Feb. 10, 1925. 1,525,558

O. LARSEN

BOTTLE WASHING MACHINE

Filed April 18, 1922 5 Sheets-Sheet 1

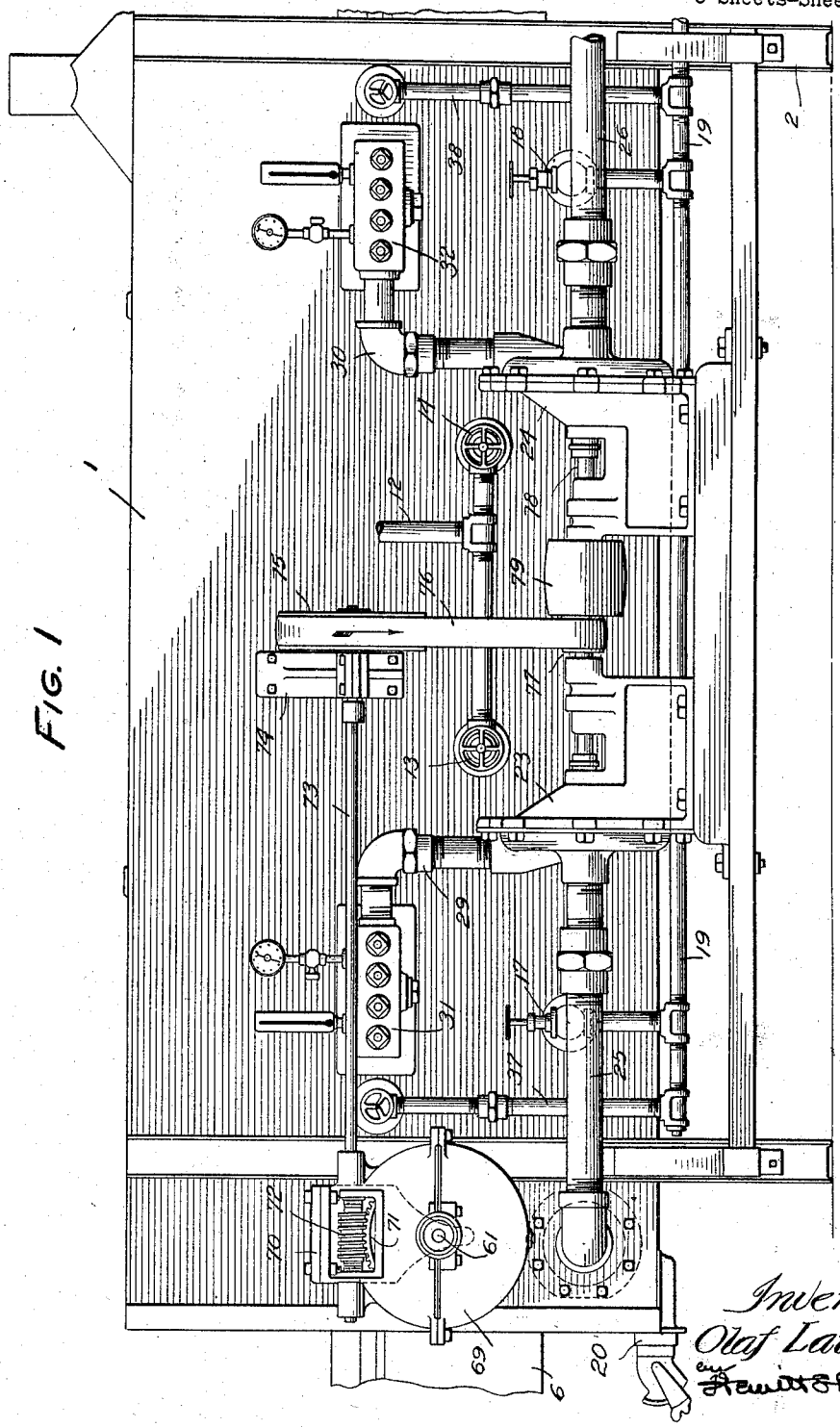


FIG. 1

