Feb. 14, 1933. F. B. HORTON 1,897,052

BOTTLE WASHER

Filed Aug. 3, 1931 2 Sheets-Sheet 1

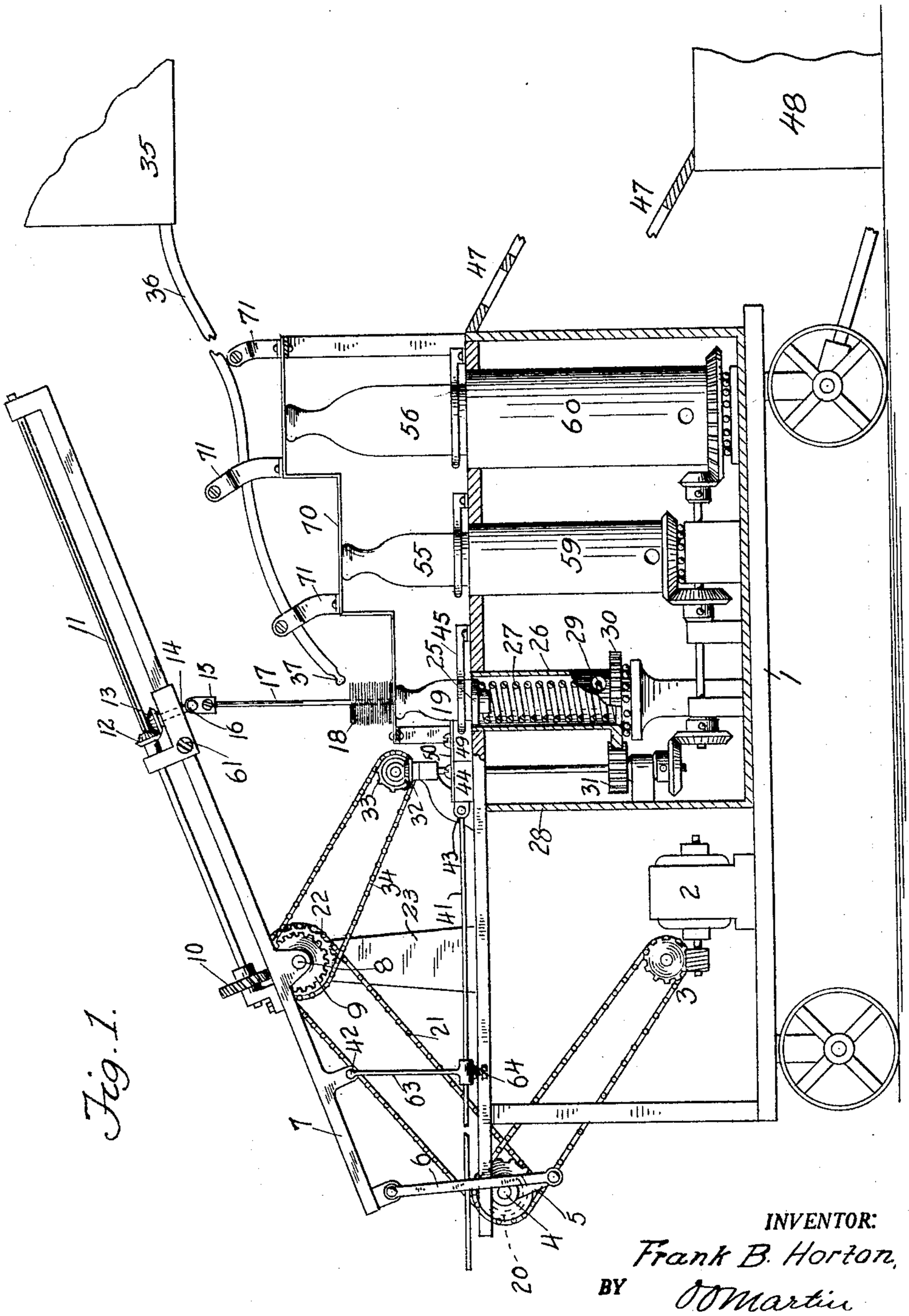

Fig. 1.

