

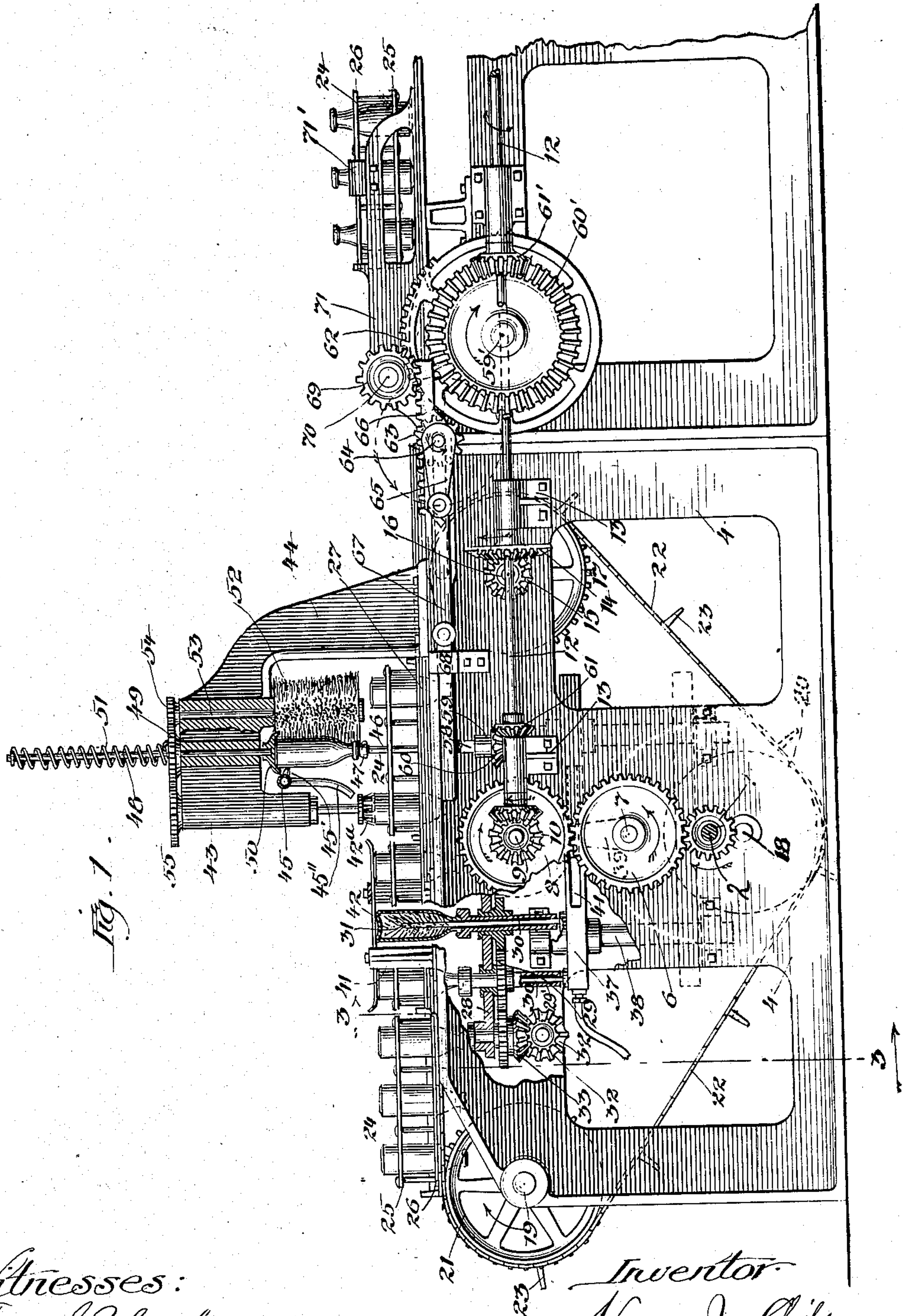
No. 885,912.

PATENTED APR. 28, 1908.

H. J. CHILTON.
BOTTLE HANDLING APPARATUS.

APPLICATION FILED MAR. 26, 1906.

