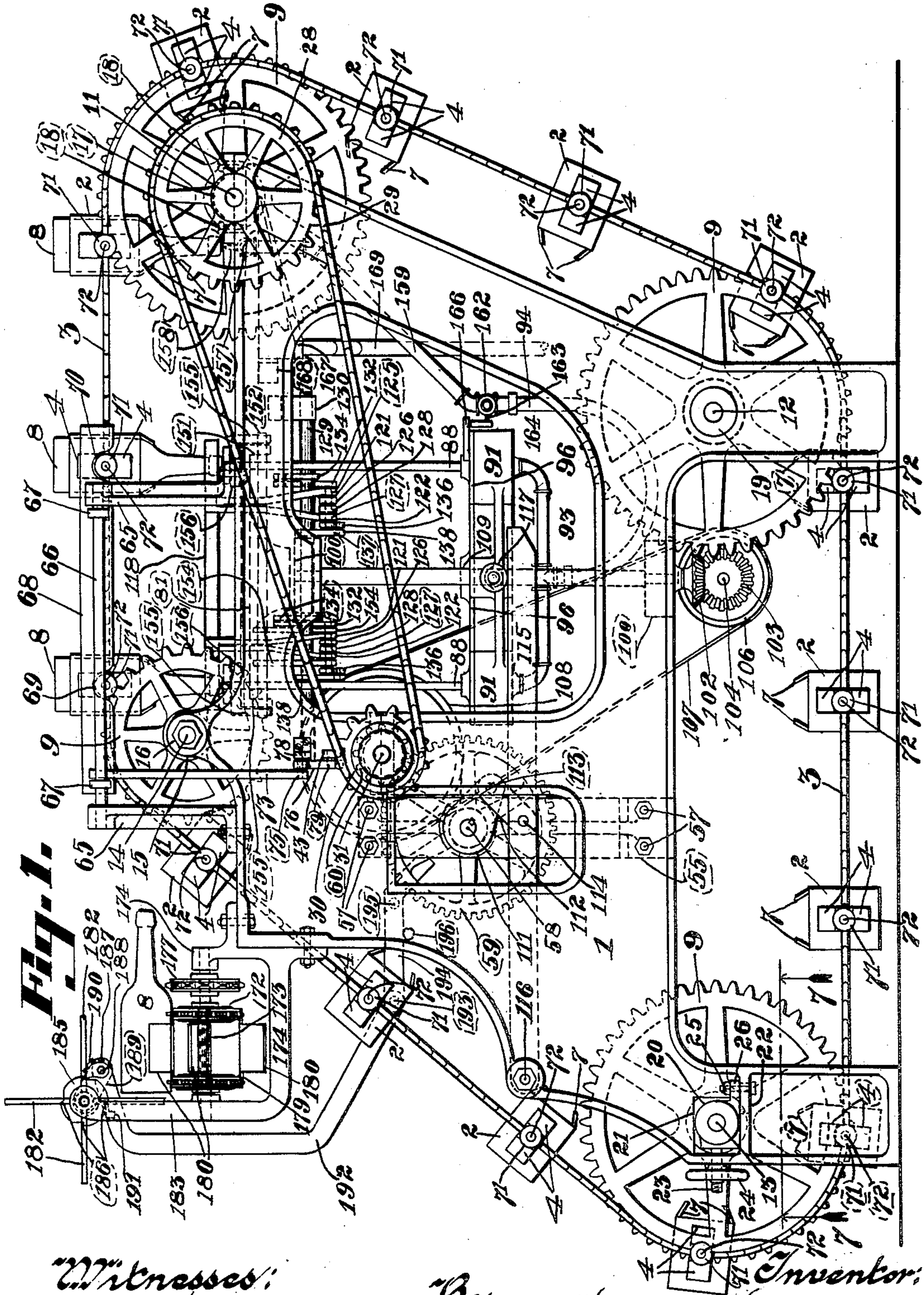


H. KRAUSE.
BOTTLE WASHER.
APPLICATION FILED JULY 5, 1910.

999,042.

Patented July 25, 1911.

8 SHEETS—SHEET 1.



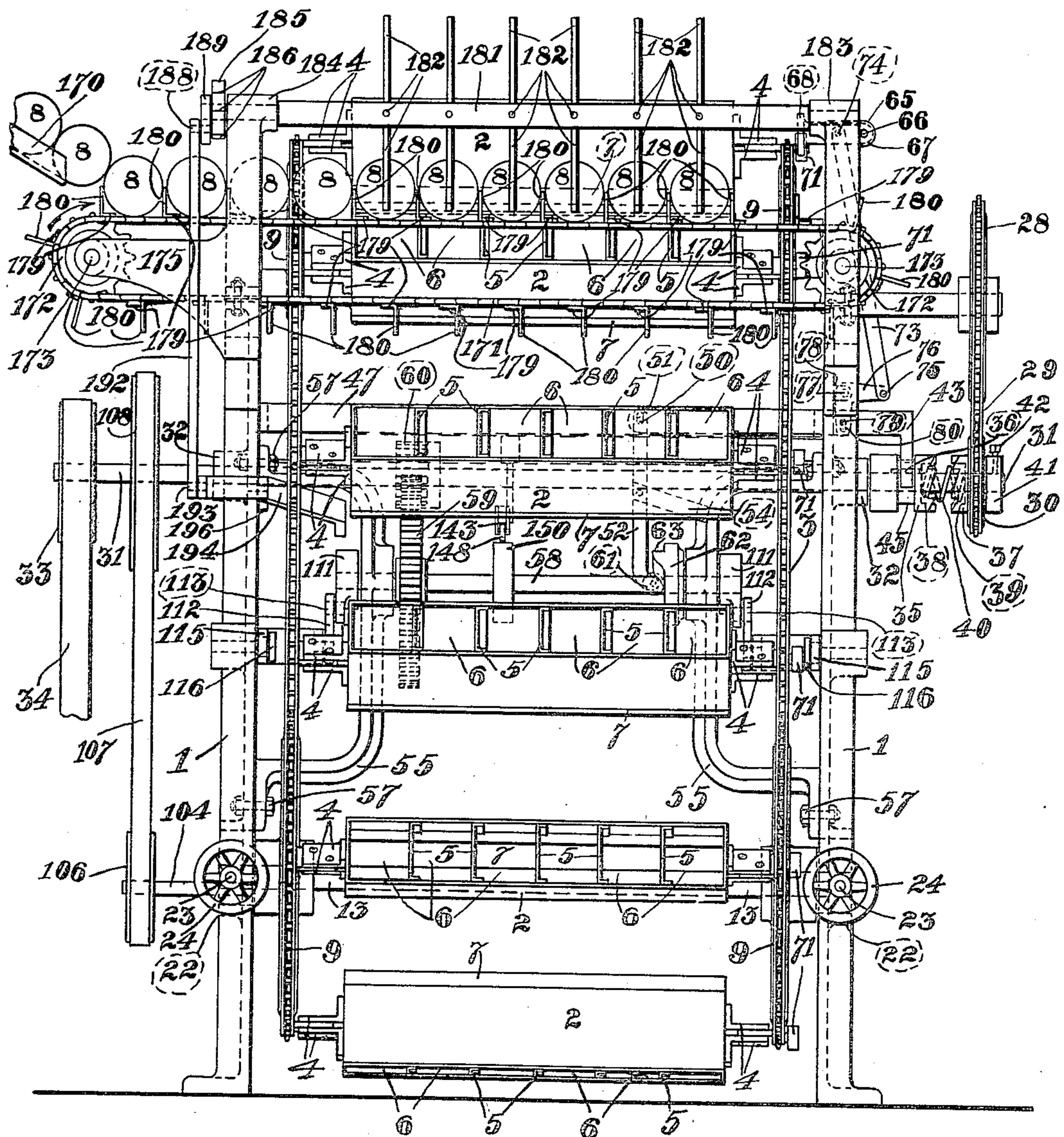
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APPLICATION FILED JULY 5, 1910.

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Fig. 2.



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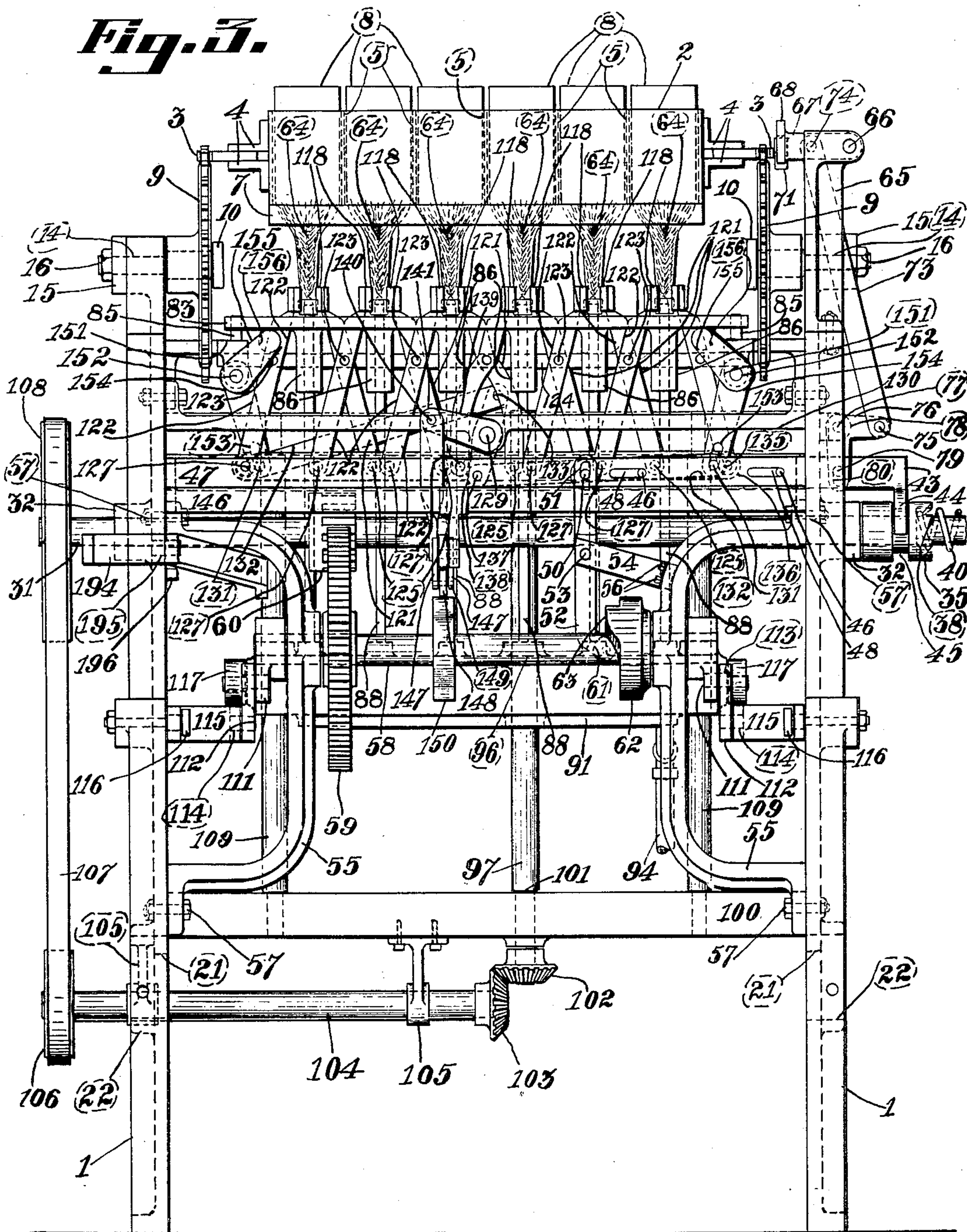
H. KRAUSE.
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8 SHEETS—SHEET 3.

