Feb. 5, 1929. 1,700,944

C. H. LOEW

BOTTLE CLEANING APPARATUS

Filed Aug. 6, 1926 2 Sheets-Sheet 1

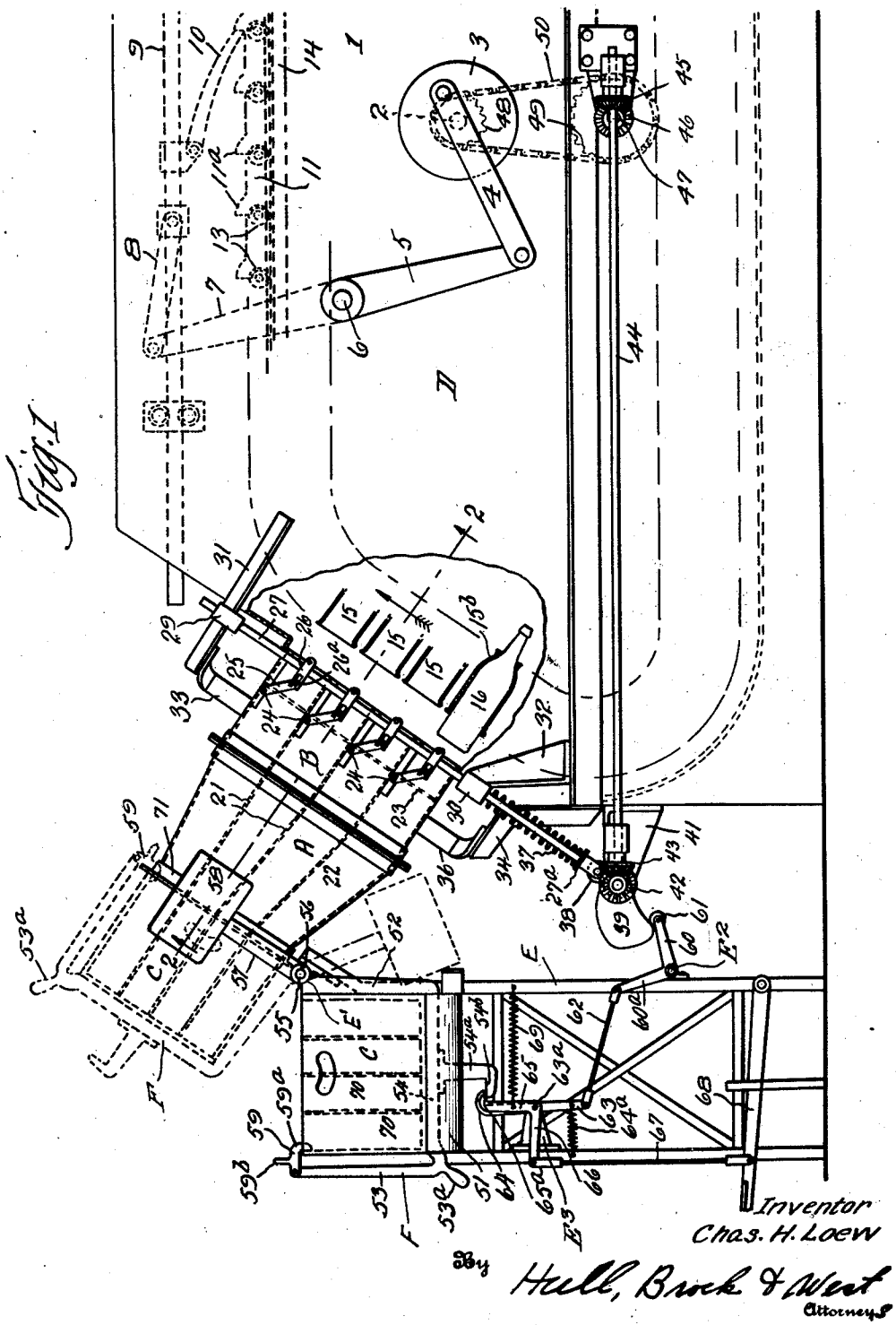


Fig. 1

Inventor
Chas. H. Loew

By Hull, Brock & West
Attorneys

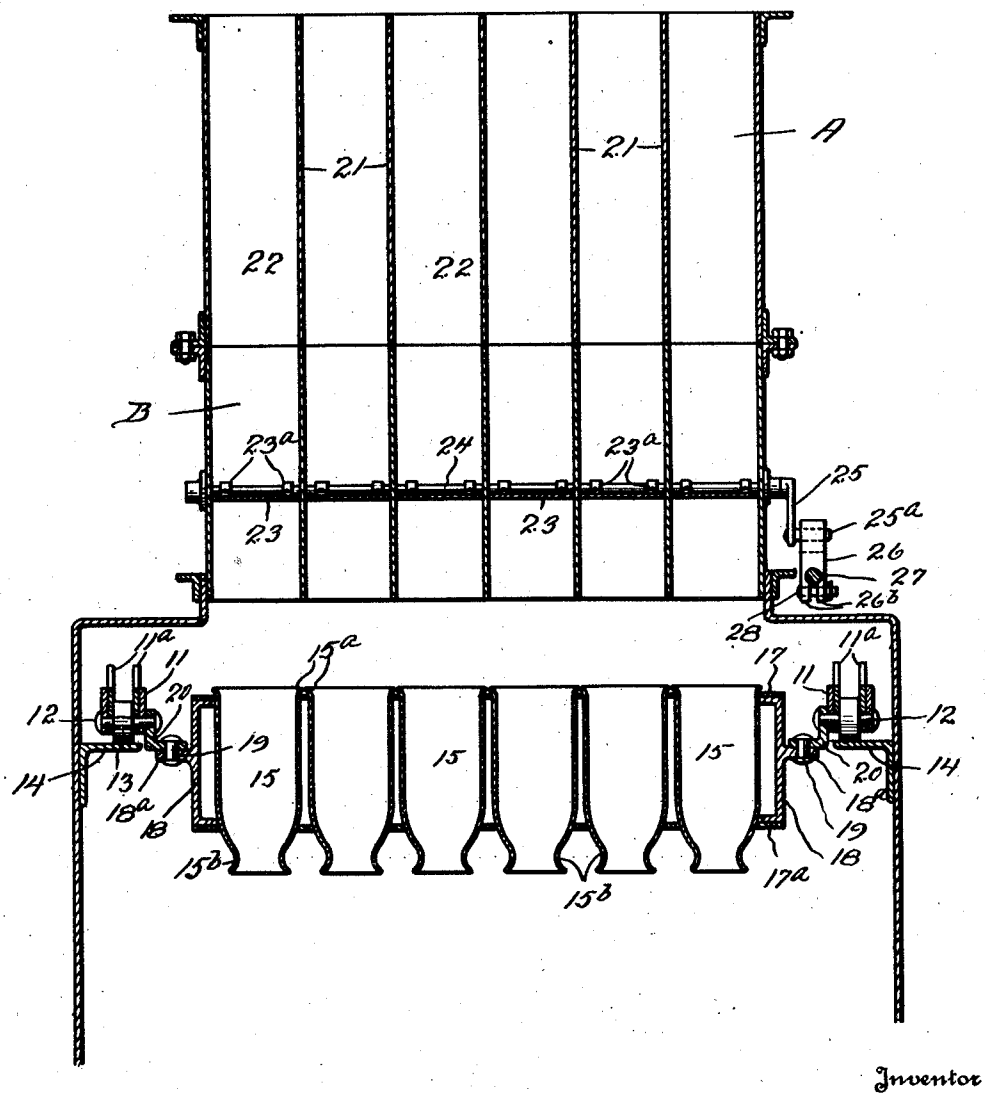
Feb. 5, 1929. 1,700,944

C. H. LOEW

BOTTLE CLEANING APPARATUS

Filed Aug. 6, 1926 2 Sheets-Sheet 2

Fig. 2



Inventor

Chas. H. Loew

By Hull, Brock & West

Attorneys

Patented Feb. 5, 1929. 1,700,944

UNITED STATES PATENT OFFICE.