3 SHEETS—SHEET 1.



Witnesses:
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Emilia Rose

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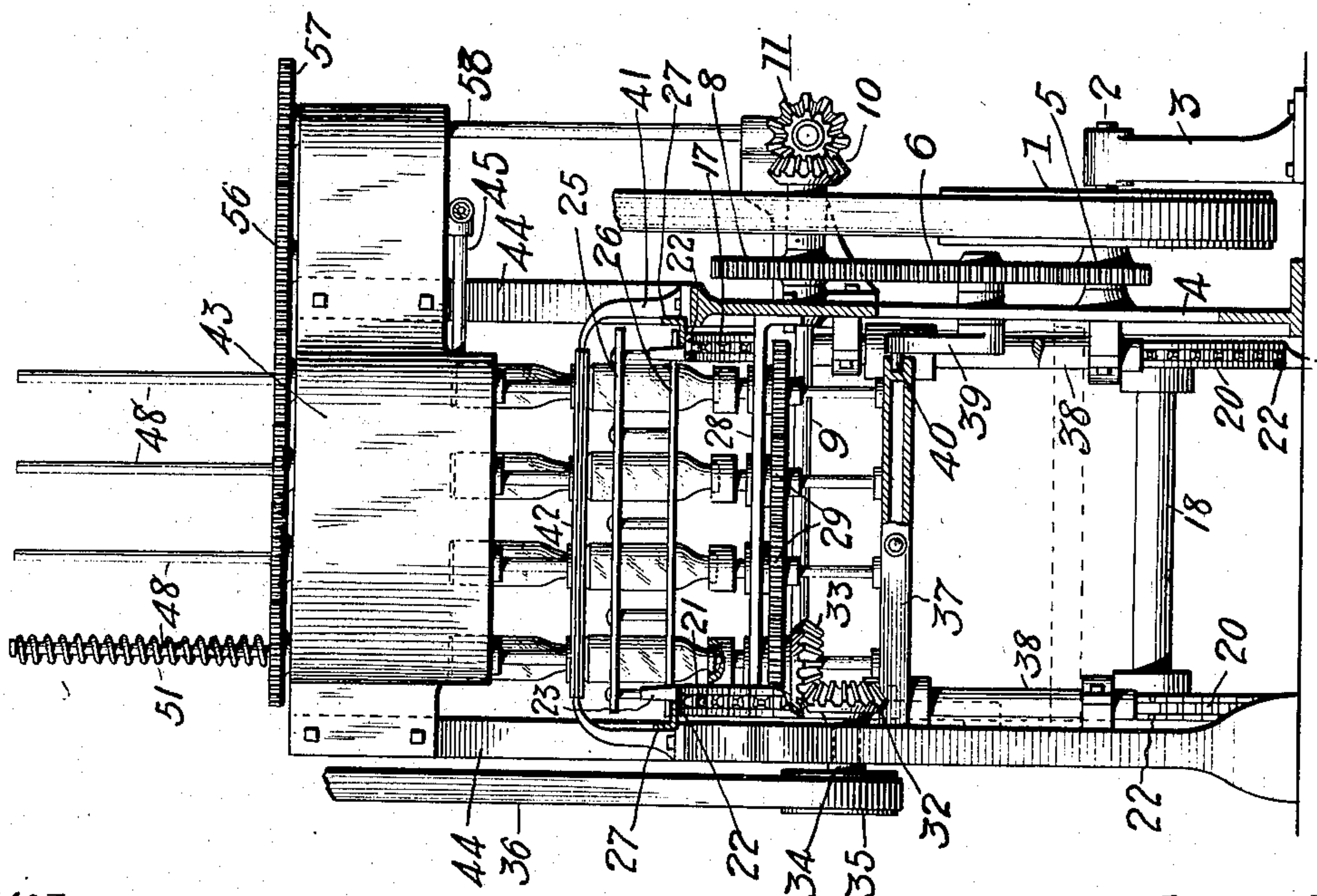
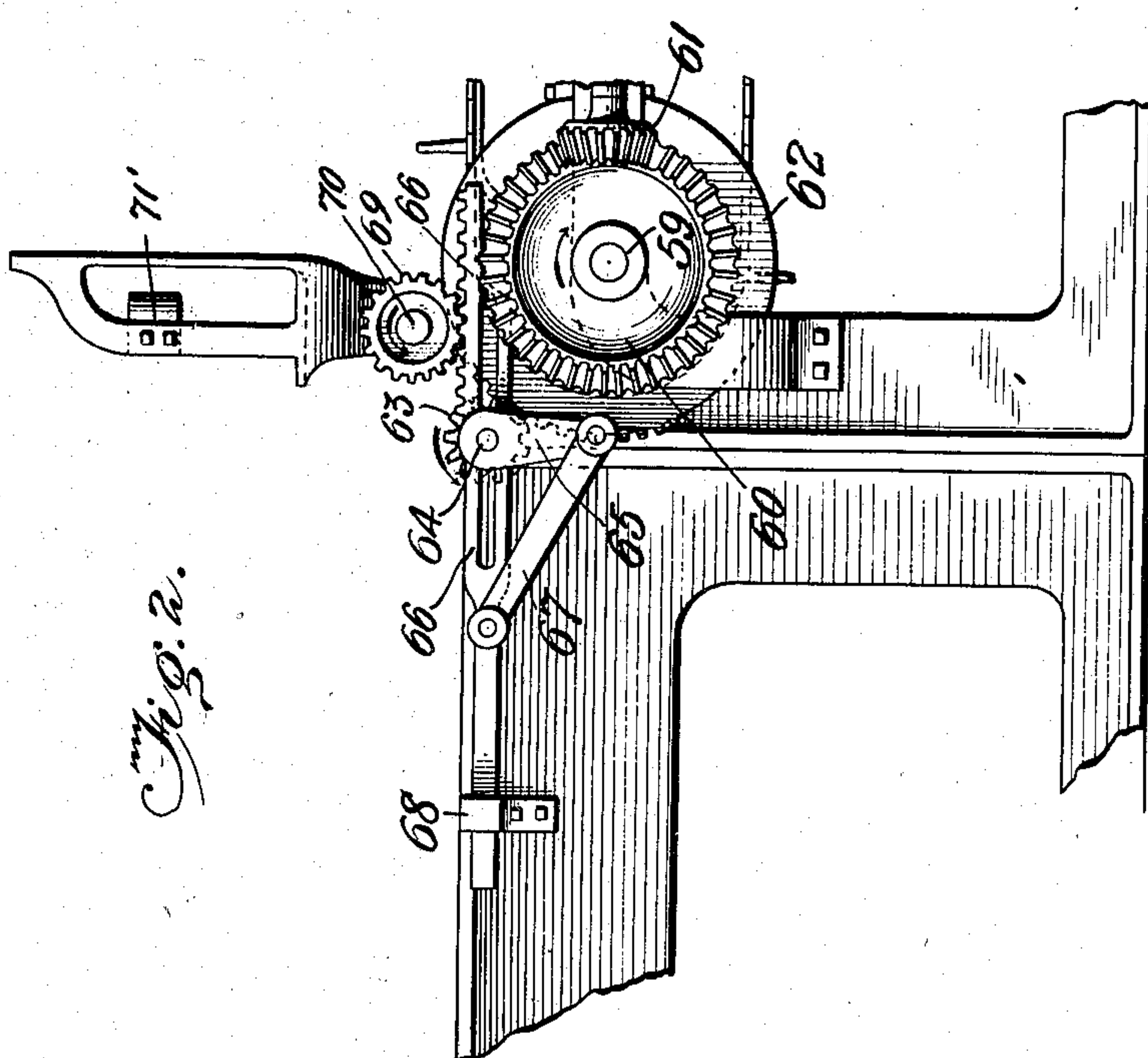
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3 SHEETS—SHEET 2.



