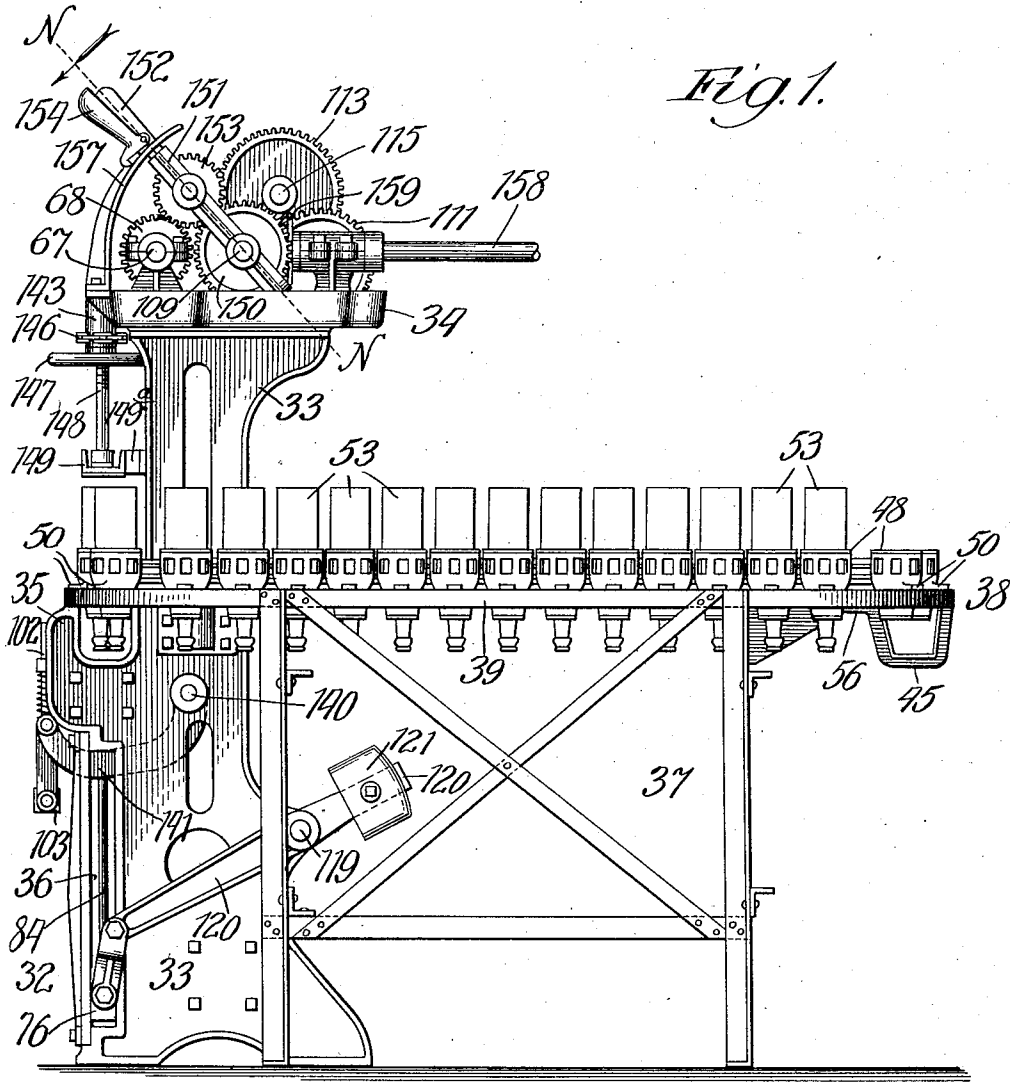


G. W. DOBSON.
BOTTLE WASHING MACHINE.
APPLICATION FILED JAN. 9, 1911.

1,012,194.

Patented Dec. 19, 1911.

11 SHEETS—SHEET 1.



Witnesses:

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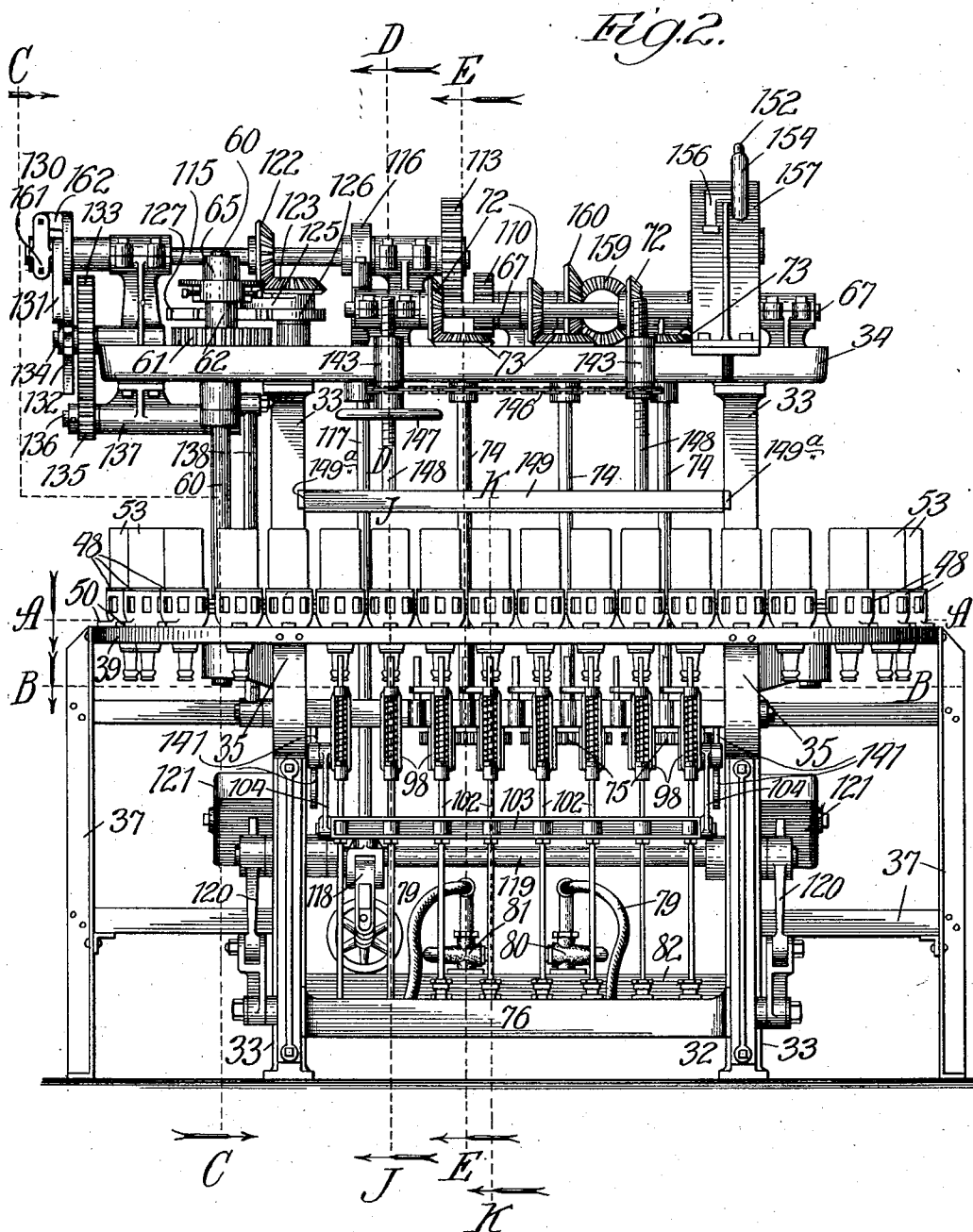
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11 SHEETS—SHEET 2.



