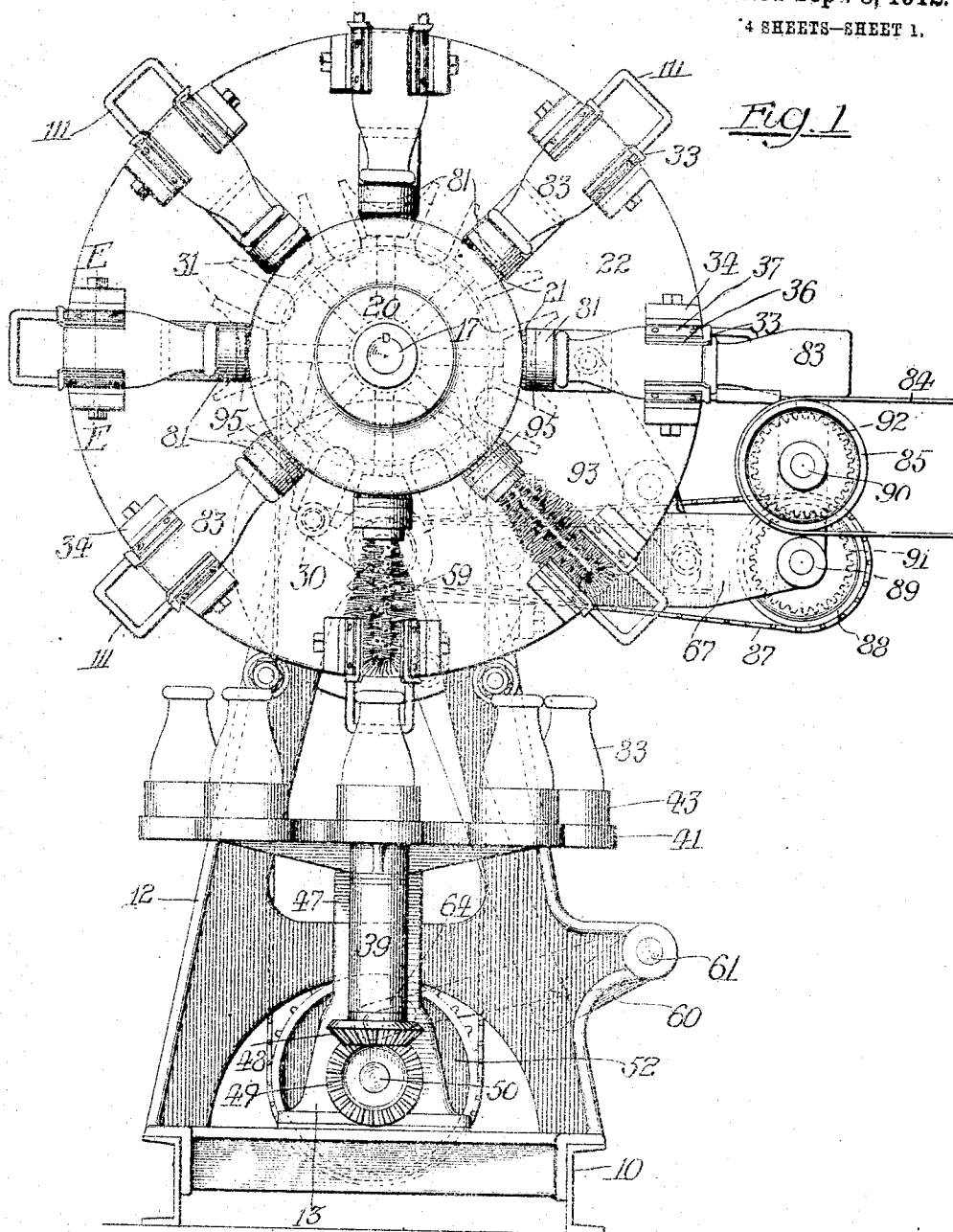


G. WEISS.
 BOTTLE CLEANING MACHINE.
 APPLICATION FILED SEPT. 23, 1904. RENEWED JAN. 27, 1912.
 1,037,380. Patented Sept. 3, 1912.
 4 SHEETS—SHEET 1.