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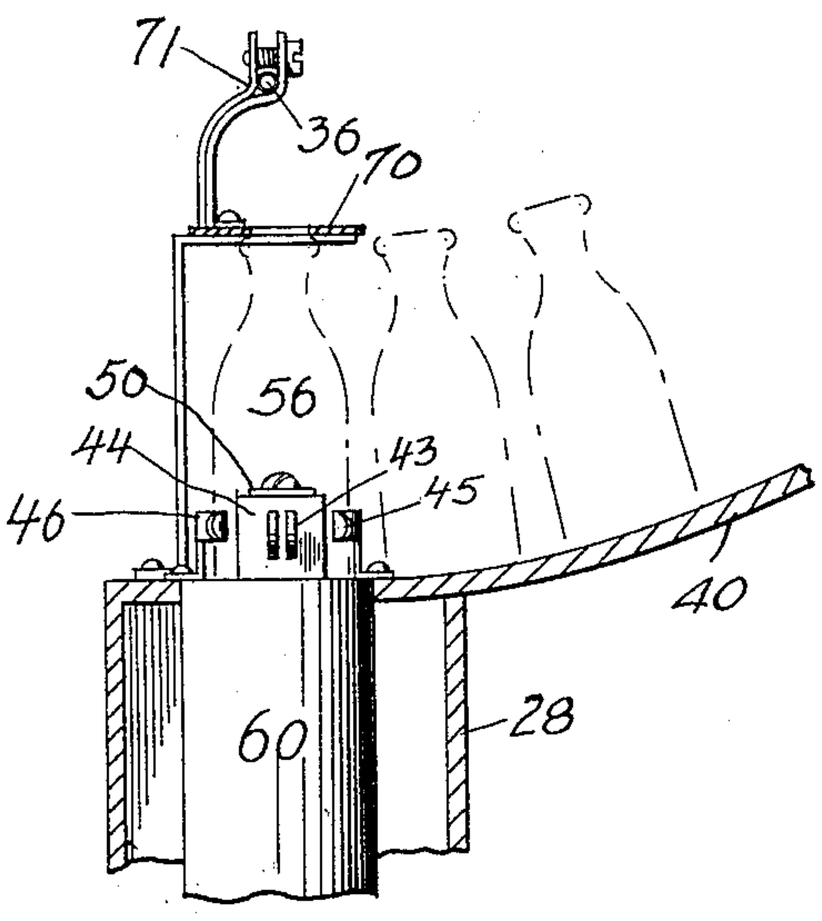
Fig. 3.