Witnesses:

E. C. Daylord,
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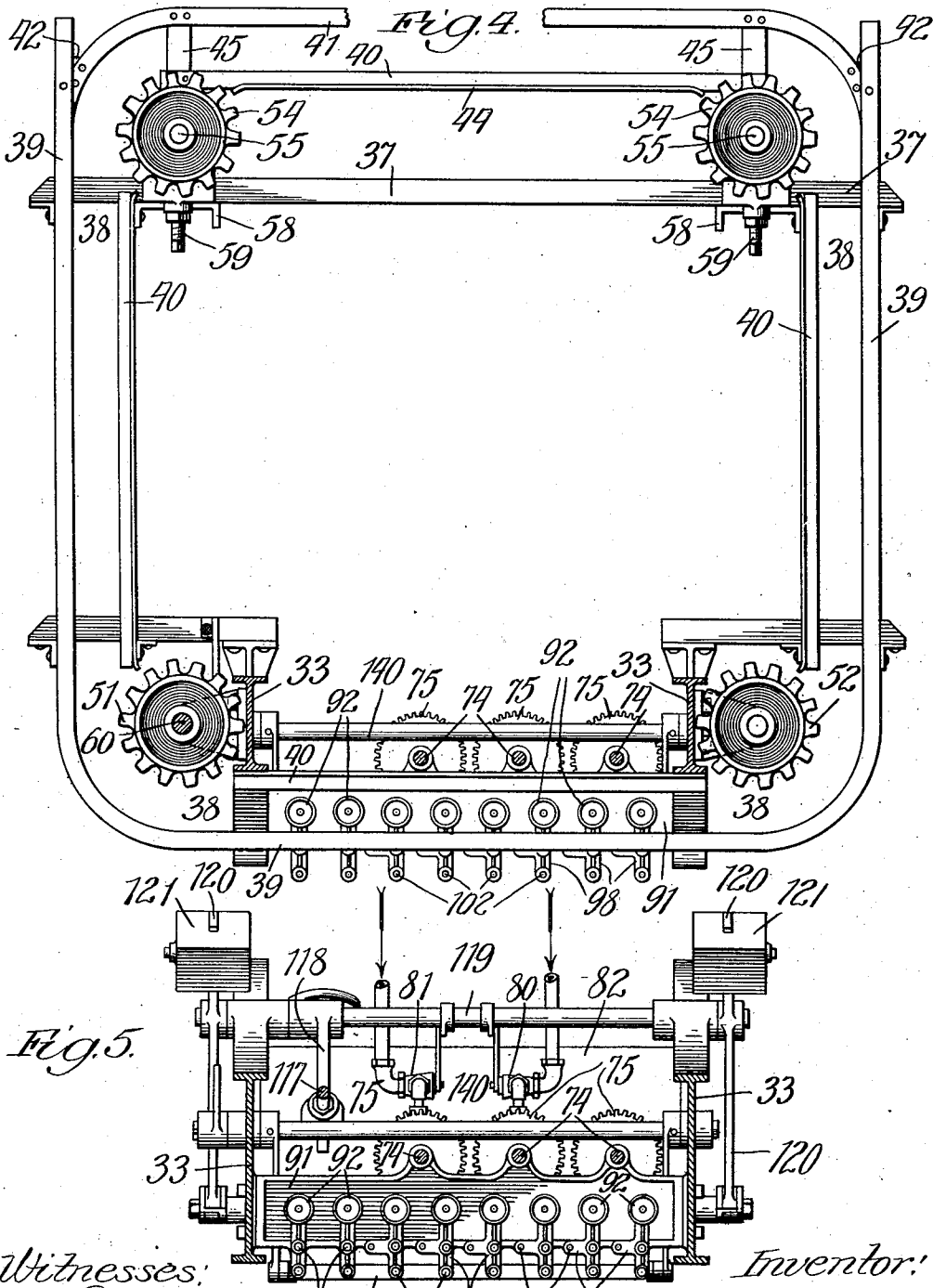
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11 SHEETS—SHEET 4.



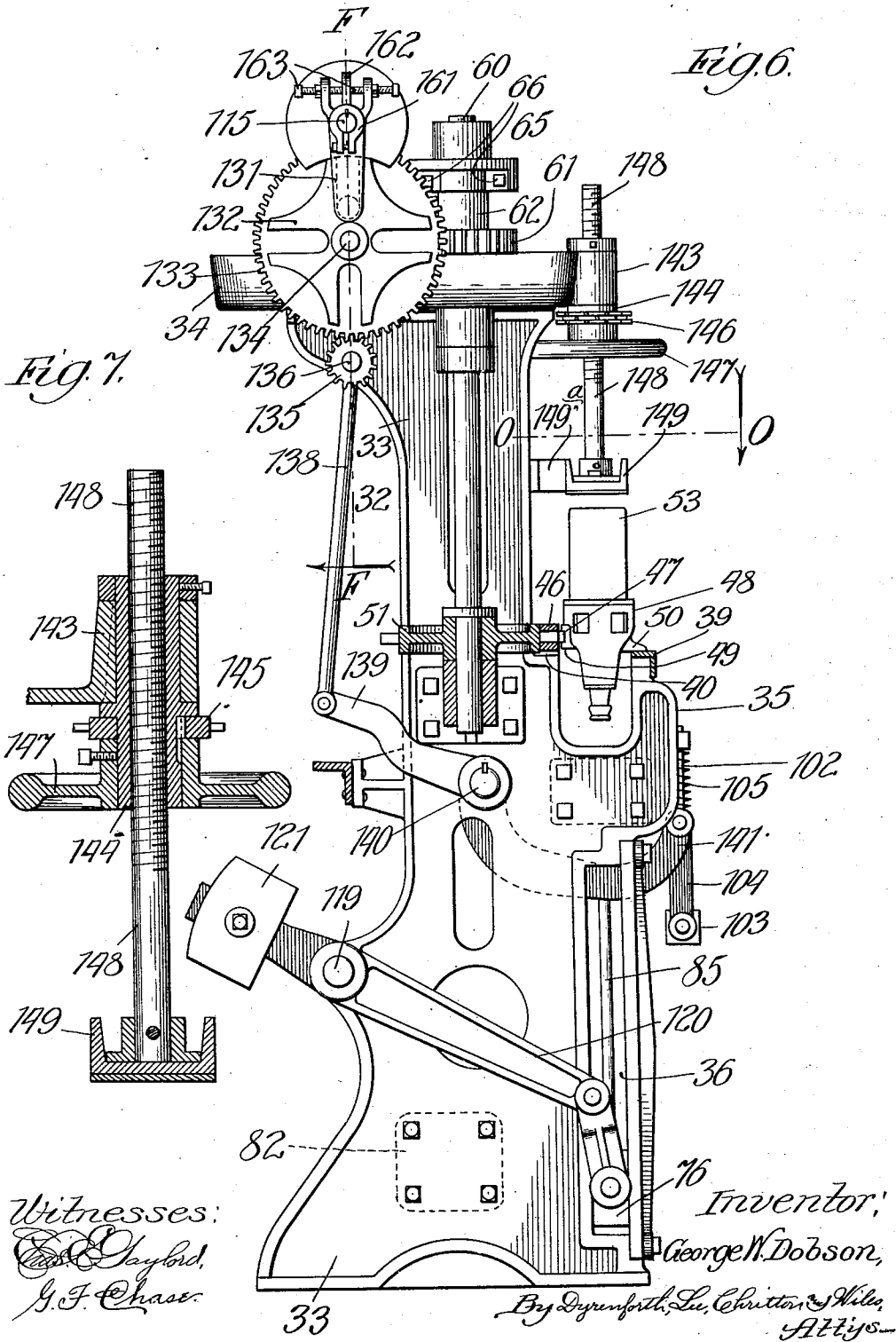
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Patented Dec. 19, 1911.

11 SHEETS—SHEET 5.

1,012,194.

