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PATENTED JULY 4, 1905.

J. H. W. ORTMANN & C. W. HERBST.

BOTTLE CLEANSING MACHINE.

APPLICATION FILED AUG. 10, 1903.

2 SHEETS—SHEET 1.

Fig. 1

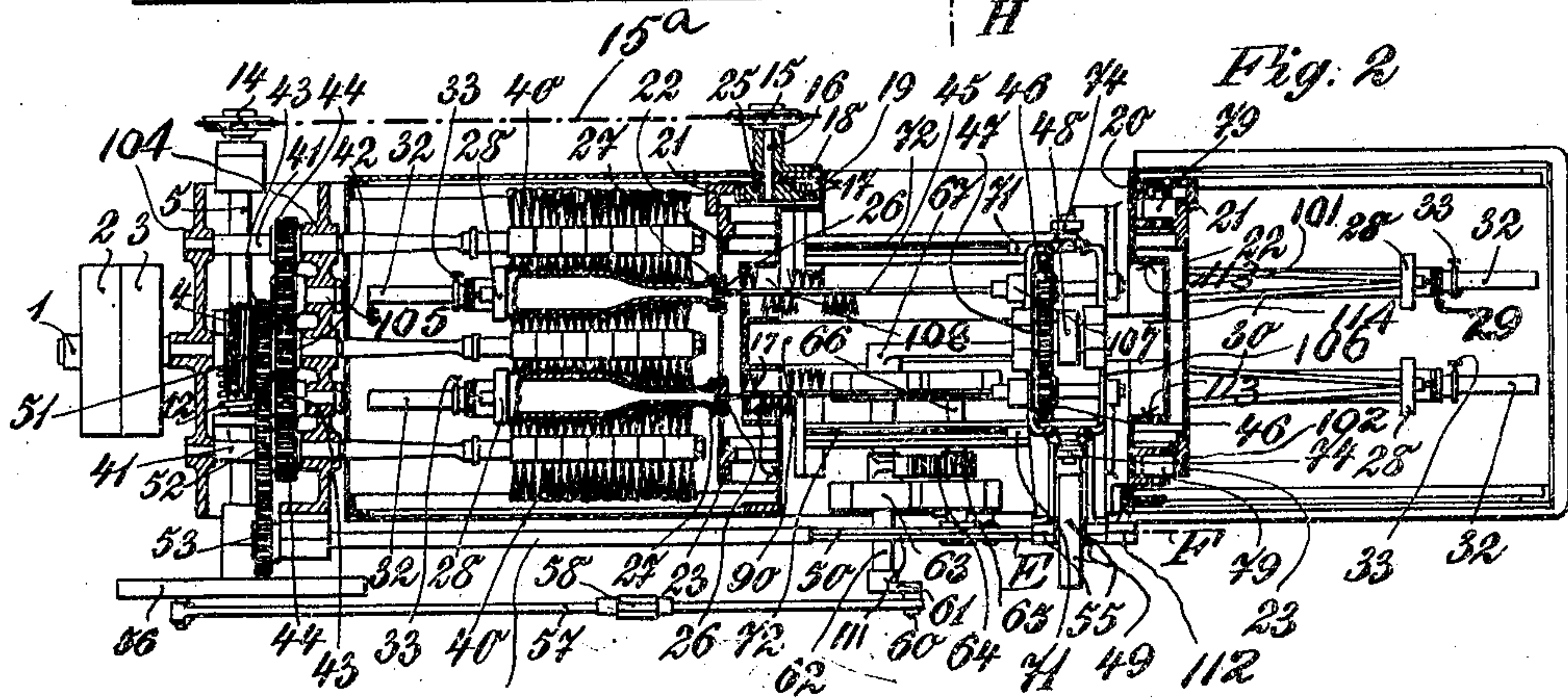
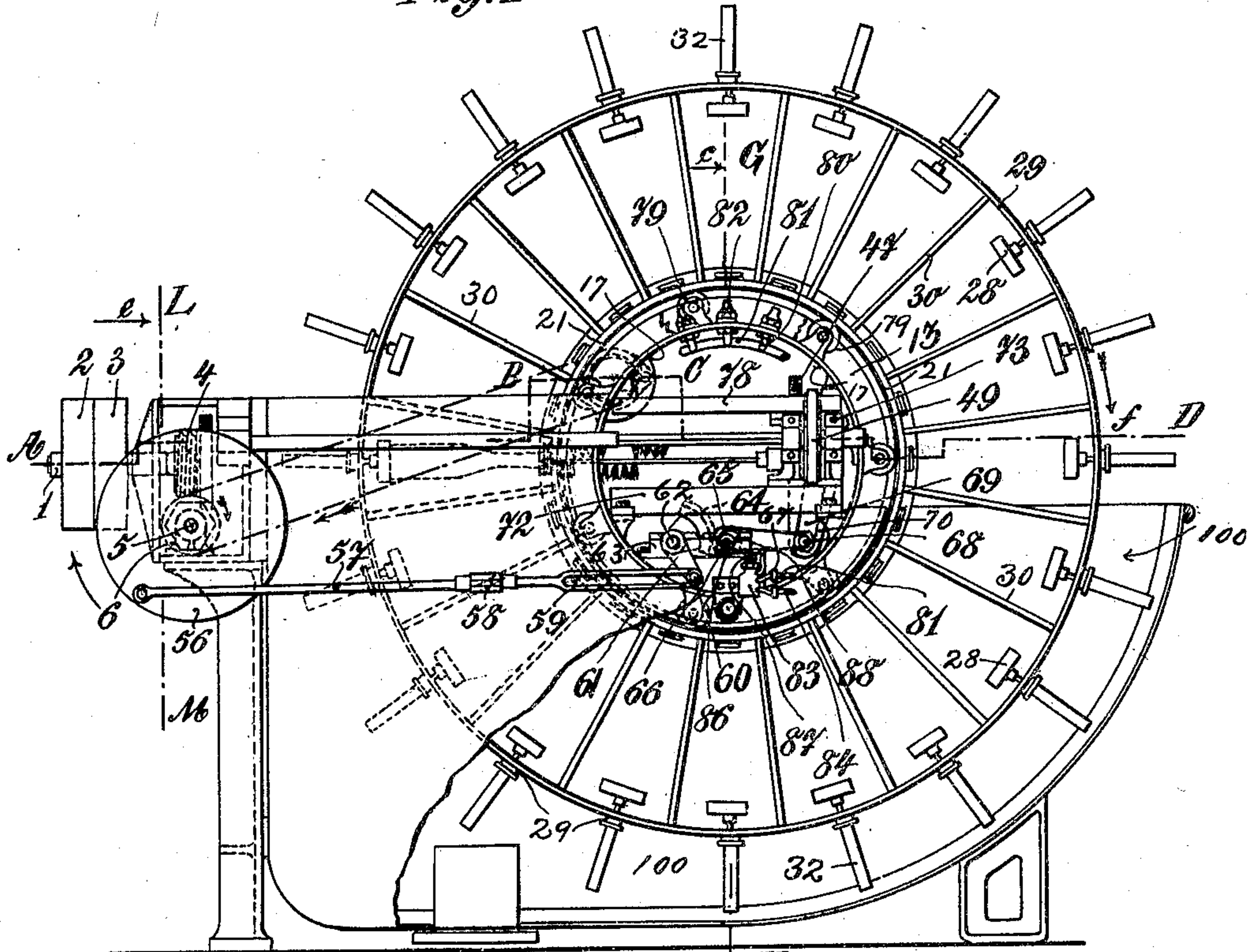
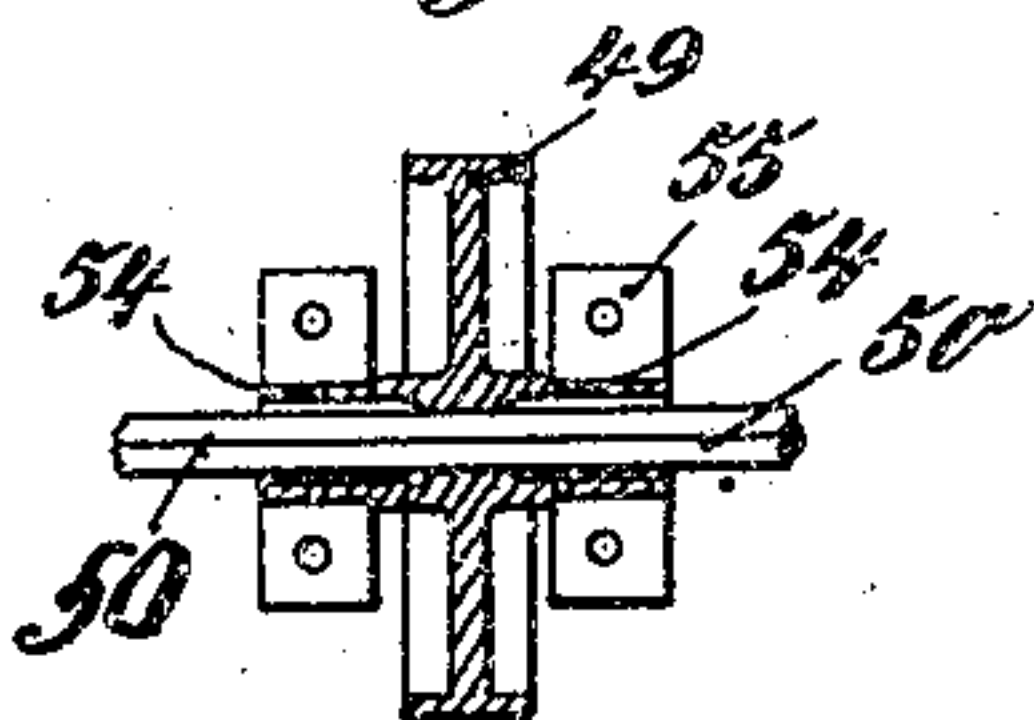