Witnesses
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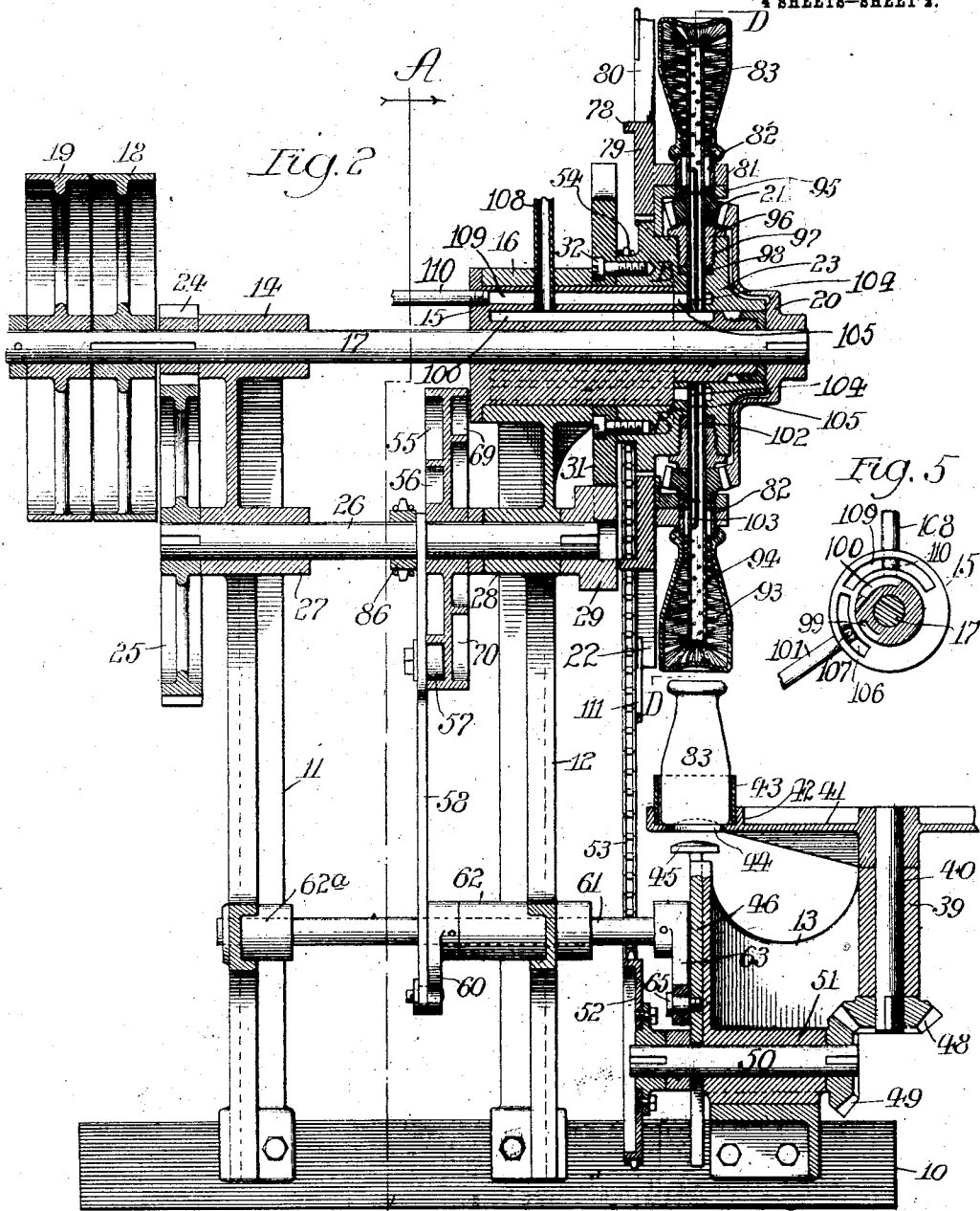
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4 SHEETS—SHEET 2.