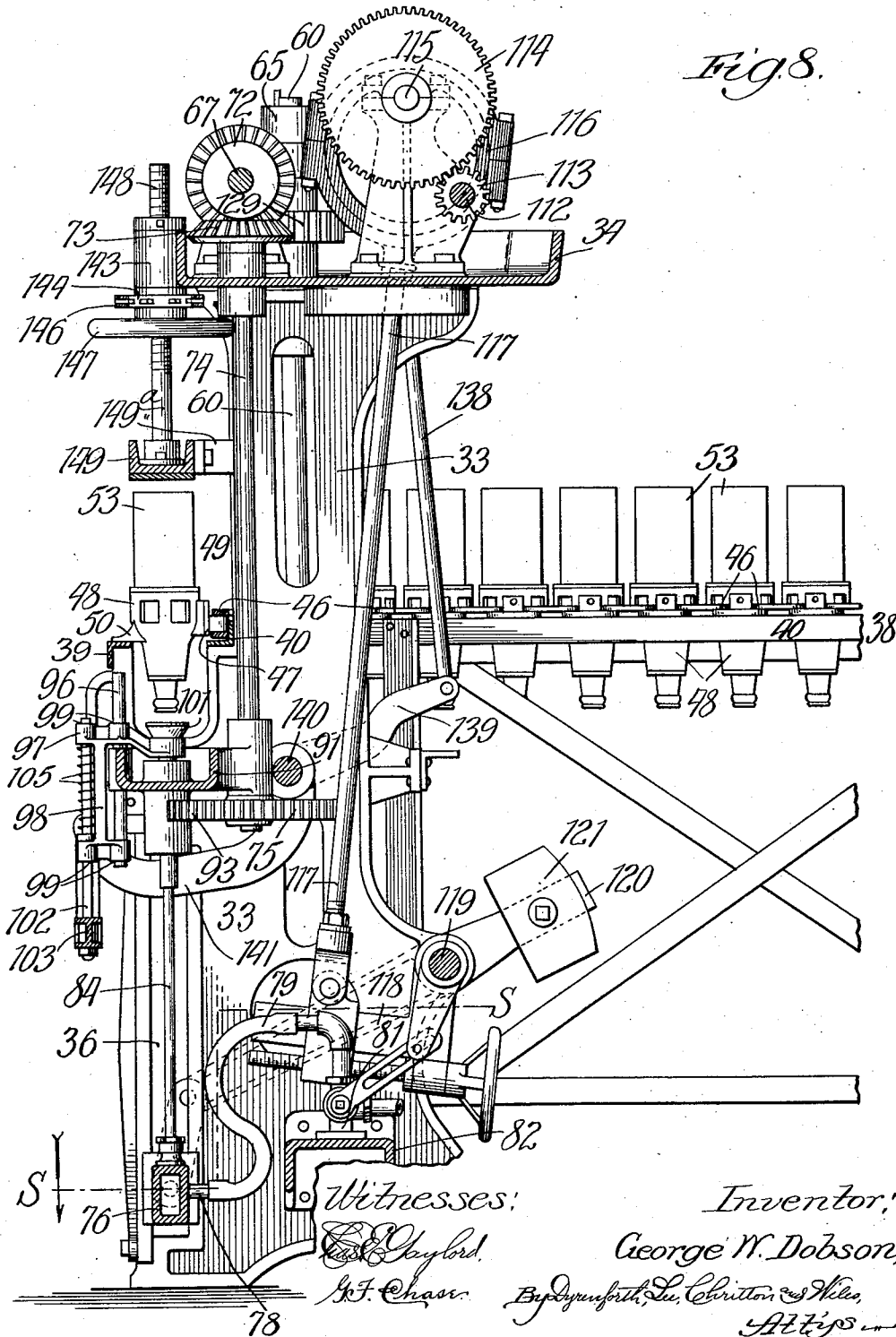


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11 SHEETS—SHEET 7.

1,012,194.

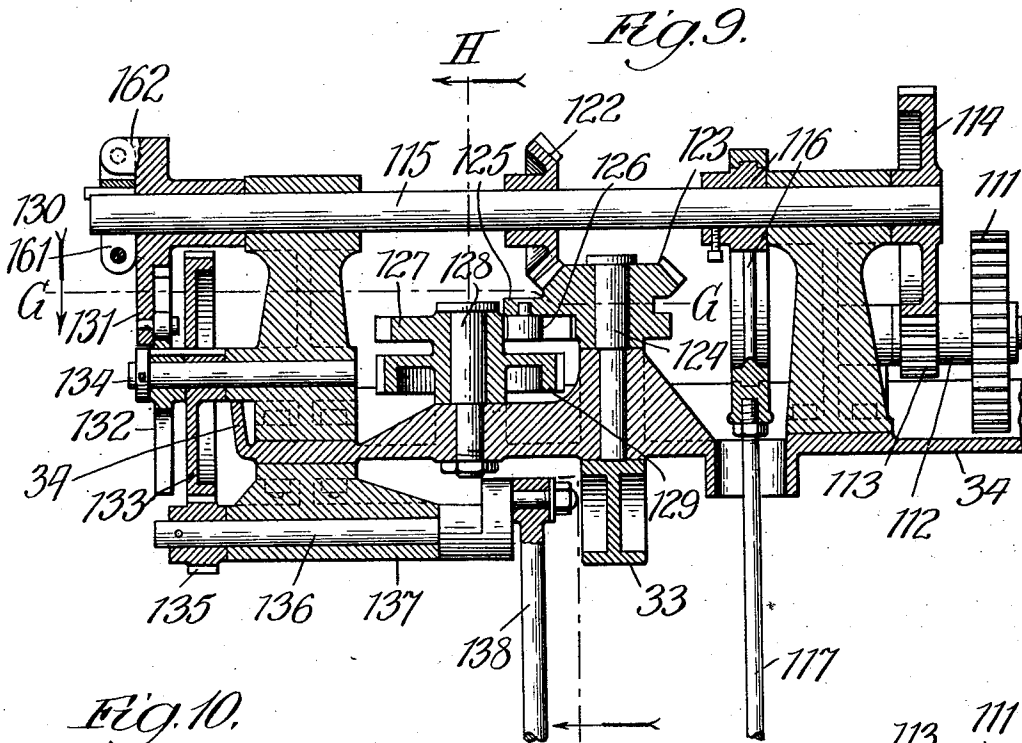
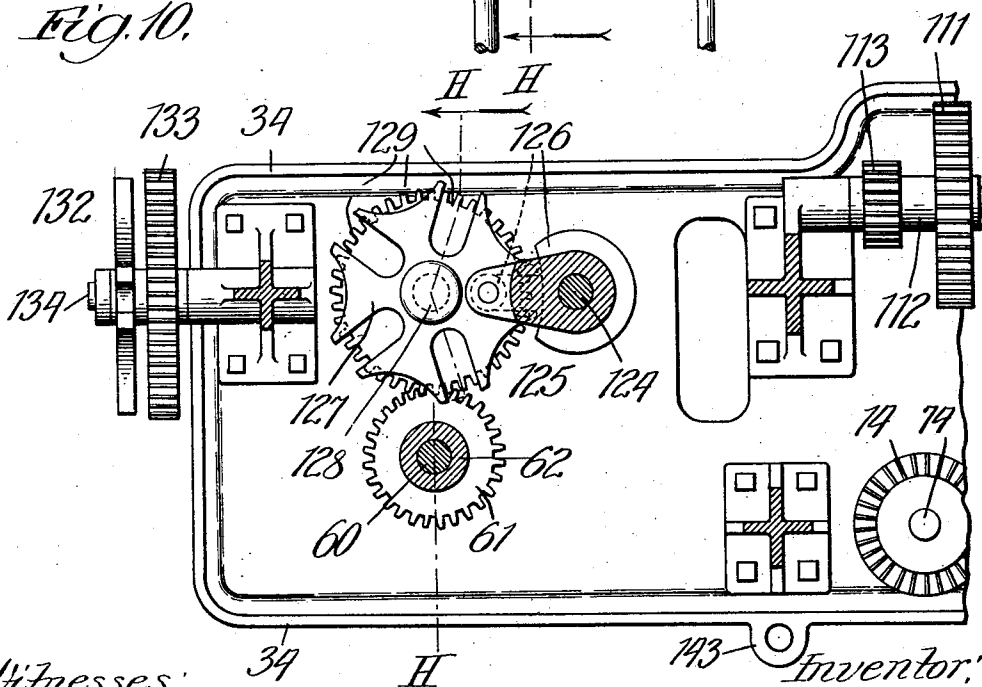


Fig. 10.



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11 SHEETS—SHEET 8.

Fig. 11.

