J. W. DAWSON.

BOTTLE WASHING MACHINE.

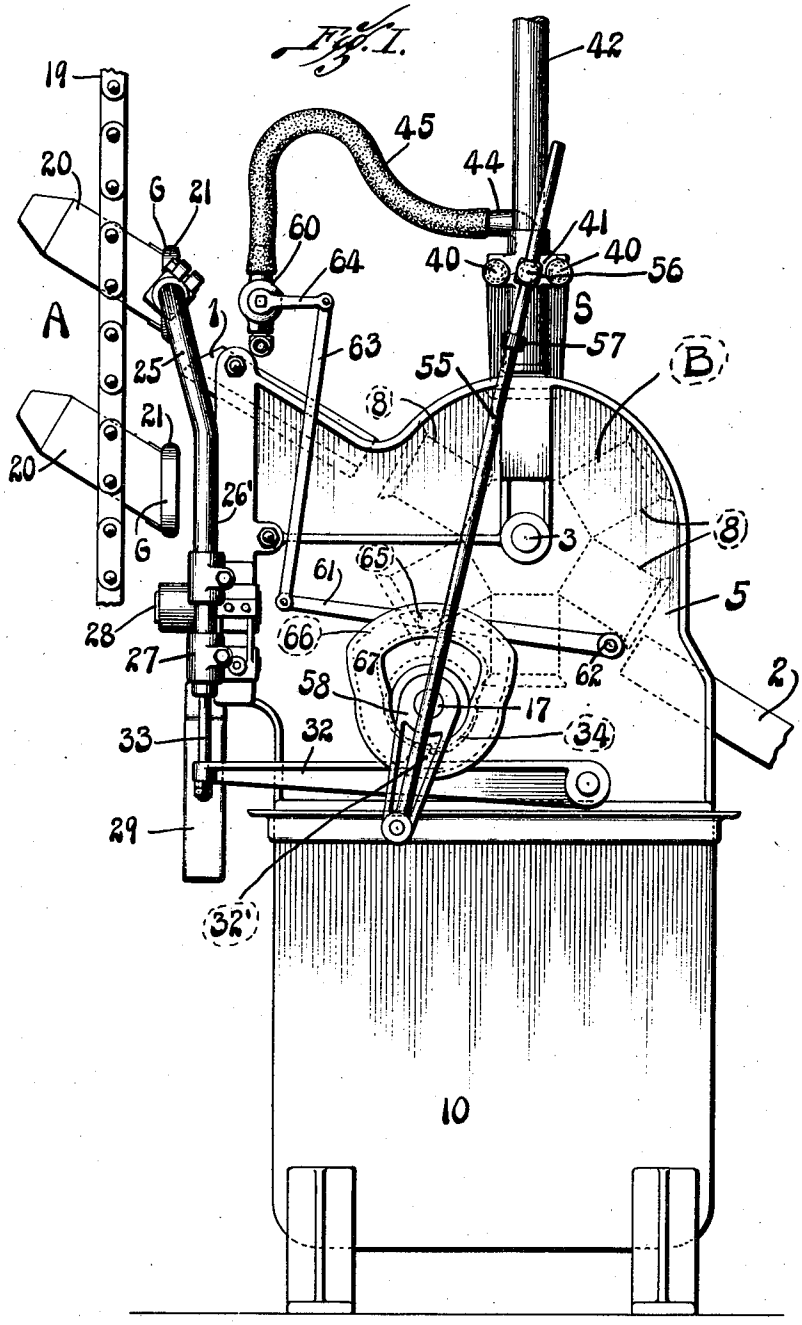
APPLICATION FILED APR. 23, 1915.

1,191,573.

Patented July 18, 1916.

5 SHEETS—SHEET 1.

Fig. 1.



Attest:
F. M. Warrington.
A. J. McCauley

Inventor:
J. W. Dawson
by Knight Bros Attys.

