

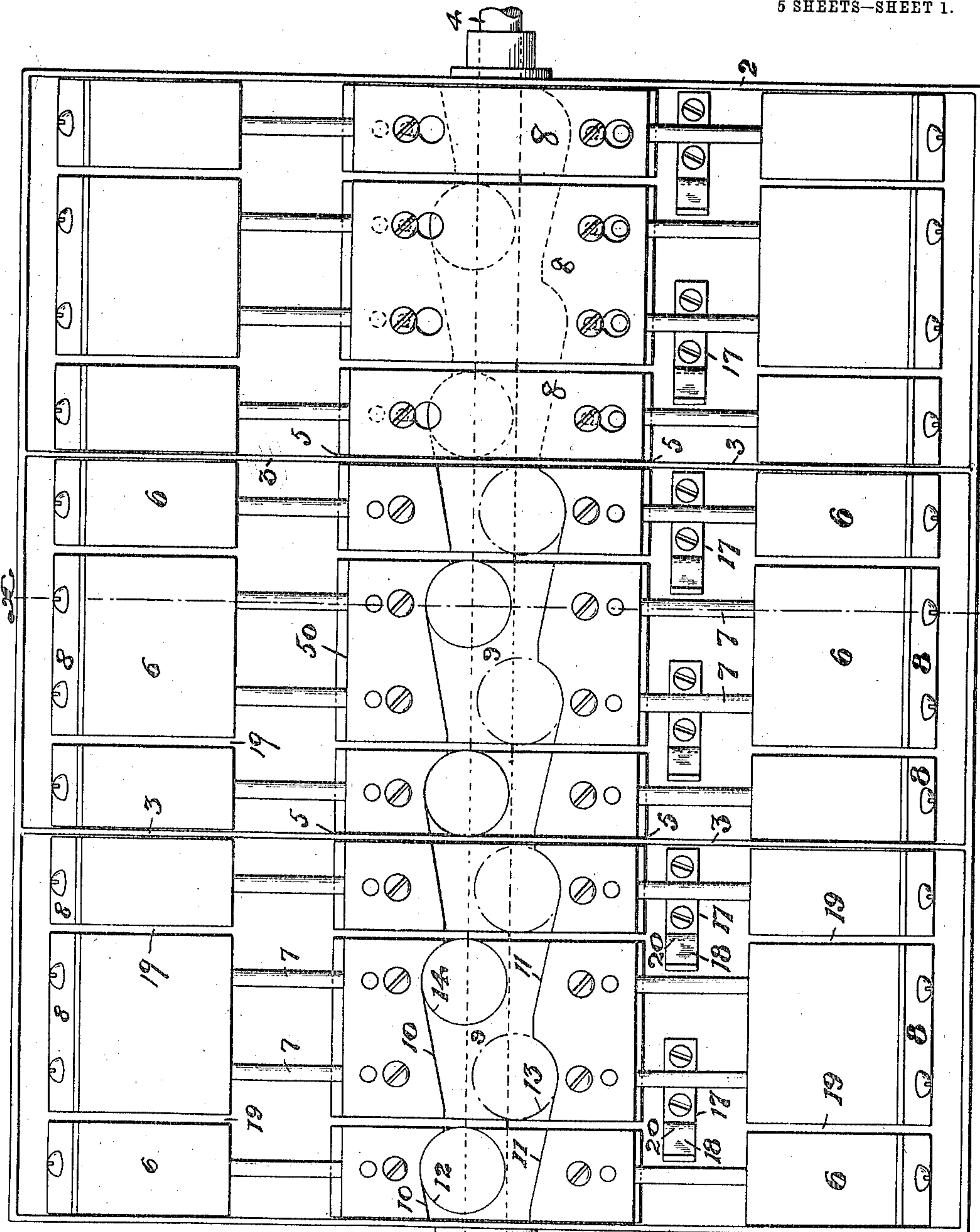
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PATENTED APR. 3, 1906.

P. D. LAIBLE.
BOTTLE WASHING MACHINE.

APPLICATION FILED JULY 15, 1905.