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BOTTLE WASHING MACHINE

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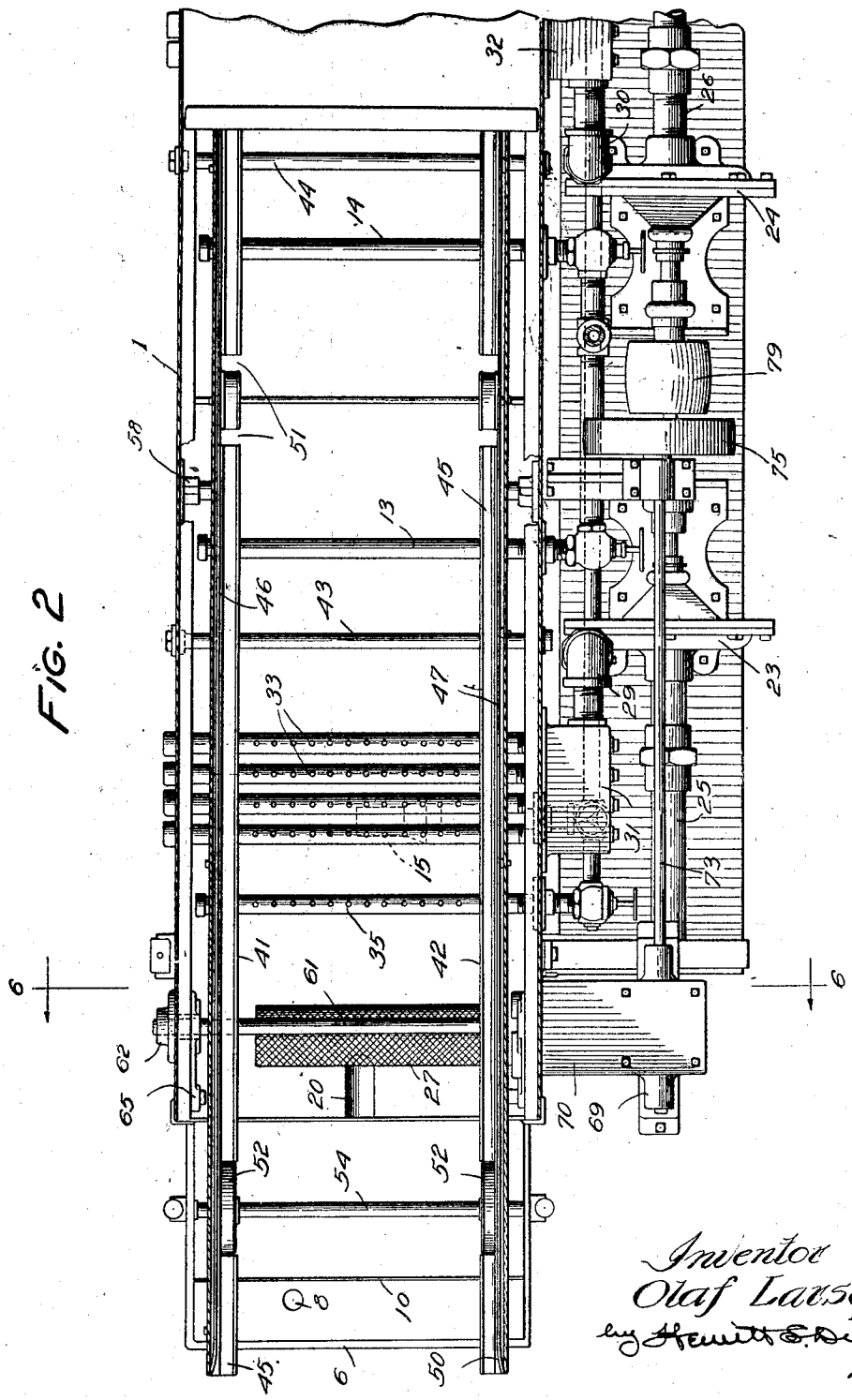


