

P. POLNISCH.  
BOTTLE WASHING MACHINE.  
APPLICATION FILED JULY 15, 1909.

944,499.

Patented Dec. 28, 1909.

3 SHEETS—SHEET 1.

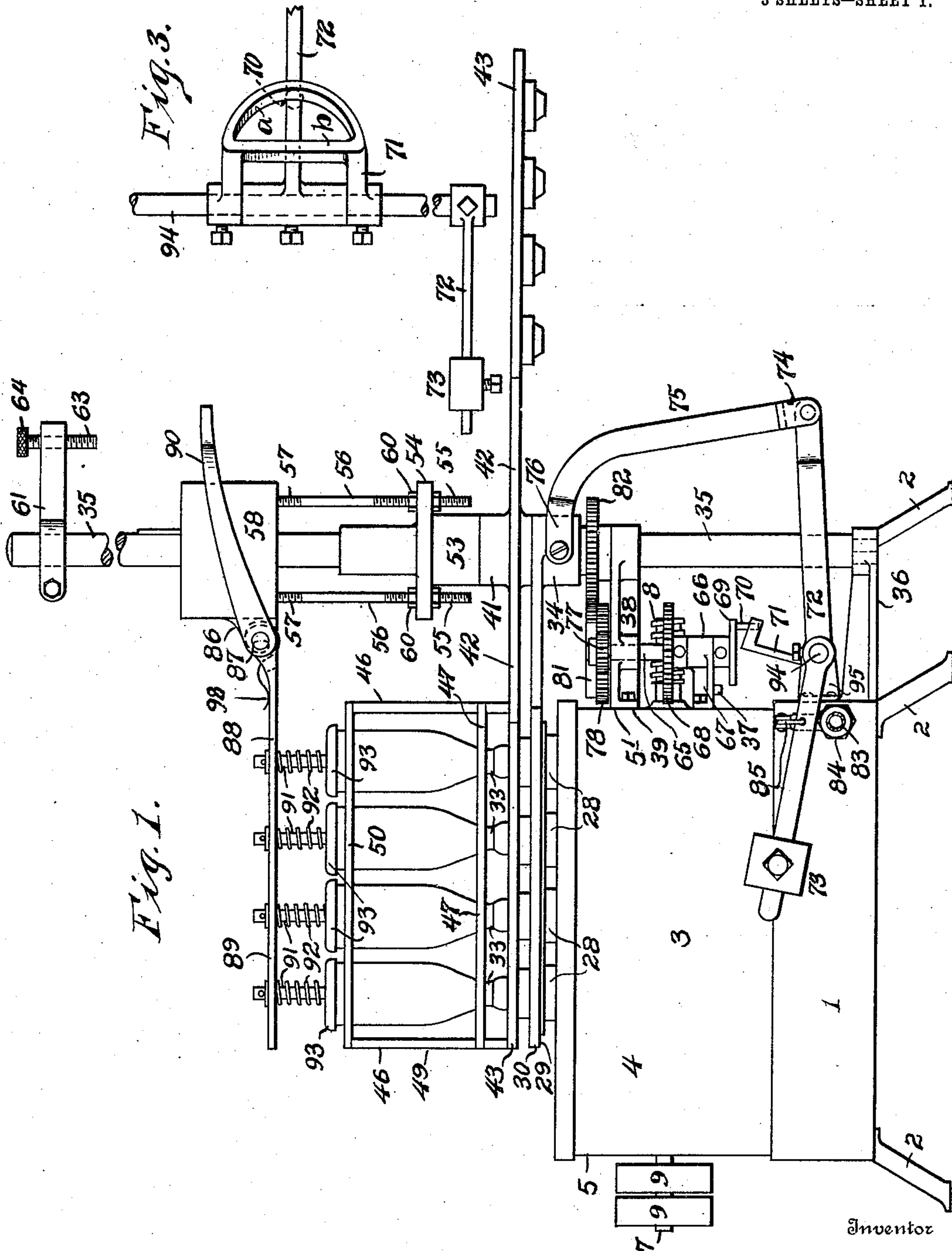


Fig. 1.

Fig. 3.