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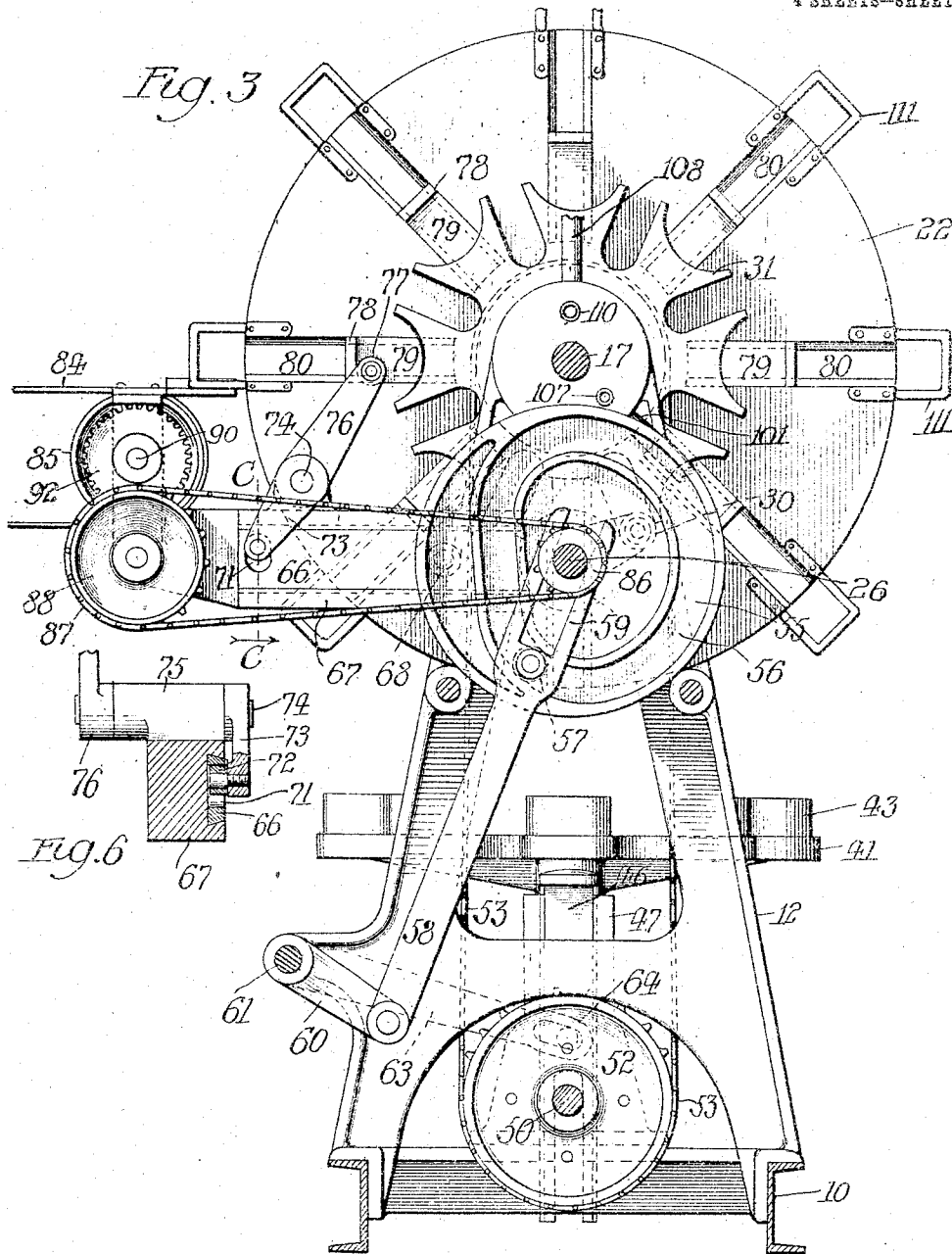
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4 SHEETS—SHEET 3.



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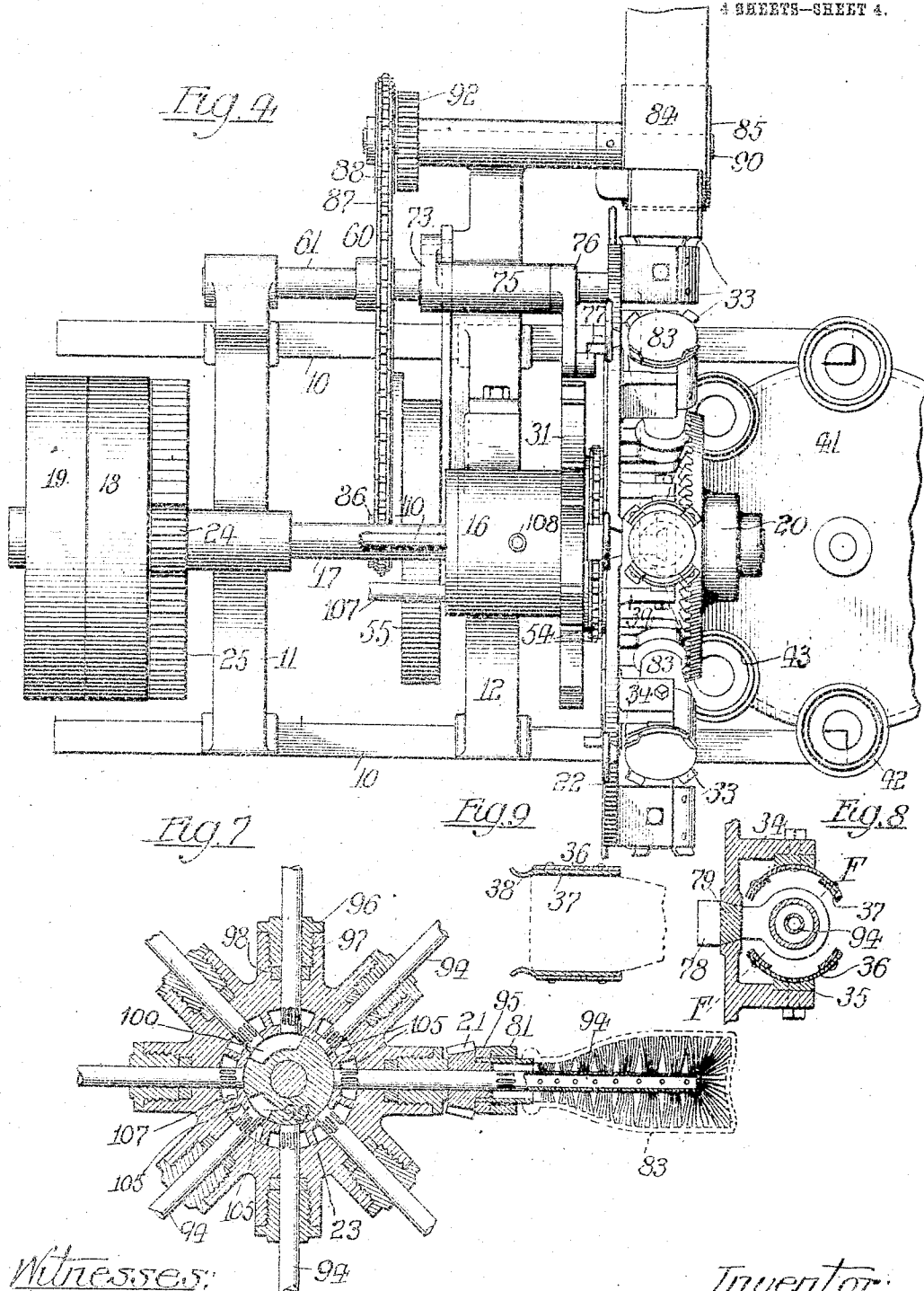
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