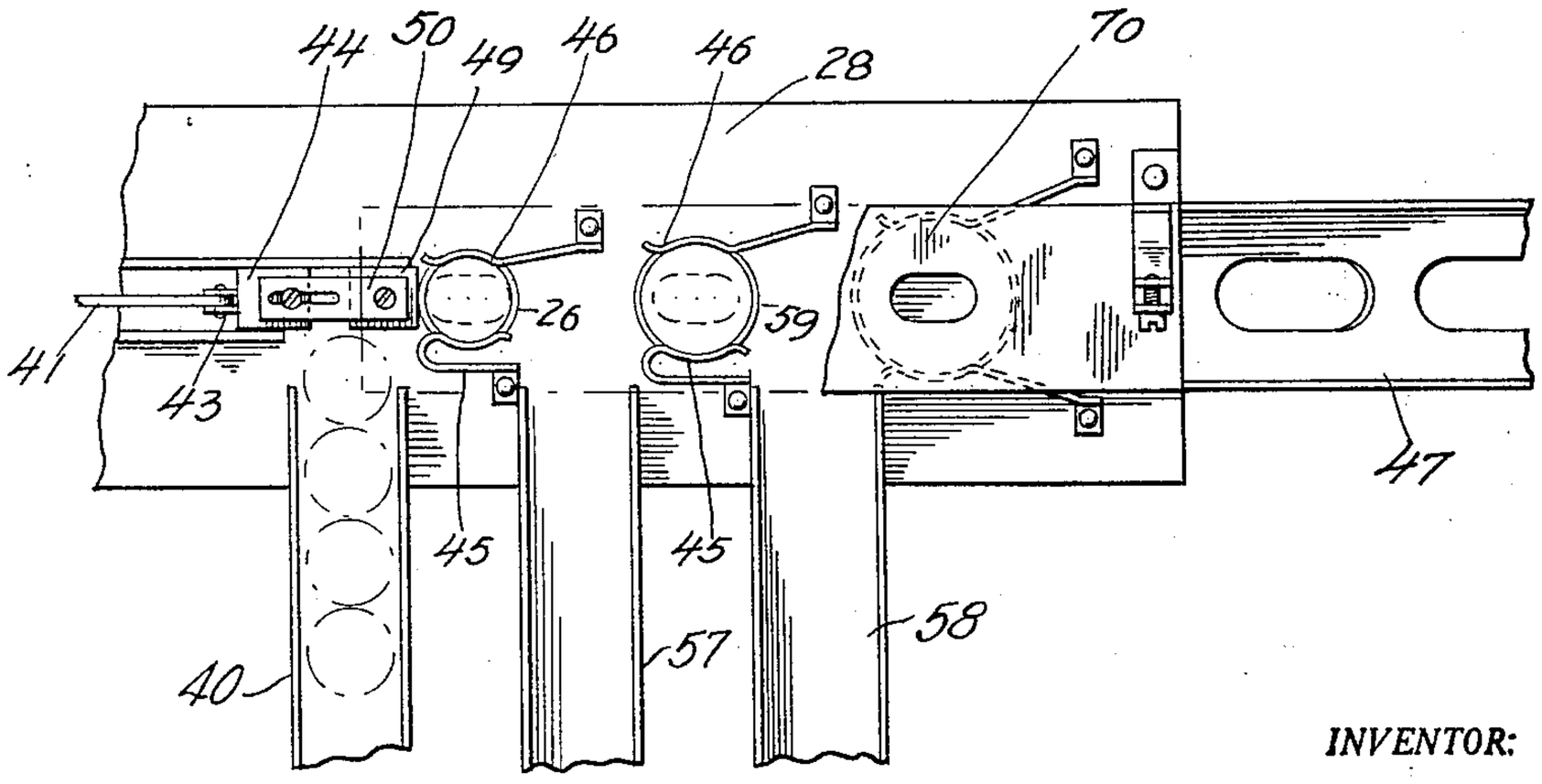


Fig. 2.

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Patented Feb. 14, 1933

1,897,052

UNITED STATES PATENT OFFICE

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BOTTLE WASHER

Application filed August 3, 1931. Serial No. 554,647.

This invention has relation to a device for use in bottling works for the purpose of cleaning milk bottles, or any other type of similar glass containers.

The general object of my invention is to provide a simple and inexpensive machine of the character referred to, capable of operation by one person and to be movable on the floor from place to place by the same operator for the purpose of serving any part of the plant where its use may be required. A further object is to provide a bottle washing machine capable of quick and simple adjustment to clean bottles of various sizes.

A device illustrative of the invention is fully set forth in the following description and outlined in the accompanying drawings of which:

Fig. 1 is a side elevation of a structure embodying the invention with parts broken away for the sake of clearness,

Fig. 2 is a fragmentary plan view showing the bottle feeding mechanism of the device, and

Fig. 3 is a fragmentary cross sectional view illustrating means of feeding bottles into the machine.

In order that the device of my invention may be readily moved from place to place, it is shown mounted on a wheel-truck 1 of any suitable, well-known construction. On the truck is shown mounted an electric motor 2 which, through speed reducing gears 3, is connected to rotate a shaft 4. The latter is, through the medium of a pitman 5 and a link 6, shown connected to oscillate a beam 7, which in turn is mounted to rock on a stub-shaft 8 and the latter is journaled in a suitable support 23 of the machine frame. A spiral gear 9 is loosely hung on the shaft 8 in engagement with a similar gear 10 of a spline-shaft 11, the latter supports a bevel-gear 12 for engagement with a second bevel-gear 13 of a stub-shaft 14. A chuck 15 is, by a universal joint 16, connected to be rotated through the medium of the aforesaid gears. This chuck is shaped to receive the stem 17 of a brush 18.

From the foregoing, it is seen that the motor is connected to oscillate the beam 7, thereby lowering the brush 18 into a bottle 19. To the shaft 4 is fastened a sprocket-wheel 20 which, through a chain 21, is connected to rotate a sprocket 22, which latter in turn is fastened to the spiral gear 9. Due to these connections, it is seen that the brush 18 is caused to rotate during the oscillations of the supporting beam 7.

The bottle 19 is shown resting on a disk 25, which is slidable within a cylinder 26 and supported in elevated position by a spring 27. In its uppermost position, the end of the stem 17 and brush 18 are shown to take a place directly above the mouth of the bottle. In its descent, the stem and brush quickly reach the bottom of the bottle, whereupon the stem commences to force the bottle downward against the tension of the spring 27 until the beam 7 reaches the end of its upward movement. The cylinder 26 is shown mounted within a tank 28 and this tank contains a suitable cleaning medium, which is free to flow into the cylinder 26 through an opening 29, or in any other suitable manner, for the purpose of cleaning the outside of the bottle while it sinks into and rises out of the cylinder.