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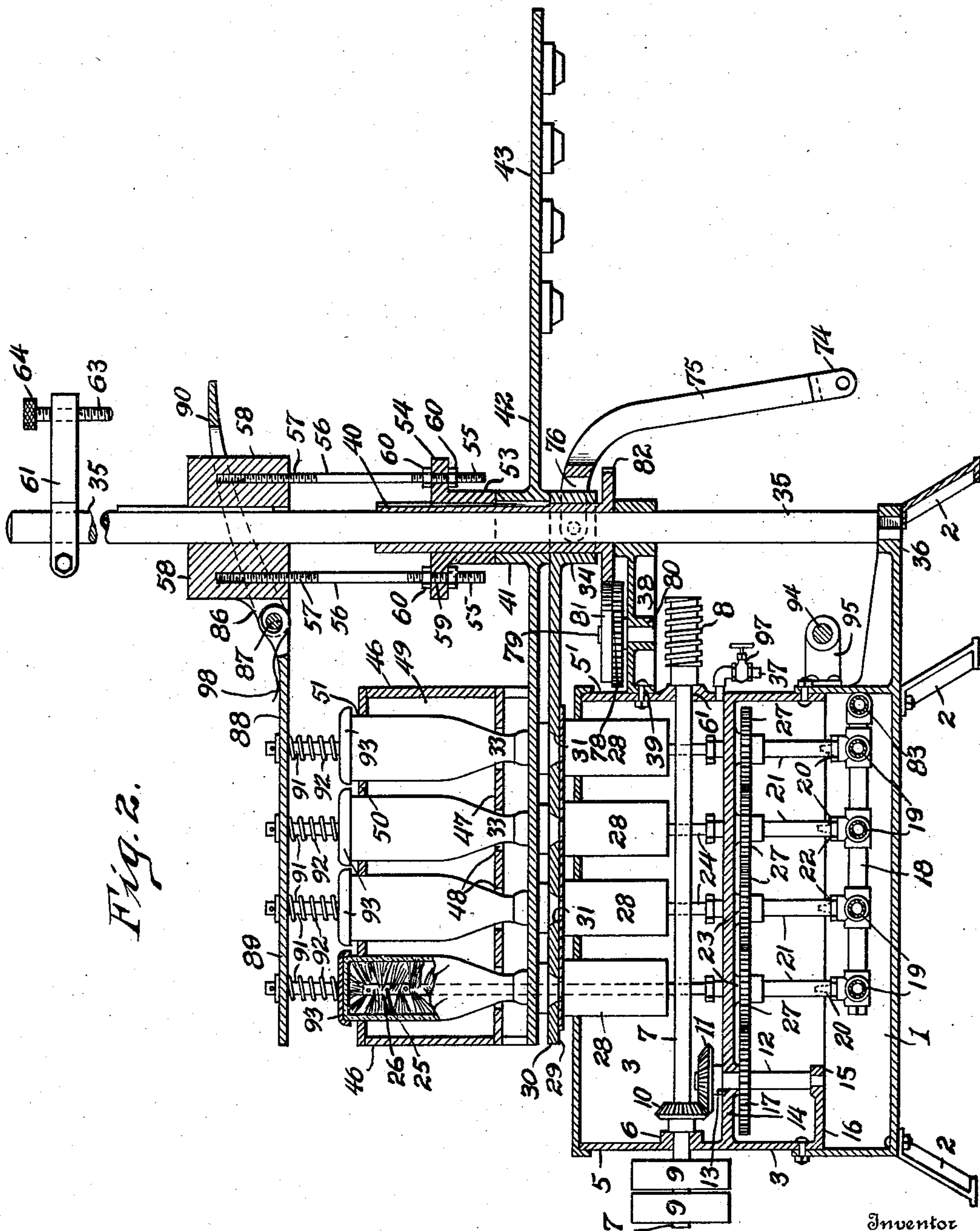
Witnesses