999,042.



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8 SHEETS--SHEET 4.

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8 SHEETS—SHEET 5.

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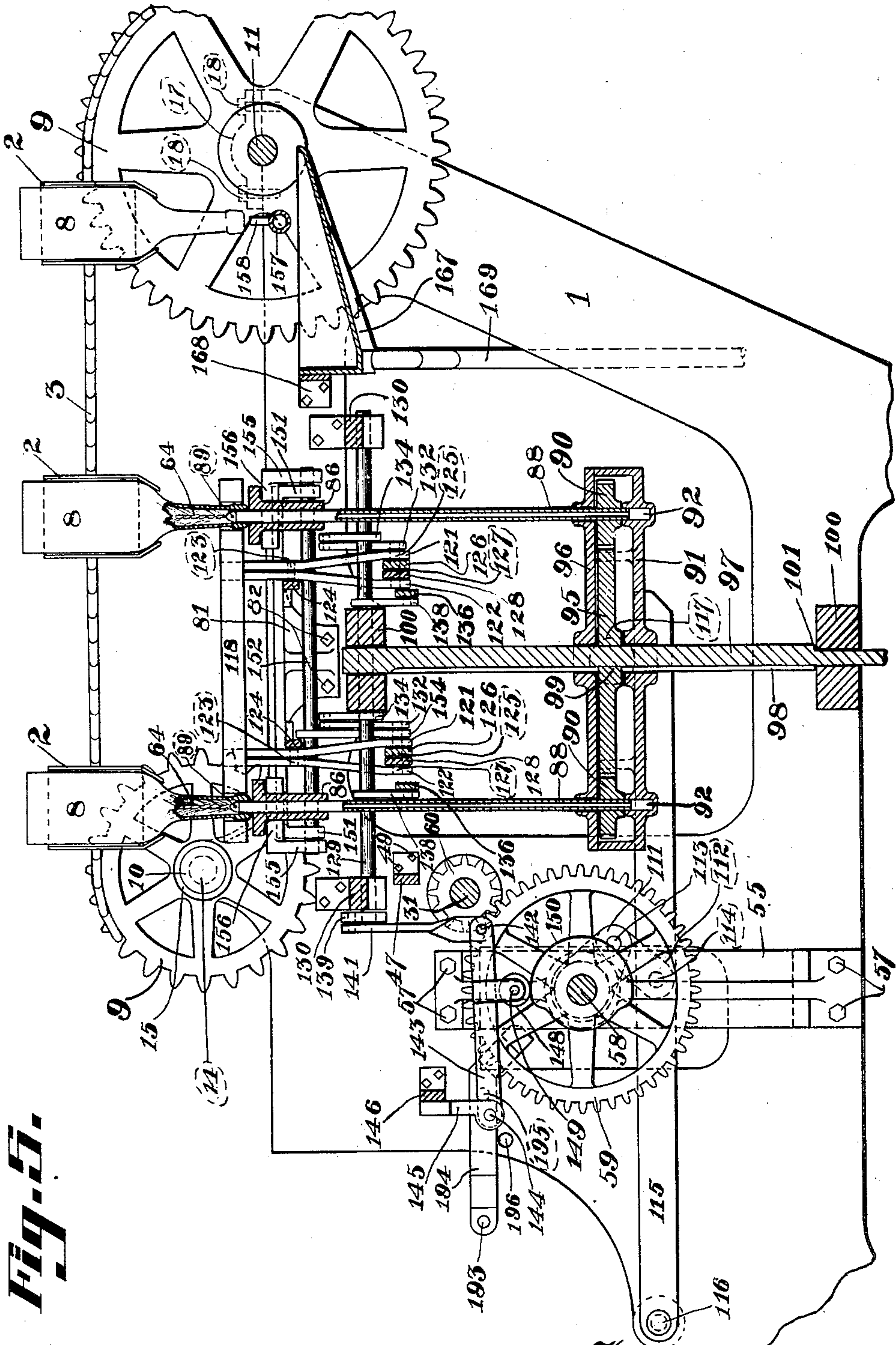


Fig. 5.

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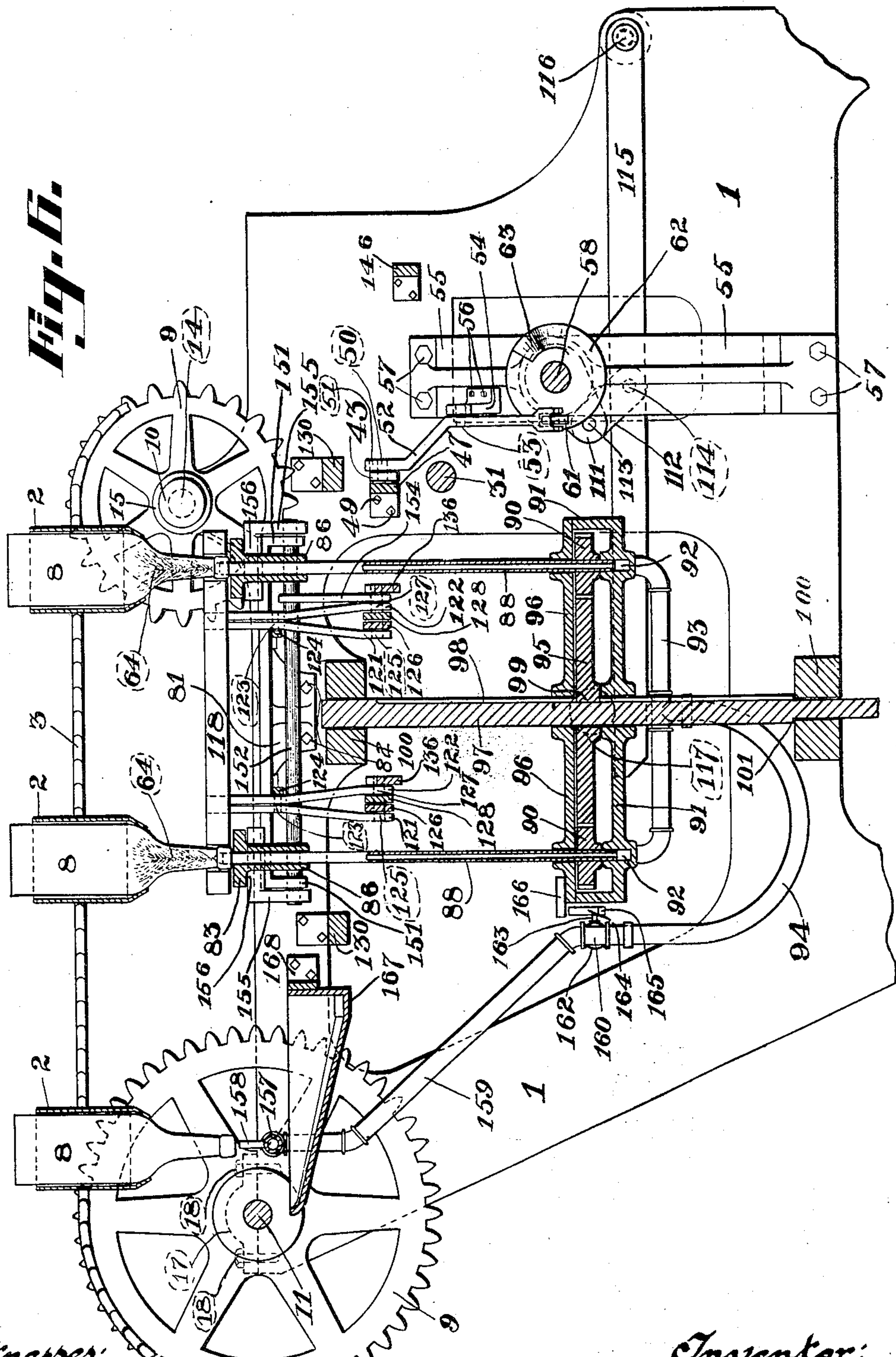
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APPLICATION FILED JULY 5, 1910.

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8 SHEETS—SHEET 6.



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Patented July 25, 1911.

8 SHEETS—SHEET 7.

999,042.

Fig. 7.

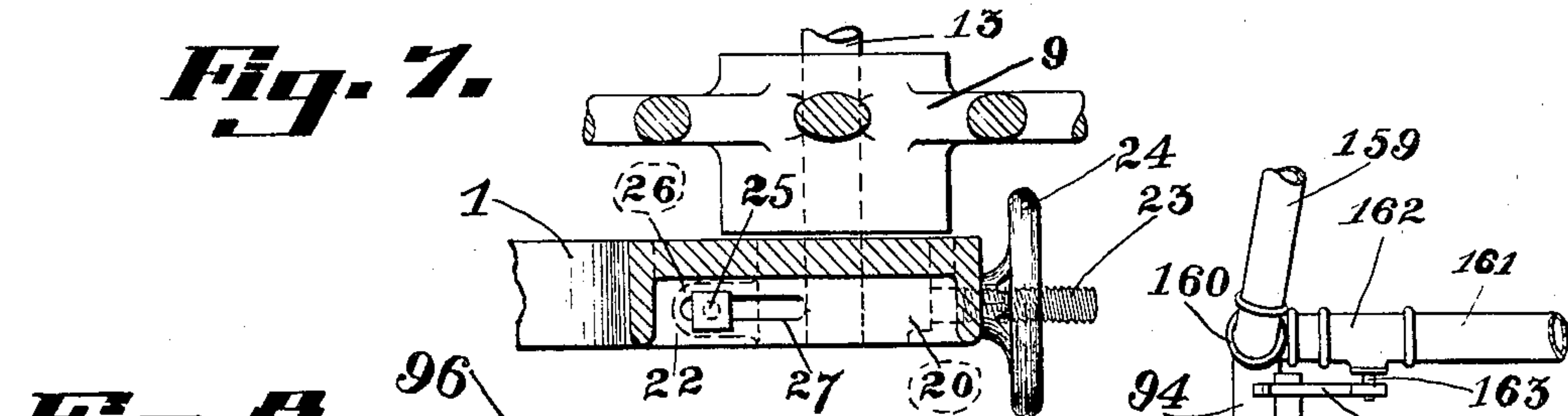


Fig. 8.