Fig. 4



Witnesses.

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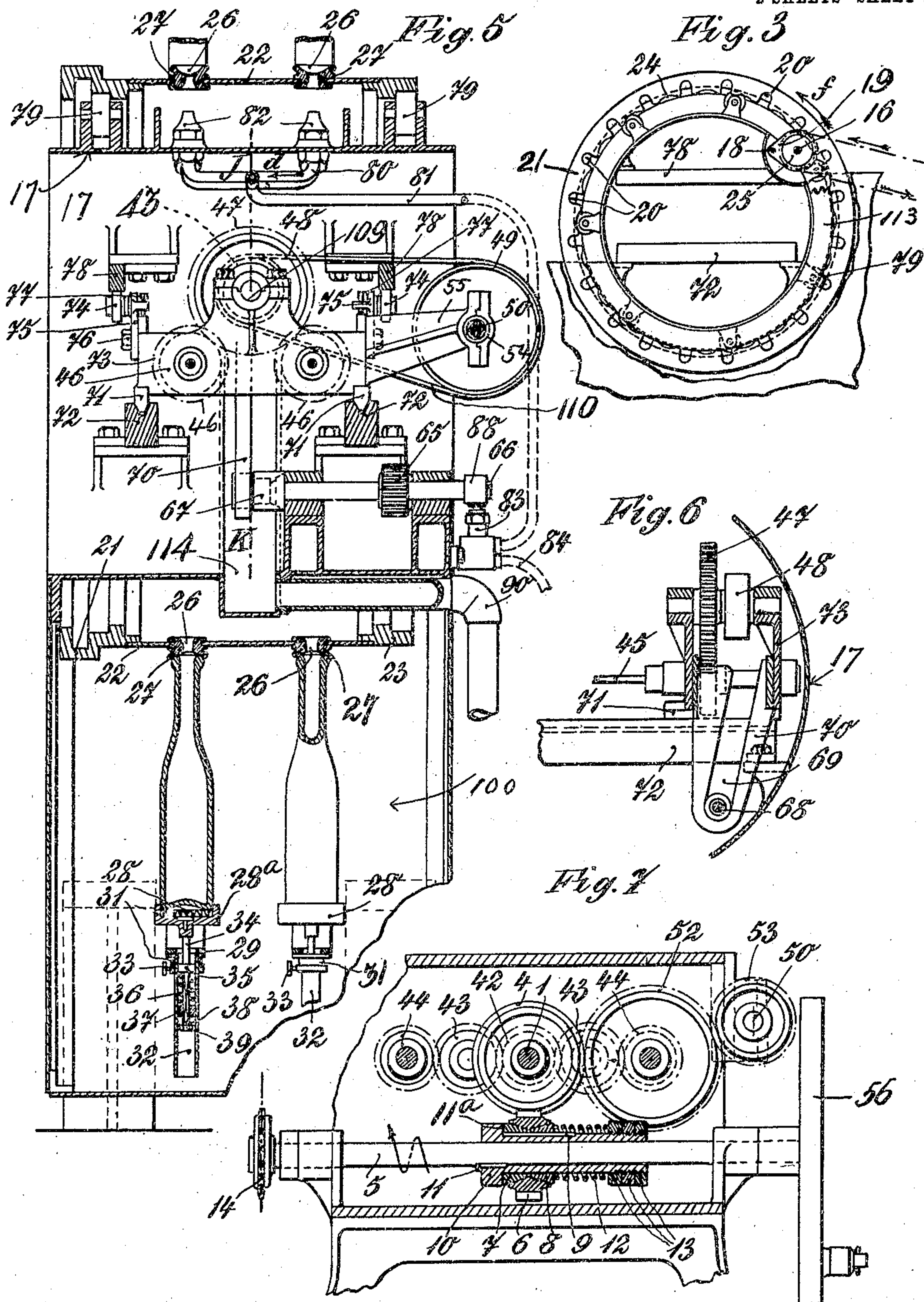
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN HENRY WILLIAM ORTMANN AND CARL WILHELM HERBST, OF
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BOTTLE-CLEANSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 793,736, dated July 4, 1905.

Application filed August 10, 1903. Serial No. 168,966.

To all whom it may concern:

Be it known that we, JOHN HENRY WILLIAM ORTMANN and CARL WILHELM HERBST, engineers, subjects of the German Emperor, residing in the free town of Hamburg, in the State of Hamburg and Empire of Germany, have invented certain new and useful Improvements in Bottle-Cleansing Machines, of which the following is a full, clear, and exact description.

This invention relates to improvements in bottle-cleaning machines of that type in which a bottle-holding frame mounted in a suitable tank is given an intermittent rotary motion to bring the bottles before suitable brush and rinsing devices.

The principal object of the invention is to provide a machine of the character referred to in which the parts requiring lubrication are located in a separate compartment in order that the oil or other lubricant used will not drip from those parts into the soaking-tank.

Another object of our invention is to effect improvements in means for mounting the rotary bottle-holding frame and for imparting an intermittent rotary motion to same.

Another object of our invention is to effect improvements in the means for controlling the brush and rinsing devices.

A further object of our invention is to improve and simplify the construction and operation of devices of this character, and thereby render them more durable in use and efficient in operation.

With these and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of our improved bottle-cleaning machine, a portion of the tank being broken away. Fig. 2 is a horizontal sectional view taken on the plane indicated by line A B C D of Fig. 1. Fig. 3 is a detail view showing the means for imparting an intermittent rotary motion to the bottle-holding frame.