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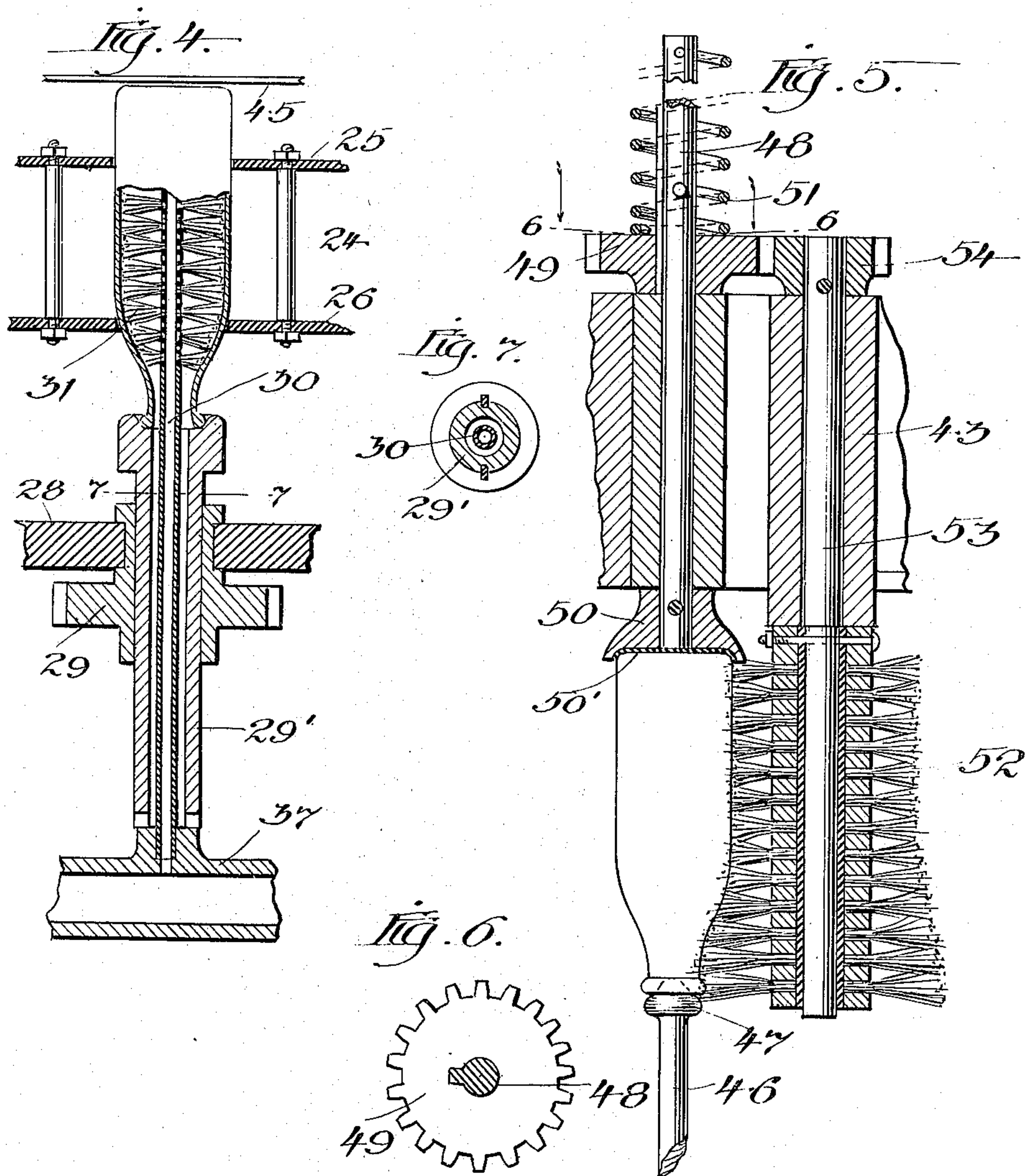
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