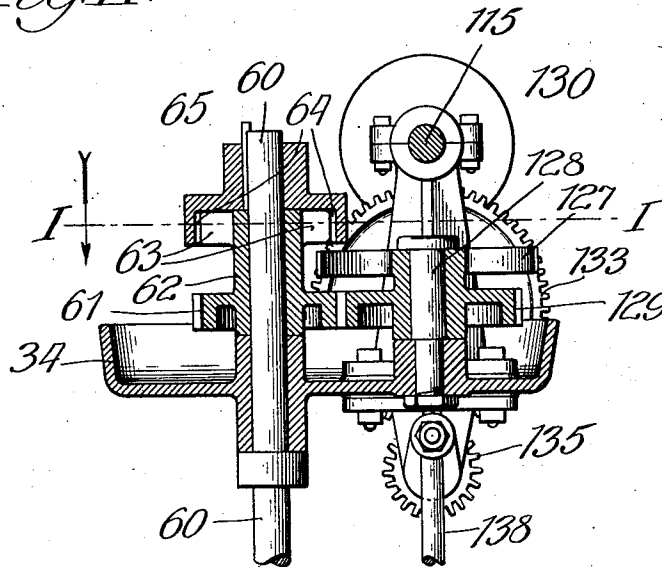


Fig. 12.

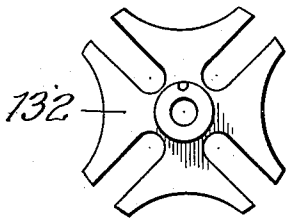


Fig. 13. Fig. 14.

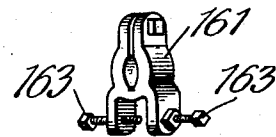
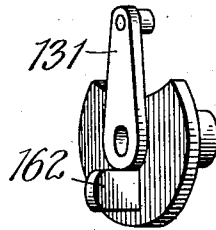


Fig. 16.

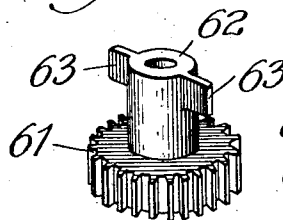


Fig. 15.

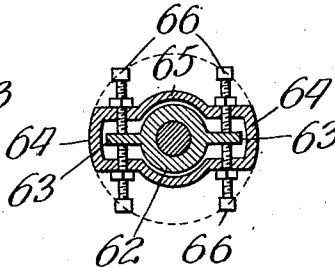
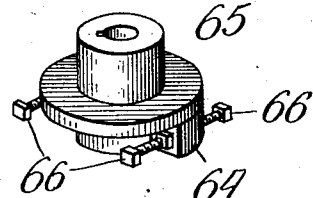


Fig. 17.



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1,012,194.

11 SHEETS—SHEET 9.



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Patented Dec. 19, 1911.

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Fig. 24.

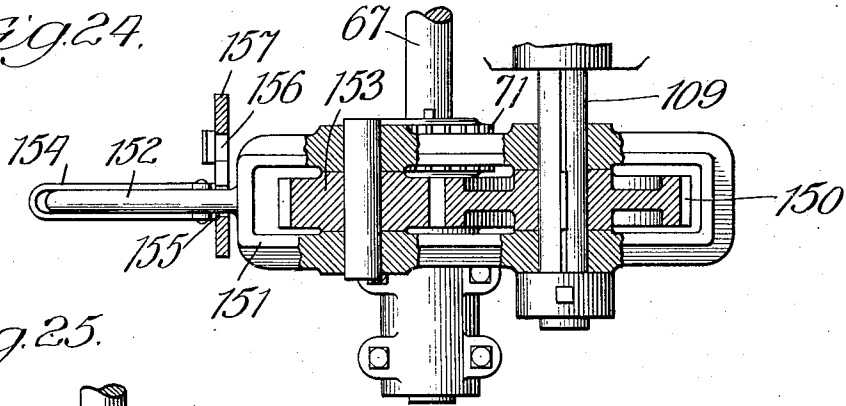


Fig. 25.

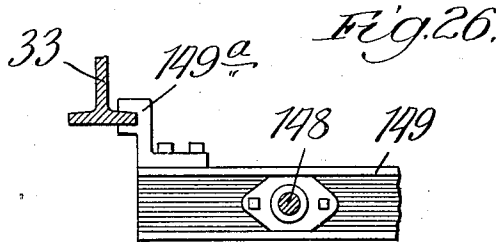
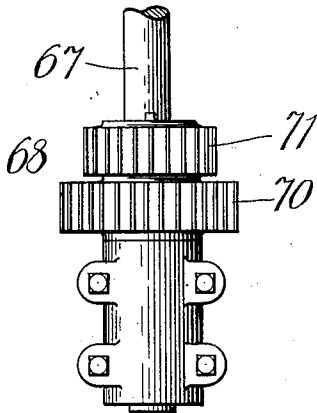


Fig. 28.

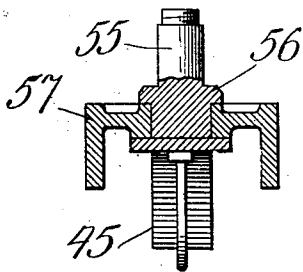
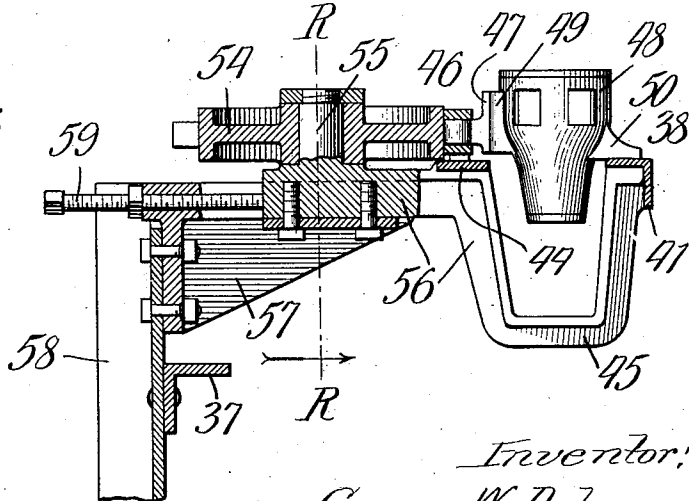


Fig. 27.



Witnesses:
E. J. Clayford.
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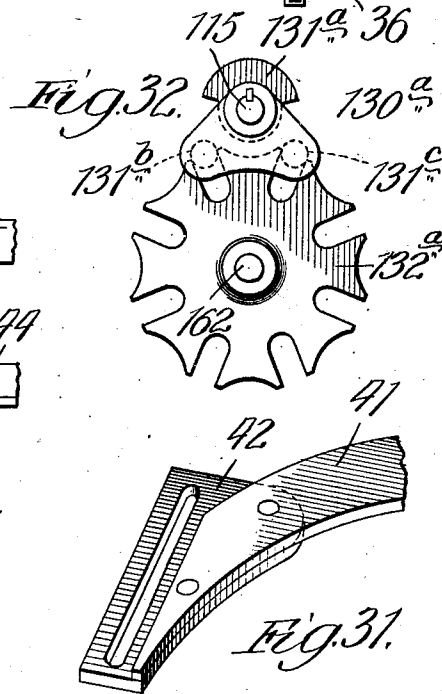
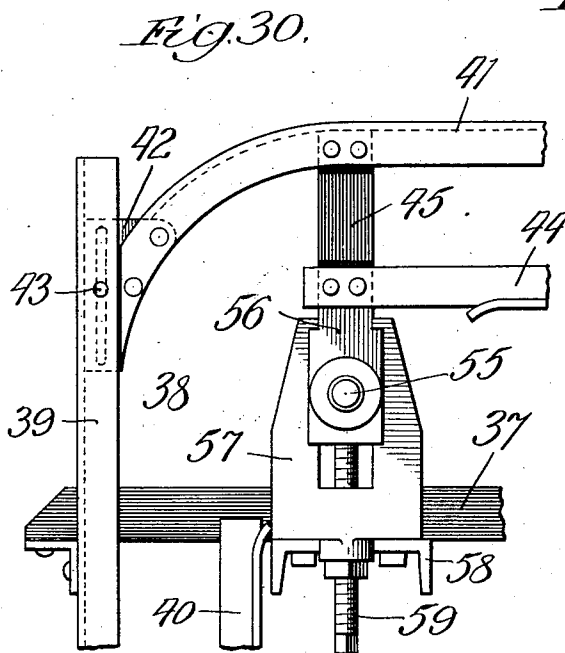
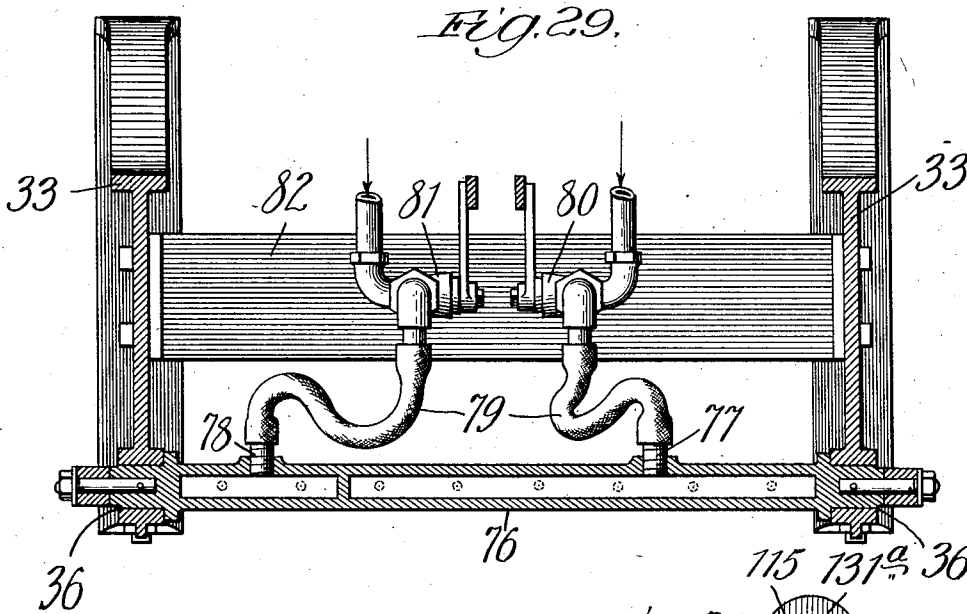
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BOTTLE WASHING MACHINE.
APPLICATION FILED JAN. 9, 1911.

