E. WAGNER.

BOTTLE CLEANER.

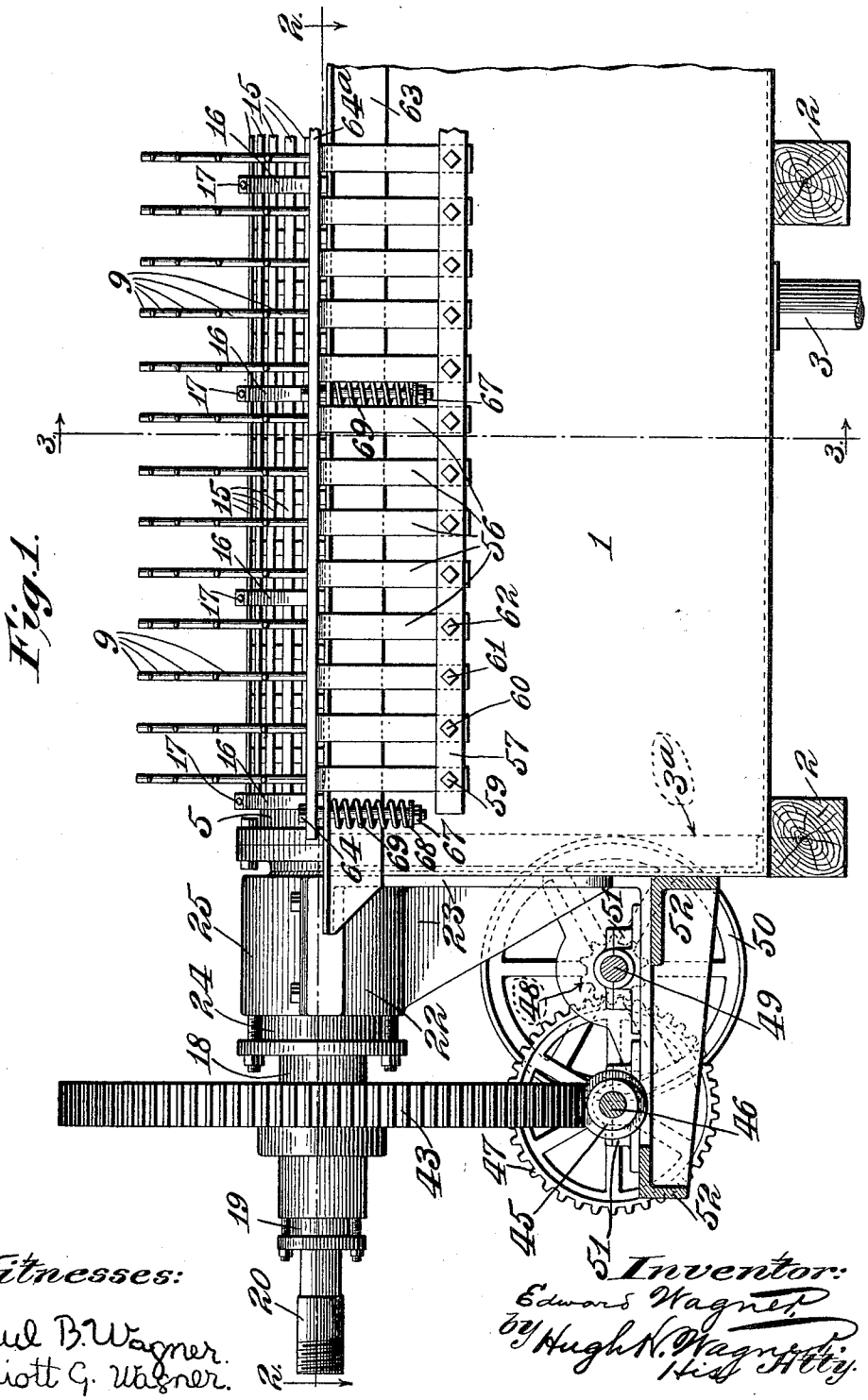
APPLICATION FILED JULY 21, 1905.

1,041,532.

Patented Oct. 15, 1912.

6 SHEETS—SHEET 1.

Fig. 1.



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6 SHEETS—SHEET 2.