Fig. 4 is a detail sectional view taken on the plane indicated by the line E F of Fig. 2. Fig. 5 is a vertical transverse sectional view taken on the plane indicated by the line G H in Fig. 1. Fig. 6 is a detail sectional view taken on the plane indicated by the line J K in Fig. 2 and looking in the direction of the arrow *d*. Fig. 7 is a detail vertical sectional view taken on the plane indicated by the line L M of Fig. 1 and looking in the direction of the arrow *e*.

Referring to the drawings by numeral, 100 denotes a suitable soaking-tank having an open top, in the center of which is secured a transversely-extending annular support 17 in the form of a cylinder or drum having open ends. Upon said support is rotatably mounted a bottle-holding frame, and within said support are mounted an internal bottle-brushing device and a suitable external bottle-rinsing device. At one end of the tank suitable internal bottle-brushing devices and suitable gearing for operating said brushes are mounted. Said rotary bottle-holding frame comprises a hub 101, one or more rims 29, and radial spokes 30, connecting said rims and hub. Said hub comprises rings 21 and 23, which are united by a cylindrical band 22, from which the said spokes project. Each of said rings is formed with an internal trackway 102, which is engaged by friction-rollers 79, journaled in brackets provided at suitable intervals upon the exterior of the support 17 in order to permit said hub to rotate upon said support. In order to impart an intermittent rotary motion to said bottle-holding frame and also to intermittently hold the same stationary, we provide said ring 21 with an annular flange or plate, the inner edge of which is formed with a series of radial recesses 20 and a series of curved depressions 24, which are disposed between said recesses. Coacting with said recesses and depressions is a disk 19, secured upon a shaft 16 and having a reduced circular portion 25 and a projecting pin 18. Said pin as the disk is rotated enters said recesses 20 to move said rim intermittently, and said portion 25 is adapted to coact with said depressions 24 when said pin is not engaged with one of said

recesses to hold said frame stationary, as will be readily understood. Said shaft 16 is journaled in a suitable bearing upon the support 17 and has secured to its outer end a sprocket-wheel 15, which is connected by a sprocket-chain (conventionally illustrated as at 15^a) to a similar sprocket-wheel 14 upon a transverse shaft 5, mounted in suitable bearings upon the end of the frame. The bottles to be washed are supported radially upon said frame between its hub and rims and have their mouths engaged with funnel-shaped cushions 27, secured in the portion 23 of the hub of the frame and formed with central apertures 26. The bottoms of the bottles are held in adjustable supports, each of which comprises a recessed head 28^a, into which the bottom bottle is inserted and which is provided with a brush 29, against which the bottom of the bottle bears. Each of said heads 28^a is formed with a projecting stem 34, which projects through an opening in one of the rims 29 and into a tubular sleeve 32, which is adjustably secured, by means of a set-screw 33, in a flanged sleeve 31, secured upon the periphery of said rim 29. The interior of said sleeve 32 is provided with a fixed ring 37, in which the polygonal portion 38 of said stem 34 slides and between which and a fixed collar 35 upon said stem 34 a coiled spring 36 is confined. It will be seen that said spring forces said head 28^a inwardly to hold the bottle in place, and the tension of said spring may be varied by adjusting the sleeve 32 in the flanged sleeve 31. In order to prevent the removal of the head 28^a and its stem when it is not engaged with a bottle, the outer end of said stem is formed with a head 29, as shown. The exteriors of the bottles are cleaned by rotary brushes 40, one of which is disposed centrally between the rims 29 and the other two of which are disposed upon the outer sides of said rims. Said spindles of said brushes project through one end of the tank and are mounted in suitable bearings 104. The spindles of each of the outer brushes have secured to them gears 44, which mesh with gears 43 upon stub-spindles 105. Said gears 43 are disposed upon opposite sides of and are in mesh with a gear 42, secured upon the shaft or spindle 1 of the central brush. Said shaft 1 forms the main drive-shaft of the machine and has upon its outer and rear end fixed and loose pulleys 2 and 3, by means of which the machine may be connected up to any suitable source of power. The interiors of the bottles are cleaned by rotary brushes 45, which are mounted upon the reciprocating carriage 106. The spindles of said brushes are journaled in suitable bearings 107 upon said carriage, and their outer ends, upon which said brushes are formed, project through openings 108, formed in said support 17. Within the said casing are secured upper and lower track or guide rails 78 and 72, between which the carriage is