1,012,194.

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11 SHEETS—SHEET 11.



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UNITED STATES PATENT OFFICE.

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BOTTLE-WASHING MACHINE.

1,012,194.

Specification of Letters Patent.

Patented Dec. 19, 1911.

Application filed January 9, 1911. Serial No. 601,572.

To all whom it may concern:

Be it known that I, GEORGE W. DOBSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Bottle-Washing Machines, of which the following is a specification.

My invention relates to an improvement in the class of machines for automatically washing, scouring with brushes, and rinsing bottles and analogous receptacles by jetting them, while supported in inverted position, with the cleansing fluid, the bottles being carried through the machine by a step-by-step motion to properly register them with the jetting-tubes and brushes and arrest them while undergoing the cleansing operations.

Referring to the accompanying drawings—Figure 1 is a view of the machine in end elevation; Fig. 2 is a view of the same regarded from the left-hand side of Fig. 1; Fig. 3 is a plan view of the machine; Figs. 4 and 5 are sections respectively on the lines A—A and B—B, Fig. 2; Fig. 6 is a section on the irregular line C—C, Fig. 2, and Figs. 7 and 8 are sections respectively on the lines D—D and E—E of the same figure, the section line D—D being also shown on Fig. 3; Fig. 9 is a section on the line F—F, Fig. 3 or 6; Figs. 10 and 11 are sections respectively on line G—G, Fig. 9, and the irregular line H—H, Fig. 10, the last-named section-line being also shown on Figs. 3 and 9; Fig. 12 is a face-view of the star-wheel member of a Geneva gear for actuating the bottle-neck-centering cups through which the spindles reciprocate; Fig. 13 is a perspective view of the stud-carrying member of the same, and Fig. 14 is a similar view of the yoke-detail used therewith for the adjustment; Fig. 15 is a perspective view of one member of the drive-chain adjusting means, Fig. 16 is a section on line I—I, Fig. 11, through both members of the last-named means, and Fig. 17 is a perspective view of the other member of said means; Fig. 18 is a broken enlarged section on line J—J, Fig. 2, and Fig. 19 is a similar view on line K—K, same figure; Fig. 20 is a broken section on line L—L, Fig. 19; Fig. 21 is a broken enlarged view in sectional elevation of the lower part of the rotary brush-spindle device shown in Fig. 19; Fig. 22 is a similar view of the upper part of the same, and Fig.

23 is a section on line M—M, Fig. 22; Fig. 24 is an enlarged broken section on line N—N, Fig. 1, and Fig. 25 is a broken view showing certain details of Fig. 24; Fig. 26 is a broken section on line O—O, Fig. 6; Fig. 27 is an enlarged broken section on line P—P, Fig. 3; Fig. 28 is a section on line R—R, Fig. 27; Fig. 29 is a section on the irregular line S—S, Fig. 8; Fig. 30 is a plan view showing a corner-portion of the bottle-holder track and means for adjusting the same and taking up wear in the carrier-chain; Fig. 31 is a broken perspective view showing a feature of the track-corner construction, and Fig. 32 shows a modified construction of the Geneva gear of Figs. 12 and 13.

The general plan of the machine involves an upright frame at one end thereof and a horizontal endless track on a lower frame for the intermittent travel of an endless chain carrying pockets for holding the bottles to be cleaned in inverted position for their successive presentation to the washing-spindles on the upright frame. All the mechanisms for driving the chain, for raising and lowering the bottle-neck centering cups and the spindles which enter the bottles to brush and rinse them, as also for rotating the brushing-spindles and opening and closing the water-supplying valves, and the mechanism for adjusting the rate of travel of the chain and for other adjusting purposes, are supported on the upright frame. The bottles are loaded, neck-downward, into the pockets at one side of the machine and are taken out of them at the opposite side thereof or at any other desired point of the carrier after being cleansed, the action of the machine being to feed them intermittently past the brushes at which they are arrested while the centering-cups are raised to engage their necks, this operation being followed by that of raising into the bottles the water-spraying and brushing spindles, and thereupon succeeded by withdrawing the spindles and lowering the centering-cups to permit the travel of the pocket-carrying chain to be continued.

The vertical frame 32, which forms the head or one end of the machine, comprises two similar side-standards 33 surmounted by a pan-like top 34 and provided about midway between their ends, on their outer edges, with similar vertically-recessed projections

35 forming track-supports, and with vertical slots 36 (Figs. 6 and 20) below the projections for guiding the spindle-carrying cross-head hereinafter described. The track 38, which is of general rectangular shape with rounded corners, is mainly supported on a lower frame 37 and consists of an outer rail 39 composed of an angle-bar with one of its two flat sides uppermost and, uniformly spaced therefrom, an inner rail 40 composed of a plurality of angle-bar sections, with one of the two flat-sides lowermost and extending outwardly to afford a chain-guiding support. The portion of the track which crosses the frame 32 at its outer side extends over and is secured to the projections 35. The outer track-rail 39 is continuous except at its rear ends, or those opposite the head-frame 32. There the straight ends of the outer rail have adjustably connected with them the ends of a rail-section 41 (Figs. 30 and 31) and these ends are curved to form rounded corners like those at the head-end of the machine, each curved portion carrying an outwardly-projecting, longitudinally-slotted flange 42 to lap under the upper side of the angle-rail 39 and receive through a hole therein and the slot in the flange, a bolt 43. The cooperating section 44 of the inner rail 40 is straight, terminating at its ends where the curves on the rail-section 41 begin and where those ends are rigidly connected with the section 41 by depending yokes 45. Each of the other three sides of the inner rail, moreover, is a section, like the section 44, separated from the other sections at the curved corners, where they are rigidly fastened to the frame-work of the machine. The endless chain 46 rides on the inner rail and is provided at uniform intervals, at the inner edges of alternate links, with upwardly-projecting transversely-perforated lugs 47 (Fig. 27), through which rubber-lined downwardly-tapering metal pockets 48, for bottles 53 in inverted position, are riveted at lugs 49 on their sides interlocking with the lugs 47; these pockets being open at both ends and having guide-tongues 50 projecting from the bases of their larger sections diametrically opposite the lugs 47 to ride on the outer rail 39.