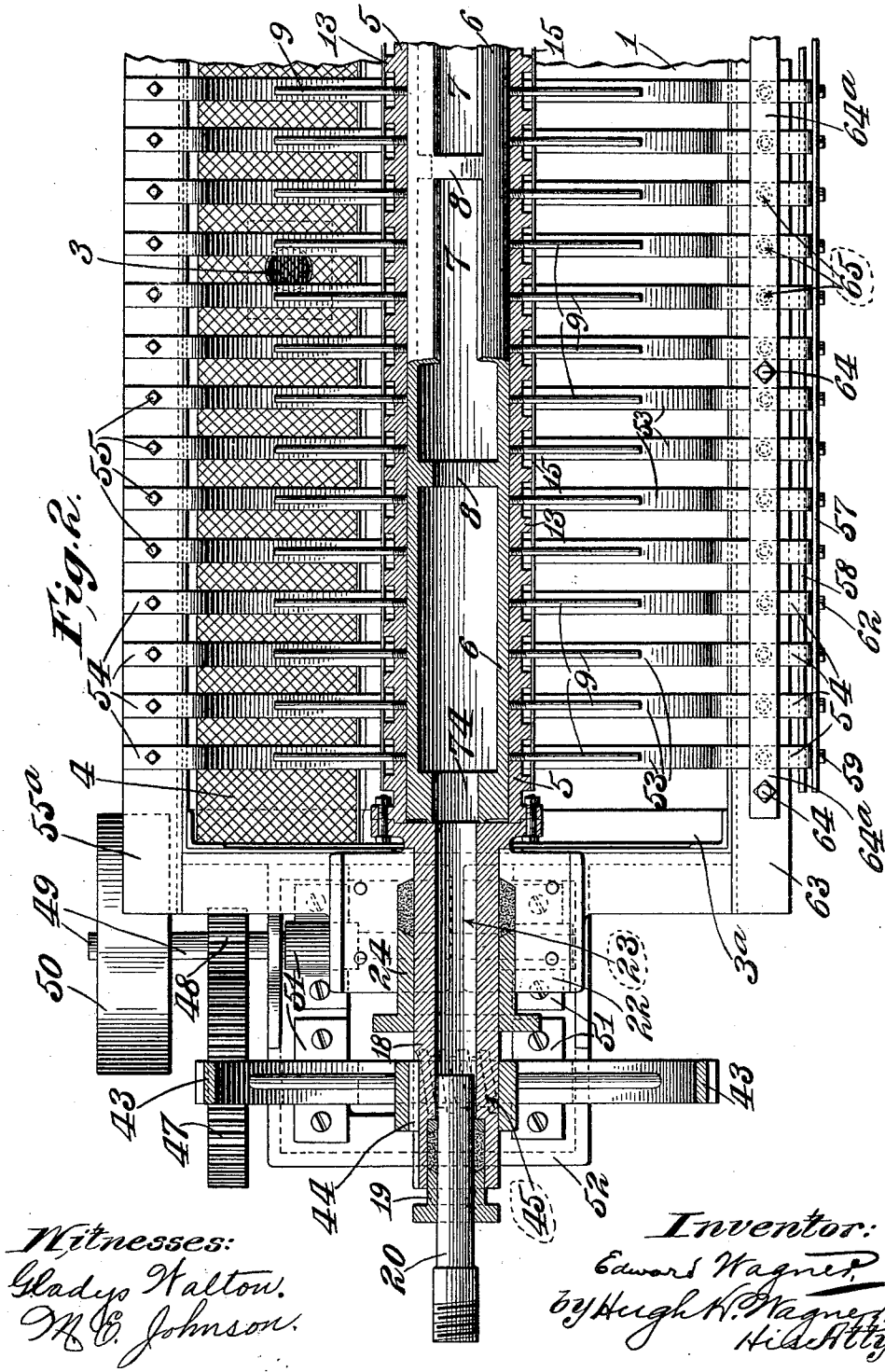

Fig. 2.

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6 SHEETS—SHEET 3.

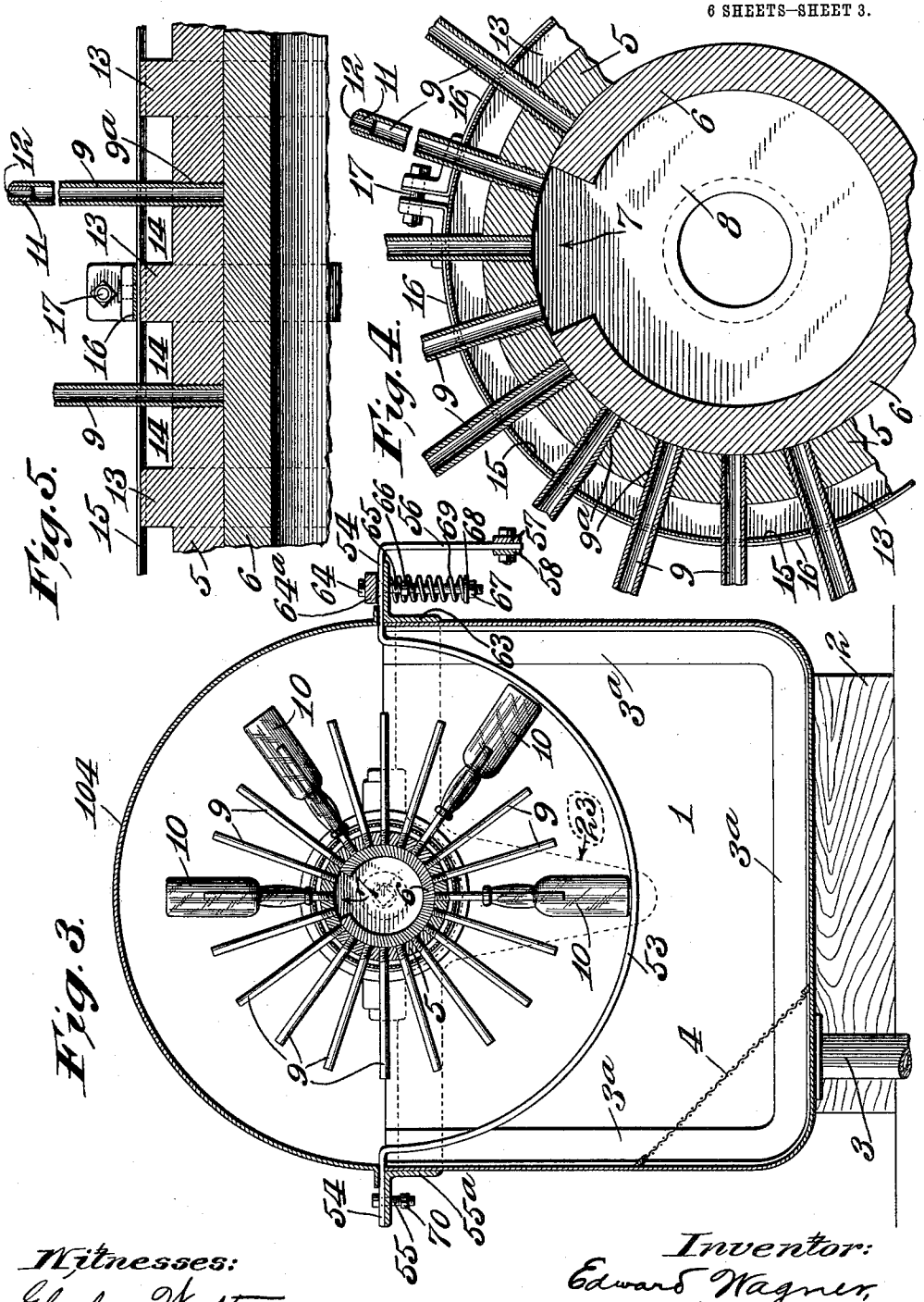

Fig. 3.