Daniel Webster, Jr.  
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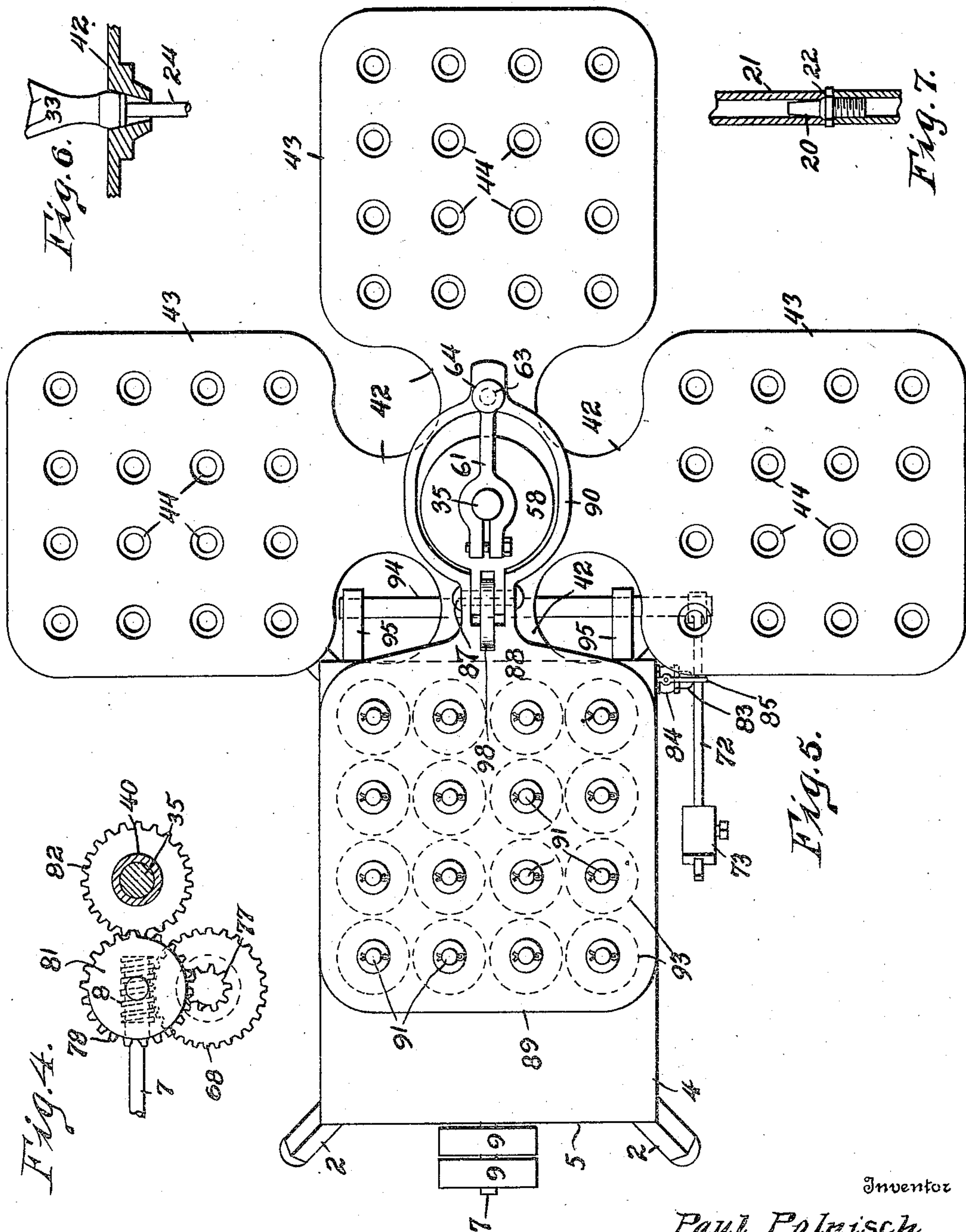


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# UNITED STATES PATENT OFFICE.

PAUL POLNISCH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO WILLIAM C. SCHWEBEL, OF PHILADELPHIA, PENNSYLVANIA.

## BOTTLE-WASHING MACHINE.

944,499.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed July 15, 1909. Serial No. 507,826.

*To all whom it may concern:*

Be it known that I, PAUL POLNISCH, a citizen of the United States, residing in Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in a Bottle-Washing Machine, of which the following is a specification.

My invention relates to machines for washing the inside of bottles, and the object thereof is, first—a mechanism for forcing a set of bottles over brushes and for holding them until they are washed, second—a mechanism for lifting the bottles off the brushes, and lifting cups over the brushes, third—a mechanism for carrying the washed bottles away from the brushes and at the same time carrying a new supply of bottles for the brushes, fourth—a mechanism for revolving the brushes, for supplying water for washing purposes only during the process of washing, and fifth—to combine the various mechanisms for the purpose of producing the best possible results.