The chain is intermittently driven, as hereinafter explained, by a sprocket 51 fitting, to engage with it, in a curved corner of the track, at the opening there provided by the separated ends of the inner rail adjacent to one side of the frame 32, a sprocket 52 similarly engaging the chain in the corresponding track-corner at the opposite side of the head-frame, being an idler. Each of two similar idler-sprockets 54 engaging the chain in the rounded corners formed by the curved ends of the rail-section 41 is journaled on a stud 55 rising from an inwardly-extending horizontal arm 56 on the respec-

tive yoke 45 and supported to ride on a ledge 57 projecting from the upper end of a vertical channel-plate 58 rigidly fastened to the inner side of the end of the frame 37; and a set-screw 59 works in the plate and back of the ledge against the inner end of the yoke-arm 56 to force outwardly the sprockets 54 for taking up any slack in the chain due to wear of the link-and-pivot connections thereof. When this adjustment is required, the bolts 43 are loosened to enable the rail-section 41 to yield correspondingly with the chain-tensioning action, after which the bolts are again tightened.

The driving-sprocket 51 is on the lower end of a shaft 60 journaled in the top 34 to depend therefrom near one of its ends. Above the top this shaft carries a gear 61 (Figs. 11 and 16) on a sleeve 62 having fingers 63 extending diametrically opposite each other from near its upper end to enter recesses 64 in the opposite sides of a head 65, in which set-screws 66 work against opposite sides of the fingers. This device serves for adjusting the pockets to insure centering thereof with relation to the spindles hereinafter described. Thus when, through wear of the chain, such centering becomes inaccurate, by loosening a pair of the set-screws at diagonally opposite sides of the fingers 63 and tightening the others, the shaft 60 is turned to correspondingly turn the sprocket 51 and move the chain with the pockets thereon to the required position of the latter. This device enables the adjustment to be readily effected to a nicety.

A horizontal shaft 67, which may be the main drive shaft, and is then intended to be geared to any suitable motor for driving it, is journaled toward its opposite ends in suitable bearings rising from the top 34 and carries near its outer end the gear-wheel 68 having the two sections 70 and 71 (Fig. 25) of relatively larger and smaller diameters for the speed-varying purpose hereinafter explained. This shaft also carries, at equal intervals apart, three similar miters 72 meshing with corresponding miters 73 on the upper ends of vertical shafts 74 journaled in the top 34 to depend therefrom and carrying on their lower ends, below bearings therefor on the inner side of the frame 32, spindle-rotating cog-wheels 75.

A hollow spindle-carrying cross-head 76 is confined at its ends in the frame-slots 36 to adapt it to be reciprocated vertically therein. This cross-head which is shown (Fig. 29) to be divided into two chambers, is provided on its inner side, near the ends, with nipples 77 and 78, one for each chamber, for connecting with each one end of a flexible tube or hose 79. The opposite ends of the tubes 79 are respectively coupled to valve-devices 80 and 81 (Figs. 5 and 29) supported on a base or cross member 82 of

the frame 32, and which are adapted to be automatically opened and closed as herein-after described. At uniform distances apart, from the upper side of the reciprocating cross-head 76, extend upwardly hollow brush-carrying spindles 84, of which six are provided in the present machine, and two rinsing-spindles 85. Each spindle 84 is a tube provided with diametrically-opposite longitudinal guide-grooves 86 (Fig. 23) in its outer surface, a head on its lower end at which it is rotatably confined in a stuffing-box 83 (Fig. 21), and a thread on its upper end upon which to screw a brush-device 87. Each brush-spindle works through a reciprocating sleeve 88 terminating at its upper end in a head 89 and containing in its bore opposite inwardly-projecting guide-lugs 90 to enter the spindle-grooves 86. A stationary cross-bar 91 extends between the side-members of the vertical frame at the projections 35 thereof and has formed in it a series of vertical bearing-sleeves 92, one for each brush-spindle, provided with an opening through the rear section of its wall, and a similar one for each rinsing-spindle unprovided with such opening. In the brush-spindle bearings 92 the reciprocating sleeves 88 are surrounded by pinions 93 (Figs. 19 and 22) confined therein between bushings, as shown against up-and-down movement and engaging with the sleeves 88 to cause rotation of the pinions to rotate the brush-spindles. As will be seen, by regarding Fig. 23, the sleeve-extension of the pinion 93 is feathered internally to engage it with longitudinal grooves in the sleeve 88. The two rinsing-spindles 85 are merely reciprocated by the cross-head, while the brushing-spindles are both reciprocated thereby and axially rotated, their rotation being caused by engagement with the pinions 93 on two of each pair thereof, of one of the cog-wheels 75, whereby the gear-connection between the drive-shaft and brushing-spindles rotates the latter constantly. Guide-pins 96 (Figs. 8 and 18) extend vertically through the outer-edge portion of the cross-bar 91 in horizontal line with the bearings 92. Each pin 96 forms a guide for a vertically-movable spring-pressed yoke 97 consisting of an upright back-bar 98 of general I-shape with eyes 99 formed in the opposite ends of each of its heads (Figs. 18 to 20), the inner alining eyes surrounding these guide-pins and having arms 100 extending inwardly and inclinedly from them and terminating in centering-cups 101 for the bottle-necks registering with the upper ends of the reciprocating sleeves, the heads of which latter are rotatably confined in the base-portions of the cups to move therewith. The alining eyes 99 in the opposite, outer ends of these yoke-heads surround, as guides, posts 102 rising from the upper side

of a vertically-reciprocating cross-head 103 having link-arms 104 on its opposite ends, by which to actuate it as hereinafter described, each post being surrounded by a spiral spring 105 confined endwise between the upper head of the respective yoke and a lower collar 106 secured about the respective post, whereby in raising the cross-head the springs are compressed. Adjacent to each guide-pin 96 near a brush-spindle is shown rising from the stationary cross-bar a supplemental guide-pin 107 to be surrounded by the eye in a horizontal lateral extension 108 of the upper head of each yoke to resist any tendency in the yoke to turn.

A shaft 109 is journaled in bearings on the top 34 to extend parallel with the shaft 67 and carries on its inner end a pinion 110 meshing with a cog-wheel 111 on a stub-shaft 112, which also carries a pinion 113 meshing with a cog-wheel 114 on the adjacent end of a rotary shaft 115. The last-named shaft, which is journaled in suitable bearings on the top 34 to extend horizontally in a higher plane than that of the shafts 67 and 109, carries adjacent to one bearing an eccentric 116 having the lower end of its rod 117 adjustably connected with a crank-arm 118 extending from a rock-shaft 119 journaled in the opposite frame-standards 33 and carrying on its projecting ends arms 120 provided with counterbalancing weights 121 on their inner ends and linked at their outer ends to the ends of the cross-head 76. The action of the eccentric, by rotation of the shaft 115, is to constantly rock the shaft 119 and thereby reciprocate the cross-head with the spindles thereon, while that of the shaft 67 is to drive the vertical shafts 74 and gears 75 for constantly rotating the brush-spindles. The shaft 115 also carries, about centrally between its ends, a miter 122 meshing with a similar miter 123 on a vertical stub-shaft 124 journaled in a bearing rising from the top 34, this stub-shaft carrying the stud-member 126 of a Geneva gear 125, the star-wheel member 127 of which is on a vertical stub-shaft 128 journaled in a bearing rising from the frame-top and carrying a cog-wheel 129 larger than and meshing with the pinion 61 on the shaft 60 of the driving-sprocket 51. Thus each rotation of the shaft 115, after reciprocating the spindles and while they are in their lowered positions, actuates the gear 125 to move the chain and bottle-pockets thereon one step. The shaft 115 furthermore carries, on its outer end, (Figs. 6 and 9) the stud-member 131 of a second Geneva gear 130, the star-wheel member 132 of which, with a cog-wheel 133 on its inner face, is rotatably supported on a fixed bearing 134 formed on the lower part of the adjacent bearing for the shaft 115. The cog 133 meshes with a pinion 135 on

the outer end of a short shaft 136, which is journaled in an elongated bearing 137 on the under side of the top 34 and is connected from a crank on its inner end, by a link-rod 138, with a crank-arm 139 on the adjacent end of a rock-shaft 140 journaled in the frame-members 33 near the recessed projections thereon and having crank-arms 141 extending from it near its ends and connected with the links 104 on the opposite ends of the cross-head 103 which carries the spring-pressed cup-carrying yokes 97. In each rotation of the shaft 115, therefore, the Geneva drive 130 thereon actuates the rock-shaft 140 to raise the cups 101 for centering the bottle-necks relative to the spindles, and hold them there temporarily before lowering them; the incidental compression of the springs 105 serving to cause the cups to bear truly but yieldingly against the bottle-necks.