Fig. 4.

Fig. 5.

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6 SHEETS—SHEET 4.

Fig. 7.

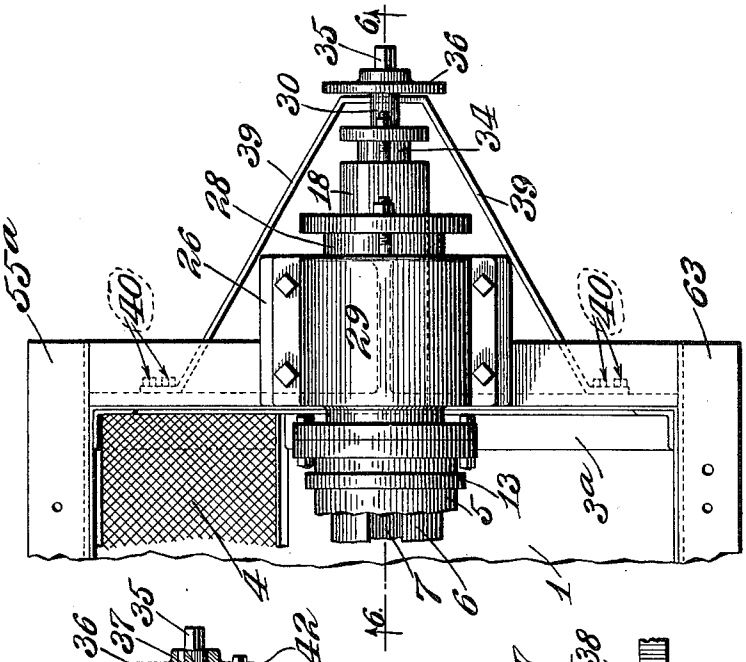

Fig. 6.

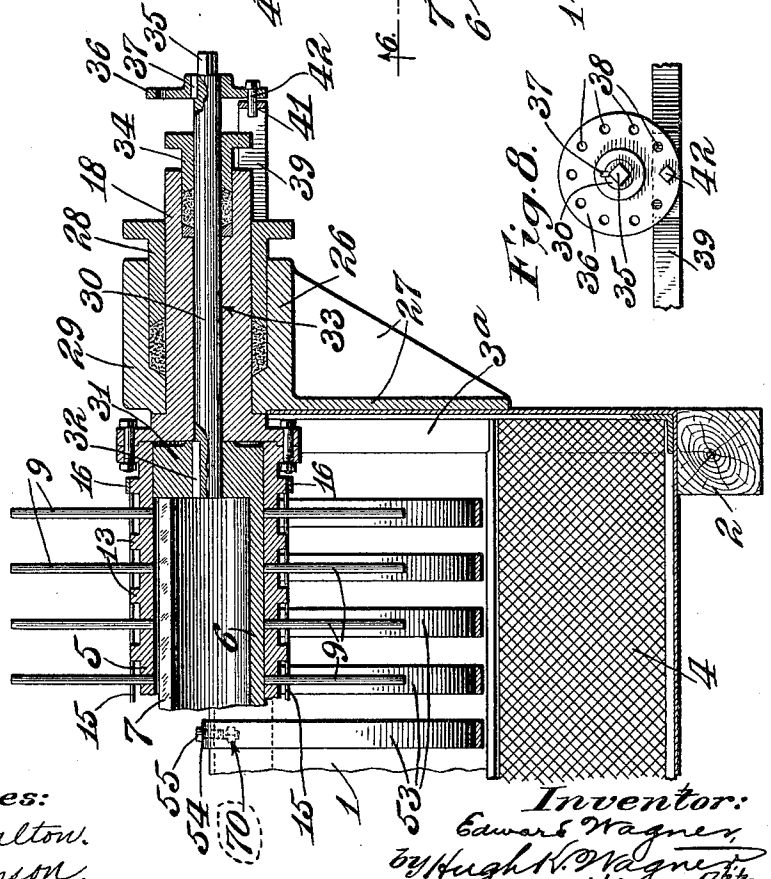

Fig. 8.