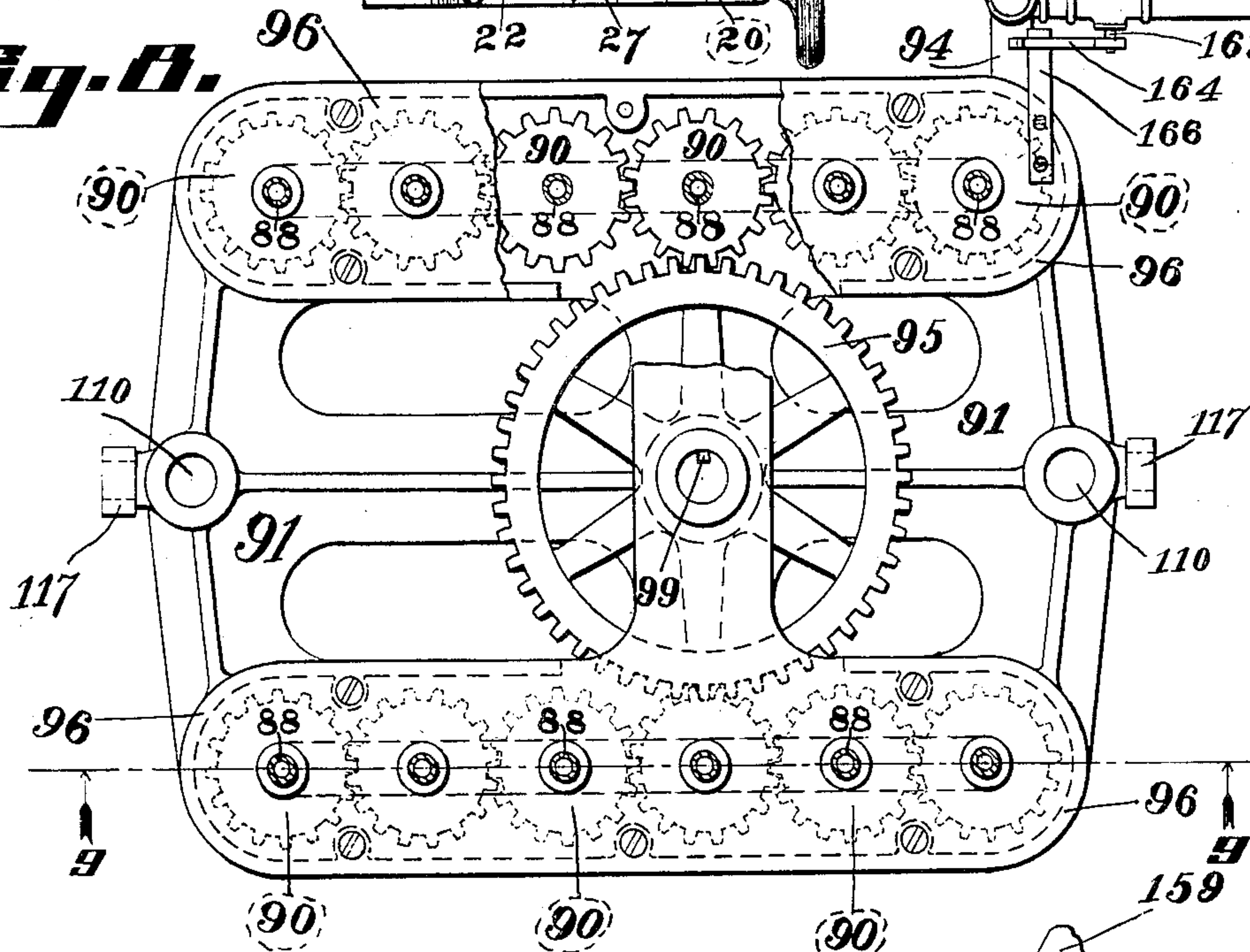
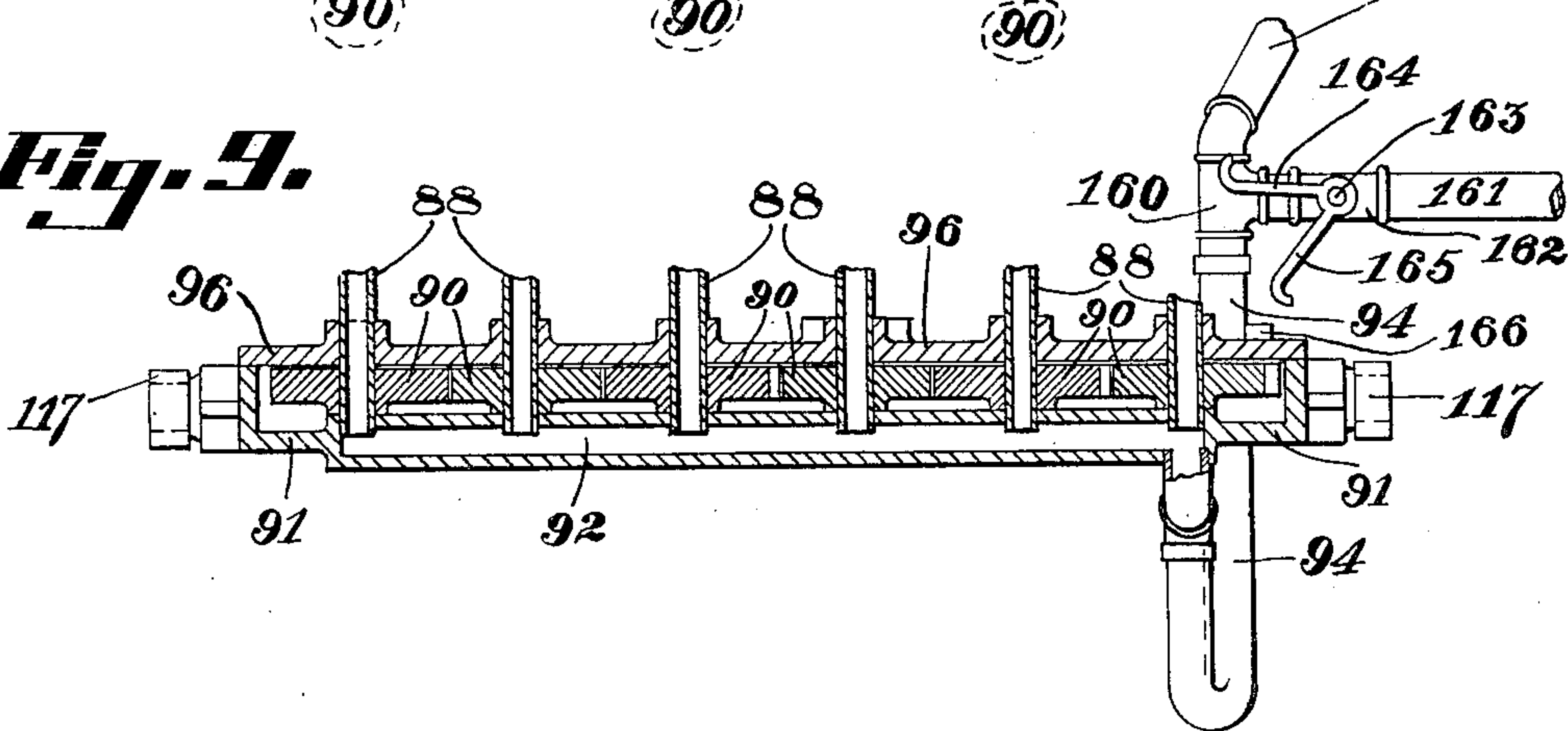


Fig. 9.



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999,042.

8 SHEETS—SHEET 8.

Fig. 14.