With these and other objects in view, my invention consists in the construction, combination and arrangement of parts as will be hereinafter more fully described and claimed, and illustrated in the accompanying drawings, it being understood that changes in form, size shape and minor details may be within the scope of my claims without departing from the spirit or sacrificing any of the advantages of this invention.

In the accompanying drawings, Figure 1, is a front elevation of the machine; Fig. 2, is a cross section thereof; Fig. 3, is a detail view of a slotted rocker arm in connection therewith; Fig. 4, is a view of an intermittent gearing arrangement; Fig. 5, is a plan view of the machine; Fig. 6, is a detail showing the neck of a bottle mounted over a brush spindle, and Fig. 7, is a detail showing the manner of mounting the brush spindles on the revolving spindles.

Similar characters refer to similar parts throughout the several views.

A base 1, mounted on legs 2, carries a pedestal 3, consisting of a body 4, and of sides 5, 5', provided with bearings 6, 6', for a shaft 7, terminating in a worm 8, at the bearing 6', to be driven by means of pulleys 9 or in any other manner. On shaft 7, is mounted a bevel gear 10, meshing with a

bevel gear 11, mounted on a vertical shaft 12, supported by a bearing 15, in the bottom 14, of the body 4, and by a bearing 13, of a bracket 16, below the bottom bracket 14. On shaft 12, is also mounted a driving gear 17. In the base 1, are mounted pipes 18, feeding water through taps 19, provided with spouts 20. Over the spouts are mounted tubular spindles 21, free to revolve about the spouts at 22, and further supported by bearings 23 in the bottom 14. The spindles 21, carry tubular spindles 24, provided with spouts 25 and with brushes 26. On the spindles 21, are mounted pinions 27, driven from the gear 17. The brush spindles 24, pass through cups 28, suspended from the bottom 29, of a rack 30, provided with holes 31, over the cups 28, for the spindles 24 to pass through. The rack 30 is provided with a collar 34, mounted on a sleeve 40, revolvably mounted on a rod 35, supported by an extension 36, of the base 1, and by a bracket 38, attached to pedestal 3, at 39. The sleeve 40, is free to revolve in a collar 34. On the sleeve 40, and over collar 34, is slidingly mounted a collar 41, constrained to revolve with the sleeve. Arms 42, radiate from the collar 41, which carry racks 43, provided with holes 44, for the spindles 24, to pass through. Crates 49, consist of frames 46, a partition 47, provided with holes 48, of sufficient width for the necks of bottles 33, to pass through, and with partitions 50, provided with holes 51, for supporting the bottles at 52. Over the sleeve 40, and above collar 41, is slidingly mounted a collar 53, provided with a rim 54. The rim 54, has holes 59, for threaded ends 55 of rods 56, to pass through, whose upper ends 57, project within a collar 58, slidingly mounted on the rod 35. Threaded nuts 60, are used for the purpose of adjusting the relative positions of the collars 53 and 58. On the rod 35, and above the collar 58, is clasped a bracket 61, provided with a threaded bolt 63, provided with a milled head 64. A shaft 65, supported by a bearing 66, of a bracket 67, carries a worm gear 68, meshing with the worm 8, of shaft 7, and a disk 69. On disk 69, is mounted a pin 70, for producing an intermittent rocking motion in a slotted arm 71, mounted on a pin 94, pivoted in a bracket 95, mounted on base 1. On pin 94 is mounted a bar 83 carrying a weight 73 and a bar 72 on which is pivoted one end 74, of a lever



75, whose other end 76, is forked and pivoted on collar 34. On shaft 65, is mounted a gear 77, meshing with a gear 78, mounted on a shaft 79, supported by a bearing 80. The shaft 79, carries an intermittent gear 81, meshing with a gear 82, fixed on the sleeve 40, for causing the sleeve to revolve on the rod 35, and in collars 34, 53 and 58, and with the collar 41.

Water pipes 18, are fed by a pipe 83, leading from a source not shown and is provided with a cut-off valve 84, operated by a lever 85, linking valve 84, with the arm 72, and drain 37, is provided for running off waste water. Collar 58, at 86, carries a pin 87, on which is pivoted a lever 88, leaving a plate 89, and an arm 90. Plate 89, carries pins 91, on which are mounted coiled springs 92, carrying plates 93.

The *modus operandi* is as follows: Shaft 7, revolves and transmits its motion through bevel gear 10, mounted thereon, to bevel gear 11, and through worm 8, to worm gear 68. Gear 17, mounted on the driven shaft 12, which carries gear 11, transmits its motion to the train of gears 27, mounted on the spindles 21, carrying brush spindles 24, causing the brushes to rotate.