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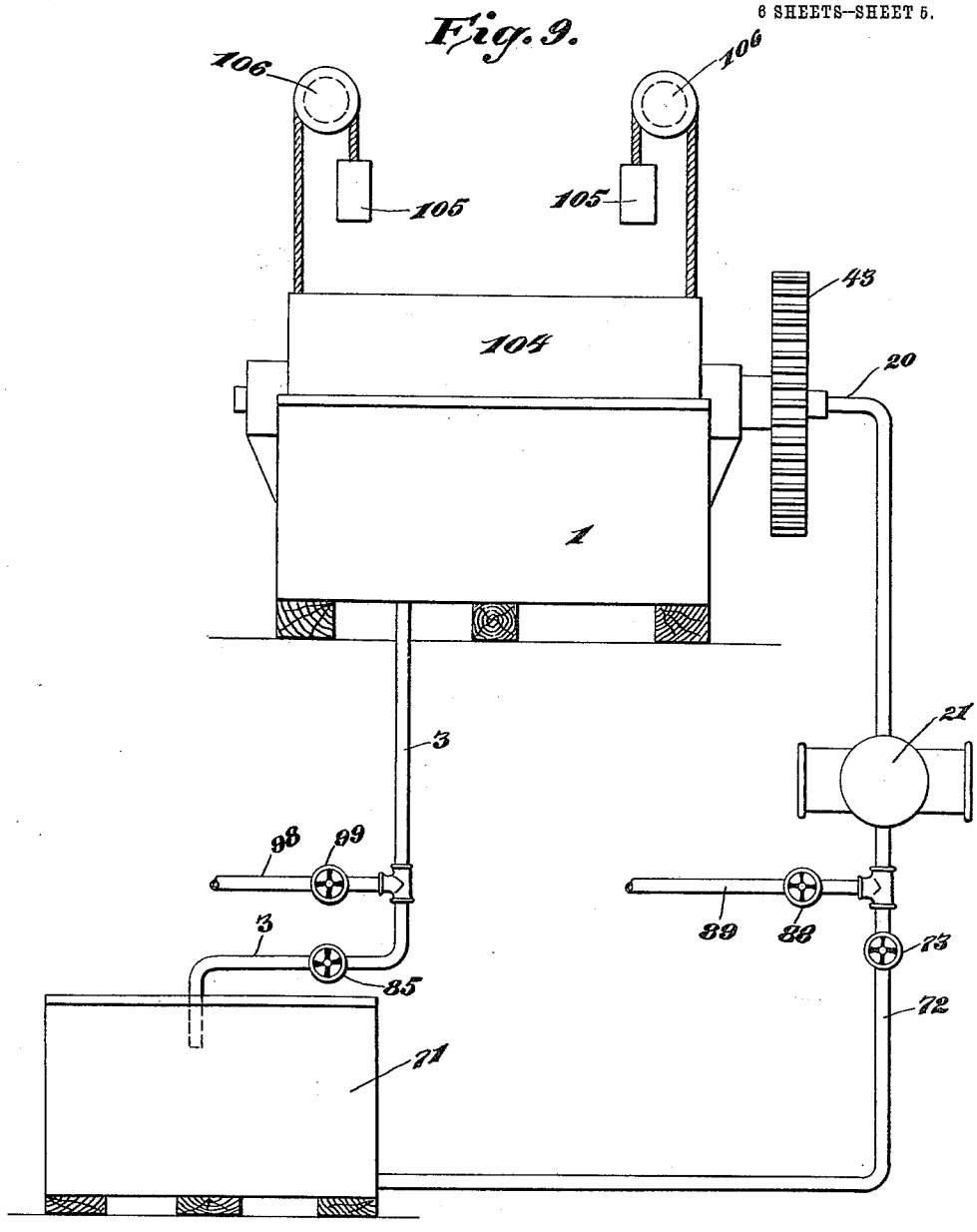
6 SHEETS—SHEET 5.

Fig. 9.



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BOTTLE CLEANER.

APPLICATION FILED JULY 21, 1905.

1,041,532. **Patented Oct. 15, 1912.**

6 SHEETS—SHEET 6.

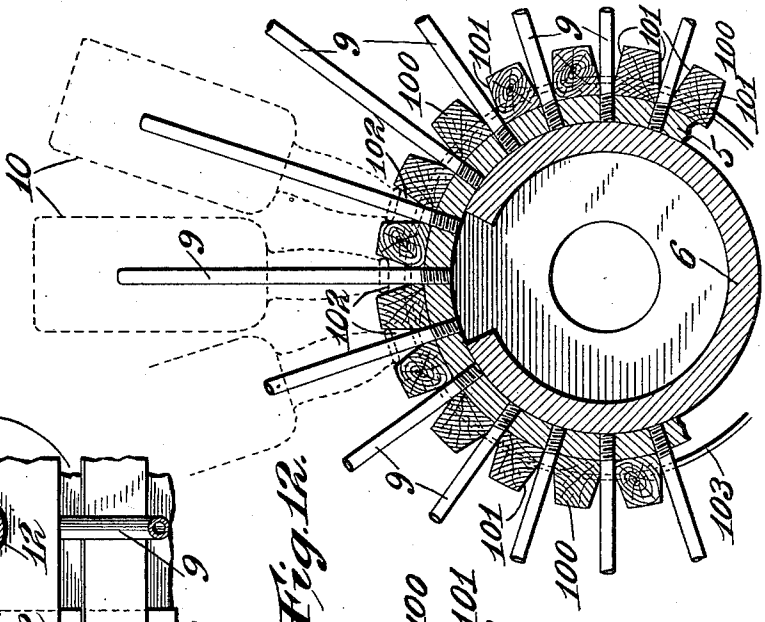

Fig. 12.

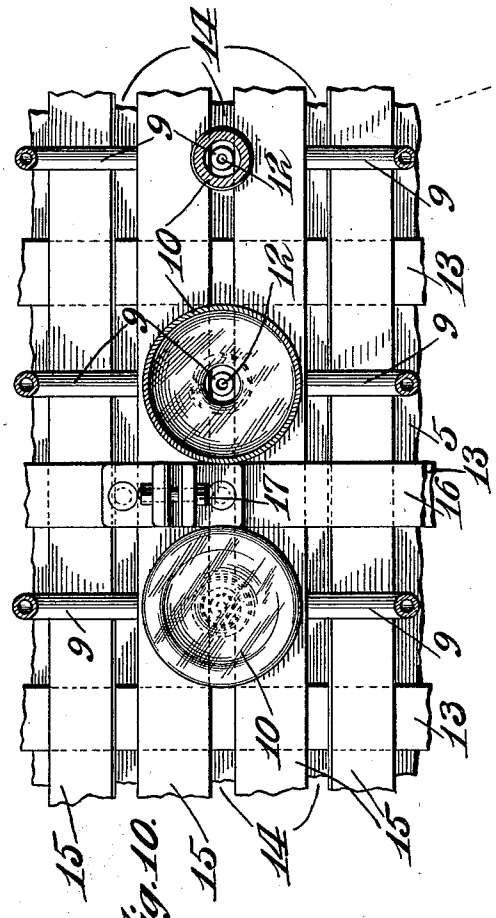

Fig. 10.