CHARLES H. LOEW, OF AVON LAKE, OHIO; FRED BOMONTI, ADMINISTRATOR OF SAID CHARLES H. LOEW, DECEASED, ASSIGNOR TO THE CLEVELAND TRUST COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

BOTTLE-CLEANING APPARATUS.

Application filed August 6, 1926. Serial No. 127,540.

This invention relates to bottle cleaning apparatus of the type wherein the bottles to be cleaned are carried on a transverse series of supports or seats, the said supports or seats being secured to side chains and constituting, with said chains, an endless conveyor that is driven intermittently, thereby to bring the series of bottles successively in operative relation to transversely arranged cleaning mechanism, such as pressure-rinsing jets, and brushes for operating upon the interiors of the bottles. An apparatus of this character is shown in the patent granted to myself and John R. Gruetter on or about August 19, 1919, No. 1,313,706.

It is the general purpose and object of this invention to provide, for bottle washing apparatus having a conveyor provided with such transverse series of bottle supports or seats, charging mechanism which is adapted to deliver bottles to the said seats, without danger of breakage; which will act automatically to effect such delivery at such predetermined time intervals as will enable several transverse series of seats to be charged at the same time and without interference with the intermittent operation of the conveyor; which will reduce to a minimum the danger of breaking the bottles; and which will reduce to a minimum the labor required in so charging the bottles to the conveyor. Further and more limited objects of the invention will be explained hereinafter and will be realized in and through the construction and arrangement of parts shown in the drawings, wherein Fig. 1 represents a side elevation, with parts broken away, of the rear of a bottle washing apparatus of the character referred to, having my invention incorporated therewith; and Fig. 2 a detail in section corresponding substantially to the line 2—2 of Fig. 1.

Describing the parts by reference characters, 1 denotes the rear part of the casing of a bottle-cleaning machine, the same being preferably of the general type shown in the patent referred to hereinbefore. 2 denotes a shaft extending transversely of the casing and driving, by means of a crank disk 3, link 4 and arm 5, a transverse rock shaft 6. An arm 7 is secured to the rock shaft, near each side thereof, and each such arm is connected by a link 8 with a rod 9, each of the rods being provided with pawls (one of which is indicated at 10), which pawls are adapted to engage shoulders 11^a on the side plates 11 of the conveyor chains. This construction for intermittently advancing the conveyor is shown and described in detail in the patent referred to hereinbefore.

The conveyor side chains formed by the side plates 11 and pintles 12 are carried by rollers 13 on the angular tracks 14, as is the case with the construction shown in the aforesaid patent. The side chains form supports for the transversely extending rows of bottle seats or carriers, one such row being shown in section in Fig. 2. The particular seats as shown herein consist each of a sleeve 15 having its upper or receiving end 15^a flared and having a contracted neck 15^b which is adapted to receive the breast of a bottle 16. The bottle seats comprised in each transverse series are mounted in a frame having an upper plate 17 and a lower plate 17^a the said plates having openings for the bottle seats. The plates 17 and 17^a are connected by side plates 18, each having an ear 18^a by means of which it is secured by a rivet 19 to the horizontal branch of an angular connector 20, the vertical branch of which is secured to the pintle 12.

The sprockets (not shown) at the rear of the apparatus are so arranged that the portion of the conveyor which extends between the bottom and top of the rear of the casing is inclined upwardly. Above such inclined portion and extending rearwardly therefrom is a charging hopper. This hopper has an upper portion A and a lower portion B. The top and bottom sides of the part A converge upwardly so as to correspond in width with a crate C from which the bottles are dumped into the upper section of the hopper. The top and bottom sides of the part B are preferably parallel, as shown. The space within the hopper A, B, is divided by partitions 21 into transversely extending chutes 22