5 SHEETS—SHEET 1.



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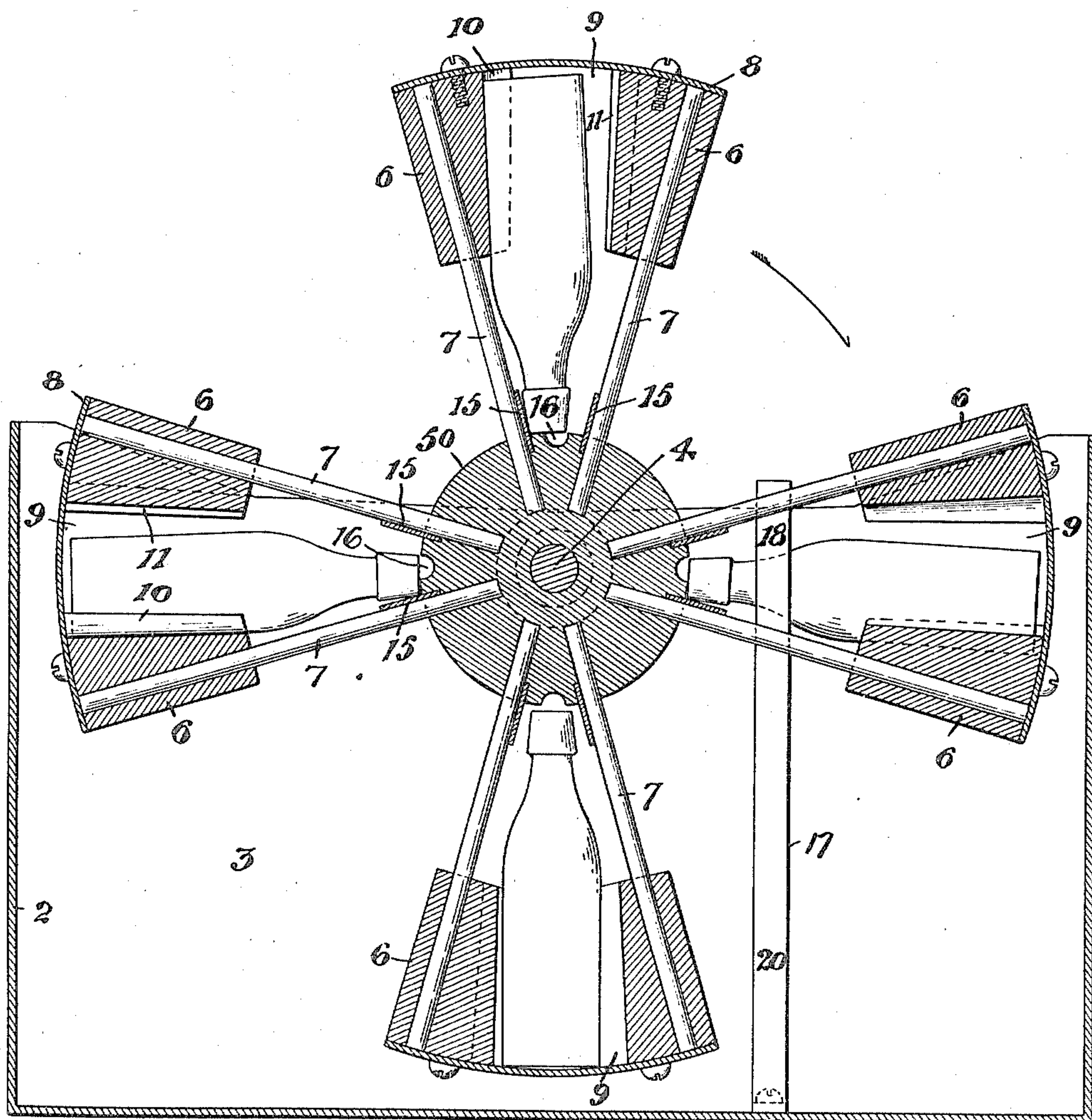
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5 SHEETS—SHEET 2.

Fig. 2.