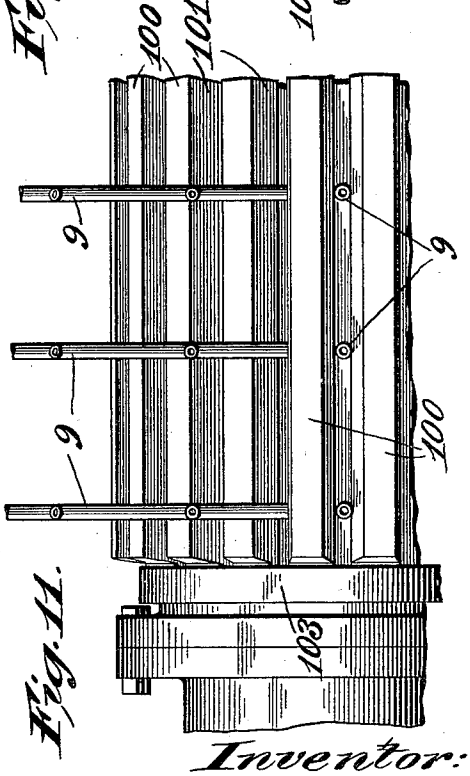

Fig. 11.

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UNITED STATES PATENT OFFICE.

EDWARD WAGNER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE MODEL BOTTLING MACHINERY COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

BOTTLE-CLEANER.

1,041,532. Specification of Letters Patent. Patented Oct. 15, 1912.

Application filed July 21, 1905. Serial No. 270,616.

To all whom it may concern:

Be it known that I, EDWARD WAGNER, a citizen of the United States, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Bottle-Cleaners, of which the following is a specification.

This invention relates to apparatus for cleansing bottles, jars, and similar articles, and particularly to that form thereof in which cleansing fluid consisting preferably of a lye solution, or the like, is injected under pressure into the inside of the bottle, after which the bottle is rinsed internally by clear water, similarly injected. During the aforesaid operations, the bottle is, also, subjected externally to the action of the cleansing solution, and later to the rinsing fluid, but not under pressure.

In the accompanying drawings forming part of this specification, in which like numbers of reference denote like parts wherever they occur, Figure 1 is a partial side elevation; Fig. 2 is a horizontal sectional view on the line 2—2, Fig. 1; Fig. 3 is a sectional view on the line 3—3, Fig. 1; Fig. 4 is a sectional view on an enlarged scale, through the nozzles, the cylinder which carries same, and the cylinder valve, and, also, shows one end wall of the cylinder valve from an interior view; Fig. 5 is a detail on an enlarged scale, showing the relative engagement of the nozzles and resilient bottle supports; Fig. 6 is a vertical sectional view on the line 6—6, Fig. 7; Fig. 7 is a top plan view of the end of the machine opposite the driving mechanism; Fig. 8 is a detail of the valve-lock; Fig. 9 is a diagrammatic view of a bottle-cleansing machine, such as that illustrated in detail in the preceding figures, arranged with a suitable pump (shown conventionally), supply and drain pipes, and a reservoir for the cleansing fluid; Fig. 10 is a detail, showing the relation of the nozzles to the resilient strips, and the position of a bottle thereupon; Fig. 11 illustrates a modified form of the construction of said strips in top plan view; and Fig. 12 illustrates the same in section.

The tank 1 may be constructed of wood or metal, or it may be formed of glass in order to avoid the corroding effect of the strong cleansing solution which is used in cleaning the bottles. This cleansing fluid usually consists of a solution of lye, but any other suitable agent may be employed. The tank may be elevated above the floor upon blocks 2. The tank is approximately rectangular in form. When made of wood or metal it is preferably strengthened at its corners by U-shaped angle-irons 3^a riveted to its end and side walls, and extending along its floor and up to the top of its said walls. A drain pipe 3 allows of the exit of fluid from said tank. The strainer 4, composed of reticulated material, extends from end to end of the tank running obliquely from one wall to the floor of the tank, so as to cover the mouth of the drain pipe 3, as shown in Fig. 3, in order to prevent labels which have been soaked off the bottles during the operation of washing from floating into and clogging the drain pipe.

The bottle-carrier consists of a revoluble cylinder 5, within which is situated the cylinder valve 6, containing the longitudinal slot 7 throughout the greater part of its length, same being interrupted only by the strengthening and bracing ribs 8 which run entirely around the inside of the walls of the cylinder 6. A plurality of threaded openings in the periphery of the bottle-carrier 5 allows the insertion thereinto of a plurality of nozzles 9, which are threaded at the end inserted into the openings 9^a, so as to be held therein both rigidly and securely. The said nozzles 9 are inserted into the necks of bottles 10, and the latter are thereby held upon the bottle-carrier 5 and carried through the operations hereinafter to be described in the various positions illustratively shown in Fig. 3. The outer end of the nozzles 9 contains a bushing-cap or plug 11, the perforations 12 allowing the ejection of the fluid from the nozzle with considerable force into the bottle carried by said nozzle.

The cylinder 5 is provided with a plurality of circumferential ribs 13, the openings 9^a for the nozzles 9 being located in the grooves or channels 14 between same. Resilient strips 15, preferably of metal, run longitudinally from one end of the cylinder 5 to the other, resting upon all of said ribs 13, and being located one between each two longitudinal rows of nozzles, as best shown in Figs. 1 and 10. Said longitudinal resilient strips 15 are held in their several positions by circumferential split bands 16

(of which there may be a number, as shown in Fig. 1), which are bolted together by the bolt 17, and tightly clamp the resilient strips 15 upon the ribs 13. The strips 15 are located near enough to the longitudinal rows of bottles on each side of same to afford a resilient cushion for each bottle as it is slipped over the nozzle which is to carry same, so that it can be allowed to slide down upon said nozzle without particular care, and without fear or danger of chipping its mouth. The position of each bottle on its respective nozzle 9 when resting on the strips 15 is shown in Fig. 10.

The cylinder valve 6 is normally stationary while the bottle-carrying cylinder 5 is intended to revolve around same. The slot 7 of the valve 6 is normally stationary in the upper arc of the circumference of said valve, and in the path of rotation of the nozzles 9 as borne by said bottle-carrier 5, being clearly shown in Fig. 4. The slot 7 may be of any desired dimensions, but in the drawings is shown as extending the full length of the valve 6, and sufficiently so as to be open from one end to the other and to all the nozzles mounted upon the bottle-carrier 5. This slot 7 is, also, illustrated as embracing in width three of the longitudinal rows of nozzles, although in this respect, also, its dimensions may be varied. If desired, however, the ribs 8 can be placed closer together than shown in the drawings, and thus form a separate slot or opening 7 for each circumferential row of nozzles 9.