slidably mounted. Said lower rails 72 are formed with V-shaped grooves, with which V-shaped blocks 71 upon the under side of said carriage coact to support and guide said carriage. Said upper rails 78 are engaged by friction-rollers 74, mounted upon the upper portion of said guide, and prevent displacement of the latter. Said rollers 74 are adjustably mounted by journaling them upon brackets 75, which are held upon the carriage by bolts 76, which pass through vertical slots formed in said brackets and are adjusted by means of set-screws 77, as clearly shown in Fig. 5. In order to rotate the brushes, their spindles are provided with gears 46, which mesh with a gear 47 upon a shaft 109, journaled in bearings upon said carriage. Upon said shaft is secured a pulley 48, which is connected by a suitable belt 110 to a pulley 49. Said pulley 49 has its hub formed with projecting portions 54, which are journaled in brackets 55, secured upon said carriage, and its hub is also formed with a square or polygonal shaped bore, through which a similar-shaped portion 50 of a longitudinally-disposed shaft 111 extends. It will be seen by this construction the said pulley may slide longitudinally upon said shaft as the carriage is reciprocated, but must rotate with the same. Said shaft 111 is journaled in bearings 112, secured upon said support 17 and one end of said tank. Upon the rear end of said shaft is a pinion 53, which meshes with a gear 52, loosely mounted upon the spindles of one of said brushes 40. Said gear 52 meshes with a gear 51, secured upon the main drive-shaft 1. In order to reciprocate said carriage 106, a depending arm 70 is connected at its upper end to a bracket 73 on the carriage, as shown in Fig. 6, and said arm is formed with a slot 69, into which a pin 68 upon a crank-shaft 67 projects. Said crank is secured upon the inner end of a shaft 66, journaled in bearings within said support 17. Upon said shaft 66 is a gear 65, which is rotated by a segmental gear 64 upon a shaft 62, journaled in bearings 63, secured within said support 17. The outer end of said shaft 62 is provided with a crank 61, the pin of which projects into a slot formed in one end of a pitman-rod 57, the other end of which is connected to a crank-disk 56, secured upon one end of said shaft 5. In order to adjust the length of said pitman-rod, and thus vary the operation of the segmental gear 64, we form said pitman-rod in two parts and connect them by a turnbuckle 58, as will be readily understood.

The shaft 5 is driven from the main shaft 1 by providing the latter with a worm 4, which meshes with a worm-gear 6 in order that said shaft 5 will be permitted to rotate without imparting motion to said worm-gear when the resistance offered to the latter is abnormal, as is the case when some part of the machine becomes caught. Said clutch connection com-

prises a sleeve 10, keyed, as at 11, upon said shaft 5 and formed with an annular shoulder 11^a. Slidably mounted upon said sleeve are two oppositely-tapered or cone-shaped rings 7 and 8, the tapered faces of which engage oppositely-tapered ends of the bore of the worm-gear 6. Said rings 7 and 8 are permitted to slide longitudinally upon the sleeve, but are keyed to rotate therewith, as shown at 9, and between the outer end of the ring 8 and lock-nuts 13, secured upon the end of said sleeve, is confined a coil-spring 12, which wedges said rings into said gear to frictionally lock it upon said sleeve. It will be seen that said nuts may be adjusted upon the sleeve to vary the tension of said spring 12 to permit the gear and shaft to turn independently whenever a certain degree of resistance is reached. By this construction it will be seen that should a bottle break or any part of the machine become broken or damaged, so as to offer resistance to the rotation of the bottle-holding frame, the shaft 5 will be permitted to turn without rotating the worm-gear, and thus prevent breakage of the other parts of the machine.