The cylinder is, through the medium of intermediate gears 30, 31, 32, 33, and sprocket gearing 34, connected to be continuously rotated by the motor at comparatively high speed. This causes the liquid within the cylinder to churn, thereby insuring effective and complete cleaning of the bottle exterior. From a tank 35, conveniently located within the plant, a flexible hose 36 may be carried to a fixed nozzle 37, through which a stream of cleaning fluid is constantly directed into the mouth of the bottle. Whatever fluid is wasted, drains into the tank 28 and serves to re-

plenish the cleaning medium in this tank, which otherwise quickly becomes polluted, thick, and unfit for use.

Bottles are fed to the machine in any suitable manner, the means here illustrated merely consisting in an inclined chute 40. A rod 41 is shown provided with an upright support arm 63, the upper end of which is pivotally attached to the beam 7 at 42, the other end of the rod being shown journaled at 43 to a bottle locator 44. Each time the beam 7 is oscillated vertically, this movement is, by the connections just mentioned, translated into a horizontal reciprocation of the locator 44 for the purpose of pushing each bottle, as it is delivered, by gravity into the machine between resilient fingers 45 and 46, which yieldingly aline each bottle with the cleaning brush 18. It is readily seen that each oncoming bottle, while it is being pushed into position by the locator, serves to push the preceding bottles forward step by step until each bottle reaches an abrupt incline 47. The bottle now slides down this incline into a rinsing tank 48, during which movement it is caused to topple over and waste its contents through the open bottom of the slide before it reaches the tank 48.

The timing of the locator is important. It is necessary to delay the movement of this device in order to afford the bottle time to pass into and out of the cylinder during the cleaning operation. This timing may be affected in various ways, the simple means here shown consisting in making the locator in two parts 44 and 49, combining these parts by means of a plate 50, which is fastened to one part and perforated to afford the other part limited, lengthwise movement.

It is readily seen that, in this manner, the part 44 is caused to travel back and forth continually and that there is a sufficient dwell in the movement of the part 49 at each end of its stroke, to permit a new bottle to slide into the place of the bottle which has just been cleaned.

As above stated, the device, to be commercially practical, must be adjustable to bottles of various sizes. Such bottles are indicated by the numerals 55 and 56 and they are, along chutes 57 and 58, directed into proper position within the machine. For use in connection with each size of bottle, I provide a corresponding cylinder 59 and 60 which, through the medium of suitable gears, are connected to be rotated in the manner the cylinder 26 is moved. Except for size, these cylinders may be constructed exactly like the former. It is not necessary, however, to provide an individual cleaning brush for each size bottle as the chuck 16, carrying with it the gears 12 and 13, may readily be moved along the slide shaft 11 for alinement with the size of bottle required to be cleaned. The chuck and its driving gears may then conveniently be clamped into position on the beam by means of a screw or bolt 61. It is also necessary to adjust the position of the bottle locator, and this may readily be accomplished by making the locator push rod 41 slidable in the support arm 63 and to hold the rod rigidly in adjusted position by means of a clamping screw 64.

The foregoing description should be sufficient to enable those versed in the art to construct a washing machine embodying the invention in such compact manner that it may be mountable on an ordinary floor-truck. I do not, however, mean to confine myself to the particular construction shown, but reserve the right to make such structural changes as will tend to cheapen and improve the construction of the device, so long as I remain within the scope of the following claims.

While any type of cleaning brush may be used, it is preferred to employ a brush of large enough diameter thoroughly to clean the inner wall of the bottle. Such brush necessarily would fit the neck of the bottle very tightly and would have a tendency to lift the bottle from its support, permitting the next following bottle to slide into position or, at least, causing a collision which would be certain to result in the breakage of one or more bottles. In order to prevent such damage, I provide a stripper frame 70, which is made with perforations large enough to admit the brush, but small enough to prevent movement of the bottle. The support 71 for the nozzle 37 may conveniently be mounted on this stripper, substantially as shown in the drawings.

I claim:

1. In a bottle washing machine, a covered tank, bottle supporting means in said tank and yieldingly held elevated in line with the tank cover, a lever mounted for vertical oscillation above the tank, cleaning means pivotally suspended from said lever and positioned directly above said bottle supporting means, means for oscillating the lever to cause said cleaning means to enter a bottle on said supporting means and to depress the bottle and its yielding support into the tank, and means connected for operation by said lever intermittently to advance bottles to position on said support in line with said cleaning means.

2. In a bottle washing machine, a covered tank, bottle supporting means in said tank and yieldingly held elevated flush with the tank cover, a lever mounted for vertical oscillation above the tank, cleaning means pivotally suspended from said lever and positioned directly above said bottle supporting means, means for oscillating the lever to cause said cleaning means to enter a bottle on said support to depress the bottle and support into said tank and simultaneously to ro-

tate the cleaning means, and means connected for operation by said lever intermittently to advance bottles to position on the support in line with said cleaning means.