The relative timing of the actuating parts is such as to cause each intermittent movement of the endless carrier to bring a succession of bottles in its pockets with their necks into coincidence with the cups 101, each such movement, under the action of the driver 125, being sufficient to shift a bottle past one cup to the next-but-one in the cup-series, whereby two bottles at a time may be initially scoured by successive brush-spindles; of course, though, the movement may be provided to bring each bottle to each of successive cups or to skip more than one cup. In each interval of the carrier-movement, the cups are thus raised, whereupon the action of the eccentric 116 raises the spindles through the cups into the presented bottles and lowers them after they have acted momentarily in the bottles, the lowering of the spindles out of the bottles being succeeded and partway accompanied by the withdrawal of the cups under the action of the Geneva-device 130 to permit the next movement of the bottles, which, thereupon ensues under the action of the Geneva-device 125 upon the shaft 60. The rock-shaft 119 has extending from it arms 142 (Fig. 8) which are connected with crank-handles (Fig. 29) shown on the stems of the valves 80 and 81, whereby with each turn of the rock-shaft to raise the spindles, the valves are opened to the supply of cleansing water, which is under pressure from any suitable source (not shown) connected with the valve devices; and the latter are closed to shut off the flow by the opposite turn of the rock-shaft. The flow to the cross-head 76, from the valve 80 supplies the six brushing-spindles, while that to the valve 81 supplies only the two rinsing-spindles, whereby the pressure to the latter is dissipated less and is therefore more forcible in its rinsing action.

As the bottles acted upon clear the cleansing mechanism on the frame 32, and arrive on one side of the machine, they are taken

out of the pockets by an attendant; while another attendant loads other bottles to be cleansed into the pockets at the opposite side of the machine.

For any "run" of the machine all the bottles to be handled by it through that run should be of the same or approximately the same size. The apparatus is adapted, however, to be set for runs on different-sized bottles. Adjustable means for this purpose are provided on the outer side of the top 34 and are shown to comprise, as a preferred construction, vertical bearings 143 in which are confined rotatable nuts 144 carrying on their lower ends sprockets 145 connected by an endless chain 146, one of these nuts carrying a hand-wheel 147; and posts 148, provided with threaded upper-end portions, which extend through the nuts, depend therefrom over the path of the pockets and carry on their lower ends, to extend lengthwise over the series of centering-cups, a stop-bar 149, shown of channel-form, to present an abutment to the bottoms of the bottles undergoing the cleansing operations. With the rise of the centering cups, in engaging the bottle-necks, they tend to raise and thus displace the bottles, but this is prevented by the latter abutting against the stop-bar, which may be adjusted to admit below it any length of bottle by turning the hand-wheel to work the posts in the nuts and thus raise and lower the bar. To resist any tendency of the bar 149 to get out of the true line in raising and lowering it, guides 149^a (Fig. 26) are extended from its opposite end-portions into embracing engagement with vertical flange-portions of the frame-members 33.

The speed of the shaft 109, which more immediately drives the endless bottle-carrier and actuates the spindles and centering-cups, should be variable for adapting the machine to different capacities in the number of bottles to be cleansed in a day or run, while the speed of rotation of the shaft 67, which immediately rotates the brushing-spindles, may be constant. For rotating the shaft 109, it carries a cog-wheel 150 to engage through the idler 153 with one or the other of the two sections 70 or 71, of different diameters, of the gear 68 on the shaft 67, to be rotated at relatively-slow speed by meshing with the section 70 and at faster speed by meshing with the section 71. To effect this variation, the gear 150 is longitudinally movable on the shaft 109 and is confined between the arms of a yoke 151 journaled and longitudinally shiftable on that shaft, the yoke terminating at its outer end in a handle 152 and having journaled in it, adjacent to the handle, the idler-pinion 153 permanently meshing with the gear 150 and engageable with either gear-section 70 or 71. By raising the yoke and forcing it laterally

to shift the gear 150 and pinion 151, the latter may be brought into mesh with either of the said gear-sections; and to lock the yoke in each position of its adjustment, its handle is equipped with a spring-pressed pawl 154 to engage with recesses 155 and 156, respectively coinciding with the gear-sections 70 and 71, in a head 157 rising in proper position on the frame 32.

10 If desired, as indicated in Figs. 1 and 3, the shaft 109 may be the drive-shaft of the machine, to be driven, by a suitable motor (not shown), through the medium of a shaft 158 carrying a beveled gear 159 meshing
15 with a similar gear 160 on the shaft 109.

It is desirable to provide for adjusting the Geneva-gear 130 to regulate the timing of the rise of the centering-cups; and means for the purpose are shown in Figs. 6, 13 and

20 14. A finger 162 projects from the outer face of the stud-member 131 and extends between the arms of a yoke 161 secured on the outer end of the shaft 115 and carrying set-screws 163. By loosening one of these set-screws and tightening the other against the
25 finger, the member 131 will be turned to engage its stud sooner or later with the star-wheel member 132 to actuate it and, therefore, the rock-shaft 140 and cross-head 103
30 accordingly.

The so-called Geneva gear 130 for rocking the shaft 140 to reciprocate the centering-cups is found, in the practical operation of the machine of this application, to operate
35 imperfectly, under certain relative conditions of the several movements therein, by too speedily reciprocating the cups to properly time their action. For the purpose of slowing the action a modified form of that
40 gear is provided; and it is illustrated in Fig. 32. The modification of this device, which is denoted as a whole by the reference-character 130^a, consists in duplicating the number of equidistant radial slots in the
45 star-wheel member 132^a and making them shallower than in the form of the corresponding member 132, and providing the co-operating stud-member 131^a with two studs 131^b and 131^c to extend from it in such rela-
50 tion to the member 132^a that in each rotation of the stud-member its two studs will engage successively with successive slots in the star-wheel member to turn the latter twice in order to cause it to make its re-
55 quired quarter revolution with two impelling motions, instead of one, and reduce the speed of turning accordingly.

What I claim as new and desire to secure by Letters Patent, is—

60 1. In a bottle-cleansing machine, the combination with a frame, of an endless carrier for bottles supported to travel above said frame and provided with pockets adapted to receive bottles in inverted position, said
65 pockets being in fixed relation to the plane

of the traverse of the carrier, a series of vertically-reciprocable centering-cups for the necks of the bottles, a vertically-reciprocable cross-head connected with said cups to actuate the same, means for positively reciprocating said cups comprising a rock-shaft
70 connected with said cross-head and driving-mechanism for rocking said shaft to reciprocate the cross-head, and means for causing said centering-cup actuating means to op-
75 erate in timed relation with the traverse of the bottle-receiving pocket carrier.

2. In a bottle-cleansing machine, the combination with a frame, of an endless carrier for bottles supported to travel above said
80 frame and provided with pockets adapted to receive bottles in inverted position, said pockets being in fixed relation to the plane of the traverse of the carrier, a series of vertically-reciprocable centering-cups for
85 the necks of the bottles, a vertically-reciprocable cross-head having spring pressed connections with said cups to reciprocate them, means for positively reciprocating said cups comprising a rock-shaft connected with
90 said cross-head, driving-mechanism for rocking said shaft to reciprocate the cross-head, and means for causing said centering-cup actuating means to operate in timed relation with the traverse of the bottle-receiv-
95 ing pocket carrier.

3. In a bottle-cleansing machine, the combination with a frame, of an endless carrier for bottles supported to travel above said
100 frame and provided with pockets adapted to receive bottles in inverted position, said pockets being in fixed relation to the plane of the traverse of the carrier, a series of vertically-reciprocable centering-cups for
105 the necks of the bottles, a series of vertically reciprocable fluid-conducting spindles, and reciprocating and rotatory brushing-spindles, working through said cups, a vertically reciprocable cross-head having connec-
110 tions with said cups and spindles to actuate the same, means for rotating the brushing spindles, means for positively reciprocating said centering cups comprising a rock-shaft connected with said cross-head, driving
115 mechanism for rocking said shaft to reciprocate the cross-head, and means for operating the centering cup and spindle actuating means successively one with the other and in timed relation with the traverse of the bottle-receiving pocket carrier.
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4. In a bottle-cleansing machine, the combination with a frame, of an endless carrier for bottles supported to travel above said
125 frame and provided with pockets adapted to receive bottles in inverted position, said bottles being in fixed relation to the plane of the traverse of the carrier, a series of vertically-reciprocable centering-cups for the necks of the bottles, a series of vertically reciprocable fluid-conducting spindles, and
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reciprocating and rotatory brushing-spindles, working through said cups, a hollow vertically reciprocable cross-head having connections with said cups and spindles to
 5 actuate the same, valve-mechanism for supplying cleansing fluid to said cross-head and opened and closed by the movement thereof, means for rotating the brushing
 10 spindles, means for positively reciprocating said centering cups comprising a rock-shaft connected with said cross-head, driving mechanism for rocking said shaft to reciprocate the cross-head, and means for operating the centering cup and spindle actuating means successively one with the other
 15 and in timed relation with the traverse of the bottle-receiving pocket carrier.

