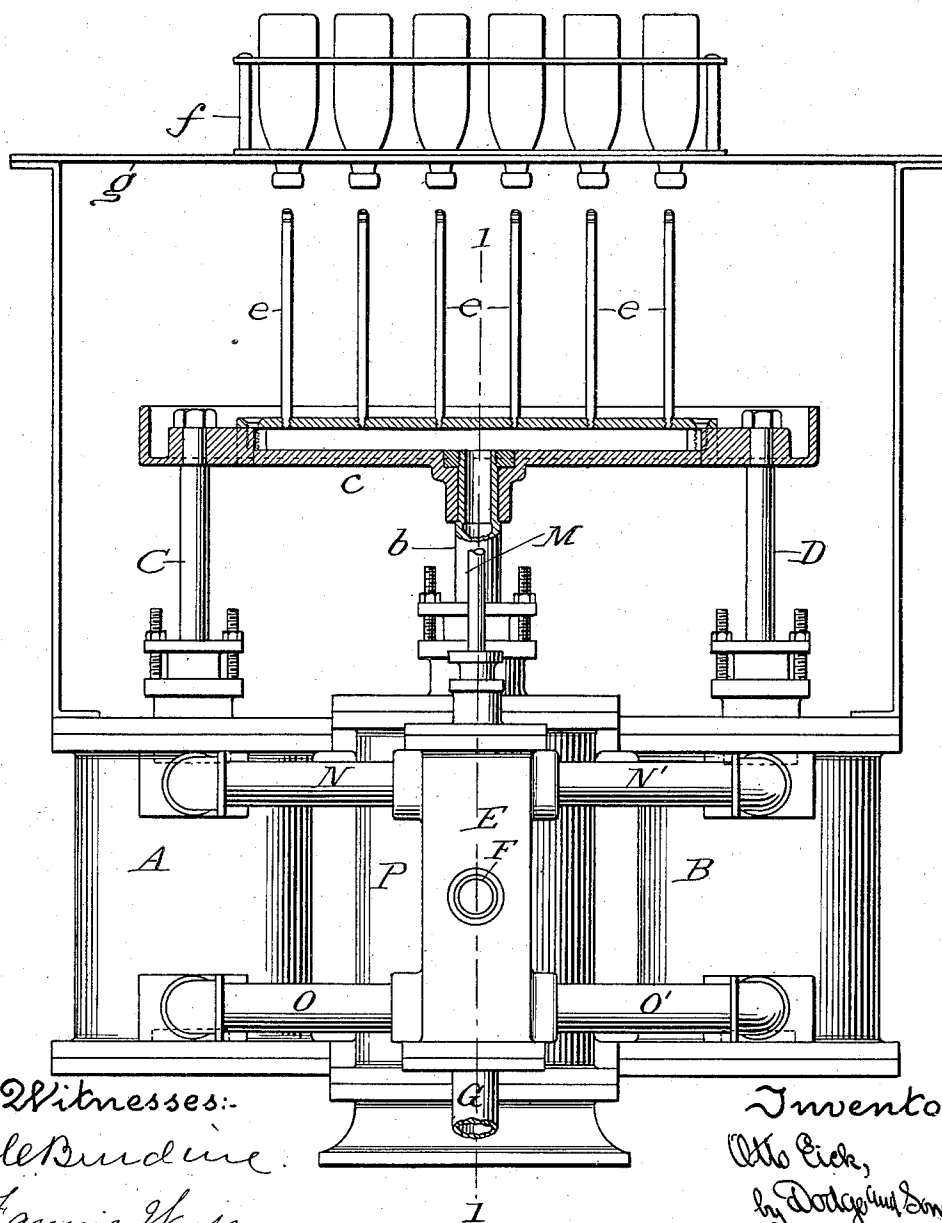


O. EICK.  
BOTTLE WASHING APPARATUS.  
APPLICATION FILED AUG. 21, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

*Fig. 1.*

Witnesses:  
Ele B. Rindine  
Fannie Wise

Inventor:  
Otto Eick,  
by Dodge & Sons  
Attorneys.

O. EICK.  
BOTTLE WASHING APPARATUS.  
APPLICATION FILED AUG. 21, 1902.

NO MODEL.

3 SHEETS—SHEET 2.

Fig. 2.