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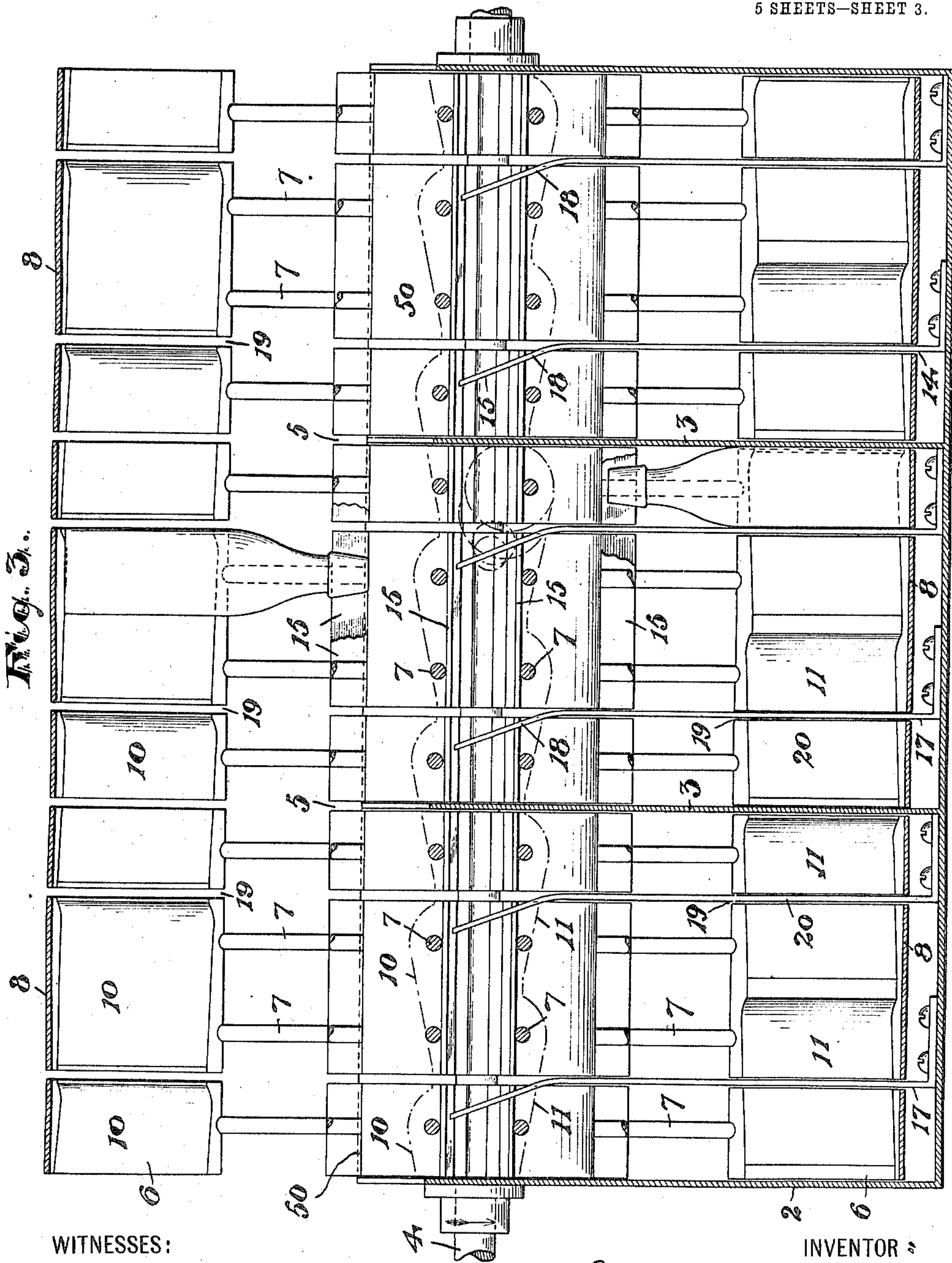
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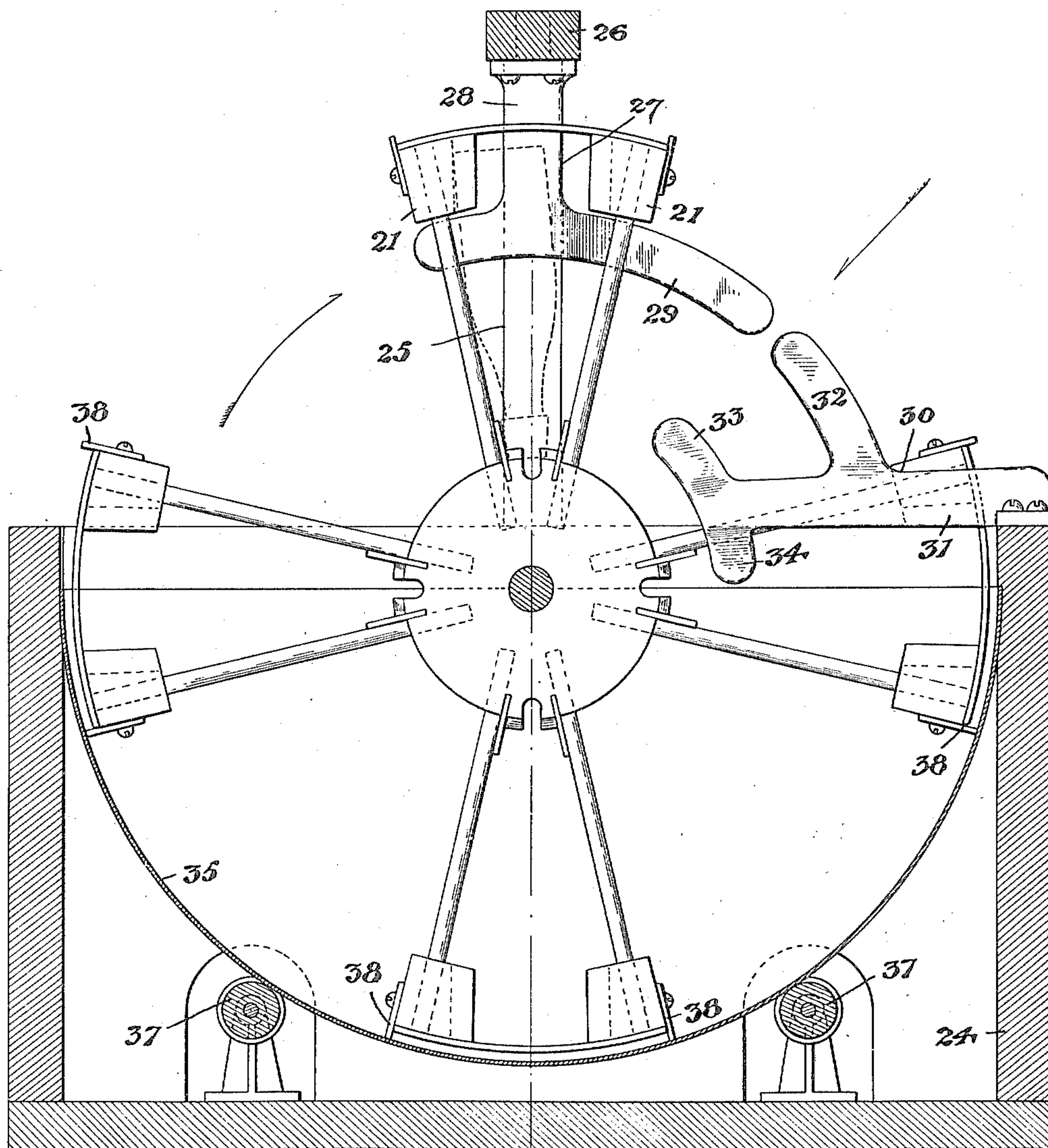
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5 SHEETS—SHEET 4.