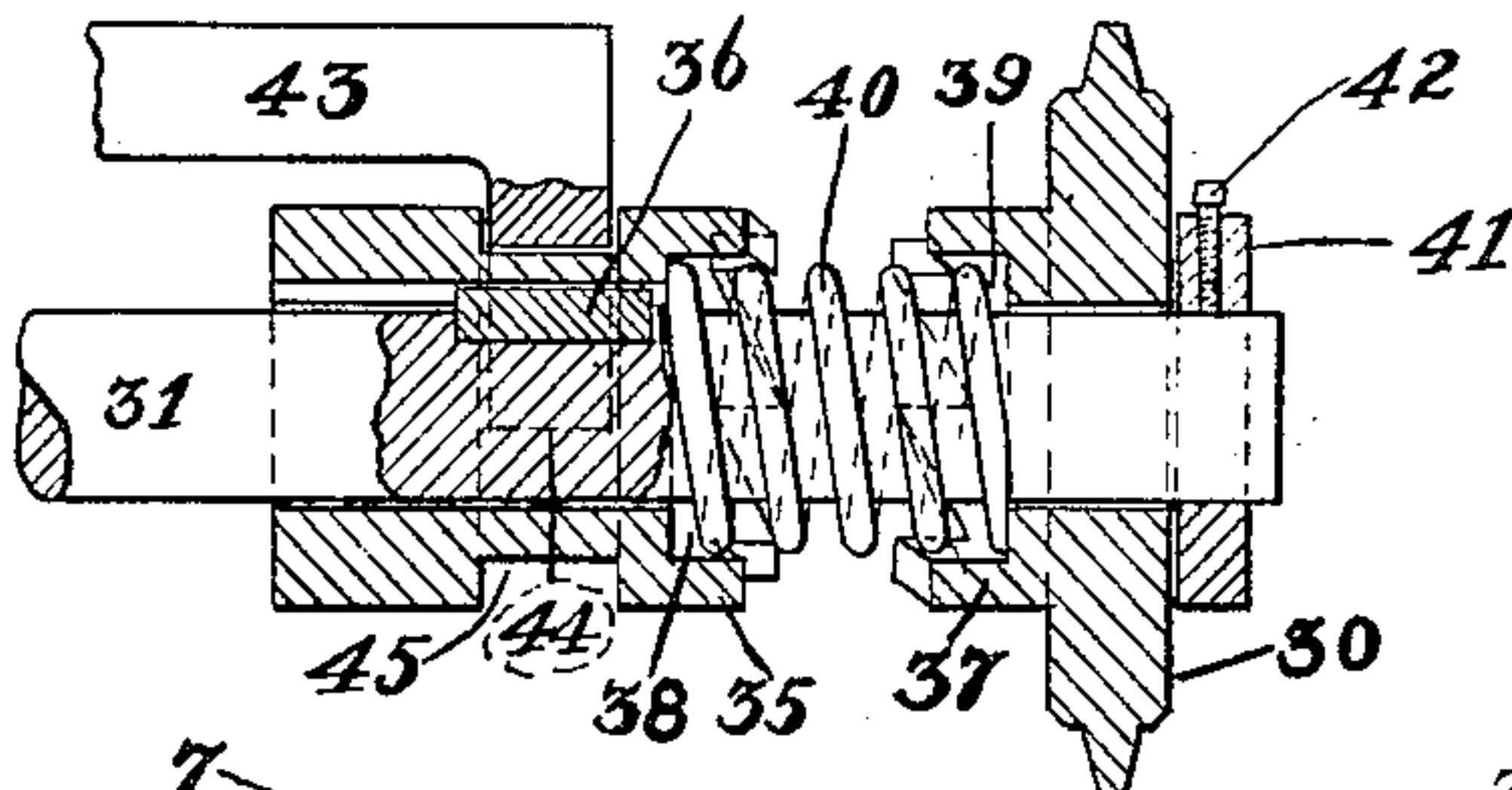


Fig. 10.

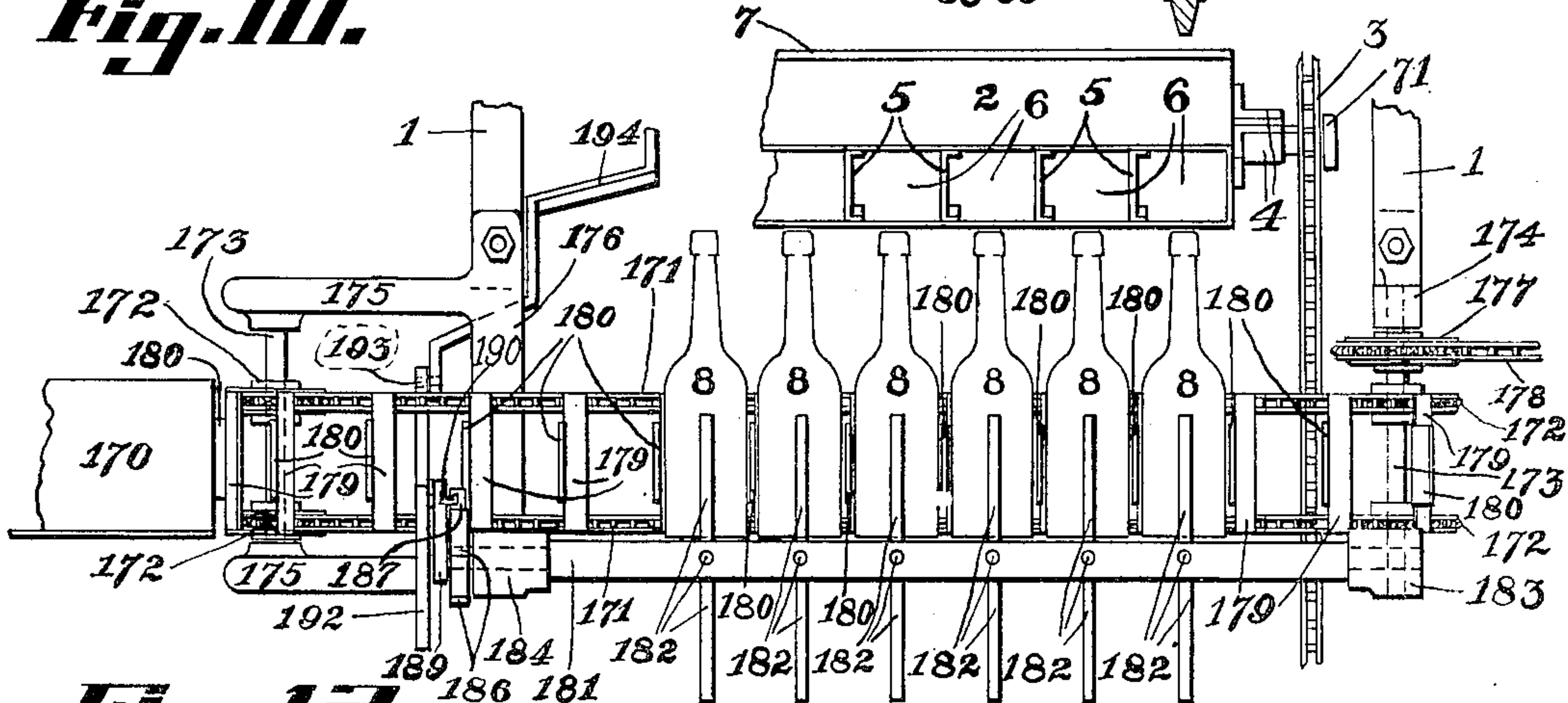


Fig. 12.

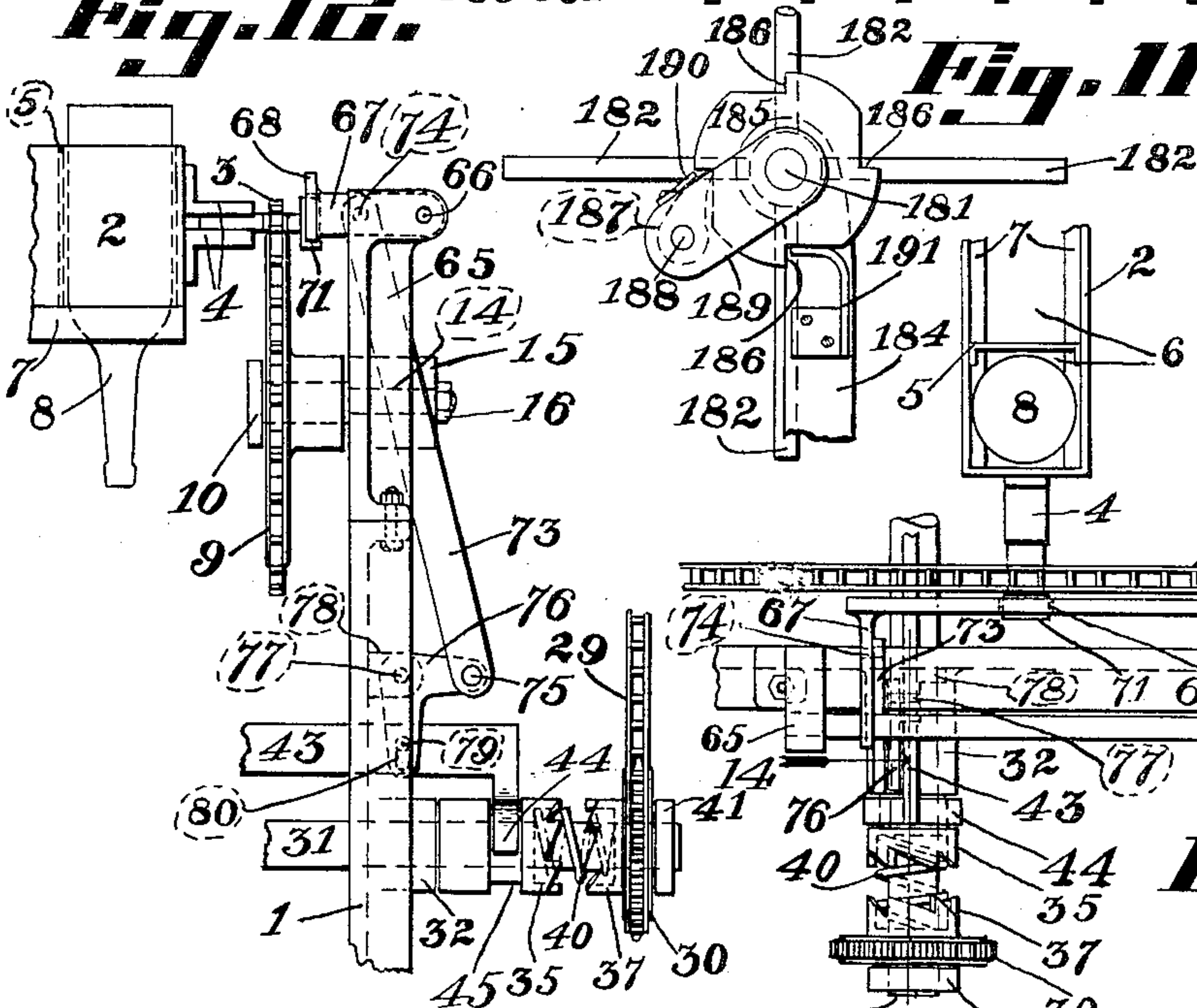


Fig. 11.