As the bottle-carrier revolves around the valve 6, each longitudinal row of nozzles 9 and bottles 10 inverted thereupon pass the slot 7, at which time cleansing fluid is injected into the bottles through the nozzles 9, the interior of the cylinder valve 6 being filled with same under pressure. The fluid enters the cylinder 6 through the hollow shaft 18 of the bottle-carrier 5, the fluid entering same through the packing-gland 19 from the supply pipe 20, the supply pipe leading from, for instance, the pump 21 (see Fig. 9). The shaft 18 at one end of the machine is mounted in the bearing 22 borne by the bracket 23 which projects from the end wall of the tank 1, being provided with the packing-gland 24 and held by the pillow-block 25. At the other end of the machine, the shaft 18 is mounted in the bearing 26 borne by the bracket 27 projecting from the other end wall of the tank 1, being there provided with the packing-gland 28, and retained by the pillow-block 29. At this end of the machine, the shaft 18 is hollow as well as at the other end, but at this end it is hollow not for the inlet of the cleansing fluid from the supply pipe, but for the reception of a shaft 30 attached to the end wall 31 of the valve 6 by the key 32, said shaft 30 passing through an opening 33 in the shaft 18, and being provided with a packing-gland 34, and having its outermost end squared, as at 35. Adjacent to the squared end 35, a disk 36 is keyed at 37 to the shaft 30, said disk being provided with a plurality of perforations 38, the perforations 38 in the lower arc thereof being adjacent to the outer portion of a yoke 39 which is fastened at 40 to the end wall of the tank. The yoke 39 is provided with a perforation 41 through which a pin 42 can be inserted after having passed through the lowermost of the perforations 38 in the disk 36 whereby the shaft 30, and with it the valve 6, will be locked in any desired position, normally that shown, for instance, in Fig. 4. If it is desired, however, to revolve the cylinder valve 6 so that the slot 7 shall occupy any other position, the pin 42 may be withdrawn, which will leave the disk 36 free to revolve, and, by application of a wrench to the squared end 35 of the shaft 30, the valve 6 may be caused to revolve until the slot 7 opens in any desired direction.

Motion is imparted to the cylinder 5 or bottle-carrier by the large worm wheel 43 which is keyed thereto at 44, and which meshes with the worm 45 upon the shaft 46 rotated by the gear 47 meshing with the pinion 48 mounted on the shaft 49 bearing the band-wheel 50. The shafts 46 and 49 are mounted in bearings 51 supported by the bracket 52 extending out from one of the end walls of the tank.

Within the tank 1 flat curved rails 53, approximately semicircular in form in their longitudinal side elevation in that portion which is within the tank, act as guides or supports for the bottles in their travel through the lower half of their circuit, there being one such rail for each circumferential row of bottles borne by the bottle-carrier 5. The object of these rails 53 is to prevent the bottles from slipping off their respective nozzles when they arrive at and while going through the lower half of their revolution, that is to say, in their travel through the soaking solution in the tank. In the upper arc of their travel there is no danger of their thus slipping off the nozzles because of the inverted position which they then occupy. Other suitable means than these rails 53 may be employed. It is my preference, however, to use rails somewhat like the rails 53 illustrated and described herein for convenience in getting rid of broken bottles. Thus, if a bottle having a flaw in it should go to pieces in the lower arc of rotation, it might possibly tend to impede or jam the operation of the machine. By reason of the loose arrangement of the rails 53, hereinafter to be described, each individual rail 53 can be shaken or slightly lifted, at first one of its

longitudinal edges, and then the other, until the fragments of such a bottle are shaken off of it and drop into the tank below. At one side of the tank, these rails 53 terminate in straight portions 54 by which bolts 55 attach strips or rails 53 to angle-irons 55ª riveted to the side walls of the tank. It will be observed that the nuts on bolts 55 do not bind the rails 53 tightly to angle-irons 55ª, but allow play for the rocking or shaking of the rails 53 just described. At the other side of the tank, the rails 53 terminate in similar straight portions 54, but beyond same (as shown in Fig. 3) an additional depending portion 56 is formed partly to serve as a handle for the shaking or rocking to which reference has been made. In order that the rails 53 may be united together to form a frame for purposes of adjustment, as hereinafter described, all the depending portions 56 of the rails 53 are connected together by straps 57 and 58 (as shown in Figs. 1 and 3), the bolts 59, 60, 61, 62, etc., passing through strap 58, depending portions 56, and strap 57 (as shown in Fig. 3). The straight portions 54 of the rails at the end which has the depending terminations 56 rest upon the angle-iron 63 riveted to the side wall of the tank, and through each passes a bolt 64 which also passes through strip 64ª. Each of the straight portions 54 of the strip 53 at this side of the tank is attached to the angle-iron 63 by a bolt 65, the head of which is countersunk in the part 54. The location of the nuts 66 on the bolts 65 allows of the rocking or shaking movement of the rails 53 hereinbefore described, and also of a vertical movement of all the rails 53 and strip 64ª, the nut 67 and washer 68 forming a shoulder against which the helical spring 69 on each bolt 64 abuts. The nuts 70 on the bolts 55 at the other side of the tank allow for the same movement as the nuts 66 on the bolts 65. When, for instance, pint bottles are borne by the bottle-carrier 5, the portions 56 and straight portions 54 force the strip 64ª upwardly and elevate each of the rails 53 so as to accommodate said rails to the shorter length of pint bottles, the left-hand ends of the rails 53 in Fig. 3 being somewhat loose, and, therefore, adjustable, and the rising of the straight portions 54 at the right-hand end of the rails 53 diminishing the arc of the circle described by said rails 53, and causing all portions thereof to approach closer to the nozzles 9. When, however, quart bottles are being washed, they travel on the rails 53 in their lowest position through the bath. The upper abutment for springs 69 is the horizontal portion of angle-iron 63. When pints are being washed, the strips 57 and 58 must be held in an elevated position by means not shown, the springs 69 being then extended.