Fig. 4



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5 SHEETS—SHEET 5.

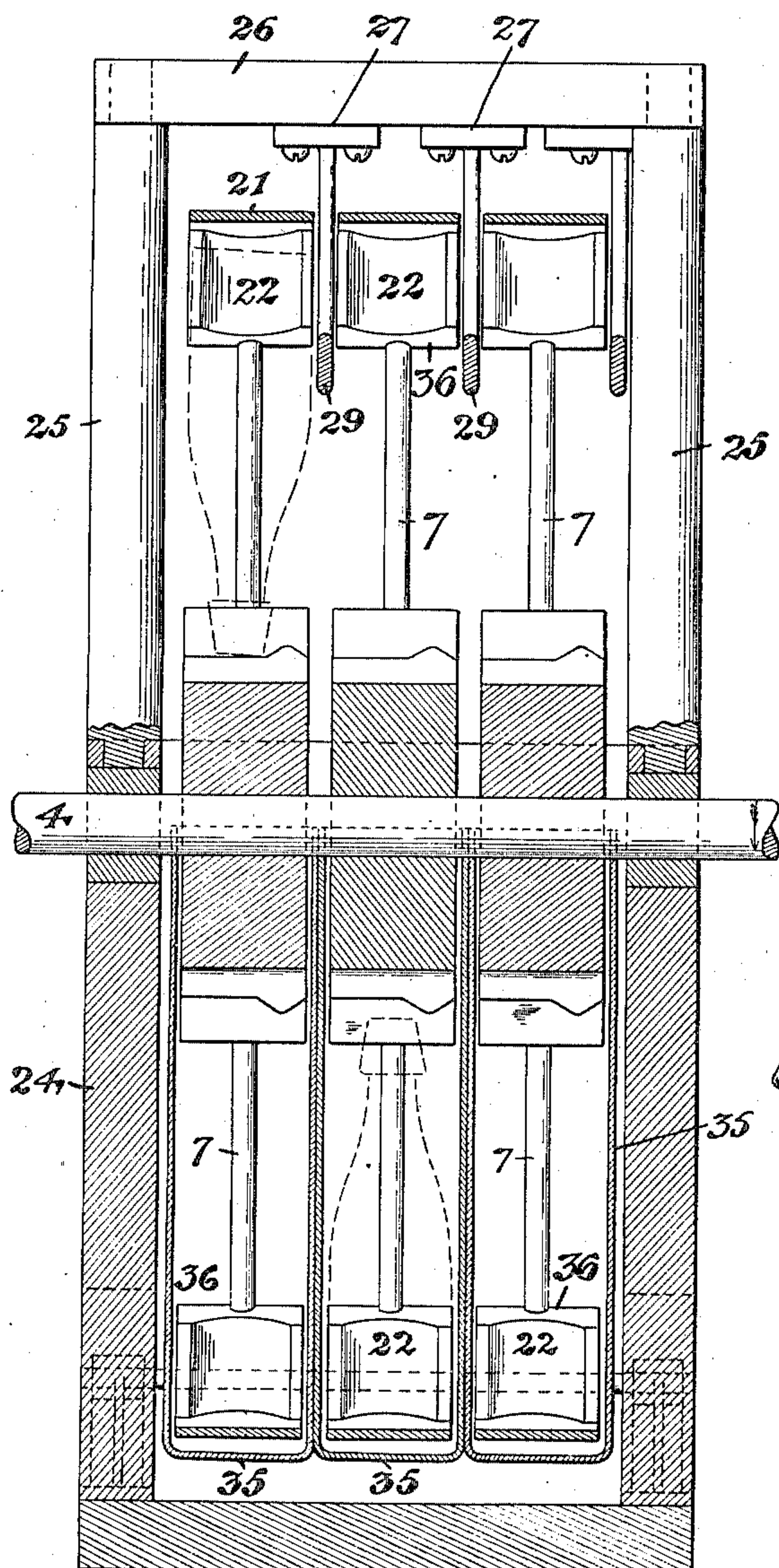


Fig. 5.

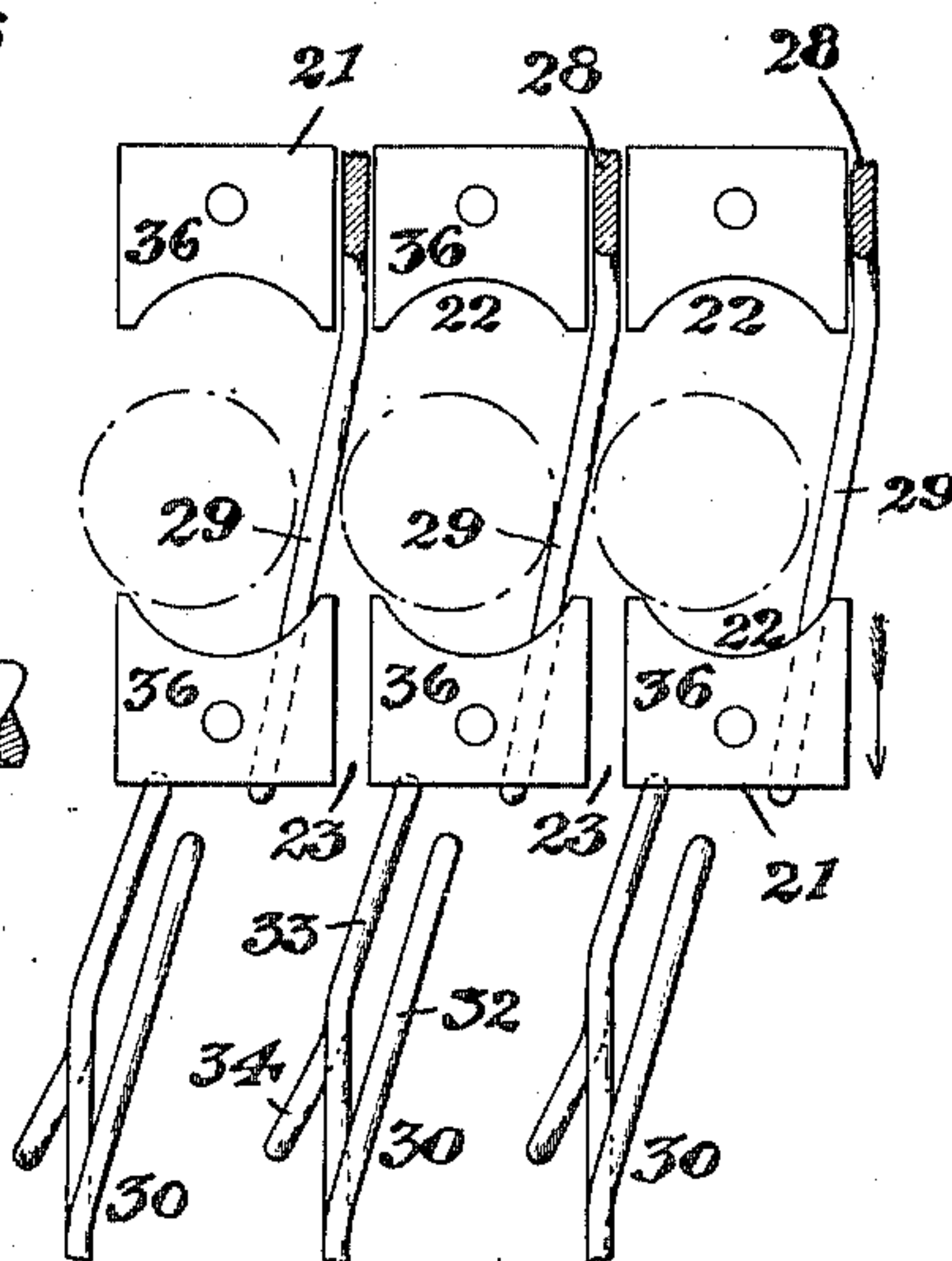


Fig. 6.