GEORGE WEISS, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-THIRD TO JOHN HOWARD McELROY, OF CHICAGO, ILLINOIS.

BOTTLE-CLEANING MACHINE.

1,037,380.

Specification of Letters Patent.

Patented Sept. 3, 1912.

Application filed September 23, 1904, Serial No. 225,587. Renewed January 27, 1912. Serial No. 673,919.

To all whom it may concern:

Be it known that I, GEORGE WEISS, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Bottle-Cleaning Machines, of which the following is a specification.

My invention is concerned with a novel machine which I have designed for automatically cleansing the interior of milk bottles, but which, it will be apparent, could, with proper modifications in design, be employed to cleanse the interior of any sort of a receptacle.

To illustrate my invention, I annex hereto four sheets of drawings in which the same reference characters are used to designate identical parts in all the figures, of which—

Figure 1 is a front elevation of the machine; Fig. 2 is a central vertical section through the same; Fig. 3 is a rear elevation in section on the line A—A, of Fig. 2; Fig. 4 is a top plan view of the machine; Fig. 5 (Sheet 2) is a detail in section on the line B—B of Fig. 2; Fig. 6 (Sheet 3) is a detail in section on the line C—C, of Fig. 3; Fig. 7 (Sheet 4) is a vertical section on the line D—D, of Fig. 2; Fig. 8 is a section on an enlarged scale on the line E—E, of Fig. 1; and Fig. 9 is a detail in section on the line F—F, of Fig. 8.

Upon a suitable base 10, which I have shown as constructed of a pair of channel bars, are mounted three standards, 11, 12, and 13. Journaled in the bearing 14, at the top of the standard 11, and in a bearing formed in the center of the chamber piece 15 which is secured in the collar 16, constituting the top of the standard 12, is a driving shaft 17, which has mounted on the rear end thereof the fast and loose pulleys 18 and 19, with which the driving belt coöperates in the customary manner. Secured on the front end of the shaft 17 is a bevel gear wheel 20 of the somewhat peculiar design shown, which is designed to bring its teeth into engagement with the bevel gear pinions 21, journaled in the manner to be described, in the main carrier 22, which preferably takes the form of a disk having the hub 23 of the shape best shown on cross-section in Fig. 2, and which is mounted to rotate in the suitable bearing formed by the end of the chamber piece 15. A gear pinion 24, secured on the shaft 17, meshes with the gear wheel 25 se-

cured on the rear end of the shaft 26, which is journaled in the bearings 27 and 28 formed in the standards 11 and 12, respectively. The outer end of the shaft 26 has secured thereon the Geneva stop driving member 29, the driving roller 30 of which coöperates with the radial slots of the Geneva stop disk 31, which is rigidly secured to the rear of the hub of the carrier 22, as by the pins 32. The driven disk 31 is provided with as many radial slots as there are stations in the complete rotation of the carrier disk, in the form shown, eight. With this construction, it will be apparent that every rotation of the shaft 26, the carrier 22 will be advanced to a fresh position during a portion of the rotation of said shaft, and held securely from movement during the remainder of said rotation. The carrier is provided with a corresponding plurality of clamps 33, which may be of any desired form to receive and securely hold a bottle, and which may be opened and closed automatically, but I prefer to use the simple spring form best illustrated in detail in Figs. 8 and 9, where it will be seen that the ears 34 projecting from the face of the disk 22 have secured thereto the pieces 35 which carry the curved arms 36, which are of spring metal, and to which are secured the jaws 37, which likewise are preferably formed of spring metal and have the curved ends 38 of the shape shown, which are adapted to spread apart as the large part of the bottle is forced through them, and to spring back into place and rest against the bottom of the bottle to hold it against any pressure of the cleaning fluid or anything else tending to accidentally displace them.