J. W. DAWSON.

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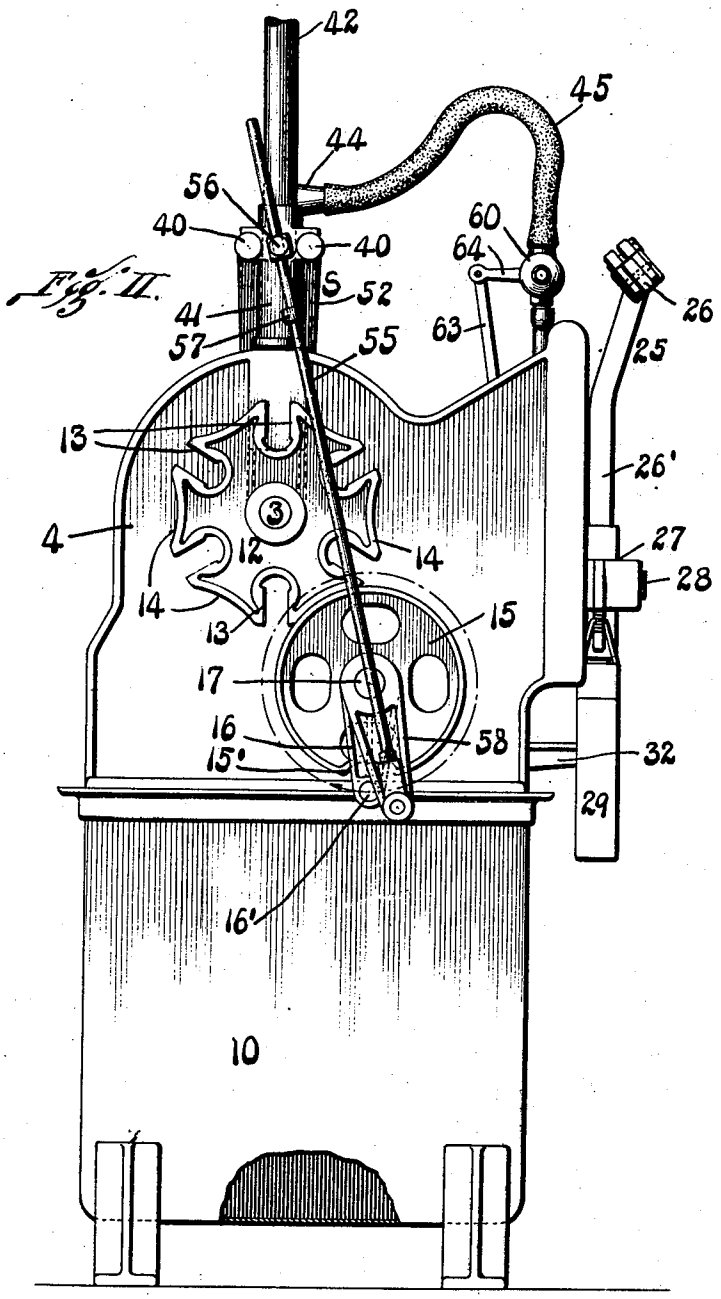
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5 SHEETS—SHEET 2.

Fig. II.



Witnesses:

E. M. Harrington.

A. J. McCauley

Inventor:

J. W. Dawson

Knight & Cook Attys.