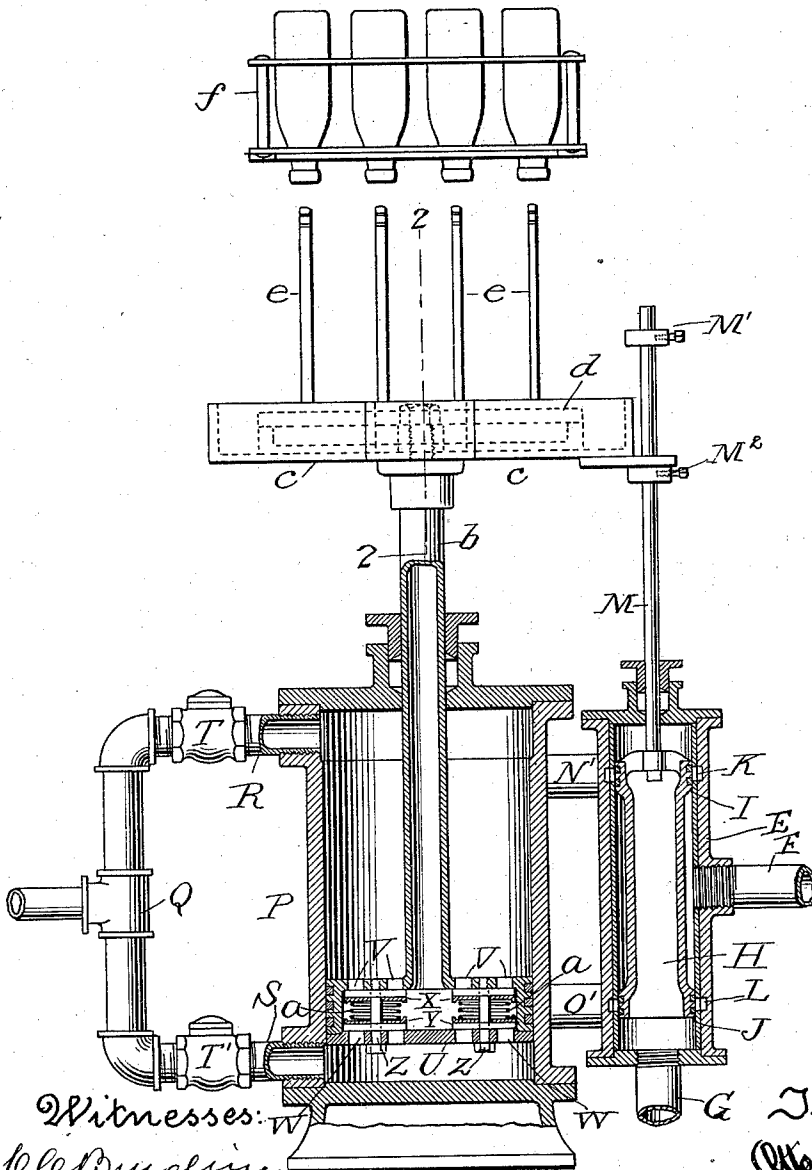
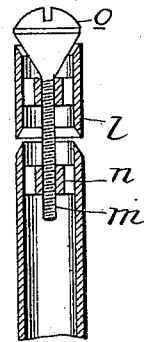


Fig. 3.