In order to rinse the bottles, a series of nozzles 82 are provided upon said support 17 and are connected by short pipes 80 to a pipe 81, which has its lower end opening into a valve-casing 83. A pipe 84 for the supply of water or other cleaning liquid also opens into said valve-casing 83. The stem 85 of the valve in said casing is held elevated by a coiled spring 87 and is adapted to be depressed by a lever 86, pivoted at 89 upon a bracket projecting from said valve-casing. Said lever is operated by a cam 88, secured upon said shaft 66. It will be seen that as said shaft 66 rotates the valve will be opened and closed to permit water to pass from said supply-pipe 84 to the nozzles 82, which discharge it into the bottles in order to rinse them. Owing to the fact that the bottles are in an inverted position, this rinsing-water will immediately discharge from the same and fall upon the upper side of the support 17 between semicircular flanges 113, and as it runs down said upper side it will be caught in a depressed portion 114, formed in the center of the support 17. Said depressed portion 114 forms a drain for this rinsing-water, which is permitted to discharge through a pipe 90, opening into said portion 114 and communicating with a sewer or the like. It will thus be seen that the oil, grease, dirt, and other matter washed from the bottles will be prevented from passing into the soaking-tank 100, in which the bottles are initially submerged.

The operation of the machine will be readily understood from the foregoing description, taken in connection with the accompanying drawings and the following brief statement. The operator stands at one end of the machine and inserts and removes the bottles into and

from the bottle-holding frame as the latter is rotated step by step in the direction of the arrow *f*. (Shown in Fig. 3.) The bottles first pass through the tank, in which they are thoroughly soaked, and are then brought between the brushes 40 and in alinement with the brushes 45, at which time the carriage 106 is reciprocated to move said brushes 45 into the bottles, as will be readily understood. At the same time the carriage is reciprocated the valve of the rinsing apparatus will be opened to permit its nozzles to discharge water into the bottles in alinement with them.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a bottle-cleaning machine comprising an open-top soaking-tank, a cylindrical support secured transversely upon the top of said tank, an annular bottle-holding frame mounted and adapted to rotate upon said cylindrical support, rotary external bottle-brushes at one end of said tank, rotary internal bottle-brushes mounted within said cylindrical support in combination with the mechanism for intermittently reciprocating said internal brushes, with a slotted depending arm and an adjustable pitman connected indirectly with said slotted depending arm, substantially as described.

2. In a bottle-cleaning machine, rotary brushes for cleaning the external parts of bottles and rotary brushes for cleaning the internal parts of the bottles, a reciprocating carriage carrying the internal brushes, a slotted arm depending from said carriage, a crank-shaft, a crank thereon, a pin on said crank to enter the slot in said depending arm, a pinion on said crank-shaft, a segmental gear meshing with said pinion, an adjustable pitman actuating said segmental gear and means for reciprocating the pitman.

3. In a bottle-washing machine, the combination of an annular cylindrical support mounted upon an open-top tank, an annular bottle-holding frame adapted to rotate about said support, a reciprocating brush-carriage within said support, and means for operating said carriage comprising a slotted arm depending from said carriage, a crank-shaft, a crank thereon, a pin on said crank to enter the slot in said depending arm, a pinion on said crank-shaft, a segmental gear meshing with said pinion, an adjustable pitman actuating said segmental gear, and means for reciprocating the pitman.

4. In a bottle-washing machine provided with a bottle-holding device, rotary brushes for cleansing the external and rotary brushes for cleansing the internal parts of the bottles,

and a rinsing device, in combination with an
annular cylindrical support mounted upon a
tank, opposing walls extending partly beyond
the external periphery of said annular cylin-
5 drical support to provide means for allowing
waste water to flow into a depression in said
cylindrical support through a pipe, as shown
and described.

In witness whereof we have hereunto set our
hands in presence of two witnesses.

JOHN HENRY WILLIAM ORTMANN.
CARL WILHELM HERBST.

Witnesses:

HANS KOOP,
E. H. L. MUMMENHOFF.