J. W. DAWSON.

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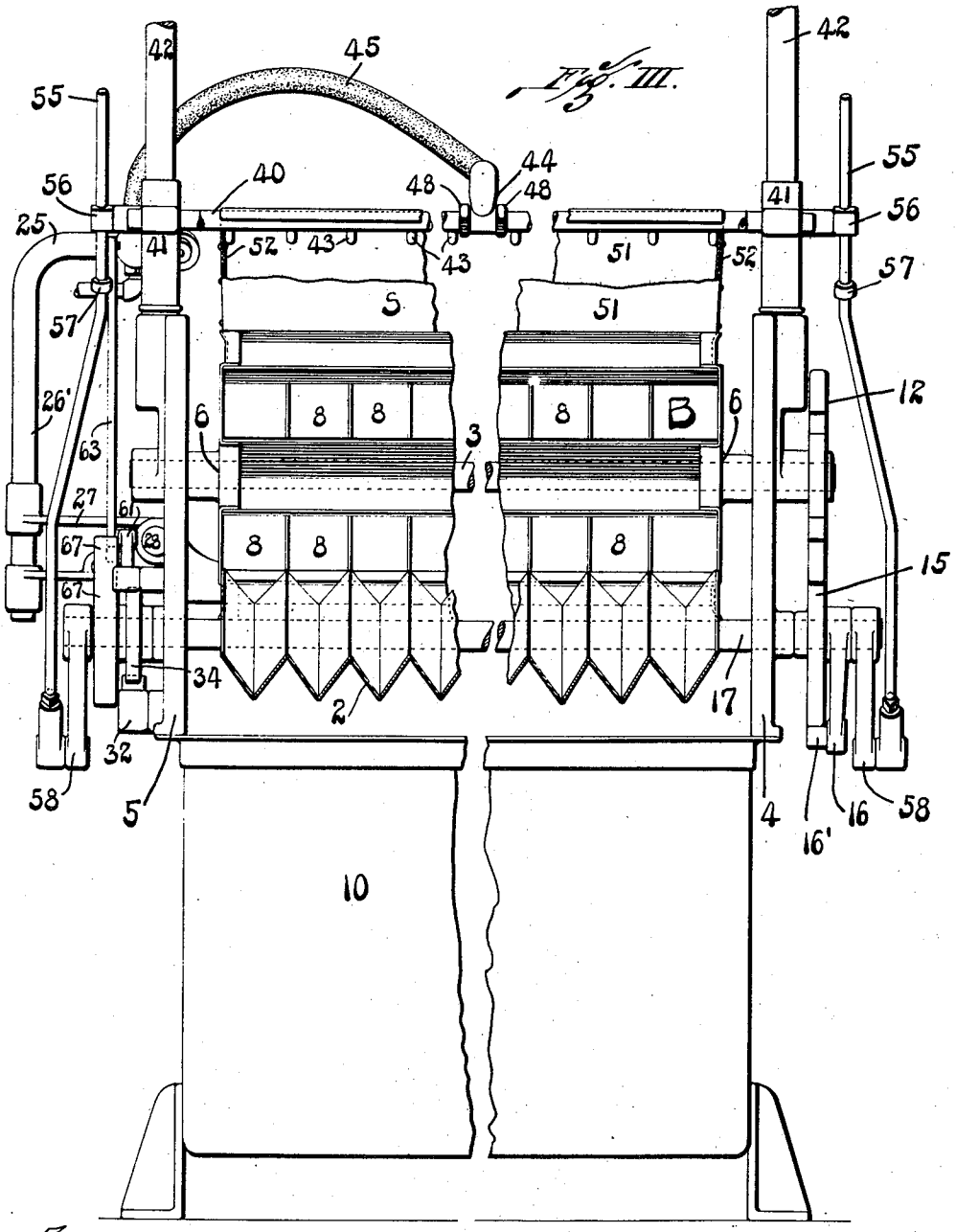
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5 SHEETS—SHEET 3.

Fig. III.



ATTEST:

E. M. Harrington.

A. J. McCauley

INVENTOR:

J. W. Dawson

BY

Knight & Cook ATTYS.

J. W. DAWSON.

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5 SHEETS—SHEET 4.

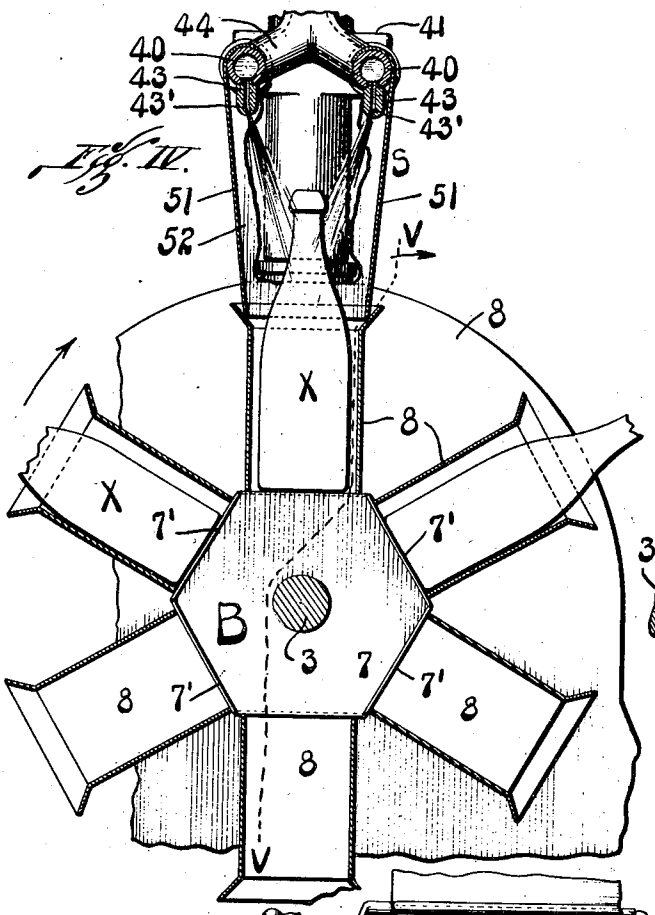
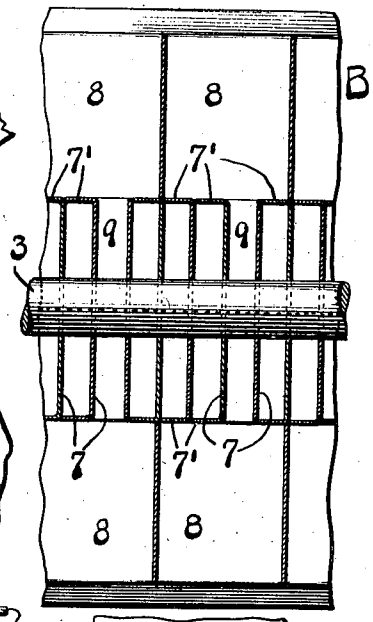
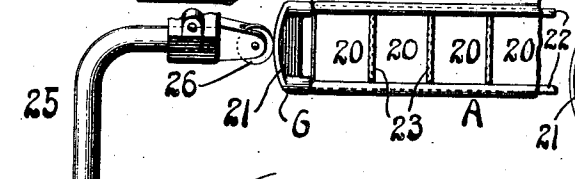