HENRY J. CHILTON, OF CHICAGO, ILLINOIS.

BOTTLE-HANDLING APPARATUS.

No. 885,912.

Specification of Letters Patent.

Patented April 28, 1908.

Application filed March 26, 1906. Serial No. 308,158.

To all whom it may concern:

Be it known that I, HENRY J. CHILTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bottle-Handling Apparatus, of which the following is a specification.

This invention relates to improvements in bottle handling apparatus, and among the salient objects of the invention are to provide an apparatus in which the bottles may be automatically, and as the result of a continuous operation, washed and rinsed inside and out, drained, reversed and passed to a filling machine, not shown; to provide an apparatus in which the bottles are handled in groups, each group in a crate, and nevertheless are washed thoroughly both inside and out without disassociating them from their crates after they are once placed therein, throughout the entire cycles of operation to which they are subjected; to provide an apparatus in which the bottles are at one stage shifted out of their seats in the crate while being externally washed and rinsed and are returned to the seats from which they are shifted, all this being accomplished automatically; to provide an apparatus in which at the proper stage of operation the crates with the bottles therein are reversed bodily in readiness for filling; to provide simple and improved mechanism whereby the several movements are effected positively and in properly timed relation to each other; and in general to provide an improved apparatus of the character referred to.

The invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims.

The invention will be readily understood from the following description, reference being had to the accompanying drawings, in which—

Figure 1 shows a side elevation of the machine, partly broken away. Fig. 2 shows the reversing apparatus in an elevated position. Fig. 3 is a view partly in end elevation and partly in transverse section, taken approximately on line 3—3 of Fig. 1 and looking in the direction of the arrows. Fig. 4 is a sectional detail showing the manner of washing the interior of the bottles while supported within the crate. Fig. 5 is a sectional detail showing the manner of washing the exterior of the bottles. Fig. 6 is a detail taken

through line 6—6 of Fig. 5 and looking in the direction of the arrows. Fig. 7 is a sectional detail taken through line 7—7 of Fig. 4.

In the drawings, that end of the machine shown in Fig. 1 is the end to which the filled crates are fed, and the bottles progress longitudinally through the machine and are delivered at its opposite end, as seen in Fig. 2.

Referring to Figs. 1 and 3, 1 designates the main drive-wheel, shown as a belt-wheel, mounted on a suitable stub shaft 2 journaled between a bracket 3 and the side frame 4 of the machine; said shaft carrying also rigid with the belt-wheel a pinion 5. The pinion 5 meshes with a gear 6 mounted on a stub-shaft 7, and the gear 6 in turn meshes with another gear 8 which is mounted on a through shaft 9. The shaft 9 extends outside the gear 8 and carries a miter-gear 10 which meshes with a similar miter-gear 11 mounted upon a longitudinally extending shaft 12 journaled in suitable brackets 13 upon the side of the machine frame. Shaft 12 rotates continuously and carries a mutilated miter-gear 14 which intermeshes with a cooperating bevel-gear 15 mounted upon a through-shaft 16 carrying a pair of belt-sprockets 17. The belt-sprockets 17 are located just inside of the respective side frames of the machine, as best seen in Fig. 3, and upon idle shafts 18 and 19 located in the lower central portion of this section of the machine and at the upper front end of the latter, respectively, are mounted pairs of idle sprockets 20 and 21 which together with the drive sprocket 17 carry a pair of endless belts 22. The upper laps of these belts are horizontal, and the belts are provided at regular intervals apart with transversely opposite prongs 23, spaced a suitable distance apart, to receive and propel bottle crates 24 of any suitable construction. In the particular instance shown, the crates comprise transverse frame bars 25 and 26, the ends of the latter being arranged to project laterally outside the sprocket belts and ride over angle iron ways 27 mounted upon the upper portions of the said frames, as seen clearly in Fig. 3, thus supporting the crates in their travel across the machine.

In order to support the bottles in inverted position, the transverse bar plates 25 and 26 are each provided with suitable circular apertures through which the bottles are inserted from the top. The apertures in the

bar member 26 are of less diameter than those in the upper bar member to prevent the bottles slipping through as shown clearly in Fig. 4.

5 The mutilated gear 14 and coöperating gear 15 are so constructed as to shift the conveyer chain forwardly a distance equal to the distance between successive transverse rows of bottles at each actuation, and
10 the crates are so constructed that when placed end to end and conveyed along by the conveyer chains, the distance between the successive rows of bottles will be substantially equal.

15 The crates are placed upon the receiving end of the machine with the bottles in inverted position, and the first treatment to which they are subjected is a scrubbing of their interiors by means of rotating spindle
20 brushes. To this end a horizontal transversely extending frame plate 28 is mounted in the front part of the machine (see Fig. 1) and suspended from this plate are journaled a series of intermeshing spur-gears 29
25 arranged in transverse rows at intervals apart corresponding to the axes of the corresponding sets of bottles arranged in the crates 24. Each gear 29 has a hollow shaft 29' through which is arranged to reciprocate
30 the non-revoluble spindle 30 of a corresponding scrubbing brush 31, and the train of gears is conveniently driven through a pair of miter-gears 32 and 33; the former of which is mounted upon a short shaft 34
35 journaled to extend through the side frame of the machine and carrying at its outer end a belt pulley 35 which is actuated by a belt 36.