FIG. 2

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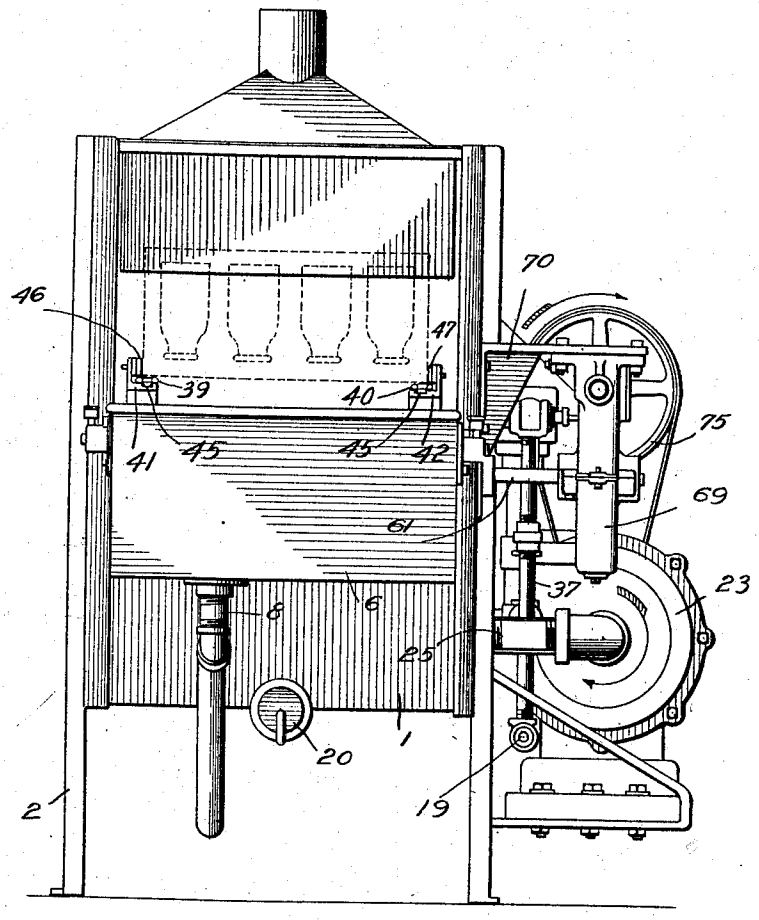
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BOTTLE WASHING MACHINE

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Fig. 3



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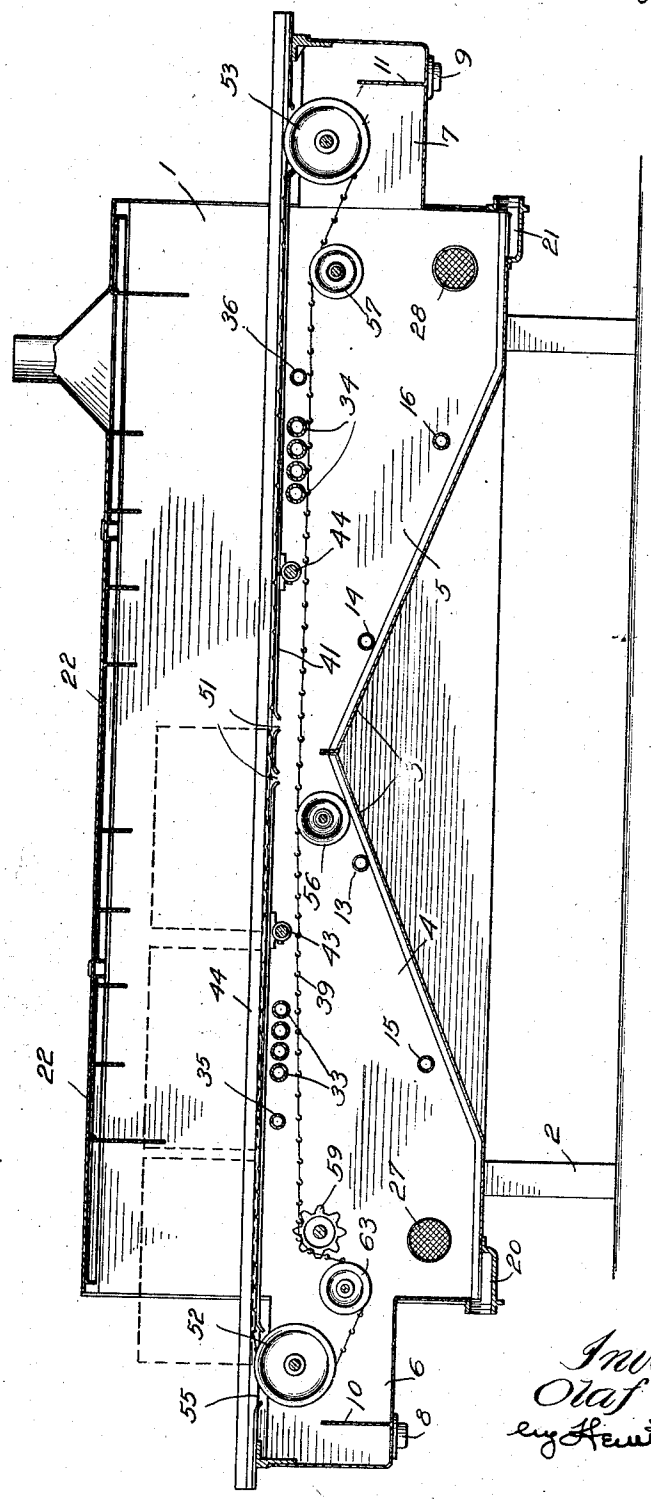
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BOTTLE WASHING MACHINE