5. In a bottle-cleansing machine, the combination of an upright frame, a vertically-reciprocating cross-head working on said frame and carrying upright posts, a series of centering-cups having spring-pressed connections with said posts, a vertically-reciprocating hollow cross-head working on
 25 said frame, a series of fluid-conducting spindles rising from the hollow cross-head to work through said cups, means for reciprocating the hollow cross-head to raise it succeeding the rise of said cups and lower it prior to lowering them, all said means being supported on said frame, a second frame extending from the upright frame, a pocket-equipped endless carrier for bottles in inverted position supported to travel on said
 35 second frame and traverse the cup-series and present the pockets successively into registration therewith, said pockets being in fixed relation to the plane of the traverse of the carrier, and means for intermittently driving the carrier in alternation with the descent of said hollow cross-head and cups.
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6. In a bottle-cleansing machine, the combination of an upright frame, a series of alining vertically-reciprocable fluid-conducting spindles supported on said frame, means on said frame for reciprocating said spindles, a second frame extending from the upright frame, a horizontal track on said second frame crossing the upright frame
 50 over and along said spindle-series and comprising a generally-rectangular structure having rounded corners and formed of an outer rail provided with an adjustable end-section and an inner sectional rail, a pocket-equipped endless chain riding on said track, sprockets engaging the chain, means on the upright frame connected with one of said sprockets for actuating it intermittently to drive said chain in alternation with the descent of said spindles, and sprocket-carrying adjusting devices connecting the said end-sections of the outer track and corresponding section of the inner track for moving said end-section to take up wear
 65 on the chain.

7. In a bottle-cleansing machine, the combination with an upright frame carrying vertically-reciprocable fluid-conducting spindles and means for reciprocating them, of a second frame extending from the upright frame, a horizontal track on said second frame formed of spaced outer and inner rails with a movable end-section in the outer rail, yokes movably connecting said end-section with the adjacent inner-rail section and provided with sprocket-bearings, sprockets on said bearings and sprockets on the upright frame, set-screws engaging said sprocket-bearings, a pocket-equipped endless chain riding on said track and engaged by said sprockets, and means on the upright frame connected with one of said sprockets thereon for driving the chain intermittently in alternation with the descent of said spindles.
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8. In a bottle-cleansing machine, the combination of an upright frame and, supported thereon, a vertically-reciprocable cross-head with a series of alining water-conducting spindles extending upwardly from it, a series of vertically-reciprocating centering cups extending above and in registration with said spindles, a vertically-reciprocable cross-head connected with said cups to actuate them, and driving mechanism including a rock-shaft connected with the hollow cross-head to reciprocate it, an eccentric connected with said rock-shaft to actuate it, a second rock-shaft connected with said cup-actuating cross-head to reciprocate it, a Geneva gear connected with said second rock-shaft to actuate it, and a second Geneva gear, a second frame extending from the upright frame, a track on the second frame, an endless pocket-carrying chain riding on said track to move lengthwise over said cup-series, and sprockets engaging said chain, one of said sprockets being connected with said second Geneva gear for driving the chain intermittently in alternation with the descent of said spindles and cups.
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9. In a bottle-cleaning machine, the combination of a frame carrying a series of alining vertically-reciprocable fluid-conducting spindles and driving-mechanism therefor, a second track-carrying frame with an endless pocket-equipped chain riding thereon to traverse the upper ends of said spindles, a sprocket engaging the chain to drive it, a vertical shaft carrying said sprocket on one end and geared to said driving-mechanism to be actuated intermittently in alternation with the descent of said spindles, and means on said shaft for turning it to move the chain and thereby adjust the registration of the pockets therein relative to the spindles.
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10. In a bottle-cleansing machine, the combination of a frame carrying a series of alining vertically-reciprocable fluid-con-
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ducting spindles and driving mechanism therefor, a second track-carrying frame, an endless pocket-equipped chain riding on the track to traverse the upper ends of said
 5 spindles, a sprocket engaging the chain to drive it, a vertical shaft carrying said sprocket on one end and geared to said driving-mechanism to be actuated intermit-
 10 tently in alternation with the descent of said spindles, a recessed head on the upper end of said shaft, a finger extending on the shaft into a recess of said head, and set-
 screws working against the opposite sides of said finger, for the purpose set forth.

11. In a bottle-cleansing machine, the combination of a frame carrying a series of
 15 alining vertically-reciprocable fluid-conducting spindles and driving-mechanism therefor, a second track-carrying frame, an
 20 endless pocket-equipped chain riding on the track to traverse the upper ends of said spindles, a sprocket engaging the chain to drive it, a vertical shaft carrying said
 25 sprocket on one end and geared to said driving-mechanism to be actuated intermittently in alternation with the descent of said
 spindles, a head on the upper end of said shaft provided with recesses, fingers extend-
 30 ing on the shaft into said recesses, and set screws working in the head against said
 fingers, for the purpose set forth.

12. In a bottle-cleansing machine, the combination of a frame carrying a series of
 35 vertically-reciprocable centering-cups for the necks of inverted bottles, a vertically-reciprocable cross-head connected with said
 cups to actuate them, a rock-shaft connected with said cross-head to reciprocate it, driv-
 40 ing-mechanism for rocking said shaft, including a Geneva gear, and means on the stud-member of said gear for timing its en-
 gagement with the companion-member thereof, for the purpose set forth.

13. In a bottle-cleansing machine, the combination of a frame carrying a series of
 45 vertically-reciprocable centering-cups for the necks of inverted bottles, a vertically-reciprocable cross-head connected with said
 cups to actuate them, a rock-shaft connected
 50 with said cross-head to reciprocate it, driv-

ing-mechanism for rocking said shaft, including a Geneva gear, a finger extending from the stud-member of said gear, and a yoke on the shaft of said member embracing
 55 said finger and carrying set-screws working against opposite sides thereof, for the purpose set forth.

14. In a bottle-cleansing machine employ-
 ing a vertically-reciprocable and axially ro-
 60 tatable fluid-conducting spindle, in combination with said spindle, a drive-shaft geared thereto to rotate it, reciprocating
 mechanism for the spindle including a second shaft, and means for actuating said second
 65 shaft by said drive-shaft and varying the speed of said reciprocating mechanism, comprising a gear wheel on said drive-shaft
 formed of sections of different diameters, a gear-wheel movable on said second shaft
 70 lengthwise thereof, and a yoke movable thereon and embracing said movable gear, an idler-gear journaled on the yoke to mesh
 with said movable gear and with either gear-section, and means for locking the yoke
 75 in adjusted position.

15. In a bottle-cleansing machine employ-
 ing a vertically-reciprocable and axially ro-
 80 tatable fluid-conducting spindle, in combination with said spindle a drive-shaft geared thereto to rotate it, reciprocating
 mechanism for the spindle including a second shaft, and means for actuating said
 85 second shaft from said drive-shaft and varying the speed of said reciprocating mechanism, comprising a gear-wheel on said drive-
 shaft formed of sections of different diameters, a gear-wheel movable on said shaft
 90 lengthwise thereof and a handle-equipped yoke movable thereon and embracing said movable gear, an idler-gear journaled on
 the yoke to mesh with said movable gear and with either gear-section, a stationary
 95 locking head adjacent to the yoke, and a pawl on the yoke-handle releasably engage-
 able with said head to lock the yoke in ad-
 justed position.

GEORGE W. DOBSON.

In the presence of—
 R. A. RAYMOND,
 A. C. FISCHER.