The set of internal brushes (there are two transverse rows shown in the present in-
40 stance) are raised and lowered bodily at suitable time intervals to permit the bottles to be stepped forward row after row and to successively enter and scrub the interiors of each row. To accomplish the up and down move-
45 ments of the brushes, the lower ends of the spindles 30 thereof are fixed in a vertical reciprocatory crosshead 37, which is mounted to move on suitable guides 38 and is actuated by mechanism now to be described. Upon
50 the shaft 7 is keyed a crank-arm 39 provided with wrist 40 (see Fig. 3) which enters and engages a slot 41 formed to extend longitudinally in the head 37 at the side thereof. This crank-arm alternately raises and de-
55 presses the crosshead so as to cause the brushes to successively enter the bottles and scrub the interiors thereof; it being understood that the brushes are of a well understood construction which expand as they
60 enter the bottles. The front end of the crosshead, with which the brush spindles 30 are connected, is hollow, as are also the spindles, and water is supplied to the crosshead through a suitable hose connection and
65 injected into the bottles through the spindles

in a usual way. The water escapes from the bottles outside of the spindles, as indicated in the sectional part of the drawing Fig. 4.

In order that the bottles may not be raised out of their positions within the crate
70 by the upward thrust of the brush spindles as the brushes enter the bottles, brackets 41 are mounted at each side of the main frame and carry at their upper ends an overhanging
75 confining plate 42 against which the bottoms of the bottles impinge when lifted by the brushes.

After passing the two series of internal scrubbing brushes, the bottles are next sub-
80 jected to the action of a series of brushes which scrub their bottoms exteriorly. This set of brushes, designated 42^a, is mounted and journaled in a supporting head 43; the latter being carried by a pair of upstanding
85 brackets 44 rising from the respective sides of the main frame. The brushes 42^a are mounted in a plane substantially coincident with the upper ends of the bottles as they pass from beneath the confining plate 42, so
90 that when they pass into register with the brushes they are scrubbed without further adjustment. Water is supplied to the brushes 42^a by means of a series of supply
95 pipes 45' connected with a main supply pipe 45 and said brushes are rotated by mechanism which will be described in connection with the description of the next succeeding scrubbing operation.

Inasmuch as it is obviously impossible to scrub the sides of the bottles while they are in
100 position within the crates, an important feature of the present invention resides in providing mechanism whereby the bottles are bodily lifted out of their crates temporarily, and while held in an uplifted position thor-
105 oughly scrubbed throughout the lengths of their sides, and then returned to their proper seats in the crate. Describing this mechanism, 46 designates a series of spindles connected with and rising from the head 37 near
110 the rear end of the latter; these spindles being arranged in a transverse row to correspond to the transverse rows of bottles, and being of such length that when in their lowermost position their upper ends will be just
115 below the lower ends or necks of the bottles in the horizontal travel of the latter, and when the crosshead is raised to its upper limit of movement will engage and lift the bottles bodily upward entirely free of the
120 crate, as shown clearly in Fig. 1. In order that the upper ends of the spindles may thus engage and properly lift the bottles, they carry at their upper ends caps 47 adapted to receive the necks of the bottles and hold the
125 latter against lateral displacement.

Above the series of spindles 46, and in axial alinement with the several spindles, is arranged a series of spring pressed holders
130 48, each comprising a spindle having splined

engagement with a corresponding gear 49 through which it extends axially, an inverted cup 50 mounted upon its lower end, and a coiled contractile spring 51 connected at one end with the upper end of the spindle and at its other end with the top of the corresponding gear and tending to hold the spindle in its depressed position. The cups 50 are suitably shaped to receive the butt ends or bottoms of the bottles and hold the latter against lateral displacement under the action of the brushes. A brush 52 is provided for each bottle position; these brushes being mounted on spindles 53 journaled in the supporting head 43 and intergeared with the gears 49 by means of gears 54. The gears 49 and 54, as well also as similar gears 55 mounted upon the upper ends of the several brush spindles 42, are all interconnected and driven as a single train. To this end one of the gears 49 is arranged to mesh with an idler gear 56 (see Fig. 3) suitably mounted upon a lateral extension of the head 43, and said gear 56 in turn meshes with a drive gear 57 mounted upon the upper end of a shaft 58 journaled in the extension of the head, as seen clearly in said figure. The lower end of the shaft 58 is mounted in a suitable bearing 59 on the main frame and carries a bevel gear 60 which intermeshes with a corresponding bevel gear 61 mounted upon the shaft 12. It follows that the several spindles 42^a, 48 and 53 will be constantly rotated during the operation of the machine.