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UNITED STATES PATENT OFFICE.

PHILIP D. LAIBLE, OF NEWARK, NEW JERSEY.

BOTTLE-WASHING MACHINE.

No. 816,920.

Specification of Letters Patent.

Patented April 3, 1906.

Application filed July 15, 1905. Serial No. 269,765.

To all whom it may concern:

Be it known that I, PHILIP D. LAIBLE, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Bottle-Washing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to numerals of reference marked thereon, which form a part of this specification.

This invention relates to machines for washing and rinsing bottles such as are commonly used by brewers and bottling establishments, the objects of the invention being to provide a washing-machine that will more effectually cleanse the interiors of the bottles, while facilitating the work as compared with the older methods and means employed, to simplify and reduce the cost of construction, and to gain other advantages and results, some of which may be hereinafter referred to in connection with the description of the working parts.

The invention consists in the improved bottle-washing machine and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like numerals of reference indicate corresponding parts in each of the several figures, Figure 1 is a plan of my improved machine, certain straps for retaining the bottles in their runways being removed to show the construction of a runway more clearly; and Fig. 2 is a cross-sectional view of the same, taken upon line *x*, Fig. 1. Fig. 3 is a side elevation with the wall of the tank and the adjacent bottle-carrying arms broken away, the upper and lower vertical arms being shown in central section. Fig. 4 illustrates certain modifications of construction in the tank and the guides. Fig. 5 is a vertical longitudinal section upon line *y*, Fig. 4; and Fig. 6 is a diagrammatic view of the said modified construction of guides looking in the direction of the arrow on Fig. 4.

In said drawings, 2 indicates a tank, which is preferably divided, as by partitions 3, into a series of compartments adapted to hold different liquids, such as are commonly em-

ployed in washing bottles. Above the said tank is arranged, horizontally and longitudinally thereof, a shaft 4, having upon itself a hub or drum 50, which is preferably divided, as at 5, to accommodate the divisions or compartments of the tank. This said hub or drum carries upon itself, longitudinally thereof, radial extensions, which may be of any number, although preferably four, as I have shown in the drawings. Each of said radial extensions is composed of opposite facing parts 6 6, separated by a space in the plane of the shaft 4 and forming between themselves a runway or passage for bottles. The said facing parts 6 are each supported by rods 7, extending outward from the hub 5, and at their outer ends are connected, as by metal straps 8, it being understood that said radial extensions are divided transversely in coincidence with the divisions of the hub or drum above described. The passage or runway for the bottles between the said facing parts or members 6 6 is of a zigzag formation, each section or step 9 of said runway having one of its side walls, as 10, disposed obliquely to the general direction which the bottles are to take in passing through the machine, and the next section or step having its opposite side wall, as 11, also oblique or inclined, but in the opposite direction. The passage or runway is, moreover, of a width adapted for a single bottle to roll loosely through. In operation of the machine, therefore, the tank-compartments having been suitably filled with liquids, the shaft 4 is rotated in the direction indicated by the arrows. A bottle is then inserted in said runway at the left-hand end of the machine, as seen in Fig. 1, and obviously such insertion must be made into the upper or exposed radial spoke of the machine and through the end thereof. The bottle thus lies in radial position with respect to the shaft 4, as indicated at 12 in Fig. 1, its neck abutting against the hub or drum and the body portion of the bottle lying between the opposite members 6 6 of the runway. As the shaft 4 turns and the radial spoke in which the bottle has been placed passes a vertical position the bottle falls over against the opposite side 11 of the second runway-section and rolls by gravity along said section, so that it lies in the position marked 13 in Fig. 1. The bottle occupies this position throughout a half-turn of the shaft 4 or until it reaches the lowermost vertical position, filling with liquid as it is immersed in the

tank. Upon passing said lowermost vertical position and as the carrying arm or spoke begins to rise in the tank the bottle falls by gravity against the opposite side 10 of the next step of the runway and rolls along the inclined face thereof into the position shown at 14 in Fig. 1. The bottle occupies this position for the next half-turn of the machine, during which time it is emptied of liquid, and then repeats the movement above described during the next revolution of the machine, so that each revolution advances the bottle one step until the bottle has traveled the entire length of the machine, when it is ejected. During these movements the bottle is being alternately filled and emptied and its exterior subjected to washing. Of course in actual practice another bottle is inserted as soon as the previous one has passed along into the machine to give room or one bottle is inserted into each carrying-arm of the machine at each of its revolutions, and so each arm of the machine is constantly filled with bottles, which are being discharged at one end and replaced by others inserted at the opposite end. The bottles are therefore kept constantly in motion in the liquid and are being repeatedly filled and emptied, so that they are perfectly cleansed and rinsed.