for the bottles discharged from the crate. It will be noted that the partitions in the upper part A of the hopper diverge somewhat from the top of the part A to the bottom thereof, being widest at the bottom, such width being equal to the width of the chutes formed in the part B. This widening of the chutes in the part B is to insure registration of the bottles in the said chutes with the seats 16 in the part of the conveyor therebeneath. The hopper section B is provided, above the bottom of each chute 22, with a trap door 23, the trap doors in each transverse series of chutes being connected by straps 23^a with a shaft 24. Connected with one end of each shaft 24 is a rock arm 25 having its lower end provided with a pin 25^a which is inserted within a slot 26^a in the upper end of a short arm 26 the bottom of which is mounted on a rod 27 by means of a fork 26^b on the bottom of the arm 26 and a bolt 28 clamping said forks against the said rod. The rod 27 is slidably mounted in sleeves 29 and 30 which are carried by bracket arms 31, 32 respectively. The former bracket arm is carried by the casing D and has secured to the upper end thereof a strap 33 forming part of the means for supporting the hopper from the casing. 34 denotes an arm which is secured to a rail 35 of the frame work for the apparatus, the said arm supporting a strap 36 which assists in carrying the hopper.

The lower end of the rod 27 is provided with an abutment 27^a between which and the sleeve 30 there is interposed a coiled spring 37 which tends to force the rod downwardly. Below the abutment 37 a roller 38 is carried by the forked lower end of the rod, the said roller being arranged to engage a cam 39 mounted on a shaft 40. This shaft is supported in suitable brackets, one of which is indicated at 41, and is provided with a bevel gear 42 which meshes with a bevel gear 43 on a shaft 44 having at its opposite end a bevel gear 45 meshing with a bevel gear 46 on a transverse shaft 47, which transverse shaft is driven from the shaft 2 by means of a sprocket 48 on the shaft 2, a sprocket 49 on the shaft 47, and a chain 50. The chain-and-sprocket connection between the shafts 2 and 47 effects a speed-reducing drive between the shafts whereby the shaft 47 will be driven preferably at one-quarter the speed of shaft 2.

E denotes a frame work at the rear of the apparatus, which frame work supports a series of rollers 51 upon which the crates C may be moved until they are aligned successively with the hopper A, B. When so aligned or registering with the hopper section A, a crate C will be received within a frame F having the side members 52, 53 and the bottom 54. The side member 52 is provided with a shaft 55 rigid therewith and which is pivoted in a transverse bearing 56 carried by a forwardly extending part E′ of the frame work E. This shaft has rigid therewith an arm 57 carrying a counterweight 58 which may be adjustable therealong. Pivoted to the upper part of the side member 53 is a catch 59 having a hook 59^a adapted to be inserted within the top of a crate C and against the outer or rear side of said crate. This catch is provided with an operating handle 59^b, and the side member is provided at the bottom thereof with a handle 53^a. Projecting from the bottom member 54 of the frame F is an arm 54^a having a rearwardly extending latch surface 54^b.

Carried by the frame work E is a pivot E^2 for a bell-crank lever one arm 60 whereof is provided with a roller 61 engaged by the cam 39 and the other arm 60^a is connected by a link 62 with the lower end of a lever 63 which is pivoted intermediate its ends at 63^a from a bracket E^3, the upper end of the lever being provided with a hook 64 adapted to engage the latch 54^b. A spring 64^a tends to hold the lever 63 in latch-engaging position. A bell-crank lever is also pivoted at 63^a, the said lever having an upper arm 65 provided with a hook 65^a adapted to engage the latch 54^b while the other arm 66 is connected by link 67 with a pedal lever 68, the front end of which is pivoted to the frame E at E^4. A spring 69 tends to hold the hook 65^a in engagement with the latch 54^b.

It will be noted that each crate C is provided with transverse extending series of chutes or compartments 70 for the reception of bottles from which chutes or compartments the bottles are adapted to be discharged into the upper portion A of the hopper.