Fig. IV.

Fig. V.





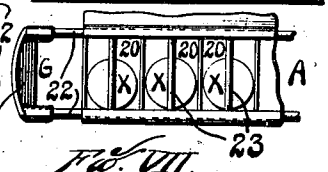
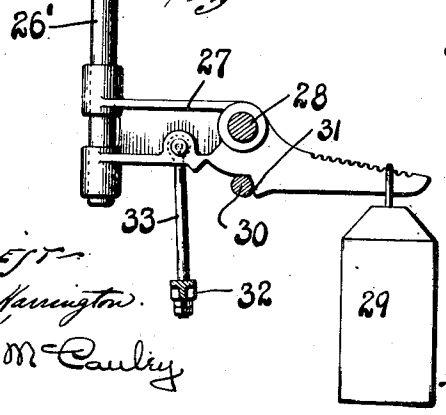


Fig. VII.

Fig. VI.



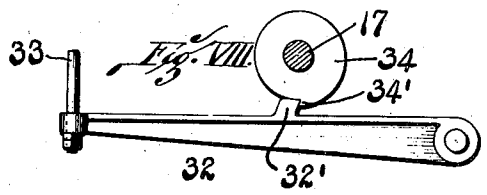


Fig. VIII.

Witness—
F. M. Harrington.
A. J. McCauley.

Inventor—
J. W. Dawson
By Knight & Cook Attys.

J. W. DAWSON.

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5 SHEETS—SHEET 5.

Fig. IX.

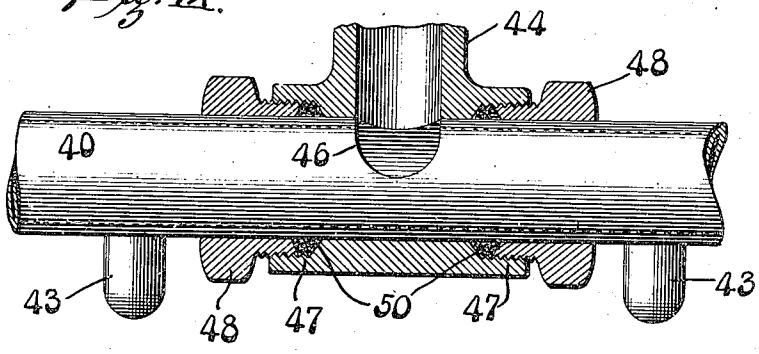


Fig. X.

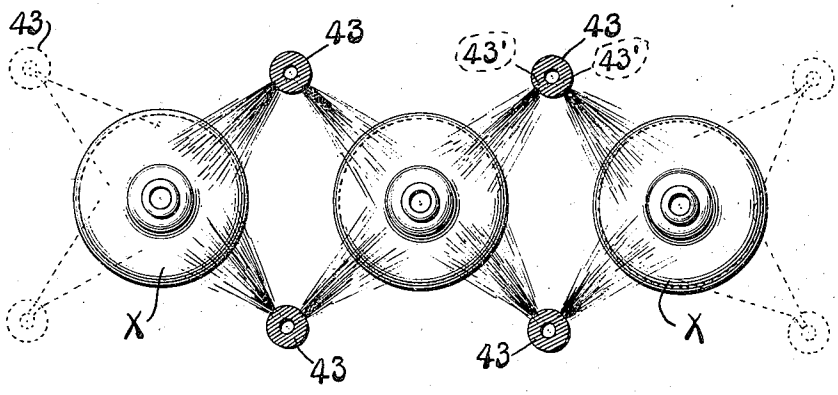


Fig. XII.