Witnesses:  
O. E. Buschlin  
Fannie Kile

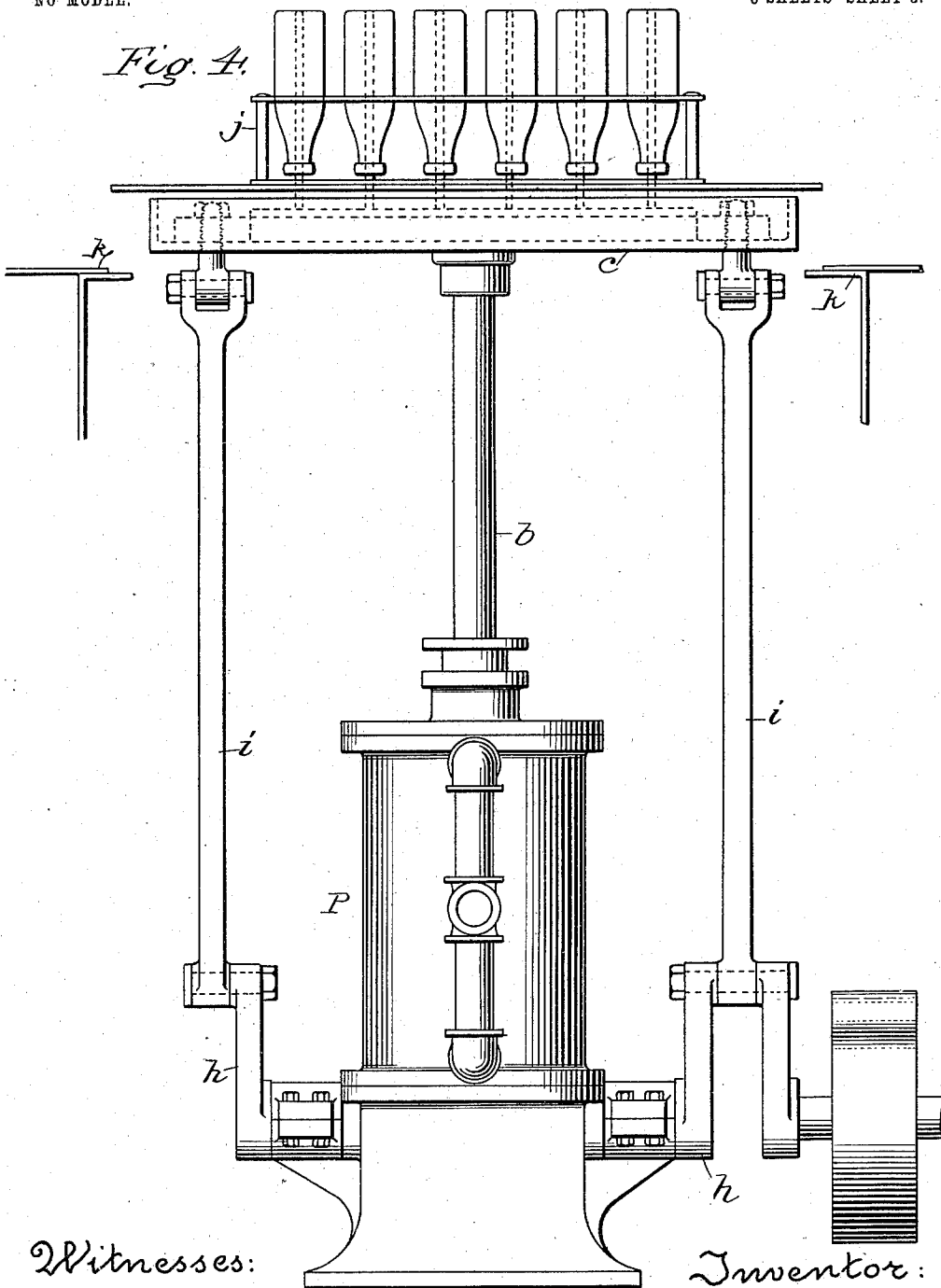
Inventor:  
O. E. Eick,  
by Dodge and Sons,  
Attorneys.

O. EICK.  
BOTTLE WASHING APPARATUS.

APPLICATION FILED AUG. 21, 1902.

NO MODEL.

3 SHEETS—SHEET 3.



Witnesses:  
*Elle B. B. B.*  
*Fannie W. W.*

Inventor:  
*Otto Eick,*  
*by Dodge and Sons,*  
*Attorneys.*

## UNITED STATES PATENT OFFICE.

OTTO EICK, OF BALTIMORE, MARYLAND.

## BOTTLE-WASHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 743,155, dated November 3, 1903.

Application filed August 21, 1902. Serial No. 120,527. (No model.)

*To all whom it may concern:*

Be it known that I, OTTO EICK, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Bottle-Washing Apparatus, of which the following is a specification.

My present invention pertains to improvements in bottle-washing apparatus, the construction and advantages of which will be hereinafter set forth, reference being had to the annexed drawings, wherein—

Figure 1 is a side elevation of the apparatus, partly in section, the section being taken on the line 2 2 of Fig. 2; Fig. 2, a vertical sectional view thereof on the line 1 1 of Fig. 1; Fig. 3, a detail sectional view of one of the nozzles, and Fig. 4 a front elevation of a modified form of construction of the apparatus.

The object of my invention is to provide a simple and efficient bottle-washing apparatus with which a series of bottles may be speedily and thoroughly cleaned, the apparatus being automatic in its action. The advantages incident to the construction will hereinafter appear and the novel features will be specifically claimed.