With the parts constructed and arranged as described, the operation will be as follows: a crate, charged with bottles, having been moved along the rollers 51 into the tilting frame F, the operator secures the crate within the frame by means of the catch 59. The hook 64 normally engages the latch 54^b, whereby the frame F, containing the crate C, cannot be swung into register with the hopper A, B, until permitted to do so by the action of the cam 39. When this occurs and when the cam 39 shall have rocked the bell crank 60, 60^a to disengage the hook 64 from the latch 54^b, the operator depresses the pedal lever 68, thereby releasing the additional hook 65^a and then can swing the frame F and the crate C therein about its pivot on the part E′, the lifting of the crate being facilitated by the counterweight 58. When the crate and frame are in the position shown in dot-and-dash lines in Fig. 1, the top of the crate will be supported by the band 71 around the top of the hopper while the bottles slide down the chutes 22 until their mouths contact with the trap doors. The inclination of the chutes, taken with the doors 23, prevents injury to the bottles by dropping from the crate into the hopper. When the conveyor shall have advanced a sufficient distance to move the rear-

most series of bottles therein out of register with the uppermost transverse series of chute in the hopper, the cam 39 will thrust the rod 27 upwardly, thereby rocking the shafts 24 to move the trap doors downwardly and permit the bottles to drop into their seats. When the cam shall have traveled a sufficient distance, the roller 38 will ride off the high part of the cam and the spring 37 will move the said rod downwardly, thereby closing the trap doors. The operator can swing the frame F and crate C downwardly and remove the crate and insert another one for the next operation.

By reason of the construction and arrangement of the parts shown herein, one person can move the crates into register with the charging hopper; can inspect the bottles in the crate; can clamp the crate to its tilting frame F; can swing the crate up to its discharging position; can return the frame and crate to the full-line position shown in Fig. 1; and can remove the crate from the frame, so that the operation may be repeated. Furthermore, the provision of the trap doors 23 and of the means for operating the same prevents the breaking of the bottles by dropping entirely through the hopper into their seats in the conveyor and also prevents the dropping of bottles from the hopper against bottles in the conveyor seats. An additional feature of safety resides in the use of the two catches or hooks for the latch 54^b. While the operator can, of course, release his hook 65^a at any time by merely pushing down upon the pedal lever 68, the crate C and frame F cannot be swung upwardly to discharging position until the cam 39 shall have operated the catch 64; and this operation will not be permitted until the cam shall have permitted the doors 23 to be closed by the rod 27 and spring 37, which will prevent the dropping of the bottles from their chutes in the crate, without checking, into the seats in the conveyor; and a further feature of safety resides in the fact that the doors 23 will not be opened by the cam until the conveyor shall have been advanced a sufficient distance to insure that no bottle-occupied series of seats 16 will be in register with a series of chutes in the hopper A, B.

The charging mechanism as a whole is comparatively inexpensive of construction and is capable of being installed conveniently on existing conveyor-type of bottle-washing machines.

Having thus described my invention, what I claim is:—

1. In bottle-cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor intermittently, of a charging hopper arranged above a portion of said conveyor, the said hopper having transverse series of chutes for bottles adapted to register at their lower ends with corresponding transverse series of seats on the conveyor, means for temporarily retaining the bottles in the chutes in the said hopper, a movably supported charging device for said hopper having transverse series of seats for bottles corresponding to the transverse series of chutes in the hopper, means controlled by the conveyor-advancing means for releasing the bottle-retaining means in said chutes, a locking device normally preventing the movement of the charging device toward the hopper, means for operating the said locking device to permit the movement of the charging device only when the bottle-retaining means is operative, additional locking means for preventing the movement of said bottle charging device, and manually operated connections for releasing the last-mentioned locking means.

2. In bottle cleaning apparatus the combination with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor intermittently of a charging hopper arranged above a portion of said conveyor, the said hopper having transverse series of chutes for bottles adapted to register at their lower ends with corresponding transverse series of seats on the conveyor, means for temporarily retaining the bottles in the chutes in the said hopper, a charging device for said hopper having transverse series of seats for bottles corresponding to the transverse series of chutes in the hopper, a pivotally supported frame for said device, means controlled by the conveyor-advancing means for releasing the bottle-retaining means in said chutes, a locking device normally preventing the movement of the frame toward the hopper, means for operating the said locking device to permit the movement of the said frame only when the bottle-retaining means is operative, additional locking means for preventing the movement of said frame, and manually operated connections for releasing the last-mentioned locking device.