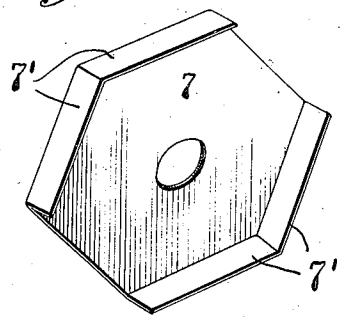
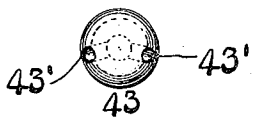


Fig. XI.



Attest—
E. M. Harrington.
A. J. McCauley

Inventor—
J. W. Dawson
By Knight Bros. Attys.

UNITED STATES PATENT OFFICE.

JOSEPH W. DAWSON, OF ST. LOUIS, MISSOURI, ASSIGNOR TO BARRY-WEHMILLER MACHINERY COMPANY, A CORPORATION OF MISSOURI.

BOTTLE-WASHING MACHINE.

1,191,573. Specification of Letters Patent. Patented July 18, 1916.

Application filed April 23, 1915. Serial No. 23,308.

To all whom it may concern:

Be it known that I, JOSEPH W. DAWSON, a citizen of the United States of America, a resident of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Bottle-Washing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part this specification.

My invention relates to improvements in bottle washing machines, one of the principal objects being to produce a very simple and highly efficient means for washing the outer faces of bottles.

The invention also includes certain details of construction and certain combinations of elements which will be hereinafter described.

Figure I is a side elevation of a bottle washing machine embodying the features of my invention, showing a bottle carrier for conveying bottles to the machine and a runway onto which the bottles are discharged after the bottle washing operations. Fig. II is a side elevation of the machine, showing the side opposite to that shown in Fig. I. Fig. III is a rear elevation of the machine. Fig. IV is an enlarged vertical section illustrating the rotary bottle carrier and the water distributing device above the bottle carrier. Fig. V is a fragmentary section, taken approximately on the line V—V, Fig. IV. Fig. VI is a detail view of the hammer mechanism for opening the gates of the bottle conveyer which carries the bottles to the bottle washing machine, showing a gate in its open position to permit the bottles to pass from the bottle conveyer. Fig. VII is a detail view of a portion of the bottle conveyer showing the gate in its closed position. Fig. VIII is a detail view of the cam and cam actuated lever for moving the hammer away from the gates of the bottle conveyer. Fig. IX is an enlarged section, partly in elevation, showing one of the water distributing pipes and the means for conducting water to said pipe. Fig. X is a diagrammatical view of the water distributing device, showing two rows of nozzles arranged in planes on opposite sides of the bottles so as to discharge converging streams of water onto the necks of the bottles. Fig. XI is an inverted plan view of one of the nozzles. Fig. XII is a detail view of one of the partition members of the rotary bottle carrier.

A designates a conveyer, Fig. I, adapted to carry bottles from a bottle soaking machine to my bottle washing machine.

1 designates a runway arranged to receive the bottles which are discharged from the conveyer A. The bottles slide down the runway 1, pass into the rotary bottle carrier B which carries them to the water distributing device, and after being washed the bottles are discharged, by gravity, onto the runway 2, Fig. I.

The rotary bottle carrier B comprises a drive shaft 3 rotatably fitted to side wall members 4 and 5, heads 6 fixed to said shaft 3, Fig. III, and polygonal partition members 7 arranged between said heads 6. The bottle carrier B also includes radial bottle receiving pockets extending from the partition members 7. Each partition member 7 (Figs. IV, V and XII) is preferably a hexagonal sheet metal member having flanges 7′ at four of its edges. By arranging these partition members as shown in Figs. IV and V, their flanges 7′ form the inner walls of the pockets 8, and passageways 9 are formed between the partition members. The object in forming passageways 9, Fig. V, is to permit the water, labels and other matter to pass through the rotary bottle carrier and into a tank 10 below said bottle carrier. All of the elements of the bottle carrier B are secured to the shaft 3, and the latter moves step by step to impart a corresponding movement to the bottle carrier.

The mechanism for operating the shaft 3 (Figs. II and III) comprises a wheel 12 fixed to one end of said shaft 3 and provided with radial slots 13 and arcuate faces 14. 15 designates a disk adapted to engage any one of the arcuate faces 14, as shown in Fig. II, to prevent the shaft 3 from turning. A crank 16, as well as the disk 15, is secured to a power shaft 17, the latter being driven continuously by any suitable mechanism. The crank 16 is provided with a crank pin 16′ which travels in a path indicated by the dotted circle in Fig. II. When the crank pin 16′ enters one of the radial slots 13, the movement of the crank 16 will be transmitted to the slotted wheel

12. At this time a portion of the slotted wheel 12 enters a recess 15′ in the disk 15, and when the crank pin 16′ passes from a slot 13 one of the arcuate faces 14 engages the periphery of the disk 15 to lock the slotted wheel 12 as shown in Fig. II. Obviously, the mechanism just described will move the shaft 3 and bottle carrier B step by step so as to carry the bottles from the intake runway 1, shown at the left side of Fig. I, to the discharge runway 2 at the right side of Fig. I.