3. In a bottle washer, a covered tank for a cleaning liquid, a bottle support in said tank yieldingly held elevated flush with the tank cover, a lever mounted for vertical oscillation above the tank, cleaning means held pivotally suspended from said lever directly above said support, a prime mover connected to oscillate the lever to cause said cleaning means to enter a bottle on said support and to depress the bottle and its yielding support into the liquid of the tank, a cylindrical shell mounted in the tank to encompass said support and operatively connected to be rotated by said prime mover, and means operatively connected with said lever to advance bottles to the support as the lever reaches its uppermost position.

4. In a bottle washer, a tank, a lever mounted on said tank, a cleaning member held pivotally suspended from said lever, a bottle support resiliently supported in the tank directly below said member, means for oscillating the lever vertically to lower said member into a bottle on said support and to depress the bottle and support into the tank, means to limit the return movement of the bottle, and means to push a new bottle on to said support at the end of each lever oscillation.

5. In a bottle washer, a covered tank, a lever mounted for vertical oscillation above said tank, a bottle support mounted in the tank and yieldingly held elevated in line with the tank cover, a cleaning member held pivotally suspended from said lever above said support, means for oscillating the lever to cause said cleaning member to enter a bottle on said support, to depress the bottle and support into the tank and simultaneously to rotate the member, means for agitating a cleaning liquid surrounding the descending and rising bottle, means for directing cleaning liquid against the cleaning member, and means for advancing the bottle from its support at the end of the cleaning operation.

6. In a bottle washing machine, a tank, a lever mounted to oscillate above said tank, a prime mover, a cleaning member held pivotally suspended from said lever and connected for rotation by said prime mover, a cylindrical shell in the tank directly below said cleaning member and connected to be rotated by the prime mover in the opposite direction with respect to the member, a bottle support within said shell yieldingly held elevated in line with the top of the tank, connections from the prime mover to oscillate said lever vertically and thereby to cause the cleaning member to enter a bottle on said support and to depress the bottle and support into the tank, a bottle locator, and connections for moving said locator at the end of each lever oscillation to advance a bottle to a position of registration with said support.

7. In a bottle washer, a covered tank, a shell mounted in the tank, a bottle support within the shell and yieldingly held elevated flush with the tank cover, a cleaning member mountable for vertical reciprocation above said tank in line with said shell and support, means for reciprocating said member to cause it to sink into a bottle on said support and to depress the bottle and support into the tank, means for rotating the shell and the said cleaning member in opposite directions, and means for advancing a bottle to a position of registration with said support at the end of each reciprocation.

8. In a bottle washing machine adjustable to clean bottles of various sizes, a series of yielding supports corresponding in size to the bottles to be cleaned, a lever mounted for vertical oscillations above said supports, a cleaning member freely suspended from said lever and adjustably mounted on the lever to register with any one of said supports, means for oscillating said lever, means for simultaneously rotating said member and the said supports, and means for advancing bottles through the machine, said means being adjustable to register with whichever support is to be used.

9. In a bottle washing machine, a tank, a series of rotatable supports for bottles of different sizes mounted in said tank, a cleaning member mounted above said tank for vertical reciprocation above said supports and adjustable to register with any one of the supports, means for reciprocating said member to enter a bottle on one of the supports and to depress the bottle and support into a cleaning liquid of said tank, means for rotating the member, means for directing a flow of cleaning liquid toward a bottle on any one of the supports, and means for positioning bottles on the support selected.

10. In a bottle washer, a covered tank, yielding means mounted in the tank flush with its cover for supporting bottles of different sizes, a stripper mounted above the tank for preventing bottles to rise from the supports, a cleaning member mounted above said tank and adjustable to register with any one of said supports, means for vertically reciprocating said member to enter a bottle on its support and to depress the bottle and support into a cleaning liquid of said tank against the tension of the support, and means for advancing a new bottle along the tank cover to a position of registration with a support at the end of each reciprocation, said means being adjustable to register with any one of the supports.

11. In a bottle washer, a covered tank, a series of bottle supports yieldingly mounted in said tank flush with the tank cover for

supporting bottles of different sizes, cleaning means mounted above the tank and adjustable to register with any one of said supports, means for vertically reciprocating said member to enter a bottle on its support and to depress the bottle and support into the tank, and means for advancing a new bottle along the tank cover to a position of registration with the support selected at the end of each reciprocation.

In testimony whereof I have hereunto affixed my signature.

FRANK B. HORTON.