The operation of the machine is as follows: Motion is imparted to the band-wheel 50, which, by means of shaft 49, rotates the pinion 48, and that, by meshing with gear 47, causes the worm 45 on shaft 46 to rotate. The gear 43 meshing with the worm 45 revolves its shaft 18, and thereby rotary motion is imparted to the bottle-carrier 5. The bottles 10 are slipped over the nozzles 9 and form a plurality of longitudinal, and a plurality of circumferential, rows of bottles upon the bottle-carrier 5. The pump 21 is started and draws the cleansing solution from the reservoir 71 through a pipe 72 controlled by valve 73 and forces the same through supply pipe 20 through the hollow shaft 18 and the opening 74 in one end wall of the valve 6 into the interior of said valve-cylinder, openings through the ribs 8 allowing of the passage of the fluid therethrough. With the rotation of the bottle-carrier 5 on its axis, each longitudinal row of nozzles 9 and bottles 10 borne thereby is successively brought opposite the slot 7, whereupon the cleansing fluid within the cylinder 6 is forced out through said slot 7 into the nozzles 9 and into the interior of the bottles 10, effectually cleansing same. It will be observed that in this position the nozzles 9 do not reach all the distance to the bottoms of the bottles, but some space is left for the effective discharge of the injection. When a bottle has reached that portion of the arc of its rotation where it receives the injection of the cleansing fluid, as just described, it is in the lowest position on the nozzle possible, as illustrated in Figs. 3 and 10. This position it has assumed by the action of gravity, the bottles diametrically opposite in the lower arc of rotation of same having slipped as far off their respective nozzles as possible, and being retained on the nozzles only by the fact that they travel on the rails 53 through the lower half of their revolution. When each bottle rises slightly above the horizontal position, when it reaches the upper half of its path of rotation, it begins to slip toward the bottle-carrier 5 on its nozzle 9, and when gravity has caused it to move as far as possible toward the center, the mouth of each bottle encircling a nozzle 9 rests upon the two resilient strips 15 which run along each side of the nozzle on which it is borne. Its position with relation to the strips 15 is clearly shown in Fig. 10. From Figs. 2, 5, 6, and 10, it will be evident that when the mouth of a bottle rests upon a pair of strips 15, ample space is left for the fluid, which is injected by the nozzle, to escape from the bottle around the nozzle, and, by means of the channels 14, into the main body of the tank. It will there preferably be allowed to stand, so that the bottles may be externally soaked as they pass on rails 53 through the lower half of

their revolution. Unless the bottle-washer is used as one of a series or bank, as hereinafter described, the cock 85 controlling the drain pipe 3 may be opened when the cleansing is concluded, and the cleansing fluid allowed to run back into the reservoir 71.

After the bottles have been revolved the desired number of times (one or more, as the case may require) past the slot 7 of the valve 6, and through the fluid contained in the tank 1, and after the cleansing fluid has been drained or pumped therefrom, a supply of clear water for rinsing the bottles is then drawn from pipe 89, which leads from any suitable source of supply (not shown), valve 88 controlling said pipe, and is injected into same under the pressure of the pump 21, forcing same through the supply pipe 20, hollow cylinder 18, valve 6, and nozzles 9. After the rinsing has been accomplished, the rinsing water is allowed to waste, which may be by running out through the drain pipe 3 and a branch pipe 98, entrance to the reservoir 71 in this instance being prevented by a cock 85. The arrangement just suggested would be used only when a single bottle washer alone is operated.

In the modification illustrated in Figs. 11 and 12 of the means for preventing the chipping of the bottle mouth when it slides down upon the nozzle 9, and also for holding the bottle mouth sufficiently above the cylindrical wall of the bottle-carrier 5 to allow the liquid to flow out of the bottle after being injected thereinto through the nozzle 9, a plurality of longitudinal slats or ribs 100 are mounted upon the cylinder 5, said ribs 100 having greater thickness at that part which adjoins the cylinder 5 than at their highest portion, *i. e.*, the part farthest removed from the cylinder 5. In the drawings I have shown these slats in the shape of a truncated wedge, the sides 101 thereof being oblique in cross-section. This allows the bottle mouth to fit into the space between two of said adjoining ribs 100 in the position clearly shown in Fig. 12, and leaves the space or channel 102 through which the liquid may make its escape. As the ribs 100 are formed of wood or similar material not so hard as the steel of the cylinder 5, the bottle-mouths are not chipped when they impact upon same. At their ends, the ribs 100 are cut down so as to have a projection on each end. A band ring 103 encircling all of said reduced portions of the ribs 100 acts as a clamp to hold same upon the cylinder 5 and in their proper position.

In order to retain the heat of the cleansing liquids when same are injected warm or hot, a cover 104 counterbalanced by weights 105 may be hung from shafts 106 so as to be raised or lowered as may be desired, same being illustrated in the lowered position in Figs. 3 and 9.

Having thus described my said invention, what I claim and desire to secure by Letters-Patent is:

1. In a machine of the type set forth, a cleansing-solution containing-cylinder having an outlet, a bottle carrier surrounding the said cylinder, a pressure-pipe passing through one end of said cylinder and carrier and revolubly supporting the same, a shaft passing through and supporting the opposite end of the cylinder and carrier and secured to the cylinder, means for revolving the carrier, and means whereby said outlet of the cylinder may be adjusted with relation to said carrier.

2. In a machine of the type set forth, a cylindrical bottle-carrier having a plurality of circumferential ribs, a plurality of longitudinal resilient strips in engagement with said ribs, and a plurality of bottle-supports adapted to hold bottles adjacent to said strips.

3. In a machine of the type set forth, a cylindrical bottle carrier formed with a plurality of circumferential ribs providing channels between each pair, a plurality of resilient strips running at right angles to said ribs, and a plurality of bottle-supports adapted to hold bottles adjacent to said strips.