The bottle conveyer A (Fig. I) which carries the bottles to the runway 1, comprises a chain 19, bottle receiving pockets 20 secured to said chain, and gates G slidably fitted to the discharge ends of the pockets 20. Each gate G (Figs. VI and VII) comprises an abutment member 21, long rods 22 secured to said abutment member, and cross rods 23 secured at their ends to the long rods 22. When a gate G occupies the position shown in Fig. VII, its cross rods 23 retain the bottles X in the bottle receiving pockets 20, and when a gate is shifted to the position shown in Fig. VI the bottles are free to drop by gravity from the pockets 20. The bottles discharged from the bottle conveyer A drop onto the inclined runway 1, (Fig. I) and pass into the rotary bottle carrier B. The bottle carrier A may be moved step by step through the medium of any suitable mechanism, and when one of the bottle receiving pockets 20 is at rest near the runway 1, a gate G is opened automatically to permit the bottles to pass onto said runway.

The means for operating the gates G comprises an angular hammer 25 having a roller 26 at its free end (Fig. VI) which engages the abutment 21 to open the gates at predetermined times. The angular hammer 25 also includes the rod 26′ and a lever 27 to which said rod is secured. The hammer is pivotally supported by a stud 28. 29 designates a weight adjustably fitted to the lever 27. This weight tends to move the hammer into engagement with a gate G, the movement of the hammer being limited by a stationary stop member 30 (Fig. VII) adapted to engage an abutment 31 on the lever 27. The means for moving the hammer away from the gates comprises a cam lever 32, a pull rod 33 connecting said cam lever 32 to the hammer structure, and a constantly rotating cam 34 coöperating with the cam lever 32. The cam 34, shown in Figs. I and VIII, is fixed to a power shaft 17 which rotates continuously, and the cam lever 32 is provided with a projection 32′ which engages the eccentric face of said cam. By comparing Figs. VI and VIII it will be noted that the cam 34 is adapted to depress cam lever 32 so as to pull the rod 33 downwardly, thereby moving the pivoted hammer away from a gate G, this movement being yieldingly resisted by the weight 29 which tends to move the hammer into engagement with the gate G. When the shoulder 34′ on cam 34 reaches the projection 32′, the lever 32 is permitted to move quickly toward the axis of cam 34, thereby permitting the weight 29 to force the hammer into engagement with a gate G so as to shift the gate to its open position. The means for closing the gates G is not shown in the drawings for the reason that it forms no part of the present invention.

The water distributing device I have shown comprises a pair of manifold pipes 40, fitted at their ends to cross heads 41, the latter being fitted to vertical guide rods 42. The cross heads 41 are tubular members having arms which receive the manifold pipes 40. Each manifold pipe is provided with a series of nozzles 43 and each nozzle is preferably provided with diverging discharge ports 43′ (Fig. XI) through which the water is discharged as shown most clearly in Figs. IV and X. The manifold pipes 40 pass through a delivery member 44, the latter being provided with a pair of tubular arms for the reception of the manifold pipes. 45 designates a flexible water tube for conducting water to the delivery member 44. Each manifold pipe 40 is closed at its ends and provided with an inlet port 46 (Fig. IX) which communicates with the delivery member 44.

47 designates stuffing boxes formed in the delivery member 44, and 48 designates stuffing box glands screwed into said stuffing boxes.

The streams of water passing from the nozzles 43 are preferably discharged onto the necks of the upright bottles and it is important to note that these streams of water converge toward the bottles so that the entire outer faces of the bottles are subjected to the action of the water. The nozzles are arranged in planes above and on opposite sides of the bottles so that the converging streams of water are forcibly discharged downwardly onto the upper portions of the bottles with the result of thoroughly washing the outer faces of the bottles. The water passing from the lower ends of the bottles flows between certain partitions 7 at the center of the bottle carrier and circulates through a bottle receiving pocket 8 at the lower portion of the bottle carrier. The water then drops into the tank 10 below the bottle carrier. The labels and other matter washed from the bottles are forced through the bottle carrier by the rapidly moving current of water and discharged with the water into the tank 10.

