous opening of the nozzles and to the same extent. Each of the shafts for lifting the sets of valves may be provided with operating means, in the present instance handles 31 at one end of the respective tanks are shown.

The bottles are supported by suitable carriers 8, which comprise a framework 32 having a series of pans or plates 33, receiving the bottles and preferably apertured at 34 to prevent accumulation of liquid; such carriers having wheels 35 adapted to the rails 4 and 5 carried by the base frame of the apparatus.

The apparatus as shown in the drawings has been designed to fill bottles holding one gallon, five pints, and five gallons, and the trays are normally provided with two sets of pans fixed thereto on opposite sides of the same for the one gallon and five pint bottles. For the larger bottles, which are filled from the upper tank 12, special pans are provided detachably secured to the carriers, and for this purpose the carriers are provided with studs 36 arranged to lock the larger pans thereto in the manner shown in Fig. 5; the pans being slotted at 37 to pass over said studs, and be secured in place by turning the same.

To hold the bottles in position and insure that the nozzles will register with the same when lowered for the purpose of filling them, I provide a cross member 38 suitably connected to the tank carriers and having guiding devices 39 and 40; the devices 39 serving to engage the shoulders of the smaller bottles, while the devices 40 may engage the shoulders of the larger bottles. This detail of the structure is clearly shown in Fig. 6. The bottles are placed on the carriers and the front row is brought by the operator to the proper position beneath the nozzles 13 and filled; then the second row is filled, and then the carrier is pushed out of the way by another carrier; the filled bottles being removed and the carrier dropped to the rails 5 on which it returns ready to be placed on the rails 4 and receive a fresh supply of bottles.

The liquid flows to the tanks 11 and 12, from a pipe 41 connected to a suitable source of supply; flow therethrough being controlled by a valve 42. This pipe is preferably fixed and in order that the tanks or receptacles for the liquid being bottled may move up and down, I provide a telescoping section 43, more clearly shown in Fig. 8, connected to the supply pipe. Either portion of this telescoping structure may be connected to the tanks or receptacles, but in the drawings I have shown the inner section connected to a pipe 44 leading to the tank or receptacle 11 and provided with a valve 45; a by-pass 46 leading to the tank or receptacle 12 and controlled by a valve 47. Instead of providing a telescopic connection for the supply pipe, the latter may be connected with the tanks by a flexible tube or conduit, or the nozzles may be telescopic or provided with flexible ends. I prefer, however, the arrangement shown.

I find it desirable to provide a connection between the two tanks 11 and 12, and by preference, such connection is in the form of by-passes 51 arranged at each end of these tanks; each by-pass being provided with a suitable pet cock 52, the manipulation of which, together with the presence of the by-pass, insuring the proper operation of the tanks and the presence of sufficient water or other liquid at all times to effect the filling operation when the valved outlets from said tanks are opened. When the tanks have emptied, for instance, the air may be relieved through the pet cocks before again filling.

The tanks are preferably provided with sight holes 53 at their ends permitting examination of the interior of the same while

the apparatus is in operation; a feature particularly desirable in order to make sure that all the valves are working properly. To avoid loss of liquid and prevent undue slopping, it is desirable, in the operation of the machine, to fill all of the bottles at once. In the hands of skilful operators, it is possible to fill the bottles to the desired degree without any waste.

Although designed particularly for filling bottles with potable water, my improved apparatus, modified as to size and character of nozzle, as well as in any other necessary detail, can be satisfactorily employed for the purpose of filling bottles or other forms of receptacles with liquids of any character.

I claim:

1. In a bottle filling machine, the combination of a bottle support, a movably mounted tank, means for moving the same, a nozzle carried by said tank and arranged to enter a bottle, a valve within the tank controlling the discharge through said nozzle, a flexible support for said valve, a threaded connection between said valve and its support which may be shortened or lengthened to regulate the extent of opening of such valve, means exterior of the tank and operable independently of the movement of the same for controlling said valve, and means movable with the tank for centering a bottle beneath the nozzle thereof.

2. In a bottle filling machine, the combination of a frame having two sets of rails with curved sections continuous with said rails and connecting both sets of the same at their ends, a reversible bottle carrier, wheels on said carrier adapted to travel on both sets of said rails and the curved end sections, and separate and independent bottle supporting seats carried on both sides of said bottle carrier.

3. In a bottle filling machine, the combination of a tank, a nozzle carried by said tank, a valve within the tank controlling the discharge of liquid through said nozzle, a movable shaft, a flexible connection between said shaft and valve, means for positively adjusting the length of such connection, means for operating said shaft, and means exterior of the tank for regulating the effective length of the connection between the shaft and valve to control the extent of opening of said valve and the volume of discharge through the nozzle.

4. In a bottle filling machine, the combination of a plurality of tanks, a plurality of nozzles carried by each of said tanks, valves within the tanks controlling the discharge of liquid through said nozzles, movable shafts, flexible connections between said shafts and valves, means for adjusting the length of each valve connection to effect simultaneous operation of the valves, and means exterior of the tanks for operating said shafts.

5. In a bottle filling machine, the combination of a plurality of tanks, nozzles carried by said tanks, valves within the tanks controlling the discharge of liquid through said nozzles, movable shafts, flexible connections between said shafts and valves, means for positively adjusting the length of such connections, means for operating said shafts, and means exterior of the tanks for regulating the effective length of the connections between the shafts and valves to control the extent of opening of said valves and the volume of discharge and effect simultaneous delivery through the several nozzles.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

FRANK W. CALVERT.

Witnesses:

MURRAY C. BOYER,

WM. A. BARR.