The worm gear 68 produces an intermittent rocking movement in slotted arm 71, through the medium of the pin mounted on the disk 69, carried by the driven shaft 65, on which gear 68, is mounted. Arm 71, causes bar 83 to rock and to transmit the motion to valve arm 85, for successively opening and closing the valve and bar 72 for causing collar 34, to slide up and down through the medium of the arm 75, pivotally connecting the collar 34, with the bar 72. When the collar 34, is pushed up, it forces collars 41, 54 and 58, up until arm 90, strikes the belt 63. As the collars are being pushed farther up, lever 86 is caused to rock, arm 90, going down and plate 89 up thereby lifting the plates off the bottoms of the bottles. The crate carrying the bottle can now be removed and another set substituted. When collar 41, is pushed up the rack 43, forces the bottles off the brushes and the cups 28, of racks 30, are forced over the brushes. When the arms slide down a spring 98, forces plate 89, down and springs 92 press plates 93, against the bottoms of the bottles, forcing the bottles down over the brushes, which are released from the cups which move down with the rack 30. The gear 77, meshes with gear 78, mounted on shaft 79, carrying gear 81, and meshing with gear 83, mounted on sleeve 40. As gear 81, has only a limited number of teeth it causes an intermittent motion of the sleeve 40, and of the collar 41, constrainedly mounted thereon causing the racks carrying the bottles to pass over the bottles intermittingly.

For the successful operation of the ma-

chine it is necessary that the gear 82 should be stationary when slotted arm is in motion, first to permit a rack carrying a crate of bottles to force the bottles off the brushes, and the plates suspended from the springs to release the bottom of the bottles. It is then necessary for the arm to stop, and for gear 82 to revolve to cause the sleeve and the crates carrying racks to revolve, until the washed bottles are carried away from over the brushes and a rack carrying a crate of unwashed bottles is brought over the brushes. The gear 82 should then be stopped and the slotted arm racked again but in the opposite direction to cause the collars to slide down for forcing the bottles over the brushes, and to open the valve to allow water to play in the bottles. These operations should be repeated successively, which is accomplished by the construction of the slot of the rocking arm 71, which consists of a slot bound by a curved surface of a variable radius. The curved surface which I designate by the letter *a*, is of a radius equal to the distance of the pin 70 from the center of the disk 69 and the portion which I designate by the letter *b*, is of an infinite radius. When the teeth of the intermittent gear are engaged with those of the sleeve gear, the pin revolves over the surface *a*, and therefore cannot transmit any motion to the rocker 71. When the pin reaches *b* the teeth of the intermittent gear have just left the teeth of the sleeve gear which is the position when the rack carrying the bottles is immediately over the cup rack with the cups over the brushes. As the pin travels along the surface *b*, it causes the arm to rock, forcing the brushes out of the cups and the bottles over the brushes, and at the same time causes the water valve to open. The pin then moves across from the surface *b* to the surface *a*, when both the arm and the gear remain stationary and the bottles are being washed. As the pin travels over the surface *a* the arm rocks to its starting position, forcing the collars upon the sleeve until the bottles are forced off the brushes and the cups forced over the brushes, at the same time closing the water valve. The teeth of the intermittent gear are engaged with the teeth of the sleeve gear during the period when the pin 71 is traveling from the center of the surface *a* to its ends. These operations are repeated, with an intermittent gear making, say, five revolutions per minute, and with a sleeve gear making one revolution per minute and with four racks of sixteen bottles per rack, eighty bottles would be washed each and every minute.

Having thus described my invention what I claim as new and desire to protect by Letters Patent, is:—