It will be remembered that the hub or drum and its radial spokes are divided transversely, as at 5, to receive the partitions 3 of the tank, and the pockets or inclines of each runway are so arranged in number and sequence that the shifting of a bottle from one tank to the next always occurs at the top or uppermost position, so that the bottle passes freely above the partition between the tanks. On the other hand, every longitudinal shifting at the lower position of the bottle-carrying spokes occurs wholly within one compartment of the tank, as will be understood. Preferably slats or strips 15 are provided upon the rods 7 adjacent to the hub 5 in order to more completely guide the necks of the bottles, and, furthermore, the surface of the hub 5 is recessed, as at 16, in any suitable manner, so that the mouths of the bottles shall not be stopped or impeded.

In order to insure that the lighter neck of the bottle does not lag or drag behind in the rolling of the bottle along a section or step of the runway, guiding-fingers 17 are provided upon the bottom of the tank, which project upward at one side of the shaft 4 and hub or drum 5 thereon. These guides have inclined upper ends 18, which are adapted to engage the necks of the bottles, as shown in Figs. 1, 2, and 3 more particularly, and throw the same forward into alinement with the body portion of the bottle. The said inclined portions are readily passed by the rod portion of the bottle-carrying spokes; but the outer facing parts 6 6 of the spokes have to be transversely slotted, as at 19, to pass the

upright portions 20 of the guides, as will be understood.

In Figs. 4, 5, and 6 I have shown a form of machine in which the bottles are shifted mechanically and entirely by means of guides. Here the bottle-carrying arms each comprise, at the outer ends of the spokes 7, opposite pieces 21 21, each having a longitudinal series of grooves 22 for bottles and the grooves of one piece or member 21 being opposite those of the other. The said members 21 are divided transversely between such grooves, as at 23, to pass the bottle-shifting guides, next to be described. At the end walls of the tank frame or body 24 are uprights 25 to support a top rod 26, which extends parallel to the shaft 4 and vertically above the same out of reach of the arms on said shaft. This rod 26 supports certain upper guides 27, formed of sheet metal and one for each transverse division 23 of the bottle-carrying arms. Each of said upper guides comprises a stem 28, projecting downward through a division 23 of the grooved members 21 21 of the bottle-carrying arms and having at its lower end a finger 29, extending forwardly with respect to the direction of turning of the shaft 4 and bottle-carrying arms thereon. This finger 29 is laterally deflected or bent as much as possible, while still permitting the spokes 7 to pass its extremity, as shown in Fig. 6, whereby the bottles are each started out of its groove toward the next adjacent groove, as indicated in outline on Fig. 6. Upon the edge of the tank frame or body 24 are stationed the lower guides 30, each comprising a horizontal stem 31, adapted to pass through the divisions 23 of the grooved members 21 21 of the bottle-carrying arms and having at its upper edge fingers 32 33 and at its lower edge a finger 34, all of which fingers are bent laterally into positions substantially parallel to the finger 29 of the upper guide, as shown in Fig. 6. The operative effect of these guides therefore is to force all the bottles to move along longitudinally of the machine one groove for every revolution of the shaft 4.

In Figs. 4 and 5 I have also shown a modified form of tank or container for the fluids used for washing the bottles or, in other words, separate tanks 35 for each annular portion 36, into which the bottle-carrying arms are divided by the divisions 23. To this end the tank-frame 24 has at its bottom rollers 37, upon which the tanks 35 are set, said tanks being stamped out of sheet metal and semicircular in side view. They fit close to the bottle-carrying arms, as shown, and thus as said arms sweep around they automatically remove from the tanks any waste matter, such as paper from the bottles, &c. This cleaning of the tanks is further facilitated by flexible brushes 38 on the extremities of arms and which positively sweep the walls of the tanks.