The nozzles 43 are preferably so arranged that each bottle is subjected to the action of four streams of water (Fig. IX) which

merge into each other at the neck of the bottle and circulate downwardly, as previously described.

The machine is intended to be used in washing bottles of different sizes, and the water distributing device, including manifold pipes 40 and their nozzles 43 may be adjusted to vary the inclination of the streams of water so as to insure a most efficient cleansing action. Each manifold pipe 40 is rotatably fitted to the delivery member 44 so that it may be turned about its axis to change the inclination of the discharge passageways. After the manifold pipes have been adjusted they are prevented from turning by tightening the stuffing box glands 48 so as to force the packing 50 into engagement with the outer faces of the manifold pipes.

S designates a shield for preventing the water from splashing from the machine during the washing operations. This shield is provided with side walls 51 and end walls 52 and it is open at the bottom to receive the upper portions of the bottles. The shield incloses the water distributing device and it is preferably secured at its upper end to the manifold pipes 40. The upper margins of the side walls 51 are turned inwardly to overlie the manifold pipes, as shown in Fig. IV. It will be noted that the upper margins of the bottle receiving pockets 8 are flared outwardly to receive the lower edge of the shield S (Fig. IV).

The shield S, manifold pipes 40, and cross heads 41 at the ends of said manifold pipes, form part of a reciprocating carriage which is guided by the vertical guide rods 42. During the washing operations the reciprocating carriage occupies the position shown in Fig. IV, and after the bottles have been subjected to the action of the streams of water for a predetermined length of time, the carriage is elevated to permit the bottle carrier B to advance one step. Thereafter, the reciprocating carriage is lowered to the position shown in Fig. IV. The means for reciprocating this carriage comprises a pair of rods 55 located at the sides of the machine, and slidably fitted to abutment members 56, the latter being pivoted to the cross heads 41. Each rod 55 is provided with an abutment collar 57 adapted to engage one of the pivoted abutment members 56. 58 designates cranks secured to the constantly rotating drive shaft 17, and pivotally connected at their outer ends to the rods 55. When the parts occupy the position shown in Fig. II the reciprocating carriage is at rest and the rods 55 slide idly in the pivoted abutment members 56. Upon the completion of a washing operation, the abutment collars 57 on rods 55 strike the pivoted abutment members 56, and the movement of rods 55 is then transmitted to the reciprocating carriage so as to elevate the latter, thereby permitting the bottle carrier to advance one step as previously described. As the cranks 58 continue to rotate, after lifting the carriage, the carriage is permitted to drop by gravity to the position shown in the drawings.

The means for controlling the water supply comprises a valve 60, and mechanism associated with said valve to shut off the water automatically.

61 designates a cam lever (Fig. I) pivotally supported at 62 and connected, by means of a link 63, to the valve handle 64. The cam lever 61 is provided with a roller 65 which lies in a groove 66 formed in a cam 67. This cam is secured to the constantly rotating drive shaft 17 and the cam groove 66 is so formed that the lever 61 will occupy the position shown in Fig. I when the valve 60 is open. After each washing operation, the cam actuated lever 61 is shifted to close the valve 60, and the valve remains closed until the bottle carrier B has advanced one step. At this time the water distributing device and shield S are lowered and the water is automatically turned on by the valve controlling mechanism.

I claim:—

1. A bottle washing device comprising a bottle carrier, a water distributing device adapted to discharge water onto the bottles in said carrier, and a shield movable toward and away from said carrier, said shield being adapted to prevent the water from splashing from the bottle washing device at points near the bottles.

2. A bottle washing machine comprising a bottle carrier having bottle receiving pockets, a water distributing device for discharging water onto the bottles in said pockets, and a shield movable toward and away from said pockets and adapted to coöperate therewith to prevent water from splashing from the machine at points near said water distributing device.

3. A bottle washing machine comprising a bottle carrier, a water distributing device arranged above the bottle carrier and adapted to discharge streams of water onto the outer faces of the bottles, a shield associated with said water distributing device to confine the water near the upper ends of the bottles, and means for moving said shield toward and away from the bottle carrier.

4. A bottle washing device comprising a bottle carrier having bottle receiving pockets the upper ends of which are flared outwardly, a shield arranged above the bottle carrier to confine the water during the washing operations, a water distributing device associated with said shield and adapted to discharge streams of water onto the bottles, and means for moving said shield toward and away from the upper ends of said bottle receiving pockets.

5. A rotary bottle carrier comprising a shaft, heads secured to said shaft, a series of polygonal partition members arranged between said heads, and bottle receiving pockets radiating from said polygonal partition members, said bottle receiving pockets being open at their inner ends to permit the drainage of water between said partition members and through the bottle carrier.