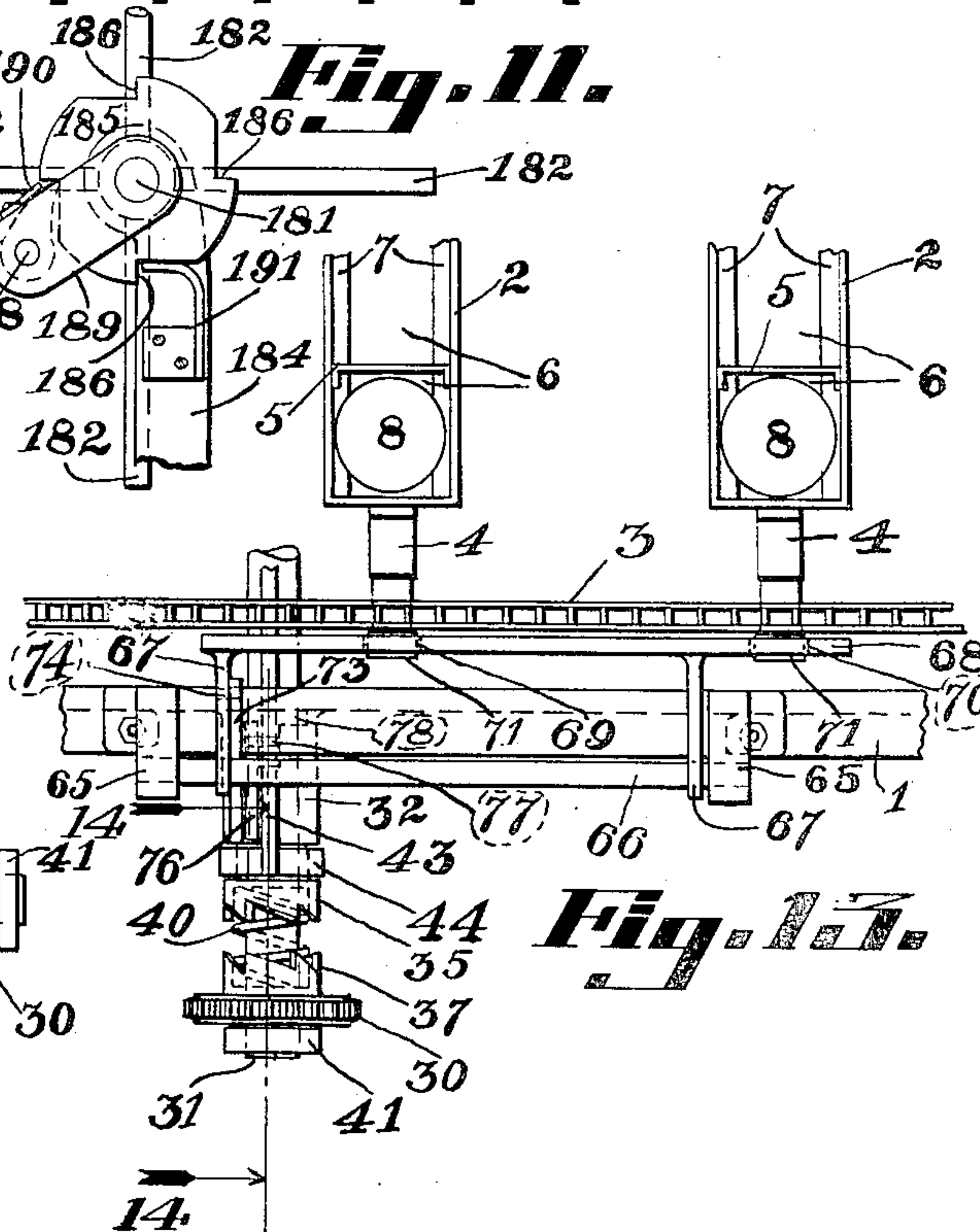


Fig. 13.

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UNITED STATES PATENT OFFICE.

HERMANN KRAUSE, OF ST. LOUIS, MISSOURI, ASSIGNOR TO HENRY SCARBOROUGH, SR.,
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BOTTLE-WASHER.

999,042.

Specification of Letters Patent. Patented July 25, 1911.

Application filed July 5, 1910. Serial No. 570,262.

To all whom it may concern:

Be it known that I, HERMANN KRAUSE, a subject of the Emperor of Germany, residing at the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Bottle-Washers, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The object of the present invention is to provide a bottle washing machine that is particularly adapted to receive and to discharge the bottles automatically and to wash and rinse same at predetermined places intermediate the receiving and discharging points, said machine being the one on which improvements are made that constitute the subject-matter of my copending application, Serial No. 559,009, filed May 2, 1910.

20 This invention consists in certain novel combinations of parts and certain details of construction as hereinafter fully described and pointed out in the claims.

25 In the accompanying drawings forming part of this specification, like numbers of reference denote like parts wherever they occur, and Figure 1 is a side elevation of a machine embodying this invention; Fig. 2 is a front elevation of same; Fig. 3 is a front elevation, on an enlarged scale, of the machine, the bottle-loading device and bottle-conveying means being removed; Fig. 4 is a top plan view, on an enlarged scale, of part of the machine, the bottle-conveying means being removed; Fig. 5 is a sectional view on the line 5—5, Fig. 4; Fig. 6 is a sectional view on the line 6—6, Fig. 4; Fig. 7 is a sectional view, on an enlarged scale, on the line 7—7, Fig. 1; Fig. 8 is a top plan view, on an enlarged scale, of the pan containing the brush-operating mechanism; Fig. 9 is a sectional view on the line 9—9, Fig. 8; Fig. 10 is a top plan view of the bottle-loading device; Fig. 11 is a side elevation, on an enlarged scale, of a means for actuating the bottle-loading device; Figs. 12 and 13 are detailed views of the means for actuating the bottle-conveying means; and Fig. 14 is a sectional view, on an enlarged scale, on the line 14—14, Fig. 13.

The parts of the machine are supported by a suitable framework that is preferably

formed of a pair of castings 1. A plurality of bottle receptacles 2 are attached to a pair of parallel endless chains 3 by means of angle-irons 4, or the like, and are spaced at equal distances along the length of each chain. Each of said bottle receptacles is divided by a plurality of division plates 5 into a plurality of pockets 6. The lower side edges 7 of each bottle receptacle 2 are bent inwardly so that, when said receptacle occupies a position to receive a plurality of bottles 8, each pocket 6 will receive one of said bottles and will hold same in an inverted position.

Each chain 3 is arranged to travel in engagement with a plurality of sprocket wheels 9, the sprockets of one chain being located opposite the sprockets of the other chain. One of the sprockets 9 of each chain is mounted on a pintle 10 and the other sprockets 9 of said chain are mounted on the shafts 11, 12, and 13, respectively. A stud 14 of pintle 10 extends through an opening in a boss 15 of a casting 1 and is fastened to said boss by means of a nut 16 or the like, said boss being preferably located near the upper front corner of said casting. Shaft 11 is journaled in journal-boxes 17 that are secured to castings 1 by means of bolts 18, said journal-boxes being preferably located adjacent the upper back corners of said castings so that chains 3 travel substantially horizontal from sprockets 9 on pintles 10 to sprockets 9 on said shaft 11 with the result that each bottle receptacle 2 carries the bottles 8 in an inverted position, when said receptacle moves from the front to the back of the machine. Shaft 12 is journaled in openings in bosses 19 of castings 1 and is arranged at a lower elevation than shaft 11 so that chains 3 hold each bottle receptacle 2 in an inclined position when said receptacle moves from the sprockets on shaft 11 to the sprockets on shaft 12, thereby causing the bottles 8 within said receptacle to slide therefrom. Shaft 13 is mounted in a pair of adjustable journal-boxes 20 which afford means for regulating the tension of chains 3. Said shaft 13 is located at a lower elevation than pintles 10 so that chains 3 travel approximately at 45 degrees to the horizon, when said chains move from the sprockets

on shaft 13 to the sprockets on said pintles, whereby each bottle receptacle 2 is held in an inclined position to receive a plurality of bottles 8 in the manner hereinafter described.

One of the journal-boxes 20 extends through an opening 21 in one casting 1 and the other extends through a similar opening in the other casting 1. Each journal-box is supported upon a ledge 22 of a casting 1 and is secured to a rod 23 that passes through an opening in said casting, said rod being screw-threaded to receive a hand-wheel 24 by means of which said journal-box can be moved on said ledge in order to adjust the tension of a chain 3. A bolt 25, or the like, that passes through an opening in a lug 26 of journal-box 20 extends through a slot 27 in ledge 22 and affords a means for fastening said journal-box in place on said ledge.

One end of shaft 11 extends beyond a journal-box 17 and bears a sprocket 28 which is driven with a chain 29 that travels in engagement with a sprocket 30 loosely mounted on drive shaft 31, said shaft 31 being journaled in bosses 32 of castings 1. A pulley 33 is rigidly mounted on shaft 31 and is driven with a belt 34 that receives its power from any suitable source. A clutch 35 is mounted by means of a feather 36 on shaft 31 and is arranged to slide into and out of engagement with a clutch member 37 borne by the hub of sprocket 30. Depressions 38 and 39 in clutch 35 and clutch member 37, respectively, form seats for a spring 40 that holds said clutch normally out of engagement with said clutch member, a collar 41 being secured on shaft 31 by means of a set-screw 42, or the like, in order to prevent said spring from pushing sprocket 30 off the end of said shaft 31. A member 43 extends through an opening in a casting 1, and is provided with a bifurcated end 44 that projects into an annular groove 45 in clutch 35. Pins 46 project from a cross-piece 47 into slots 48 in member 43 in order to support said member and to guide same in its movement, said cross-piece being fastened to castings 1 by means of bolts 49. The other end of member 43 bears a pin 50 that projects into a slot 51 in a lever 52, said lever being fulcrumed at 53 to a bracket 54, which is fastened to one of a pair of members 55 by means of bolts 56, or the like. Said members 55 are fastened to castings 1, respectively, by means of bolts 57 and are arranged to form bearings for shaft 58. A gear 59 is rigidly mounted on shaft 58 and is driven with a pinion 60 on drive shaft 31. A roller 61 borne by one end of lever 52 rides upon a cam 62 on shaft 58, and, when said roller rides on the high point 63 of said cam, lever 52 is moved on ful-

crum 53 thereby causing member 43 to move clutch 35 into engagement with the clutch member 37. When clutch 35 is thus moved into engagement with clutch member 37, sprocket 30 is caused to rotate therewith and to drive chain 29 which imparts motion to sprocket 28 and shaft 11, thereby causing the sprockets 9 on said shaft 11 to drive chains 3 with the result that said chains 3 move the bottle receptacles 2. When the high point 63 of cam 62 moves out of engagement with roller 61, spring 39 forces clutch 35 out of engagement with clutch member 37, whereby sprocket 30 is prevented from rotating with said clutch. The bottle receptacles 2 and chains 3 remain at rest until clutch 35 is moved again into engagement with clutch member 37 in the manner just described.

During each period of rest of chains 3 a receptacle 2 is loaded automatically with a plurality of bottles 8. Chains 3 then move said receptacle in the manner hereinabove described to its next stopping point where the interiors of the bottles in said receptacle are washed by means of a set of revolving brushes 64 that is reciprocated toward and away from said bottles in order to cause said brushes to enter and to leave said bottles during the time that chains 3 are at rest. While the bottles 8 in the first receptacle 2 are being washed, the second receptacle 2 is loaded automatically with a plurality of bottles. After the brushes 64 are withdrawn from the bottles in the first receptacle, chains 3 move to their next position of rest with the result that the second receptacle stops at the point previously occupied by the first receptacle and the first receptacle stops over another set of revolving brushes 64 that reciprocates simultaneously with the brushes 64 under the bottles in the second receptacle 2, whereby the bottles in the first and second receptacles 2 are washed interiorly during said period of rest of chains 3.