Referring first to Figs. 1 and 2, A and B denote two cylinders, each having a piston mounted therein with the piston-rods C D extending upwardly therefrom, as shown. In other words, the cylinders are arranged vertically with the rods working in vertical parallel lines.

E denotes a valve-chest provided with an inlet port or opening F for steam or other actuating fluid and with an exhaust port or opening G.

Mounted and slidable back and forth in the chest E is a hollow trunk-valve H, said valve having two annular outwardly-projecting working faces I J, which contact with the inner wall of the chest and control, respectively, ports K and L, formed in the chest. As will be seen upon reference to Fig. 2, the steam-inlet F is in communication at all times with the space formed intermediate the outer wall of the body of the valve and the inner face of the chest, so that as the valve is moved up and down by its stem M from the position shown in said figure one or the other of the ports K and L will be placed in communica-

tion with the steam-inlet F, while the other port will be in communication with the exhaust-port G.

Suitable pipes N O and N' O' connect the ports K and L with the upper and lower ends of the cylinders A and B, and as the valve H is actuated or moved they admit steam or other fluid under pressure to one end of said cylinders, while exhausting it from the other, and consequently raising and lowering the pistons therein and their rods.

Mounted intermediate the cylinders A and B is a third cylinder P, the upper and lower ends thereof being connected to a common supply-pipe Q by branches R and S, each branch being provided with an outwardly-closing check-valve T T', respectively. Pipe Q may be connected to a tank, pump, or the like for supplying water or other fluid which it may be desired to use for cleaning the bottles.

A hollow piston U works in cylinder P, the upper face of the piston being provided with a series of ports V, while similar ports or openings W are formed in the lower face thereof. Valves X and Y, sliding on bolts or pins Z, are normally held to their seats upon the inner faces of the hollow piston by springs a and serve when the piston is at rest to close the ports V and W formed therein.

The piston-rod b of the piston U is hollow and is in communication at its lower end with the space formed in said piston, while the upper end of the rod is connected to and is in communication with a hollow plate or head c, hereinafter designated the "spindle-head." Said head is likewise connected to the piston-rods C and D and is moved up and down thereby as the valve H is shifted. With the arrangement shown in Fig. 2 this shifting is effected by means of tappets M' M<sup>2</sup>, adjustably mounted on the valve-stem M. As will be readily understood, the spindle-head contacts first with one and then with the other of these tappets and shifts the valve H, and as a consequence reverses the motion of travel of the pistons in the cylinders A and B.

Secured in the upper face-plate d of the spindle-head is a series of hollow spindles e, there being by preference twenty-four spindles in all, which are arranged in six lines of four each, the spindles being so spaced as to

enter the mouths of the bottles to be washed, said bottles being held in an inverted position in a frame or holder *f*. This frame is in turn supported by a framework *g* or in any other suitable manner, as may be found expedient.

As above noted, the spindle-head is raised and lowered by the action of the steam or other propelling fluid on the pistons in the cylinders A and B, and as said head is moved the hollow piston U is likewise operated. As said piston U is moved the liquid confined in one end of the cylinder P will be forced through the ports upon one side of the piston, unseating the valves and passing up through the stem or rod *b* into the spindle-head, and thence out through the spindles. As the piston forces the liquid out of one end of the cylinder it draws a charge into the other end, the check-valves T T' preventing any retrograde flow of liquid back through the pipe Q. From this it will be seen that so long as there is any movement of the piston liquid will be forced out of the spindles, so that there is a constant supply while the spindles are moving up and down in the bottles.

Instead of employing two cylinders to actuate the spindle-head and its connected piston a construction such as is shown in Fig. 4 may be employed. A crank-shaft *h* is mounted in suitable bearings formed in a base or support for the liquid-supplying cylinder or chamber, the cranks being connected by crank-rods *i* to the opposite ends of the spindle-head. Rotary motion imparted to the shaft will cause the rods to raise and lower the spindle-head, and as a consequence will cause the liquid to be forced out of the spindles, as above described. The bottles in this instance are carried by a frame *j*, which normally rests upon supports or brackets *k*. Inasmuch, however, as the throw of the cranks is fixed, the frame, with the bottles, is carried up during the upper part of the crank motion, but comes to rest again upon the brackets *k* during the latter part of the stroke. The construction first described is, however, the preferred one.