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FIG. 4



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BOTTLE WASHING MACHINE

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Fig. 5

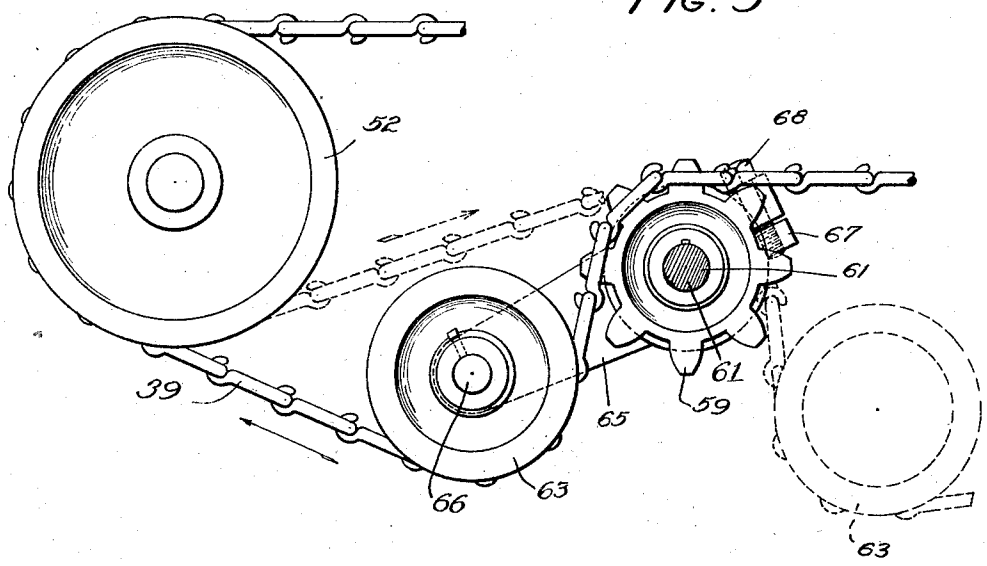
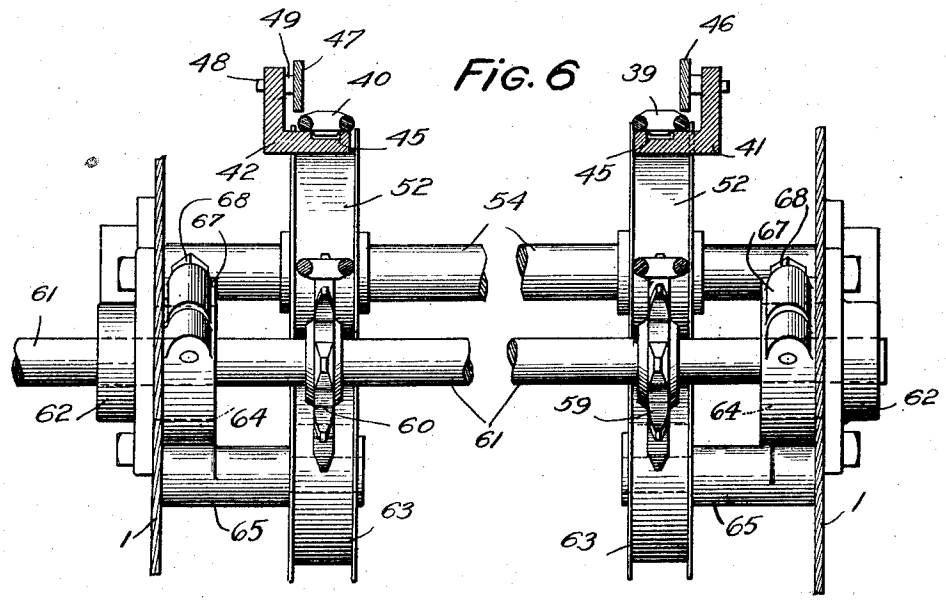