Each set of brushes 64 is arranged to reciprocate in a fixed path of travel, and for this reason, it is necessary to provide a device for stopping chains 3 so that one receptacle 2 stops at a point to allow one set of brushes 64 to enter the bottles 8 in said receptacle and, also, that another receptacle 2 comes at rest in a position to allow the bottles 8 therein to receive the other set of brushes 64. This stopping device consists of the following parts: A pair of standards 65 is supported upon a casting 1 and is arranged to form bearings for a shaft 66 to which a pair of arms 67 is fastened. A plate 68 is secured to arms 67 and is arranged adjacent one of the chains 3. Notches 69 and 70 are formed in plate 68 and are preferably spaced apart so that notch 69 is adjacent the point where one of

the bottle receptacles 2 stops to allow one set of brushes to enter the bottles 8 therein and the notch 70 is adjacent the point where the next receptacle 2 stops to allow the bottles therein to receive the other set of brushes 64.

Each bottle receptacle 2 is provided with a roller 71 which is pivoted at 72 to the chain 3 that is adjacent plate 68, said rollers being so arranged relative to notches 69 and 70 in plate 68 that, during each period of rest of chains 3, one of the rollers 71 seats in notch 69 and an adjacent roller 71 seats in notch 70. One end of a link 73 is pivotally attached at 74 to one of the arms 67 and the other end of said link is pivoted at 75 to one of the arms of a bell crank 76, said bell crank being fulcrumed at 77 to bracket 78 that projects from a casting 1. A pin 79 borne by member 43 projects into a slot 80 in the other arm of bell crank 76, and, when said member is moved in the manner hereinabove described to cause clutch 35 to engage clutch member 37, pin 79 causes bell crank 76 to rock on fulcrum 77, thereby causing link 73 to move upwardly. As said link moves upwardly it rocks shaft 66 with the result that arms 67 raise plate 68 so that notches 69 and 70 move out of engagement with two of the rollers 71 of chain 3, whereby chains 3 and bottle receptacles 2 are free to move as long as clutch 35 remains in engagement with clutch member 37. Cam 62 is arranged so that roller 61 rides upon the high side 63 until the roller 71 that moves away from notch 69 nearly reaches a position to enter notch 70, at which time high side 63 moves out of engagement with roller 61 whereby spring 40 tends to push clutch 35 out of engagement with clutch member 37 and, also, to return member 43 to its initial position. When member 43 moves toward its initial position, it rocks bell crank 76 in the direction to cause link 73 to lower plate 68, but roller 71 that approaches notch 70 prevents said plate from being lowered sufficiently to allow clutch 35 to disengage clutch member 37. This prevention continues until said roller 71 enters notch 70 and the roller 71 following same enters notch 69, whereby the pressure of spring 40 moves clutch 35 out of engagement with clutch member 37 and returns member 43 to its normal position. By means of this stopping device, two of the loaded receptacles 2 are caused to stop in position to allow the sets of brushes 64, respectively, to enter the bottles 8 therein, even though the wear on chains 3 causes same to stretch so that the distance between each two adjacent receptacles 2 is lengthened.

A pair of brackets 81 is fastened by means of bolts 82, or the like, to castings 1, respectively, and is arranged to support a pair of members 83, one of said members being located in the path of travel of one set of

brushes 64 and the other being located in the path of travel of the other set of brushes 64. Each end of each member 83 is provided with an aperture 84 through which a pin 85 extends that projects from its adjacent bracket 81 in order to guide the movement of member 82 when said member is raised and lowered in the manner hereinafter described. Each member 83 bears a plurality of projections 86, each of said projections being preferably arranged to project from the lower side of said member and provided with an opening 87 through which a tube 88 passes that bears a brush 64. An orifice 89 in tube 88 allows the fluid that enters said tube in the manner hereinafter described to discharge into a bottle 8, when brush 64 on said tube is inserted into said bottle. Each tube 88 is provided with a gear wheel 90 which is secured thereto and which is mounted in a pan 91. The lower end of each tube 88 of one set of brushes 64 extends into a passage 92 in the bottom of pan 91 and the lower end of each tube 88 of the other set of brushes 64 extend into a similar passage 92, said passages being connected by means of a pipe 93 to which a flexible pipe 94 is attached. Each gear 90 of one set of tubes 88 is arranged to mesh with the one adjacent thereto so that, when one of said gears 90 is rotated, the other gears of said set are caused to rotate therewith, the gears 90 of the other set of tubes 88 being similarly arranged. A pinion 95 is mounted in pan 91, and is arranged to mesh with one of the gears 90 of each set of tubes 88. A member 96 is fastened to pan 91, and holds all of the gears 90 and pinion 95 in place in said pan.

A shaft 97, upon which pinion 95 is slidably mounted, is provided with a key-way 98, which extends longitudinally thereof. A projection 99 or the like borne by pinion 95 extends into said key-way, whereby said pinion is caused to rotate with said shaft. Said shaft 97 is journaled in a pair of cross-pieces 100 that are supported from castings 1 by any suitable means, a shoulder 101 or the like on said shaft being arranged to rest upon one of said cross-pieces in order to support said shaft in a vertical position. The lower end of shaft 97 extends through the lower cross-piece 100 and bears a miter gear 102 that meshes with a miter gear 103 on shaft 104, said shaft 104 being journaled in hangers 105 or other suitable means. A pulley 106 on shaft 104 is driven with a belt 107 which receives its power from a pulley 108 on drive shaft 31. Cross-pieces 100 support a pair of vertically-disposed rods 109, one rod being located adjacent one end of pan 91 and arranged to extend through an opening 110 in said pan and the other rod being arranged to extend through a similar opening 110 at the other end of said pan.

When pan 91 is raised and lowered in the manner hereinafter described, same is guided by means of rods 109 and shaft 97.

Each end of shaft 58 is provided with an arm 111 which is secured thereto by any suitable means. A link 112 is pivotally attached at 113 to arm 111 and is pivoted at 114 to member 115 that is fulcrumed at 116 to a casting 1. Said member extends adjacent an end of pan 91 and supports a roller 117 borne by said pan. Arms 111 are so arranged relative to each other that, when shaft 58 is rotated, one arm 111 raises and lowers one member 115 and the other arm 111 raises and lowers the other member 115 simultaneously, thereby causing said members to raise and lower pan 91. When members 115 raise pan 91 to its highest position tubes 88 move upwardly through openings 87 in members 83 with the result that one set of brushes 64 enters the bottles 8 in a receptacle 2 thereabove and the other set of brushes 64 enters the bottles 8 in the next receptacle 2, but when said members 115 lower said pan to its lowest position, said brushes are withdrawn from said bottles and are lowered into their respective openings 87 in order to allow said bottles to be moved to their next position of rest.

In order to cause the mouths of bottles 8 to center over openings 87 in members 83, clamping devices are provided. Each clamping device consists of a pair of plates 118 that is arranged to extend across and above members 83. Said plates 118 are arranged parallel to each other and are spaced apart so that a space 119 is left therebetween in order to guide the mouth of a bottle 8, when said bottle is moved from a position of rest over an opening 87 in one member 83 to a position of rest over an opening 87 in the other member 83. Each plate 118 is provided with a pair of notches or depressions 120, one notch being located adjacent an opening 87 in one member 83 and the other notch being located adjacent an opening 87 in the other member 83. The notches 120 of a plate 118 are disposed opposite the notches 120 of an adjacent plate 118 so that, during each period of rest of chains 3, the mouth of a bottle 8 in a receptacle 2 is held between a pair of oppositely-disposed notches 120 of a pair of adjacent plates 118 with the result that said bottle mouth is centered over an opening 87 in one member 83, and the other pair of oppositely-disposed notches 120 of said pair of plates holds the mouth of a bottle 8 in the next receptacle 2 in position to register with an opening 87 in the other member 83. One plate 118 is supported by means of a pair of arms 121 and its adjacent plate 118 is supported by means of a pair of arms 122, the arms 121 being preferably located opposite the arms 122. An arm 121 and an oppositely-disposed arm 122 of a

pair of plates 118 are preferably arranged adjacent one member 83 and are pivotally attached at 123, respectively, to a cross-piece 124, supported from brackets 81 by any suitable means, and the other arms 121 and 122 of said pair of plates are arranged adjacent the other member 83 and are fastened in the same manner to another cross-piece 124, supported from said brackets. The ends of each arm 121, which is pivoted to one cross-piece 124, are pivoted at 125, respectively, to a member 126, and the ends of each arm 122 adjacent thereto are pivoted at 127, respectively, to a member 128, a similar member 126 and a member 128 being attached in the same manner to the ends of each of the other arms 121 and 122, respectively.

A shaft 129 is preferably arranged to extend through an opening in the upper cross-piece 100 and is journaled in a pair of cross-pieces 130 that are supported from castings 1 by any suitable means. One of the members 126 is pivoted at 131 to a link 132 that is pivoted at 133 to an arm 134 borne by shaft 129, and the member 128 adjacent said member 126 is pivotally attached at 135 to a link 136 that is pivoted at 137 to an arm 138 on shaft 129, a duplicate of each of the links 132 and 136, pivots 133 and 137, and arms 134 and 138 being provided for the other members 126 and 128, respectively. Arm 134 is preferably arranged to extend from the side of shaft 129 that is opposite the side from which arm 138 extends so that, when shaft 129 is rocked in the manner hereinafter described, said arms rock therewith, whereby arm 134 causes link 132 to move member 126 in one direction and arm 138 causes link 136 to move arm 128 in the opposite direction. When shaft 129 is rocked counter-clockwise, Fig. 3, arm 134 causes link 132 to move member 126 toward the left, thereby causing arms 121 attached to said member 126 to rock clockwise on their respective pivots 123, and arm 138 causes link 136 to move member 128 toward the right, whereby arms 122 attached to said member 128 are caused to rock counter-clockwise on their respective pivots 123. This rocking of each arm 121 clockwise and of each arm 122 counter-clockwise causes plates 118 borne by said arms to move farther apart so that space 119 is widened to allow the mouth of a bottle 8 to pass therethrough. When shaft 129 is rocked clockwise, Fig. 3, each arm 121 is caused to rock counter-clockwise and each arm 122 is caused to rock clockwise through the intermediation of arms 134 and 138, link 132 and 136, and members 126 and 128, respectively, which results in causing plates 118 borne by arms 121 and 122 to move toward each other, whereby space 19 is narrowed and each pair of oppositely-disposed notches 120 of said plates 118 is caused to grip the mouth of a bottle 8 and to hold

same in position to register with an opening 87 in a member 83.