In Fig. 3 a detail of the spindle-nozzle is shown. As will be seen upon reference to said view, the upper end of the body *e* is beveled upwardly and inwardly, while above said end is a collar *l*, adjustably mounted on a screw-stem *m*, which passes into a cross-bar *n*, formed or secured in the upper end of the spindle proper. The lower edge of the collar is beveled in a direction similar to the beveled face of the spindle-body, while the upper end of the collar is formed with a reversely-beveled face. The upper end of the screw-stem carries a conical-shaped head *o*. By screwing the stem *m* down into the cross-bar *n* and by adjusting the collar on the screw-threaded stem the openings through which the liquid is forced may be regulated to a nicety.

It is manifest, of course, that other forms

of nozzles may be employed. It is likewise apparent that any number of spindles may be employed and their disposition on the spindle-head varied as desired.

Having thus described my invention, what I claim is—

1. In a bottle-washing apparatus, the combination of a spindle; means for projecting the same into and withdrawing it from a bottle; and devices actuated by said means for forcing liquid through the spindle as the same is moved back and forth into and out of the bottle.

2. In a bottle-washing apparatus, the combination of a hollow head; a series of spindles carried by said head; means for reciprocating the head; and devices actuated by the reciprocating movement of the head to force a continuous flow of liquid into the head and out through the spindles.

3. In a bottle-washing apparatus, the combination of a hollow head; a series of spindles carried thereby; means for reciprocating said head; a cylinder; a piston working in said cylinder; a hollow piston-rod connecting said piston and the head; means for supplying liquid to said cylinder; and devices carried by the piston for causing a flow of liquid through the rod as the piston is moved back and forth.

4. In a bottle-washing apparatus, the combination of a hollow head; a series of spindles carried thereby; a fluid-pressure motor for reciprocating said head; a valve for said motor; connections intermediate the valve and the head for shifting the valve; and means actuated by the movement of the head to force a flow of liquid into the head and through the spindles.

5. In a bottle-washing apparatus, the combination of a pair of cylinders; a piston mounted in each of said cylinders; piston-rods extending up from said pistons; a hollow cross-head connected to said rods; a valve for controlling the supply of steam to said cylinders; a third cylinder; a source of liquid-supply connected to the respective ends of said cylinder; means for preventing outflow of liquid from said cylinder through the connections with the liquid-supply; a hollow piston mounted in said third cylinder, the piston having ports or openings upon its opposite faces; valves normally closing said ports or openings; a hollow piston-rod connected to said piston and likewise connected at its upper end to the hollow cross-head; and a series of spindles carried by said cross-head.

6. In a bottle-washing apparatus, the combination of a pair of cylinders; valve mechanism for controlling the supply of steam to said cylinders; a piston mounted in each of said cylinders; piston-rods extending up from said pistons; a hollow cross-head connected to said rods; a series of spindles carried by the upper face of said cross-head; a third cylinder; pipes connected to the upper and lower ends of said cylinder; check-valves located in

said pipes to prevent retrograde flow of liquid therethrough; a hollow piston U mounted in said third cylinder, the piston having ports or openings in its upper and lower faces; 5  
 spring-actuated valves mounted in said piston and normally closing said ports or openings; and a hollow piston-rod connecting said piston with the hollow cross-head, substantially as and for the purpose described.

7. In a bottle-washing apparatus, the combination of a pair of cylinders; a valve for controlling the supply of steam to said cylinders; a piston mounted in each of said cylinders; piston-rods extending up from said 15  
 pistons; a hollow cross-head connected to said rods; a series of spindles carried by the upper face of said cross-head; a third cylinder; pipes connected to the upper and lower ends of said cylinder; check-valves located in said 20  
 pipes to prevent retrograde flow of liquid therethrough; a hollow piston U mounted in said third cylinder, the piston having ports or openings in its upper and lower faces; spring-actuated valves mounted in said pis-

ton and normally closing said ports or openings; a hollow piston-rod connecting said piston with the hollow cross-head; and adjustable tappets mounted on the stem of the steam-controlling valve, said tappets being in the path of movement of the hollow cross-head, substantially as described. 25 30

8. A spindle for washing-machines, comprising a hollow body having a tapered upper face; a threaded stem or rod extending into said body; a sleeve or collar adjustably 35  
 mounted upon said stem, the upper and lower ends of said collar being inclined or beveled substantially as described; and a conical-shaped head carried by the upper end of the threaded stem or rod, as set forth. 40

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

OTTO EICK.

Witnesses:

C. C. BURDINE,  
 HORACE A. DODGE.