Fig. 6



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Patented Feb. 10, 1925. 1,525,558

UNITED STATES PATENT OFFICE.

OLAF LARSEN, OF FORT ATKINSON, WISCONSIN, ASSIGNOR TO THE CREAMERY PACKAGE MFG. COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BOTTLE-WASHING MACHINE.

Application filed April 18, 1922. Serial No. 555,188.

To all whom it may concern:

Be it known that I, OLAF LARSEN, a citizen of the United States, residing at Fort Atkinson, in the county of Jefferson and State of Wisconsin, have invented certain new and useful Improvements in Bottle-Washing Machines, of which the following is a specification.

The invention relates to machines for washing bottles in crates, more particularly to the type of such machines in which the bottles are moved continuously through successive cleansing operations.

One of the objects of the invention is to provide a simply constructed compact machine wherein the cleansing means and the conveying means are so arranged that by simple adjutsment the machine may be operated to deliver the bottles at either end as desired, and at the same time preserve the proper sequence of the several cleansing operations.

Another object is to provide a washing machine in which the continuous conveying mechanism is devoid of obstruction to the play of the cleansing fluid jets, and which permits ready access for cleaning the fluid tanks without removing any of the mechanism.

Other objects and advantages will be apparent in the following description of a preferred embodiment of my invention which I have illustrated in the accompanying drawings.

In the drawings, Fig. 1 is a side elevation of a washing machine embodying the invention, Fig. 2 is a plan view with covers removed, and Fig. 3 is an end elevation of the same. Fig. 4 is a longitudinal vertical section through the center of the machine. Fig. 5 is a detail view of parts of the conveying mechanism. Fig. 6 is a fragmentary sectional elevation taken on the plane of the line 6—6 in Fig. 2.

The machine illustrated herein comprises a tank 1, supported on legs 2, and preferably having a pyramidal shaped bottom wall 3 effecting a division of the tank into two fluid reservoirs 4 and 5. Endward extensions 6 and 7 of the tank accommodate parts of a conveyor mechanism hereinafter described, and also are provided with outlets 8 and 9 which drain any overflow from the tank over the level-maintaining partitions 10 and 11.

The two reservoirs 4 and 5 may be filled with water through the pipe 12 and valved inlet connections 13 and 14. A suitable washing solution may be used in one of the reservoirs, the water in the other being used for rinsing. The water in both reservoirs may be heated by means of submerged steam devices as indicated at 15 and 16 connected through valves 17 and 18 with a live steam line 19. Suitable drain outlets 20 and 21 are provided at the lowermost end portions of each reservoir.

The side walls of the tank extend upwardly from the reservoir portion, forming with preferably removable sectional covers 22 an enclosed compartment over the reservoirs and the conveying means later described herein.

The washing operation is accomplished by pumping the water from the reservoirs and spraying it under pressure into and upon the bottles as they are carried through the machine. To that end a pair of rotary pumps 23 and 24 are suitably supported alongside the tank, having pipe connections 25 and 26 with screened intakes 27 and 28 in the respective reservoirs. Delivery connections 29 and 30 lead from the pumps to a pair of headers 31 and 32, from which series of jet pipes 33 and 34 extend across the tank in position to spray the passing bottles, the spent water falling back into the reservoirs. Steam sterilizing jets also are provided, as illustrated at 35 and 36, having connections through the valved pipes 37 and 38 with the steam line 19.