An arm 139 is fastened to shaft 129 and is pivotally attached at 140 to a link 141. 5. Said link 141 is pivoted at 142 to a lever 143 that is fulcrumed at 144 to member 145 borne by a cross-piece 146, said cross-piece being supported from castings 1 by any suitable means. Lever 143 is preferably arranged to extend over shaft 58, and bears a 10 pair of members 147, to which a roller 148 is pivoted at 149, said roller being arranged to ride upon a cam 150 on said shaft 58. The cam 150 is arranged upon shaft 58 so 15 that the roller 148 rides upon the low side of said cam during the time that chains 3 are moving from one position of rest to another, whereby lever 143 causes link 141 to draw arm 139 downwardly with the re- 20 sult that said arm 139 holds shaft 129 in position to cause plates 118 to spread apart in the manner hereinabove described in order to allow the mouths of the bottles 8 to pass through spaces 119, but, during each 25 period of rest of chains 3, roller 148 rides upon the high side of cam 150 and causes lever 143 to raise link 141 and arm 139, whereby shaft 129 is held in position to cause plate 118 to clamp the mouths of the 30 bottles 8.

Each bracket 81 is provided with a pair of projections 151 that form journals for a shaft 152, said shaft being preferably arranged to extend beneath the ends of each 35 member 83 that rests upon said bracket. The pivot 131 of one of the members 126 extends into a slot 153 in an arm 154 borne by one of the shafts 152, and the pivot 135 of one of the members 128 projects into a slot 40 153 in a similar arm 154 borne by the other shaft 152 so that, when said members 126 and 128 are moved in either direction in the manner hereinabove described, same cause arms 154 to rock their respective shafts 152. 45 Each end of shaft 152 is provided with an arm 155, which bears a finger 156, said finger being arranged to extend beneath a member 83 adjacent thereto, and, when said shaft 152 is rocked in one direction, the fin- 50 gers 156 of the arms 155 on said shaft raise the members 83 with the result that each member 83 is held against the mouths of the bottles 8 thereabove during a rest period of chains 3, but, when said shaft is rocked in 55 the opposite direction, the fingers 156 of the arms 155 move downwardly and allow said members 83 to lower and rest upon brackets 81 while the chains 3 are moving from one position of rest to another. When a mem- 60 ber 83 is thus raised into engagement with the mouths of the bottles 8 in a receptacle 2 thereabove, the openings 87 in said member register with said bottle mouths and guide the brushes into said bottles.

65 After the bottles 8 in a receptacle 2 re-

ceive their last brushing, said receptacle is moved to its next position of rest over a pipe 157 which is arranged to underlie the mouths of said bottles. A plurality of noz- 70 zles or jets 158 project from pipe 157, and are arranged to squirt fluid, preferably water, into the interior of said bottles when same are at rest over said pipe. A pipe 159 connects pipe 157 with a tee 160, to which 75 flexible pipe 94 is, also, attached, said tee being connected to a water-supply pipe 161 in which a valve 162 is located. The valve-stem 163 of said valve bears arms 164 and 165, the arm 164 being disposed at angle to 80 arm 165. The valve 162 is located near the path of travel of pan 91 so that either arm 164 or arm 165 extends into the path of travel of a member 166 that projects from said pan. As pan 91 moves upwardly to 85 cause the brushes 64 to enter the bottles thereabove, the member 166 rides past arm 165 and engages arm 164 with the result that further travel upwardly of said pan causes member 166 to move upwardly, Fig. 9, whereby valve-stem 163 is rotated in the 90 direction to open valve 162 and arm 164 is moved out of the path of travel of member 166. When arm 164 is thus moved out of the path of travel of member 166, the arm 165 is simultaneously moved into said path 95 of travel and, as pan 91 moves downwardly, said member 166 rides past member 164 and engages arm 165, whereby valve-stem 163 rotates in the opposite direction in order to close valve 162, and arm 165 moves out 100 of the path of travel of said member. As the arm 165 thus moves out of the path of travel of member 166, the arm 164 moves simultaneously into said path of travel so that same is engaged by said member when 105 pan 91 is raised again. By this means of operating valve 162, the water is cut off while the chains 3 are in motion and, also, while the brushes 64 are withdrawn from the bottles, but, during each period of rest 110 of chains 3, said valve is open, which allows water to flow through pipes 94 and 93 and passages 92 to tubes 88 from which said water flows through orifices 89 into the interior of bottles 8 while brushes 64 are with- 115 in said bottles, thereby aiding in the operation of cleaning the interior of said bottles. When valve 162 is open, water flows through pipes 159 and 157 to nozzles 158 from which said water squirts into the in- 120 terior of bottles 8 in a receptacle 2 thereabove and rinses the interior of said bottles. A drip pan 167 is arranged to catch the water that drains from the bottles 8 above pipe 157 and is supported by means of a 125 cross-piece 168, or the like, fastened to castings 1, a drain pipe 169 being arranged to carry the waste water away.

An inclined chute 170 is arranged to deliver the bottles to a pair of endless chains 130

171 that travels in engagement with sprockets 172 mounted on a pair of shafts 173, one shaft being journaled in bracket 174, fastened to one casting 1, and the other being
 5 journaled in arms 175 of bracket 176 fastened to the other casting 1. A sprocket 177 on one of said shafts 173 receives its power from a chain 178 that is driven continuously from any suitable source of power,
 10 and rotates said shaft in order to drive chains 171. Chains 171 are preferably arranged to travel substantially parallel to a receptacle 2 and near the place where said receptacle stops previous to being moved to
 15 a position of rest over the first set of brushes 64. Said chains 171 are connected by means of a plurality of plates 179 which are spaced at equal distances apart along the length of each of said chains. Each plate 179 is
 20 provided with a side 180 that is bent to project approximately at a right angle to chains 171 so that when a bottle 8 rolls from chute 170, said bottle enters the space between the sides 180 of two adjacent plates 179 and
 25 rests upon said chains, said sides thus separating said bottle from the bottles 8 adjacent thereto.

The chains 171 travel in the direction indicated by the arrows, Fig. 2, and as the
 30 bottles 8 roll from chute 170 and rest upon said chains, said chains move said bottles toward the right with their mouths projecting toward a receptacle 2 that occupies a position of rest previous to being moved to
 35 a resting position over the first set of brushes 64. When the first bottle upon chains 171 reaches a position to aline with the right-hand pocket 6 of said receptacle 2, a plurality of bottles that is equal in number to the
 40 number of pockets 6 in said receptacle is swept from chains 171 with the result that said plurality of bottles enter the pockets 6 in said receptacle, said sweeping operation being timed to occur during each period of
 45 rest of chains 3. After said receptacle 2 is loaded with a plurality of bottles 8, same is moved to a position of rest over the first set of brushes 64 whereby the following receptacle 2 is moved to a position to receive
 50 the next plurality of bottles that are swept from chains 171.

The mechanism for sweeping a plurality of bottles 8 from chains 171 consists of the following: A shaft 181 that bears a plural-
 55 ity of fingers 182 is journaled in arms 183 and 184 of brackets 174 and 176 respectively. Fingers 182 are preferably arranged in rows that extend longitudinally of shaft 181, the fingers of each of said rows being
 60 spaced apart so that same aline with pockets 6 of said receptacle 2 in order to sweep a plurality of bottles from chains 171 into the pockets of said receptacle, when said bottles aline with said pockets. A ratchet
 65 185 is fastened to one end of shaft 181 and

is provided with a plurality of notches 186, said notches being preferably equal in number to the number of longitudinal rows of fingers 182. A pawl 187 is pivoted at 188
 70 to an arm 189 that is loosely mounted on shaft 181 and is normally held in engagement with a notch 186 of ratchet 185 by means of a spring 190, borne by said arm. A spring 191 borne by arm 184 normally
 75 seats in a notch 186 of ratchet 185 and not only prevents the retrogression of shaft 181 but holds said shaft in position to cause a row of fingers 182 to project adjacent the
 80 bottoms of the bottles on chains 171. One end of a link 192 is pivoted at 188 to arm 189 and the other end of said link is pivotally attached at 193 to an end of lever 194, said lever being fulcrumed at 195 to a casting 1. The other end of said lever extends
 85 into the path of rotation of an arm 111 on shaft 58. A pin 196 projects from said casting 1 and holds said lever in its normal position. When a plurality of bottles 8 on chains 171 occupy a position to aline with
 90 the pockets 6 of a receptacle 2 which is in a resting position to receive same, said arm 111 trips the end of lever 194 and causes said lever to rock upon fulcrum 195 with the result that said lever raises link 192, where-
 95 by arm 189 is raised. When said arm 189 is raised it causes pawl 187 to rotate ratchet 185 and shaft 181 counter-clockwise, Fig. 1, until spring 191 seats in the notch 186 following the one that moved away from said
 100 spring, at which time arm 111 moves out of engagement with lever 194, thereby allowing link 192 to lower arm 189 and lever 194 to their initial position. While arm 189 is being lowered pawl 187 rides on the periphery of ratchet 185 until same enters the
 105 next following notch 186 of said ratchet. When the shaft 181 is rocked in the manner just described, a row of fingers 182 sweep a plurality of bottles off the chains 171, thereby causing same to enter the pockets 6
 110 of a receptacle 2 that is in position to receive same. After chains 3 are moved to their next stopping place, the next following row of fingers cause another plurality of bottles to discharge into the pockets 6 of the
 115 next receptacle 2.

The operation of the machine is as follows: Power is applied from any suitable source to shaft 31 and to one of the shafts
 120 173, thereby setting the parts of the machine into operation. The rotation of shaft 31 causes pinion 60 to drive gear 59 and shaft 58 and, also, drives belt 107 which rotates shaft 104, whereby gear 103 drives gear
 125 102 and shaft 97, said shaft 97 imparting rotary motion to brushes 64 through the intermediation of pinion 95, gears 90, and tubes 88.