From the foregoing it will be obvious that the cups 50 will have frictional engagement with the bottom of the bottles by reason of the spindles 48 being forced downwardly through the action of their respective springs 51. And inasmuch as the spindles 48 are constantly rotated during the operation of the machine the cups 50 will positively rotate the bottles when the latter are forced upwardly by the spindles 46. Water is supplied to the bottles while they are subjected to the action of the brushes 52 by means of branch pipes 45' connected with some source of supply, as the pipe 45.

After the bottles have been scrubbed in their uplifted position, and returned to their seats in the crate, they are conveyed along the main frame to a position at which they are bodily reversed and transferred to the second section of the machine; it being understood that they have had ample time to thoroughly drain before being thus reversed.

Describing the reversing and transferring mechanism, 59' designates a cross-shaft journaled to extend through the main side frame members of the second section of the machine near the receiving end of the latter, and carrying at its outer end a bevel-gear 60'. This bevel-gear meshes with a corresponding bevel-gear 61' mounted upon the main longitudinal shaft 12. Rigid with shaft 59', and the

gear thereon 60', is a spur-gear 62 which is mutilated, being provided with teeth upon one portion only of its periphery; the number of these teeth corresponding to the number of teeth in a pinion 63 mounted upon a suitable stub-shaft and arranged to intermesh therewith, as seen clearly in Figs. 2 and 4. It follows from this arrangement that upon each revolution of the gear 62 the gear 63 will also be turned a single revolution. The shaft 64 which carries gear 63 is provided with a crank-arm 65 which is connected with a sliding rack 66 by means of a link 67. The rack 66 is longitudinally slotted and slides horizontally upon the shaft 64, its other end being supported and guided in a suitable bearing 68. With the rack is arranged to mesh a spur-gear 69 mounted upon a shaft 70 extending transversely above the bed of the machine, and upon this shaft is rigidly mounted a crate-carrier or basket 71. During the most of the time of the operation of the machine this basket rests in upright horizontal position, as seen in Fig. 1, but when the rack 66 is reciprocated the basket is oscillated over into reversed position, picks up a crate of bottles and returns to its normal position; the operation of reversing, picking up and returning to normal position being performed without interruption.

In order that the basket may automatically engage the side bars of the crate and carry the latter with it during its return movement, spring catches 71' are mounted upon each side frame member of the basket, as seen clearly in Figs. 2 and 4, the catches being so shaped that as the basket passes downwardly in inverted position over the crate the inclined portions 71'' of the catches are sprung back and thereafter snap into engagement with the side bars.

The second section of the machine is provided with a pair of endless conveyer belts 72 substantially similar to those hereinbefore described; the receiving ends of said belts being trained around idle pulleys (not shown) loosely mounted on the shaft 59' (see Fig. 4), while the opposite ends of the belts are trained around and driven by sprockets 74 mounted on a cross-shaft 75 which carries a bevel-gear 76 intermittently operated by a mutilated bevel-gear 77 mounted on the end of shaft 12.

The basket 71 is of skeleton form and so constructed that when in its horizontal normal position the prongs of the belts 72 may engage the crate and slide it endwise out of the basket.

The bottles are now washed and in position to be filled and corked.

I claim as my invention:

1. In a bottle handling apparatus, the combination with a suitable main frame, of a conveyer mechanism for moving crates of bottles along said frame, step by step, means

operating automatically for washing the interiors of the bottles during an early part of their progress through the machine and while in an inverted position, and automatic mechanism for reversing the crates at the end of their travel.