It will be observed that the sterilizing jets 35 and 36 are positioned between the washing fluid jets 33 and 34 and the respective ends of the tank. By closing one of the valves controlling the steam pipes 37 and 38, and by introducing the washing solution into the reservoir at that end of the tank, the sequence of washing, rinsing and sterilizing operations may be readily established from either end of the machine selectively.

The conveying means illustrated in the present embodiment for conducting the bottles over the spray jets comprises a pair of endless travelling elements preferably chains 39 and 40 operating respectively on opposite sides of the interior of the tank. The upper runs of the chains pass above the jet pipes and are supported on a pair of longitudinally disposed parallel rails 41 and

42, the latter being rigidly supported at their outer ends preferably on the end wall structure of the tank extensions 6 and 7. Inner support for the rails may be provided by the cross braces 43 and 44 secured between the side walls of the tank and having suitable attachment with the rails 41 and 42.

To prevent lateral displacement of the chains operating along the rails without inter-connecting support, I have provided a longitudinal channel 45 in the bearing surface of each of the rails adapted to engage the chain links and guide them longitudinally on the rails. In the present illustration I employ a type of chain in which the centrally positioned link connections project sufficiently to engage the channels while the links proper slide on the rail surfaces.

The rails 41 and 42 preferably are constructed of L shaped cross section, the upright flanges adding strength to the structure and serving to support the lateral bottle case guides 46 and 47. The latter are suitably secured to the rails as by bolts 48, and preferably with some space therebetween as effected by the spacer rings 49. The guides 46 and 47 are spaced from each other so that they will just freely admit the passage of a bottle case between them, the abutting walls of the case being positioned directly upon the upper surface of the chains 39 and 40. The extremities of the guides at each end of the rails may be outwardly inclined as at 50 to admit the bottle cases more readily when initially placed in the machine.

The channeled portions of the rails 41 and 42 preferably are opened as at 51 at each side of the dividing portion of the tank bottom between the two reservoirs, so that the water from the washing compartment will not be carried into and contaminate the water in the rinsing compartment.

The operating mechanism for the chains 39 and 40 comprises pairs of double-flanged rollers 52 and 53 located at each end of the machine, each pair being mounted on a shaft 54 suitably journaled in the side walls of the tank extensions 6 and 7 respectively. The rollers 52 and 53 mainly support the chains at their run ends, and are positioned in openings 55 in the bearing portions of the rails 41 and 42 so that the bearing surfaces of the rails are tangent to the bearing peripheries of the rollers. The lower runs of the chains, in which it is operatively advantageous to permit slack, may be supported by additional pairs of rollers 56 and 57 suitably mounted on stub shafts secured to the tank walls as illustrated at 58.

Power is transmitted to the chains by means of a pair of sprockets 59 and 60 engaging the lower runs of the respective chains and rigidly mounted on a drive shaft 61 journalled in suitable bearings 62 mounted in the side walls of the tank. A pair of adjustable idler rollers 63 is provided to take up the slack in the chains. It will be obvious that the slack in the chains will occur on that side of the driving sprockets on which the chains leave the sprockets. Having provided for operating the chains in either direction, it is advantageous to swing the rollers 63 to either side of the sprockets. To that end I have provided inwardly extending sleeves 64 on the drive shaft bearings 62 upon which are mounted a pair of swinging brackets 65 carrying pivot pins 66 at their free ends for the operative support of the rollers 63. The rollers 63 may be shifted and secured on either side of the driving sprockets by means of the split bracket bearings 67 and tightening bolts 68 to clamp the brackets to the sleeves 64. The broken lines in Fig. 5 indicate the relative positions of the parts upon reversing the direction of the chain drive.