The bottles 8 to be washed are placed either by hand upon chute 170, or are deliv-
 130

ered by means of a conveyer or the like to said chute. As the bottles roll successively onto chains 171 from chute 170, said chains move said bottles toward the right, Fig. 2, until a plurality of same aline with the pockets 6 of a receptacle 2 which occupies a position of rest previous to being moved to a resting position over the first set of brushes 64. At the same time that said plurality of bottles reach a position to aline with the pockets 6 of said receptacle 2, arm 111 on shaft 58 trips lever 194, thereby causing shaft 181 to rotate with the result that a row of fingers 182 sweep said bottles from chains 171 and cause same to enter the pockets of said receptacle. After a receptacle 2 is thus loaded with a plurality of bottles 8, the high side 63 of cam 62 engages roller 61 and causes lever 52 to rotate on pivot 53, whereby member 43 moves clutch 35 into engagement with clutch member 37 of sprocket 30 and, also, rocks bell crank 76 on fulcrum 77 with the result that link 73 raises plate 68 so that notches 69 and 70 disengage a pair of adjacent rollers 71 of chains 3. When clutch 35 engages clutch member 37, sprocket 30 drives chain 29 which causes sprocket 28 and shaft 11 to rotate, thereby causing sprockets 9 on shaft 11 to drive chains 3. Said chains 3 continue to move until the high side 63 of cam 62 rides out of engagement with roller 61 and, also, until the loaded receptacle 2 reaches a position over the first set of brushes 64, at which time roller 71 adjacent the end of said loaded receptacle enters notch 69 in plate 68 and roller 71 adjacent the end of the receptacle 2 which is ahead of said loaded receptacle enters notch 70 in said plate 68, whereby spring 40 forces clutch 35 out of engagement with clutch member 37 and allows sprocket 30 to remain at rest, thus stopping the movement of chains 3 and receptacles 2 until roller 61 again rides on the high side 63 of cam 62. While the loaded receptacle 2 occupies a position of rest over the first set of brushes 64, the next following receptacle 2 is loaded with a plurality of bottles which are swept from chains 171, as hereinabove described. Chains 3 are then caused to move to their next position of rest, whereby the first loaded receptacle 2 stops over the second set of brushes 64 and the second loaded receptacle stops over the first set of brushes 64, and the third receptacle stops in position to receive the next plurality of bottles that are discharged from chain 171. After the third receptacle receives a plurality of bottles chains 3 move to their next position of rest, thereby causing the first loaded receptacle 2 to stop over nozzles 158 and the second and third receptacles 2 to stop over the second and first set of brushes 64, respectively, and the fourth receptacle to stop in position to be loaded

with a plurality of bottles 8 that are swept from chains 171.

During each resting period of chains 3, roller 148 rides on the high side of cam 150, whereby lever 143 causes link 141 to raise arm 139 with the result that shaft 129 is held in position to cause notches 120 in plates 118 to clamp the mouths of the bottles in the receptacles over brushes 64 through the intermediation of arms 134 and 138, links 132 and 136, members 126 and 128, and arms 121 and 122, as hereinabove described. When plates 118 thus clamp the mouths of said bottles, arm 154 causes shaft 152 to rock arms 155 into position to cause fingers 156 to raise members 83 into engagement with said bottle mouths. While the chains 3 are at rest, arms 111 on shaft 58 cause members 115 to raise and lower pan 91. As said pan ascends it causes the first set of brushes to enter the bottles in a receptacle 2 thereabove and, simultaneously, causes the second set of brushes to enter the bottles in another receptacle 2, and, also, opens valve 162 as hereinabove described. When said valve is open water flows from apertures 89 into the interior of said bottles and, also, squirts from nozzles 158 into the interior of the bottles in a receptacle thereabove. As the pan 91 descends it withdraws brushes 64 from the bottles in the receptacles thereabove and, also, closes valve 162.

While the chains 3 are in motion, roller 148 rides on the low side of cam 150, whereby shaft 129 is held in position to cause members 83 to lower and, also, to spread plates 118 farther apart, as hereinabove described, in order to allow the mouths of the bottles to pass through spaces 119. The pan 91 descends to its lowest position when the chains 3 are moving, and lowers the tops of the brushes out of the path of movement of the bottle mouths.

After a loaded receptacle is moved from a position of rest over nozzles 158, it passes over shaft 11 and moves toward shaft 12, whereby said receptacle inclines and allows the cleansed bottles to discharge by gravity to a table or conveyer (not shown in the drawings). By means of this machine the bottles 8 are handled automatically and the interior of each of said bottles receives two brushings and is then rinsed, whereby same is thoroughly cleansed.

I claim:

1. In a bottle-washing machine, the combination of an endless carrier having a plurality of bottle receptacles, a driving-shaft, an operating shaft, a clutch slidably mounted on said driving-shaft, a member loosely mounted on said driving-shaft, means actuated by said member adapted to drive said carrier, a spring holding said clutch normally out of engagement with said member, a cam borne by said operating shaft, and

means actuated by said cam adapted to shift said clutch into engagement with said member.

2. In a bottle-washing machine, the combination of an endless carrier having a plurality of bottle receptacles, a driving-shaft, an operating shaft, a clutch slidably mounted on said driving-shaft, a member loosely mounted on said driving-shaft, means actuated by said member adapted to drive said carrier, a spring holding said clutch normally out of engagement with said member, a cam borne by said operating shaft, a pivoted member actuated by said cam, and a reciprocatory member actuated by said pivoted member and adapted to shift said clutch into engagement with said first-mentioned member.

3. In a bottle-washing machine, the combination of an endless carrier having a plurality of bottle receptacles, a driving-shaft, a clutch slidably mounted on said shaft, a member loosely mounted on said shaft, means actuated by said member adapted to drive said carrier, a spring holding said clutch normally out of engagement with said member, means for shifting said clutch into engagement with said member, a rock-shaft, a notched member attached to said rock-shaft, rollers borne by said carrier adapted to seat in the notches in said notched member, and means actuated by said shifting means adapted to rock said rock-shaft to move said notched member out of engagement with said rollers.

4. In a bottle-washing machine, the combination of an endless carrier having a plurality of bottle receptacles, a driving-shaft, a clutch slidably mounted on said shaft, a member loosely mounted on said shaft, means actuated by said member adapted to drive said carrier, a spring holding said clutch normally out of engagement with said member, means for shifting said clutch into engagement with said member, a rock-shaft, a notched member attached to said rock-shaft, rollers borne by said carrier adapted to seat in the notches of said notched member, a bell-crank actuated by said shifting means, and a member actuated by said bell-crank adapted to rock said rock-shaft to move said notched member out of engagement with said rollers.

5. The combination with a series of movable bottle-cleaning devices, and means for operating the same, of a movable guide for said devices, a pair of shafts, means borne by said shafts for moving said guide toward and away from the mouths of the bottles to be cleaned by said devices, and means for rocking said shafts.

6. The combination with a series of movable bottle-cleaning devices, and means for operating the same, of a movable guide for said devices, a rock-shaft, a pair of auxil-

iary shafts, means borne by said auxiliary shafts for moving said guide toward and away from the mouths of the bottles to be cleaned by said devices, means actuated by said rock-shaft for rocking said auxiliary shafts, and means for rocking said rock-shaft.

7. The combination with a series of movable bottle-cleaning devices, and means for operating the same, of a movable guide for said devices, a rock-shaft, a pair of auxiliary shafts, means borne by said auxiliary shafts for moving said guide toward and away from the mouths of the bottles to be cleaned by said devices, means connecting said rock-shaft with said auxiliary shafts, an operating shaft, a cam borne by said operating shaft, a pivoted member actuated by said cam, and means connecting said pivoted member with said rock-shaft.

8. In a bottle-washing machine, the combination of an endless carrier having a plurality of bottle receptacles adapted to convey the bottles to be cleansed, means for driving said carrier intermittently, rotary-reciprocatory bottle-cleaning devices, means for stopping said carrier in position to allow said devices to enter and leave the bottles in a receptacle, a support, a plurality of members pivoted to said support, clamps borne by said members and adapted to hold the mouths of the bottles in a receptacle in position to register with said devices during each pause of said carrier, and means for actuating said members.

9. In a bottle-washing machine, the combination of an endless carrier having a plurality of bottle receptacles adapted to convey the bottle to be cleansed, means for driving said carrier intermittently, rotary-reciprocatory bottle-cleaning devices, means for stopping said carrier in position to allow said devices to enter and leave the bottles in a receptacle, a support, a plurality of members pivoted to said support, clamps borne by said members adapted to hold the mouths of the bottles in a receptacle in position to register with said devices during each pause of said carrier, a rock-shaft, means connecting said rock-shaft with said members, and means for rocking said shaft.

10. In a bottle-washing machine, the combination of an endless carrier having a plurality of bottle receptacles adapted to convey the bottles to be cleansed, means for driving said carrier intermittently, rotary-reciprocatory bottle-cleaning devices, means for stopping said carrier in position to allow said devices to enter and leave the bottles in a receptacle, a support, a plurality of members pivoted to said support, clamps borne by said members adapted to hold the mouths of the bottles in a receptacle in position to register with said devices during each pause of said carrier, a rock-shaft,

means connecting said rock-shaft with said members, an operating shaft, a cam borne by said operating shaft, a pivoted member actuated by said cam, and means connecting said last-mentioned member with said rock-shaft.

11. In a bottle-washing machine, the combination of an endless carrier having a plurality of bottle receptacles adapted to convey the bottles to be cleaned, means for driving said carrier intermittently, rotary-reciprocating bottle-cleaning devices, means for stopping said carrier in position to allow said devices to enter and leave the bottles in a receptacle, means for guiding said devices into the interior of said bottles, and pairs of movable plates arranged upon opposite sides of said bottles and adapted to engage the mouths thereof for clamping said mouths in position over said guiding means.

12. In a bottle washing machine, the combination of a carrier having a plurality of bottle receptacles adapted to convey the bottles to be cleansed, means for driving said carrier, reciprocating bottle cleaning devices adapted to enter and leave the bottles in a

receptacle, means for operating said devices, and pairs of movable plates adapted to engage the mouths of said bottles for clamping the same in position to register with said devices.

13. In a bottle-washing machine, the combination of a carrier having a plurality of bottle receptacles, adapted to convey the bottles to be cleansed, means for driving said carrier, reciprocating bottle-cleaning devices adapted to enter and leave the bottles in a receptacle, means for operating said devices, pairs of movable plates arranged upon opposite sides of said bottles and adapted to engage the mouths thereof, for clamping said mouths in position to register with said devices, pivotally mounted arms supporting said plates, and means for rocking said arms to operate said plates.

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

HERMANN KRAUSE.

Witnesses:
GLADYS WALTON,
GEORGE G. ANDERSON.