1. A bottle washing machine, comprising



brushes carried by spindles provided with spouts and mounted on spindles revolvingly supported over spouts carried by taps of pipes supplied with water under a pressure to discharge water through the spouts of the brush carrying spindles, and a train of gears for producing the continuous rotation of the spindles, a rack provided with holes and cups suspended from the rack for the brush spindle to pass through extending from a collar, a collar mounted above the cup rack collar and provided with a series of radial racks provided with holes to coincide with the holes of the cup carrying rack when a radial rack is directly over the cup carrying rack, crates provided with means for supporting bottles over the holes of the radial racks, a plate provided with pins, coiled springs mounted on the pins, and disks suspended from the springs, of a lever provided with an arm, a collar provided with a pin for pivoting the lever, rods extending from the collar and provided with threaded ends passing through the collar mounted above the radial rack collar, a sleeve passing through the collar a fixedly mounted rod passing through the sleeve, a bracket mounted on the rod and provided with a check-bolt, a worm gear mounted on a shaft carrying a disk, a pin mounted on the disk, a rocking arm provided with a slot for the pin and mounted on a pin pivoted in brackets, an arm carrying a counter-balancing weight, mounted on the pivoted pin, a lever pivoted thereon and on the cup carrying rack collar, a gear mounted on the disk shaft, and a gear meshing therewith mounted on a shaft carrying an intermittent gear, and a gear provided by the sleeve passing through the collars meshing with the intermittent gear, and a driving shaft provided with a gear for transmitting motion to the train of gears causing the brushes to rotate and terminating in a worm meshing with the worm gear for the purposes set forth.

2. In a bottle washing machine, a base, a pedestal body mounted on the base and provided with bearings, a shaft mounted in the bearings carrying a gear and terminating in a worm, pipes mounted in the base, spouts tapped in the pipes, spindles mounted over the spouts, gears mounted on spindles, spindles provided with brushes carried by the gear spindles, a pin pivoted in brackets and provided with a slotted rocking arm, a driven shaft, a worm gear, a driving gear and a disk mounted on a driven shaft, a pin mounted on a disk engaging the slot of the rocking arm, a transmitter shaft, a gear meshing with the driving gear and an intermittent gear mounted on the transmitter shaft, a fixedly mounted rod, a sleeve mounted thereon provided with a gear meshing with the intermittent gear, a col-

lar slidingly mounted on the sleeve, a rack provided with holes and cups suspended from the rack and under the holes for the brush spindles to pass through extending from the collar, a collar slidingly mounted on the sleeve and racks provided with holes to correspond with the holes of the cup rack extending from the collar, a collar slidingly mounted on the sleeve and provided with a rim having holes, a collar slidingly mounted on the sleeve rod, rods extending from the collar provided with threaded ends passing through the holes of the rim collar, a lever pivoted on the collar mounted on the rod and provided with an arm and with a plate, pins carried by the plate, coiled springs mounted on the pins, and disks suspended from the springs, a bracket mounted on the rod and a check bolt carried by the bracket.

3. A bottle washing machine comprising a base and a pedestal body mounted thereon and provided with bearings, a driving shaft mounted in the bearings and terminating in a worm, a vertical shaft, a gear mounted on the driving shaft, a gear meshing with the gear on the driving shaft and a driving gear mounted on the vertical shaft, pipes mounted in the base, spouts tapped in the pipes, tubular spindles revolvingly mounted over the spouts, gears mounted on the spindles meshing with each other and driven by the driving gear on the vertical shaft, tubular spindles carrying brushes and provided with spouts fixedly mounted on the gear carrying spindles, a pivoted pin, a rocking arm having a slot mounted thereon, a worm driven shaft, a worm gear meshing with the driving shaft worm, a driving gear and a disk mounted on said worm driven shaft, a pin mounted on the disk engaging the slot of the rocking arm, a transmitter shaft, a pinion meshing with the driving gear of the driven shaft and an intermittent gear mounted on the transmitter shaft, a rod vertically supported by brackets, a sleeve revolubly mounted on the rod, a gear provided by the sleeve and driven by the intermittent gear, a rack provided with holes, cups suspended from the rack and under the holes surrounding the brush spindles provided with a collar mounted on the sleeve, a lever pivotally connecting the bar mounted on the pivoted pin with the cup carrying collar, racks provided with holes to correspond with the cup rack holes radiating from a collar constrainedly mounted on the sleeve and over the cup rack collar, a collar provided with a rim having holes mounted on the sleeves and above the constrainedly mounted collar, a collar slidingly mounted on the rod, joining rods extending from the collar and provided with threaded ends passing through the holes of the rimmed collar and nuts for fixing the rimmed collar on the rod, a lever pivoted



on the collar mounted on the rod and consisting of a plate carrying pins and of an arm, coil springs mounted in the pins and plates suspended from the springs, a clasp  
5 adjustably mounted on the rod and a check bolt carried by the clasp.