Journaled in the bearing 39 forming a part of the standard 13, is the vertical shaft 40, the upper end of which has secured thereto the carrier 41, which consists of a horizontal disk having formed on its periphery a number of pockets 42, corresponding to the number of stations on the main carrier. These pockets are adapted to have the bottles placed therein by the attendant, as the machine operates, and I may increase the vertical faces of the pockets by placing therein the metallic cylinders 43, which virtually form the upward extensions of the pockets. Centrally located in the bottoms of each of the pockets is the aperture 44, through which is adapted to

rise the head 45 (shaped to fit on the bottom of the bottle) of the pusher slide 46, which is mounted to reciprocate vertically in the ways 47, formed on the back of the standard 13.

The lower end of the shaft 40 has secured thereon the miter-gear 48, meshing with the corresponding miter gear 49 secured on the adjacent end of the short horizontal shaft 50 mounted to rotate in the bearing 51 formed in the standard 13. The other end of the shaft 50 has secured thereon the sprocket wheel 52, which is driven by the sprocket chain 53 from the same sized sprocket wheel 54, secured on the hub of the main carrier 22, so that the two carriers rotate in unison.

The shaft 26 has secured thereon the cam 55, which preferably takes the form of the face cam whose channel 56 contains the anti-friction roller 57 secured on the link-bar 58, whose slotted upper end 59 embraces the shaft 26 to hold the link in position, and whose lower end is pivoted to the crank arm 60, which is secured on the center of the rock-shaft 61, which is journaled in the bearings 62 and 62^a formed in the standards 11 and 12. The outer end of the shaft 61 has secured thereon the crank-arm 63, whose slotted outer end 64 embraces the pin 65 secured in the rear of the slide 46, so that at the proper time, at each revolution of the shaft 26, after the two carriers have been moved and are held at rest, the bar 46 is raised up quickly to push the bottle which may be over it, up onto the clamp 33. The bottle remains in the clamp until it reaches the discharge position, which is at 270 degrees from the receiving position, where it is discharged by suitable mechanism, consisting of a slide-bar 66 mounted to reciprocate in the ways 67, supported from the standard 12. An anti-friction roller 68 projecting from the rear of this slide, takes into the channel 69 of the face cam 70, which is preferably made integral with the cam 55, so that the slide bar 66 is reciprocated at the proper time during the rotation of the shaft 26. A short vertical slot 71 is provided in one end of the slide bar 66, and the anti-friction roller 72 carried by the outer end of the crank-arm 73, projects into this slot, so that as the slide-bar 66 is reciprocated the crank-arm 73 is likewise swung. This crank-arm 73 is secured upon the short rock-shaft 74, journaled in the bearing 75, secured on the top of the ways 67, and having the crank-arm 76 secured on the other end. The outer end of the crank-arm 76 carries the lug or anti-friction roller 77, which is suitably positioned to cooperate with the flange 78, projecting rearwardly from one end of the sliding piece 79, which is mounted, preferably by means of a dove-tailed radial chan-

nel 80, to reciprocate in the carrier 22. This sliding piece 79 carries the collar 81, which, in its inner position, as shown in Fig. 2, surrounds the tube 82 upon which the mouth of the bottle rests when held in the clamp 33. As the slide 79 is shoved out radially, the collar 81, contacting with the flanged mouth of the bottle 83, shoves it off on to the carrier 84, which may consist of a belt carried by suitable pulley wheels, one of which, 85, is shown as journaled in an extension of the bearing bracket in which the slide-ways 67 are formed. The other pulley of the carrier (not shown) is supported from any suitable standard, and in order to carry the bottles away as fast as they are discharged, motion is imparted to the belt from the sprocket wheel 86, secured upon the shaft 26, by means of the chain 87, which meshes with the sprocket wheel 88, journaled in a bearing 89, beneath the bearing 90 of the pulley wheel 85. A gear wheel 91 is secured to the sprocket wheel 88, and meshes with the corresponding gear wheel 92 secured to the pulley wheel 85, so that the belt 84 is constantly advanced in the proper direction at the proper speed to carry the washed bottles from the machine to the point at which it is desired to deliver them.