6. A rotary bottle carrier comprising a shaft, heads secured to said shaft, polygonal partition members arranged between said heads, radial bottle receiving pockets extending from said partition members, the latter being provided with marginal flanges which form the inner walls of the bottle receiving pockets, said inner walls being provided with openings to permit the drainage of water through the bottle carrier.

7. A bottle washing device comprising a bottle carrier, a carriage movable toward and away from said bottle carrier, said carriage including a shield adapted to confine the water during the washing operations, and means for operating said carriage to locate said shield near the bottle during the washing operations and to remove the shield from the bottles after each washing operation.

8. A bottle washing device comprising a bottle carrier, a carriage movable toward and away from said bottle carrier, said carriage including a shield adapted to confine the water during the washing operations, and means for operating said carriage to locate said shield near the bottles during the washing operations and to remove the shield from the bottles after each washing operation, said means including a crank, and members for transmitting movement from said crank to said carriage, said members being movable independently of said carriage during the bottle washing operations.

9. A bottle washing device comprising a bottle holder adapted to support a row of bottles, and means for washing the outer faces of the bottles, said means including two horizontal rows of nozzles arranged in planes above and on opposite sides of the row of bottles, each of said nozzles having a pair of angular discharge ports which diverge from each other to provide for the discharge of diverging streams of water onto two different bottles, said nozzles being so formed that the diverging streams discharged from one nozzle will converge toward the streams discharged from adjacent nozzles.

10. A bottle washing device comprising a bottle holder adapted to support a row of bottles, and means for washing the outer faces of the bottles, said means including two horizontal rows of nozzles arranged in planes above and on opposite sides of the planes of the row of bottles, said horizontal rows of nozzles being provided with angular discharge ports for the discharge of converging streams of water downwardly onto the upper portion of each bottle.

11. A bottle washing device comprising a bottle holder adapted to support a row of bottles, and means for washing the outer faces of said bottles, said means including a water distributer provided with a row of nozzles, each of said nozzles having two discharge ports formed at an angle to each other so as to discharge streams of water which diverge from the nozzle to two of the bottles.

12. A bottle washing device comprising a bottle holder adapted to support a horizontal row of bottles, and means for washing the outer faces of said bottles, said means including a water distributer arranged above the horizontal row of bottles and provided with two oppositely disposed horizontal rows of angular discharge ports for the discharge of diverging streams of water downwardly and onto the upper portions of the bottles, and said angular discharge ports being so formed that the diverging streams of water discharged from one of the horizontal rows of ports will converge toward the diverging streams discharged from the other horizontal row of ports.

13. A bottle washing device comprising a bottle carrier, and means for washing the outer faces of the bottles on said bottle carrier, said means including a water distributing device located above said bottle carrier and adapted to discharge streams of water downwardly onto upper portions of the outer faces of the bottles, guides for said water distributing device, and means for moving said water distributing device downwardly to its operative position and upwardly to its inoperative position.

14. A bottle washing device comprising a rotary bottle carrier adapted to support bottles in upright positions, a water distributing device for discharging streams of water onto the outer faces of the necks of the upright bottles, means for moving said bottle carrier step by step to convey the bottles toward and away from said water distributing device, said water distributing device being located above the necks of the bottles supported by said carrier, and means for moving said water distributing device toward and away from the necks of the bottles.

15. A bottle washing device comprising a bottle carrier, a carriage movable toward and away from said bottle carrier, said carriage including a water distributing device for discharging water onto the bottles in said bottle carrier, cross heads at the ends of said water distributing device, guides for said cross-heads, and power mechanism including constantly rotating cranks, rods pivoted to said cranks, said rods and cross heads

being provided with abutments adapted to engage each other to provide for the transmission of movement from said cranks to said carriage, and said rods being free to move independently of the carriage during the bottle washing operations.

16. The combination of a bottle carrier having bottle receptacles provided with gates for retaining the bottles in said bottle receptacles, a rockable hammer adapted to open said gates, a weight tending to move said hammer into engagement with said gates, and mechanism for pulling said hammer away from the gates, said mechanism including a rotatable power shaft beyond the control of said bottle carrier.

17. The combination of a bottle carrier having bottle receptacles provided with gates for retaining the bottles in said bottle receptacles, a rockable hammer adapted to open said gates, a weight tending to move said hammer into engagement with said gates, a cam lever, a pull rod extending from said lever to said hammer, and a rotary cam shaft provided with a cam for operating said lever and pull rod to move the hammer away from the gates.

JOSEPH W. DAWSON.