4. In a bottle washing machine the combination of a driving shaft mounted in bearings provided by a pedestal body, and  
10 mounted on a base supporting water pipes, spouts tapped on the pipes, spindles mounted over the spouts, and spindles carrying brushes, and provided with spout mounted on the spindles of the tapped spout, gears  
15 meshing with each other mounted on the tapped spindle, gears for transmitting the motion from the driving gear to the spindle gears for causing the brushes to rotate, a worm of the driving shaft, a worm driven  
20 shaft, a worm gear meshing with worm, a driving gear and a disk carrying a pin mounted thereon, a pin and a slotted arm mounted receiving an intermittent rocking motion from the pin of the disk on the  
25 worm driven shaft, a transmitter shaft, a gear meshing with the gear on the worm driven shaft, and an intermittent gear mounted thereon, a rod, a sleeve revolubly mounted thereon, a collar slidingly mounted  
30 on the sleeve, a collar carrying a rack provided with cups, a collar, racks provided with holes radiating from said collar, a collar slidingly mounted on the sleeve rod and rod connected with a collar slidingly mounted  
35 on the sleeve, a lever pivoted on the rod collar and provided with an arm, and with plate provided with pins, springs mounted thereon and disks suspended from the springs, an arm carrying a counterbalancing weight and operating a water pipe  
40 valve, mounted on the rocker arm pin, an arm pivotally connecting the cup rack carrying collar with an arm mounted on the pivoted pin for causing the collars to slide upwardly for forcing the bottles of the  
45 brushes, and the cups over the brushes, a bracket, a bolt projecting through the bracket, for causing the arm of the lever pivoted on the collar slidingly mounted on the rod to rock downwardly and its plate upwardly for releasing the bottles, a gear  
50 carried by the sleeve meshing between the intermittent gear to cause the sleeve to revolve causing a crate carrying rack to move away from the brushes, and to bring a similar rack over the brushes, when the rocker  
55 arm is stationary, said arm to cause the collars to move downwardly, for forcing the bottles over the brushes to be washed as the brushes continue to revolve when the sleeve gear is stationary, and for the brushes to wash the bottles as water is spurted from the brush carrying spindles when both the  
60 gear and rocker arm are stationary.

65 5. In a bottle washing machine a driv-

ing shaft terminating in a worm, a vertical shaft and revolving spindles provided with brushes, gears mounted on said shafts and spindles for causing the brushes to revolve, a worm driven shaft, a worm gear mounted  
70 thereon meshing with the driving shaft worm, a driving gear and a disk provided with a pin mounted thereon, a slotted arm to be caused to rock intermittingly by the pin of the disk of the worm driven shaft, a  
75 transmitter shaft, a gear mounted thereon meshing with the driving gear on the disk carrying shaft and an intermittent gear mounted thereon, a rod, a sleeve revolubly mounted thereon and provided with a gear,  
80 meshing with the intermittent gear to cause the sleeve to rotate when the slotted arm is stationary, two bars mounted on a pin carrying the slotted arm, a water valve linked with one of the arms, and a lever pivotally  
85 connecting a collar with the other arm for causing the collar to slide upwardly and operating the valve to shut up the water when the collars carrying sleeve is stationary, a collar slidingly mounted on a rod, a  
90 bracket carrying a check bolt adjustably mounted on the rod, a lever pivoted on the collar and provided with an arm and with a plate to be caused to rock for releasing bottles of a crate supported on a rack of a collar  
95 constrainedly mounted on the sleeve to revolve therewith.

6. In a bottle washing machine, a driving shaft provided with a worm and carrying a gear, a vertical shaft provided with  
100 a gear meshing with a gear of the driving shaft, pipes provided with taps having spouts, spindles provided with gears driven by the driving gear of the vertical shaft revolvingly mounted over the spouts, spin-  
105 dles mounted on the gear spindles, provided with brushes and with spouts, a fixedly mounted rod, a sleeve provided with a gear revolubly mounted on the rod, a collar provided with a rack having holes and cups  
110 under the holes for the brush spindles slidingly mounted on the sleeve and above its gear, a collar slidingly and constrainedly mounted on the sleeves and over the collar provided with cups, racks radiating from  
115 the collar and provided with holes passing through the racks to correspond with the holes over the cups, for supporting the lips of bottles carried by crates removably mounted on the racks, a rimmed collar slid-  
120 ingly mounted on a sleeve and over the constrainedly mounted collar, and a collar slidingly mounted on the rod and rods connecting it with the rimmed collar, a lever provided with an arm and with a spring  
125 actuated plate pivoted on the collar pins carried by the spring actuated plate and disks suspended from springs mounted on the pins, a bracket adjustably mounted on the sleeve rod and provided with a check  
130