Any suitable reversible transmission means may be employed to drive the shaft 61. As herein illustrated, the outer end of the shaft 61 is journalled in the housing 69 supported upon the bracket 70 mounted on the tank wall. Conventional spiral gear and worm elements 71 and 72 in the housing connect the shaft 61 in driven relation to the pulley shaft 73, supported near its opposite end in a bearing bracket 74 and carrying a fixed pulley 75. The latter is preferably connected by a belt 76 to a driving pulley 77 mounted on the drive shaft 78 by which the pumps 23 and 24 are operated. A main drive pulley 79, also mounted on the pump shaft, is adapted to receive belt power for the operation of both pumps and conveyor.

By crossing the belt 76 between the pulleys 77 and 75, the direction of travel of the chains 39 and 40 may be reversed. The interchangeable direction of the chains also may be effected by interchanging right and left worms and gears in the housing 69.

The ability to operate the conveyor chains in either direction by a simple rearrangement of the power transmission has material advantage in the installation of the washing machines. The conditions of location in users' plants make it highly desirable for economy of space and efficient association with other equipment, that the washing machine deliver the washed bottles at one end or the other of the machine, depending upon the particular conditions.

The simple means for taking up the slack in the chains on either side of the driving sprockets accomplishes the even operation of the conveyor at all times without back lash or jamming of the bottle crates.

A further distinct advantage in the present conveyor construction is the absence of

any cross elements connecting the two continuously operating chains. This obviates all obstruction to the free and effective play of the cleansing sprays upon the passing bottles and eliminates much of the splashing. It further gives unobstructed access to the tank reservoirs, screens and spraying apparatus for thorough cleaning after use without removing the conveyor.

It will now be apparent that I have provided a simple durable construction in a bottle washing machine which effectively accomplishes the purposes set forth.

I claim as my invention:

1. In a washing machine, a series of compartments, washing means in each compartment, selectively controlled sterilizing means in the end compartments positioned outwarly of the washing means, and means for conveying articles to be cleansed through said series of compartments successively, said conveying means being adapted for operation toward either end of said series of compartments.

2. In a washing machine, a tank having serial compartments, a washing fluid spraying device in each compartment, a sterilizing fluid spraying device adajcent each end of said tank, said latter devices being independently controlled, and a reversible continuously operable conveyor for carrying articles to be cleansed from either end of said tank to the other.

3. In a machine for washing bottles in crates, a tank adapted to contain washing fluid, means therein for spraying the fluid, selectively controlled sterilizing means positioned in each end of said tank outwardly of said spraying means, a pair of spaced parallel rails extending through said tank, a pair of endless conveyor elements having operative runs supported longitudinally on said rails in spaced disconnected relation to each other, said elements being adapted to carry crated bottles past said spraying means, and operating means adapted for the selective movement of said elements in either direction along said rails.

4. In a machine for washing bottles in crates, a tank having a substantially enclosed upper portion and a lower portion forming a reservoir for washing fluid, spraying means in the lower portion of said tank arranged to discharge an upwardly directed jet of washing fluid, a pair of separate endless conveyor chains having carrying runs for moving crates containing bottles over said spraying means and said reservoir and providing an unobstructed passage for said jet between said moving chains, a pair of parallel channeled rails underlying the carrying runs of said chains to support and retain the same against lateral displacement, and means for uniformly operating the chains.

5. In a washing machine, a tank having serial compartments, cleansing means in each compartment, a conveyor for moving articles into operative relation to said cleansing means successively and including an endless chain supported for reversible operation, a sprocket having operative engagement with said chain, reversible means for driving said sprocket, a roller, and an adjustable support therefor adapted to selectively position said roller in engagement with said chain on either side of said sprocket.

6. In a washing machine, a tank having serial compartments, cleansing means in each compartment, an endless conveyor chain in said tank having a supported operative run and a slack return run, said chain being operable in either direction to move articles into operative relation to said cleansing means, a shaft, a sprocket on said shaft having driving engagement with said chain, a roller, a bracket having a pivotal support for said roller, said bracket being adjustably supported to swing about the axis of said shaft, means for securing said bracket in position to cause the engagement of said roller with said chain on either side of said sprocket selectively, and reversible means for rotating said shaft.

In witness whereof I have hereunto set my hand.

OLAF LARSEN.