In connection with each of the clamps 33, I provide a scraper 93, which I have illustrated as consisting of a brush of the proper size and shape, so that its bristles will contact with the interior of the bottle. The bristles of this brush are secured upon the hollow stem 94, which is suitably perforated, so that the cleaning and rinsing fluids employed may be forced out through the bristles and against the surface of the glass. While I have illustrated the brush as made of bristles, it should be understood that it may be made of any other material that is suitable to permit the passage of the water to the interior of the bottle, and at the same time scrub its surface. The tube 94 forms the axis of the above gear pinion 21 which is secured thereto, so that the brush will be rapidly rotated all the time the bottle is over it, thus securing an efficient and certain cleaning of the surface of the bottle. The collar 82, against which the bottle rests, is held stationary by the bracket 95 secured to or formed integrally with the face of the carrier-disk 22, and bridging the dove-tailed channel 80. The clamp at the outer end of the bottle also serves to hold it stationary, so that any tendency that the bottle might have to rotate with the brush is overcome. I preferably arrange in connection with the rotating brush a supply stream of fluid thereto, of which I may employ as many kinds and varieties as I find necessary to thoroughly cleanse and rinse the bottles. I preferably employ, first, a solution of soda

as a cleaning fluid, and as this is of some value, it is allowed to circulate through and be collected as it is discharged. I then apply a stream of clean water for rinsing purposes, which, after it passes through the machine, is, of course, discharged. The bearing for the rotating stem 94 is formed partially by the collar 82, and partially by the bearing sleeve 96, which is screwed into the recess 97 formed in the periphery of the hub 23. The sleeve or plug 96 does not entirely fill the recess 97, so that there is room therein for the collar 98, which is secured to the tube 94 and prevents its longitudinal movement. The chamber-piece 15 is provided with two sets of channels, the inner set by which the fluids are supplied to the bottles, and the outer set by which they are withdrawn. The numbers of these channels will vary with the different kinds of fluids employed, and I have shown two of the inner channels 99 and 100. The inner channel 99 extends over a sufficient arc so that when a bottle is in the next position after the one in which it is placed on the carrier, the cleaning fluid, which enters through the pipe 101, extending into the channel 99, passes into the end of the tube 94. Half of the end of the tube is closed by the partition 102, which extends nearly to the point where the bristles begin, where it terminates opposite an opening 103 formed in that side of the tube, so that the cleaning fluid which flows in from this station, preferably under pressure, will pass through the end of the tube, and through the length of the tube, and out through the apertures between the bristles to the inner surface of the bottle, where it is applied by the brush. Water can escape through the aperture 103, into the channel formed by the partition 102, and from thence through the aperture or apertures 104 formed in the tubes and opening into the short horizontal channels 105, of which there is, of course, one for each tube 94. These channels 105 open into whatever discharge channel may be opposite. In the position just considered, it opens into the discharge channel 106, which, as seen from Fig. 5, extends far enough to cover two positions, and the pipe 107 opening into the end of this channel, as indicated in Fig. 4, serves to carry the cleansing fluid which has been used back to the reservoir, whence it can be returned if desired. At the next position, the supply of the cleansing fluid is cut off, so that while in this position the cleansing fluid has a chance to run out or be withdrawn and leave the bottle empty or comparatively so, for the introduction of the rinsing fluid which it receives at the next station from the chamber 100, which is supplied by the pipe 108. This chamber 100, supplying the rinsing fluid, preferably extends over the two positions, as shown, so

that an abundance of the rinsing fluid will be applied to surely remove all the cleansing fluid and leave nothing but clean water in the bottle when it is finally discharged. The discharge-chamber 109 for the rinsing fluid, which connects with the outlet pipe 110, preferably extends, as shown, over three positions, so that it is quite thoroughly removed before the bottle is finally discharged. Of course, it will be understood that any desired number of stations may be employed, and any desired number and variety of cleaning and rinsing fluids, as I have merely illustrated and described one member and one arrangement of the chamber piece and its associated channels.

While I have shown and described my invention as embodied in the form which I at present consider best adapted to carry out its purposes, it will be understood that it is capable of very wide modifications, both in structure, combinations, and designs, and that I do not wish to be limited in the interpretation of the following claims, excepting as may be necessitated by the state of the prior art.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a device of the class described, a brush having a stem and adapted to rotate in a bottle, said stem being provided with passages therein through which a liquid may be supplied to the bottle and simultaneously withdrawn therefrom.

2. In a device of the class described, the combination with a bottle holder, of a brush having a stem and adapted to rotate in a bottle, said stem being provided with passages therein through which a liquid may be supplied to the bottle and simultaneously withdrawn therefrom, means for supplying liquid to said stem, and means for rotating the brush.

3. In a device of the class described, the combination with a rotating support having a plurality of bottle holders thereon, a plurality of brushes having stems and adapted to rotate in the bottles, said stems being provided with passages therein through which a liquid may be supplied to the bottles and simultaneously withdrawn therefrom, means for supplying liquid to said stems, and means for rotating the brushes.