3. In bottle-cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor intermittently, of a charging hopper arranged above a portion of said conveyor, the said hopper having transverse series of chutes for bottles adapted to register at their lower ends with corresponding transverse series of seats on the conveyor, means for temporarily retaining the bottles in their chutes in the said hopper, a movably supported charging device for said hopper, the said device having transverse series of seats for bottles adapted to register with the chutes in the said hopper, means normally

locking the said charging device against movement toward the said hopper, means operative by the bottle-advancing means for operating the retaining means to release bottles from the chutes into the seats in the conveyor, and means also operative by the conveyor-advancing means for rendering the retaining means operative and for operating the locking means thereby to release the charging device for movement toward the said hopper.

4. In bottle-cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor intermittently, of a charging hopper arranged above a portion of said conveyor, the said hopper having transverse series of chutes for bottles adapted to register at their lower ends with corresponding transverse series of seats on the conveyor, means for temporarily retaining the bottles in their chutes in the said hopper, a charging device for said hopper, the said device having transverse series of seats for bottles adapted to register with the chutes in the said hopper, a pivotally supported frame for said device, means normally locking the said frame against movement toward the said hopper, means operative by the bottle-advancing means for operating the retaining means to release bottles from the chutes into the seats in the conveyor, and means also operative by the conveyor-advancing means for rendering the retaining means operative and for operating the locking means, thereby to release the frame for movement toward the said hopper.

5. In bottle-cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor intermittently, of a charging hopper arranged above a portion of said conveyor, the said hopper having transverse series of chutes for bottles adapted to register at their lower ends with corresponding transverse series of seats on the conveyor, means for temporarily retaining the bottles in their chutes in the said hopper, a charging device for said hopper pivotally supported adjacent thereto, the said device having transverse series of seats for bottles adapted to register with the chutes in the said hopper, means controlled by the conveyor-advancing means for releasing the bottle-retaining means in the said hopper, and means preventing the swinging of the bottle-charging device about its pivotal support while the bottle-retaining means are inoperative.

6. In bottle-cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor intermittently, of a charging hopper arranged above a portion of said conveyor, the said hopper having transverse series of chutes for bottles adapted to register at their lower ends with corresponding transverse series of seats on the conveyor, means for temporarily retaining the bottles in their chutes in the said hopper, a charging device for said hopper supported adjacent thereto, the said device having transverse series of seats for bottles adapted to register with the chutes in the said hopper, means controlled by the conveyor advancing means for releasing the bottle-retaining means in the said hopper, and means preventing the movement of the bottle charging device to discharging position above said hopper while the bottle-retaining means are inoperative.

7. In bottle cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor intermittently, of a charging hopper arranged above a portion of said conveyor, the said hopper having transverse series of chutes for bottles adapted to register at their lower ends with corresponding transverse series of seats on the conveyor, doors in said chutes, above the bottom thereof, adapted to retain the bottles temporarily in said chutes, a shaft to which the doors in each series of chutes are secured, and means controlled by the conveyor-advancing means for rocking the said shafts to open said doors only when the conveyor shall have been moved a predetermined distance by its advancing means.

8. In bottle-cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor intermittently, of a charging hopper arranged above a portion of said conveyor, the said hopper having transverse series of chutes for bottles adapted to register at their lower ends with corresponding transverse series of seats on the conveyor, doors in said chutes, above the bottom thereof, adapted to retain the bottles temporarily in said chutes, means for opening said doors, and means controlled by the conveyor-advancing means for operating the door-opening means only when the conveyor shall have been moved a predetermined distance by its advancing means.

9. In bottle-cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor intermittently, of a charging hopper arranged above a portion of said conveyor, the said hopper having transverse series of chutes for bottles adapted to register at their lower ends with corresponding transverse series of seats on the conveyor, doors in said chutes, above the bottom thereof, adapted to retain the bottles temporarily in said chutes, a shaft to which the doors in each series of chutes are secured, an arm connected with each shaft, a slidably

mounted rod engaging said arms, a spring tending to move said rod to a position to retain the shafts in door-closing position, and means, operative by the conveyor-advancing means, for moving the said rod against said spring at predetermined time intervals.