Having thus described the invention, what I claim as new is—

1. In a bottle-washing machine, a shaft, a drum on said shaft, radial spokes arranged longitudinally of said drum, said spokes providing longitudinal bottle-passages, and means for imparting to bottles in said passages step-by-step movement.
2. In a bottle-washing machine, a shaft, a drum on said shaft forming at its periphery a drainage-seat for the necks of radially-disposed bottles, spokes projecting from said drum and forming runways for bottles and means for turning said shaft and means adapted to automatically effect a movement of said bottles through said runways as the shaft and its spokes rotate.
3. In a bottle-washing machine, a tank, a shaft, a drum on said shaft, spokes projecting from said drum and having opposite members with bottle-recesses in their facing sides and forming a longitudinal runway for bottles, means for shifting the bottles from recess to recess in said runway, and means for turning the shaft.
4. In a bottle-washing machine, a tank, a shaft, longitudinal radial spokes on said shaft each comprising opposite members having in their facing sides series of oppositely-disposed bottle-recesses adapted to guide the bottles in a direction parallel with the shaft as they gravitate after having been raised and carried across the vertical plane of the said shaft by the said spokes, and means for turning said shaft.
5. In a bottle-washing machine, a tank, a shaft, longitudinal radial spokes on said shaft comprising opposite members having in their facing sides series of oppositely-disposed bottle-recesses, guides stationed in the forward upper quadrant of the path of movement of said spokes and adapted to engage the bottles to shift them from one recess to the next, and means for turning said shaft.
6. In a bottle-washing machine, a tank, a shaft, radial spokes projecting from said shaft and forming a longitudinal runway for bottles, guides upon said tank adapted to engage the bottles and shift them in said runway, and means for turning said shaft.
7. In a bottle-washing machine, a tank, a drum, radial spokes upon said drum forming longitudinally of the drum runways for bottles and being transversely slotted, guides projecting into said slots and adapted to engage and shift the bottles, and means for rotating said drum.
8. In a bottle-washing machine, a tank, a drum, radial spokes upon said drum each forming a longitudinal runway for bottles and being transversely slotted, upper and lower guides projecting into said slots and means for turning the drum.
9. In a bottle-washing machine, a tank divided transversely into narrow compartments adapted to successively receive the bottles, a drum arranged longitudinally of said tank, spokes projecting radially from said drum and forming longitudinal runways for bottles, and means for turning said drum.
10. In a bottle-washing machine, a tank divided into narrow transverse compartments adapted to successively receive the bottles, a shaft, radially-extending members upon said shaft forming between themselves a longitudinal runway for bottles, guides adapted to engage the bottles, and means for turning the said shaft.
11. In a bottle-washing machine, a tank, a drum, longitudinal radially-projecting members upon said drum each comprising members forming between themselves a runway for bottles, said members being transversely slotted, guides projecting into said slots, and means for turning said shaft and its radial members.
12. In a bottle-washing machine, a tank, transversely divided into compartments, a rotary bottle-carrier mounted above said tank and slotted to receive the partitions thereof, and means for shifting bottles in said carrier when they are elevated out of the tank.
13. In a bottle-washing machine, a tank, a recessed drum adapted to receive the abutting mouths of bottles without closing the same, spokes upon said drum forming at their outer portions runways or passages for the bodies of bottles, guides for shifting the bottles in said runways or passages, and means for turning the drum.
14. In a bottle-washing machine, a tank, a drum, longitudinal rows of spokes on said drum, having members at the outer ends of two adjacent rows of spokes forming between themselves a runway for the body portions of bottles, straps closing the outer side of said runway, strips upon the bases of said spokes forming a rest for the necks of the bottles, means for rotating said drum, and fixed guides adapted to engage the bottles in said runway.
15. In a bottle-washing machine, a tank, a rotary bottle-carrier comprising a drum, radial spokes thereon with outer bottle-receiving members, said outer members being transversely slotted, fixed guides each having a body portion adapted to enter a slot of the outer members of the bottle-carrier and an inclined end adapted to lie between the spokes of said carrier and engage the bottles, and means for turning said bottle-carrier.
16. In a bottle-washing machine, a tank, a rotary bottle-carrier mounted longitudinally of and above said tank, and comprising a drum, spokes on said drum having outer bottle-receiving members, said outer members being transversely slotted, a top rod above said bottle-carrier, upper guides upon said top rod and lower guides upon the tank,

said guides each having a body portion adapted to enter a slot of the outer members of the bottle-carrier and an inclined end adapted to lie between the spokes of said carrier and engage the bottles, and means for turning said bottle-carrier.

17. In a bottle-washing machine, a tank, a series of transverse tank-compartments, a bottle-carrier mounted longitudinally of said series of tank-compartments and comprising a drum, spokes on said drum having outer transversely-slotted members to receive the bottle, said bottle-carrier, upper guides upon said top rod and lower guides upon the tank,

said guides each having a body portion adapted to enter a slot of the outer members of the bottle-carrier and an inclined end adapted to lie between the spokes of said carrier and engage the bottles, and means for turning said bottle-carrier.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of July, 1905.

PHILIP D. LAIBLE.

Witnesses:

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