4. In a device of the class described, the combination with a support having bottle holders arranged thereon, of means for advancing the support step by step, brushes having stems and adapted to rotate in bottles in said holders, said stems being provided with passages therein through which a liquid may be supplied to the bottles and simultaneously withdrawn therefrom, means for continuously rotating the brushes, and means for supplying liquid to the stems of the brushes.

5. In a device of the class described, the combination with a support having the bottle holders arranged thereon, of the brushes located concentrically with the holders, means for advancing the support step by step, means for supplying liquid to the bottles while in the holders, means for rotating the brushes, and mechanism for automatically inserting the bottles at one position of the holder, and mechanism for discharging them at another.
6. In a device of the class described, the combination with a rotary support, of the circularly arranged bottle holders carried thereby, means for giving the support a step by step movement, means for inserting the bottle in one position, means for cleansing it in another, and means for discharging it in still another.
7. In a device of the class described, the combination with a rotary support, of the circularly arranged bottle holders thereon, means for giving the support a step by step movement, means for inserting a bottle in one position, means for supplying it with cleansing fluid in another position, supplying it with rinsing fluid in another, and means for discharging it in still another.
8. In a device of the class described, the combination with a rotary support, of the circularly arranged bottle holders, the brushes concentrically located with the bottle holders, means for giving the support a step by step movement, means for rotating the brushes, means for inserting a bottle in one position, means for supplying it with cleansing fluid in another, and means for discharging it in another.
9. In a device of the class described, the combination with a rotary support, of the circularly arranged bottle holders, means for giving the support a step by step movement, axially located liquid supply chambers, tubes connecting the supply chambers with the interior of the bottles, means for inserting the bottles in one position, means for cleansing them in another, and means for finally discharging them in still another.
10. In a device of the class described, the combination with the rotary support, of the circularly arranged bottle holders, means for advancing the support step by step, the axially located liquid supply and discharge chambers, tubes connecting the supply and the discharge chambers with the interiors of the bottles, and means for inserting the bottles in one position, means for cleansing them in another, and means for discharging them in another.
11. In a device of the class described, the combination with the driving shaft, of the bevel gear wheel secured thereon, the bottle support journaled concentrically therewith, the rotary brushes radially mounted on said support, bevel pinions on the axis of the
- brushes, and connections between the shaft and support for intermittently rotating the support from the continuously rotating shaft.
12. In a device of the class described, the combination with the driving shaft, of the bevel gear wheel secured thereon, the bottle support journaled concentrically therewith, the rotary brushes radially mounted on said support, bevel pinions on the axis of the brushes, the second shaft parallel to the first, gear connections between said shafts, and Geneva stop connections between the second shaft and the support.
13. In a device of the class described, the combination with the driving shaft, of the bevel gear wheel thereon, the bottle support journaled concentrically therewith, the rotary brushes radially mounted on said support, bevel pinions on the axes of the brushes engaging with the gear wheel, connections between the shaft and the support for intermittently rotating the latter from the continuous rotation of the former, and means for automatically placing bottles over the brushes.
14. In a device of the class described, the combination with the driving shaft, of the bevel gear wheel thereon, the bottle support journaled concentrically therewith, the rotary brushes radially mounted on said support, bevel pinions on the axes of the brushes engaging with the gear wheel, connections between the shaft and the support for intermittently rotating the latter from the continuous rotation of the former, and means for automatically placing bottles over the brushes in one position of the support, and means for automatically discharging the bottles in another position of the support.
15. In a device of the class described, the combination with a driving shaft of the bevel gear wheel secured thereon, the bottle support journaled concentrically therewith, the rotary brushes radially mounted on said support, the bevel pinions on the axis of the brushes meshing with the bevel wheel, connections between the shaft and support for intermittently rotating the support from the continuously rotating shaft, the bottle carrier, gearing to rotate the carrier in unison with the support, and automatic mechanism for moving the bottle from the carrier to the support.
16. In a device of the class described, the combination with a driving shaft of the bevel gear wheel secured thereon, the bottle support journaled concentrically therewith, the rotary brushes radially mounted on said support, the bevel pinions on the axis of the brushes meshing with the bevel wheel, connections between the shaft and support for intermittently rotating the support from the continuously rotating shaft, the bottle

carrier, gearing to rotate the carrier in unison with the support, a cam on the shaft, a sliding pusher adjacent the carrier, and connections between the cam and pusher for automatically moving the bottles one by one from the carrier to the support.

17. In a device of the class described, the combination with a driving shaft of the bevel gear wheel secured thereon, the bottle support journaled concentrically therewith, the rotary brushes radially mounted on said support, the bevel pinions on the axis of the brushes meshing with the bevel wheel connections between the shaft and support for intermittently rotating the support from the continuously rotating shaft, the bottle carrier, gearing to rotate the carrier in unison with the support, a cam on the shaft, a sliding pusher adjacent the carrier, the rock shaft having two crank arms, a link cooperating with the cam and connected to one rock-shaft, and the pin on the sliding pusher engaging a slot in the other crank arm.