2. In a bottle handling apparatus, the combination with a suitable supporting frame, of a conveyer mechanism, means for actuating the conveyer mechanism, one or more bottle holders moving with the conveyer, take-off mechanism operating to automatically withdraw the bottles from the holder or holders and to restore them to their original seats therein, and scrubbing mechanism arranged to wash the sides of the bottles while supported by the take-off mechanism.

3. In a bottle handling apparatus, the combination with a suitable main frame, of a conveyer mechanism, bottle holding crates actuated by said conveyer mechanism and wherein the bottles are arranged in rows extending transversely to the direction of movement of the conveyer, means for actuating the conveyer mechanism step by step distances corresponding to the distance between rows of bottles, take-off mechanism operating to automatically withdraw a row of bottles from a crate while the latter is in register with said take-off mechanism and to restore them to their original seats therein, and scrubbing mechanism associated with said take-off mechanism and operating upon the exteriors of the bottles while supported in the take-off mechanism.

4. In a bottle handling apparatus, the combination with a suitable main frame, of a conveyer mechanism, crates actuated by said conveyer mechanism and in the initial part of their travel arranged with the bottles inverted, means for actuating said conveyer step by step, automatically advancing and retracting brushes arranged to pass into each group of bottles, scrub the latter and withdraw as they are brought into register by the conveyer, automatically advancing and retracting take-off mechanism operating to shift the bottles bodily out of the crate and return them to position therein, and scrubbing mechanism associated with the take-off mechanism and operating to wash the exteriors of the bottles while supported by the take-off mechanism.

5. In a bottle handling apparatus, the combination with a suitable supporting frame and a conveyer traveling thereon, of a series of crates carried by said conveyer, mechanism for subjecting the bottles to treatment during their travel with the conveyer, a reciprocatory reversing basket mounted in proximity to the conveyer and adapted to remove the crates bodily from the conveyer and reverse them and suitably

timed automatic means operating to actuate said reversing mechanism.

6. In a bottle handling apparatus, the combination with a suitable supporting frame and a conveyer traveling thereon, of a series of crates carried by said conveyer, automatically extending and retracting washing spindles operating to cleanse the interiors of the bottles during an early part of their travel with the conveyer, automatically advancing and retracting take-off mechanism operating to shift the bottles bodily out of the crate and return them to position therein, scrubbing mechanism associated with said take-off mechanism and adapted to operate upon the exteriors of the bottles while supported by the take-off mechanism, and suitably timed automatic reversing mechanism mounted in proximity to the conveyer and operating to remove the crates bodily from the latter, and reverse them.

7. In a bottle handling apparatus, the combination with a suitable main frame, of a conveyer mechanism, bottle holders moving with said conveyer mechanism, means for actuating the conveyer mechanism step by step, and take-off mechanism operating to withdraw the bottles from the crates and restore them to the latter comprising a shiftable frame, a series of bottle-engaging projections carried by said frame, a yieldably supported clamping mechanism cooperating with the bottle engaging projections to hold the several bottles between the respective projections and clamping mechanism, scrubbing devices arranged to act upon the exteriors of the bottles while held in the take-off mechanism, and means for effecting the actuation of the several parts of said take-off mechanism in properly timed relation to the movements of the conveyer.

8. In a bottle handling apparatus, the combination with a suitable main frame, of a conveyer mechanism, bottle holders moving with said conveyer mechanism, means for actuating the conveyer mechanism step by step, and take-off mechanism operating to withdraw the bottles from the crates and restore them to the latter comprising a shiftable frame, a series of bottle-engaging projections carried by said frame, a series of yieldably projected clamping cups arranged in alinement with the respective bottle-engaging projections of the shiftable frame, a series of brushes rotatably mounted alongside of the bottle holding devices of the take-off mechanism, means for supplying liquid to said mechanism, and means for actuating the several parts of the take-off mechanism in properly timed relation to the movements of the conveyer.

9. In a bottle handling apparatus, the combination with a suitable supporting frame, of a conveyer mechanism, means for

actuating the conveyer mechanism, one or more bottle-holders moving with said conveyer, take-off mechanism operating to engage the bottles, shift them out of bearing
5 with their seats in the holder and return them to their seats, means for rotating the bottles about their individual axes while supported by the take-off mechanism and associated scrubbing mechanism for scrubbing the exteriors of the bottles while engaged by the take-off mechanism. 10

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