10. In bottle-cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor, of a hopper mounted above a portion of said conveyor and having transverse series of chutes adapted to register with transverse series of seats in said conveyor, a charging device for said hopper, the said device comprising a bottle container having transverse series of seats adapted to register with the transverse series of chutes in the said hopper, a supporting frame for said bottle container, the said frame being pivoted adjacent to the upper end of said hopper, means for securing the said container to the said frame, and a counterbalance connected to the said frame and extending in the opposite direction from the pivot therefor.

11. In bottle cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor, of a hopper mounted above a portion of said conveyor and having transverse series of chutes adapted to register with transverse series of seats in said conveyor, a charging device for said hopper, the said device comprising a bottle container having transverse series of seats adapted to register with the transverse series of chutes in the said hopper, a supporting frame for said bottle container, and means movably supporting said frame in operative proximity to said hopper.

12. In bottle-cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor, of a hopper mounted above a portion of said conveyor and having transverse series of chutes adapted to register with transverse series of seats in said conveyor, a charging device for said hopper, the said device comprising a bottle container having transverse series of seats adapted to register with the transverse series of chutes in the said hopper, a supporting frame for said bottle container, a shaft connected with the upper portion of said frame and journaled near the upper portion of said hopper, an arm rigid with said shaft and extending away from the said frame, a counterweight on said arm, and means for securing the container to the said frame.

13. In apparatus for cleaning bottles, the combination, with a conveyor having transverse series of seats therein and means for advancing the conveyor, of a hopper mounted above a portion of the said conveyor and having transverse chutes adapted to register with transverse series of seats on the conveyor therebeneath, trap doors in said chutes above the lower ends thereof, a cam driven by the conveyor-advancing means, means operated by said cam for opening and closing said doors, a charging frame movably supported adjacent the upper or receiving end of the hopper, a bottle container secured to said frame and having transverse series of bottle seats adapted to register with the chutes in the hopper, a latch projection carried by the said frame, a catch, means normally holding said catch in engagement with the said projection, and means operated by said cam for operating the said catch thereby to disengage the same from the said latch only after the said doors shall have been closed.

14. In apparatus for cleaning bottles, the combination, with a conveyor having transverse series of seats therein and means for advancing the conveyor, of a hopper mounted above a portion of the said conveyor and having transverse chutes adapted to register with transverse series of seats on the conveyor therebeneath, bottle retaining means in said chutes above the lower ends thereof, a cam driven by the conveyor-advancing means, means operated by said cam for releasing the bottle-retaining means, a charging device movably supported adjacent the upper or receiving end of the hopper, the said device including a bottle container having transverse series of bottle seats adapted to register with the chutes in the hopper, a latch projection carried by the said device, a catch, means normally holding said catch in engagement with the said projection, and means operated by said cam for operating the said catch, thereby to disengage the same from the said latch only after the said bottle-retaining means are in operative bottle-supporting position in their respective chutes.

15. In bottle-cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor, of a charging hopper arranged above a portion of said conveyor, the said hopper having transverse series of chutes for bottles adapted to register at their lower ends with corresponding transverse series of seats on the conveyor, means for temporarily retaining the bottles in their chutes in the said hopper, and means for operating the bottle-retaining means thereby to deliver bottles from the chutes to the conveyor when the latter shall have been advanced a predetermined distance.

16. In bottle-cleaning apparatus, the combination, with a conveyor provided with transverse series of seats for bottles and means for advancing the said conveyor, of a charging hopper arranged above a portion of said conveyor, the said hopper having

transverse series of chutes for bottles adapted to register at their lower ends with corresponding transverse series of seats on the conveyor, means for temporarily retaining the bottles in their chutes in the said hopper, and means, operative by the conveyor-advancing means, for operating the bottle-retaining means to deliver the bottles from the hopper chutes to the seats in the conveyor only when the said conveyor shall have been moved a predetermined distance by its advancing means.

In testimony whereof, I hereunto affix my signature.

CHARLES H. LOEW.