18. In a device of the class described, the combination with the driving shaft, of the bevel gear wheel secured thereon, the bottle supports journaled concentrically therewith, the rotary brushes radially mounted on said support, bevel pinions on the axis of the brushes meshing with the bevel gear wheel, connections between the shaft and the support for intermittently rotating the support from the continuously rotating shaft, the carrier journaled at right angles to the support, the sprocket gear, and miter gears connecting the carrier and the support to rotate them in unison, and automatic mechanism for raising the bottle from the carrier to the support.

19. In a device of the class described, the combination with the driving shaft, of the bevel gear wheel secured thereon, the bottle support journaled concentrically therewith, the rotary brushes radially mounted on said support, bevel pinions on the axis of the brushes meshing with the bevel wheel, connections between the shaft and support for intermittently rotating the support from the continuously rotating shaft, radial slides on the bottom support cooperating therewith, a swinging arm to contact with the radial slides on one position, and means to automatically reciprocate said arm at each position.

20. In a device of the class described, the combination with the driving shaft, of the bevel gear wheel secured thereon, the bottle support journaled concentrically therewith, the rotary brushes radially mounted on said support, bevel pinions on the axis of the brushes meshing with the bevel wheel, connections between the shaft and support for intermittently rotating the support from the continuously rotating shaft, radial slides on

the bottle support cooperating therewith, a swinging arm to contact with the radial slides in one position, and means to automatically reciprocate said arm at each position, consisting of a slide, a cam driven by the shaft, a slide reciprocated by the cam, and a slot and pin connection between the swinging arm and the slide.

21. In a device of the class described, the combination with the driving shaft, of the bevel gear wheel thereon, the bottle support journaled concentrically therewith, the rotary brushes radially mounted on said support, the bevel pinions on the axis of the brushes meshing with the bevel wheel, connections between the shaft and support for intermittently rotating the support from the continuously rotating shaft means for automatically placing bottles over the brushes, means for automatically discharging the bottles at one position, and an automatic carrier for removing the bottles as they are discharged.

22. In a bottle washing machine, the combination with supply and discharge conduits, of a support upon which a bottle may be secured so as to prevent the passage of liquid from the bottle except through passages in the support, a pipe leading from the supply conduit, through said support to the interior of the bottle, and over which the bottle is passed as it is secured to the support, said support having a passage therethrough leading from the interior of the bottle to the discharge conduit, whereby a continuous current of water may be passed through the bottle.

23. In a bottle washing machine, the combination with supply and discharge conduits, of a support upon which a bottle may be secured so as to prevent the passage of liquid from the bottle except through passages in the support, a pipe leading from the supply conduit, through said support to the interior of the bottle, and over which the bottle is passed as it is secured to the support, said support having a passage therethrough leading from the interior of the bottle to the discharge conduit, whereby a continuous current of water may be passed through the bottle, a brush connected with the pipe, and means for causing relative rotation of the brush and the bottle.

24. In a bottle washing machine, the combination with supply and discharge conduits, of a support upon which a bottle may be secured so as to prevent the passage of liquid from the bottle except through passages in the support, a pipe leading from the supply conduit, through said support to the interior of the bottle, and over which the bottle is passed as it is secured to the support, said support having a passage therethrough leading from the interior of the bottle to the discharge conduit, whereby

a continuous current of water may be passed through the bottle, a brush connected with the pipe, and means for rotating the brush.

25 In a bottle washing machine, the combination with supply and discharge conduits, of a support upon which a bottle may be secured so as to prevent the passage of liquid from the bottle except through passages in the support, a pipe leading from the supply conduit, through said support to the interior of the bottle, and over which the bottle is passed as it is secured to the support, said support having a passage there-
10 through leading from the interior of the bottle to the discharge conduit, whereby
15 a continuous current of water may be passed through the bottle, and means for automatically applying bottles to the support.

26 In a bottle washing machine, the combination with supply and discharge conduits, of a support upon which a bottle may

be secured so as to prevent the passage of liquid from the bottle except through passages in the support, a pipe leading from the supply conduit, through said support to the interior of the bottle, and over which the bottle is passed as it is secured to the support, said support having a passage therethrough leading from the interior of the bottle to the discharge conduit, whereby
25 a continuous current of water may be passed through the bottle, and means for automatically applying bottles to the support and taking them therefrom after they have
30 been washed.

In witness whereof, I have hereunto set my hand this 21st day of September, 1904.

GEORGE WEISS.

Witnesses:

JOHN H. McELROY,
G. Y. DANKWARD.