4. In a machine of the type set forth, a cylindrical bottle carrier having a plurality of circumferential ribs, there being a channel between each pair of said ribs, nozzle bottle-supports arranged in rows projecting out of said channels, and longitudinal resilient strips running between each pair of longitudinal rows of bottles.

5. In a machine of the type set forth, a cylindrical bottle carrier having a plurality of circumferential ribs, a plurality of longitudinal strips engaging said ribs, means for binding said strips to said ribs, and a plurality of bottle-supports adapted to hold bottles adjacent to said strips.

6. In a machine of the character described, a movable bottle-carrier provided with a plurality of projecting bottle-supports and resilient strips mounted thereon to prevent chipping of the bottle-mouths while being mounted or sliding on said supports by direct and sudden engagement or impact upon said bottle-carrier.

7. In a machine of the character described, the combination of a revoluble bottle-carrier having bottle supports on which the bottles are loosely mounted and means for supporting the individual bottles on their supports during the lower portion of their revolution, said supporting means comprising a plurality of rails passing underneath said bottles, each of said rails terminating at each end in a straight portion, each of said straight portions being loosely fastened to the side walls of the tank, and

said straight portions on at least one side terminating in further extensions, said extensions being united together adjacent their ends.

8. In a machine of the character described, the combination of a revoluble bottle-carrier having bottle supports on which the bottles are loosely mounted and means for supporting the individual bottles on their supports during the lower portion of their revolution, said supporting means comprising a plurality of rails passing underneath said bottles, each of said rails terminating at each end in a straight portion, each of said straight portions being loosely fastened to the side walls of the tank, and said straight portions on at least one side terminating in further extensions, said extensions being united together adjacent their ends, there being a member above said straight portions adapted under spring pressure to hold same normally in their lowest position.

9. In a machine of the character described, the combination of a pair of cylinders, the outer one forming a bottle-carrier and being provided with a plurality of tubular bottle-supports, and the inner one forming a valve communicating with a supply pipe, said valve-cylinder having the valve opening therein arranged normally to allow the discharge of fluid in only one direction, and means for locking said valve in said discharge position.

10. In a machine of the character described, the combination of a pair of cylinders, the outer one forming a bottle-carrier and being provided with a plurality of tubular bottle-supports, and the inner one forming a valve communicating with a supply pipe, said valve-cylinder having the valve opening therein arranged normally to allow the discharge of fluid in only one direction, means for locking said valve in said discharge position and for unlocking same therefrom, and means connected with said valve for changing the position of said discharge opening.

11. The combination, in a machine of the character described, of a tubular support adapted to be connected to a fluid supply pipe and provided with an elongated discharge orifice, a cylinder revolubly mounted on said support and provided with a plurality of tubular bottle holders normally closed by the wall of said support but having communication with the interior thereof when presented to said orifice during the revolution of said cylinder, means for revolving said cylinder, and means for turning the support upon its longitudinal axis, to vary the position of said orifice.

12. The combination, in a machine of the character described, of a tubular support adapted to be connected to a fluid supply pipe and provided with an elongated discharge orifice, a cylinder revolubly mounted on said support and provided with a plurality of tubular bottle holders normally closed by the wall of said support but having communication with the interior thereof when presented to said orifice during the revolution of said cylinder, means for revolving said cylinder, means for turning the support upon its longitudinal axis, to vary the position of said orifice, and means for locking said support in adjusted position.

13. The combination, in a machine of the character described, of a tubular support adapted to be connected to a fluid supply pipe and provided with an elongated discharge orifice, a tubular member revolubly mounted on said support and provided with a plurality of circumferential rows of tubular bottle holders normally closed by the wall of said support but having communication with the interior thereof when presented to said orifice during the revolution of said member, means for revolving said member, and a series of movable supports arranged beneath said member for retaining the bottles thereon during the lower portion of their revolution, said supports being adapted to be rocked to dislodge fragments of broken bottles therefrom.

14. The combination, in a machine of the character described, of a tubular support adapted to be connected to a fluid supply pipe and provided with a discharge orifice, a cylinder revolubly mounted thereon and provided with a plurality of tubular holders adapted to loosely receive bottles, said holders being normally closed by the wall of said support but having communication with the interior thereof when presented to said orifice during the revolution of said cylinder, means for revolving said cylinder, and resilient strips mounted upon said cylinder adjacent said holders to prevent chipping of the bottle mouths during the movements of the bottles thereon by impact upon said cylinder.

15. In a machine of the character described, the combination of a revoluble bottle carrier provided with a plurality of projecting bottle holders, resilient strips mounted on the carrier adjacent said holders for preventing chipping of the bottle mouths during the movements of the bottles thereon by impact upon said carrier, and movable supports arranged beneath said carrier for retaining the bottles thereon during the lower portion of their revolution, said supports being adapted to be rocked to dislodge fragments of broken bottles therefrom.

16. In a machine of the character described, the combination of a revoluble bottle carrier provided with a plurality of projecting bottle holders, resilient strips mounted on the carrier adjacent said holders for

preventing chipping of the bottle mouths during the movements of the bottles thereon by impact upon said carrier, and supports arranged beneath said carrier and parallel with said holders for retaining the bottles thereon during the lower portion of their revolution.

17. In a bottle cleaning machine, a hollow cylinder provided with a continuous discharge orifice which is coextensive with the longitudinal axis of said cylinder, a bottle carrier revolubly mounted on the cylinder and provided with longitudinal rows of radially-projecting tubes adapted to extend into the mouths of the bottles, means for revolving the carrier, said discharge orifice of the cylinder being of such width as will permit the same to simultaneously register with a plurality of rows of tubes, means for supplying fluid to the cylinder interior to permit the same to enter said tubes, and means for adjusting the position of said discharge orifice of the cylinder to thereby alter the direction in which the fluid enters the bottles.

In testimony whereof I have affixed my signature in presence of two witnesses.

EDWARD WAGNER.

Witnesses:
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GLADYS WALTON.