bolt, a worm driven shaft, a worm gear meshing with the worm of the driving shaft, a driving gear and a disk carrying a pin mounted on the said worm driven shaft, a pivoted pin, a slotted intermittingly rocking arm and bars mounted thereon, a transmitter shaft, a worm driven gear meshing with the driving gear of the worm gear shaft and an intermittent gear meshing with the sleeve gear mounted on the transmitter shaft, a water pipe provided with a valve and linked with one of the arms of the pivoted pin, a lever pivotally connecting the cup rack collar with the other bar of the pivoted pin for the purposes set forth.

7. In a bottle washing machine, the combination of a driving shaft provided with a worm and a gear mounted on said shaft, a vertical shaft, a gear meshing with the driving shaft gear and a driving gear mounted thereon, spindles carrying brushes and provided with spouts, spindles carrying the brush spindles and gears mounted on said spindles meshing with each other and driven by the driving gear of the vertical shaft, means for forcing water through the spindles, a rack having holes and carrying cups under the holes to be forced intermittently over the brushes and off the brushes, radiating racks to be successively brought over the rack carrying the cups and provided with holes to be forced over the brushes when the cups are off the brushes and to be forced off the brushes, when the cups are over the brushes, and carrying crates of bottles to be washed when the cups are off the brushes, a spring actuated plate provided with disks suspended from springs for forcing bottles over the brushes to be washed by the brushes, means for causing the disks to release the bottles after they are washed means to cause the radiating arms to revolve past the cup rack when the cups are over the brushes, a fixedly mounted rod, a sleeve provided with a gear meshing with the intermittent gear revolubly mounted on the rod, a collar carrying the cup rack slidably mounted on the sleeve, a collar carrying the radiating racks slidably mounted on the sleeve and constrained to revolve in it, a rimmed collar slidably mounted on the sleeve, and a collar slidably mounted on the fixedly mounted rod, rods connecting the said collar with the rimmed collar, a lever carrying the spring actuated plate pivoted on the collar of the rod, a bracket provided with a check bolt for operating the lever adjustably mounted on the rod, a pivoted

pin, arms mounted on the pin, an arm pivotally connecting the cup rack collar with one of the said pin arms, a weight mounted on the other pin arm which is linked with a valve for a water supplying pipe.

8. In a bottle washing machine the combination of a rockable arm and a revoluble gear, an intermittent gear for causing the gear to revolve intermittently and a disk provided with a pin for causing the arm to rock, said arm provided with a slot for the pin to travel in and consisting of a curved surface of a variable diameter for causing the arm to rock intermittently for the purposes set forth.

9. In a bottle washing machine, the combination of a rockable arm and a revoluble gear, an intermittent gear for causing the gear to revolve intermittently a disk provided with a pin for causing the arm to rock intermittently, said arm provided with a slot for the pin to travel in, and bounded by a curve of a variable radius, the radius of part of the curve being infinite and that of the other part being equal to the distance of the pin from the center of its disk for the purposes set forth.

10. In a bottle washing machine, the combination of a rockable arm and a revoluble gear, a driving shaft provided with a worm, a worm driven shaft, a worm gear mounted thereon meshing with the driving shaft worm, a driving gear and a disk provided with a pin for causing the arm to rock mounted on a worm driven shaft, a transmitter shaft, a driven gear meshing with the driving gear of the worm driven shaft and an intermittent gear meshing with the revoluble gear mounted on the transmitter shaft, said arm provided with a slot for the pin of the disk to travel in, and bound by a curved surface of a variable radius to be caused to rock first in one direction when the revoluble gear is stationary, to remain stationary when the gear revolves, and for the gear to remain stationary when the arm is caused to rock in the opposite direction, and to repeat the operation after an intermission when both the gear and arm remain stationary for the purposes set forth.

In witness whereof, I have hereunto attached my signature to this specification in the presence of two subscribing witnesses.

PAUL POLNISCH.

Witnesses:

WM. PORTNER,  
EMANUEL KLINE.